Apache Trail Project

In Cooperation with
Arizona Department of Transportation and
Tonto National Forest

AZ FLAP SR 88(1)
MARICOPA COUNTY, AZ

ENVIRONMENTAL ASSESSMENT/ DRAFT INDIVIDUAL 4(F) EVALUATION

Prepared By:

U.S. Department of Transportation
Federal Highway Administration
Central Federal Lands Highway Division
Lakewood, Colorado

May 13, 2021

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U.S. Department of Transportation

Federal Highway Administration

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Submitted Pursuant to:

(Federal) 42 U.S.C. 4332(2)(c)

for

Apache Trail Project

AZ FLAP SR 88(1)

Maricopa County, AZ

Additional information may be obtained from the following individuals:

Dustin Robbins
Project Manager
Federal Highway Administration
12300 West Dakota Avenue, Suite 380
Lakewood, CO 80228
dustin.robbins@dot.gov

Kurtis J. Harris
Assistant SE District Engineer
Arizona Department of Transportation
PO Box 2717
Globe, Arizona 85502
kharris@azdot.gov

CURTIS R SCOTT Digitally signed by CURTIS R SCOTT Date: 2021.05.13 07:54:41 -06'00'

05/13/2021

Curtis Scott, P.E.
FHWA-CFLHD, Chief of Engineering

Date

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EXECUTIVE SUMMARY

This Environmental Assessment (EA) documents the impact studies for a proposed project to improve the Apache Trail Roadway. The Federal Highway Administration, Central Federal Lands Highway Division (CFLHD), in cooperation with the Arizona Department of Transportation (ADOT) and the United States Forest Service, Tonto National Forest (TNF), has been planning roadway improvements to 11.20 miles of State Route (SR) 88, the Apache Trail, between mileposts (MP) 229.20 and 240.60, Maricopa County, Arizona. The project is located on TNF lands and an ADOT easement crossing TNF lands. Recent disaster events resulted in significant damage to this roadway facility that affected the preliminary ongoing design. Funding for the project is through the Federal Lands Access Program (FLAP), in conjunction with a local funding match as well as supplemental funding from the Emergency Relief (ER) program as detailed below. FHWA-CFLHD is the lead federal agency for this project and is designing and constructing the project.

The Apache Trail is a 42-mile, winding historic road that links Apache Junction with Roosevelt Lake through the Superstition Mountains and TNF. The Apache Trail is paved from Apache Junction to approximately MP 220, while the remainder of the road is unpaved until just west of Theodore Roosevelt Dam and the junction of Apache Trail and SR 188. The proposed improvements would begin at MP 229.2 and extend approximately 11.16 miles east-northeast to MP 240.6. Within the project limits, the roadway surface consists of decomposed granite (DG), which requires frequent blading to maintain an effective surface. Contractor staging and use areas are proposed to occur within the ADOT right of way or in previously disturbed areas.

On June 8, 2019, the human-caused Woodbury Fire began in the Superstition Wilderness near the Woodbury Trailhead. This Forest Service land is full of rugged terrain with virtually no access which limited the ability of firefighters to safely confront the fire on land. Over the course of the summer, the fire grew burning a total of 123,875 acres. Within Tonto National Monument, 88% (989 acres) of the land was burned. Although previous fires had burned small sections of the Monument, this was the largest in recorded history. Large and severe wildfires present a major threat to watershed health, because they can impair watershed condition, alter hydrologic and geomorphic processes, and ultimately degrade water quality. Wildfires can lead to changes in flow regimes, flood frequency, erosion, and debris flows. Wildfires can also lead to significant changes in stream water chemistry, and post-fire sediment-driven transport can lead to increases in contaminant loads. The historic Woodbury Fire reached full containment in the summer of 2019. However, on September 23, 2019 and November 19, 2019 severe thunderstorms originating from the remnants of Tropical Storms Lorena and Raymond respectively moved over the project area for the Apache Trail project. Excessive rainfall over this denuded and degraded watershed resulted in significant flooding of the Apache Trail roadway. Much of the roadways drainage features, many which were historic character defining features for the Apache Trail (SR 88), were damaged or destroyed.

The Apache trail has qualified for funding under the Emergency Relief program. Congress authorized in Title 23, United States Code (U.S.C.), Section 139(1), a special program from the Highway Trust Fund for the repair or reconstruction of Federal-aid highways and roads on Federal lands which have suffered serious damage as a result of (1) natural disasters or (2) catastrophic failures from an external cause. This program, commonly referred to as the

emergency relief or ER program, supplements the commitment of resources by States, their political subdivisions, or other Federal agencies to help pay for unusually heavy expenses resulting from extraordinary conditions.

In response to changing hydraulic conditions and recent failure events, the FHWA-CFLHD in partnership with the ADOT and U.S. Forest Service (USFS) reassessed the ongoing design approach to the Apache Trail project. Damage to the roadway surface, embankments, culverts and other drainage features have been documented within the project limits. Within the project limits, the scope of the proposed activities would include, roadway paving; replacing, repairing, upsizing, extending and/or cleaning roadway culverts; placement of decomposed granite aggregates to reestablish roadway crown and drainage paths; standardizing roadway width; cutting back slopes to improve line of sight distance; removing decomposed aggregate berms along roadway margins; general maintenance activities; various culvert treatments; and installation of erosion control elements, consisting of constructing gabion baskets in existing roadway ditches and placing rip-rap within existing drainage channels. The total cost of the project is estimated at $13.4 million.

WHAT'S IN THIS DOCUMENT

The Federal Highway Administration (FHWA) Central Federal Lands Highway Division (CFLHD), in cooperation with Arizona Department of Transportation (ADOT) and Tonto National Forest (TNF), has prepared the Apache Trail Project Environmental Assessment (EA), which examines the potential environmental impacts of the alternatives being considered for a 11.16-mile section of the Apache Trail located within TNF, Arizona. This document describes why the Apache Trail Project is being proposed, alternatives for the project, the existing environment that could be affected by the project, the potential impacts from each of the alternatives, and the proposed avoidance, minimization and/or mitigation measures.

What You Should Do

- In accordance with 23 CFR 771.119 this EA will be available for public review and comment for 30-days.

- Please read this document by accessing the project's web site: https://highways.dot.gov/federal-lands/projects/az/apache-trail. Or you can access via ADOT's web site at https://azdot.gov/projects/southeast-district-projects or TNF's web site at https://www.fs.usda.gov/alerts/tonto/alerts-notices.

- We welcome your comments. If you have any comments about the proposed project, please send your written comments to:

  Dustin Robbins
  Project Manager, FHWA-CFLHD
  12300 West Dakota Ave, Suite 380
  Lakewood, Colorado 80228

  or by e-mail to: dustin.robbins@dot.gov.

Before including a personal address, phone number, e-mail address, or other personal identifying information in written comments, anyone providing written comment should be aware their entire comment – including their personal identifying information – may be made publicly available at any time. While anyone wishing to comment may ask the FHWA-CFLHD in their comment to withhold their personal identifying information from public review, the FHWA-CFLHD cannot guarantee it will be able to do so.

- Send comments by the deadline: June 19, 2021

For individuals with sensory disabilities, this document can be made available in Braille, large print, on audiocassette, or on computer disk. To obtain a copy in one of these alternate formats, please call, email or write to Dustin Robbins at 720-963- 3586, Dustin.Robbins@dot.gov or 12300 West Dakota Ave., Suite 380, Lakewood, CO 80228.

What Happens Next

After comments are received from the public and reviewing agencies, CFLHD, in cooperation with ADOT and TNF, will respond to comments, prepare the final environmental decision document and may: (1) give environmental approval to the proposed project, (2) conduct additional environmental studies, or (3) abandon the project. If the project is given environmental approval, part, or all, of the project can be designed and constructed after all of the required permits or agreements are obtained.

Following public and agency review of the EA, FHWA-CFLHD in coordination with ADOT and TNF, will update the environmental analysis, if necessary, in response to comments received during the 30-day public review of the EA. Mitigation measures may be replaced with equal or more effective measures prior to project approval. If the impacts of the proposed project remain less than significant, then CFLHD will conclude the National Environmental Policy Act (NEPA) process with a Finding of No Significant Impact (FONSI). Because the environmental analyses and impact calculations contained in the EA are based on conceptual design, the impacts represent a worst-case scenario. Refinements undertaken through the design process would be anticipated to lessen both the extent and severity of impacts presented in this EA.

A Federal agency may publish a notice in the Federal Register, pursuant to 23 USC §139(l), indicating that one or more Federal agencies have taken final action on permits, licenses, or approvals for a transportation project. If such notice is published, claims seeking judicial review of those Federal agency actions will be barred unless such claims are filed within 150 days after the date of publication of the notice, or within such shorter time period as is specified in the Federal laws pursuant to which judicial review of the Federal agency action is allowed. If no notice is published, then the periods of time that otherwise are provided by the Federal laws governing such claims will apply.

ACRONYM LIST

AASHTO	American Association of State Highway and Transportation Officials
ACHP	Advisory Council on Historic Preservation
ADEQ	Arizona Department of Environmental Quality
ADOT	Arizona Department of Transportation
ADWR	Arizona Department of Water Resources
AGFD	Arizona Game and Fish Department
AJD	Approved Jurisdictional Determination
APE	area of potential effect
ARPA	Archaeological Resources Protection Act
ASM	Arizona State Museum
ASTM	American Society for Testing and Materials
BA	biological assessment
BMP	best management practices
BLM	Bureau of Land Management
CAA	Clean Air Act
CEQ	Council on Environmental Quality
CFLHD	Central Federal Lands Highway Division
CFR	Code of Federal Regulations
CO	carbon monoxide
CWA	Clean Water Act
dBA	A-weighted decibels
DPS	distinct population segment
EA	environmental assessment
EIS	environmental impact statement
EPA	Environmental Protection Agency
FCDMC	Flood Control District of Maricopa County
FEMA	Federal Emergency Management Agency
FESA	Federal Endangered Species Act
FHWA	Federal Highway Administration
FIRM	flood insurance rate map
FLAP	Federal Lands Access Program
GIS	Geographic Informational Systems
GPS	Global Positioning System
HPTP	Historic Properties Treatment Plan
MBTA	Migratory Bird Treaty Act
MIS	management indicator species
MOA	memorandum of agreement
MP	milepost
MDP	Monitoring and Discovery Plan
n.d.	no date
NAAQS	National Ambient Air Quality Standards
NEPA	National Environmental Policy Act
NO_2	nitrogen dioxide
NO_x	nitrogen oxides
NPDES	National Pollutant Discharge Elimination System

NPS	National Park Service
NRCS	National Resources Conservation Service
NRHP	National Register of Historic Places
PM_{10}	particulate matter less than 10 micrometers in diameter
$PM_{2.5}$	particulate matter less than 2.5 micrometers in diameter
REC	recognized environmental conditions
ROW	right-of-way
SHPO	State Historic Preservation Office
SO_2	sulfur dioxide
SR	state route
SRP	Salt River Project
SWPPP	stormwater pollution prevention plan
TDML	total daily maximum load
TNF	Tonto National Forest
USACE	United States Army Corps of Engineers
USBR	United States Bureau of Reclamation
USDOT	United States Department of Transportation
USFS	United States Forest Service
USFWS	United States Fish and Wildlife Service
USGS	United States Geological Society
WOTUS	waters of the U.S.
WRCC	Western Regional Climate Center
WQLS	water quality limited segments

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CHAPTER 1: PURPOSE AND NEED

1.1 Introduction

The Federal Highway Administration, Central Federal Lands Highway Division (FHWA-CFLHD), in cooperation with Arizona Department of Transportation (ADOT) and Tonto National Forest (TNF), is proposing improvements to a 11.16-mile, gravel section of the Apache Trail (Arizona State Route [SR] 88) between milepost (MP) 229.2 near the Apache Lake Marina and MP 240.6 near the Theodore Roosevelt Dam; herein referred to as the project portion of the Apache Trail, SR88, the project corridor, and/or the project area. The entire project area is within Maricopa County, Arizona. The proposed improvements include applying four inches of aggregate base and a chip seal pavement to the 11.16-mile section. Improvements to sight distance in five spot locations would be completed to improve roadway safety. In addition, the project would replace, repair, and/or extend culverts that are not currently functional or have been damaged by flood events within the project area.

In recent storm events of 2019, ADOT Southeast District has observed severe damages on SR88 (Apache Trail) due to monsoon rains. The monsoons' effects were greatly supplemented by the effects of the Woodbury Fire. This fire destroyed the watershed's vegetation which decreased the infiltration factor while also increasing the rate of sedimentation. The debris and water flows are now too large for the current drainage infrastructure to carry. Culverts have been blocked by high sediment loads transported from the hill sides above the roadway and the resulting drainage paths have aggraded to the point that culvert inlets are no longer visible. Now, water and debris is flowing over the roadway and eroding away the road surface and embankment with every storm. Some culverts have already failed under these conditions with significant scour holes occurring next to embankments, headwalls and wingwalls. These conditions will continue to worsen and repeat until permanent hydraulic solutions, that can pass the water and debris loads, are implemented on this route.

This Environmental Assessment (EA) has been developed to meet FHWA-CFLHD's obligations as the lead agency under the National Environmental Policy Act (NEPA) of 1969, as amended. The analysis in this document concentrates on aspects of the project that could have a significant effect on the environment and/or historic resources, and identifies feasible measures to mitigate (i.e., reduce or avoid) these impacts. Two funding programs are being utilized on this project as discussed below.

1.2 Project Funding

1.1.1 Federal Lands Access Program

The proposed improvements are administered under the Federal Lands Access Program (FLAP), which provides funds for projects on "access transportation facilities." An access transportation facility is a public highway, road, bridge, trail, or transit system that is located on, is adjacent to, or provides access to federal lands for which title or maintenance responsibility is vested in a state, county, town, township, tribal,

municipal, or local government. The FLAP supplements state and local resources for public roads, transit systems, and other transportation facilities, with an emphasis on high-use recreation sites and economic generators.

The proposed project was placed in the FLAP in 2017 with matching funds from ADOT. The estimated cost of construction for road improvements is approximately $9 million. Funding for the project is programmed for obligation in FY 2021, pending environmental reviews and all necessary approvals.

1.1.2 Emergency Relief Program

The proposed hydraulic repairs are administered under the Emergency Relief program. Congress authorized in 23 U.S.C. Section 139(1), a special program from the Highway Trust Fund for the repair or reconstruction of Federal-aid highways and roads on Federal lands which have suffered serious damage as a result of (1) natural disasters or (2) catastrophic failures from an external cause. This program, commonly referred to as the emergency relief or ER program, supplements the commitment of resources by States, their political subdivisions, or other Federal agencies to help pay for unusually heavy expenses resulting from extraordinary conditions.

The applicability of the ER program to a natural disaster is based on the extent and intensity of the disaster. Damage to highways must be severe, occur over a wide area, and result in unusually high expenses to the highway agency. Applicability of ER to a catastrophic failure due to an external cause is based on the criteria that the failure was not the result of an inherent flaw in the facility but was sudden, caused a disastrous impact on transportation services, and resulted in unusually high expenses to the highway agency.[1]

While the majority of Apache Trail is affected by this, an emergency relief funding request for the area between Mile Posts (MP) 229.2 and 240.5 has been approved conditioned upon NEPA clearance. In addition to the FLAP funded improvements, this EA assesses impacts from ER funded repairs approved for this roadway. Under the ER program, approximately $4.4 million in drainage and roadway repairs have been approved. Considering the effects of the past two tropical storms and the damage Apache Trail sustained during these high flow events; it is apparent that adding the additional drainage improvements now means saving millions in emergency repair costs which would be incurred after future storm events.

The ER program funds that are provided following a disaster may be used on repairs that improve the long-term resilience of the Federal-aid highways, if 1) consistent with current standards, or 2) the State DOT demonstrates that the resilience feature is economically justified to prevent future recurring damage.[2]

The FHWA defines resilience as the ability to anticipate, prepare for, and adapt to changing conditions and withstand, respond to, and recover rapidly from disruptions.[3]

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[1] https://www.fhwa.dot.gov/programadmin/erelief.cfm
[2] https://www.fhwa.dot.gov/specialfunding/er/191011.cfm

[3] https://www.fhwa.dot.gov/specialfunding/er/191011.cfm

Transportation agencies across the country are assessing ways to ensure that transportation infrastructure is resilient and is prepared for and able to withstand, respond to, and quickly recover from disasters in the future.

Resilience includes the ability of transportation agencies to adapt State transportation infrastructure and assets to changing conditions. Characteristics that make roads and bridges more resilient include features such as hydraulic structures engineered to accommodate streamflow up to or exceeding the level of the return period storm the agency has decided is the proper level of risk, shoreline stabilization methods such as stone or vegetation that prevent road erosion from flooding, scour protection measures for bridge piers, and the siting of facilities to avoid hazardous areas and minimize exposure.

FHWA-CFLHD's proposed design incorporates features that increase the resiliency of the Apache Trail to reduce repair costs, improve safety, and reduce travel disruption.

The total cost of the project, including roadway improvements and emergency repair, is estimated at $13.4 million.

1.3 Route Description

The Apache Trail is a 42-mile, winding road that links Apache Junction with Roosevelt Lake through the Superstition Mountains. The historic road is considered one of Arizona's transportation "crown jewels" and is listed in the Arizona Register of Historic Places. It has also been previously determined eligible for inclusion in the National Register of Historic Places (NRHP). The road features scenic views of the Salt River, Canyon Lake, Apache Lake, and the adjacent mountains. While the road is on US Forest Service land, it is maintained by ADOT. The Apache Trail is paved from Apache Junction to approximately MP 220, while the remainder of the road is unpaved (historically a decomposed granite surfacing material) until just west of Roosevelt Dam and the junction of the Apache Trail and SR 188. The portion of the road between MP 220 and the Apache Lake Marina includes Fish Creek Hill, a notoriously steep, narrow, and windy portion of the historic route. The proposed project area is defined as the portion of the Apache Trail between MP 229.2 at the turn off to the Apache Lake Marina and MP 240.6 where the gravel road turns to asphalt (Figure 1 and Figure 2). Within the project area, the existing gravel roadway width is between 18 feet and 28 feet. The route passes through mountainous terrain with vertical grades ranging from 0.5% to 18%.

Figure 1. Project Vicinity Map

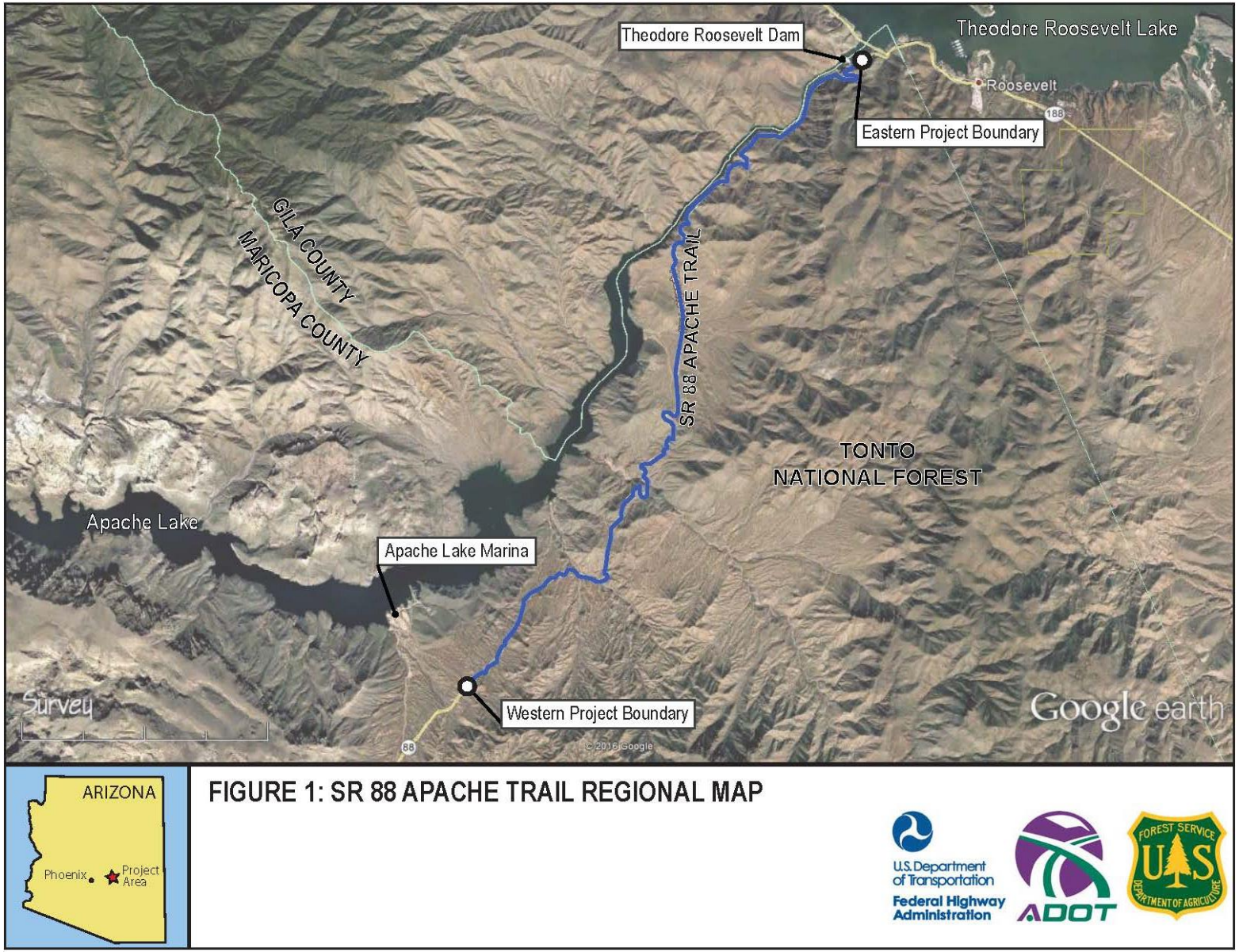
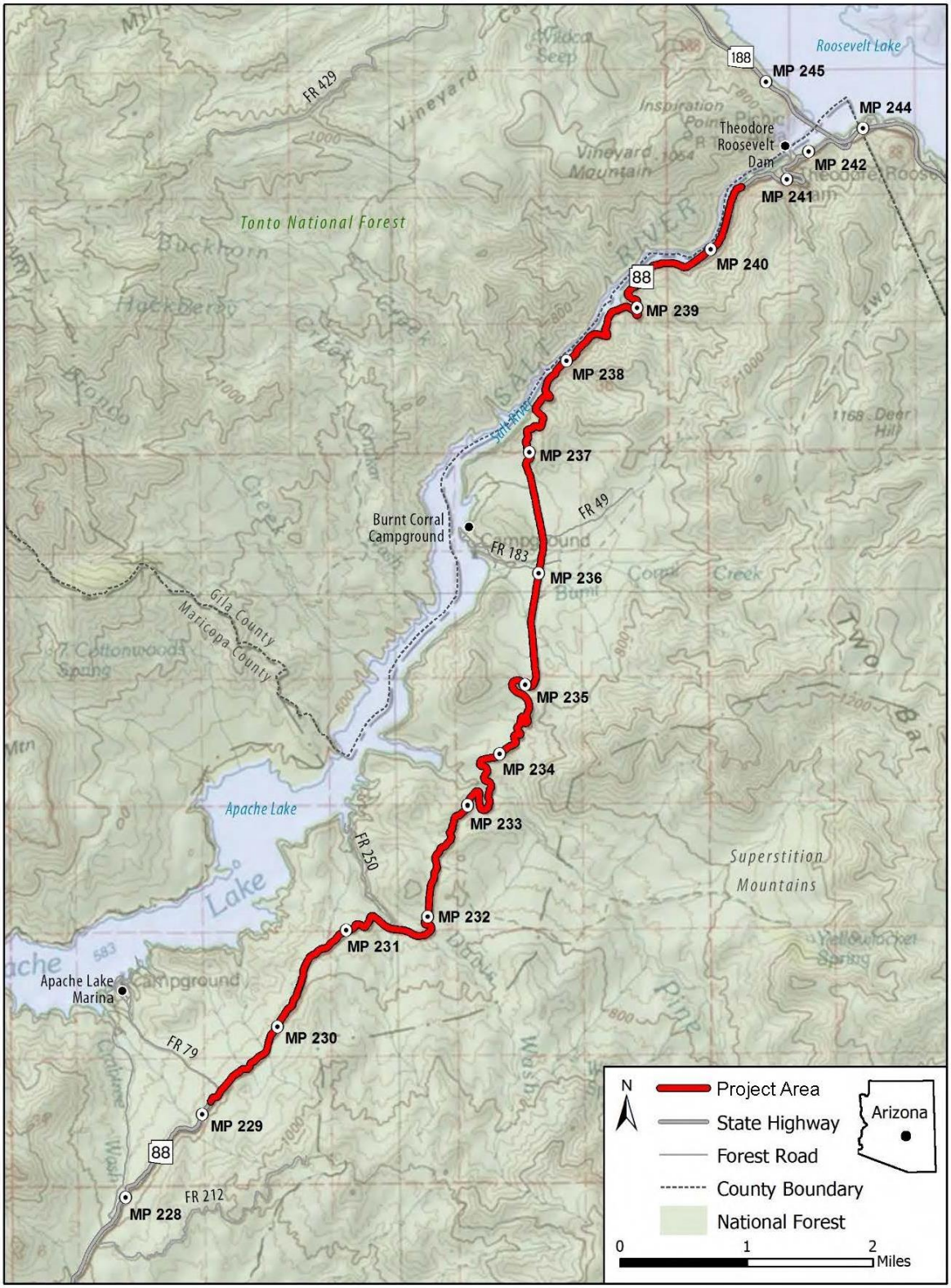


Figure 2. Project Corridor with Mileposts



1.4 Purpose, Need, and Objectives

The purpose of the project is to improve the resiliency of the road corridor to reduce maintenance demands, and improve and maintain accessibility while protecting elements of the historic road, as practicable.

The project is needed because routine maintenance requiring the continual importing of material and regrading of the road surface contributes to watershed damage, places the roadway at further risk to unintentional damage, and requires extensive financial resources as described further below. Undersized culverts can't handle flows during heavy rain events resulting in road washouts that lead to further degradation to the watershed and limit public access. The project is needed for the followign reasons:

Culvert pipe damaged from road blading

- Vehicular use of the decomposed granite surfacing material on the road emits large volumes of fugitive dust that limits sight distance and contributes to poor air quality.
- Given the erosive nature of the decomposed granite, excess surfacing material is frequently lost to roadside ditches and washes and during rain events it has the potential to impact water quality within the adjacent Apache Lake.
- The decomposed granite surfacing requires frequent blading to maintain a drivable surface and the constant routine maintenance results in the ongoing risk of unintentional damage and/or burying of individual features of the historic roadway.
- Supply of the historically used decomposed granite surfacing is in short supply and ADOT will need to seek an alternative fill source, which may differ in appearance and require substantial funds to bring onsite.
- Damaged and undersized culverts increase flooding of the road during heavy rain events resulting in road washouts.
- Roadway damage has resulted in temporary closures of portions of the project area thereby limiting access for visitors, nearby residents, TNF employees, and local business staff. Significant erosion and continual roadway degradation poses a risk for long-term roadway closure affecting access to the project area.

Objectives for the project include the following:

- Reduce particulate pollution in Maricopa County to improve air quality.
- Encourage drivers (especially those pulling boat trailers) to access the marina from the north by providing a hardened, resilient, and more trailer-friendly route.
- Enhance the long-term preservation of Fish Creek Hill by reducing the volume of marina-bound traffic on this section of the Apache Trail.

CHAPTER 2: ALTERNATIVES

This section describes the proposed action and the project alternatives that were developed pursuant to NEPA to meet the project purpose and need while avoiding or minimizing environmental impacts. The alternatives evaluated in this EA include the No Action Alternative and the Action Alternative.

2.1 No Action Alternative

Under the No Action Alternative, there would be no changes to the existing roadway.

- The dirt road surface would continue to deteriorate due to age, use, and storm events.
- Ongoing weekly maintenance activities would continue to be required to control washboarding and maintain a drivable surface. These activities would include blading the road surface, which requires the importing of material. The continual importing of material and grading would continue to contribute to ongoing watershed damage and place intact historic features at risk of unintentional damage.
- The fill side windrow (berm) which has been bladed to the outside edge of the fill side along much of the project corridor would remain in place. Maintenance crews would continue to actively take from or add to this material, which informally delineates the edge of the travel way.
- The roadway width would continue to vary along the 11.16-mile stretch of road ranging between 16-30 feet.
- No actions to address sight distance improvements or improve signage would occur.
- No actions would be taken to replace, repair, or extend culverts that are not functioning, failing, or have failed. Erosion and deterioration around non-functional culverts during storm events would continue to cause damage to the road and its remaining historic elements.

2.2 Action Alternative (Proposed Project)

Under the Action Alternative, improvements would be made to 11.16 miles of the Apache Trail between milepost 229.2 and milepost 240.6 (Figure 3). Generally, the project area includes the area approximately 30 feet on either side of the roadway centerline for a total width of approximately 60 feet. The project area widens to varying widths at areas of proposed drainage repair/improvements and/or slope setbacks. All project-related work and ground-disturbing activities, including contractor staging and use areas, would occur within the ADOT right of way, within a temporary easement from TNF, or within previously disturbed areas within TNF such as pullouts and parking areas.

The Action Alternative would be anticipated to take one season (9-12 months) to complete. The majority of the project would be constructed with single lane closures, maintaining a minimum 10-foot lane and minimizing construction-caused delays to public traffic.

The proposed improvements would include the following:

- Rehabilitating and chip sealing the 11.16-mile segment of road.
- Paving under the chip seal in steep segments of the road where the grade exceeds 8%.
- The proposed project would generally maintain the existing roadway widths. The design would include two template widths of 20 feet and 24 feet. Along some straight sections of the road, the 24-foot template width would be narrower than the existing surface. Where possible, spot widening would occur to achieve either the 20- or 24-foot width. In isolated areas where the roadway width varies between 16 feet to 20 feet in bench width, the road would be constructed to the greatest extent possible while remaining on the existing road bench, but would likely remain less than 20 feet.
- Minor safety improvements including sight distance improvements and signage. Five areas were identified by ADOT and FHWA-CFLHD as locations to improve safety by cutting back cut slopes (slope setbacks) to improve sight distance (Table 1). One location in particular would better align sight as drivers approach Pine Creek Bridge (MP 233.5) from the north. These locations are depicted on Figure 3.

Table 1. Action Alternative Site Distance Improvements

Milepost	Which Side of the Road	Proposed Action
MP 229.5	South	10' from toe of slope, lay back at 1:2
MP 229.6	South	10' from toe of slope, lay back at 1:2
MP 229.9	South	5' from toe of slope, lay back at 1:2
MP 233.5	North	10' from toe of slope, lay back at 1:2
MP 234.5	North	10' from toe of slope, lay back at 1:1.5

- The proposed vertical alignment would match the existing vertical curvature, but an overall grade raise would occur with each of the following scenarios:
  - A 1.5-inch chip seal on top of a 4-inch aggregate base would result in a raise of 5.5 inches.
  - In the steepened areas, a total grade raise of 8.5 inches would occur, consisting of 1.5 inches of chip seal, 3 inches of asphalt, and 4 inches of aggregate base.
  - In those spot locations where the bench width is less than 20 feet, 4 inches of subgrade material would be removed, and 4 inches of an aggregate base and 1.5 inches of a chip seal would be added resulting in an overall grade raise of 1.5 inches.
  - In overlapping areas that are steep and narrow, the narrow width would be the controlling criteria. Areas with grade raises would taper to provide a smooth riding surface.

- The excess fill material within the fill side windrow (berms) would be removed and/or regraded back into the roadway. Excess material removed would be carried offsite or stockpiled in a previously disturbed area for future use by ADOT and/or TNF.

- An armored ditch would be constructed along the roadway in spot locations to direct high runoff flows away from steep and narrow sections of the road and towards existing and/or new culverts.

- At numerous locations, culverts within the project area would be replaced, repaired, lined and/or extended. Some culverts will be replaced with concrete box culverts to account for changes in drainage volume and debris passage needs. Additional improvements would be made to stabilize drainage areas that have scoured or aggraded where needed to restore proper hydrologic function. Four culvert treatment options have been identified to address erosion and drainage issues that are affecting the current roadway and the structural integrity of existing roadway structural features. A description of the four proposed scour treatment options follows below, and schematic drawings are contained in Appendix A.

  - **Treatment A:** Treatment would include a standard apron end section, which would serve to spread drainage flow at the transition from the culvert outlet to the natural drainage channel, or to sheet flow where no natural drainage exists. These improvements would be installed below and downslope from existing culvert outlets, and would not modify any existing structural elements. Design elements would include the following:

    - Placement of rip-rap along drainage channels to prevent additional scour and erosion
    - Installation of a geotextile filter topped with fill dirt within existing scour slopes below culvert outlets to match the grade of adjacent slopes
    - Installation of the apron end section below the culvert outlet.

  - **Treatment B**: Treatment B would be a modified version of the Treatment A apron end section, and would serve the same function, which is to distribute drainage flow at the transition from the culvert outlet to the natural drainage channel, or to sheet flow where no natural drainage exists. Design elements for Treatments A and B would be the same, the only exception is that Treatment B would include a thicker end section.

  - **Treatment C1**: Treatment C1 would include a retrofit option for an existing, perched outlet. Many perched pipes in the area have large scour damage at their existing outlet. These improvements would be installed below and downslope from existing culvert outlets, and would consist of extending existing outlet pipes downslope to arrest erosion damage. Design elements would include the following:

    - Filling scour holes to stabilize the slope
    - Adding a bend joint to the existing outlet to extend the existing pipe down the side of the roadway prism. At the toe of slope, another bend

joint would be added to extend the pipe a distance downslope from the roadway prism

- Placement of rip-rap along drainage channels to prevent additional scour and erosion (as needed)
- Installation of a geotextile filter topped with fill dirt within existing scour slopes below culvert outlets to match the grade of adjacent slopes (as needed)
- The extended pipe would terminate with the installation of the Treatment A apron end section.

- **Treatment C2:** Treatment C2 is a modified version of the Treatment C1 retrofit option and would be installed in areas where it would be impractical to extend the existing culvert outlet pipe to the toe of the roadway prism. Design elements would include:
  - Adding a bend joint to the existing outlet to extend the existing pipe down the side of the roadway prism, short of the toe of slope.

2.2.1 Construction

In general, construction activities for the proposed project would include minor clearing and grubbing, grading, placement of crushed aggregate base and paved surface, drainage improvements, installation of signs, and other safety related features necessary to meet current design practice. A summary of construction information and assumptions based on the current design and schedule is provided in Table 2.

In general, construction activities would be within the 20- to 24-foot wide alignment, but there could be temporary disturbance up to 10 feet on either side of the alignment. Additional disturbance could be required where large drainage structures are proposed. In constrained or environmentally sensitive areas, including areas with active farmland and biologically sensitive areas, construction activities outside the 20- to 24-foot wide alignment would be minimized to the extent feasible.

Timing and Duration

It is anticipated that design for the project will be completed in late 2022. Construction of the proposed project could begin as early as late 2021. The actual start of construction will be dependent upon funding availability. The estimated construction duration is approximately 12 months. This period would accommodate construction of the entire alignment.

Utility Relocations and Installations

A telephone utility line runs along and across the Apache Trail within the project area. The utility line would be relocated outside of the area of impact or temporarily moved during construction to avoid any impacts or disruption to service. No other utilities are located within the project area.

Construction Staging

Construction, equipment staging, and stockpiling would take place within the ADOT right of way or within a temporary easement from TNF. To the extent possible, staging

areas will be located within previously disturbed areas such as pullouts and parking areas.

All equipment and materials would be stored, maintained, and refueled in designated portions of the staging areas in accordance with permit requirements. As such, there would be no staging in areas with sensitive biological or cultural resources or adjacent to drainages.

Table 2. Preliminary Construction Estimates[a]

Construction Information	Proposed Project
Construction Duration	9 to 12 months
Construction/Alignment Length	11.16 miles
Estimated Total Disturbance Area	38 acres
Earthwork Quantities[b]	
Excavation	16,000 cubic yards
Estimated Import[c]	
Roadway Aggregate	37,500 tons
Asphalt	6,200 tons
Portland Cement Concrete	2,200 square yards
Estimated Waste[d]	16,000 cubic yards
Estimated Pavement	
Roadway	155,500 square yards
Excavation/Grading Depth	Up to 4 inches (typical)

[a] Estimated quantities are based on preliminary design and subject to change.

