Noxious Weed Management Plan for Bá'azh chíní (Piute Creek) Canyon Watershed Biological Evaluation

for

Land Management District 2

Coconino and Navajo Counties, Arizona

San Juan County, Utah

March 2023

Prepared for:

U.S. Department of the Interior

Bureau of Indian Affairs – Navajo Region

Western Navajo Agency

Branch of Natural Resources

Tuba City, AZ 86045

Noxious Weed Management Plan for Bá'azh chíní (Piute Creek) Canyon Watershed

Biological Evaluation

Prepared for:

U.S. Department of the Interior
Bureau of Indian Affairs – Navajo Region
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List of Acronyms

BE	Biological Evaluation
BGEPA	Bald and Golden Eagle Protection Act
BIA	Bureau of Indian Affairs
BRCF	Biological Resources Compliance Form
EA	Environmental Assessment
ESA	Endangered Species Act
HUC	Hydrologic Unit Codes
MBTA	Migratory Bird Treaty Act
NEPA	National Environmental Policy Act
NNDFW	Navajo Nation Department of Fish and Wildlife
PAC	Protected Activity Center
PCE	Primary Constituent Element
USFWS	United States Fish and Wildlife Service

Table of Conversions

Distance

1 inch = 2.54 centimeters = 25.4 millimeters

1 foot = 0.30 meter

1 mile = 1.61 kilometers

Area

1 acre = 0.40 hectare

1.0 INTRODUCTION AND PROJECT DESCRIPTION

1.1 Introduction

BRIC was contracted by the Bureau of Indian Affairs (BIA), Western Navajo Agency (WNA), to prepare a biological evaluation (BE) for the development of a Noxious Weed Management Plan complimented by an environmental assessment for the Bá'azh chíní Canyon (Piute Creek HUC 10) Watershed Project Area. The management plan will manage noxious weed species in the Bá'azh chíní Canyon HUC 10 Watershed project area while incorporating best management practices for these activities from the Navajo Nation Integrated Weed Management Plan Final Programmatic Environmental Impact Statement (EIS Number: 20220131). The agricultural/grazing permit holders and community members have requested this type of planning, with the ultimate goals to improve long-term health of the watershed and streams by increasing water flow, native plant productivity and diversity, and enhancing wildlife habitat and rangelands.

The purpose of this BE is to review the proposed action to determine to what extent it may affect threatened, endangered, proposed, or candidate species, or proposed or designated critical habitat, under the authority of the Endangered Species Act (ESA). This BE was prepared in accordance with legal requirements set forth under Section 7 of the ESA of 1973, as amended (16 USC 1536, et seq.). This BE will also review the proposed action to determine to what extent it may affect avian species protected under the Bald and Golden Eagle Protection Act (BGEPA) and the Migratory Bird Treaty Act (MBTA). This BE tiers off the *Final Biological Assessment for the Navajo Nation Integrated Weed Management Plan* (BIA 2022a). In addition, The FPEIS for the Navajo Nation Integrated Weed Management Plan includes conservation measures designed to limit impacts to resources from weed management actions and externally proposed projects. These conservation measures from the FPEIS Navajo Nation Integrated Weed Management Plan planning document that apply to this proposal can be found in Appendix D.

This BE is being prepared concurrently with an environmental assessment (EA). The EA will evaluate potential environmental, socioeconomic, and cultural resource effects from the preferred alternative of the proposed action and a no action alternative. The EA will be prepared in compliance with the National Environmental Policy Act (NEPA) of 1969 and implementing regulations, 40 CFR Parts 1500-1508.

1.2 Project Location

The project area is located in north-central Arizona and south-central Utah within Coconino and Navajo Counties, AZ, and San Juan County, UT (Figures 1 and 2).

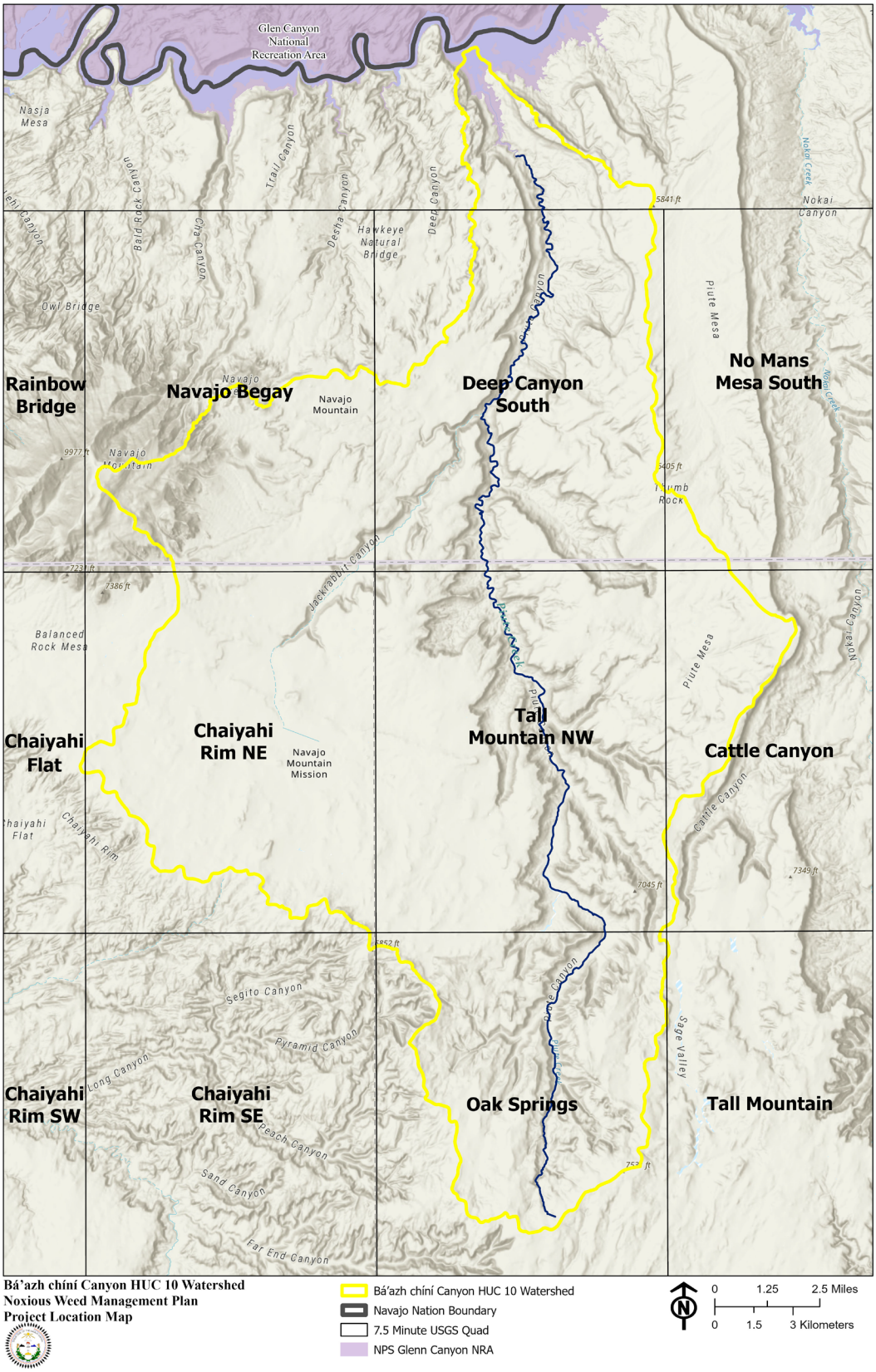

Figure 1. Location of the Bá'azh chíní Canyon HUC 10 project area.