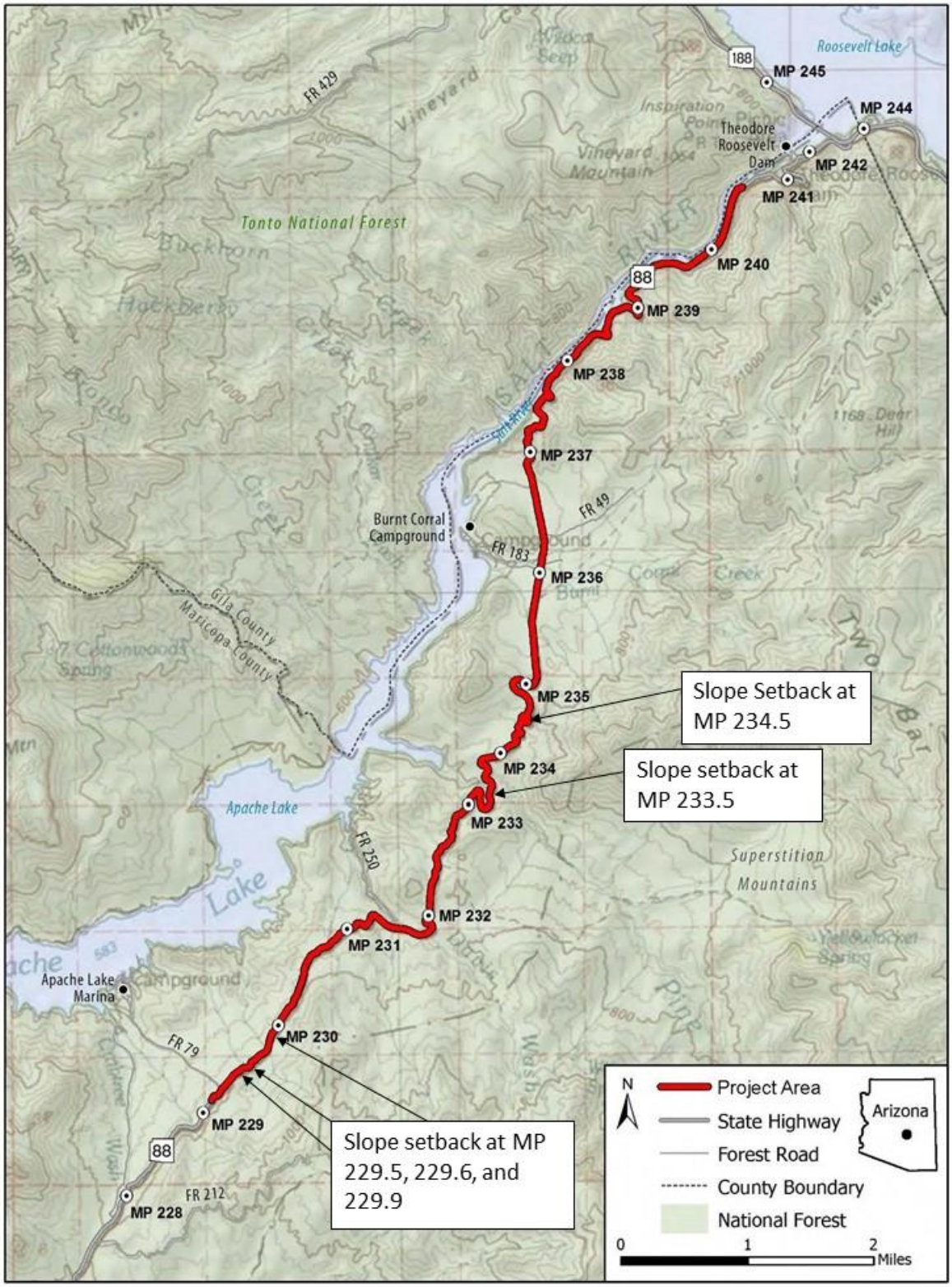
[b] The excavation material would be used to construct embankment/fill, and no fill would be imported. For the Proposed Project, the current estimated earthwork quantities yield a volume of waste identified under "Estimated Waste."

[c] The import materials would be used for paving the roadway and low water crossings. These estimates are independent of and have no direct correlation to the Earthwork Quantities identified above.

[d] This includes the remaining excavation material that is not used for embankment construction/fill. Approximately 10,000 cubic yards would go to a USFS-permitted ADOT waste pit near the project site, with the remaining waste hauled off site.

Source: The construction information is provided by Federal Highway Administration's Central Federal Lands Highway Division based on current design and schedule.

Figure 3. Location of Site Distance Improvements Along Project Corridor



2.3 Preferred Alternative

The benefits and impacts of the No Action Alternative and Proposed Project Alternative, as further discussed in Chapter 3, were analyzed and considered in the identification of a preferred alternative. Based on this analysis and the ability of each alternative to meet the purpose and need of the project, CFLHD has identified the Proposed Project as the Preferred Alternative. This determination is subject to public review and final selection of a Preferred Alternative will occur following the public review and comment period.

After the 30-day public comment period, all comments will be considered and CFLHD will select a Preferred Alternative. A final determination of the project's effects on the environment will be identified at that time. If it is determined the proposed action would not significantly impact the environment, a Finding of No Significant Impact will be issued in accordance with NEPA.

2.4 Alternatives Considered but Dismissed from Further Evaluation

The resiliency of the roadway, maintenance demands, accessibility, and unintentional impacts to the historic elements of the road were identified through project scoping as issues the project needs to resolve. During the scoping process which included two public scoping periods, one conducted July 14, 2017 through October 2, 2017 and a second one conducted on June 23, 2020 through July 23, 2020 (following the addition of ER elements to the project), it also became apparent that options for addressing these issues would be constrained by the Apache Trail's historic significance and its remote and ecologically sensitive location within TNF. Based on this information, the following alternatives or options were considered during preliminary design, but were dismissed either because they were beyond the scope of the project, had unacceptable impacts, or did not meet the project purpose and need.

- **Surfacing with Asphalt Millings:** Use of a milled asphalt surface over the length of the project area was considered for the project; however, this type of surfacing would still require ongoing maintenance. In addition, compared to the existing surfacing, the dark coloring of asphalt millings compared to the existing unpaved surface would result in a greater visual impact to travelers on the historic route. Due to both the high cost of ongoing maintenance and the continued potential for unintentional impacts to historic elements of the road associated with maintenance, this alternative was not considered further.
- **Straight Aggregate Base Surfacing:** Use of a straight aggregate base surface material was considered for the project; however, given the steep gradient of the road and the frequency of flash flood events in the area, concerns were raised over sediment transport, the continued need for maintenance, and the continued potential for maintenance-related unintentional impacts to historic elements of the road. In addition, the cost of resurfacing with an aggregate base would be high when compared to the temporary nature of any maintenance benefits. As a result, this alternative was not considered further.

- **Widening and Paving to Meet AASHTO Design Standards:** To meet AASHTO design standards along the project portion of the Apache Trail, the roadway would need to be widened with shoulders and a clear zone would need to be established. In addition, numerous curves do not meet the design standards. Widening the roadway and improving all substandard curves to meet current design standards would require a substantial amount of ground disturbance. The roadway traverses or is adjacent to special status species habitat, and visual landscapes that are valued and intended for preservation within TNF. In addition, the roadway itself, in its current alignment, is a historic resource. Because of the context-sensitive nature of the project area, improving the roadway to meet current design standards would result in unacceptable impacts to natural and cultural resources, it was not considered further. Instead, the project proposes to narrow the road in areas to either a 24-foot or 20-foot width.

2.5 Permits and Approvals Needed

The following permits and approvals are required prior to construction:

- Section 106 consultation for potential effects to historic resources, with the Arizona State Historical Preservation Office (SHPO)
- National Pollutant Discharge Elimination System (NPDES) General Permit, issued by the Arizona Department of Environmental Quality (ADEQ) for stormwater discharges associated with construction and land disturbance activities.

CHAPTER 3: AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES

This chapter describes the resources that could be affected by the Action Alternative and an analysis of the impacts that are expected to result from its construction and implementation. The No Action Alternative is also analyzed as a baseline for comparison.

Under NEPA, an EA is used to determine if significant effects to the environment would result from the proposed actions. If yes, then an Environmental Impact Statement (EIS) must be prepared; if no, then a Finding of No Significant Impact (FONSI) is prepared to document the decision of the NEPA lead agency. Under NEPA, significance is based on the context and intensity of an impact. Context refers to who and what would be affected by the action. Intensity refers to the severity of the impact. The Affected Environment sections prepared for each resource, below, describe the context. The Environmental Consequences sections analyze the intensity.

The analyses that follow incorporate a conservative worst-case scenario based on conceptual design of the Action Alternative. The level of impact reported in this EA would be expected to decrease as design progresses.

A project area and individual study areas unique to each resource were defined in order to conduct the impact analyses that follow. For all resources, the project area is the construction limits of the Action Alternative, as described in Chapter 2 and depicted in Figure 3. Because the nature and extent of an impact differs by resource, individual study areas were defined to evaluate the existing condition and potential impact to each resource appropriately. For example, the study area for historic resources is a 200-foot wide corridor following the Apache Trail centerline, that extends up to 300 feet in width around several culverts and in areas being considered for slope setbacks. The study area for recreation and visitor experience is defined by destinations that are served by the Apache Trail.

3.1 Resources with Negligible to No Impact or that Do Not Exist in the Project Area

3.1.1 Environmental Justice

FHWA projects must comply with Executive Order 12898 of February 11, 1994, titled *Federal Actions to Address Environmental Justice in Minority Populations and Low Income Populations*. This executive order strives to avoid, minimize, or mitigate disproportionately high and adverse human health and environmental effects on minority or low-income populations. The project area is entirely within TNF. There are no residences within the project area. SR 88 does provide access to some seasonal housing near the Apache Lake Marina and Resort. Their status as low-income and minority populations is currently unknown; however, the actions proposed under this project are not expected to result in a disproportionately high adverse impact to any populations.

3.1.2 Floodplains

The project is located in an area that has not been delineated on the Federal Emergency Management Agency (FEMA) Flood Insurance Rate Map (FIRM) for the 100-year floodplain. Impacts to floodplains typically occur when the topography within a floodplain is substantially modified either by placement or removal of materials within the floodplain. Because this is resurfacing, drainage improvement, and rehabilitation project on existing alignment, this project will not substantially modify the floodplain topography in the project area. Therefore, no impacts to floodplains are anticipated.

3.1.3 Hazardous Waste and Materials

The Arizona Department of Environmental Quality's Hazardous Material Incident database was searched and no records were found within the project area. A recent ADOT project on a nearby portion of the Apache Trail conducted a Preliminary Initial Site Assessment (PISA) in September of 2016 (ADOT 2017). The study was prompted by proposed modifications to load-bearing structures and the removal of paint striping containing lead-based paint. The PISA gave that project area a "Low Priority" for further hazardous materials study. Due to the findings of the nearby recent survey, the undeveloped nature of the project area, and the absence of pavement and roadway paint, it was determined there is a low potential for hazardous waste and materials within the project area and this topic was not further analyzed. Standard construction practices will be implemented to prevent spills and soil or water contamination from hazardous materials used during construction and ensure proper handling of hazardous materials and waste if generated during construction.

3.1.4 Land Use

The planning, design, and construction of roads is often based on land use development patterns and trends, and affects existing land uses and plans and proposals for future development. Induced growth is an indirect impact that occurs when a project causes changes in the intensity and integrity, location, or pattern of land use.

The project is located within a unit of the National Forest Service, which controls the majority of the land surrounding the Apache Trail. Therefore, no change to land use and no induced growth is expected. The proposed improvements would primarily follow an existing roadway easement that ADOT has for purposes of maintaining the roadway. Drainage improvements would be considered, which could convert small spot locations of existing forest land to a use in correlation with drainage of the roadway. However, use of these areas within proximity of the roadway corridor would be consistent with TNF management plans for the area and would not prevent alternative use of the lands adjacent to the roadway.

3.1.5 Prime or Unique Farmlands and Agricultural Resources

According to the U.S. Department of Agriculture Natural Resources Conservation Service Resource Assessment Division, the project area does not contain any designated prime or unique farmland. In addition, the project area is located within mountainous, desert habitat within the TNF and is not available for farming.

3.1.6 Section 6(f) Properties

Section 6(f) of the Land and Water Conservation Act requires that the conversion of lands or facilities acquired with Land and Water Conservation Act funds be coordinated

with the Department of Interior. Usually replacement in kind is required. No lands that meet this criterion were identified within the study area.

3.1.7 Utilities

A telephone utility line runs along and across the Apache Trail within the project area. The utility line would be relocated outside of the area of impact or temporarily moved during construction to avoid any impacts or disruption to service. No other utilities are located within the project area.

3.1.8 Wild and Scenic Rivers

No rivers officially designated as wild, scenic, or recreational exist within the project study area.

3.2 Transportation

This section evaluates the potential impacts to access, safety, and traffic along the Apache Trail within the study area.

3.2.1 Regulatory Setting

The segment of the Apache Trail within the study area is maintained by ADOT. The Salt River Valley Water Users' Association quitclaimed the roadway to the State of Arizona in 1922. The transaction did not document a defined right of way even though the road was within federal TNF lands. On July 5, 2017, a highway easement deed was granted to ADOT, through the Arizona Division of FHWA, under the jurisdiction of the Department of Agriculture – U.S. Forest Service (USFS) in the State of Arizona. The right of way easement width established along the project corridor is 50 feet from each side of road centerline for a total width of 100 feet.

3.2.2 Affected Environment

Traffic

The Apache Trail is functionally classified as a rural major collector. There is no posted speed. The 2013 average annual daily traffic is approximately 150, with higher traffic volumes typically in winter (USDOT 2015).

In addition to passenger cars, pickup trucks hauling boats, trailers, and other recreation vehicles such as campers, frequently use the Apache Trail, including the portion of the road within the project area. Motorcyclists and bicyclists also travel the route and project area, especially during the winter. Portions of the road may be unsuitable or challenging for these vehicles. For example, motorcyclists may encounter difficulty driving on the unpaved surface, and trucks hauling RVs or boats may not be able to easily navigate Fish Creek Hill, a steep portion of the Apache Trail located west of the project area. Since the Apache Trail is a state highway, users may not anticipate some of these challenges. The Apache Trail is the sole access route for some users, particularly for recreational boaters hauling their boat to Apache Lake, which is accessed within the project area (USDOT 2015). Trucks hauling boats often access Apache Trail from state highway SR188 near the Theodore Roosevelt Dam to avoid using the Fish Creek Hill segment. The northern segment of Apache Trail becomes especially important for access to Apache Lake and its marina during times of closure on the Fish Creek Hill segment.

Safety

The project portion of the Apache Trail is in mountainous terrain with near-vertical rock faces on the cut side and steep drop-offs on the fill side. Vertical grades range from approximately 1% to 18%. The existing roadway is unpaved. Roadway widths vary from 16 feet to 30 feet, with a limited clear zone width (generally less than 5 feet). In dry conditions, dust generated from the decomposed granite surfacing material may negatively affect visibility. The decomposed granite surface is loose, requires frequent maintenance and often creates areas of rutting and/or washboarding. These problems create a raveled surface where cars are more likely to slide out of control and brakes do not work as effectively. Unfortunately, these conditions are frequently worse in areas where vehicles turn and brake, such as curves and steep grades, where vehicle control is most critical.

First-time visitors may not be aware that the Apache Trail is a historic road maintained to preserve historic and scenic value rather than create a fast and direct drive. Unaware visitors may not be prepared to drive the road as prudently as its conditions require. As noted in the U.S. Department of Transportation *Apache Trail, Tonto National Forest Observations, Considerations, and Recommendations from the Interagency Transportation Assistance Group (TAG)* Report (2015), while the conditions of the Apache Trail cause most drivers to reduce their speeds, thrill-seekers, those unaccustomed to the road, or confident frequent users may drive faster than is prudent, especially along the paved portion. These high speeds increase the hazard posed by the road's many curves (USDOT 2015). As noted in the 2001 *State Route 88 (The Apache Trail) Historic Context Analysis for Planning Safety Enhancements to the Trail*, speeding motorists have been a safety concern on the roadway since the early 1900s when accidents resulting from speeding drivers drove the U.S. Reclamation Service to set a speed limit for mountainous sections of the road and letters to drivers seen speeding "warned them that their right to use the road would cease if their bad habits continued" (Stein 2001).

Crash data from 2012 through 2017 was provided by the ADOT Traffic Records Section; however, due to the remoteness of the project area, it is suspected that the records are likely incomplete. During this 6-year time, 30 crashes were reported within the project limits. None of the reported crashes involved fatalities and no pedestrian or bicyclist injuries or fatalities were reported. The most common crash types reported were single vehicle rollovers and run-offs on the east side of the road with half of the crashes occurring on curves. In all the crashes, the roadway surface condition was reported as dry and most of the crashes occurred during the day and in clear weather. The most common contributing factor noted in the crash data was that the vehicle speed was too fast for conditions. The locations with the highest number of crashes were near milepost 237 (7 crashes: 2 sideswipes, 2 head on collisions, 2 runs off road right, 1 run off west side) and near milepost 233 (5 crashes: 4 crossed centerline, 1 ran off east side).

Access

The Apache Trail is a state highway and is signed to reflect this; however, the road is also a state historic road and has a character distinct from most other state highways. In addition, the Apache Trail functions as an access road in that it provides the only method of accessing some of TNF's attractions. As mentioned in the Recreation and Visitor Experience section, within the project area, the Apache Trail accesses several U.S.

Forest Service (USFS) day use sites, scenic overlooks, trailheads, campgrounds, and boat launches. These facilities include the Apache Lake Marina Resort, Davis Wash Shoreline Area, Burnt Corral Campground and Day Use Area, and the Three Mile Wash Shoreline Area. Access is also provided to a four-wheel-drive road network that accesses Deer Hill. Within the project area, the Apache Trail also provides access to telephone and transmission utilities.

Many people access the Apache Lake Marina, and other USFS facilities within the project area from the Phoenix area traveling east through Tortilla Flat and down Fish Creek Hill along the Apache Trail. This route requires people to drive along steep, unpaved and winding portions of the Apache Trail (as seen in Figure 4) to access these facilities. An alternate access route to the project area is available traveling east along U.S. Route 60 and then north on SR 188 and towards Roosevelt.

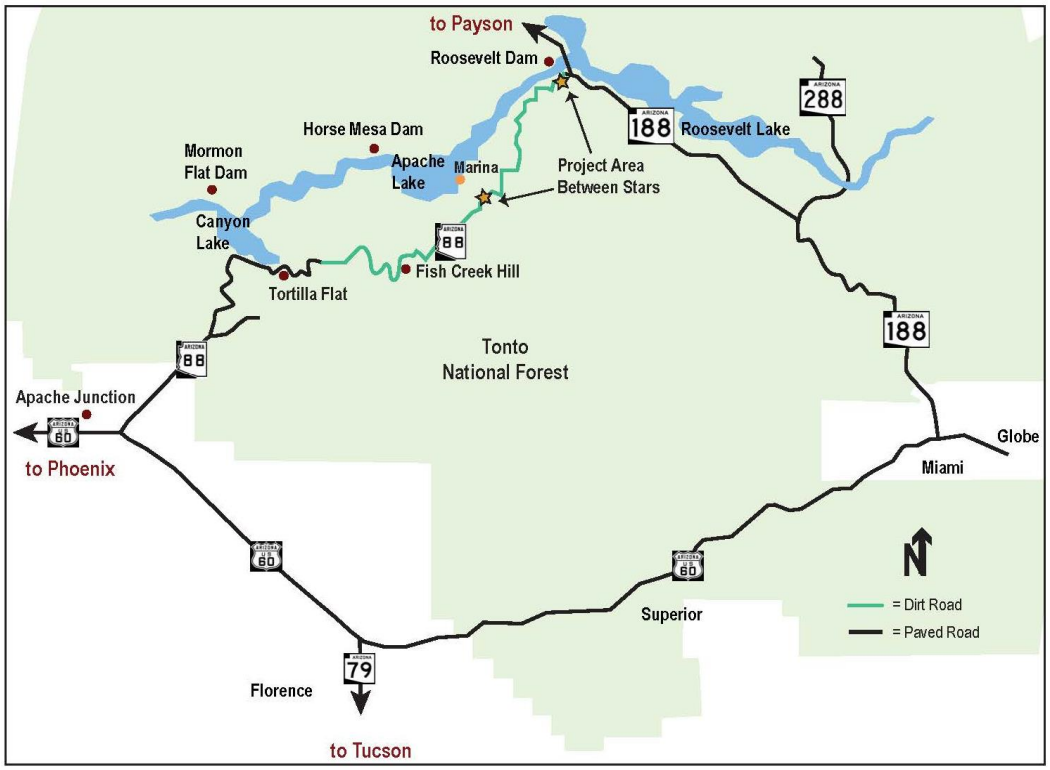


Figure 4. Regional Map

3.2.3 Environmental Consequences

No Action Alternative

Under the No Action Alternative, current roadway conditions would be maintained. There would be no changes to the road surfacing and no safety improvements would be implemented. The road would remain a decomposed granite surface and continue to vary widely in width, with poor sight distance in several areas. A variety of vehicles, including passenger cars, pickup trucks hauling boats, trailers, and other recreation vehicles such as campers would continue to utilize the project route. Many users would have accessed the project area via Tortilla Flats and Fish Creek Hill which would have

been challenging and alarming for some users even in its pre-damaged condition. Access through Fish Creek Hill already caused some users to turn around, limiting the number of people accessing the project area which resulted in minor adverse impacts to transportation. However, now that the Fish Creek Hill segment is closed (MP 220 to MP 229) with no timeline for when access to the area via this route would be restored, transportation impacts have been worsened.

Speed limits would remain unposted and signage along the route would remain limited. Rutting and washboarding would continue to be chronic problems along the project route and would continue to adversely impact vehicle control. Vehicles traveling at speeds faster than is prudent would continue to be a safety concern, especially along the wider straight portions of the road between MP 229-231 and MP 235-237. Between MP 235-237, a lack of pullouts or areas of interest would continue to limit traffic diversity in this area, contributing to the potential for excess vehicle speed and continued adverse impacts to safety. Roadway embankments damaged and narrowed by scour and washouts would remain unrepaired. Stability of compromised culverts with debris plugged inlets would remain, and safe and functional access along the route would be compromised.

The Apache Trail would continue to provide the only access route to several USFS day use sites, overlooks, trailheads, campground, and boat launches, many of them within the project area. As such, access to these amenities would continue to be restricted to those individuals willing to travel on sections of unpaved and unstable roads, resulting in continued adverse impacts to visitors uncomfortable with those driving conditions.

Action Alternative

Traffic

Under the Action Alternative, a chip seal surface would be applied along the project corridor in two template widths of 20 feet and 24 feet, depending on the location.

Implementation of the Action Alternative would provide a fully paved route between Phoenix and the Apache Lake Marina and Resort via U.S. Route 60 and Arizona SR 188. The availability of a fully paved route could entice visitors who were previously uncomfortable driving the unpaved road and thereby increase traffic along the project route. It is anticipated that the Action Alternative may result in a slight increase in trucks hauling boats, trailers, and other larger recreation vehicles along the project corridor, including an increase in those accessing the project area from the east. In response, it is anticipated there would be a decrease in the number of vehicles hauling boats and trailers to Apache Lake along the portion of SR88 between Tortilla Flats and Fish Creek Hill once or if access from that direction is restored.

Construction activities to implement the Action Alternative would temporarily impact access and traffic. A maximum daytime 30-minute delay combined with some temporary full closures would affect visitors; USFS employees and service providers; and ranchers, their families and employees en route to destinations along and beyond the project route. This delay and a temporary reduction to one operating travel lane would create temporary traffic lines and congestion, which would be particularly intensified during the peak spring and summer visitation season. Avoidance,

minimization, and mitigation measures described below would help offset these impacts.

Safety

Under the Action Alternative, speed limits would remain unposted; however, additional signage would be placed along the route, including advisory speeds along some curves. Slope setbacks in five spot locations would improve the driver's line of sight and reduce the potential for head-on collisions and vehicle-animal collisions. The application of a chip seal (and paving under the chip seal in steep segments of the road) would provide a more durable road surface thereby reducing rutting and washboarding and providing a huge benefit in friction and adhesion of tires to the road surface. This would result in a substantial safety benefit in terms of stopping distance and traction on wet roads and curves. Vehicles traveling at speeds faster than is prudent would continue to be a safety concern, especially along the straight portions of the road between MP 229-231 and MP 235-237; however, along these portions of the road, the chip seal surface would be narrower than the existing driving surface. The narrower driving surface could help to reduce driving speeds within these two straighter sections. Existing pull-outs help increase traffic diversity in these road segments. Collectively, these improvements would result in long-term benefits to safety on the project portion of SR88.

Access

Under the action alternative, the Apache Trail would continue to provide the only access route to several USFS day use sites, overlooks, trailheads, campground, and boat launches, many of them within the project area; however, applying a chip seal surface to the project portion of the Apache Trail, would provide the option of a fully paved access route between Phoenix and the Apache Lake Marina and Resort via U.S. Route 60 and Arizona SR 188. By improving access to recreational areas along SR 88, the project would contribute to the Forest Service's objective of managing Forest resources to connect people to the outdoors. Infrastructure improvements such as the proposed project contribute to a higher quality of life that is supported by access to natural environment and nature-based activities. The improved access may encourage additional visitors to Apache Lake who were previously intimidated by the driving conditions of the unpaved road resulting in long-term benefits to transportation access.

Conclusion

Overall, the Action Alternative would result in long-term beneficial impacts to safety as a result of improvements to driver's line of sight in five spot locations, additional signage, and the application of a more durable road surface. While vehicles traveling at speeds faster than is prudent would continue to be a safety concern, a narrower driving surface between MP 229-231 and MP 235-237 could help to reduce driving speeds in these two straighter road sections.

During construction, short-term adverse impacts to traffic would be anticipated because of delays, single lane travel, and temporary full closures; however, these temporary impacts would be mitigated to less than significant levels with implementation of the measures described below.

3.2.4 Avoidance, Minimization, and/or Mitigation Measures

The following measures would be implemented to minimize impacts:

- During the majority of the construction period, at least one lane of traffic shall remain open during construction with a maximum daytime 30-minute delay. Temporary full closures would be anticipated to accomplish specific construction activities, such as culvert replacements or blasting. Prior to Memorial Day, an extended delay from 9 am to 3 pm would be permitted with the contractor passing traffic once through this delay to perform blasting operations and major earthwork where maintaining a single traffic lane would not be feasible. Nighttime closures would be considered for culvert replacements or heavy earthwork/blasting as needed. Public notification of anticipated closures and delays would be posted on ADOT's and TNF's website and along the route. Prior to full closures, notice must be provided to the public, relevant local agencies, school districts, and emergency service providers.
- Emergency vehicles shall be permitted to pass through the construction limits during construction without delay.

3.3 Socioeconomics

This section addresses potential social and economic impacts to ranching operations, community services, and visitor expenditures as a result of the project. The study area includes commercial operations that are served by the project portion of the Apache Trail.

3.3.1 Regulatory Setting

NEPA policy (40 CFR § 1500.2) requires federal agencies to "…restore and enhance the quality of the human environment and avoid or minimize any possible adverse effects of their actions upon the quality of the human environment." NEPA regulations (40 CFR § 1508.14) define human environment as "the natural and physical environment and the relationship of people with that environment." Economic or social effects are to be addressed in a NEPA document when they are interrelated with natural or physical effects.

3.3.2 Affected Environment

Community and Emergency Services

Both the Arizona Highway Patrol and Maricopa County Sheriff's Office (MCSO) respond to motor vehicle accidents on the project portion of the Apache Trail. The MCSO has a station located at Apache Lake near the marina and MCSO deputies work in the area on weekends and some weekdays. Tonto Basin Fire Department, located in Roosevelt, is the closest first responder, providing fire, medical, and rescue emergency services to citizens and visitors in the project area. In the event of an accident within the project area, Gila County Sheriff's Office may assist until the arrival of MCSO. In the event of a wildfire in the project vicinity, USFS Tonto Basin District fire engines respond and may be assisted by the Tonto Basin Fire Department depending on the severity. If needed, additional USFS units respond from the Mesa, Globe and Payson Ranger Districts.

Ranching

The TNF area has a history of mining and cattle ranching. Cattle ranching has been, and continues to be, a traditional economy and lifestyle within and around the project and Globe areas. There are several ranches within TNF that remain in the same families who originally homesteaded the area in the 1870's. Within the vicinity of the project, there is one private ranch in-holding located approximately 2 miles west of the project start and along the Apache Trail. While none of their ranch operations are located within the ADOT right of way along the project corridor, the project does go through three pastures of the Roosevelt Grazing Allotment within TNF. The grazing permittee for the Roosevelt Allotment holds a Forest Service Term Grazing Permit. Cows regularly cross the Apache Trail to access water from Apache Lake in all three pastures. Terrain allows cattle access to and across the Apache Trail from Three Mile Wash (just west of MP 239) down the road to the cattle guard across the Apache Trail near Davis Wash (near MP 232). When cattle occupy these pastures, they utilize the road and road edges for travel between water sources and the areas with best feed when that is the easiest route for them. The project portion of the Apache Trail provides the only access to the Roosevelt Grazing Allotment. While the single ranch and use of the three grazing allotments

within the project area provide income for the local community, they compromise a very small percentage of total agricultural value within Maricopa County.

Visitor Expenditures

Trip-related spending by USFS visitors generates and supports economic activity for TNF and adjacent communities. As mentioned in the Recreation and Visitor Use section, the project portion of the Apache Trail provides access to several TNF day use sites, scenic overlooks, trailheads, campgrounds, and boat launches. Permits and use fees are required for boating, camping, and day use of these areas. While there is no specific revenue or use data available for the use of these sites, they are reported to frequently be at full capacity, especially on weekends, during the peak season between Memorial Day and Labor Day. Use of these areas contributes to the local economy. The Roosevelt/Tonto Basin Arizona area is dependent on the economic activity generated by tourism and recreation on the area lakes and river. The local economies of these small communities are tied to the local transportation network with the majority of recreation trips originating from nearby metropolitan areas outside the local area.

There is a private outfitter guide out of Tortilla Flats, Apache Trail Tours, who conducts multiple Jeep tours of varied length along the Apache Trail. As advertised on their website, one of their tours accesses the Reavis Ranch Trailhead, approximately 1.5 miles south and west of the project starting point at the Apache Lake Marina and Resort turnoff. While this private outfitter approaches the project area, they do not regularly utilize the project portion of the road on their tours.

Apache Lake Marina and Resort is a concessionaire within TNF and is located north of the project area along the shoreline of Apache Lake. It is only accessible by the project portion of the Apache Trail. The proposed project begins at the junction with the marina access road. The resort is the only marina on Apache Lake and operates under a permit from TNF. Amenities at the marina include 58 motel rooms, 101 wet slips, 30 day slips (no overnight docking), 30 RV spots, a restaurant, and a bar. The resort also allows primitive camping at the marina. Apache Lake is one of four reservoirs built along the Salt River as part of the Salt River Project (SRP). Out of all four lakes within the area, Apache Lake, and specifically the Apache Lake Marina and Resort is the only location where motel accommodations are available. Peak visitation occurs between Memorial Day and Labor Day and is heaviest on the weekends. During summer weekends, the resort is typically at full capacity. According to staff, the lowest tourism at the resort occurs between November and January. The resort employs approximately 20 staff year-round and about 36 employees during the peak season with all employees residing onsite during their 5-day work shift. Marina staff estimate that at least 60-70% of visitors come from the Tucson area with most of the remaining visitors coming from the Phoenix area. According to staff, a good percentage of marina patrons, especially those trailing larger boats, access the resort along 188 from the Roosevelt side. Resort staff have received complaints of vehicle, trailer, and boat damage from the condition of the Apache Trail and from the emotional anxiety of driving it. While individualized statistics for the marina and/or the Tonto Ranger District area are not available, trip-related spending by TNF visitors generates and supports a considerable amount of economic activity for forest concessionaires and adjacent communities.

3.3.3 Environmental Consequences

No Action Alternative

Under the No Action Alternative, the road surface would continue to deteriorate and be impacted by flash flood events. Frequent routine maintenance of the dirt road surface under the No Action Alternative could continue to temporarily delay ranchers accessing the Roosevelt Grazing Allotment and visitors, recreationalists, and outfitters utilizing those sections of the roadway. Ranchers and concessionaires who rely on the project portion of the Apache Trail as their sole access could experience short-term adverse economic impacts primarily related to temporary road closures and/or delays.

While many visitors seek out the Apache Trail because of its rugged character, poor road conditions may discourage potential visitors visiting the area and the destinations along the trail. Local businesses have reported that some customers avoid their establishment or do not return because they had a prior negative experience on the road. As mentioned under Recreation and Visitor Use, the intimidating nature of the winding, steep, and unpaved road would continue to deter some visitors from frequenting areas accessed off the project area, which could affect visitor spending over the long-term. Although precise impacts cannot be quantified, they are expected to be slight. In addition, concessionaire and TNF employees would continue to be impacted by road closures or delays and may not be able to reach their work destinations.

Action Alternative

Under the Action Alternative, improved sight distance, and an improved surface would help emergency service providers use the road more safely and efficiently. The improvements would reduce the amount of ongoing roadway maintenance and repair, which would likely increase as the road continues to deteriorate. As a result, emergency services would experience beneficial impacts from reduced delays. Periodic roadway closures due to maintenance would also be less frequent, thereby providing a more reliable transportation route for these community services. Emergency service providers would be given priority to travel with minimal or no delay during construction.

Temporary disruption to ranch operations could occur during construction as their access to their property from the west is currently closed. In addition to the traffic delays discussed in the Transportation Section, traffic could be disrupted when culverts are replaced and partial full closures are implemented on a temporary basis. The year that construction is anticipated, the USFS would work with the Roosevelt Grazing Allotment permittee to adjust the rotation of cattle to avoid conflict as much as possible. Over the long-term, ranchers moving cattle on and off the grazing allotment would experience the same benefits as the emergency providers discussed above.

Under the Action Alternative, increased visitor spending could occur at the Apache Lake Marina and Resort and the numerous TNF facilities accessed by the project route as a result of improved driving surface and roadway function. Ongoing maintenance tasks for grading and other roadway damage, which could result in transportation delays, would be reduced, thereby reducing an impediment to visitor access and a hardened driving surface and improved visibility could decrease some driver's anxiety. During construction, the traffic delays discussed in the Transportation Section could reduce visitation, resulting in a temporary reduction in visitor expenditures.

The Action Alternative would improve the convenience, safety, and reliability of the roadway for access to TNF day use areas, concessionaires and grazing allotments, emergency services, and access to surrounding communities and services. Increased visitor expenditure could also occur. The result would be long-term, beneficial impacts.

Conclusion

The Action Alternative would improve the convenience, safety, and reliability of the roadway for access to TNF visitors, emergency services, ranchers, and access to surrounding communities and services. The improvements would reduce the amount of ongoing roadway maintenance and repair, which would result in fewer closures and delays. Increased visitor expenditure could also occur. The result would be long-term, beneficial impacts. Traffic delays during construction would be mitigated by the measures described below.

3.3.4 Avoidance, Minimization, and/or Mitigation Measures

The following measures would be implemented to minimize impacts to the public:

- During the majority of construction period, at least one lane of traffic shall remain open, with a maximum daytime 30-minute delay. If any delay longer than 30 minutes is anticipated to accomplish specific construction activities, then notice shall be provided. Prior to Memorial Day, an extended delay from 9 am to 3 pm would be permitted with the contractor passing traffic once through this delay to perform blasting operations and major earthwork where maintaining a single traffic lane would not be feasible. Nighttime closures would be considered for culvert replacements or heavy earthwork/blasting as needed. Public notification of anticipated closures and delays would be posted on ADOT's and TNF's website and along the route. Prior to full closures, notice must be provided to the public, relevant local agencies, school districts, and emergency service providers.
- Emergency vehicles shall be permitted to pass through the construction limits during construction without delay.
- The contractor shall provide the construction schedule to businesses and nearby residences adjacent to the construction limits and notify them at least 48 hours in advance of construction work.
- FHWA-CFLHD will coordinate closely with the Apache Lake Marina & Resort, Apache Trail Tours, private ranch owner, and other entities before and during the project to ensure appropriate public outreach and notification is employed.

3.4 Recreation and Visitor Experience

This section describes impacts to people visiting and recreating at TNF destinations that are served by the Apache Trail within the project area. The Apache Trail provides access to popular destinations within TNF, especially Apache Lake. There is no alternative access to these destinations.

3.4.1 Regulatory Setting

The Forest Service Manual (FSM) Series 6000-6800 – Management Services provides directives on safety and health. The Multiple Use Sustained Yield Act of 1960 addresses the establishment and administration of national forests to provide for multiple use and sustained yield of products and services, including recreation, range, timber, watershed, and wildlife and fish purposes.

3.4.2 Affected Environment

TNF includes almost 3 million acres of rugged landscape that ranges from Saguaro cactus-studded desert to pine-forested mountains. TNF is the fifth largest forest in the United States and is one of the most-visited "urban forests in the U.S. with approximately 5.8 million visitors annually" (USDA 2018a).

The Apache Trail is an Arizona Historic Road that is frequently driven purely for its recreational and scenic value. The road is narrow, winding, and often exposed, which is intimidating to many drivers. There is a maximum vehicle length limit of 40 feet (not recommended for trailers over 22 feet) and RVs are not recommended (USDA 2018b). These conditions and restrictions limit the number of people who access the project area as evidenced by the fact that the Apache Lake Marina and Resort has received numerous complaints of vehicle, trailer, and boat damage from the condition of the dirt road as well as complaints related to the emotional anxiety of driving along the route.

Along the entire length of the Apache Trail there are marinas, restaurants, accommodations, and small shops that cater to recreation visitors. Most of the facilities and businesses are concentrated along the paved portion of the road from Apache Junction to Tortilla Flat; however, businesses and accommodations associated with Apache Lake are accessed only by unpaved road and are nearly equidistant from either end of the paved portions of the Trail. Within the project area, the Apache Trail accesses a number of USFS day use sites, scenic overlooks, trailheads, campgrounds, and boat launches. These facilities include the Apache Lake Marina Resort, Davis Wash Shoreline Area, Burnt Corral Campground and Day Use Area, and the Three Mile Wash Shoreline Area. Davis Wash and Three Mile Wash offer dispersed camping while the Burnt Corral Campground offers restroom facilities, potable water, designated camping areas, and requires an additional camping fee. The Apache Lake Marina and Three Mile Wash Shoreline Area provide boat access to Apache Lake. These areas are popular with visitors to Apache Lake during the spring, summer, and fall months. Apache Lake is one of four reservoirs built along the Salt River as part of the SRP. Recreational boating is popular on each of the lakes and requires a permit.

3.4.3 Environmental Consequences

No Action Alternative

Under the No Action Alternative, it is anticipated that annual visitation to the project area and the recreational facilities accessed off the project area would remain similar to current rates with similar seasonal variability. The intimidating nature of the winding, steep, and unpaved road would continue to deter some visitors from frequenting areas accessed off the project area, particularly those traveling with a trailer. For those visitors intimidated by the unpaved roadway surface, the No Action Alternative would result in a continued slight adverse impact to recreation and visitor experience. However, some visitors prefer a more rugged and remote recreational experience and value both the historic condition of the dirt road and the fact that it may contribute to a more secluded (low use volume) visitor experience. For these visitors, the No Action Alternative would result in a continued beneficial effect to their experience.

Visitors would continue to be adversely impacted by dust generated from vehicles driving on the unpaved road surface, which hinders visibility and contributes to poor air quality. These impacts would range in intensity based on weather conditions and the volume of traffic on the road.

Frequent routine maintenance of the dirt road surface under the No Action Alternative would continue to temporarily delay recreationalists and visitors with slower-moving equipment taking up the width of the roadway. During these maintenance activities, there would be short-term adverse impacts to visitors utilizing those sections of the roadway.

Action Alternative

Under the Action Alternative, the availability of a continuous paved/chip sealed surface that provides access to amenities offered along the easternmost portion of the Apache Trail would provide long-term benefits to recreation and the visitor experience for those visitors who have previously been concerned about damage to their vehicles and/or too intimidated by the unpaved driving surface. The reduction of dust and particulate pollution would have a benefit to the visitor experience from a visual and health standpoint. Visitation to the area could increase as a result of the project, although any increase in visitation is not anticipated to be substantial. Long-term benefits would be greatest for those visitors who utilize the project corridor frequently and are impacted by frequent continuous maintenance to the existing decomposed granite surface and by long term exposure to dust from the road.

For those visitors who value the historic nature of the unpaved road and prefer a more rugged and remote recreational experience, implementation of the Action Alternative could diminish their experience within the project area and result in some adverse impacts. However, the proposed actions would not alter the scenic views, alignment, or recreational opportunities along the route and would not be considered significant since the project area would still be approachable from the west through Tortilla Flat and along the unpaved portion of the Apache Trail down Fish Creek Hill once it is repaired and reopened. However slight, an increase in visitation would have its costs, with some visitors preferring the limited activity at the USFS day use sites, scenic overlooks, trailheads, campgrounds, and boat launches. An increase in visitation would lead to a

greater amount of visitor-generated noise from vehicles, motorized boats, or the simultaneous presence of users on available recreation sites, which could diminish the visitor experience for some; however, these impacts are not anticipated to be substantial.

During construction, temporary closures and traffic delays could impact visitors trying to access the project route and visitor amenities along it. For those visitors with an end destination of the Apache Lake Marina and who wish to access the marina from the west along the Apache Trail and down Fish Creek Hill, temporary impacts during construction would not be anticipated since the project begins at the marina turnoff and extends to the east. Visitors accessing the marina from the east along SR 188, or who wish to access any of the USFS facilities along the project route, could experience minor, temporary adverse impacts during construction of the project. These impacts would result from the narrowing of the roadway to a single lane in work zones, which would result in traffic delays, or from planned temporary road closures in some locations during certain construction operations. Except for planned full closures of short duration, access to the facilities and day use sites along the project route would be maintained during construction. As a result, short-term impacts to recreation and visitor experience during construction are anticipated to be minor in intensity.

Conclusion

Impacts to recreation and visitor experience would be both beneficial and adverse, depending on the values and intent of the visitor, as discussed above. The reduction of dust and particulate pollution that would result from applying a chip seal, would have a benefit to the experience of all visitors from a visual and health standpoint. Short-term, adverse impacts that would occur during construction would be minimized with implementation of the measures described below.

3.4.4 Avoidance, Minimization, and/or Mitigation Measures

The following measures would be implemented to minimize impacts:

- At least one lane of traffic will remain open during construction, with a maximum daytime 30-minute delay. If any delay longer than 30 minutes is anticipated to accomplish specific construction activities, then notice shall be provided. Prior to Memorial Day, an extended delay from 9 am to 3 pm would be permitted with the contractor passing traffic once through this delay to perform blasting operations and major earthwork where maintaining a single traffic lane would not be feasible. Nighttime closures would be considered for culvert replacements or heavy earthwork/blasting as needed. Public notification of anticipated closures and delays would be posted on ADOT's and TNF's website and along the route. Prior to full closures, notice must be provided to the public, relevant local agencies, school districts, and emergency service providers.
- Emergency vehicles shall be permitted to pass through the construction limits during construction without delay.

3.5 Cultural Resources (Including Archeological and Historic Resources)

The Apache Trail itself has been identified as an historic road eligible for listing on the National Register with numerous features such as culverts and retaining walls that are character defining/ contributing features. In addition, there are numerous archeological and historic sites throughout TNF and within the vicinity of the Apache Trail project corridor. The cultural resources that could be affected by the action alternative were identified within the Area of Potential Effects (APE) defined for this project as part of cultural survey for the project (Luhnow and Schilling 2018). The APE is the geographic area within which actions may change the character or use of historic properties, and serves as the study area for historic resources. The width of the APE for this project ranges between 100 and 300 feet centered on the Apache Trail centerline. The APE was expanded in areas to include pull-outs, low water crossings, areas where slope setbacks are being considered, and areas of drainage work where culvert replacement and/or repair work would occur.

Following the fire and floods in 2019 and as a result of changed site conditions, FHWA-CFLHD reassessed the ongoing design approach to the Apache Trail project. A cultural resources addendum was developed to document the design changes and their impacts to historic resources along the Apache Trail (Schilling et. al 2021).

3.5.1 Regulatory Setting

NEPA establishes that the federal government use all practicable means to "assure for all Americans . . . culturally pleasing surroundings," and "preserve important historic, cultural, and natural aspects of our national heritage . . . "(42 United States Code [USC] 4331[b][2]).

The National Historic Preservation Act (NHPA) of 1966, as amended (54 USC 300101 - 307108), and its implementing regulations, Protection of Historic Properties (36 CFR 800), requires federal agencies to take into account the effects of their actions on historic properties for any federal undertaking. Historic properties are defined as those that are included in the National Register of Historic Places (NRHP) or that meet specific criteria (are "eligible") for listing in the NRHP, which is the official list of America's historic places worthy of preservation. An effect on a historic property is "an alteration to the characteristics of a historic property qualifying it for inclusion or eligibility for the NRHP" (36 CFR 800.16).

The Arizona Antiquities Act prohibits excavation of historic or prehistoric sites on lands owned or controlled by the State of Arizona, any agency or institution of the state, or any county or municipal corporations within the state without obtaining the written permission of the director of the Arizona State Museum (ASM), and directs those in charge of activities on such lands to notify the director of the ASM of the discovery of any archaeological sites, historical resources, and human remains (ASM 2014) in coordination with the Arizona SHPO. ADOT controls (i.e. maintains) SR 88, the Apache Trail.

3.5.2 Affected Environment

History of Tonto Basin

Geographically, the APE and its vicinity is located in a transitional area between the mountain highlands to the north and the desert lowlands to the south; it is also situated in the Tonto Basin. This transitional aspect is also true from a cultural perspective, particularly during the prehistoric ceramic period, with influences present from the Hohokam core area within the Phoenix Basin, and the Salado culture in the Tonto Basin.

The project area has been occupied by humans for thousands of years. Within the Tonto Basin, there is evidence of habitation ranging from the Paleoindian period (ca. 12,000–7500 B.C.) through modern day Apache and Yavapai, who inhabited the area by at least the late 1600s. To date, the only evidence of Paleoindians within the Tonto Basin consists of isolated projectile point finds (Luhnow and Schilling 2018). Work along SR 260 northeast of the APE has provided significant data regarding the Early Agricultural period. This period is defined by the presence of domesticated plants; in the sub-Mogollon Rim region, ongoing research has found maize in a context dating to 1200 B.C., and the Early Agricultural Period has been tentatively established from 1200 B.C. to A.D. 500 (Luhnow and Schilling 2018). The occupation of the Tonto Basin from A.D. 100 to A.D. 1450 is defined by the use of local and non-local ceramics, and has been divided into various periods and phases by researchers working in different portions of the basin. It is unknown at this time whether an indigenous population occupied the Tonto Basin at the beginning of the Early Ceramic period, or whether it was settled by an outside group, such as the Hohokam (Luhnow and Schilling 2018). The Preclassic period dates from A.D. 650–A.D. 1150. The Deer Creek Site in the Upper Tonto Basin is a well-documented settlement dating to the Snaketown (A.D. 650–750) or early Gila Butte (A.D. 750–850) phases (Luhnow and Schilling 2018). Analyses showed that corn, agave, and little barley grass were important resources to the inhabitants. Shell artifacts and Gila Butte Red-on-buff ceramics indicate that there was interaction between the residents of the Deer Creek site and the Hohokam to the south. In the subsequent Santa Cruz phase (A.D. 850–950), Hohokam buffwares were still prevalent; whiteware ceramics indicate contact with the northern regions as well (Luhnow and Schilling 2018). Corn agriculture was practiced, along with use of agave, plant gathering, and limited hunting.

Between A.D. 950-1150, during the Sacaton phase, permanent settlements become more numerous in the archaeological record. The most archaeologically visible period in the Tonto Basin was the Late Classic period Gila phase (A.D. 1300-1450) with large masonry ruins and numerous polychrome ceramics within the area.

The semi-nomadic Apache utilized agriculture to supplement hunting and gathering subsistence activities. The Apache incorporated the horse (introduced by Coronado) as part of their subsistence, and used it for carrying both people and goods, and as a food source. The horse enabled the Apache to increase their range, and thus increase the resources available to them. By the mid-1700s, the Apache boasted a trade and raiding system that spanned from northern Arizona into Mexico (Luhnow and Schilling 2018).

The ancestral homelands of the Yavapai people encompassed areas in central and west-central Arizona in territory that ranged from the San Francisco Peaks to Ash Fork and

towards the Colorado River, extending southward towards Yuma, and then eastward towards Globe (Khera and Mariella 1983). The Yavapai people were hunter-gatherers who had a strong and varied food supply due to their extensive and rich land base (Khera and Mariella 1983). The Yavapai that occupied the Tonto Basin area were the Kewevkapaya.

In 1865, Fort McDowell was founded to support the war on Native Americans. General George Crook launched his military campaign between 1865 and 1873, and soon many Native Americans were confined to reservations. A military road connecting Fort McDowell with Camp Reno, in the Tonto Basin, was constructed beginning in October of 1867 (Luhnow and Schilling 2018). The Mazatzal Mountains were an imposing obstacle, and the road was constructed on the south side of Mount Ord. The Tonto Basin was attractive to many ranchers and the area was rapidly populated in the 1870s, with most settlers coming from the Globe-Miami area. One of the ranches, owned by Sam Haught, later become the nearby community of Rye, with a post office established in 1883 (Luhnow and Schilling 2018).

TNF was established in 1905 for the primary purpose of protecting the watersheds that are encompassed by the forest. Construction of Roosevelt Dam, a key component of the watershed protection, was begun in 1906; the dam was dedicated in 1911. The region has been used for water control and power generation, ranching, and tourist/recreational purposes throughout the historic and modern era.

History of the Apache Trail (SR88)

The Apache Trail begins near the city of Apache Junction, Maricopa County, Arizona at milepost 193.90, and terminates at its junction with United States Highway 60, near Globe, Gila County, Arizona, at milepost 242.66. The present Apache Trail owes its existence to the need for a dam on the Salt River within Tonto Basin. As Phoenix and its environs grew in the latter part of 19th centurewy, the flooding and drought caused by the unchecked Salt River became a significant impediment to development. Citizens in the Salt River Valley united to petition Congress for a dam to help control the river fluctuations, and to irrigate crops (Luhnow and Schilling 2018). Under the National Reclamation Act, signed into law by President Theodore Roosevelt in 1902, the proposed construction of a dam along the Salt River became a reality.

The dam, initially called Tonto Dam–but later renamed Theodore Roosevelt Dam–was located in a fairly remote area, and the need for an adequate supply route became apparent. After consideration of alternatives, a route along the Salt River from Mesa, Arizona to the dam site was selected, and initial construction of the Apache Trail began in 1903 (Luhnow and Schilling 2018). Construction of the road was conducted by the U.S. Reclamation Service (renamed the U.S. Bureau of Reclamation [USBR] in 1923); the actual labor force was made up largely of Native Americans, including Apaches. The roadbed was constructed of native soil extracted during construction of the road and was unsurfaced. By the end of 1904, the road was sufficient for basic transit, and transportation of construction loads began in early 1905 (Luhnow and Schilling 2018).

The Apache Trail was in constant use, and subjected to maintenance and improvements, during the construction of Roosevelt Dam from 1906 to 1911. With the dedication of the dam in 1911, ownership of the road and its future role were unknown. In 1920, the U.S. Reclamation Service conceded they had no "direct interest in the future care of the road"

and that the Salt River Valley Water User's Association would be the agent in handling the road project and its features (Stein 2001). The Salt River Valley Water Users Association was planning to develop hydroelectric dams downstream from Roosevelt Dam and knew they would need good access to the areas via the Apache Trail. As a result, they passed a resolution in March 1922 urging the U.S. Reclamation Service to transfer ownership of the road to the State of Arizona upon several conditions; including that the road be declared a state highway and that the water users' association could change the location of portions of the road at any time that such changes may become necessary to permit power development on the Salt River (Stein 2001). The Arizona State Highway Department took responsibility for the road's operation and maintenance from the U.S. Reclamation Service and implemented additional improvements and upgrades. Chief among these were widening the original roadway from 12 feet to 14 to 16 feet in some locations; and the repair of deteriorating stretches of roadway and wall structures. With the shift in management oversight came a change in purpose for the Apache Trail from its initial use as a construction supply route. A new road from Phoenix to Globe provided alternate access to the dam and newly-filled Roosevelt Lake, and relegated the Apache Trail to a tourist attraction. By the summer of 1927, the completion of Horse Mesa Dam and subsequent formation of Apache Lake rendered much of the original Apache Trail underwater. A realignment project, which included much of the proposed project area began the relocation of this portion of the road to higher on the hillsides (Stein 2001). Additional large-scale work was completed between the years 1935 and 1937 and included widening much of the unpaved roadway to 24 feet to accommodate increased automotive travel. In 1939, the Davis Wash Bridge was reconstructed using Works Progress Administration labor. Following the construction of the bridge, work along the roadway consisted largely of ongoing repair and maintenance classified as "spot improvements." These spot improvements resulted in the construction of additional structures, such as culverts and retaining walls. In the 1950s and 1960s, ADOT began to modernize, widen, and pave parts of the road. This prompted public concern that the scenic and historic character of the road was in jeopardy, and ADOT halted further changes to the road aside from routine maintenance.

The Apache Trail has been previously determined eligible for inclusion in the NRHP under Criteria A, C, and D for its association with important historic events, unique qualities of design and construction, and potential to yield important data regarding the development of early Arizona roadways. The unpaved stretch of the historic roadway within the APE was determined to contribute to the overall NRHP eligibility of the Apache Trail under the aforementioned criteria. The maintenance history of this roadway segment is quite different from that of the paved section of the Apache Trail, and can be characterized by four major maintenance periods, all of which have historic significance (Sullivan 2017). However, these maintenance activities have not significantly altered the historic characteristics of the roadway, which exhibits a high degree of integrity of workmanship, materials, setting, design, association, feeling, and location. As discussed in Sullivan (2017), the unpaved section of roadway still contours across the landscape, and horizontal and vertical curves force drivers to slow down and enjoy the scenic vistas that are iconic to the alignment. This is quite a different driving experience from that along the paved portions of the roadway, where the historic characteristics of the roadway features have been significantly altered.

In 1986, Arizona designated the Apache Trail as a Historic Road, currently one of three in the state, recognizing its importance in Arizona's history and providing guidelines and rules on road operations and maintenance (Luhnow and Schilling 2018).

From the 1920s to modern times, the Apache Trail has served mainly as a scenic byway. It has undergone many improvements since its initial construction, including grading, realignment, and paving. The portion of the Apache Trail between Mileposts 201.00 and 220.18 is paved. This project studies the portion of the remaining unpaved section of road between MP 229.2 and 240.8. The project area includes approximately half of the remaining unpaved portion of the Apache Trail.

Within the project area, the road maintains its original grades. Consequently, the numerous curves and the relatively narrow roadway that were also of the original design serve to reduce the speed of today's automobile traffic (Luhnow and Schilling 2018). Despite the alterations and maintenance over the years, the Apache Trail still retains some aspects of its historic character. However, many of the culverts which are character defining features /contributing elements of the route have become damaged and degraded overtime from flooding and debris flows.

Cultural Resources within the Area of Potential Effect (APE)

Eleven resources were identified within the APE defined for the proposed project, including the Apache Trail. Each resource was determined to be eligible for listing on the NRHP.

To be determined eligible for inclusion in the NRHP, cultural resources must be important in American history, architecture, archaeology, engineering, or culture; must possess integrity of location, design, setting, materials, workmanship, feeling, or association; and must meet at least one of the following four criteria (36 CFR Part 800):

A. Are associated with events that have made a significant contribution to the broad patterns of our history;

B. Are associated with the lives of persons significant in our past;

C. Embody the distinctive characteristics of a type, period, or method of construction, or that represents the work of a master, or that possesses high artistic values, or that represents a significant distinguishable entity whose components may lack individual distinction;

D. Have yielded, or may be likely to yield, information important in prehistory or history.

Properties may be of local, state, or national importance. Typically, historic properties are at least 50 years old, but younger properties may be considered for listing if they are of exceptional importance (Criteria Consideration G). Once historic properties are evaluated, the federal agencies can determine whether or not historic properties are affected. The NRHP defines *historic property* as any prehistoric or historic district, site, building, structure, or object included in, or eligible for inclusion in, the NRHP.

The eleven resources and the criteria that makes them eligible for inclusion in the NRHP are listed in Table 3.

Table 3. Cultural Resources Determined Eligible for the National Register of Historic Places

Site/Feature No.	Description	Eligibility
03-555(TNF)/ AZ U:7:7(ASM)	Historic transmission line	Determined eligible (A)
03-556(TNF)/ AZ U:7:8(ASM)	Historic telephone line	Determined eligible (A, D)
06-450(TNF)/ AZ U:8:604(ASM)	Historic work camp	Determined eligible (A, D)
06-2426(TNF)/ AZ U:8:600(ASM)	Historic site of unknown use	Determined eligible (D)
06-2428(TNF)/ AZ U:8:602(ASM)	Historic road and corral	Determined eligible (D)
06-2429(TNF) / AZ U:9:603(ASM)	Yavapai temporary campsite	Determined eligible (D)
06-2430(TNF)/ AZ U:8:605(ASM)	Hohokam limited activity area	Determined eligible (D)
06-2431(TNF)/ AZ U:8:606(ASM)	Historic trash dump	Determined eligible (D)
06-2435(TNF)/ AZ U:8:607(ASM)	Historic work camp and access road	Determined eligible (D)
06-2503(TNF)/ AZ U:8:632(ASM)	Historic blasting cans	Determined eligible (D)
06-218(TNF)/Apache Trail roadway and historic roadway features	Historic roadway	Determined eligible (A, C, D)

Historic Transmission Line

The historic transmission line consists of a series of towers and foundations that was constructed as part of the original power transmission systems between Roosevelt Dam and Mesa (Luhnow and Schilling 2018). The site loosely parallels and crosses the project APE for its length and there are a total of nine features and artifacts associated with the site that fall within the ADOT easement along the project corridor. It has been determined eligible for inclusion in the NRHP due to its association with events that have made a significant contribution to the broad patterns of our history (Criterion A). The features loosely parallel and cross the project corridor, but are outside of the roadway.

Historic Telephone Line

The historic telephone line is a series of poles, pole bases, and related artifacts that represent the historic line built to provide communication with workers during

construction of the Roosevelt Dam (Luhnow and Schilling 2018). The site parallels and crosses the project APE for most of its length and there are a total of 30 features and artifacts associated with the site that fall within the ADOT easement along the project corridor. The site has been determined eligible for inclusion in the NRHP due to its association with events that have made a significant contribution to the broad patterns of our history and due to its ability or potential to yield information important in history or prehistory (Criteria A and D). The features of this historic line are outside of the roadway.

Historic Work Camps Associated with the Construction of the Road

The historic work camp is possibly related to the construction of the northern extension of the Apache Trail in 1923 (Luhnow and Schilling 2018) or work done in 1927. The site has been determined eligible for inclusion in the NRHP due to its association with events that have made a significant contribution to the broad patterns of our history and due to its ability or potential to yield information important in history or prehistory (Criteria A and D). The camp occurs on both sides of the road and within the project area.

Historic Site of Unknown Use

The historic site is poorly preserved with an unknown function (Luhnow and Schilling 2018). The site may be associated with the 1922-1924 initial state maintenance efforts. The site has been determined eligible for inclusion in the NRHP due to its ability or potential to yield information important in history or prehistory (Criterion D). The camp occurs on both sides of the road and within the project area.

Historic Road and Corral

This site is a possible historic road alignment that extends from the Apache Trail alignment and terminates at a corral (Luhnow and Schilling 2018). The site has been determined eligible for inclusion in the NRHP due to its ability or potential to yield information important in history or prehistory (Criterion D). Only the historic road alignment is located within the project APE. Review of aerial imagery reveals that within the APE, the road has been destroyed by modern use as a turnout and the coral is no longer present. The extant features of this site are not within an area where proposed improvements to the roadway would occur.

Yavapai Temporary Campsite

This site is a prehistoric/protohistoric site interpreted as representing a Yavapai temporary campsite (Luhnow and Schilling 2018). The site has been determined eligible for inclusion in the NRHP due to its ability or potential to yield information important in history or prehistory (Criterion D). The site occurs atop a cut bank and does not approach the roadway itself.

Hohokam Limited Activity Area

This site is a prehistoric site interpreted as a Hohokam limited activity area with a potential historic component (Luhnow and Schilling 2018). The site has been determined eligible for inclusion in the NRHP due to its ability or potential to yield information important in history or prehistory (Criterion D). The site occurs on a slope below the roadway and does not approach the roadway itself.

Historic Trash Dump

This site is a historic trash dump. The presence of blasting cans at the site indicates that part of the refuse may be associated with the Apache Trail roadway construction episodes dating to the 1930s and 1940s (Luhnow and Schilling 2018). The site has been determined eligible for inclusion in the NRHP due to its ability or potential to yield information important in history or prehistory (Criterion D). The site is plotted atop and on the west side of a steep bluff along the Apache Trail. Review of an earlier cultural report, revealed that a portion of the site atop the bluff, and adjacent to the roadway, has been demolished by road maintenance blading, and the features and artifacts associated with the site are at an elevation below the roadway along the sides of the bluff (Luhnow and Schilling 2018).

Historic Work Camp and Access Road

This work camp site is interpreted as a work camp associated with the construction of the northern alignment of the Apache Trail. The site has been determined eligible for inclusion in the NRHP due to its ability or potential to yield information important in history or prehistory (Criterion D). The only portion of the site within the project APE is an access road to the camp, which is no longer accessible from the Apache Trail roadway (Luhnow and Schilling 2018).

Historic Blasting Cans

This site includes a scatter of historic blasting cans associated with the blasting of a series of switchback curves along the road alignment. The site has been determined eligible for inclusion in the NRHP due to its ability or potential to yield information important in history or prehistory (Criterion D) (Luhnow and Schilling 2018). The site is atop a cut bank above the roadway.

Historic Roadway and Features of the Roadway – Character-Defining Contributing Elements to the Overall NRHP Eligibility of the Apache Trail

The historic roadway, within the proposed project APE, consists of the historic roadway alignment, including the roadway and numerous roadway features (including culverts, headwalls, Pine Creek Bridge, and Davis Wash Bridge etc.). In total, there are 216 individual features of the Apache Trail within the APE. As described above, the Apache Trail was originally constructed as a wagon road to supply the construction of Roosevelt Dam. The roadway, in its entirety, is 49 miles long. Within the APE, only a small portion of the road (between MP 229.2 and 231.5) was part of the original construction between 1903 and 1905. The remainder of the road within the project area was completed during reroute work in the 1920s after much of the original route was submerged under Apache Lake after the completion of the Horse Mesa Dam. The site has been determined eligible for inclusion in the NRHP due to its association with events that have made a significant contribution to the broad patterns of our history (Criteria A), due to its distinctive characteristics of a type, period, or method of construction that represents the work of a master, or that possess high artistic values, or that represent a significant and distinguishable entity whose components may lack individual distinction (Criteria C), and due to its ability or potential to yield information important in history or prehistory (Criteria D). Of the 216 individual features of the Apache Trail, 67 roadway features are either individually eligible and/or considered character-defining features / contributing elements to the NRHP eligibility of the historic Apache Trail. These features

predominantly consist of culverts and headwalls, but also include some mile markers, turn outs, or other features associated with the roadway. At several features, it appears that widening of the road during previous roadway improvements resulted in culvert extensions and the construction of a new headwall on one end of the extended culvert. In these locations, there is potential that an original headwall was buried.

3.5.3 Environmental Consequences

No Action Alternative

Under the No Action Alternative, there would be no effects to the following cultural resources:

- Historic transmission line
- Historic telephone line
- Yavapai temporary campsite
- Hohokam limited activity area
- Historic blasting cans

Under the No Action Alternative, continued maintenance of the historic Apache Trail road corridor would be needed to prevent degradation and maintain a drivable surface. The dwindling supply of the historically used decomposed granite surfacing material would require ADOT to eventually seek an outside fill source that may differ from the historic color of the road surface.

In addition, ongoing maintenance activities under the No Action Alternative, including blading the road surface, would continue to potentially cause unintentional damage and/or bury individual features of the historic roadway. Exposed culvert pipes would continue to rust further compromising the integrity of the features. In addition, the use of heavy equipment to stockpile and continually relocate excess fill material to and from pull-outs along the road corridor, in combination with visitor use and parking in several pull-outs, could continue to adversely affect the integrity of historic work camps, the historic site of unknown use, the historic trash dump, and the historic road and corral. Maintenance to repair storm damage would also continue.

Overall, the continued degradation and maintenance of the Apache Road within the project area could result in adverse effects to several cultural resources within the project APE.

Action Alternative

Under the Action Alternative, the following effects to cultural resources within the project APE would be anticipated.

Historic Transmission Line

With the exception of some unmaintained roads that access the historic transmission towers, all of the features and artifacts associated with this site and within the project area are outside of the roadway where improvements would occur. Under the Action Alternative, there would be no improvements to the access roads and all other associated features would be avoided. Therefore, there would be *no effect* to the historic transmission line.

Historic Telephone Line

All of the features associated with the historic phone line are outside of the roadway where proposed improvements would occur under the Action Alternative and therefore there would be *no effect* to the historic telephone line.

Historic Work Camps Associated with the Construction of the Road

This historic work camp is located on both sides of the road in an area where proposed improvements would occur under the Action Alternative. To ensure there are no impacts to the site, the site boundary and a 50-foot avoidance buffer would be flagged by a qualified archaeologist prior to construction. With the delineation of the avoidance buffer, the project would have *no effect* to the historic work camp under the Action Alternative.

Historic Site of Unknown Use

This historic site of unknown use is located on both sides of the road in an area where proposed improvements would occur under the Action Alternative. To ensure there are no impacts to the site, the site boundary and a 50-foot avoidance buffer would be flagged by a qualified archaeologist prior to construction. With the delineation of the avoidance buffer, the project would have *no effect* to the historic site under the Action Alternative.

Historic Road and Corral

While a portion of the historic road is within the project APE, this portion of the road has been destroyed by modern use as a turnout and no longer retains integrity. All of the other features associated with this site fall outside of the project APE and would be avoided under the Action Alternative. As a result, there would be *no effect* to the historic road and former corral under the Action Alternative.

Yavapai Temporary Campsite

This campsite occurs atop a cut bank above the roadway and would be avoided. There would be *no effect* to the Yavapai temporary campsite under the Action Alternative.

Hohokam Limited Activity Area

This site is located downslope from the roadway and would be avoided. The project will have *no effect* to the Hohokam Limited Activity Area under the Action Alternative.

Historic Trash Dump

The intact portion of this site would be avoided under the Action Alternative. The project will have *no effect* to the historic trash dump.

Historic Work Camp and Access Road

Under the Action Alternative, the access road portion of this site which falls within the ADOT roadway easement would be avoided. The remainder of the site is located outside the project impact area. The project would have *no effect* to the historic work camp and access road under the Action Alternative.

Historic Blasting Cans

This site occurs atop a cut bank above the roadway in an area proposed for line of sight improvements under the Action Alternative. The site improvements proposed under the Action Alternative will have an *adverse effect* to the historic blasting can site.

Historic Roadway and Features of the Roadway – Character-Defining Contributing Elements to the Overall NRHP Eligibility of the Apache Trail

Under the Action Alternative, roadway improvements such as applying a chip seal, improving line of sight in five locations, and drainage improvements would adversely affect the NRHP qualities, including workmanship, materials, feeling and association of the historic roadway. Improvements to the roadway itself, such as placing a chip seal surface, would not alter the existing NHRP qualities of individual features (such as culverts and headwalls) as character-defining contributing elements to the eligibility of the historic Apache Trail alignment. However, proposed drainage improvements, such as replacing, repairing, and modifying individual character-defining contributing elements (such as culverts and headwalls) of the Apache Trail would adversely impact the existing NRHP qualities of both contributing elements and the Apache Trail roadway.

Due to the condition of the historic and often undersized culverts and the changes to the watershed from recent wildfire and flooding events, the Action Alternative proposes numerous drainage improvements within the project area to restore culvert functionality and stabilize the roadway. Proposed activities that could affect the numerous character-defining contributing elements of the Apache Trail are described below. Documentation, treatment, and proposed actions to mitigate for adverse effects are also discussed below.

- A total of 21 character-defining contributing elements (i.e. culverts and associated headwalls/wingwalls, stand-alone retaining walls) to the NRHP eligibility of the Apache Trail would be avoided by the proposed actions (i.e. no structural work, no cleaning of culvert or nearby ditches, no outlet treatments). Roadway improvements would be done, but the improvements would not alter the existing NRHP qualities of these individual features as character-defining contributing elements to the eligibility of the Apache Trail.
- Clean out of a culvert is required at approximately eight locations where an individual feature is a character-defining contributing element. Cleaning would not significantly alter the existing NRHP qualities of these individual features as character-defining contributing elements to the eligibility of the Apache Trail.
- Only Scour Treatments, as described in Chapter 2, would be applied at approximately 10 culverts, defined as character-defining contributing elements to the Apache Trail. No other structural work is proposed at these culverts. The application of scour treatments would not significantly alter the existing NRHP qualities of these individual features as character-defining contributing elements to the eligibility of the Apache Trail.
- Due to the need for additional drainage capacity at numerous locations, culverts will be upsized to large capacity culverts. Other culverts have been damaged beyond repair and need replacement to function adequately. In some locations damage to headwalls and wingwalls will require replacement. Culvert replacements and/or the addition or replacement of wingwalls and headwalls associated with those culverts would occur at 26 individual features that are defined as character-defining contributing elements to the Apache Trail. Scour Treatments would also be applied

to many of these culverts. These modifications would significantly alter the existing NRHP qualities of these individual features as character-defining contributing elements to the eligibility of the Apache Trail.

- No structural changes are proposed for the two bridges within the project corridor, the NRHP-listed Pine Creek Bridge and the NRHP-eligible Davis Wash Bridge. Roadway improvement would occur at these bridges, but the improvements would not significantly alter the existing NRHP qualities of either bridge and would not impact the NRHP-eligibility of the Apache Trail.
- Several character-defining contributing roadway elements are outside of the existing roadway and would be avoided by the proposed actions. The area around these elements would be marked on the project plans by delineation of construction limits to ensure there would be no inadvertent damage during construction. The project would not significantly alter the existing NRHP qualities of these individual features as character-defining contributing elements to the eligibility of the Apache Trail.
- Buried features may be associated with 25 character-defining contributing elements along the Apache Trail. Any roadway construction that requires excavation greater than 6" in depth would be monitored by a qualified archaeologist as outlined in the MOA and project-specific Historic Properties Treatment Plan (HPTP).
- Numerous features of the roadway were determined to be non-character defining elements of the NRHP eligibility of the Apache Trail. Some of these features will undergo modifications or otherwise be impacted by roadway improvements; however, because these features were determined to be non-character defining elements, modifications of these features would not impact NRHP-eligibility of the Apache Trail.

Chip sealing, standardizing the road width, improving line of sight, and replacing and modifying existing drainage features would diminish the features and attributes that qualify the Apache Trail for NRHP eligibility, including workmanship, materials, feeling and association of the historic roadway and contribute to the diminishment of the Apache Trail's integrity. Therefore, the Action Alternative will have an *adverse effect* to the NRHP eligibility of the Apache Trail.

SHPO Concurrence

The request for concurrence on the recommended APE, eligibilities, and effect determinations was transmitted to SHPO along with the cultural report prepared for this project on June 19, 2018 (cover letter included in Appendix B). The SHPO concurred with the recommended APE, eligibilities, and an adverse finding of effect on July 2, 2018.

Due to the adverse effect finding, the project was submitted to the Advisory Council on Historic Preservation (ACHP) on July 3, 2018. The ACHP sent a letter accepting the invitation to participate in the consultation process on August 14, 2018.

However, on September 23, 2019 and November 19, 2019 severe thunderstorms originating from the remnants of Tropical Storms Lorena and Raymond respectively moved over the project area for the Apache Trail project. Excessive rainfall over this denuded and degraded watershed resulted in significant flooding of the Apache Trail

roadway. Much of the roadways drainage features, many which were historic character defining features for the Apache Trail (SR 88), were damaged or destroyed. The excessive roadway damage required that FHWA-CFLHD reassess the ongoing roadway and drainage design. The FHWA-CFLHD notified the AZ SHPO, ADOT, TNF, and the ACHP that changes to projects scope of work and area of potential effects would occur in numerous meetings during 2020. A revised determination of eligibility and finding of adverse effects along with a cultural report addendum was submitted to the SHPO, ACHP, and partner agencies ADOT and TNF on March 31, 2021. The SHPO concurred with the updated APE, eligibilities, and an adverse effect finding on April 6, 2021.

Coordination with FHWA-CFLHD, ADOT, TNF, AZ SHPO, ACHP and concurring parties on a Memorandum of Agreement (MOA) for the adverse impacts to cultural resources is ongoing and would be completed prior to issuance of a decision document. Please refer to Appendix C to view the draft MOA. See below for additional information regarding the development of the MOA and the proposed mitigation.

Conclusion

The Action Alternative would result in an adverse effect to the historic blasting can site and the historic Apache Trail roadway and 26 character-defining contributing elements to the eligibility of the historic roadway. An appropriate level of documentation and treatment has been outlined in the draft MOA to mitigate the adverse effects to these resources, as described below.

3.5.4 Avoidance, Minimization, and/or Mitigation Measures

In accordance with the finding of adverse effect, an MOA between FHWA-CFLHD, ADOT, TNF, the AZ SHPO, and the ACHP, which requires the development of a Historic Properties Treatment Plan (HPTP), Historic American Engineering Record (HAER) documentation, and historic property interpretative materials, has been drafted to articulate the proposed mitigation for the adverse effects. This document outlines the proposed avoidance, minimization, and mitigation measures described below. The document would be finalized and signed following public comment on this EA and prior to the signing of a decision document.

The following measures will be implemented to reduce or avoid potential impacts to historic properties:

- FHWA-CFLHD shall, if possible, avoid adverse effects to all types of historic properties, with input from consulting parties. Avoidance measures for historic properties may include (but are not limited to) fencing or flagging of sites during construction, monitoring of construction near site areas within a buffer zone, or placing infrastructure outside of site boundaries. A Monitoring and Discovery Plan (MDP) (see HPTP measure below) will be in place to ensure avoidance during construction.
- Any ground disturbing activities in proximity to features with a known potential for buried walls would require the presence of a qualified archaeologist.
- A site boundary and a 50-foot buffer avoidance would be flagged by a qualified archaeologist prior to construction around the historic work camp and the historic site of unknown use in order to avoid impacts to these sites.

The following measures have been proposed to mitigate for those adverse impacts that would result under the Action Alternative:

- Where avoidance is not possible, FHWA-CFLHD shall minimize or mitigate adverse effects to historic properties through the development and implementation of an HPTP. The HPTP will be developed in consultation with the parties to the agreement, and will specify a program of measures to minimize (if applicable) and/or mitigate adverse effects. FHWA-CFLHD shall ensure that the HPTP is consistent with the Secretary of the Interior's Standards and Guidelines for Archaeological Documentation (48 FR 44734-44737). The HPTP will include additional detail regarding the following items:
    - Development of interpretive materials such as signs, kiosks, pamphlets, books and/or electronic documentation for the historic corridor, further described below.
    - A data recovery/documentation plan for contributing elements along the Apache Trail.
    - The proposed disposition and curation of recovered materials and records in accordance with relevant state and federal laws (ARS 41-842, 844) (36 CFR 79).
    - A Monitoring and Discovery Plan with procedures for monitoring, evaluating, and treating existing features and discoveries of unexpected or newly identified cultural resources during construction of the Undertaking, including the consultation process and timelines with appropriate consulting parties.
    - A project suspension/termination statement that stipulates the procedures to be followed if the project is halted during data recovery for any reason. This statement shall include the steps to be taken in order to complete any data recovery or other treatment measures that are in progress at the time of project termination; a brief discussion shall also be included that outlines how analysis, interpretation, reporting, and curation of remains obtained during treatment measures at all historic properties will be completed if the project is terminated prior to completion of the archaeological investigations.
    - A proposed schedule for the Undertaking tasks, and a schedule for the submittal of draft and final reports (preliminary data recovery reports and data recovery reports) to consulting parties for review and comment.
- Prior to the start of any work that could adversely affect any characteristics that qualify the Apache Trail as a historic property, FHWA-CFLHD shall have a Secretary of the Interior-qualified professional in history or architectural history (as specified in 36 CFR Part 61) complete historical recordation and documentation of up to 15 character-defining features of the Apache Trail to the "outline format: engineering structures" specified in the *Historic American Engineering Record (HAER) Guidelines for Historical Reports* (NPS 2008, updated December 2017).
- FHWA-CFLHD will develop interpretive materials such as signs, kiosks, and/or electronic documentation for the historic corridor as outlined below.
    - Prior to construction completion, FHWA-CFLHD shall develop and install interpretation materials (i.e., signs/kiosk) at up to five currently developed

recreation sites (i.e. Needle Vista Recreation Site, Canyon Lake Vista, Tortilla Flat, Fish Creek Hill Vista, and Apache Lake Vista) located along the Apache Trail. Developed and installed interpretive signs/panels shall not exceed 11 in number. The interpretive materials may include topics such as characteristics of the historic road (i.e. drainage features, retaining walls, bridges, etc.); engineering, construction methods and challenges of building the historic road; work force or people involved in designing and building the original road; stagecoach stops along the Apache Trail; tribal occupation and history; desert culture living and cultural landscapes; history of the of town of Tortilla Flat; and/or history of tourism along Apache Trail. Final topics will be determined by FHWA-CFLHD in consultation with SHPO, signatories and concurring parties of the MOA, but shall not deviate from the history of the Apache Trail and the cultural resources associated with it.