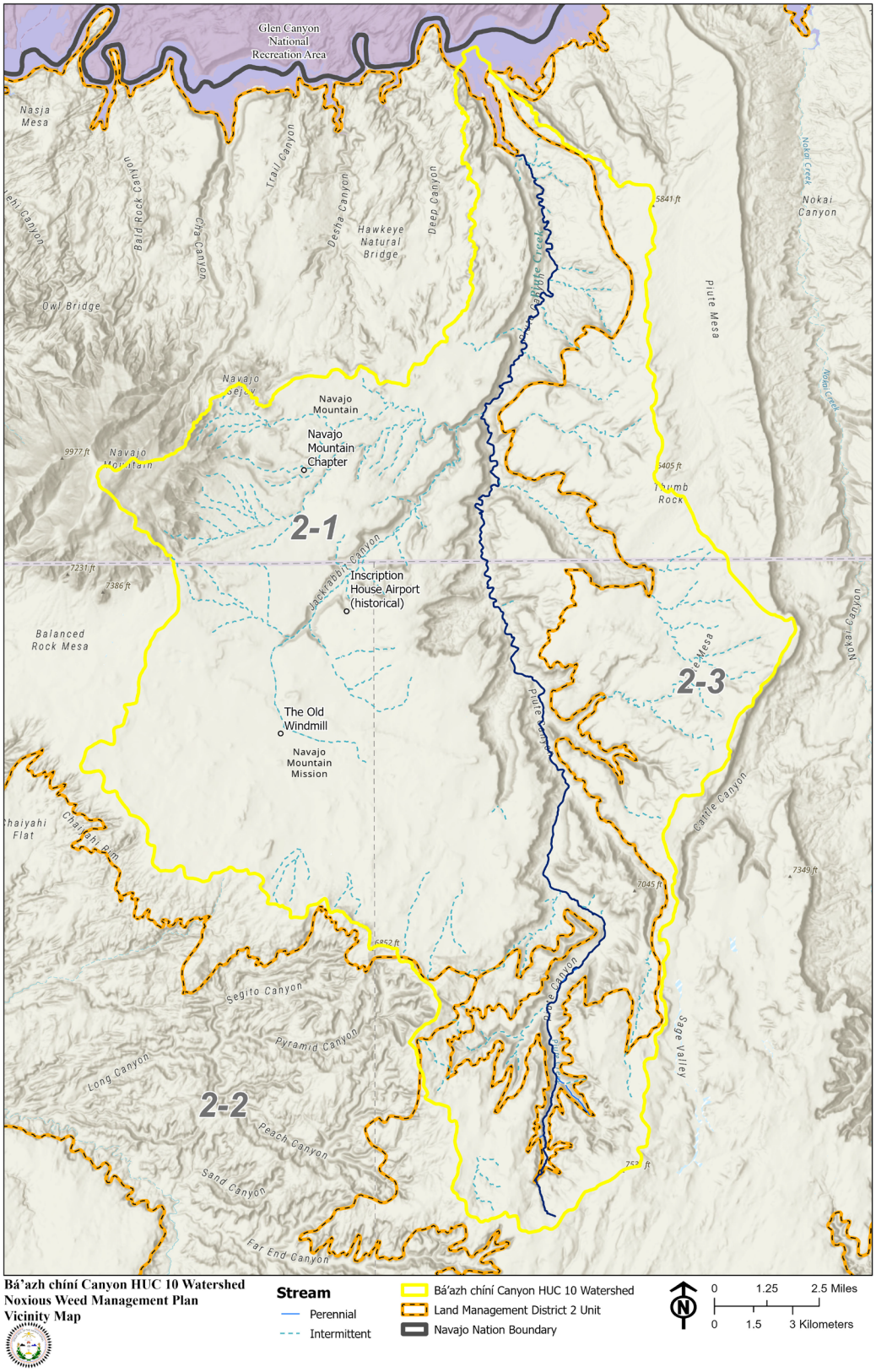

Figure 2. Location of the Bá'azh chíní Canyon Watershed Noxious Weed Treatment Areas.

1.3 Proposed Action

Under the Proposed Action, the BIA WNA Branch of Natural Resources would authorize noxious weed treatments within Bá'azh chíní Canyon HUC 10 Watershed on approximately 200 miles of streams (Figures 2 to 3). Thirteen of the 45 targeted noxious weed species identified by the BIA were detected, with 2,891 noxious/invasive weed infestations mapped that covered 2,879 acres of the planning area. Out of the 2,879 acres surveyed, only 345 acres had noxious/invasive weed infestations (Table 1). The annual goal is to treat up to 50 acres. An integrated weed management approach would allow for selection from manual, mechanical, herbicide, cultural and/or biological treatments. A combination of methods could be used for each project site depending on site conditions and weeds present. Weeds would be treated using the best available control technique(s) based on their life history and cost-effectiveness. Repeated treatments are often necessary due to the spread of seeds, lack of complete root kill, and residual weed seeds in the seed bank. In addition, all treatments should include native plant restoration where native vegetation covers less than 75% of the treated area. Retreatment and restoration would be included for each type of treatment as funding allows. Treatment methods are described below. The weed species known to occur within the project area and their potential treatment methods are listed in Table 1.

Table 1. Weed species known to occur in project area and best treatment methods.

Weed	Total Acres	Best Treatment Methods
Bull Thistle	0.00036	Manual, Mechanical, Herbicide, Cultural, and Biocontrol
Canada Thistle	0.00203	Mechanical, Herbicide, and Cultural
Cheatgrass	81.68430	Manual, Mechanical, Herbicide, and Cultural
Common Mediterranean Grass	157.59509	Mechanical and Herbicide
Halogeton	0.00076	Mechanical, Cultural, and Herbicide
Kochia	0.00932	Manual, Mechanical, Herbicide, and Cultural
Puncturevine	0.00222	Manual and Herbicide
Red Brome	5.53233	Manual, Mechanical, Herbicide, and Cultural
Russian Knapweed	0.00002	Manual, Mechanical with Herbicide, and Biocontrol
Russian Olive	74.55002	Mechanical and Herbicide
Russian Thistle	13.48904	Manual and Herbicide with Cultural
Saltcedar	11.68676	Mechanical and Herbicide
Scotch Thistle	0.00981	Manual, Mechanical, and Herbicide

*Source: 2022 Noxious Weed Inventory Report for Bá'azh chíní Canyon Watershed Noxious Weed Management Plan

Treatment Methods

Manual Treatment

Manual treatments would use hand tools and hand-operated power tools, including handsaws, loppers, shovels, brush shook, machetes, grubbing hoes, mattocks, Pulaskis, weed whackers, and axes. Manual tools would be used to cut, prune, or remove herbaceous and woody species. Treatments would include cutting undesired plants above ground level; pulling, digging, or grubbing out root systems to prevent resprouting and regrowth; or cutting at the ground level or removing competing plants around desired plants.

Manual treatments would typically be used on small, isolated infestations, where native plant species would be retained. Manual treatments would be used for annual or biennial species with tap roots or shallow roots that do not resprout from tissue remaining in the soil, or weeds growing in sandy or gravelly soils that allow

for easier root removal. Manual treatments are most effective on small weed infestations and when complete root removal is possible (Rees et al. 1996). Repeated treatments are often necessary due to soil disturbance and residual weed seeds in the seed bank. All weeds removed by manual treatments would be bagged and sent to a certified incinerator to prevent reinfestation from seeds or other plant materials.

Mechanical Treatment

Mechanical treatments would involve the use of power tools and heavy equipment to remove large areas where weeds are widespread and dense. Tractors or vehicles with attached implements (e.g., root rippers, plows, mowers) would be used to grub, till, or mow herbaceous and woody weed species. Grubbing would be used to remove perennial plants with deep root systems on areas with dense populations. Tilling would be used to remove shrubs and dense monocultures on deep, rock free soils. Mowing would be used to remove annual and biennial weed species along riparian areas and roads. Heavy equipment, such as chippers, roller choppers, feller bunchers, bulldozers, or masticators and extracting equipment could be used to treat dense woody vegetation or tree weed species.

Mechanical treatments are typically used to remove thick stands of weed infestations. Mechanical methods are appropriate where a high level of control over vegetation removal is needed, such as in sensitive wildlife habitats or near home sites and are often used instead of herbicide treatments for vegetation control in the wildland urban interface. Repeated treatments are often necessary due to the spread of seeds by machinery, lack of complete root kill, and residual weed seeds in the seed bank.

Chemical/Herbicides

Chemical treatments involve the use of herbicides to kill or suppress targeted weed plants. Herbicides could be used selectively to control specific vegetation types or non-selectively to clear all vegetation in a particular area. There are 20 herbicides that may be used on the on the Navajo Nation, and out of the 20 only 4 of them would be used on the proposed stream sites in the planning area (Appendix C). Selection of a specific herbicide and application rate for site-specific use would depend on its effectiveness on a particular weed species, success in previous similar applications, habitat types, soil types, and proximity to water. All herbicides will be used according to their labels, and a Navajo Nation Certified Pesticide Applicator will be on site. Water for mixing herbicide and cleaning herbicide equipment would be potable water obtained off-site or through a Water Use Permit. Water Use Permits may be obtained from the Navajo Nation, Technical, Construction, and Operations Branch, Water Code Section. An anti-siphon and back flow preventer device are required to prevent contamination of the water source. Treatment methods would be targeted herbicide techniques including cut stump, basal bark, frill or "hack and squirt", foliar spray, pelletized treatment, or pre-emergent treatment. Cut stump, basal bark, and frill or "hack and squirt" treatment methods would be used in areas where heavy machinery is not feasible or are sparsely populated with trees. Foliar spray treatment method could be used on large areas with weed infestations. The treatment methods are described below.

- Cut Stump—Trees are cut as close to the ground as possible using a chainsaw or loppers. The cut stump would be sprayed or painted with a systemic herbicide within 30 minutes to prevent resprouting.
- Basal Bark—Basal bark spraying would be used on dormant or leafless woody plants less than 6-inches in diameter. This method would spray the bottom 12–18 inches of a stem with herbicide. The herbicide would be mixed with a penetrating oil that allows it to pass through the bark. This method results in a dead standing snag.
- Frill or "Hack and Squirt" —This method would use an axe, machete, or hatchet to space cuts around a dormant or leafless tree trunk less than 6 inches in diameter. It is important that the cut penetrates to the cambium layer. Herbicide would then be applied to the cuts using a spray bottle or similar tool.

- Foliar Spray—Herbicide would be applied directly to the leaves using a backpack sprayer, spray bottle, a boom or boomless sprayer mounted on an all-terrain vehicle (ATV) or truck, fixed winged airplane, or helicopter to distribute over a large area.
- Pelletized Treatment—Herbicides that are small pellets would be buried around target weed shrub or tree's base.
- Pre-emergent Treatment—Herbicide would be applied to the soil before the target noxious weed species germinates or emerges.

All herbicide treatments would have a treatment plan submitted to the Navajo Nation Environmental Protection Agency (NNEPA) Pesticide Program that outlines the proposed herbicides to be used, application method and concentration levels, and timing of herbicide treatments. All herbicides used would be U.S. Environmental Protection Agency (EPA) approved and would be applied following the specified label conditions. Herbicide applications would comply with the Navajo Nation Pesticide Act as enforced by the NNEPA, which includes annual reporting on projects that use herbicide treatments and proper disposal of unused herbicide. Herbicides would be applied by applicators with a state applicators license and a U.S. EPA Certified Pesticide applicator card for the Navajo Nation. In addition, herbicides would be applied using proper equipment and personal protective equipment.