- FHWA-CFLHD will document the historic context of the Apache Trail and related resources, including Roosevelt Dam, Apache Lake and Marina, Fish Creek Hill, as well as contributing elements of the Apache Trail to provide a permanent record of how maintenance, fire, and flooding (including the 2019 events) have affected resources in the area. In coordination with ADOT, the historic context document will be made available to interested parties on the ADOT website for a minimum of five years.

- FHWA-CFLHD shall ensure that all artifacts, samples and records resulting from the mitigation program are curated in accordance with 36 CFR Part 79, except as determined through consultations with Tribes carried out in accordance with federal and state laws pertaining to the treatment and disposition of Native American Human Remains, Associated/Unassociated Funerary Objects, and Objects of Cultural Patrimony. FHWA-CFLHD would be responsible for any written agreements or fees associated with the curation.
- All materials and records from any archaeological investigations necessitated by the Undertaking will be curated at the ASM, or other repository that meets the standards set forth in 36 CFR Part 79, in accordance with Archaeological Resources Protection Act (ARPA) (Section 4.b.3) and 36 CFR Part 79.
- If new cultural resources are discovered, or if unanticipated effects on historic properties are identified, FHWA-CFLHD shall implement the project specific Monitoring and Discovery Plan (MDP) that is part of the HPTP.
- Should a discovery of archaeological or historical materials not covered under NAGPRA or the Arizona State Burial Laws occur, FHWA-CFLHD and the Project Contractor will follow procedures detailed in the MDP of the HPTP. FHWA-CFLHD will require that any cultural resources discovered during construction or other ground-disturbing activities be protected immediately in accordance with all applicable laws. The contractor will cease all construction activity in the immediate vicinity and all ground disturbing activities within 50 feet of any discovery, and will notify FHWA-CFLHD of the discovery within 24 hours. FHWA-CFLHD will notify the SHPO and appropriate consulting parties (e.g., the land manager) of the discovery.

- FHWA-CFLHD will consult with all of the consulting parties on the eligibility of newly discovered cultural resources. If eligible, FHWA-CFLHD will ensure that treatment measures follow the final HPTP, as well as the review processes and timelines for all reports as embodied in this agreement document.
- Unanticipated discoveries of cultural items covered under NAGPRA (i.e., human remains, funerary objects, sacred objects, and objects of cultural patrimony) are the responsibility of TNF, the federal landowner. If human remains or NAGPRA cultural items as described in 43 C.F.R. 10 are discovered, the protocol for the treatment of human remains and NAGPRA cultural items found in the HPTP will be followed. All construction within 50 feet of the discovery will cease and TNF will be notified.

3.6 Visual Resources

This section describes impacts to visual and aesthetic resources expected from implementation of the No Action and Action Alternative. The Apache Trail is designated as a historic road as part of the Arizona State Scenic Roads program. This program includes Scenic Roads, Historic Roads, and Parkways. ADOT oversees the designating and planning of scenic roads within the state. The study area encompasses an 11.16-mile segment of the Apache Trail, including views from the road and of the road. The project area is also designated as a USFS Scenic Byway.

3.6.1 Regulatory Setting

NEPA establishes that the federal government use all practicable means to ensure for all Americans aesthetically and culturally pleasing surroundings (42 United States Code [USC] 4331[b][2]). To further emphasize this point, in its implementation of NEPA (23 USC 109[h]), FHWA directs that final decisions on projects are to be made in the best overall public interest, taking into account adverse environmental impacts, including the destruction or disruption of aesthetic values.

The land within the project area is administered by the USFS and therefore the USFS Visual Management System (VMS) was utilized in analyzing potential impacts to visual resources as a result of the proposed project. The VMS system identifies the visual characteristics of the land and defines objectives to manage the resource.

The initial step in the VMS is to establish the character type or to determine the visual characteristic of the physiographic unit. The identified physiographic unit for this project area is considered a part of the Sonoran Desert Subtype, which contains distinctive and diverse landforms characterized by highly fractured and eroded mountains and mesas with interspersed water bodies and rivers. Predominant vegetation type within the project area is associated with Sonoran Desert types, most commonly the saguaro cactus community.

Using the established character type as a frame of reference, the inherent scenic quality is rated based on the different degrees of landscape variety within the unit. Inherent scenic quality is a measure of the natural landscape's scenic beauty based on its attributes such as landform, vegetation, water forms and rock formations. The basic assumption of the VMS is that all landscapes have some inherent value, but those with the most variety or diversity have the greatest potential for "high scenic value."

Sensitivity levels are defined as the measure of people's concern for the scenic quality of the landscape. Basically, all viewed landscape is rated for a level of sensitivity. These levels are determined by estimating the number of users expressing concern about scenic quality based on their location of travel routes, use areas and water bodies. The assumption is that users of travel routes and adjacent use areas and water bodies are the most sensitive to the changes in the landscape.

By combining the sensitivity levels/distance zone and scenic quality, visual quality objectives (VQO) are determined. VQOs are assigned to the landscape to describe the degree of acceptable alteration of the natural landscape. The VQO classifications are Preservation, Retention, Partial Retention, Modification and Maximum Modification.

As defined in the *National Forest Land Management Plan, Tonto National Forest* (1985), the project falls within the Tonto Basin Ranger District – Roosevelt and Apache Lakes Recreation Area of TNF (Management Area 6F). This entire management area is within the retention VQO class characterization (USFS 1985). Retention (R) areas are managed with a VQO that in general means man's activities are not evident to the casual forest visitor.

A new scenery management system was developed by the U.S. Department of Agriculture (USDA) after the finalization of TNF's land management plan. Under the new scenery management system, a 'retention' VQO correlates to a 'High Scenic Integrity' VQO. This VQO appears unaltered. "High scenic integrity refers to landscapes where the valued landscape character 'appears' intact. Deviations may be present but must repeat the form, line, color, texture, and pattern common to the landscape character so completely and at such scale that they are not evident" (USDA 1995).

Per the scenery management system handbook, *Landscape Aesthetics, A Handbook for Scenery Management* (1995), structures required for serving public use of scenic and recreation resources include viewing platforms, such as roads. They are a part of the expected image of the public being served. However, allowable limits of contrasts only go to the extent that functions of structures are served. They should also reflect design excellence. Such structures should be a positive element of the built environment that does not detract from scenic experiences. Structures should blend into the landscape while still retaining their function. They should be an indicator of sensitive land stewardship (USDA 1995).

Although the portion of the Apache Trail within the project area is designated as a USFS Scenic Byway, there is not currently a management plan available to identify potential impacts related to management goals/objectives or previously documented intrinsic scenic qualities of the byway.

3.6.2 Affected Environment

Visual Environment

The Apache Trail is a designated historic road that offers spectacular views of the surrounding mountains and some of the most rugged terrain in Arizona. Steep-sided canyons, rock outcroppings and magnificent geologic formations occur all along the road. The Apache Trail's natural beauty has long made it a major attraction in Arizona. President Theodore Roosevelt stated that "the Apache Trail combines the grandeur of the Alps, the glory of the Rockies, the magnificence of the Grand Canyon and then adds an indefinable something that none of the others have. To me, it is the most awe-inspiring and most sublimely beautiful panorama nature has ever created" (USDOT 2015).

Road Surface

The westernmost 19 miles of the road and an approximately 1-mile long section near Roosevelt Dam are paved while the remaining mileage is composed of native decomposed granite surfacing material. The unpaved portion of the Apache Trail is surfaced with decomposed granite, which gives the road a distinctive color. Decomposed granite was historically available and reflects the road's distinctive color, but does not have the strength, gradation, and plasticity required to meet compaction

standards. This results in washboarding, loss of material, and fugitive dust. The dust issue, in particular, impacts the visual environment and requires ADOT to constantly spray down the road with water while addressing the frequent issues that arise on the unpaved sections (USDOT 2015). Due to the climate and intense solar exposure, the paved (or chip sealed) portions of the road do not differ drastically in visual appearance from the unpaved portion, as demonstrated below in Figure 5.

Figure 5. Road Surface at Intersection of Marina Access Road and Apache Trail

Visible Historic Road Features

The tops of several culvert headwalls are visible while driving along the project segment of the Apache trail and a few larger out headwalls are visible along the northern side of the project route. In addition, several culvert outlets and headwalls are visible to boaters from Apache Lake. These features contribute to the overall visual setting of the historic Apache Trail, some more strongly than others. In numerous locations, the backs of culvert headwalls are slightly visible from the road, as evidenced in the background of Figure 6 and in the foreground in Figure 8. A few have headwalls that are highly visible from the road and/or Apache Lake and contribute to the driving and recreational experience along the project route as seen in Figure 7. While some of these features survived the floods of 2019, others suffered damage (compare Figure 7 and 9).

Figure 6. Slightly visible culvert headwalls prior to flood damage

Figure 7. Highly visible culvert headwall prior to flood damage

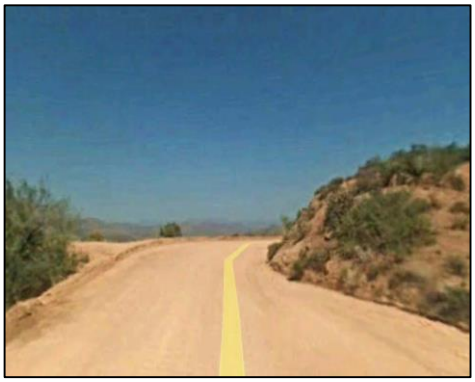
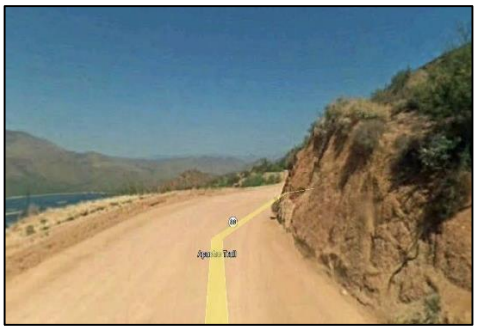
Figure 8. Slightly visible culvert headwalls following flood damage

Figure 9. Highly visible culvert headwall following flood damage

Landforms and Vegetation

There are several locations along the project route where the driver's line of sight is restricted by the adjacent landform. Within the project area, this occurs in five notable locations, as depicted in Figure 10 (see Table 1). None of these landforms are named features or are visually iconic or remarkable when compared to the rest of the project corridor.

Figure 10. Locations of Limited Site Distance

Mile Post	Image	Mile Post	Image
229.5		233.5	
229.6		234.5	
229.9			

The project area is arid and primarily dominated by a desertscrub vegetation community with distinct riparian communities found along the larger drainages. Vegetation is generally characterized by the dominant presence of saguaro cactus, which provide a distinctive desert visual character, and various other cacti and smaller shrubs. Dominant species vary along the route based on elevation, slope, aspect, and soils. There are no large trees within the project area.

Viewer Characteristics

In addition to its status as a designated Arizona Historic Road under the state Scenic Road/Byway system, the natural qualities of the Apache Trail area draw visitors, especially since the road is close to the Phoenix metropolitan areas and is part of TNF,

providing access to campgrounds, trails, and other recreation sites sections (USDOT 2015).

Viewer groups within the project vicinity can be classified as TNF staff, recreationists visiting TNF and Apache Lake, boaters on Apache Lake, commercial business employees, and drivers and passengers commuting along the road corridor.

3.6.3 Environmental Consequences

No Action Alternative

Under the No Action Alternative, no improvements would be made to the Apache Trail within the project area. Activities under the No Action Alternative would include ongoing road maintenance activities to repair and maintain the granite gravel surface. While a future alternative gravel source could differ in color from what is currently used, no intentional long-term visual impacts would occur within the study area under the No Action Alternative; however, ongoing maintenance and natural weather events would be expected to continually impact the road itself and/or some of the historic features along the route, including culverts and headwalls. Depending on the damage, unpredictable changes could result in long-term impacts to the visual character of the road similar to what was observed in the 2019 flood events. Under the No Action Alternative, the project area along the Apache Trail would be maintained consistently with the visual objectives identified within TNF's management plans and policies.

Action Alternative

The application of a chip seal would alter the visual appearance of the road surface along the project route. It is anticipated that this impact would be greatest immediately following construction and any future resurfacing maintenance; however, the coloration of the road surface would fade quickly in the arid, high-sun exposure of the project area. As evidenced in Figure 5, the intersection of SR88 with the Apache Lake Marina and Resort access road depicts a variation in color between the chip sealed surface and the decomposed granite surface, but the color variation is not substantial.

In general, application of a double chip seal process consists of applying a tack coat to the existing gravel surface, followed by placing two layers of binder and rock chips to comprise the new road surface. A local aggregate source would be utilized to produce the rock chips for the chip seal, in anticipation of providing an aggregate surface that would blend visually with the natural surroundings found along Apache Trail. A fog seal is then applied to the top of the chip sealed surface to seal the top and limit water intrusion into the roadway subgrade.

Under the Action Alternative, proposed drainage improvements would avoid impacts to highly visible culvert headwalls, as much as possible. The project would include several drainage improvement approaches that could affect the visual character of historic road features. These options include adding additional elements/improvements to existing culverts, replacing or extending one end of an existing culvert, entirely replacing a culvert, replacing are adding headwalls/wingwalls.

Of all the culverts and stand-alone retaining walls along the route, the project would maintain the original structure at approximately 51 locations. Some of the culverts may require cleaning, but this activity will not impact their visual characteristics.

The addition of culvert end treatments, replacement of culverts, and/or replacement of headwalls/wingwalls would occur at 72 culvert locations. Many of the culvert inlets and outlets along the project route experienced scour damage as the result of the floods in 2019. For this reason, a scour treatment, as described in Chapter 2 (see also Appendix A), will be applied to many of the 72 culverts. The scour treatments are deemed necessary to protect the road prism from future erosion during rain or flood events. Treatments A and B would require the addition of riprap (i.e. rock) and apron end sections to the culverts. A majority of the drainage improvements would not be visible from the roadway. Rock used as riprap will be similar in color to the existing soil and rocks in the project area and would blend in with the surroundings found along Apache Trail. Treatment C will require the extension of culverts down the side of road prisms. These extensions will occur at 10 locations. Some of these extensions may be viewable from Apache Trail.

Under the Action Alternative, modifications to structural drainage features are needed at 57 of the 72 culverts. These modifications include culvert replacements and/or the replacement of associated headwalls and wingwalls. Approximately 12 of these culverts will be replaced with large box culverts. To reduce any potential for visual impacts, culverts, headwalls, wingwalls, and concrete box culverts will be constructed to blend in with the existing structures along the route. For more visible structures, colored concrete may be used to better blend these structures with the colors of the natural surroundings. Form liners may be used to provide texture to some of these concrete structures to further minimize visual impacts. As a result, impacts to the visual quality of the road as a result of these full replacements are anticipated to be negligible. While some visitors may notice the applications, it is not anticipated that they would result in an adverse impact to the visual character of the route.

Of the five locations being considered for slope setbacks under the Action Alternative, none of them are named features or considered to be iconic in nature (see Table 1). The slope setbacks would not dramatically alter the landform or visual character of the project route. While the setback at MP 234.5 (Figure 10) could change the intensity of the "canyon feel" within this tight turn, it is not anticipated that it would considerably alter the visual character or detract from the visual experience of the driver.

Under the Action Alternative, vegetation would be removed in spot locations where drainage improvements and slope setbacks are proposed. Most of the vegetation within the project area is sparse and low in height. The removal of saguaro cacti would be limited to a few occurrences if any is impacted at all. All areas of vegetation would be reseeded with a native seed mix upon completion of the project. Given the limited extent of vegetation removal, the low vertical profile of most of the vegetation proposed for removal, and proposed reseeding efforts, impacts to the visual character resulting from vegetation removal are not anticipated.

Construction of proposed improvements would result in temporary visual changes, including views of construction equipment operations, dust, increased construction worker traffic, and construction signage.

Under the Action Alternative, the types of viewer groups utilizing the project area would not be anticipated to change drastically; however, the availability of an entirely paved route from Phoenix to the Apache Lake Marina and Resort via U.S. Route 60 and

Arizona SR 188 could result in an increase in visitors who were previously intimidated by the unpaved route, an increase in visitors trailing boats, and in commercial business employees driving larger trucks.

Since the road corridor is existing and there are no proposed changes to the horizontal alignment, impacts to the scenic character of the project corridor would not be anticipated. In keeping with the USFS Scenery Management Plan (USDA 1995), deviations to the road corridor would be present in the form of a darker surfacing material, but the form, line, texture, and pattern would be consistent with current conditions such that the road corridor would not appear drastically different. Overall, existing visual character of the project area would be maintained and long-term adverse impacts to visual resources would be minor in intensity. The proposed project would be in keeping with the land-management agency's (TNF) specific visual resource management objectives.

Conclusion

Application of a chip seal under the Action Alternative would alter the visual appearance of the road surface along the project route. It is anticipated that these impacts would be greatest immediately following construction; however, the coloration of the road surface would fade quickly in the arid, high-sun exposure of the project area minimizing the long-term adverse impacts to the visual appearance of the road. Adverse impacts to visual resources would not be anticipated as a result of adding additional elements/improvements to existing culverts or replacing, upsizing, or installing concrete box culverts with aesthetic treatments due to their low visibility and/or the use of similar materials to what is currently present. Due to the low visibility of a majority of the culverts proposed for full replacement, adverse impacts to the visual quality are anticipated to be negligible. Since the road corridor is existing and there are no proposed changes to the horizontal alignment, impacts to the scenic character of the project corridor would not be anticipated. Overall, existing visual character of the project area would be maintained and long-term adverse impacts to visual resources would be minor in intensity. The proposed project would be in keeping with the land-management agency's (TNF) specific visual resource management objectives. Impacts would be less than significant with incorporation of avoidance, minimization, and/or mitigation measures listed below.

3.6.4 Avoidance, Minimization, and/or Mitigation Measures

The Action Alternative was designed to minimize impacts to the existing historic infrastructure and the amount of elevation changes while meeting the project's purpose and need. The project design minimizes visual impacts in the following ways:

- Minimize the size of cut and fill slopes to the extent practicable.
- Minimize removal of trees, saguaros and other vegetation to the extent practicable.
- Minimize the number of road signs.
- Design cut slopes to blend into the adjacent natural topography.

Implementation of the following measures will offset the visual changes that would result from the proposed roadway improvements.

- The limits of clearing shall be irregular, and straight clearing lines shall be avoided by varying the width of the area to be cleared or by leaving selected clumps of vegetation, rock formations, and or boulders near the edge of the clearing limit.
- All disturbed areas shall be reseeded to the limits of clearing with native seeding mix.
- The contractor shall preserve and protect all vegetation outside of the approved clearing limits. Removal of vegetation outside of the approved clearing limits shall only occur with the authorization of the contracting officer.
- The contractor shall round and blend new slopes to mimic the existing contours, maintain slope stability, and highlight natural formations.
- Erosion-control fiber rolls shall be of natural earth-tone and biodegradable material.
- Integral natural appearing concrete coloring, natural rock, and/or formliners will be used for highly visible headwalls and/or wingwalls when deemed appropriate.

3.7 Noise

This section describes temporary noise impacts that would occur during project construction. The study area for noise includes all noise sensitive receptors that could be impacted by construction activities.

3.7.1 Regulatory Setting

23 CFR Part 772 provides procedures for preparing operational and construction noise studies and evaluating noise abatement considered for federal and federal-aid highway projects. Under 23 CFR § 772.7, projects are categorized as Type I, Type II, or Type III projects. FHWA defines a Type I project as a proposed federal or federal-aid highway project for the construction of a highway on a new location, or the physical alteration of an existing highway that significantly changes either the horizontal or vertical alignment, or increases the number of through-traffic lanes. A Type II project is a noise barrier retrofit project that involves no changes to highway capacity or alignment. A Type III project is a project that does not meet the classifications of a Type I or Type II project.

This project is considered a Type III project because it would not significantly alter the vertical or horizontal alignment of the existing roadway, and no additional traffic lanes would be provided. Therefore, the Action Alternative would not result in increased traffic noise impacts, and no long-term operational noise abatement is considered. However, construction of the Action Alternative would temporarily elevate noise levels in the project area, and those potential effects are evaluated below.

According to 23 CFR § 772.19, the following general steps are to be performed for construction noise analysis:

- Identify land uses or activities that may be affected by noise from construction of the project during the project development studies.
- Determine the measures needed in the plans and specifications to minimize or eliminate adverse construction noise impacts to the community. This determination shall include a weighing of the benefits achieved and the overall adverse social, economic, and environmental effects and the costs of the abatement measures.
- Incorporate the needed abatement measures in the plans and specifications.

3.7.2 Affected Environment

The project area is within a remote area of TNF where the primary activities include scenic driving along the Apache Trail as well as other recreational activities including hiking, camping, fishing, boating, and sight-seeing. The noise environment in the vicinity of the project is typical of an undeveloped, rural desertscrub environment. The predominant existing noise source in the corridor is vehicular traffic on the road. Additional noise is generated by off-road vehicle use, motorized boat use (near Apache Lake) by visitors to the TNF, and occasional aircraft overhead. Noise sensitive receptors in the project area include visitors to the national forest that recreate by hiking, camping, boating, and motorized off-road use. The receptors are transient and are typically located greater than 50 feet from the roadway and often much farther.

3.7.3 Environmental Consequences

No Action Alternative

The No Action Alternative would not involve reconstruction or improvement of the roadway. Noise levels in the study area are generally low and would not be anticipated to substantially change with ongoing maintenance activities. The high frequency of maintenance activities would continue. Therefore, no changes to existing noise impacts would be anticipated under the No Action Alternative.

Action Alternative

The Action Alternative would not increase the overall capacity of the project corridor and would not substantially alter the vertical or horizontal alignment. Therefore, no long-term noise impacts are anticipated.

Construction activities associated with the Action Alternative would temporarily elevate noise levels in the study area. Noise resulting from construction activities would depend on the different types of equipment used, the distance between construction noise sources and sensitive noise receptors, and the timing and duration of noise-generating activities.

Construction activities would require the use of heavy equipment such as backhoes, cranes, drills, and diesel-powered earth-moving equipment, such as dump trucks and bulldozers, and back-up alarms on certain equipment. The level of construction noises at receptor locations would depend on the loudest piece of equipment operating at any moment. According to the FHWA Construction Noise Handbook (August 2006), maximum noise levels from diesel-powered equipment range from 80 to 95 dBA at a distance of 50 feet. Impact equipment, such as impact hammers, can generate louder noise levels up to 101 dBA.

The Superstition Wilderness Area is located south of a portion of the project area, and although there would be temporary, construction-related noise from the project, the construction activity would be greater than one quarter mile (1,380 feet) from the wilderness boundary at the closest point. The Apache Lake Marina and Resort is approximately 1 mile northwest of the start of the project area. While there could be temporary, construction-related noise while work took place in that area, the distance, natural topography, and a 600-foot change in elevation would lessen any temporary noise impacts. The Davis Wash Shoreline Area and Burnt Corral Campground and Day Use Area are approximately 0.8- and 0.4-miles, respectively, from the road and within the project area while the Three Mile Wash Shoreline Area is only 0.10-miles from the road within the project area. While there would be temporary, construction-related noise from the project in these locations, construction would not occur along the entire length of the project for the entire duration of the project. Given the temporary nature of construction-related noise in proximity to these areas, the natural topography, distance, and the existing noise source of engine-powered boats on nearby Apache Lake, the impacts from the construction-related noise would not be anticipated to be significant.

A sound level measured from a point source decreases at a rate of 6 dBA per doubling of distance (FHWA 2011). For example, a piece of construction equipment has a noise level of 91 dBA at 25 feet, at 50 feet it reduces to 85 dBA, and at 100 feet it reduces another 6

dBA to 79 dBA. Therefore, the noise from a 91 dBA piece of equipment would attenuate to less than 59 dBA one-quarter mile (1,350 feet) from the equipment.

Based on the maximum noise levels from construction activities and the distance of noise sensitive receptors from the road, temporary noise levels associated with construction activities are anticipated to exceed levels that would be expected in a rural setting. However, these impacts will be of short duration, lasting only during construction and would occur only during the daytime. These temporary noise impacts are anticipated to be minor.

Conclusion

As mentioned above, no changes to noise levels would occur in the long term because the Action Alternative would not increase overall capacity or substantially alter the alignment. Ambient noise levels would increase during construction, temporarily affecting visitors in close proximity to the construction. However, these impacts would not be significant due to their short-term and intermittent nature. In addition, the measures listed below would reduce noise levels during construction.

3.7.4 Avoidance, Minimization, and/or Mitigation Measures

During construction, the following measures will be implemented to help reduce noise levels:

- Construction equipment shall have mufflers conforming to original manufacturer specifications that are in good working order and are in constant operation to prevent excessive noise or unusual noise.
- Operators shall avoid leaving equipment idling for more than five minutes when parked or not in use.

3.8 Geology and Soils

This section describes the soils and geologic hazards within the study area as they relate to public safety and design of the Action Alternative. The study area includes a 20-foot buffer beyond the existing roadway edge, with wider areas at culverts proposed for improvements and at proposed slope setbacks.

3.8.1 Regulatory Setting

Federal regulations protect geologic and topographic features under the Historic Sites Act of 1935, which establishes a national registry of natural landmarks and protects "outstanding examples of major geological features."

3.8.2 Affected Environment

Soils

As noted in the *Apache Trail Biological Assessment/Biological Evaluation Amendment* (BA/BE) (Jacobs 2021a) completed for the project, most of the project area is covered by deep alluvium washed in from the adjacent mountains. These deposits of silt, sand, and gravel are very young in the present-day drainageways and much older on the valley floors and terraces (Jacobs 2021a). Three distinct geological units exist within the project area. The majority of the project area consists of early Proterozoic metamorphic gneiss rock, but the western end of the project area consists of eroded volcanic basalt and andesite from Middle Miocene to Oligocene, and the eastern end of the project area consists of early Proterozoic granite rock. The variations in underlying geology create a noticeable difference in the stream channel morphology and vegetative communities observed onsite.

The Natural Resources Conservation Service (NRCS) has not published soil maps for this section of TNF. The project area is located generally within the Lithic Torriorthents-Lithic Haplustolls-Rock Outcrop Association of soils (TS6), with Torrifluvent soils along drainageways. These soils are well-drained, shallow soils and rock outcrop on semiarid, mid-elevation hills and mountains. The soils formed in residuum weathered from many rocks including granite, gneiss, rhyolite, andesite, tuffs, limestone, sandstone and basalt (Jacobs 2021a).

Topography

The Apache Trail winds through the mountainous terrain of the Superstition Mountains within TNF. Within the project area, the topography varies between rolling rocky slopes and rocky and cliff-dominated terrain. The road crosses numerous desert washes that vary in size and depth. Two of the larger washes within the project area are Davis Wash and Pine Creek.

Geologic Hazards

During heavy seasonal rain storms, water can overflow the roadway in spot locations along the project area. Depending on the severity, flooding sometimes causes damage to the roadway and/or culvert infrastructure. Partial or full closures are sometimes needed to repair the road and/or remove debris. During these events, culverts can plug resulting in roadway overtopping that scours the roadway surface and downstream embankment. In 2019, severe thunderstorms entered the project area in September and

November that caused heavy rains which resulted in roadway flooding, significant debris flows and rock fall to occur along the route.

The decomposed granite road surfacing material does not have the strength, gradation, and plasticity required to meet typical compaction standards (USDOT 2015). This results in washboarding, loss of material to roadside ditches, and dust. As a result, dust stirred up from traveler use may negatively affect visibility and air quality. Please refer to the 'Air Quality' section for further discussion.

3.8.3 Environmental Consequences

No Action Alternative

Under the No Action Alternative, current roadway conditions would be maintained. Regular maintenance activities would continue, as well as maintenance on an as-needed basis to address damages. Impacts to soils would include soil compaction and increased potential for erosion due to regular maintenance activities, inadequate drainage, and vehicles that inadvertently leave the roadway.

Action Alternative

Long-term impacts to soils would result from widening the roadway in spot locations to achieve a 20-foot or 24-foot typical road width, depending on the location and geologic constraints. In addition, impacts to soils would result from applying a chip seal pavement to the currently unpaved 11.16-mile section of road and paving existing pullouts. Temporary impacts to soils would result from clearing vegetation, constructing slope setbacks in several locations, and replacing and installing culverts. Applying a chip seal paving surface to the 11.16-mile decomposed granite stretch of road would create an impervious surface and increase the potential for runoff and erosion in proximity to the roadway. However, the completion of a hydraulic analysis of the project area and implementation of a drainage plan incorporating properly sized culverts and scour protection to handle surface water runoff in drainageways and ditches would reduce the potential for erosion and minimize impacts to soils. In addition, implementation of a Stormwater Pollution Prevention Plan (SWPPP) and Water Quality Construction Best Management Practices (BMPs) would reduce the impacts to soils, including soil erosion and the ability of the soil to support vegetation. As a result, long-term impacts to soils would be less than significant.

Conclusion

Under the Action Alternative, short and long-term adverse impacts to soils would result from soil disturbance from widening of the road in spot locations, clearing vegetation in spot locations, drainage improvements, and slope setbacks. However, long-term beneficial impacts to soils by upgrading drainage features would also occur. In addition, converting the 11.16-mile project area to an impervious surface would increase the potential for runoff and erosion; however, the short- and long-term impacts to geology and soils would be less than significant with incorporation of avoidance, minimization, and/or mitigation measures listed below.

3.8.4 Avoidance, Minimization, and/or Mitigation Measures

During construction, the following measures will be implemented to help reduce impacts to geology and soils:

- As part of the National Pollutant Discharge Elimination System (NPDES) Permit, a Stormwater Pollution Prevention Plan shall be implemented which would reduce impacts to soils.
- The area beyond the construction limits shall not be disturbed. Areas impacted from construction-related activity shall be replanted or reseeded with native plants under guidance from TNF and/or ADOT biologists. Revegetated areas shall be protected and cared for until restoration criteria have been met under NPDES standards.

3.9 Air Quality

Per the transportation conformity rule, this project is exempt from conformity with established air quality goals (40 CFR § 93.126 exempt projects) because the Action Alternative would not increase the overall capacity of the Apache Trail and would not significantly alter the vertical and horizontal alignment. Therefore, no long-term air quality impacts are anticipated. However, short-term air quality impacts from construction activities are anticipated and discussed below. The study area for air quality is Maricopa County.

3.9.1 Regulatory Setting

The Clean Air Act is the federal law that governs air quality. The Environmental Protection Agency (EPA) is responsible for establishing national ambient air quality standards (NAAQS) for six "criteria" pollutants to protect the public from health hazards associated with air pollution. These six criteria pollutants are carbon monoxide (CO), nitrogen dioxide (NO_2), ozone (O_3), particulate matter ($PM_{2.5}$ and PM_{10}), lead (Pb), and sulfur dioxide (SO_2).

The relevant air quality management agencies in Maricopa County include the EPA, ADEQ, and the Maricopa County Air Quality Department. The EPA has established federal standards for which ADEQ and Maricopa County have primary implementation responsibility. ADEQ and Maricopa County are also responsible for ensuring that state standards are met. At the local level, air quality is managed through land use and development planning practices, which are implemented in the county through the general planning process. The Maricopa County Air Quality Department is responsible for establishing and enforcing local air quality rules and regulations that address the requirements of federal and state air quality laws.

Guidance for the determination of significant air quality impacts within Maricopa County is found in the *Maricopa County Air Pollution Control Regulations*, published by the Maricopa County Department of Air Quality.

The nearby Superstition Wilderness Area is a designated Class I area under the Clean Air Act, which is an area that is afforded the highest degree of air quality protection with little allowance for deterioration of air quality.

3.9.2 Affected Environment

Climate Conditions

Average annual precipitation equals 15.74 inches with low intensity winter rains and high intensity monsoon thunderstorms in July and August (WRCC 2018). The data from the local Roosevelt weather station confirms that monsoonal precipitation cycle is the dominant precipitation event which likely drives the geomorphology of the local stream channels (WRCC 2018). The region has experienced annual drought conditions since 2010, with no single rain event exceeding 2 inches during that time. The largest single rain event on record (1905–2012) occurred in March of 1978 with a one-day total of 4.14 inches (WRCC 2018).

In Fall of 2019, a powerful late-season transition event aided by tropical moisture from the remnants of Hurricane Lorena led to widespread rainfall across south-central Arizona during a five-day period beginning September 23rd and ending on September 27th 2019. Maricopa County rain gages measured event totals anywhere from 0.00" - 4.50". Residents in Mesa, Apache Junction, Fountain Hills, Buckeye, Tonopah and several other communities experienced significant flash flooding due to heavy rain from this event (FCDMC 2019).

According to the Western Regional Climate Center (WRCC), the closest, most representative monitoring station to the proposed study area is the Roosevelt 1 WNW station. Climate data at this station was available from years 1905 to 2016 and is summarized in Table 4.

Table 4. Temperature and Precipitation Data (1905-2016) for Roosevelt 1 WNW, Arizona

Month	Temperature (°F)		Precipitation (inches)
	Average Maximum	Average Minimum	Average
January	59.2	37.1	1.9
February	64.2	40.1	1.77
March	70.8	44.7	1.76
April	79.7	51.7	0.67
May	89.3	60.2	0.34
June	99.4	69.2	0.24
July	102.2	75.3	1.47
August	99.7	73.7	1.97
September	94.8	67.8	1.29
October	83.5	56.5	1.09
November	69.8	45.1	1.21
December	59.9	37.8	2.02
Annual	81.0	54.9	15.74

Source: WRCC 2018

Fugitive Dust

The project occurs outside of Phoenix in Maricopa County, which is a (Serious) non-attainment area for PM-10 (1987), as designated by the EPA. A primary source of particulate matter in the area is fugitive dust from unpaved roads.

A report from Volpe noted that the decomposed granite surface on the unpaved portion of the road easily enters the air when dry and disturbed, decreasing visibility and overall air quality. This is a challenge, in particular, for decomposed granite surfacing compared to other unpaved surface materials.

Ozone

Maricopa County is in (Moderate) non-attainment for 8-Hr Ozone (2008). Ozone is not emitted directly into the air, but is created by chemical reactions between nitrogen oxides (NOx) and volatile organic compounds (VOCs). Emissions from industrial processes,

motor vehicle exhaust, and chemical solvents are some of the major sources of nitrogen oxides and VOCs.

Breathing in ozone can trigger a number of health problems including chest pain, coughing, throat irritation, and congestion, as well as worsen existing conditions such as bronchitis, emphysema, and asthma. Ground-level ozone also damages vegetation and ecosystems.

3.9.3 Environmental Consequences

No Action Alternative

Under the No Action Alternative, current roadway conditions would be maintained. Continued vehicular use of the unpaved road surface would continue to emit large volumes of fugitive dust. In addition, ongoing maintenance activities would be required to repair damages, smooth the road surface, and combat washboarding. These activities would continue to require the importing of and movement of additional fill material. Although water would continue to be imported to reduce the amount of dust generated during maintenance, these activities and the equipment used to perform them would continue to contribute fugitive dust and emissions that contribute to the formation of ozone resulting in a long-term localized adverse impact to air quality.

Action Alternative

Under the Action Alternative, rehabilitation and the application of a chip seal hardened surface along the 11.16-mile length of the project, would drastically reduce the generation of fugitive dust from vehicular use of this section of the road. In addition, installation of a chip seal surface would eliminate the need for additional fill material and maintenance activities to combat washboarding. While some road maintenance would still be required, the frequency and magnitude of routine maintenance would be greatly reduced. The reduction of maintenance driven emissions and the generation of fugitive dust along the project area would provide long-term beneficial impacts to air quality.

Construction activities are a source of dust and exhaust emissions that can have substantial impacts on local air quality. Emissions can vary substantially from day to day, depending on level of activity, the specific operations, and the prevailing weather. During construction, the Action Alternative would generate fugitive dust as a result of earthmoving construction operations and hauling materials. In addition, equipment required for these operations would temporarily increase NOx emissions. Given the short-term nature of the project and the relatively small scale of the construction, the emissions are not expected to contribute measurably to the formation of ozone. While BMPs would be implemented to reduce fugitive dust and emissions, minor localized temporary adverse impacts to air quality would result during implementation of the project. The air quality effects would be negligible with respect to the overall air quality within Maricopa County

Conclusion

This project is exempt from transportation conformity requirements. Long-term air quality impacts are anticipated to be beneficial as applying a chip seal surface would reduce the generation of fugitive dust from vehicular use within the project area. Mitigation would be implemented to reduce the impact of temporary impacts to air quality during construction to less-than-significant levels, as described below.

3.9.4 Avoidance, Minimization, and/or Mitigation Measures

Project construction is not anticipated to exceed thresholds of significance for construction-related criteria air pollutants and precursors. Therefore, control measures to reduce temporary construction-related emissions are not required, and therefore not recommended.

Standard construction BMPs will be implemented to minimize fugitive dust and NOx emissions during construction. Examples of which include the following:

- Maintain roadways during construction as follows:
  - Manage dust on the traveled way such that visibility and air quality are not affected and a hazardous condition is not created.
  - Remove accumulations of soil and other material from traveled way.
- Before grubbing or grading construct sediment controls around the perimeter of the project including filter barriers, diversion, and settling structures.
- Provide an adequate water supply and apply water uniformly across the traveled way as necessary to control dust. Uniformly apply water using pressure-type distributors, pipelines equipped with spray systems, or hoses with nozzles.
- Control dust within the construction limits as necessary including nights, weekends, and periods of non-work when the project is open to public traffic. When the project is not open to public traffic, control dust in areas of the project that have adjacent residences or businesses. Apply water at the locations, rates, and frequencies as ordered.
- Control dust on active haul roads, in pits and staging areas, and on the project during periods not covered above.

3.10 Wetlands and Other Waters of the U.S.

The following discussion summarizes the evaluation of existing waters of the U.S. (WOTUS) and potential effects to these resources that could occur with implementation of either the No Action Alternative or the Action Alternative. Additional information on the assessment of these resources is available in *Apache Trail AZ FLAP SR 88(1) Tonto National Forest, Maricopa County, AZ Waters of the U.S. Delineation Report* (Jacobs 2021b). The study area includes the existing roadway corridor, with wider areas at culverts proposed for improvements.

3.10.1 Regulatory Setting

Under Section 404 of the Clean Water Act (CWA), the USACE regulates the discharge of dredged and fill materials into WOTUS. As defined in 33 CFR § 328.3, these waters generally include wetlands and other waters, such as intrastate lakes, rivers, streams, mudflats, and tributaries to those waters. The EPA shares responsibility over WOTUS, with the USACE overseeing the Section 404 permit program. In addition, Executive Order 11990 directs federal agencies to observe a "no net loss" of wetlands in order to "minimize the destruction, loss, or degradation of wetlands, and to preserve and enhance the natural and beneficial values of wetlands."

3.10.2 Affected Environment

The project area traverses the landscape, generally paralleling the east side of Apache Lake, which is an impounded reach of the Salt River. The study area includes 177 ephemeral or intermittent drainages of varying sizes, including 21 larger streams that are mapped as blue-line intermittent streams by the U.S. Geological Survey (USGS), but which most are actually ephemeral in nature (Jacobs 2021b). The remaining minor drainages are not identified by the USGS or the National Hydrography Dataset (NHD) mapping. The project limits cross three larger named drainages: Davis Wash, Pine Creek, and Burnt Corral Creek.

A delineation was conducted between October 12 and 28, 2020. The survey area was investigated for the presence of wetland indicators (wetland hydrology, hydrophytic vegetation, and hydric soils), other WOTUS, and riparian habitat. Identification of wetland areas within the project area followed the *USACE 1987 Corps of Engineers Wetlands Delineation Manual* (1987 Manual) (USACE 1987) and the *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West Region* (Supplement) (USACE 2008). The survey area was investigated for the presence of wetland hydrology, hydrophytes, and hydric soils. Hydrophytic vegetation was identified utilizing the National Wetland Plant List (NWPL), wetland indicator status for the Arid West Region (Lichvar et al. 2016). Taxonomy was determined utilizing *A Natural History of the Sonoran Desert, Second Edition* (Phillips et al. 2015), and the University of Arizona Herbarium (UAH 2018). Per the Supplement (USACE 2008), if an observed plant species did not occur on the applicable regional list, the plant was assumed to be an upland species. Vegetation was determined to be "naturally problematic" throughout the survey area. The field survey was conducted during a dormant season for most forbs, grasses, and deciduous shrubs.

Due to the extensive, linear nature of the project area, and limited scope of the proposed project, surveys did not extend beyond the immediate road corridor except in areas where proposed drainage improvements/actions were anticipated. Most identified features were mapped using a submeter accuracy Global Positioning System (GPS) unit (Trimble GeoXH). GPS data was post-processed using ArcGIS 10.3 and mapped features were then overlain on aerial imagery. Some drainage features located within the project limits, but not subject to project impacts, were identified in the field and delineated with field map notes and desktop aerial photos.

Wetlands

Due to the steep topography and arid conditions of the landscape, potential WOTUS were limited to mostly ephemeral washes and streams within the project limits. No wetlands were delineated within the project corridor. Apache Lake is adjacent to portions of the project and is an open water, but was not delineated because it was beyond the survey area boundaries

Other Waters of the U.S.

The delineation identified a total of approximately 7.96 acres of potential WOTUS within the survey area. All features delineated were either ephemeral or intermittent streams. Ephemeral streams are those drainages that flow after rain events or temporarily channel snow melt. Intermittent streams have flowing water during certain times of the year, when groundwater provides water for stream flow. During dry periods, intermittent streams may not have flowing water. Both ephemeral and intermittent streams are classified as intermittent riverine streambed with seasonal flooding (R4SBC) (Cowardin et al. 1979).

Surveys focused on the immediate road corridor except in areas where proposed drainage improvements and/or actions were anticipated. A unique identification number was designated for each delineated feature chronologically from west to east. Streams were further divided with a directional designation (e.g., E, W, N, or S) when the drainage passed through a culvert or was separated by the road. All streams drain into Apache Lake, which is an open water feature north of the project corridor. One hundred seventy-seven (177) potential streams were delineated. The width of the streams ranged from 1 to 300 feet wide at their ordinary high-water mark. At the time of investigation, no surface water was present within any of the features delineated.

3.10.3 Environmental Consequences

No Action Alternative

The No Action Alternative would not improve the roadway and would consist of continuing existing maintenance activities. Maintenance activities, including the continued importing and movement (blading) of additional fill material on the roadway, could result in impacts to jurisdictional and non-jurisdictional waters. Erosion and dispersal of the excess fill material that sits along the shoulders of the Apache Trail ends up in the numerous streambeds that cross under and over the roadway resulting in adverse impacts. While standard BMPs would be implemented during some maintenance activities, weather events and the frequent blading of the road surface would continue to increase the potential for some of the roadway fill material to enter streams where it can wash down into Apache Lake. As a result, the No Action

Alternative would be anticipated to have adverse impacts to WOTUS that range in severity depending on location, weather events, and the proximity of any berms of roadway fill material to WOTUS.

Action Alternative

The Action Alternative may permanently and temporarily impact ephemeral washes as a result of roadway and drainage improvements. Some of these may be determined to be other WOTUS. According to 33 CFR 328.3(a), the limits of federal jurisdiction for "Jurisdictional" WOTUS are defined as follows:

(1) The territorial seas, and waters which are currently used, or were used in the past, or may be susceptible to use in interstate or foreign commerce, including waters which are subject to the ebb and flow of the tide.

(2) Tributaries;

(3) Lakes and ponds, and impoundment of jurisdictional waters; and

(4) Adjacent wetlands.

"Non-jurisdictional" waters. Or waters that are not WOTUS are defined as follows:

(1) Waters or water features that are not identified in paragraph (a)(1), (2), (3), or (4) of this section;

(2) Groundwater, including groundwater drained through subsurface drainage systems;

(3) Ephemeral features, including ephemeral streams, swales, gullies, rills, and pools;

(4) Diffuse stormwater run-off and directional sheet flow over upland;

(5) Ditches that are not waters identified in paragraph (a)(1) or (2) of this section, and those portions of ditches constructed in waters identified in paragraph (a)(4) of this section that do not satisfy the conditions of paragraph (c)(1) of this section;

(6) Prior converted cropland;

(7) Artificially irrigated areas, including fields flooded for agricultural production, that would revert to upland should application of irrigation water to that area cease;

(8) Artificial lakes and ponds, including water storage reservoirs and farm, irrigation, stock watering, and log cleaning ponds, constructed or excavated in upland or in non-jurisdictional waters, so long as those artificial lakes and ponds are not impoundments of jurisdictional waters that meet the conditions of paragraph (c)(6) of this section;

(9) Water-filled depressions constructed or excavated in upland or in non-jurisdictional waters incidental to mining or construction activity, and pits excavated in upland or in non-jurisdictional waters for the purpose of obtaining fill, sand, or gravel;

(10) Stormwater control features constructed or excavated in upland or in non-jurisdictional waters to convey, treat, infiltrate, or store stormwater runoff;

(11) Groundwater recharge, water reuse, and wastewater recycling structures, including detention, retention, and infiltration basins and ponds, constructed or excavated in upland or in non-jurisdictional waters; and

(12) Waste treatment systems.

Non-tidal WOTUS, or non 328.3 (a)(1) waters, must meet the definition of (a)(2)-(4) waters to be WOTUS. As defined in 328.3 (c), "*The term tributary means a river, stream, or similar naturally occurring surface water channel that contributes surface water flow to a water identified in paragraph (a)(1) of this section in a typical year either directly or through one or more waters identified in paragraph (a)(2), (3), or (4) of this section. A tributary must be perennial or intermittent in a typical year. The alteration or relocation of a tributary does not modify its jurisdictional status as long as it continues to satisfy the flow conditions of this definition. A tributary does not lose its jurisdictional status if it contributes surface water flow to a downstream jurisdictional water in a typical year through a channelized non-jurisdictional surface water feature, through a subterranean river, through a culvert, dam, tunnel, or similar artificial feature, or through a debris pile, boulder field, or similar natural feature. The term tributary includes a ditch that either relocates a tributary, is constructed in a tributary, or is constructed in an adjacent wetland as long as the ditch satisfies the flow conditions of this definition.*"

The delineation report was submitted to the USACE in February 4, 2021, for an Approved Jurisdictional Determination (AJD). According to the AJD dated March 5, 2021, the USACE determined that all the streams, with the exception of Pine Creek, are ephemeral streams and do not meet the definition of WOTUS. Pine Creek was determined to be an intermittent stream and thus, met the definition of WOTUS. The AJD and maps identifying aquatic features are in Appendix B.

Based on conceptual design, the Action Alternative would permanently impact less than 0.85 acres of ephemeral waters and temporarily impact less than 1 acre of ephemeral waters. No work below the ordinary high water of Pine Creek is proposed. Table 5 summarizes these impacts. Additionally, there would be no impacts to wetlands or riparian habitat since they do not occur within the project impact area. Temporarily impacted areas would be restored shortly after construction, which would include stabilization and erosion control. These impacts are a conservative estimate based on conceptual design. Actual impacts after final design are anticipated to be similar or less.

Table 5. Aquatic Resource Impacts

Water Type	Acres within Study Area	Permanent Impacts (acres)	Temporary Impacts (acres)
Aquatic Resources			
Ephemeral Streambed	7.96	<0.85	<1.0

Along most of the project corridor, these impacts would be associated with drainage improvements to existing culverts. Approximately 91 drainage features would undergo modification or maintenance. These actions include culvert replacement or extension, culvert cleaning, ditch reconditioning, wingwall/headwall replacement and repair, low-

water crossing replacement, and/or addition of one of several scour protection treatments as described in Chapter 2. The majority of these scour protection treatments would add additional infrastructure that would extend the outlet of the culvert onto the floor of the ephemeral channel. While these actions would result in permanent fill within the channels, they would reduce the potential for excessive erosion caused by high volumes of water flowing through undersized culverts or pouring into the channels from a perched culvert outlet during rain events. Permanent impacts would result from the placement of fill and/or infrastructure within the channels. Temporary impacts would result from construction equipment accessing the channels and streambanks. In localized areas of roadway, the impacts would be associated with excavation and fill to widen the roadway a few feet. The largest single impact would occur at the low water crossing located at approximately MP 236.34 as a result of localized reconstruction because the road crosses through the ephemeral channel and the hardened low water crossing would extend approximately 22-feet beyond the road corridor on both sides of the road in this location.

Conclusion

All WOTUS will be avoided in the Action Alternative. Overall, the Action Alternative would initially result in adverse impacts to ephemeral streams (i.e. non-jurisdictional waters), through the direct placement of roadway fill and culvert replacement, repair, or extension. However, with the implementation of BMPs and the restoration and stabilization of temporary impact areas, the impacts would ultimately be expected to be minimal. In addition, long-term beneficial impacts would result from drainage improvements to reduce erosion and improved hydrologic function at the roadway interface.

3.10.4 Avoidance, Minimization, and/or Mitigation Measures

There is no practicable alternative to avoid impacting ephemeral streams while meeting the purpose and need of the project. The following measures will be implemented in order to avoid or minimize impacts:

- Maintain the existing roadway alignment to minimize impacts to ephemeral streams and adjacent WOTUS.
- In certain locations, the road width and numerous curves will have design exceptions in order to minimize ground disturbance.
- Culvert repair or replacement and associated work shall not be completed if there is flowing water within the ephemeral channel.
- The construction contractor shall use BMPs to prevent the discharge of equipment fluids. All equipment shall be stored, repaired, maintained, and fueled at least 65 feet away from waterways. A plan to allow a prompt and effective response to any accidental spills shall be developed prior to construction.
- The area beyond the construction limits shall not be disturbed. Degraded areas impacted from construction-related activity shall be replanted or reseeded with native plants. FHWA-CFLHD shall work with TNF and ADOT for appropriate seed mixes.

3.11 Water Quality and Hydrology

This section discusses the existing hydrology of the project area, existing water quality conditions and standards, and the potential to impact the watershed. The study area used for this assessment encompasses the existing 100-foot wide ADOT easement and select areas beyond the easement that encompass areas of localized improvements. In addition, the study area includes 200 feet downstream of delineated perennial, ephemeral, and intermittent streams and drainages to account for any indirect impacts to water quality during construction.

3.11.1 Regulatory Setting

The Federal Water Pollution Control Act of 1972, as amended by the CWA of 1977, dictates water quality standards and regulates the discharge of pollutants from point sources into WOTUS. The overall goal of the CWA is "to restore and maintain the chemical, physical, and biological integrity of the Nation's waters." Section 303 of the CWA requires states to develop or adopt and implement water quality standards. This consists of designating the use of waters and setting water quality criteria. In addition, each state identifies impaired waters, also known as the 303(d) list, that require additional measures and a long-term plan to bring such waters up to water quality standards. Under Section 304(a), the EPA also issues recommended water quality criteria that aid states in developing these standards.

Section 402 and Section 404 of the CWA set forth the permitting programs to regulate discharges into WOTUS. Section 402 establishes the NPDES permitting program, which requires a permit for any point source discharge (excluding dredged and fill material) into a water of the U.S. As previously discussed in the Wetlands and Other Waters of the U.S. section, Section 404 regulates the discharge of dredged and fill materials into WOTUS. As part of the goal of maintaining water quality standards, any entity requiring a permit, commonly a Section 404 permit, needs to obtain water quality certification from the state.

3.11.2 Affected Environment

The project is generally located within the Lower Salt River watershed (U.S. Geological Survey [USGS] Hydrologic Unit Code [HUC] 15060106) and spans three sub-watersheds: Pine Creek (HUC 150601060101), Burnt Corral Creek (HUC 150601060102) and Davis Wash (HUC150601060103) (Jacobs 2021b). Apache Lake is a 2,192-acre impoundment (located north and parallel to the project area) that is within the SRP chain of reservoirs which provide water to the Phoenix metropolitan area. The project area traverses the landscape, generally paralleling the south/east side of Apache Lake. The project crosses approximately 177 drainages of varying sizes, including 21 larger ephemeral streams that are mapped as blue-line intermittent streams by USGS (Jacobs 2021b), but are actually ephemeral in nature, with the exception of Pine Creek. The remaining minor drainages delineated are not identified by the USGS or the National Hydrography Dataset (NHD) mapping. The project limits cross three larger named drainages: Davis Wash, Pine Creek, and Burnt Corral Creek. In general, within the project area, the road prism of the Apache Trail intersects numerous drainages

originating from the Superstition Mountains and flowing towards the Salt River/Apache Lake.

The project area is within the Central Highlands Planning Area, as managed by the Arizona Department of Water Resources (ADWR). According to Section 5.2 (Salt River Basin) of the *Arizona Water Atlas Volume 5 Central Highlands Planning Area* (ADWR 2009), water quality standards were not exceeded in Apache Lake when the report was published in 2009. In 2016, ADEQ requested that the EPA add water quality limited segments (WQLS) for Apache Lake to the 2016 list due to measured fish tissue mercury exceedances. ADEQ reached out to the EPA because Arizona does not currently have impairment identification procedures for listing waters based on mercury in fish tissue, but does believe the waters to be impaired. As a result, the EPA proposed to add WQLS for Apache Lake and the lake was proposed for listing as impaired for the designated uses of 'aquatic and wildlife' and 'fish consumption' (EPA 2016). No total daily maximum load (TDML) data has been recorded within Apache Lake, but the probable sources listed as contributing to impairment include the following: dam or impoundment, forest roads (road construction and use), livestock (grazing or feeding operations), other recreational pollution sources, and watershed runoff following forest fire. These sources are listed as potential contributors to impairment of dissolved oxygen and mercury in fish tissue (EPA 2016).

According to the EPA, in many waterbodies, mercury likely originates largely from air sources, such as coal-fired power plants and incinerators, that deposit in waters or nearby lands that then wash-down into nearby waters. The sources may come from a combination of local, regional, or even international contributors. The presence of mercury may also be a remnant of past practices that used mercury, such as historic gold mining, or from geologic deposits.

According to ADEQ's 2012/2014 list of impaired waters, Apache Lake was also listed as impaired for low dissolved oxygen.

The existing decomposed granite surfacing material on the Apache Trail does not have the strength, gradation, and plasticity required to meet compaction standards. As a result, erosion and dust control are a constant maintenance concern along the project corridor. The dust issue requires ADOT to constantly spray down the road with water while addressing the frequent issues that arise on the unpaved sections (USDOT 2015). The decomposed granite material frequently erodes into the numerous ephemeral drainages and ultimately into Apache Lake. While the decomposed granite is not a source of mercury, it is a source of increased sedimentation and turbidity in the lake, which impacts the water quality.

3.11.3 Environmental Consequences

No Action Alternative

Under the No Action Alternative, none of the proposed improvements would occur. Existing maintenance activities would continue, and may include grading and repairing or cleaning culverts, as needed. Generally, maintenance activities are anticipated to stay within the existing road surface; however, grading activities, ditch cleaning and culvert maintenance would result in increased sedimentation and turbidity in waterways within the project area. In particular, ongoing grading activities continually add road surfacing

material to the edges of the roadway. During rain events, grading, and continued use of the roadway, the excess surfacing material would continue to be lost to roadside ditches and washes. The erosive nature of this material would continue to contribute an adverse impact to the water quality of the adjacent Apache Lake.

Action Alternative

The Action Alternative would require excavating, filling, and grading of the road; applying a chip seal to the road surface; laying back cut slopes in five locations; improving low water crossings; repairing, replacing, or extending culverts in numerous locations; and providing scour protection in drainageways, including ditches. Based on conceptual design, a total of approximately 31 acres of impervious surface would be added as a result of chip sealing the road surface and several pullouts adjacent to the road. The increase in impervious surface could permanently affect water quality within the study area by increasing the velocity and amount of stormwater runoff into the study area watershed resulting in long-term adverse impacts to water quality. However; the application of a chip seal along the project route would eliminate 31 acres of decomposed granite surface in addition to the stockpiles and berms of material along the roadway, which are a chronic source of sedimentation and turbidity in washes and streams along the project corridor. The removal of this sedimentation source would result in long-term benefits to water quality within the project area. For these reasons, the increase in impervious surface is expected to have marginal impacts to water quality within the project area watershed.

The Action Alternative would maintain existing drainage patterns by upsizing some culverts and extending numerous existing culverts to improve their longevity and decrease erosion. Additional relief culverts would be added in several locations where there are longer segments between existing culverts to reduce the capacity load of the existing culverts. The improvements to existing culverts, the addition of several relief culverts, and the addition of armored roadside ditches in spot locations would also improve drainage dynamics.

Construction activities, particularly work within the ephemeral streambeds, could temporarily increase sedimentation into surface waters. However, the ephemeral streambeds are dry other than during and immediately following rain events and dewatering activities are not anticipated to be necessary during construction. In addition, BMPs would be implemented to limit and/or prevent sedimentation and turbidity during construction, which would reduce the severity of short-term adverse impacts to be negligible.

Prior to construction, a NPDES construction permit would be obtained. As part of the NPDES permit, a SWPPP would be developed, which would discuss means and methods to reduce potential water quality impacts during construction.

Conclusion

With implementation of avoidance and minimization measures as outlined below, permanent and temporary adverse impacts to water quality within the study area are expected to be less than significant. The Action Alternative would have no impact on fish tissue mercury levels within Apache Lake. Placing a chip seal on the road surface within the project area would eliminate the need for weekly grading activities and the

frequent addition of road surfacing material that contributes to increased sedimentation and turbidity within the ephemeral streambeds and ultimately Apache Lake. As a result, there would be long-term benefits to water quality within the project area which would offset, to a degree, the long-term adverse impacts resulting from the additional impervious surface area.

3.11.4 Avoidance, Minimization, and/or Mitigation Measures

The following measures would be implemented to reduce impacts on water quality:

- The area beyond the construction limits shall not be disturbed. Degraded areas impacted from construction-related activity shall be replanted or reseeded with native plants. FHWA-CFLHD shall work with TNF and ADOT for appropriate seed mixes.
- Certified weed-free permanent and temporary erosion control measures shall be used to minimize erosion and sedimentation during and after construction according to the contract erosion control plan, contract permits, Standard Specifications for Construction of Roads and Bridges on Federal Highway Projects (referred to as FP) Section 107 and FP Section 157.
- Any spill of petroleum products, hazardous materials, or other chemical or biological products released from stationary sources or construction, fleet, or other support vehicles shall be properly cleaned, mitigated, and remedied, if necessary. Any spill of petroleum products or a hazardous material shall be reported to the appropriate federal, state, and local authorities, if the spill is a reportable quantity. Response shall occur in accordance with federal, state, and local regulations.
- The contractor shall repair leaks immediately on discovery. Equipment that leaks shall not be used. Oil pans and absorbent material shall be in place prior to beginning work. The contractor shall be required to provide the "on-scene" capability of catching and absorbing leaks or petroleum product spills, including antifreeze from breakdowns or repair actions, with approved absorbent materials. A supply of acceptable absorbent materials at the job site in the event of spills, as defined in the SWPPP, shall be available. Sand and soil are not approved absorbent materials. Soils contaminated with fluids shall be removed, placed in appropriate safety containers, and disposed of according to state and/or federal regulations.
- The construction contractor shall use BMPs to prevent the discharge of equipment fluids. All equipment shall be stored, repaired, maintained, and fueled at least 65 feet away from waterways, wetlands, and riparian habitat. A plan for prompt and effective response to any accidental spills shall be developed prior to construction.
- Temporary erosion control measures shall be maintained in working condition until the project is complete or the measures are no longer needed.
- Only apply herbicides conforming to U.S. Environmental Protection Agency (EPA), Arizona Department of Agriculture, and/or Arizona Department of Environmental (ADEQ) requirements on project corridor.
- Apply herbicides prior to ground disturbance where there are visible noxious and invasive plant species only.

- Herbicides proposed for use on projects within transportation easements on USFS Lands shall be in conformance with the following current environmental documents including the *Environmental Assessment for Management of Noxious Weeds and Hazardous Vegetation on Public Roads on National Forest System Lands in Arizona* which is available at: http://www.fs.usda.gov/main/r3/landmanagement/projects .
- For the use and application of herbicides, follow the Tonto National Forest EA for Treatment of Noxious Weeds: http://data.ecosystem-management.org/nepaweb/nepa_project_exp.php?project=4454, including information provided at: https://www.fs.usda.gov/detail/tonto/landmanagement/resourcemanagement/?cid=fsbdev3_018789.

3.12 Wildlife (Including Special Status Species)

This section evaluates potential impacts relating to biological resources in and around the project biological study area. The TNF is home to many special status species, as well as sensitive natural communities, and federally designated critical habitat, all of which are discussed in this section. For purposes of this EA, special status species are considered the following:

- General wildlife
- Species designated as sensitive by TNF
- Bald and golden eagles
- Migratory birds
- Arizona State "Species of Greatest Conservation Need"
- Species listed, proposed for listing, or candidates for listing under the state or federal Endangered Species Acts (ESA)

The study area used for this assessment encompasses the existing 100-foot wide ADOT roadway easement and select areas beyond the right-of-way that encompass areas of localized improvements. In addition, the study area includes 200 feet downstream of delineated ephemeral and intermittent streams and drainages to account for any indirect impacts to water quality during construction.

3.12.1 Regulatory Setting

In 1973, the federal Endangered Species Act (FESA) was established for the protection of threatened and endangered species and their habitats. Under Section 7 of this act, federal agencies are required to consult with the USFWS and NMFS to ensure that they are not undertaking, funding, permitting, or authorizing actions likely to jeopardize the continued existence of listed species or destroy or adversely modify designated critical habitat. Critical habitat is defined as geographic locations critical to the existence of a threatened or endangered species. Section 9 of the FESA prohibits the take of threatened or endangered species, which is defined as "harass, harm, pursue, hunt, shoot, wound, kill, trap, capture or collect or any attempt at such conduct."

The Bald and Golden Eagle Protection Act (16 U.S.C. 668–668c) prohibits the take of bald or golden eagles, including their parts, nests, or eggs. In terms of the act, "take" is defined as "pursue, shoot, shoot at, poison, wound, kill, capture, trap, collect, molest or disturb."

Pursuant to the Migratory Bird Treaty Act (MBTA) of 1918, federal law prohibits the taking of migratory birds, their nests, or their eggs (16 U.S.C., Section 703). In 1972, the MBTA was amended to include protection for migratory birds of prey (e.g., raptors). The USFWS enforces the MBTA (16 U.S.C. 703-711).

USFS policy requires that a review of programs and activities be conducted to determine their potential effect on threatened and endangered species, species proposed or designated as candidates for listing, and Regional Forester-designated sensitive species (FSM 2670.3). Sensitive species are plant or animal species identified by the Regional

Forester for which population viability is a concern, as evidenced by either a significant current or predicted downward trend in population numbers or density, or a significant current or predicted downward trend in habitat capability that would reduce the species' existing distribution.

3.12.2 Affected Environment

General Wildlife

On January 30 through February 1, 2018, and again on October 12 through October 28, 2020, a certified wildlife biologist investigated the survey area for general biological characteristics (Jacobs 2021a). A reconnaissance-level vegetation survey was also performed. As noted in the BA/BE completed for the project, typical mammalian wildlife in the area include desert cottontail (*Sylvilagus audubonii*), black tailed jackrabbit (*Lepus californicus*), several species of squirrel (*Sciuridae*), mice and rats (*muridae*), raccoon (*Procyon lotor*), coyote (*Canis latrans*), striped skunk (*Mephitis mephitis*), javelina (*Tayassu tajacu*), bobcat (*Lynx rufus*), mountain lion (*Puma concolor),* and mule deer (*Odocoileus hemionus*). Tracks of raccoon, coyote, and javalina were seen during field investigation and Harris' antelope squirrels (*Ammospermophilus harrisii*) were also noted throughout the project area.

A myriad of reptiles and amphibians occur in the area including turtles, lizards, venomous and non-venomous snakes, and frogs.

An extensive number of bird species are also known to occur in the area including a number of resident and migrant species. More than 45 species of birds were encountered during field surveys.

Special Status Species

In terms of this analysis, special status species are those species that are designated as sensitive by TNF, protected by federal law, and/or noted by the State of Arizona as a "Species of Greatest Conservation Need." Special status plant and habitat observations were made during field surveys. The area evaluated for potential effects to these species includes the project limits and the immediate surrounding area. Due to the relief of the local topography, the action area evaluated generally includes all areas with a direct line of sight within one mile of the project limits. Downstream species, including those beyond the parameters described above, were considered through this process. However, compliance with the National Pollutant Discharge Elimination System (NPDES) provision of the Clean Water Act is anticipated to prevent possible downstream impacts.

The action area was evaluated for the presence of and potential to support eight species listed, proposed, or identified as a candidate for listing as threatened or endangered under the ESA, 16 TNF-sensitive species and one group, for a total of 24 species and one group. Most of the species evaluated have more than one special status designation. Table 6 includes a list of all species and evaluated for the project along with the federal and state status. Those species with potential to occur are discussed further in the analysis below. Many species have multiple special status designations under state and/or federal law. All of the bird species listed are protected under the Migratory Bird Treaty Act, and bald and golden eagles are also protected under the Bald and Golden Eagle Protection Act

Table 6. Special Status Species Evaluated Summary

Common and Species Name	USFWS Status[1] /TNF Status[2] /AGFD Status[3]	General Habitat Association[4]	Habitat Present/ Closest Occurrence to Action Area[5]
Animals			
Allen's lappet-browed bat *Idionycteris phyllotis*	-/FSS/-	Caves and abandoned mine shafts within mountainous pine and oak forests.	**No.** Occurrence data not known.
Pale Townsend's big-eared bat *Corynorhinus townsendii pallescens*	-/FSS/-	Coniferous forests and woodlands, riparian woodlands, semi-desert and montane shrublands and rarely in desert mountains, typically above 3,000 feet.	**No.** Occurrence data not known.
Western red bat *Lasiurus blossevillii*	-/FSS/1A	Statewide, except in desert areas.	**No.** Occurrence data not known.
California least tern, *Sterna antillarum browni*	E/NA/-	Sandy flats, open water	**No**. Nearest confirmed occurrence is within Maricopa County, approximately 30 miles southwest of the project limits. No species records within the action area.
Mexican spotted owl *Strix occidentalis lucida*	T/T/1A	Old growth mixed pine-oak woodland and coniferous forest on steep hillsides; canyonlands	**No**. No old growth woodland or coniferous forest present in the action area. Species not known to use non-forested canyon habitat in this portion of its range. Nearest known occurrence is approximately 3 miles north of the project limits.
Southwestern willow flycatcher *Empidonax trailli extimus*	E/E, FMB/1A	Dense riparian tree and shrub	**No**. Habitat lacking the vegetation density and hydrology to meet nesting habitat criteria within the action area. Nearest known occurrence is approximately 5 miles south of Roosevelt Dam.

Common and Species Name	USFWS Status[1] /TNF Status[2] /AGFD Status[3]	General Habitat Association[4]	Habitat Present/ Closest Occurrence to Action Area[5]
Yellow-billed cuckoo, western DPS *Coccyzus americanus*	T/T, FMB, 1A	Riparian with surface water or damp soil	**No.** Habitat lacking vegetation characteristics and hydrology to meet nesting habitat criteria within the action area. Nearest known occurrence approximately 8 miles east on the inflows to Roosevelt Lake.
Yuma clapper rail *Rallus longirostris yumanensis*	E/E/-	Tall, dense emergent wetland	**No**. No wetland patches of sufficient size are present in the action area. Nearest known location is approximately 8 miles northwest of the project limits.
Peregrine falcon *Falco peregrinus*	-/FSS, FMB/1A	Mountain cliffs and river gorges.	**Yes.** Nesting pairs known within the action area.
Bald eagle *Haliaeetus leucocephalus*	-/FSS, FMB/1A	Seacoasts, rivers, large lakes, and other large areas of open water.	**Yes.** Nesting pairs known within the action area.
Black-throated Sparrow *Amphispiza bilineata*	-/MIS/-	Semi-open with 1-3m shrubs	**Yes.** Species known to occur within action area.
Canyon towhee *Melozene fusca*	-/MIS, FMB/-	Semiarid uplands, riparian, and dry watercourses	**Yes.** Species known to occur within action area.
Golden eagle *Aquila chrysaetos*	-/MIS, FMB/1B	Cliffs, open areas and vista	**Yes.** Species known to occur within and nesting areas known near action area.
Western bluebird *Sialia mexicana*	-/MIS, FMB/-	Variable	**Yes.** Species known to occur within action area.
Colorado pikeminnow *Ptychocheilus lucius*	Ex, NE/E/1A	Warm, swift, turbid mainstream rivers. Prefers eddies and pools	**No**. Closest occurrence not known, but action area lacks all habitat requirements.
Gila topminnow *Poeciliopsis occidentalis*	E/E/-	Small streams and vegetated shallows, springs	**No**. Closest occurrence not known, but action area lacks all habitat requirements.

Common and Species Name	USFWS Status[1] /TNF Status[2] /AGFD Status[3]	General Habitat Association[4]	Habitat Present/ Closest Occurrence to Action Area[5]
Bezy's night Lizard *Xantusia bezyi*	-/FSS/1A	Rock and Granite outcrops, bear live young.	**No.** Habitat within action area falls outside of elevation species occurs in.
Sonoran desert tortoise *Gopherus morafkai*	C/C/1A	Sonoran desertscrub and desert grasslands, bajadas.	**Yes.** Species known to occur within action area.
Lowland leopard frog *Lithobates* [Rana] *yavapaiensis*	-/FSS/-	Permanent waters with aquatic and herbaceous vegetation in desertscrub, grassland, and pine/oak woodlands.	**No.** Occurrence data not known.
PLANTS			
Hohokam agave *Agave murpheyi*	-/FSS/-	Gentle bajada slopes, benches, and terraces above major drainages from 1,300–2,400 ft.	**No.** Occurrence data not known.
Tonto Basin agave *Agave delamateri*	-/FSS/-	South and southwest-facing slope edges on cobbly and gravelly, deep and well-drained soils from 2,300–5,100 ft.	**Yes.** Known to occur within 10 miles of action area
Aravaipa woodfern *Thelypteris puberula* var. *sonorensis*	-/FSS/-	Moist soil in the shade of boulders in mesic canyons. On riverbanks, seepage areas, and meadow habitats.	**No.** Occurrence data not known.
Fish Creek rockdaisy *Perityle saxicola*	-/FSS/1A	Cracks and crevices on cliff faces, large boulders, and rocky outcrops in canyons.	**Yes.** Known to occur within action area.
Mayfly *Fallceon eatoni*	-/FSS/-	Poorly understood, presumably requires standing water.	**No.** Occurrence data not known.
Macro-invertebrates	-/MIS/-	Surface water	**No.** Occurrence data not known.
STATUS CODES:			

Common and Species Name	USFWS Status[1] /TNF Status[2] /AGFD Status[3]	General Habitat Association[4]	Habitat Present/ Closest Occurrence to Action Area[5]
USFWS Status[1] E – Endangered T – Threatened C - Candidate PT – Proposed Threatened Ex, NE – Experimental, Non-essential		USFS Status[2] E – Endangered T – Threatened D – Designated P – Proposed C – Candidate FSS – Forest Sensitive Species MIS – Forest Service Management Indicator Species FMB – Forest Migratory Bird Species of Concern AGFD Status[3] HS – Highly Safeguarded Native Plant 1A – Vulnerable in top 8 categories and Tier 1 for top 5 concerns 1B – Vulnerable in top 8 categories [4]: Vegetation associations and habitat characteristics sourced from TNF-provided Species Abstracts and the IUCN Red List. [5]: Occurrence data sourced from AGFD and IUCN Red List.	

Peregrine Falcon

The peregrine falcon is a USFS sensitive species. They are found in the central part of Arizona year-round, with a summer population occurring farther north and a wintering population occurring in the far southern part of the state. Peregrine Falcon prefer steep, rocky cliffs with adequate ledges for nesting platforms, similar to bald eagles, which occurs at the eastern end of the project area from approximately MP 237 to the Roosevelt Dam. Arizona Game and Fish Department (AGFD) monitors several nests in this area annually. Their foraging habitat varies widely and an adequate prey population, particularly bird populations, is generally the primary limiting factor. Adequate foraging habitat for this species occurs throughout the project area.

Bald and Golden Eagles

The bald eagle is a USFS sensitive species and the golden eagle is a USFS management indicator species. The eagles' habitat includes large rocky cliffs, which can be found along the project corridor in areas where the roadway is adjacent to the Salt River and Apache Lake. Within the project area, these features occur at the eastern end of the project from approximately MP 237 to the Roosevelt Dam. AGFD monitors several nests known to occur in this stretch (Jacobs 2021a). During field surveys in 2018, one nest was actively occupied by a pair of bald eagles that was observable from approximately MP 239.5 to the Roosevelt Dam. Two additional habitat areas occur where the Apache Trail crosses riparian washes (Davis Wash and Burnt Corral Creek) and Apache Lake. These areas are less than a mile from and within the direct line of sight of the proposed project area.

Black-throated Sparrow

The black-throated sparrow is a USFS management indicator species that inhabits semi-open areas with evenly spaced shrubs and trees. They are common in desert alluvial

fans, canyons, washes, flats, badlands, and desertscrub areas commonly found throughout the project area.

Canyon Towhee

The canyon towhee is a USFS management indicator species found in semiarid uplands and areas along dry streambeds, which are common along the proposed project corridor.

Western Bluebird

The Western bluebird is a USFS management indicator species known to occur within the project area. The bluebird may breed in grasslands and edge areas with scattered trees, snags, or other suitable nest and perch sites and winter at lower elevations within breeding range, including desert areas where winter food supply is plentiful.

Sonoran Desert Tortoise

The Sonoran desert tortoise (desert tortoise) is a long-lived terrestrial turtle typically found in Sonoran desertscrub and desert grassland where it prefers rocky slopes and bajadas. (Jacobs 2021a). The Sonoran desert tortoise is a candidate for the FESA, USFS sensitive species and is considered vulnerable by AGFD. The project area is comprised primarily of Sonoran desertscrub on rolling rocky slopes and is considered desert tortoise habitat with records of known occurrence.