Activity Fuel Disposal

Vegetation removed by manual or mechanical treatments could be placed into piles to be burned under prescribed fire conditions. Prescribed burning of piled vegetation debris would remove the potential of contributing to existing hazardous fuel loads and posing as a fire hazard. Piles would be ignited using hand ignitions such as hand-held drip torch, helitorch, or backpack propane tanks. Pile burning may be conducted at any time in some locations, though most burning occurs during the winter to reduce the risk of escape fire. All prescribed pile burning would be implemented with a prescribed fire burn plan and a smoke management plan in accordance with BIA procedures (2006) and the *Programmatic Pile Burn Agreement with Navajo Nation* and would comply with federal and state air quality regulations. All prescribed pile burns would be performed by the BIA Navajo Region/Navajo Nation Forestry Burn Boss. If prescribed pile burning is not an option, vegetative material would be disposed of properly.

In dense areas treated with cut-stump methods, debris could be stacked in piles for burning. Vegetation debris should be allowed to dry out for a month or more before burning; some piles could be left intact for wildlife habitat. Debris piles intended for burning should be stacked away from active floodplains to reduce the amount of ash that can enter the water channel. Russian olive vegetation can resprout from adventitious buds contacting soil, so all cut debris of this species should be burned. Prescribed pile burning may be impractical in some places because of weather, terrain, and logistics.

Areas with isolated or sparse tamarisk infestations interspersed with native vegetation should not be managed for prescribed burning of debris piles. In these cases, cut tamarisk debris may be left on the ground to avoid disturbing soils and native vegetation, which could occur from dragging and moving debris into piles. However, arranging debris from several close trees into small piles may be appropriate for creating wildlife habitat. In areas where the floodplain may be left bare from woody weed removal, piling some cut tamarisk debris along the edge of low terraces beside floodplains is recommended to reduce bank erosion during flood events. Ultimately, which type of debris management used would depend on conditions, density of stands, and decision by managers on the ground.

Cultural Treatments

Cultural treatments could include targeted grazing, restoration by seeding and planting of native plants, use of weed free hay and seed, and mulching. Use of domestic animals could be used to selectively suppress, inhibit, or control vegetation, seeding and planting of native species, cultivation and crop rotation, use of weed free hay and sees, and mulching. The use of domestic animals requires a "prescribed grazer," such as sheep or goats, to control the top-growth of certain weeds. Sheep consume a variety of forbs, as well as

grasses and shrubs, and goats can eat large quantities of woody vegetation; their daily diets can include up to 50% of the weed (BLM 1991). In order for domestic animals to be effective, the right combination of animals, stocking rates, timing (i.e., high intensity and short-duration grazing), and rest must be used to control a particular weed species while minimizing impacts to perennial native vegetation. Grazing should occur when plants are palatable, and grazing can damage or reduce viable seeds. Targeted grazing would only be used in Community Development Areas and agricultural fields and prohibited in waterways, Highly Sensitive Areas, and where sensitive species occur.

Biological Treatments

Biological treatments involve the use of biological control agents that are U.S. Department of Agriculture (USDA)-approved insects and pathogens (e.g., bacteria, fungi) to selectively suppress, inhibit, or control noxious weeds. The BIA would only use biological agents approved by USDA Agricultural Plant Health Inspection Service (APHIS) (USDA Biological Control Agent List), which are listed in Appendix D. These biological control agents can reduce weed populations by feeding on the plant, by destroying vital plant tissues and function, or by planting eggs in seedheads to reduce reproductive potential. These control agents are commonly used on sites where the population of target plants are large enough to support a viable population of the control agent, and when adequate numbers of the agents can be obtained. All biological control agents used by the BIA under the Proposed Action will have been tested to ensure that they are host specific, and they will feed only on the target plant, and not on crops, native flora, or sensitive plant species. Introductions of all biological control agents would be done in accordance with guidelines provided by USDA APHIS. Information on the APHIS program and approval process is available at: http://www.aphis.usda.gov and the Navajo Nation Integrated Weed Management Plan. Prior to the release of any biological control agent, the BIA will obtain a permit from APHIS.

Biological control agents are most suitable for large sites where the target plant is well established and very competitive with native species. However, biological control agents such as insects can take up to 20 years to become established and to have the desired level of control but may initially reduce the size or density of a weed infestation. Biological treatments are most effective when used in combination with other treatments. The BIA would not consider the use of the tamarisk leaf beetle (*Diorhabda carniulata*) based on lessons learned from treatments in 2004 along the Colorado River. Prior to the release of any biological control agent, the BIA will obtain a permit from APHIS.

Treatments would begin in Fiscal Year 2024. Treatments would be followed with monitoring to evaluate project success.