Tonto Basin Agave

The Tonto Basin agave is endemic to central Arizona. It is found on gravelly soils on south and southwest facing slopes in desertscrub habitat. The species is known to occur within a 10-mile radius and has some potential to occur within the project area.

Fish Creek Rock-daisy

The Fish Creek rock-daisy is a rare flowering perennial herb endemic to Arizona. It grows in cracks and crevices on cliff faces, large boulders, and rocky outcrops, and is known to occur in areas along the project corridor.

3.12.3 Environmental Consequences

No Action Alternative

Under the No Action Alternative, none of the proposed improvements would occur. Ongoing road maintenance activities would include repair and maintenance of the granite gravel surface. Generally, maintenance activities would be anticipated to stay within the existing road surface; however, repairs needed for any storm-inflicted damage to the road beyond typical wear and tear of the granite surface could impact vegetation in spot locations within the project area. These impacts could directly or indirectly affect special status species, wildlife, and the habitat on which they rely. Implementation of standard BMPs, such as timing restrictions, would minimize any potential impacts. Therefore, the No Action Alternative is expected to have minimal adverse impacts to wildlife or their habitat.

Action Alternative

General Wildlife

The Action Alternative could directly affect wildlife through mortality, harm, harassment, failed breeding attempts, and temporary displacement from project-related

impacts, such as increased noise and the presence of construction equipment and personnel, and the loss or degradation of habitat in spot locations. Direct effects from the project include vegetation removal, disturbance due to culvert repair and/or replacement, noise, and visual disturbance. All of these impacts would be temporary in nature.

Approximately 31 acres of impervious surface would be added as a result of chip sealing and paving 11.16 miles of the Apache Trail and some roadside ditches adjacent to the road. This addition could indirectly affect plants and wildlife through degradation of water quality from increased stormwater runoff. The faster velocity of stormwater runoff could also increase erosion and affect vegetation along the roadway.

During construction, BMPs would be put in place to prevent sediment and chemical releases from construction activities from entering streams, drainageways and/or Apache Lake. Culvert work and slope setbacks would have the greatest potential to increase sedimentation and BMPs would be put in place to minimize any sedimentation potential in the areas where these activities would occur. Noise and visual disturbance may temporarily affect wildlife during construction. Visual disturbance from the presence of people and construction equipment may disrupt wildlife behaviors and species' tendency to reside near the project area.

Future noise levels along the improved alignment are anticipated to remain similar to current conditions because the Action Alternative would not increase the overall capacity of the roadway. Therefore, long-term effects resulting from traffic-related noise are anticipated to remain unchanged from current conditions.

The following discussions address specific effects to special status species.

Peregrine Falcon

During construction, activities and noise associated with implementation of the proposed project could occur in proximity to nesting sites. Because peregrine falcons are generally sensitive to activities within a direct line of site of their nests, these activities could result in short-term impacts to nesting individuals and their young, potentially resulting in failed reproduction or rearing. Direct effects may also occur from construction activities at or near foraging habitat, which occurs along the length of the project. However, due to the extensive similar and remote foraging habitat found immediately adjacent to the project area, individuals would be anticipated to avoid construction activities and utilize the otherwise expansive foraging habitat not immediately adjacent to the project area. Vegetation and other clearing activities are not anticipated to impact nesting or foraging habitat for peregrine falcon.

In the year of proposed construction, FHWA-CFLHD would contact AGFD before any work would begin from MP 237 to the eastern terminus of the project (MP 240.6) between March 1 and August 31 to determine if peregrine falcon were known to be nesting within 0.5 miles of the project corridor. If an active falcon nest is present in this area, no work will occur until FHWA-CFLHD has determined that work can commence based on the location of the nest, type of construction, and expected noise levels associated with project activities in that area. This restriction does not apply from MP 229.2 to MP 237 year-round, nor does it apply from MP 237 to MP 240.6 between September 1 and February 28. With the implementation of appropriate monitoring and

timing of construction activities, impacts would be negligible and not likely to result in a loss of viability nor cause a trend toward federal listing. No long-term impacts would be anticipated as a result of the action alternative.

Bald and Golden Eagles

During construction, direct impacts to bald and golden eagles could occur at nesting sites in close proximity to the construction activity. Noise, vibration, and visual intrusion, may impact nesting individuals and their young, and could potentially result in failed reproduction or rearing. Although these individuals currently nest near the existing, active roadway, construction activities could present a different level of activity than what these individuals are habituated to. Additionally, direct effects could occur from construction activities at or near foraging habitat and foraging eagles. No indirect effects would be anticipated because vegetation and other clearing activities would not impact nesting or foraging habitat for bald and golden eagles.

FHWA-CFLHD will contact AGFD's Raptor Management Coordinator before any work would begin from MP 238.6 to the eastern terminus of the project (MP 240.6) between December 15 and August 1 to determine if an active eagle nest is located within 0.5 mile of the project corridor. If an active eagle nest is present in this area, no work will occur until FHWA-CFLHD has determined that work can commence based on the location of the nest, type of construction, and expected noise levels associated with project activities in that area, consistent with the *National Bald Eagle Management Guidelines* (USFWS 2007). This restriction does not apply from MP 229.2 to MP 238.6 year-round, nor does it apply from MP 238.6 to MP 240.6 between August 2 and December 14. With the implementation of appropriate monitoring and timing of construction activities, impacts would be negligible and not likely to result in a loss of viability nor cause a trend toward federal listing. No long-term impacts would be anticipated as a result of the action alternative.

Black-throated Sparrow, Canyon Towhee, and Western Bluebird

During construction of the Action Alternative, these species could be directly and/or indirectly impacted by the noise and disturbance of construction activities. To the extent possible, vegetation clearing would not occur during the migratory bird breeding season (February 1 – August 31). If vegetation clearing needed to be removed in spot locations during the breeding season, preconstruction surveys for active migratory bird nests would be conducted by a qualified biologist in all suitable habitat that would be disturbed. If an active birds nest was identified within the area to be disturbed, construction activities would avoid disturbing the active nest. A qualified biologist would determine the appropriate avoidance strategy until the nestlings had fledged and the nest is no longer active. As a result, short-term adverse impacts to these TNF management indicator species would be negligible and no long-term impacts would be anticipated.

Sonoran Desert Tortoise

This species likely occurs within the action area. During construction, minimal ground disturbing activities are anticipated outside of the immediate vicinity of the roadway. Short-term, direct impacts could occur from the increased vibrations, noise, and dust associated with the anticipated work, which could result in a disturbance to desert tortoises by causing them to evacuate the area and potential sheltering sites. Under the

Action Alternative, vegetation removal would be minimal, with the only broad vegetation removal area planned at the proposed slope setback near MP 234.5. Otherwise, vegetation removal would be limited to spot areas at culvert work locations. Vegetation removal could result in direct effects to sheltering desert tortoise as well as slight indirect effects through the removal of foraging habitat. However, implementation of standard conservation measures described below for this species would avoid or minimize potential adverse effects.

- During construction, FHWA-CFLHD would ensure the project adheres to the *ADOT Sonoran Desert Tortoise Awareness Program Handout* and AFGD's *Guidelines for Handling Sonoran Desert Tortoises Encountered on Development Projects* guidance documents which are both available online at: https://azdot.gov/sites/default/files/2019/06/tortoise_awareness_handout.pdf.
- The project contractor would be required to arrange for a qualified biologist to present an environmental awareness program to all personnel who would be onsite that would contain, at a minimum, information regarding the desert tortoise and procedures to be implemented in case a desert tortoise is found within the project limits. No work would begin prior to presentation of the environmental awareness program.
- The project contractor shall notify FHWA-CFLHD if a desert tortoise is encountered during construction.
- During construction, FHWA-CFLHD would report all encountered desert tortoises (live, injured, or dead) to the Arizona Department of Transportation Environmental Planning Biologist within 24 (twenty-four) hours of the encounter using the Arizona Department of Transportation Sonoran Desert Tortoise Observation Form. Photos should be taken of tortoises encountered and included in the report, if possible.
- If any desert tortoises were encountered in the project area, the contractor would take any measures necessary to ensure that project activities would not harm or disturb any desert tortoise, while adhering to the current handling guidelines for Sonoran desert tortoise.
- The contractor would require all on-site workers to check under their parked vehicles and equipment prior to driving to make sure there wasn't a tortoise sheltering underneath. If a desert tortoise were found sheltering underneath a parked vehicle or piece of equipment, the tortoise would be allowed to move out from under the vehicle on its own or be relocated following the current guidelines for Sonoran desert tortoise handling before the vehicle could be moved.
- Before replacement and/or repair of any existing culverts, the culverts must be checked to ensure no Sonoran desert tortoises are present. If a desert tortoise is found inside a culvert, the tortoise shall be allowed to move out from the culvert under its own volition, or relocated by a qualified biologist. The current guidelines for Sonoran desert tortoise handling must be followed if any tortoises must be handled.
- A qualified biologist would be required to be onsite to monitor initial vegetation clearing activities greater than 100 SF for the protection of desert tortoises in that

area. For vegetation clearing of less than 100 SF, the area would be checked by construction staff (who have received the environmental awareness program) to ensure no desert tortoise were present immediately prior to commencement of vegetation clearing.

- The contractor would not begin vegetation removal activities of over 100 SF or blasting activities until receiving project engineer approval. Project engineer approval would only be given following an initial survey of the vegetation clearing or blasting area for the presence of Sonoran desert tortoises or other sensitive species by a qualified biologist immediately prior to commencement of vegetation clearing. The contractor would not conduct initial vegetation removal of over 100 SF unless a qualified biologist was present to handle Sonoran desert tortoises.

The proposed project may affect individual Sonoran desert tortoises. Due to the limited nature of vegetation removal and implementation of the recommended conservation measures these impacts are not likely to result in a trend toward federal listing or loss of viability.

Tonto Basin Agave

Under the Action Alternative, the limited extent of proposed vegetation removal associated with the proposed actions would not adversely affect population viability or trend towards listing.

Fish Creek Rockdaisy

The Action Alternative would not include the removal of any rock cliff areas that could potentially provide habitat for the Fish Creek rockdaisy and therefore there would be no impacts to this species.

Conclusion

While the Action Alternative would permanently and temporarily impact wildlife, including special status species habitat, with an abundance of habitat within and directly adjacent to the study area, the direct and indirect impacts of the Action Alternative are not expected to substantially affect general wildlife and special status species. In addition, temporary impacts to vegetation within the project area would be restored. While short-term disruption of wildlife movement may occur during construction activities, the Action Alternative would not substantially alter species movement within the project area. Numerous species-specific mitigation measures were described for each species as discussed above. In combination with the general measures discussed below, impacts to wildlife, including special status species would be anticipated to be less than significant.

3.12.4 Avoidance, Minimization, and/or Mitigation Measures

Many measures specific to each species have been discussed above and/or incorporated into the Action Alternative to avoid, minimize, or mitigate impacts to special status species and wildlife. These measures are specific to the project area, which encompasses the project construction limits and is slightly smaller than the study area used for special status species analysis. The following BMPs would help avoid and minimize impacts to all species:

- All vehicles and equipment entering the project area must be clean of noxious weeds and free from oil leaks, and are subject to inspection. All construction equipment shall be washed thoroughly to remove all dirt, plant, and other foreign material prior to entering the project area. Particular attention shall be shown to the under-carriage and any surface where soil containing exotic seeds may exist. These efforts are critical to prevent the introduction and establishment of non-native plant species into the project area. Arrangements shall be made for inspections of each piece of equipment before entering the project, and records of inspections shall be maintained. Equipment found operating on the project that has not been inspected or has oil leaks shall be shut down and subject to citation.
- Operators shall avoid leaving equipment and vehicles idling for more than five minutes when parked or not in use.
- Any spill of petroleum products, hazardous materials, or other chemical or biological products released from construction, fleet, or other support vehicles, or stationary sources shall be properly cleaned, mitigated, and remedied, if necessary. Response shall occur in accordance with federal, state, and local regulations. Any spill of petroleum products or a hazardous material shall be reported to the appropriate federal, state, and local authorities, if the spill is a reportable quantity.
- Leaks shall be repaired immediately on discovery. Equipment that leaks shall not be used. Oil pans and absorbent material shall be in place prior to beginning work. The contractor shall be required to provide the "on-scene" capability of catching and absorbing leaks or petroleum product spills, including antifreeze from breakdowns or repair actions, with approved absorbent materials. A supply of acceptable absorbent materials at the job site in the event of spills, as defined in the SWPPP, shall be available. Sand and soil are not approved absorbent materials. Soils contaminated with fluids shall be removed, placed in appropriate safety containers, and disposed of according to state and/or federal regulations.
- The construction contractor shall be required to take appropriate measures to prevent the discharge of equipment fluids. All equipment shall be stored, repaired, maintained, and fueled at least 65 feet away from waterways. A plan to allow a prompt and effective response to any accidental spills shall be developed prior to construction.
- Certified weed-free permanent and temporary erosion control measures shall be implemented to minimize erosion and sedimentation during and after construction.
- FHWA-CFLHD shall conform to the Federal Seed Act, the Federal Noxious Weed Act, and applicable state and local seed and noxious weed laws.

3.13 Vegetation and Noxious Weeds

3.13.1 Regulatory Setting

The Federal Noxious Weed Act (7 U.S.C. §§ 2801–2813 and 7 CFR Part 360) addresses preventing the spread of noxious weeds and seeds across international borders and the transport of weeds within the U.S. on roadways. The Secretary of Agriculture designates which plants are noxious weeds, and coordinates with other federal, state, and local agencies, and private entities to control, eradicate, or prevent the spread of noxious weeds.

There are existing Arizona native plants on TNF lands in the project limits that will be impacted. The Arizona Department of Agriculture has no jurisdiction on federal lands.

3.13.2 Affected Environment

The project area is primarily dominated by a desertscrub community with distinct riparian communities found along the larger drainages. The desertscrub community is generally characterized by the dominant presence of saguaro cactus and various other cacti, jojoba (*Simmondsia chinensis*), velvet mesquite (*Prosopis velutina*), ocotillo (*Fourquieria spledens*), brittlebush (*Encelia farinose*), and foothills paloverde (*Parkinsonia microphylla*).

Dominant species vary through the project area based on elevation, slope, aspect, and soils. Xeric uplands with north and west aspects are generally dominated by jojoba, while south and east aspects are characterized by the dominant presence of saguaro cactus and foothills paloverde. Blue paloverde (*Parkinsonia florida*) and catclaw acacia (*Senegalia greggii*) are dominant in the riparian areas.

The western end of the project area has a notably higher component of Mormon tea (*Ephedra trifurca*) and agave (*Agave sp.*) which gradually give way to a greater and more varying component of cacti, including Engelmann's prickly-pear (*Opuntia engelmannii*), Hedgehog cactus (*Echinocereus engelmannii*), pincushion cactus (*Mammillaria grahamii*), Buckhorn and Teddy bear cholla (*Cylindropuntia acanthocarpa* and *Cylindropuntia bigelobii*, respectively), fishhook barrel cactus (*Ferocactus wislizeni*), and Sotol (*Dasylirion wheeleri*).

A number of plant species were noted that may not have been dominant, but occurred regularly throughout the survey area including desert mistletoe (*Phoradendron californicum*).

3.13.3 Environmental Consequences

No Action Alternative

None of the proposed improvements would occur under the No Action Alternative. Ongoing road maintenance activities would include repair and maintenance of the granite gravel surface. Generally, maintenance activities would be anticipated to stay within the existing road surface; however, repairs needed for any storm-inflicted damage to the road beyond typical wear and tear of the granite surface could impact vegetation in spot locations within the project area. Implementation of standard BMPs, such as those for controlling invasive plant species, would be anticipated to minimize any potential impacts. The No Action Alternative would have negligible to minimal adverse impacts to roadside vegetation.

Action Alternative

Construction of the Action Alternative would require limited areas of permanent and temporary disturbance of vegetation in order to construct one of two consistent template widths of 20- or 24-foot wide roadway, as well as to implement localized improvements, such as slope setbacks, and drainage improvements. Soil removal, grading, paving and chip sealing, trampling by equipment and personnel, and overall removal of habitat would adversely affect vegetation. Based on conceptual design, the Action Alternative would require the permanent disturbance of about 6 acres and the temporary disturbance of approximately 45 acres of land adjacent to the existing driving surface of the road. The amount of proposed disturbance off the existing road prism amounts to less than 1 acre of permanent disturbance, and approximately 31 acres of temporary disturbance. Refinements through the final design process may slightly change these estimates.

Indirect impacts could include the introduction or spread of invasive weeds, surface and subsurface hydrologic alterations, erosion, and removal or reduction of a vegetation buffer between human and natural activities. The increase in impervious surface area could also indirectly affect vegetation through an increase in erosion and sediment runoff. In addition, increased impervious surfaces may contribute chemical runoff from the materials used to construct the road. Runoff may then affect vegetation near roadsides or aquatic vegetation.

Conclusion

The Action Alternative would be expected to have both long- and short-term, adverse impacts to vegetation within the study area. However, impacts would be anticipated to be limited to vegetation within the desertscrub habitat, which is ample within the study area and TNF as a whole. Ultimately, impacts to general vegetation are expected to be minimal following implementation of mitigation and/or restoration (as applicable), and no significant loss of plant populations or vegetation communities would occur.

3.13.4 Avoidance, Minimization, and/or Mitigation Measures

The following measures will be implemented to minimize or mitigate impacts to vegetation and reduce the spread of invasive species. These measures are specific to the project area, which encompasses the project construction limits, and is slightly smaller than the study area used for the vegetation analysis.

- All vehicles and equipment entering the project area shall be clean of noxious weeds and free from oil leaks, and are subject to inspection. All construction equipment shall be washed thoroughly to remove all dirt, plant, and other foreign material prior to entering the project area. Particular attention shall be shown to the under-carriage and any surface where soil containing exotic seeds may exist. These efforts are critical to prevent the introduction and establishment of non-native plant species into the project area.
- Certified weed-free permanent and temporary erosion control measures shall be implemented to minimize erosion and sedimentation during and after construction.
- FHWA-CFLHD shall conform to the Federal Seed Act, the Federal Noxious Weed Act, and applicable state and local seed and noxious weed laws.

- Degraded areas impacted from construction-related activity shall be reseeded with guidance from TNF biologists. Revegetated areas shall be protected and cared for, including watering when needed, until restoration criteria have been met under USACE permits or NPDES standards. Revegetated areas shall be monitored in accordance with the approved restoration plan to ensure success criteria are met.

3.14 Cumulative Impacts

Cumulative impacts are impacts that result from the incremental effect of a proposed action when added to other past, present, and reasonably foreseeable future actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time (40 CFR § 1508.7). The purpose of a cumulative effects analysis is to ensure that federal agencies consider the full range of the consequences of their actions when making decisions in order to move towards sustainable development (CEQ 1997).

Cumulative effects were evaluated by combining the effects of the proposed action with other past, present, and reasonably foreseeable future actions in the project corridor. The past, present, and reasonably foreseeable future projects are shown in Table 7.

Table 7. Past, Present, and Reasonably Foreseeable Actions

Action/Responsible Parties	Time Frame	Description
Ash Creek Hill (ADOT)	Past (1961)	This project consists of new roadway alignment, new pipe culverts, concrete curb & spillways, retaining walls, and other incidental work for approximately a 1.7-mile stretch of SR 88 near Ash Creek.
Roosevelt Dam to Roosevelt (ADOT)	Past (1962)	Regrade, widen and pave existing dirt road to improve access to Roosevelt Dam. Construct new culverts, retaining wall, and guardrail. This section of road is now part of SR188.
Willow Creek Bridge, MP 209.6 (ADOT)	Past (1969)	Bridge repair.
Realignment and widening from upstream overlook (Inspiration Point Interpretive Overlook) to the dam access road (USBR)	Past (1990)	This project was done in coordination with work completed on the dam and the construction of the Roosevelt Lake Bridge. Prior to the completion of this project, traffic drove over the top of the Roosevelt Dam. The project included the realignment and widening of the road.
Roosevelt Dam Emergency Flood Repair, MP 241.8 (ADOT)	Past (1994)	Emergency repair to remove rock slide.
First Creek Bridge, MP 209.6 (ADOT)	Past (1995)	Bridge deck repair.
Scenic Drive to Tortilla Flat, MP 196.2 to 213.4 (ADOT)	Past (1995)	Remove and replace chip seal roadway surface.
Pavement Preservation, MP 213.35 to MP 220.20 (ADOT)	Past (1998)	Pavement preservation by applying an asphalt rubber-asphalt concrete friction course.

Action/Responsible Parties	Time Frame	Description
Retaining Wall Project (FHWA-CFLHD)	Past (2010)	This project addressed deterioration and damage at five retaining walls and embankments along the Apache Trail at MP 222.8, 224.6, 225.5, 225.3, and 226.2.
Emergency Spot Repair, MP 196.0 to MP 220.0 (ADOT and FHWA)	Past (2018)	This project consisted of roadway spot repair from flooding. All flood repairs within existing roadway prism. Work included road prism protection, replace culvert end sections, reconstruct ditches embankment curbs, regrout riprap spillways, pavement repair, etc.
State Route 88, Apache Junction to Forest Road 213, MP 203.4 to MP 220.2 (ADOT)	Past (2018)	The improvements associated with this project include addressing the deteriorating roadway surface and providing a safer driving experience by improving roadway geometry and traffic operations while maintaining access to forest recreation areas. The project included, among other maintenance activities, milling and repaving, the repaving and newly paving multiple pullouts, the reconstruction of six curves, modifications to existing culverts in three locations, repair to the concrete ford across Tortilla Creek, and removing a large rock above the roadway in one location.
Mormon Flat Dam Road Improvements (SRP)	Past	Improved access road leading to Horseshoe Dam at MP 208.7 with aggregate base material and provided soil stabilization along the route.
Apache Lake Marina Road Improvements (TNF)	Past	Improved the road to the Apache Lake Resort at MP 229.2 by adding drainage features and a layer of chip seal on the surface of the road.
Recreational Site Improvements (TNF)	Past	The USFS has developed and/or improved approximately 21 recreational sites along the Apache Trail corridor from MP 202 at the Dutchman Creek OHV Staging Area to MP 242 at Inspiration Point. The projects include campgrounds, trailhead access, trails, parking areas, boat ramps, fishing docks, picnic areas, ramadas, sidewalks, restrooms, interpretive signs, staging areas for OHV use, and overlooks.
USFS Permitted Uses (TNF)	Past and Ongoing	The USFS has provided and is continuing to provide permits for recreational support facilities such as the Apache Lake Resort, Tortilla Flat tourist area, and the Canyon Lake Marina. It also has provided recreation residence permits for a small number of cabins. In addition, two permits have been granted to ADOT for source materials to assist in the maintenance of SR 88.

Action/Responsible Parties	Time Frame	Description
Routine Road Maintenance Activities (ADOT)	Past and Ongoing	Due to the current, unpaved decomposed granite surface of the roadway, ongoing maintenance and repair activities are required to control washboarding and maintain a drivable surface. These activities include blading the road surface, which requires the importing of material. Additional maintenance activities include repairs to drainage structures, headwall repairs, erosion repair in spot locations, signage repairs, repairs from storm or accident damage (as needed), and other routine maintenance. In addition, invasive weed reduction is performed to maintain site distance at driveways and reduce vegetative growth into the roadway. Typically, vegetation is managed for tree and brush removal or trimming every 2-3 years, and weeds are treated twice annually or as needed.
Utility Improvements (SRP)	Present	Replace lattice telephone poles along the Apache Trail and develop maintenance access routes.
Bridge Replacement on Horse Mesa Dam Access Road (SRP)	Present	Replace bridge on Horse Mesa Dam access road (Forest Road 80).
Tomahawk Road to Buffalo Road, MP 197.4 to MP 201 (ADOT)	Future Action	The purpose of this project is to reduce the frequency of the roadway closures caused by the storm water overtopping/sedimentation on the roadway due to an inadequate culvert size and roadside ditch. This work includes improving the drainage systems, constructing new channels, installing shotcrete, seeding and other related work.
Dutchman Staging Area Expansion (TNF)	Future Action	TNF is considering expanding the Dutchman OHV Staging Area at MP 202.3.
MP 203 Staging Area Decommissioning (TNF)	Future Action	TNF is considering the obliteration of a user created staging area and the installation of pipe rail fence to prevent public access.
Woodbury Fire Invasive Weed Management (TNF)	Future Action	The Woodbury Fire burned the natural vegetation creating an environment susceptible to noxious and invasive weeds. Treatment money was obtained by the Burned Area Emergency Response team and will be utilized as needed.
Finalization of Apache Trail Maintenance and Operation Plan	Future Action	Programmatic Agreement between ADOT, the AZ SHPO, TNF, FHWA, and other landowners for the Apache Trail corridor regarding maintenance and operations along the route.

Since the 1960s ADOT, TNF, FHWA, USBR, and SRP have been involved in road maintenance and road improvements along the Apache Trail from Apache Junction to the Roosevelt Dam. In addition to the projects listed in Table 7, about eight (8) other transportation projects (i.e. past actions) occurred within the more developed town of Apache Junction near the western terminus of the Apache Trail, between MP 194 and MP 201 (intersection with entrance road to Lost Dutchman State Park) and have not

been listed in Table 7 due to their distance from the project site. These projects included intersection improvements, small paving jobs, and a culvert replacement.

3.14.1 Regulatory Setting

The Council on Environmental Quality (CEQ) developed *Considering Cumulative Effects Under the National Environmental Policy Act*, which recommends identifying those resources that could experience cumulative impacts, and then determining the separate effects of past actions, present actions, the proposed action, and other future actions (CEQ 1997). CEQ notes that, "most often, the historical context surrounding the resource is critical to developing baselines" and supporting decision-making (CEQ 1997).

FHWA guidance states that the degree to which cumulative impacts need to be addressed in an EA depends on the potential for the impacts to be significant, and will vary by resource, project type, geographic location, and other factors.

3.14.2 Environmental Consequences

In general, the overall health of the environmental resources considered for analysis in this document is good. With much of the proposed actions located on either previously disturbed areas, present stressors are limited, and the total impact of the proposed action is relatively minor. Because of these factors few cumulative impacts to natural resources are anticipated to result from the implementation of the proposed action in consideration of past, present, and reasonably foreseeable future projects. The exception is cultural resources, which have been unintentionally adversely impacted by age, use of the roadway, and ongoing maintenance and which are adversely impacted by improvement projects along the entire Apache Trail corridor. A summary of anticipated impacts is shown in Table 8.

The environmental consequences of the No Action Alternative and the Action Alternative on individual resources are presented throughout this EA. Included below are the overall cumulative impacts that may be anticipated when the effects of the Action Alternative (i.e. proposed project) are combined with other past, present, and reasonably foreseeable future actions.

The cumulative impact assessment presented in this EA focuses on resources for which the cumulative projects or plans would have measurable impacts on the resource. The contribution of the Project's impacts to cumulative impacts was then assessed. Resources in which the Action Alternative would have negligible to no impact, or if the resource did not exist in the project area (see Chapter 3.1) are not included in Table 8.

Table 8. Cumulative Effects Summary

Resource Area	Cumulative Impacts
Transportation	Past roadway projects, future and ongoing roadway maintenance, and the implementation of a maintenance and operations plan, in conjunction with the proposed project would have a long-term beneficial effect to transportation by improving road resiliency and driver safety.
Socioeconomics	No cumulative effects are anticipated from implementation of the proposed project.

Resource Area	Cumulative Impacts
Recreation and Visitor Experience	Over the past decades, TNF has developed and permitted recreational facilities along the Apache Trail increasing the public's opportunities to enjoy the natural and scenic resources along the project corridor. Past and present roadway projects constructed by ADOT, FHWA, TNF, USBR, and SRP has provided access to these recreational facilities by maintaining or improving roadways. The proposed project would improve the resiliency of the Apache Trail within the proposed project limits, providing a more consistent and stable road surface, and thus, possibly encouraging increased visitor use due to better road conditions. Long-term, beneficial impacts to recreational resources and visitor experience would result from implementation of these projects.
Cultural Resources	Past roadway projects have realigned and paved the historic road and replaced/modified historic drainage structures. Maintenance of the road has led to inadvertent deterioration of historic contributing elements of the road. The proposed project in conjunction with past actions, natural damage from storm events and future maintenance will have an adverse effect on the historic Apache Trail.
Visual Resources	ADOT has paved the higher use sections of the Apache Trail from Apache Junction to MP 220. Road realignments, curve correction, and drainage improvements have been done on past projects to improve safety and as a response to deteriorating road conditions due to weather events. TNF has added overlooks, parking lots, and interpretive material for recreational users along the Apache Trail to provide opportunities to enjoy the scenic resources safely. Due to the road's location on federally-owned land, development is and will continue to be very limited. The proposed project would be in keeping with the land-management agency's (TNF) specific visual resource management objectives. The proposed project in conjunction with past, present and foreseeable actions maintains the existing visual character and scenic integrity of the Apache Trail. The overall cumulative impact to scenic resources is anticipated to be minor.
Noise	No cumulative effects are anticipated from implementation of the proposed project.
Geology and Soils	Additional impervious surface, through the paving of roads and parking lots, in addition to the development of hard surfaced recreational facilities (i.e. sidewalks, access roads, boat ramps, etc.) along the project corridor would result in an increase in runoff, impacting water quality and increasing the potential for runoff, resulting in long-term adverse impacts. However; paving of the roadway surface and other visitor parking facilities would help with soil stabilization of the road prism and reduce erosion of the graveled surface and the loss of road material.

Resource Area	Cumulative Impacts
Air Quality	Paving of graveled roadways and visitor use facilities along the Apache Trail, in conjunction with the proposed project, are anticipated to result in long-term beneficial effects to air quality as applying a chip seal or paving a currently graveled surface would further reduce the generation of fugitive dust from vehicular use within the project area.
Wetlands and Other Waters of the U.S.	No cumulative effects are anticipated from implementation of the proposed project.
Water Quality	Additional impervious surface, through the paving of roads and parking lots, in addition to the development of hard surfaced recreational facilities (i.e. sidewalks, access roads, boat ramps, etc.) along the project corridor would result in an increase in runoff, impacting water quality and increasing the potential for runoff, resulting in long-term adverse impacts. However, improvements to and repair of stormwater infrastructure along the Apache Trail would minimize erosion and result in long-term benefits to water quality. Paving of the roadway surface would also reduce erosion of the graveled surface and the loss of road material into streams along the project route. Past, present and foreseeable development projects, in combination with the beneficial and adverse impacts of the proposed action, would result in a combination of beneficial and long-term adverse effects to water quality in the area.
Wildlife (Including Special Status Species)	Past, present and foreseeable roadway projects, recreational development, and utility access, along with future and ongoing maintenance, require both temporary and permanent removal of vegetation, short and long-term adverse impacts to wildlife, including special status species, and wildlife habitat would occur. A small permanent reduction in wildlife habitat immediately adjacent to the Apache Trail would occur as a result of the proposed project and on-going and future maintenance actions. However, due to the limited amount of development on TNF property and the abundance of habitat within the project area, the overall cumulative impact is anticipated to be minor.
Vegetation and Noxious Weeds	Past, present and foreseeable roadway projects, recreational development, and utility access, along with future and ongoing maintenance, require both temporary and permanent removal of vegetation, resulting in adverse effects to the vegetation community by reducing the acreage of native plant communities and introducing noxious weeds. A small permanent reduction in the dominant plant community, desertscrub, immediately adjacent to the Apache Trail would occur as a result of the proposed project and on-going and future maintenance actions. However, due to the limited amount of development on TNF property and the abundance of the desertscrub plant community within the project area, the overall cumulative impact is anticipated to be minor.

CHAPTER 4: SECTION 4(F) EVALUATION

4.1 Introduction

This chapter provides an evaluation of the project relative to Section 4(f) of the Department of Transportation Act of 1966 (49 United States Code [U.S.C.] 303) and its implementing regulations, at 23 Code of Federal Regulations (CFR) Part 774.

Section 4(f) of the U.S. Department of Transportation (USDOT) Act of 1966, as amended, and codified in 49 United States Code (U.S.C.) § 303, declares that "[i]t is the policy of the United States Government that special effort should be made to preserve the natural beauty of the countryside and public park and recreation lands, wildlife and waterfowl refuges, and historic sites." The Federal Highway Administration (FHWA) has adopted regulations to ensure its compliance with Section 4(f) (23 CFR Part 774).

Section 4(f) regulations specify in 23 CFR § 774.3 that:

The Administration may not approve the use, as defined in 23 CFR § 774.17, of Section 4(f) property unless a determination is made under paragraph (a) or (b) of this section.

(a) The Administration determines that:

(1) There is no feasible and prudent avoidance alternative, as defined in 23 CFR § 774.17, to the use of land from the property; and

(2) The action includes all possible planning, as defined in 23 CFR § 774.17, to minimize harm to the property resulting from such use; or

(b) The Administration determines that the use of the property, including any measure(s) to minimize harm (such as any avoidance, minimization, mitigation, or enhancement measures) committed to by the applicant, will have a *de minimis* impact, as defined in 23 CFR § 774.17, on the property. [Note: Per 23 CFR § 774.17, a *de minimis* impact determination under this paragraph subsumes the requirement for all possible planning to minimize harm by reducing the impacts on the Section 4(f) property to a *de minimis* level. For historic sites, a *de minimis* impact means that the Administration has determined, in accordance with 36 CFR Part 800, that no historic property is affected by the project or that the project will have "no adverse effect" on the historic property in question.]

(c) If the analysis in paragraph (a)(1) above concludes that there is no feasible and prudent avoidance alternative, then the Administration may approve, from among the remaining alternatives that use Section 4(f) property, only the alternative that:

(1) Causes the least overall harm in light of the statute's preservation purpose. The least overall harm is determined by balancing the following factors:

(i) The ability to mitigate adverse impacts to each Section 4(f) property (including any measures that result in benefits to the property);

(ii) The relative severity of the remaining harm, after mitigation, to the protected activities, attributes, or features that qualify each Section 4(f) property for protection;

(iii) The relative significance of each Section 4(f) property;

(iv) The views of the official(s) with jurisdiction over each Section 4(f) property;

(v) The degree to which each alternative meets the purpose and need for the project;

(vi) After reasonable mitigation, the magnitude of any adverse impacts to resources not protected by Section 4(f); and

(vii) Substantial differences in costs among the alternatives.

(2) The alternative selected must include all possible planning, as defined in § 774.17, to minimize harm to Section 4(f) property.

Section 4(f) further requires consultation with the U.S. Department of the Interior and, as appropriate, the U.S. Department of Agriculture and the U.S. Department of Housing and Urban Development, and relevant state and local officials with jurisdiction over the Section 4(f) resource, in developing a transportation project that uses lands protected by Section 4(f).

Documentation of compliance with Section 4(f) is required for a transportation project that receives federal funding and/or approval through USDOT. The Action Alternative developed for this project (FHWA-CFLHD Project AZ FLAP SR88[1]) involves federal funding and, therefore, meets that requirement. Therefore, this Section 4(f) evaluation has been prepared in accordance with FHWA regulations for Section 4(f) compliance codified at 23 CFR Part 774. Additional guidance has been obtained from the FHWA Technical Advisory T 6640.8A (1987) and the revised FHWA Section 4(f) Policy Paper (77 FR 42802, July 20, 2012).

4.2 Proposed Project

4.2.1 Project Purpose and Need

The purpose of the project is to improve the resiliency of the Apache Trail corridor to reduce maintenance demands, and improve and maintain accessibility while protecting elements of the historic road, as practicable. The project is needed because routine maintenance requiring the continual importing of material and regrading of the road surface contributes to watershed damage, places historic features at further risk to unintentional damage, and requires extensive financial resources. In addition, undersized culverts cannot properly accommodate the volume of flows during heavy rain events, resulting in road washouts that lead to further degradation to the watershed and limit public access. These issues are described further below.

- Vehicular use of the decomposed granite surfacing material on the road emits large volumes of fugitive dust that limits sight distance and contributes to poor air quality.
- Given the erosive nature of the decomposed granite, excess surfacing material is frequently lost to roadside ditches and washes and during rain events it has the potential to impact water quality within the adjacent Apache Lake.
- The decomposed granite surfacing requires frequent blading to maintain a drivable surface and the constant routine maintenance results in the ongoing risk of unintentional damage and/or burying of individual features of the historic roadway.
- Supply of the historically used decomposed granite surfacing is in short supply and the Arizona Department of Transportation (ADOT) will need to seek an alternative fill source, which may differ in appearance and require substantial funds to bring onsite.
- Damaged and undersized culverts increase flooding of the road during heavy rain events resulting in road washouts.
- Roadway damage has resulted in temporary closures of portions of the project area thereby limiting access for visitors, nearby residents, Tonto National Forest (TNF) employees, and local business staff. Significant erosion and continual roadway degradation poses a risk for long-term roadway closure affecting access to the project area.

4.2.2 Action Alternative

The Action Alternative is summarized below and shown on Figure 11 (also refer to Figures 1 and 2 in Chapter 1 and Figure 3 in Chapter 2). Refer to Chapter 2 for a full description.

Under the Action Alternative, improvements and repairs would be made to 11.16 miles of the Apache Trail between milepost 229.2 and milepost 240.6, and include the following:

- Rehabilitate and chip seal the 11.16-mile segment of road.

- Pave under the chip seal in steep segments of the road where the grade exceeds eight percent.
- Generally maintain existing road widths. The design includes two template widths of 20 feet and 24 feet, which would require spot widening and narrowing. In isolated areas where the roadway bench width varies between 16 feet to 20 feet, the road would be widened to the greatest extent possible while remaining on the existing road bench, but would likely remain less than 20 feet.
- Make minor safety improvements, including sight distance improvements (see Figures 12 through 15) and signage. Five areas were identified by ADOT and FHWA-CFLHD as potential locations to improve safety by cutting back cut slopes (slope setbacks) to improve the driver's line of sight (see Table 9) (also refer to Table 1 and Figure 3 in Chapter 2).

Table 9: Action Alternative Sight Distance Improvements

Milepost	Side of the Road	Improvements
MP 229.5	South	Cut back slope 10 ft. from existing toe of slope, lay back slope at 1:2 ratio
MP 229.6	South	Cut back slope 10 ft. from existing toe of slope, lay back slope at 1:2 ratio
MP 229.9	South	Cut back slope 5 ft. from existing toe of slope, lay back slope at 1:2 ratio
MP 233.5	North	Cut back slope 10 ft. from existing toe of slope, lay back slope at 1:2 ratio
MP 234.5	North	Cut back slope 10 ft. from existing toe of slope, lay back slope at 1:1.5 ratio

- Remove excess fill material within the fill side window (berms) and/or regrade it back into the roadway. Excess material removed would be carried offsite or stockpiled in a previously disturbed area for future use by ADOT and/or TNF.

Figure 11: Project Regional Map

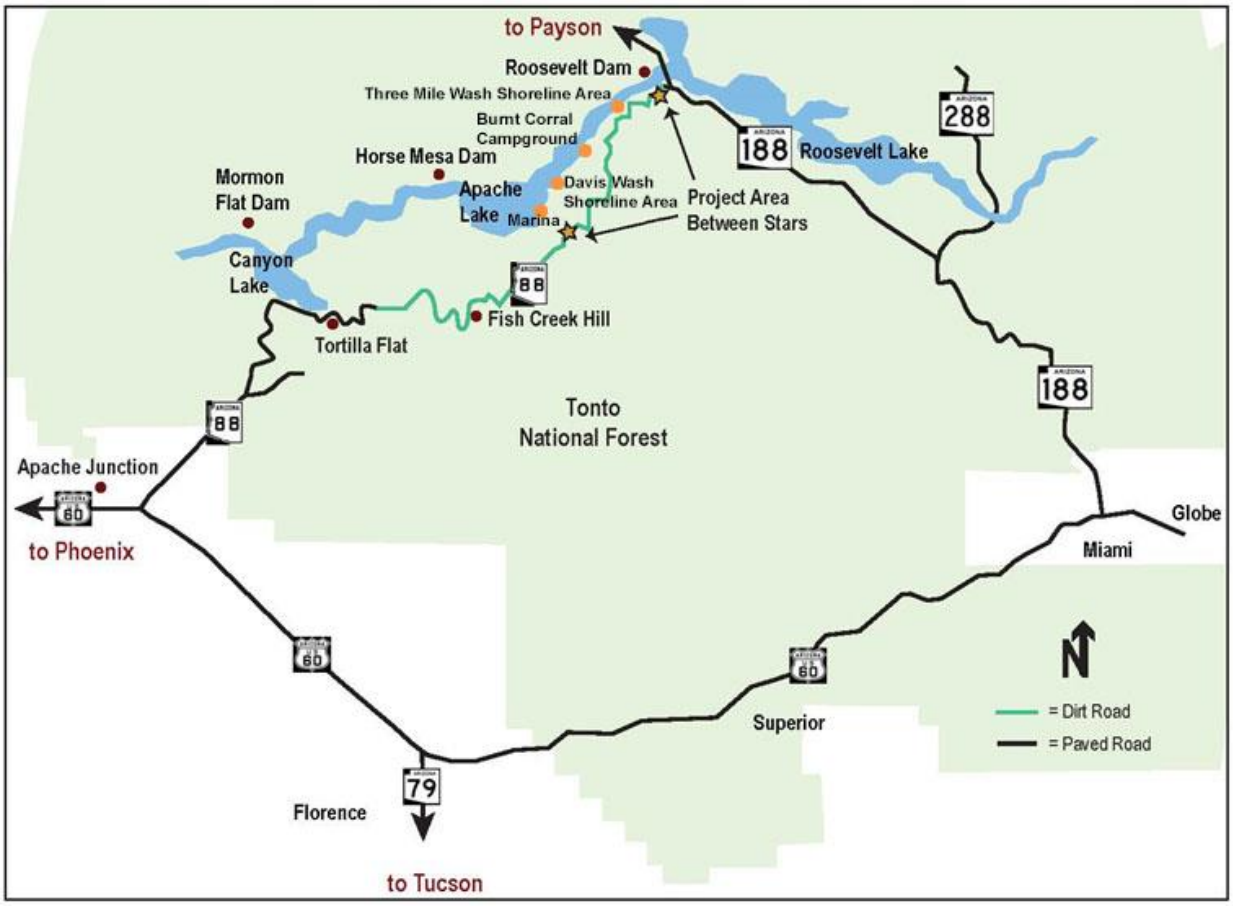


Figure 12: Location of Historic Road Features and Sight Distance Improvements (1 of 4)

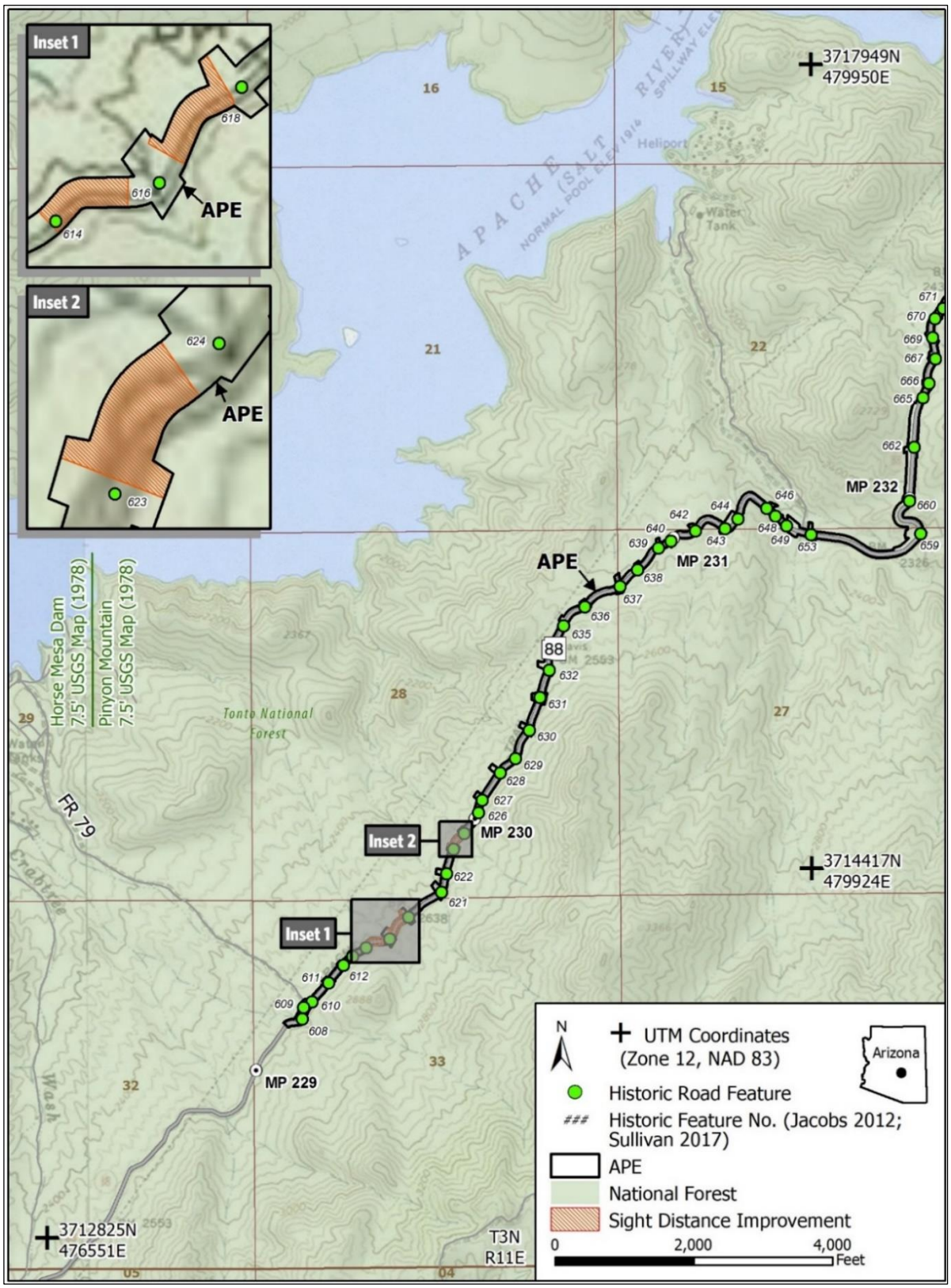


Figure 13: Location of Historic Road Features and Sight Distance Improvements (2 of 4)

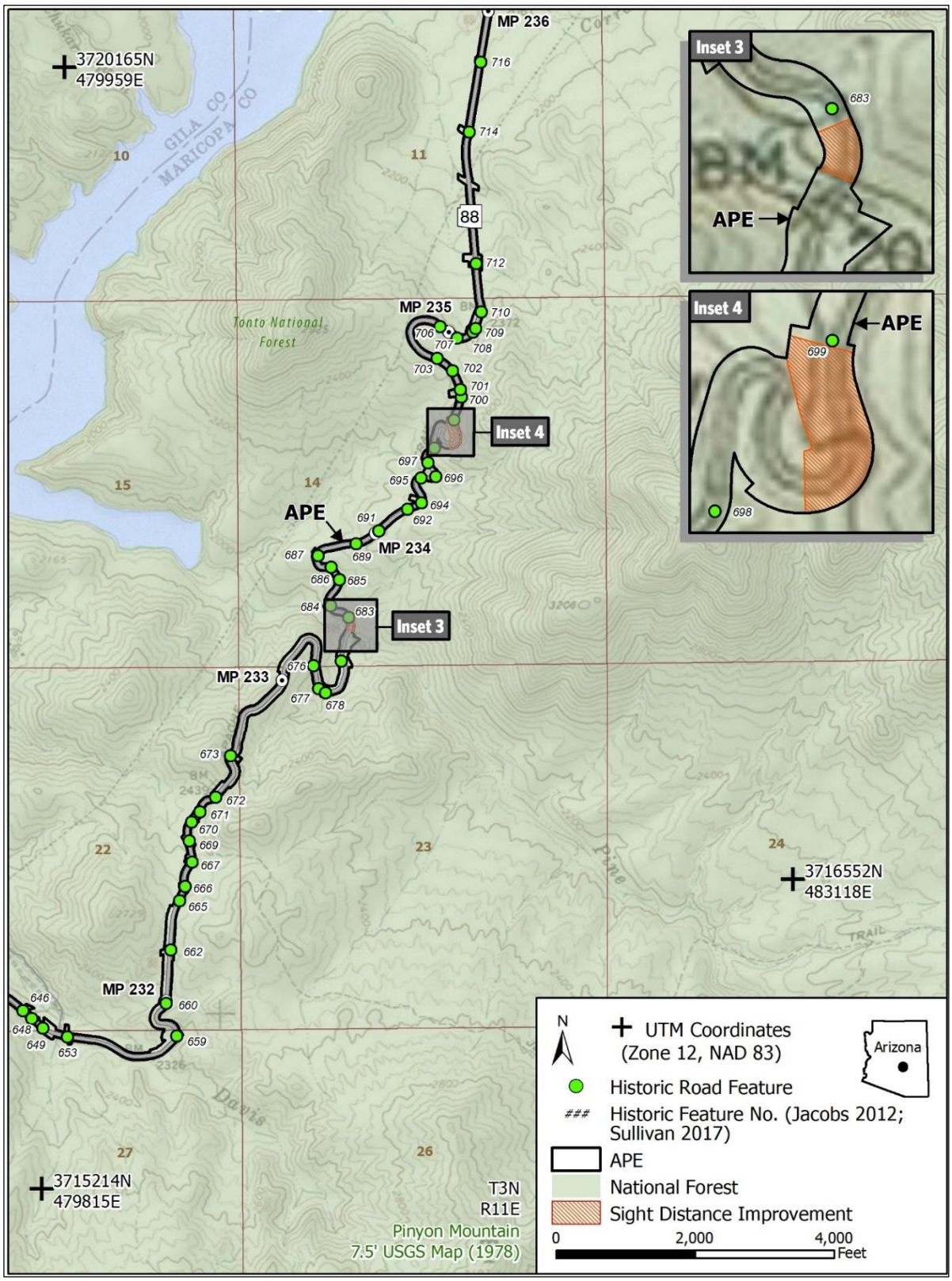


Figure 14: Location of Historic Road Features and Sight Distance Improvements (3 of 4)

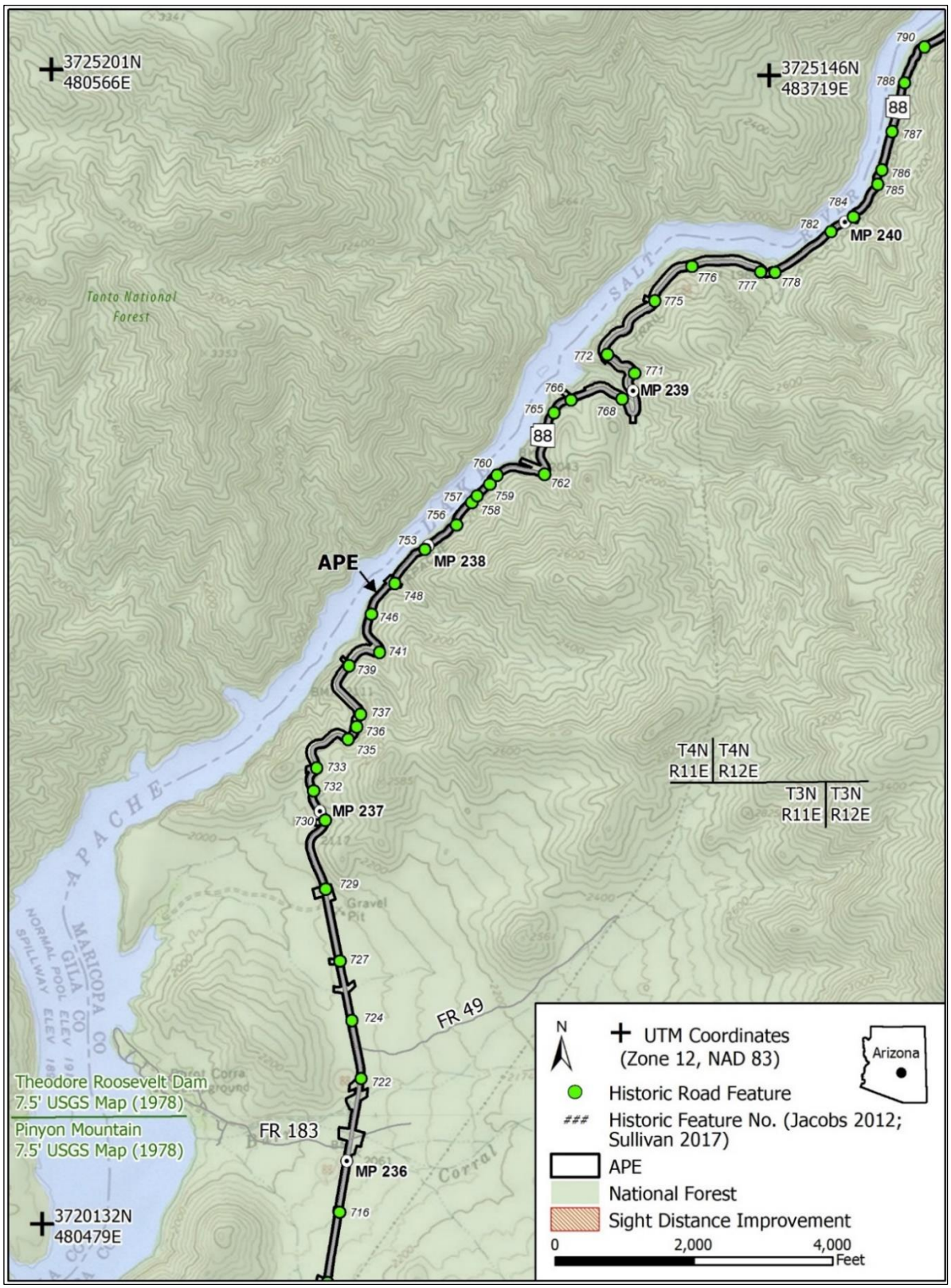
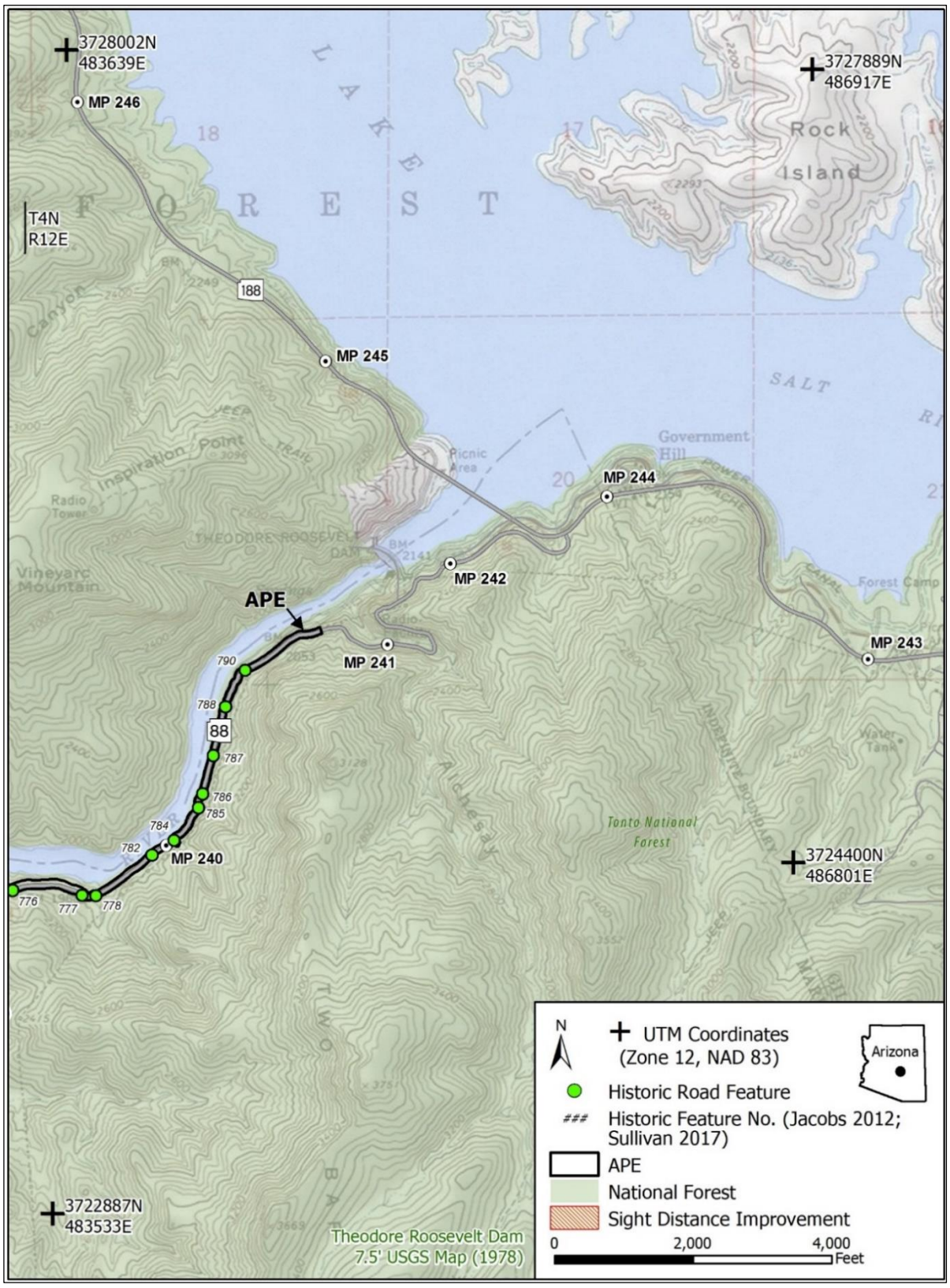


Figure 15: Location of Historic Road Features and Sight Distance Improvements (4 of 4)



- Construct an armored ditch along the roadway in spot locations to direct high runoff flows away from steep and narrow sections of the road and toward existing and/or new culverts.
- No changes to the roadway's horizontal alignment would occur, and elevation changes would be minor.
- Replace, repair, line and/or extend culverts at numerous locations within the project area. Some culverts would be replaced with concrete box culverts to account for changes in drainage volume and debris passage needs. Additional improvements would be made where needed to stabilize drainage areas that have been either scoured or filled in to restore proper hydrologic function. Four culvert treatment options have been identified to address erosion and drainage issues that are affecting the current roadway and the structural integrity of existing roadway structural features, as described below:
    - **Treatment A**: Treatment A would include a standard apron end section, which would serve to spread drainage flow at the transition from the culvert outlet to the natural drainage channel, or to sheet flow where no natural drainage exists. These improvements would be installed below and downslope from existing culvert outlets, and would not modify any existing structural elements. Design elements would include:
        - Placement of rip-rap along drainage channels to prevent additional scour and erosion
        - Installation of a geotextile filter topped with fill dirt within existing scour slopes below culvert outlets to match the grade of adjacent slopes
        - Installation of the apron end section below the culvert outlet.
    - **Treatment B**: Treatment B would be a modified version of the Treatment A apron end section, and serve the same function, which is to distribute drainage flow at the transition from the culvert outlet to the natural drainage channel, or to sheet flow where no natural drainage exists. Design elements for Treatments A and B would be the same, the only exception is that Treatment B would include a thicker end section.
    - **Treatment C1**: Treatment C1 would include a retrofit option for an existing, perched outlet. Many perched pipes in the area have large scour damage at their existing outlet. These improvements would be installed below and downslope from existing culvert outlets, and would consist of extending existing outlet pipes downslope to arrest erosion damage. Design elements would include:
        - Filling scour holes to stabilize the slope
        - Adding a bend joint to the existing outlet to extend the existing pipe down the side of the roadway prism. At the toe of slope, another bend joint would be added to extend the pipe a distance downslope from the roadway prism

- Placing rip-rap along drainage channels to prevent additional scour and erosion (as needed)
- Installing a geotextile filter topped with fill dirt within existing scour slopes below culvert outlets to match the grade of adjacent slopes (as needed)
- Terminating the extended pipe with the installation of the Treatment A apron end section.

- **Treatment C2**: Treatment C2 is a modified version of the Treatment C1 retrofit option and would be installed in areas where it would be impractical to extend the existing culvert outlet pipe to the toe of the roadway prism. Design elements would include:
  - Filling scour holes to stabilize the slope
  - Adding a bend joint to the existing outlet to extend the existing pipe down the side of the roadway prism, short of the toe of slope
  - Placing rip-rap along drainage channels to prevent additional scour and erosion (as needed)
  - Installing a geotextile filter topped with fill dirt within existing scour slopes below culvert outlets to match the grade of adjacent slopes (as needed)
  - Terminating the extended pipe with the installation of the Treatment A apron end section.

Construction

Construction activities for the Proposed Project are summarized below; refer to Section 2.2.1 for details.

Construction generally would include excavating material sources, clearing and grubbing, grading, placing crushed aggregate base and chip seal surface, revegetating, installing signs, and other safety related features necessary to meet current design standards. Construction activities generally would occur within the Apache Trail alignment, but temporary disturbance could occur up to 10 feet on both sides of the alignment. In constrained or environmentally sensitive areas, including areas with active farmland and biologically sensitive areas, construction activities outside the existing Apache Trail corridor would be minimized to the extent feasible.

Construction may require locating existing utilities, such as gas, electric, telecommunications, water, and sanitary sewer. The FHWA-CFLHD will coordinate with utility providers during final design. Construction, equipment staging, and stockpiling areas would be limited to existing disturbed areas along the road corridor to the extent feasible. Any activities required to occur outside those areas will be minimized to the extent feasible and comply with permit requirements. No staging would occur in areas with sensitive biological resources or adjacent to drainages or wetlands.

4.3 Section 4(f) Resources

4.3.1 Parks and Recreational Resources

Marinas, restaurants, accommodations, and small shops are located along the entire length of the Apache Trail that cater to recreation visitors. While the majority of the Apache Trail is unpaved, most of these facilities are concentrated along the portion of the road that is paved between Apache Junction and just east of Tortilla Flat (see Figure 11). However, the sole access to businesses and accommodations associated with Apache Lake is from the unpaved portion of Apache Trail. Those facilities are approximately equal distance between the paved portions of Apache Trail located to the south at Tortilla Flat and to the north near Roosevelt Dam. Within the project area, the Apache Trail accesses a number of TNF day use sites, scenic overlooks, trailheads, campgrounds, and boat launches. Public recreational facilities include the Davis Wash Shoreline Area, Burnt Corral Campground and Day Use Area, and the Three Mile Wash Shoreline Area. The Three Mile Wash Shoreline Area provides boat access to Apache Lake, where recreational boating is popular.

While the Apache Trail provides direct access to numerous recreational sites, the proposed project would not directly impact or incorporate land from those individual sites. Traffic volumes along the corridor are low. The average annual daily traffic in 2013 was approximately 150. The peak visitation seasons are spring and summer. However, the 2019 natural disasters resulted in reduced use of the recreational areas along Apache Trail and more difficult accessibility. The middle section of Apache Trail at Fish Creek Hill has been closed indefinitely.

The Action Alternative would not alter the scenic views, alignment, or recreational opportunities along the route. The Action Alternative would reduce dust and particulate pollution, which would benefit the visitor experience. Visitation to the area may increase as a result of the project, which could lead to increased visitor-generated noise from vehicles and motorized boats, or increased presence of users that could diminish the user experience. However, the increase in visitation is expected to be minor such that these impacts are anticipated to be minimal. Also, long-term benefits are expected for those visitors who utilize the project corridor frequently and are impacted by frequent continuous maintenance to the existing decomposed granite surface and by long-term exposure to dust from the road.

Construction activities may include detours and/or short closures, and temporary narrowing of the roadway to a single lane in work zones, all of which would result in traffic delays. These impacts would be short-term and are anticipated to be minor, especially considering that recreational uses and associated traffic along Apache Trail have been reduced since the 2019 natural disasters. Construction activities will be coordinated to account for recreational traffic and seasonal fluctuations, such that no substantial impairment of other Section 4(f) resources will result from the project. Therefore, there would be no direct or indirect impacts to recreational resources during construction that would result in a Section 4(f) use.

4.3.2 Historic Resources

The area of potential effects (APE) is located along the Apache Trail between milepost 229.20 and milepost 240.60 (Figure 16 and 17). The total length of the APE is 11.16 miles,

with a variable width ranging between 200 and 300 feet. Land jurisdiction in the APE is ADOT easement crossing public lands under the jurisdiction of the TNF, and TNF lands. The APE is a total of 165.5 acres, all of which are on TNF lands. Of this, 138.9 acres are operated and maintained by ADOT under an existing easement across TNF lands.

Figure 16: Area of Potential Effects: Southern Extent of Project Corridor

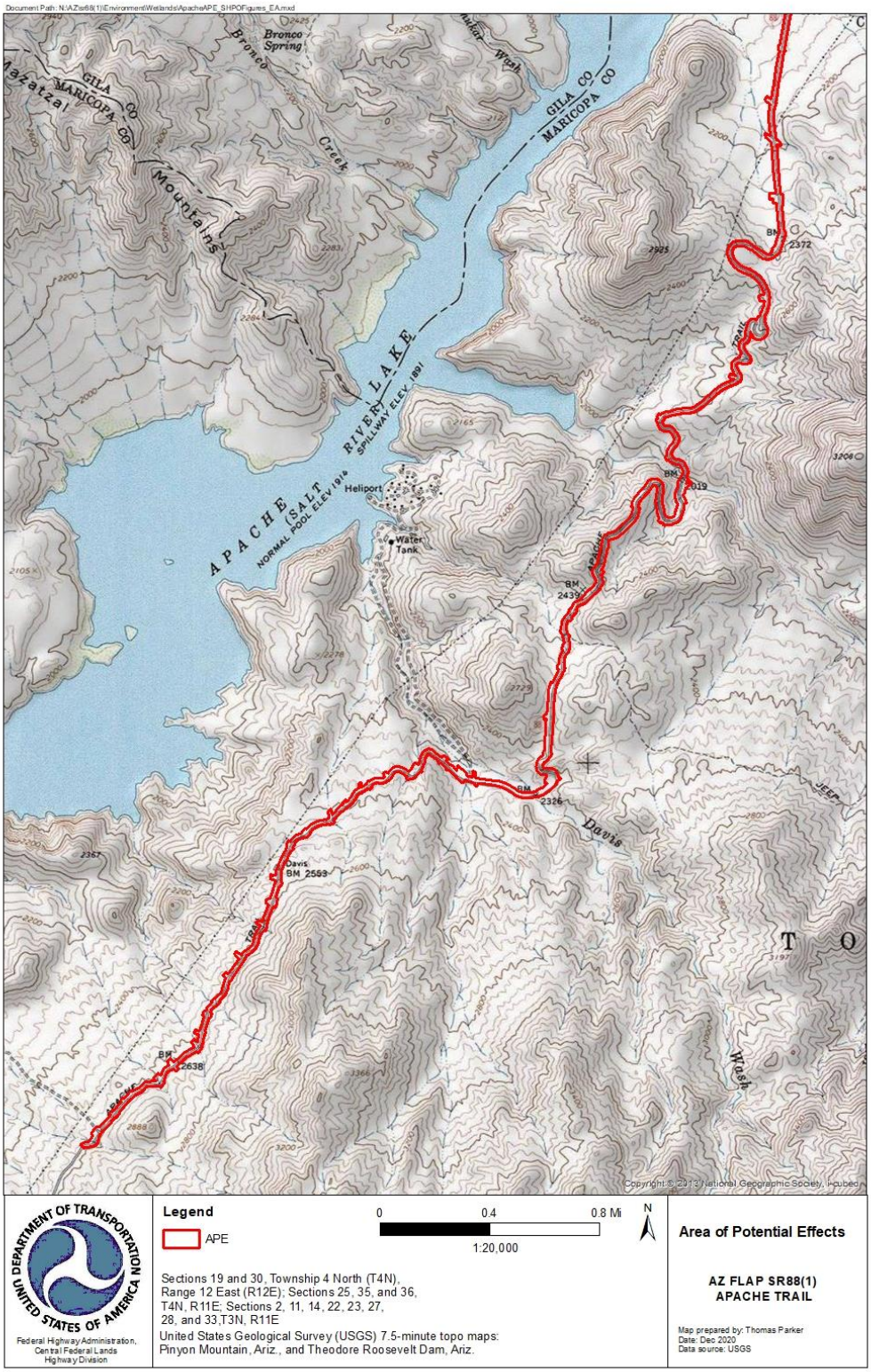


Figure 17: Area of Potential Effects: Northern Extent of Project Corridor

A total of 11 historic properties within the project's APE were determined to be eligible for listing in the National Register of Historic Places (NRHP) and considered Section 4(f) resources potentially used by the proposed project. Of the 11 historic properties:

- Nine historic properties are avoided by the Action Alternative (resulting in a Section 106 finding of *no historic properties affected*), and have no Section 4(f) use.
- Two historic properties will be impacted by the Action Alternative:
  - **Apache Trail (AR-03-12-06-218):** Impacts from the Action Alternative will result in an *adverse effect* under Section 106 of the National Historic Preservation Act. A Historic Properties Treatment Plan (HPTP) and Memorandum of Agreement (MOA) will be prepared under Section 106 to address the *adverse effect* to the Apache Trail. The Action Alternative would result in a Section 4(f) use of the Apache Trail.
  - **Blast Can Site (AR-03-12-06-2503):** This site is an artifact scatter consisting of a dispersal of blasting powder cans and other features such as a rock ring, wall corner, possible roasting pit, small rock cluster, and surficial cleared area. The site is eligible for the NRHP under Criterion A based on its association with the 1927 road reconstruction. Field mapping and recording have exhausted its data potential (Criterion D). An HPTP and MOA will be prepared under Section 106 to address the *adverse effect* to the Blast Can Site. This site is an artifact scatter that meets the criteria for the Section 4(f) exception under 23 CFR § 774.13(b) because it is important chiefly because of what can be learned by data recovery, has minimal value for preservation in place, and the State Historic Preservation Officer (SHPO) did not object to this finding. Therefore, this site is not discussed further in this evaluation.

To better inform the avoidance and least harm analysis below, the character defining attributes and features of the Apache Trail are discussed in greater detail below.

4.4 Detailed Resource Description for Section 4(f) Property Used by Project

4.4.1 Apache Trail (State Route [SR] 88)

The Apache Trail (AR-03-12-06-218 [TNF site reference number]) refers to the historic road alignment, including the roadway and features, of SR 88/Apache Trail. The APE contains a portion of the last remaining unpaved section of the Apache Trail. The road was originally constructed between 1903 and 1905 as a wagon road to supply construction of Roosevelt Dam. In its entirety, the Apache Trail is 49 miles long. As a whole, the Apache Trail is considered to be one of Arizona's transportation "crown jewels." It begins near the city of Apache Junction, Maricopa County, Arizona at milepost 193.90, and terminates at its junction with United States Highway 60, near Globe, Gila County, Arizona, at milepost 242.66.

The roadbed was constructed of native soil extracted during construction of the road and was unsurfaced. Upgrades to increase the road's hauling efficiency began almost immediately and were ongoing until the completion of Roosevelt Dam in 1911. The Arizona State Highway Department took responsibility for the road's operation and

maintenance from the U.S. Reclamation Service in 1922 and implemented additional improvements and upgrades. Chief among these were widening the original roadway from 12 feet to 14 to 16 feet in some locations; and the repair of deteriorating stretches of roadway and wall structures.

In 1927, a reroute of the original road alignment was required to accommodate the filling of Apache Lake. The rerouted section of road is located between MP 231.46 and MP 239.90 and is included in the APE. Additional large-scale work was completed between the years 1935 and 1937 and included widening much of the unpaved roadway to 24 feet to accommodate increased automotive travel. In 1939, the Davis Wash Bridge was reconstructed using Works Progress Administration labor. Following the construction of the bridge, work along the roadway consisted largely of ongoing repair and maintenance classified as "spot improvements." These spot improvements resulted in the construction of additional structures, such as culverts and retaining walls.

The Apache Trail has been previously determined eligible for inclusion in the NRHP under Criteria A, C, and D for its association with important historic events, unique qualities of design and construction, and potential to yield important data regarding the development of early Arizona roadways. The unpaved stretch of the historic roadway within the APE was determined to contribute to the overall NRHP eligibility of the Apache Trail under the aforementioned criteria. The maintenance history of this roadway segment is quite different from that of the paved section of the Apache Trail, and can be characterized by four major maintenance periods, all of which have historic significance (Sullivan 2017). However, these maintenance activities have not significantly altered the historic characteristics of the roadway, which exhibits a high degree of integrity of workmanship, materials, setting, design, association, feeling, and location. As discussed in Sullivan (2017), the unpaved section of roadway still contours across the landscape, and horizontal and vertical curves force drivers to slow down and enjoy the scenic vistas that are iconic to the alignment. This is quite a different driving experience from that along the paved portions of the roadway, where the historic characteristics of the roadway features have been significantly altered.

In addition, this segment exhibits a complex arrangement of retaining walls, culverts, and other roadway features. In total, 216 individual features of the Apache Trail are located within the APE. These features include the roadway and non-structural features within the roadway, such as turnouts and scenic overlooks; individual structural features of the roadway, such as two bridges, numerous culverts, low water crossings, and retaining walls; and "minor" features of the Apache Trail, such as survey markers and mile markers. Of the 216 features, 67 are individually eligible and/or contributing features to the Apache Trail's historic significance.

4.5 Description of Use

Improvements are proposed to the SR 88/Apache Trail roadway and to many of the 67 individually eligible and/or contributing features within the project limits, including culverts and retaining walls. Improvements to the 11.16-mile segment of road include rehabilitating and chip sealing the road; spot widening or narrowing; improving sight distance at five locations involving rock cuts, fill, and/or grading; removing excess fill material from the fill side windrow (berm at side of road) and/or regrading it back into

the roadway; building an armored ditch along the road in spot locations; and improving signage. One of the three treatment options (Treatment A through C2) described in Chapter 2 would be employed to replace, repair, line, and/or extend drainage features at numerous locations. Treatment options include varying combinations of placing rip-rap along drainage channels, installing gabion baskets in roadway ditches, installing geotextile filter topped with fill dirt, filling scour holes, installing apron end sections below culvert outlets, replacing culverts with concrete box culverts to accommodate drainage volumes and debris flows, replacing and/or resetting culvert headwalls and wingwalls, or adding bend joints to outlets to extend existing pipes.

Chip sealing, standardizing the road width, improving line of sight, and replacing and modifying existing drainage features would diminish the features and attributes that qualify the Apache Trail for NRHP eligibility, including workmanship, materials, feeling and association of the historic roadway and contribute to the diminishment of the Apache Trail's integrity. Therefore, the Action Alternative will have an adverse effect to the Apache Trail and 26 of its character-defining contributing features, resulting in a Section 4(f) use of this property.

4.6 Alternatives Analysis

There are two components to the Section 4(f) alternatives evaluation. First, under Section 4(f), if a project alternative uses a Section 4(f) property, a determination must be made whether there are any feasible and prudent alternatives that do not use the Section 4(f) property. If a feasible and prudent avoidance alternative exists, it must be selected. A "feasible and prudent avoidance alternative" is one that avoids using Section 4(f) property and does not cause other severe problems of a magnitude that substantially outweigh the importance of protecting the Section 4(f) property. More specifically, an alternative is feasible if it can be constructed as a matter of sound engineering judgment, and in accordance with 23 CFR § 774.17 an alternative is not prudent if the following is true:

1. It compromises the project to a degree that it is unreasonable to proceed with the project in light of its stated purpose and need;
2. It results in unacceptable safety or operational problems;
3. After reasonable mitigation, it still causes
    a. Severe social, economic, or environmental impacts;
    b. Severe disruption to established communities;
    c. Severe disproportionate impacts to minority or low income populations; or
    d. Severe impacts to environmental resources protected under other Federal statutes;
4. It results in additional construction, maintenance, or operational costs of an extraordinary magnitude;
5. It causes other unique problems or unusual factors; or

6. It involves multiple factors in items 1 through 5, above, that while individually minor, cumulatively cause unique problems or impacts of extraordinary magnitude.