2.0 CONSULTATION HISTORY

The BIA Navajo Region consulted with the U.S. Fish and Wildlife Service (USFWS) and Navajo Nation Dept of Fish & Wildlife/Heritage as part of the FPEIS-NNIWMP, pursuant to Section 7 of the ESA, and prepared a programmatic biological assessment (PBA; BIA 2022b) to evaluate likely impacts to federally and tribally listed or proposed threatened or endangered species as a result of noxious weed treatments. The procedures outlined in the FPEIS-NNIWMP require site-specific projects that tier off the PBA to obtain a biological resource clearance form from NNDFW before a project can start.

On May 12, 2022, Navajo Nation Department of Fish and Wildlife (NNDFW) provided a list of species and habitats of concern for this project (data request code 22bric101; Table 1; Appendix B). No informal consultation beyond this has been conducted.

3.0 AFFECTED ENVIRONMENT

3.1 Topography

Elevations on the project area vary from approximately 4,199 feet (1,280 m) in the lower valleys to over 7,054 feet (2,150 m) on the mesa top. The project area mostly consists of low valleys, watersheds, and hills and mesa tops.

3.2 Geology

The stratigraphy of the project area is typically characterized by the clastic section of the Quaternary, Jurassic and Triassic; primarily mapped as the Glen Canyon Group (Navajo, Kayenta, Wingate, Moenave Formations) and Nugget Ss in Utah and Arizona; and Chinle Formation in Arizona (Richard et al. 2000).

3.3 Soils

The project area is located within the Colorado Plateau Major Land Resource Area, which is characterized by Mesozoic and Paleozoic sedimentary formations (USDA NRCS 2022). There are 20 different soil map units within the project area (Table 2 and Figure 3), which are derived primarily from alluvium or eolian deposits derived from sandstone and/or residuum weathered from sandstone; and alluvium derived from sandstone and shale and/or colluvium derived from sandstone and shale. Dominant soil classes include fine to coarse sand, gravelly sandy clay loam, very gravelly loam, and very cobbly very fine sandy loam soils. The majority of the soils are well-drained with low to high runoff, which means water is absorbed by the soil readily and does not pool. The NRCS soil survey identifies approximately 148,420 acres within Bá'azh chíní Canyon HUC 10 that have a depth to the water table of more than 80 inches and approximately 10 to 80 inches to restrictive features, generally lithic bedrock (USDA NRCS 2022).

Table 2. Soil Map Units for Bá'azh chíní Canyon Planning Area

Soil Map Unit Name	Parent Material	Texture
Anasazi very stony very fine sandy loam, 10 to 25 percent slopes	eolian deposits derived from sandstone and/or residuum weathered from sandstone	Very Stony, very fine sandy loam
Anasazi very stony very fine sandy loam, 3 to 10 percent slopes	eolian deposits derived from sandstone and/or residuum weathered from sandstone	Very stony very fine sandy loam
Begay loamy fine sand, 3 to 8 percent slopes	eolian deposits derived from sandstone	Loamy fine sand
Jaconita-Anasazi association, 2 to 20 percent slopes	alluvium or colluvium derived from limestone and sandstone	Very gravelly fine sand
Lithic Torriorthents-Typic Torriorthents-Rock outcrop association, steep	colluvium derived from sedimentary rock and/or residuum weathered from sedimentary rock	Not Rated
Mespun-Bispen-Rock outcrop complex, moist, 1 to 15 percent slopes	alluvium and/or eolian sands derived from sandstone	Sand
Mido-Radnik-Riverwash complex, 1 to 8 percent slopes	alluvium and/or eolian sands derived from sandstone	Fine sand
Namon-Rock outcrop complex, 3 to 25 percent slopes	alluvium and/or colluvium derived from sandstone and shale	Very cobbly very fine sandy loam
Namon-Rock outcrop complex, low rainfall, 25 to 55 percent slopes	alluvium and/or colluvium derived from sandstone and shale	Very cobbly very fine sandy loam

Soil Map Unit Name	Parent Material	Texture
Oljeto-Sheppard association, sloping	alluvium derived from sandstone and shale	Loamy fine sand
Pinepoint-Parkwash-Rock outcrop complex, 1 to 10 percent slopes	Not Rated	Fine sand
Piute-Rock outcrop complex, 3 to 25 percent slopes	eolian deposits derived from sandstone and/or residuum weathered from sandstone	Loamy fine sand
Piute-Rock outcrop complex, high rainfall, 3 to 25 percent slopes	eolian deposits derived from sandstone and/or residuum weathered from sandstone	Loamy fine sand
Redbank-Shedado association, sloping	alluvium and/or eolian deposits	Very fine sandy loam
Rock outcrop-Mathis-Nalcase complex, 10 to 50 percent slopes	Not Rated	Not Rated
Rock outcrop, sandstone-Lithic Torriorthents, association, steep	Not Rated	Not Rated
Shedado loamy very fine sand, 1 to 8 percent slopes	eolian deposits derived from sandstone and/or residuum weathered from sandstone	Loamy very fine sand
Sogzie very fine sandy loam, 1 to 8 percent slopes	eolian deposits derived from sandstone	Very fine sandy loam
Ustic Torriorthents-Rock outcrop complex, 2 to 65 percent slopes	colluvium derived from shale and/or sandstone	Very gravelly loam
Ustollic Haplargids-Ustic Torriorthents-Rock outcrop association steep	colluvium derived from sedimentary rock and/or residuum weathered from sedimentary rock	Not Rated

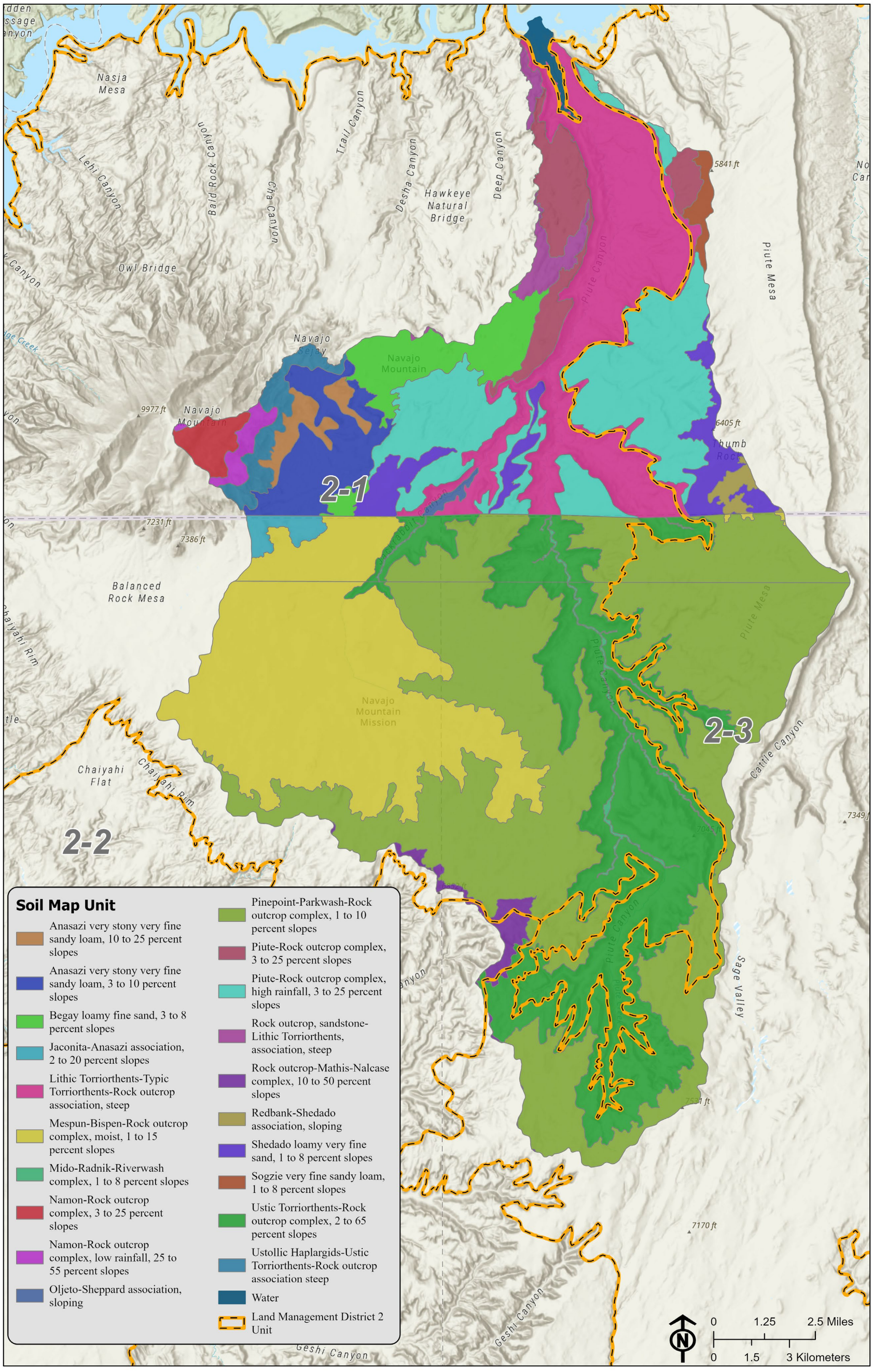

Figure 3. Soil Map Units in the Bá'azh chíní Canyon Planning Area.

3.4 Wildlife

The Bá'azh chíní Canyon HUC 10 provides habitat for a variety of wildlife species due to location within two geographic areas—Great Basin conifer woodland and Great Basin Desert scrub—and variability in elevation. A wide variety of birds, reptiles, amphibians, and mammals may occur within the Bá'azh chíní Canyon area. Big game species that may occur within the area include but are not limited to mule deer (*Odocoileus hemionus*), elk (*Cervus canadensis*), pronghorn (*Antilocapra americana*), black bear (*Ursus americanus*), and mountain lion (*Puma concolor*). Primary aquatic habitat for fish in the surrounding area includes the San Juan River and tributaries, which is about 3 miles north.