The Action Alternative would result in a Section 4(f) use of the Apache Trail (AR-03-12-06-218); therefore, an analysis of feasible and prudent avoidance alternatives was conducted, and is presented in the following section.

4.6.1 Avoidance Alternatives

Three alternatives were evaluated as avoidance alternatives using 23 CFR § 774.17 prudent and feasible criteria — the No Action and two Build Alternatives.

No Action Alternative: Under this action, no changes to the existing roadway would occur. The dirt road surface would continue to deteriorate due to age, use, and storm events. Ongoing weekly maintenance activities would continue to be required to control wash boarding and maintain a drivable surface, which includes blading the road surface that requires hauling in material approximately once a month. The continual importing of material and grading would continue to contribute to ongoing watershed damage and place historic features at risk of unintentional damage. Regular road blading has created berms of excess materials alongside the roadway margins and maintenance crews would continue to actively take from or add to this material. This berm material is on the fill-side edge (opposite the hillside) of the road and adjacent to historic roadway features, thus creating drainage, maintenance, and preservation issues. The roadway width would continue to vary along the 11.16-mile stretch of road ranging between 16 feet and 30 feet. No actions to address sight distance improvements or improve signage would occur. No actions would be taken to replace, repair, or extend culverts that are not functioning. Erosion and deterioration around non-functional culverts during storm events would continue to cause damage to the road and its historic features.

The No Action Alternative would not meet the purpose and need of the project to improve the resiliency of the road corridor to reduce maintenance demands, and improve and maintain accessibility while protecting elements of the historic road, as practicable. Therefore, the No Action Alternative is not a prudent avoidance alternative.

New Location Eastern Alignment Alternative: Under this action, the existing SR 88/Apache Trail would be abandoned and a new alignment would be constructed to the east and upslope of the existing historic road. ADOT would abandon the existing Apache Trail easement and would no longer be responsible for maintaining the existing road. The Apache Trail would then be abandoned, or potentially be subject to an alternate use, such as a jeep trail, hiking trail, or USFS access road, and maintained by another entity for that alternate use. Because of the hilly topography in the project area, creating a new alignment that maintains continuity of SR 88/Apache Trail and existing recreational access points would require extensive rock cuts, substantial amounts of earthwork, several retaining walls, and drainage structures ranging from pipe culverts to bridges. A new alignment also would require substantial additional right-of-way from the TNF. This work would fragment primarily undisturbed, sensitive desert habitat and result in a high level of impacts to natural resources, including protected plants and animals, water resources and water quality, and visual impacts to road users. The work also would result in substantially high design and construction costs, which are estimated at approximately

$41 million. However, the new road would require a lower level of maintenance than the existing Apache Trail. As such, the current high costs to operate and maintain the entire existing Apache Trail, which run between $700,000 to $900,000 annually, would be considerably reduced. The Three Mile Wash, Upper Burnt, Burnt Corral and Lower Burnt, and Davis Wash public recreation areas are currently accessed via the existing SR 88/Apache Trail. This alternative would construct intersections to provide vehicular access from the new alignment to those resources. The new intersections would incorporate and/or intersect portions of the historic road, which would impact the Section 4(f) resource.

Because the New Location Eastern Alignment Alternative would not avoid the use of all Section 4(f) resources, it is not an avoidance alternative. This alternative was included in the least harm analysis presented later in this chapter.

New Location Western Alignment Alternative: Under this action, the existing SR 88/Apache Trail would be abandoned and a new alignment would be constructed to the west of the existing historic road. Similar to the eastern alignment alternative, ADOT would abandon the existing Apache Trail easement and would no longer be responsible for maintaining the existing road. The Apache Trail would then be abandoned, or potentially be subject to an alternate use, such as a jeep trail, hiking trail, or USFS access road, and maintained by another entity for that alternate use. This alternative would require the construction of either a viaduct in the northern section of the project corridor where the existing historic road is located immediately adjacent to the Salt River on a steep slope, or would require fill in the Salt River that would require Clean Water Act permitting and considerable mitigation for impacts to water resources. A new alignment also would require substantial additional right-of-way from the TNF. This work would result in a high level of impacts to natural resources, including impacts to protected plants and animals, fragmentation of desert habitat, high number of water crossings and impacts to water resources and water quality, and visual impacts to users of adjacent recreation areas that would impact the visitor experience. The work also would result in substantially high design and construction costs to construct a viaduct or construct within the river. However, the new road would require a lower level of maintenance than the existing Apache Trail. This action would avoid the use of the Apache Trail and would provide access to public recreational areas such as Davis Wash Shoreline Area, Burnt Corral Campground and Day Use Area, and the Three Mile Wash Shoreline Area without resulting in a use of other Section 4(f) resources.

While the New Location Western Alignment Alternative would reduce the maintenance demands of the Apache Trail, it would fail to improve the resiliency of the Apache Trail corridor and improve and maintain its accessibility while protecting elements of the historic road, as practicable. The new road alignment, after reasonable mitigation, would result in severe environmental impacts to plants, animals, water resources and water quality, including severe impacts to resources protected by the Clean Water Act. Further, it would result in high design and construction costs due to the rugged topography, proximity to the river, and viaduct construction. Therefore, the New Location Western Alignment Alternative is not a prudent avoidance alternative.

4.6.2 Alternatives Evaluated for Least Overall Harm

This section provides a least overall harm analysis in accordance with 23 CFR § 774.3(c)(1). FHWA-CFLHD may approve only the alternative that causes the least overall harm. To determine which of the alternatives would cause the least overall harm, FHWA-CFLHD must compare seven factors set forth in 23 CFR § 774.3(c)(1) concerning the alternatives under consideration. The first four factors relate to the net harm that each alternative would cause to Section 4(f) property:

1. The ability to mitigate adverse impacts to each Section 4(f) property (including any measures that result in benefits to the property);
2. The relative severity of the remaining harm, after mitigation, to the protected activities, attributes, or features that qualify each Section 4(f) property for protection;
3. The relative significance of each Section 4(f) property;
4. The views of the official(s) with jurisdiction over each Section 4(f) property;

The remaining three factors enable FHWA to take into account any substantial problem with any of the alternatives remaining under consideration on issues beyond Section 4(f). These factors are:

5. The degree to which each alternative meets the purpose and need for the project;
6. After reasonable mitigation, the magnitude of any adverse impacts to resources not protected by Section 4(f); and
7. Substantial differences in costs among the alternatives.

Because no prudent and feasible avoidance alternative was identified to the proposed improvements resulting in the use of the Apache Trail, an analysis was conducted to identify alternatives that would result in least harm to the Section 4(f) resource.

As discussed in Section 2.4 of this EA, several alternatives were considered to address the purpose and need of the project. Through the scoping process, it became evident that options for addressing issues in the project corridor would be limited based on the historic significance of the Apache Trail and its remote and ecologically-sensitive location within TNF.

Three alternatives were evaluated for least harm: **New Location Eastern Alignment Alternative**, **Widening and Paving to Meet AASHTO Design Standards Alternative** (hereinafter referred to as the **Widen and Pave Alternative**), and **Action Alternative.** The **Widen and Pave Alternative** is a full build alternative that would improve the existing road to meet AASHTO design standards along the Apache Trail within the project limits. It is the only other alternative considered in the alternatives screening conducted for the EA (see Chapter 2 of the EA) that meets most of the purpose and need elements. However, through coordination with the officials with jurisdiction (OWJ) over the Apache Trail, it was apparent that designing to meet these standards throughout the entire project limits would not result in a practicable solution that would protect elements of the historic road.

Therefore, the project team developed an alternative that incorporated design variances into the project to minimize harm to the Section 4(f) resource while still addressing the purpose and need of the project, which is the **Action Alternative**.

In addition, to minimize harm to the Apache Trail, the **New Location Eastern Alignment Alternative** was developed. This alternative is described in the avoidance alternatives section above. The **Widen and Pave Alternative** and the **Action Alternative** are described below:

- **Widen and Pave Alternative**: Under this alternative, the road would be improved to meet AASHTO design standards along the project portion of the Apache Trail. The roadway would be widened with shoulders, and a clear zone would be established. All substandard curves would be improved to meet current design standards, which would require a substantial amount of ground disturbance.
- **Action Alternative**: The Action Alternative would include rehabilitating and chip sealing, and paving under the chip seal in steep road segments (see the *Action Alternative* section above and Chapter 2 of the EA for a detailed description of this alternative). This alternative incorporates several measures and design variances to minimize harm, including reduced lane and shoulder widths, maintaining existing horizontal curves and substandard grades, limiting areas of line-of-sight improvements, providing a narrower clear zone, leaving the two historic bridges undisturbed, using temporary single-lane closures and flaggers during construction instead of constructing a temporary adjacent detour route, and revegetating unpaved disturbed areas after construction completion. These measures are detailed later in the *All Possible Planning to Minimize Harm* section.

Table 11 presents the least harm analysis conducted for these three alternatives, broken out by the seven factors listed at the beginning of this section.

Table 11: Application of Least Harm Factors [23 CFR § 774.3(c)(1)] to Alternatives.

New Location Eastern Alignment Alternative	Widen and Pave Alternative	Action Alternative
• If the analysis in paragraph 23 CFR § 774.3(a)(1) concludes that there is no feasible and prudent avoidance alternative, then the Administration may approve, from among the remaining alternatives that use Section 4(f) property, only the alternative that: • (1) Causes the least overall harm in light of the statute's preservation purpose. The least overall harm is determined by balancing the following factors: (i) The ability to mitigate adverse impacts to each Section 4(f) property (including any measures that result in benefits to the property)		
• Adverse effects to the Apache Trail would be mitigated by the measures established and agreed upon in a project-specific Memorandum of Agreement that would be executed by the SHPO, FHWA-CFLHD, ADOT, and TNF, which would include measures such as historic documentation and public education materials.	• Adverse effects to the Apache Trail would be mitigated by the same measures noted for the **New Location Eastern Alignment Alternative**. Therefore, the ability of this alternative to mitigate impacts is the same as the **New Location Eastern Alignment Alternative.**	• Adverse effects to the roadway and many of its contributing features would experience much less degradation over time and be far better protected from damage caused by storm event washouts with the **Action Alternative**. The remaining adverse effects to the Apache Trail would be mitigated by the same measures noted for the other two alternatives.
• (ii) relative severity of the remaining harm, after mitigation, to the protected activities, attributes, or features that qualify each Section 4(f) property for protection		
• Mitigation measures for the **New Location Eastern Alignment Alternative** would be the same as the other two alternatives**. The New Location Eastern Alignment Alternative** would only impact the Section 4(f) resource and its setting where five new intersections would be built to access public recreation areas west of the existing Apache Trail. While the severity of direct impacts to individually eligible and/or contributing features is less than the other two alternatives, no improvements would be made to the Apache Trail. Therefore, the historic road features would continue to degrade over time.	• Mitigation measures for the **Widen and Pave Alternative** would be the same as the other two alternatives. However, the relative severity of the remaining harm after mitigation would be higher than the **New Location Eastern Alignment** and the **Action Alternatives.** This alternative would construct a wider road and correct substandard curves resulting in a higher level of impacts to the resource's contributing features—likely to result in adverse effects to nearly all, if not all, of the 67 individually eligible and/or contributing features. Further, it would require more extensive rock cuts and fills to accommodate the wider road and	• Mitigation measures for the **Action Alternative** would be the same as the other two alternatives. However, the relative severity of the remaining harm after mitigation is substantially lower than the **Widen and Pave Alternative** because this alternative would have a lower level of impacts to the roadway and its character-defining contributing features (culverts, drainages, walls, setting) through minimization measures incorporated into its design. Those measures include generally maintaining existing grades and alignment, providing narrower lanes, shoulders, and clear zones, and minimizing areas for line-of-sight

Table 11: Application of Least Harm Factors [23 CFR § 774.3(c)(1)] to Alternatives.

New Location Eastern Alignment Alternative	Widen and Pave Alternative	Action Alternative
	horizontal and vertical curves to meet AASHTO design standards. This would substantially alter the historic setting and feeling of the resource.	improvements. These measures minimize impacts to the resource's contributing features by adversely affecting only 26 of the 67 contributing features, which reduces adverse effects to these features by more than 50 percent compared to the **Widen and Pave Alternative**. • Compared to the **New Location Eastern Alignment Alternative,** the severity of remaining harm under the **Action Alternative** after mitigation would be somewhat greater because more contributing features would be adversely affected, although the historic roadway and many of its contributing features would experience much less degradation over time and be far better protected from damage caused by storm event washouts.
• (iii) The relative significance of each Section 4(f) property		
• The **New Location Eastern Alignment Alternative**, **Action Alternative,** and **Widen and Pave Alternative** affect the same Section 4(f) resource (Apache Trail). The significance of the Section 4(f) property is the same for all alternatives.	• The **New Location Eastern Alignment Alternative**, **Action Alternative,** and **Widen and Pave Alternative** affect the same Section 4(f) resource (Apache Trail). The significance of the Section 4(f) property is the same for all alternatives.	• The **New Location Eastern Alignment Alternative, Action Alternative** and **Widen and Pave Alternative** affect the same Section 4(f) resource (Apache Trail). The significance of the Section 4(f) property is the same for all alternatives.

Table 11: Application of Least Harm Factors [23 CFR § 774.3(c)(1)] to Alternatives.

New Location Eastern Alignment Alternative	Widen and Pave Alternative	Action Alternative
• (iv) The views of the official(s) with jurisdiction over each Section 4(f) property		
• FHWA-CFLHD, ADOT, and TNF developed the alternatives with input from and collaboration with the AZ SHPO. Through this collaboration, it was indicated that the goal is to improve the road while minimizing impacts to the historic resources. The **New Location Eastern Alignment Alternative** would not meet this goal. The SHPO will have the opportunity to review and comment on this Draft Section 4(f) evaluation.	• FHWA-CFLHD, ADOT, and TNF developed the alternatives with input from and collaboration with the AZ SHPO. Through this collaboration, it was indicated that the goal is to improve the road while minimizing impacts to the historic resources. The **Widen and Pave Alternative** would not meet this goal. The SHPO will have the opportunity to review and comment on this Draft Section 4(f) evaluation.	• FHWA-CFLHD, ADOT, and TNF developed the alternatives with input from and collaboration with the AZ SHPO. Through this collaboration, it was indicated that the goal is to improve the road while minimizing impacts to the historic resources. The **Action Alternative** best meets this goal. The SHPO will have the opportunity to review and comment on this Draft Section 4(f) evaluation.
• v) The degree to which each alternative meets the purpose and need for the project		
• The **New Location Eastern Alignment Alternative** would meet the element of the project's purpose and need that relates to reducing maintenance demands of the corridor. However, no improvements would be made to the Apache Trail and, therefore, it would fail to improve the resiliency of the corridor and maintain its accessibility while protecting elements of the historic road, as practicable, because the historic road features would degrade over time.	• The **Widen and Pave Alternative** would meet the elements of the project's purpose and need to reduce maintenance demands and improve and maintain accessibility. However, it would fail to meet the need to protect elements of the historic road, as practicable.	• The **Action Alternative** fully meets the stated purpose of the project by improving the resiliency of the Apache Trail corridor to reduce maintenance demands, and improving and maintaining accessibility while protecting elements of the historic road, as practicable.
• vi) After reasonable mitigation, the magnitude of any adverse impacts to resources not protected by Section 4(f)		
• The Apache Trail traverses or is adjacent to special status species habitat and visual landscapes that are valued and intended for preservation within TNF. A new 11.16-mile, 24-foot wide road would result in new permanent impacts to approximately 33	• The Apache Trail traverses or is adjacent to special status species habitat and visual landscapes that are valued and intended for preservation within TNF. Because of the context-sensitive nature of the project area, improving the roadway to meet current design	• The Apache Trail traverses or is adjacent to special status species habitat and visual landscapes that are valued and intended for preservation within TNF. Because of the context-sensitive nature of the project area, the **Action Alternative** narrows the roadway

Table 11: Application of Least Harm Factors [23 CFR § 774.3(c)(1)] to Alternatives.

New Location Eastern Alignment Alternative	Widen and Pave Alternative	Action Alternative
acres within this sensitive area, and require construction of new crossings of the extensive dry washes in the area. Construction of this alternative would fragment primarily undisturbed, sensitive desert habitat that is not easily mitigated. The extensive rock cuts and fill required to build a road on a new alignment in this topographically challenging landscape would result in a high level of visual impacts. While context-sensitive solutions would be implemented to minimize or mitigate impacts to visual resources, extensive alteration of the desert landscape would still be required to construct the road with a horizontal and vertical alignment that meets current design and safety standards. In addition, without drainage improvements along the existing road that would improve resiliency and minimize road washouts, watershed damage would be an ongoing issue. As such, the **New Location Eastern Alignment Alternative** would result in the highest level of impacts to natural resources amongst all three alternatives.	standards under the **Widen and Pave Alternative** would result in a higher level of impacts to special status species and their associated habitat, as well as visual landscapes, not protected by Section 4(f) as compared to the **Action Alternative**. This is because more extensive rock cuts and fill and more extensive improvements to contributing features, such as culverts and bridges, to accommodate the wider road are required to meet AASHTO standards. However, after reasonable mitigation, the adverse impacts to these resources would be less severe than the **New Location Eastern Alignment Alternative** because the **Widen and Pave Alternative** is within an existing, disturbed road corridor.	in areas to 24-foot or 20-foot widths to minimize adverse impacts to the Apache Trail, as well as other resources not protected by Section 4(f). As such, this alternative would have the lowest impacts to these resources amongst all three alternatives.
• (vii) Substantial differences in costs among the alternatives		
• Constructing the **New Location Eastern Alignment Alternative** ($41 million) would result in less cost than the **Widen and Pave Alternative**, but would be three times the cost of the **Action Alternative.** The high costs are associated with the large amount of earthwork for cut and fill slopes, shoulders, drainage work, and multiple wash crossings	• Constructing the **Widen and Pave Alternative** ($60 million) would result in the highest costs amongst all three alternatives—nearly two times more than the **New Location Eastern Alignment Alternative** and more than four times the cost of the **Action Alternative.** The higher cost is due to additional earthwork for cut and fill slopes,	• The **Action Alternative** ($13.4 million) would cost substantially less than the **New Location Eastern Alignment Alternative and the Widen and Pave Alternative** by staying on the existing road corridor and reducing the width of the roadway and number of culvert extensions, minimizing the amount of cut and fill areas, and reducing the

Table 11: Application of Least Harm Factors [23 CFR § 774.3(c)(1)] to Alternatives.

New Location Eastern Alignment Alternative	Widen and Pave Alternative	Action Alternative
involved in building a road on a new alignment through this rugged terrain. However, costs are lower than the **Widen and Pave Alternative** primarily because the alignment could be sited at narrower points of major dry washes and minimize the need for bridges or size of bridge structures.	shoulders, drainage work to address design standards for sight distance and roadway curves, and replacement of the existing bridges.	amount of pavement.

4.6.3 Summary of Least Harm Analysis

Although the **New Location Eastern Alignment Alternative** would result in somewhat lower impacts to the Section 4(f) resource and would reduce maintenance demands on the corridor, it would fail to improve the resiliency of the corridor and maintain its accessibility while protecting elements of the historic road, as practicable. It is estimated to be three times the cost of the **Action Alternative** to build, and would fragment primarily undisturbed, sensitive desert habitat. It would result in the highest magnitude of adverse impacts to non-Section 4(f) resources, such as special status species habitat, visual landscapes, and water resources, amongst all three alternatives. The **Widen and Pave Alternative** would fail to protect elements of the historic road, as practicable, because it would result in the highest impacts to the historic features of the Apache Trail compared to the other build alternatives. It would also result in the highest costs to construct. The **Action Alternative** would impact fewer individually eligible and/or contributing features of the Section 4(f) resource than the **Widen and Pave Alternative**; it fully meets the stated purpose of the project; it is the most cost-effective alternative by a substantial margin; and it does not cause severe impacts to Section 4(f) or other resources. For these reasons, the **Action Alternative** is the alternative that causes the least overall harm in light of Section 4(f)'s preservation purpose (23 CFR § 774.17).

4.7 Coordination

During the Section 106 process, FHWA-CFLHD in coordination with ADOT and TNF, determined that the Action Alternative would result in an *adverse effect* (36 CFR § 800.5) to the Apache Trail. The SHPO concurred with the finding of *adverse effect* for this resource in correspondence dated April 6, 2021 and participated in the development and execution of the MOA.

The Advisory Council on Historic Preservation (ACHP), TNF, and ADOT were also notified of the adverse effect and invited to participate as concurring parties in the resolution of adverse effects and development of the MOA.

FHWA-CFLHD will submit this draft Section 4(f) Evaluation to the Director, Office of Environmental Policy and Compliance, U.S. Department of the Interior (DOI) for review and comment. The National Park Service Inter-Mountain Regional Office (on behalf of the DOI), will comment on whether there are any feasible and prudent alternatives to the Action Alternative and whether all measures have been taken to minimize harm (contingent upon the execution of the MOA). The results of coordination with the DOI will be considered by FHWA-CFLHD.

In addition to Section 106 consultation, FHWA-CFLHD engaged stakeholders and the public through the NEPA scoping process to identify and determine the breadth of environmental issues and alternatives to be addressed in the EA. FHWA-CFLHD sent out an initial scoping letter on September 14, 2017 to Native American Tribes traditionally associated with the project area, TNF, others with whom the TNF regularly consults, local concessionaires that operate within the project area, and to area residents near Roosevelt, Arizona. Comments were received from three individuals, one agency, and one organization. All of the comments were in support of the project.

The Tribes with known ancestral ties or interest in the project area listed below were contacted and invited to participate in the environmental review process for the project. Three tribal responses were received to FHWA-CFLHD's scoping letters sent in September 2017. One tribal response was received to FWHA-CFLHD's 2020 scoping letter regarding a change in scope after the 2019 storm damage. And in 2021, seven Tribes responded to a request from FHWA-CFLHD to participate in the development of mitigation measures for impacts to the NRHP-eligible Apache Trail. Five of the seven Tribes requested involvement with development of interpretive materials. One of the five Tribes expressed interest in signing the MOA as a concurring party.

When the EA is released for public review, FHWA-CFLHD will send announcements to the following Tribes to solicit any additional comments on the proposed project.

- Ak-Chin Indian Community
- Fort McDowell Yavapai Nation
- Gila River Indian Community
- Hopi Tribe
- Mescalero Apache Tribe
- Pascua Yaqui Tribe
- Salt River Pima-Maricopa Indian Community
- San Carlos Apache Tribe
- Tonto Apache Tribe
- Tonto O'odham Nation
- White Mountain Apache Tribe
- Yavapai-Apache Nation
- Yavapai-Prescott Tribe
- Zuni Pueblo

4.8 All Possible Planning to Minimize Harm

Based on the above analysis, there are no prudent and feasible alternatives that would avoid use of the Apache Trail. Through Section 106 consultation with the SHPO, TNF, and ADOT, FHWA-CFLHD identified measures to mitigate the adverse effect to the Apache Trail as a result of the Action Alternative.

The Action Alternative includes the following design variances and elements to minimize impacts to the Section 4(f) resource and adjacent areas, and minimize impacts to the public during the construction phase:

- **Lane and Shoulder Width**: The existing roadway varies between 16 and 30 feet. The proposed roadway will have a typical 10-foot wide lane and a varying shoulder width to fit on the existing road bench. In isolated areas with a narrow existing road bench, the total width will be 16 to 20 feet. Two template roadway widths, 20 feet and 24 feet will be used. The reason for this is that there are isolated areas where the road bench width varies from 16 to 20 feet. In those locations, the road will be built to the greatest width possible to remain on the existing bench but is expected to be less than the 20-foot template. Also, a 1:4 paved ditch will be constructed in select narrow areas to allow vehicles to use the ditch as necessary to maneuver around approaching vehicles. In the wider areas, a 24-foot template will be used with a 2-foot unstriped shoulder. This includes areas that are up to 30 feet wide that have been inadvertently widened. Only a 24-foot width would be formalized as part of the Action Alternative in order to reduce permanent impacts. If a wider road were built to meet design standards, it would impact all 67 individually eligible and/or contributing features of the resource, likely causing adverse effects to all of those features, whereas the narrower road included under the Action Alternative would only adversely affect 26 of those features.
- **Horizontal Curve Radius**: The horizontal alignment will match the existing horizontal curvature. Because of the mountainous terrain and sensitive environment, many substandard horizontal curves exist along the route. However, to achieve the minimum curve radius, major realignment would be required, which is not included in the Action Alternative. If all the substandard curves were straightened to meet design standards, more rock cuts would be required, which would impact a higher number of contributing features of the resource. Further, visual changes caused by the additional rock cuts and straighter road would substantially impact the setting of the resource. This design variance included in the Action Alternative will minimize impacts to the resource's contributing features and setting.
- **Maximum Grade**: Because of the mountainous terrain in the project area, sections of the existing roadway exceed the maximum grade. Five locations will require asphalt paving to provide a stable foundation for the chip seal. The reason for this is that existing grades vary from 0.5 percent to approximately 18 percent. However, correcting grades is not included in the Action Alternative because it would change roadside slopes and require grading to blend with adjacent grades. Those activities would impact a higher number of contributing features of the resource and impact its setting. By maintaining existing grades, the Action Alternative reduces these impacts.
- **Road Design**: As previously mentioned, because of the sensitive environment and mountainous terrain, the horizontal alignment will match existing conditions. ADOT and FHWA-CFLHD identified five areas where existing cut slopes will be cut back to improve line of sight. Also, the proposed vertical

alignment will match the existing vertical curvature, but an overall minor grade raise between 5.5 and 8.5 inches will occur. As mentioned above, changing the horizontal or vertical alignment of the road would impact a higher number of the resource's contributing features and its setting. Limiting the number of areas where line-of-sight improvements would occur reduces impacts to the resource's contributing features and setting.

- **Safety**: The Action Alternative will provide a clear zone that is narrower than the recommended clear zone for the Apache Trail's "Very Low Volume Roads" classification. The existing clear zone (two feet maximum) is predominately on the cut slope side and varies depending on the cut slope location. There is no clear zone on the fill slope side. Because of the steep terrain and winding nature of the roadway, more extensive impacts would be required to meet the recommended standard. An additional clear zone will be provided, where possible, to remain on the existing bench and minimize impacts to the sensitive environment. Because of the steep slopes along the corridor, widening the bench is not part of the Action Alternative. If a wider clear zone were provided throughout the project area, a higher number of the resource's contributing features would be impacted. The narrower clear zone proposed under the Action Alternative would minimize impacts to contributing features of the resource.
- **Structural Design**: The two historic bridges located in the project area, Pine Creek Bridge and Davis Wash Bridge, will be left undisturbed. The chip seal will terminate at the bridge approaches and taper down to the bridge elevation to provide a smooth transition, thereby avoiding impacts to those individually eligible and contributing features.
- **Traffic Control**: Most of the project can be constructed using single-lane closures, maintaining a minimum 10-foot lane to minimize construction delays for the public. Standard traffic controls, such as flaggers and a pilot car, will be required. Construction delays to public traffic will be limited to 30 minutes through the project between the 8:00 a.m. to 5:00 p.m. Monday through Friday. In coordination with TNF, delays may be reduced to 15 minutes based on seasonal considerations. An option such as building a temporary detour to maintain two lanes during construction would impact a higher number of the resource's contributing features and impact other sensitive ecological resources, and additional delays related to a detour could impact access to public recreational sites.
- **Revegetation**: A seed mix provided by TNF will be used in all unpaved disturbed areas, unvegetated, and/or designated areas, with mulch used to help establish seed, thereby mitigating impacts to the visual setting of the resource.

The above actions and the following mitigation measures represent "all possible planning to minimize harm" under Section 4(f) and will be included in the project to minimize harm to the Section 4(f) resource.

4.8.1 Summary of Mitigation Commitments

FHWA-CFLHD, SHPO, TNF, and ADOT developed an MOA that outlines mitigation measures that will be undertaken to address the adverse effect to Apache Trail. The draft MOA is provided in Appendix C. A summary of the agreed upon mitigation commitments is as follows:

- Where avoidance is not possible, FHWA-CFLHD shall minimize or mitigate adverse effects to historic properties through the development and implementation of an HPTP. The HPTP will be developed in consultation with the MOA parties and will specify a program of measures to minimize (if applicable) and/or mitigate adverse effects. FHWA-CFLHD shall ensure that the HPTP is consistent with the Secretary of the Interior's Standards and Guidelines for Archaeological Documentation (48 FR 44734-44737).
- Prior to the start of any work that could adversely affect any characteristics that qualify the Apache Trail as a historic property, FHWA-CFLHD shall have a Secretary of the Interior-qualified professional in history or architectural history (as specified in 36 CFR Part 61) complete historical recordation and documentation of up to 15 character-defining features of the Apache Trail to the "outline format: engineering structures" specified in the *Historic American Engineering Record (HAER) Guidelines for Historical Reports* (2008, updated December 2017).
- Prior to construction completion, FHWA-CFLHD shall develop and install interpretation materials (i.e., signs/kiosk) at up to five currently developed recreation sites (i.e., Needle Vista Recreation Site, Canyon Lake Vista, Tortilla Flat, Fish Creek Hill Vista, and Apache Lake Vista) located along the Apache Trail. Developed and installed interpretive signs/panels shall not exceed 11 in number. The interpretive materials may include topics such as characteristics of the historic road (i.e., drainage features, retaining walls, bridges, etc.); engineering, construction methods and challenges of building the historic road; work force or people involved in designing and building the original road; history of stagecoach stops along the Apache Trail; tribal occupation and history; desert culture living and cultural landscapes; history of the town of Tortilla Flat; and/or history of tourism along Apache Trail. Final topics will be determined by FHWA-CFLHD in consultation with SHPO, TNF, ADOT, MOA concurring parties, and interested Tribes, but shall not deviate from the history of the Apache Trail and the cultural resources associated with it. Once the interpretive materials are installed, they will be maintained by the TNF.
- FHWA-CFLHD will document the historic context of resources of Apache Trail, including Roosevelt Dam, Apache Lake and Marina, Fish Creek Hill, as well as contributing features of Apache Trail, to provide a permanent record of how maintenance, fire, and flooding have affected resources in the area. This will include documentation of the 2020 wildfire and flooding events. FHWA-CFLHD shall consult with the SHPO, TNF, ADOT, and MOA concurring parties on the format and content of the historic documentation and ensure that all documentation activities will be performed or directly supervised by, architects, historians, photographers, and/or other professionals meeting the qualification

standards for their field in the Secretary of Interior's Professional Qualifications Standards (36 CFR 61, Appendix A). A draft of the document will be provided the SHPO, TNF, ADOT, and MOA concurring parties within two years of execution of the MOA, and the final document provided prior to completion of project construction. FHWA-CFLHD will make the completed document available to interested parties in the format of their choosing (either hard copy or electronic format) and post the documentation through the ADOT website for a minimum of five years.

4.9 Next Steps

This draft Section 4(f) evaluation is included in this EA in accordance with 23 CFR § 771.105(a). FHWA-CFLHD will provide this draft evaluation to the OWJs (SHPO and ACHP), U.S. DOI, and USFS for a 45-day review and comment period, per 23 CFR § 774.5. If the OWJ or agencies raise any issues with the evaluation, FHWA-CFLHD will work with them to resolve the issues. If no comments are received within 15 days after the comment deadline, FHWA-CFLHD may assume a lack of objection and proceed with the action. This draft evaluation also will be provided to the public for review and comment through distribution of this EA. After review of the aforementioned considerations and comments received, in accordance with 23 CFR § 774.3, FHWA-CFLHD will make the final determination, likely within the NEPA decision document, on whether there is no feasible and prudent alternative to the use of the Apache Trail, determine which remaining build alternative results in the least overall harm, and affirm that the project includes all possible planning to minimize harm to the Section 4(f) property resulting from such use.

CHAPTER 5: COMMENTS AND COORDINATION

Continuous coordination with the public and project stakeholders is essential to the development of a project and the associated environmental document. Early coordination with both project stakeholders and the public can aid in identifying project-related concerns and potential environmental impacts. This chapter summarizes the coordination efforts for the project.

5.1 Project Scoping

Scoping is an early and open process to identify and determine the breadth of environmental issues and alternatives to be addressed in an environmental assessment. The project scoping process involves informing agencies, organizations, and interested citizens of the proposed project. A variety of formal and informal methods were used to conduct the project scoping for this project. These methods include interagency scoping meetings and scoping letters. Comments were received via mail and email during the scoping efforts, which were used to identify project issues and modify or improve the impacts analysis. These comments are essential to the decision-making process under NEPA.

FHWA-CFLHD sent out an initial scoping letter on September 14, 2017 to Native American Tribes traditionally associated with the project area, TNF's mailing list with whom the national forest regularly consults, local concessionaires that operate within the project area, and to Gila County Roosevelt area residents. Comments were received from three individuals, one agency, and one organization. All of the comments were in support of the project.

Following the 2019 floods, the design of the project was reassessed and new design elements were added to the scope of proposed activities. The same Tribes were contacted again in June 2020 and invited to provide feedback on the proposed action.

Traditionally associated Tribes include those listed below. The following Native American Tribes were contacted and invited to participate in the planning process:

- Ak-Chin Indian Community
- Fort McDowell Yavapai Nation
- Gila River Indian Community
- Hopi Tribe
- Mescalero Apache Tribe
- Pascua Yaqui Tribe
- Salt River Pima-Maricopa Indian Community
- San Carlos Apache Tribe
- Tonto Apache Tribe
- Tonto O'odham Nation
- White Mountain Apache Tribe
- Yavapai-Apache Nation
- Yavapai-Prescott Tribe
- Zuni Pueblo

When this EA is released to the public, FHWA-CFLHD will again alert people and agencies on the project mailing list and all associated Tribes formally asking for their input.

5.2 Project Correspondence

Correspondence with various federal, state, and local agencies and organizations occurred throughout project development. Correspondence is categorized by subject below and included in Appendix B.

5.2.1 Cultural Resources

Cultural resource specialists and project team members from TNF and ADOT, FWHA-CFLHD, and the Arizona SHPO's office met on May 16, 2017 regarding the historic road corridor and other known cultural resources in the project area. Tribal consultation was conducted by FHWA-CFLHD during the course of project development. A letter requesting concurrence on the area of potential effects, determinations of eligibility, and finding of adverse effect was sent to the Arizona SHPO on June 19, 2018. The SHPO's office concurred on July 2, 2018.

Due to the adverse effect finding, the project was submitted to the ACHP on July 3, 2018. The ACHP sent a letter accepting the invitation to participate in the consultation process on August 14, 2018.

Tribes were invited to be a consulting party on the proposed project in September 2017. Three tribal responses were received, two requesting further consultation in October 2017. Results of the cultural survey were sent to the two Tribes for comment in June 2018. One Tribe responded in June 2018. Following the floods of 2019, the Tribes listed in Section 5.1 were contacted again in June 2020. One tribe responded in June 2020. A third letter was sent to the Tribes in February or April of 2021 requesting input on mitigation measures for adverse impacts to the Apache Trail. Tribes were also asked if they would like to sign the Memorandum of Agreement (MOA) along with the MOA's signatories. Seven Tribes responded to the request, with five Tribes requesting involvement with development of interpretive materials. One of the five Tribes expressed interest in signing the MOA as a concurring party.

5.2.2 Biological Resources

Resource specialists from USFWS, TNF, and ADOT were consulted regarding biological resources including general wildlife and vegetation as well as species of concern and rare plants. Coordination consisted of email and phone correspondence.

A project evaluation request was submitted to Arizona Game and Fish Department (AGFD) in September 2017. Correspondence with the AGFD occurred in October 2017 regarding special status species.

5.2.3 Waters of the U.S.

Correspondence in the form of email and phone calls with the USACE was initiated in spring of 2018. A request for an AJD was submitted to the USACE on February 4th, 2021. According to the AJD dated March 5, 2021, the USACE determined that all the streams, with the exception of Pine Creek, are ephemeral streams and do not meet the definition

of WOTUS. Pine Creek was determined to be an intermittent stream and thus, met the definition of WOTUS.

CHAPTER 6: LIST OF PREPARERS

ADOT

- Kris Powell, Cultural Resource Specialist
- Ruth Greenspan, Cultural Resource Specialist

FHWA-CFLHD

- Micah Leadford, Project Manager (former employee)
- Dustin Robbins, Project Manager
- Alexa Miles, Environmental Protection Specialist (former employee)
- Thomas Parker, Environmental Protection Specialist (former employee)
- Lisa Hemesath, Environmental Protection Specialist
- Melissa Jucha, Highway Engineer
- Thomas McCrary, Highway Engineer
- Ryan Owens, Highway Engineer
- Brian Campbell, Hydraulics Engineer (former employee)
- Aaron Estep, Hydraulics Engineer
- Luis Caldron, Hydraulics Engineer

Jacobs

- Glennda Luhnow, Archaeology and Cultural Resource Specialist
- Becky Rude, Project Manager
- Christy Payne, Wildlife Biologist
- Kay Nicholson, Senior Biologist
- Pat Hickey, Biologist / Wetland Delineator
- Misty Swan, Environmental Planner

Tonto National Forest

- Joel Mona, Civil Engineer
- Terrin Lane, Civil Engineer
- Craig Woods, Forest Biologist
- Kristina Hill, Cultural Resource Specialist
- Travis Bone, Cultural Resource Specialist

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