Wildlife observed during the site reconnaissance included American crow (*Corvus brachyrhynchos*), northern mockingbird (*Mimus polyglottos*), white-crowned sparrow (*Zonotrichia leucophrys*), black-throated sparrow (*Amphispiza bilineata*), mourning dove (*Zenaida macroura*), rock wren (*Salpinctes obsoletus*), and ash-throated flycatcher (*Myiarchus cinerascens*).

3.5 Vegetation

The vegetation community is mapped as Great Basin conifer woodland and Great Basin Desert scrub (Brown 1994). Dominant vegetation includes pinyon pine (*Pinus edulis*), Utah juniper (*Juniperus osteosperma*), big sagebrush (*Artemisia tridentata*), and black sagebrush (*Artemisia nova*). Sub-dominant vegetation includes Indian ricegrass (*Achnatherum hymenoides*), blue grama (*Bouteloua gracilis*), fourwing saltbush (*Atriplex canescens*), broom snakeweed (*Gutierrezia sarothrae*), mountain mahogany (*Cercocarpus montanus*), soapweed yucca (*Yucca glauca*), desert trumpet (*Eriogonum inflatum*), Russian thistle (*Salsola tragus*), longleaf jointfir (*Ephedra trifurca*), prickly pear (*Opuntia* spp.), rubber rabbitbrush (*Ericameria nauseosa*), eastern cottonwood (*Populus deltoides*), salt cedar (*Tamarix* spp.), cheatgrass (*Bromus tectorum*), and Russian olive (*Elaeagnus angustifolia*).

3.6 Hydrology

The area is within the Lower San Juan subbasin, San Juan subregion, and Upper Colorado region; with a small portion on the east end within the Lower Lake Powell subbasin, Upper Colorado-Dirty Devil Basin, Upper Colorado-Dirty Devil subregion and Upper Colorado region. The 12-digit hydrologic unit codes (HUC) and hydrologic unit names are 140802050706 Lower Bá'azh chíní, 140802050704 Navajo Mountain, 140802050705 Jackrabbit Canyon, 140802050703 Middle Bá'azh chíní, 140802050702 Fullers Spring, and 140802050701 Upper Bá'azh chíní. The USFWS National Wetlands Inventory identifies mostly riverine wetlands in the project area.

3.7 Special Designated Areas

There are no Important Bird Areas within the project area (Audubon 2022). The nearest Important Bird Area is Marble Canyon/Vermillion Cliffs (Site ID: 2287) west of the project area. Critical habitats are discussed in Section 7.2.

4.0 METHODOLOGY

BRIC staff reviewed the list of species of concern potentially occurring in proximity to the project area to determine which, if any, have potential to occur in the project area, based on the project location, observed habitats, soils, and geology. We also reviewed potential conflicts with the MBTA.

The action and analysis areas include the project area and the surrounding area. The analysis area includes the surrounding area because noise from the proposed action may travel beyond the project boundaries, and treatment activities could disturb some species beyond the immediate project area (e.g., nesting raptors). For birds and large mammals, the action and analysis areas include the project area and the surrounding area, the range of which depends on species, and would thereby extend the analysis area beyond the local action areas. This is because noise from the proposed action may travel beyond the project boundaries, and management activities could disturb some species beyond the immediate project area. For plants, the action

and analysis areas are the project area. For fishes, the action and analysis areas include the project area and the downstream portions of waterbodies intersected by the project area. In addition, impacts are analyzed at the broader level in terms of the gradual change in forest structure and management intervals and intensity over the years.

On May 16–18, 2022, we conducted a pedestrian and vehicular survey of the proposed project area and access roads. The survey area included the 148,420-acre project area and visual inspection beyond. We specifically surveyed for suitable habitat for protected species, prairie dog towns, cliffs suitable for nesting raptors, birds, and noxious weeds. Photos of the project area are shown in Appendix A. Surveys were conducted under NNDFW special permit 674.

5.0 TARGET SPECIES AND HABITATS

Table 3 presents the target species potentially occurring on the Bá'azh chíní Canyon HUC 10 project area and their status. Direct and indirect effects are discussed under Section 5.

Table 3. Target species potentially occurring in the project area, and potential impacts and reason.

Scientific name	Common name	Status*	Habitat	Potential Impacts (Y/N)	Comments
Aegolius acadicus	Northern saw-whet owl	G4, MBTA	This bird nests in tree cavities in relatively open ponderosa pine, Douglas fir or mixed conifer forests. This owl may also nest in old-growth riparian woodlands. Wintering habitat for this owl is variable, but dense vegetation is essential for this species. There is no documented breeding for this owl on Navajo Nation, but potential exists in forests and wooded canyons of Navajo Mountain.	N	Bá'azh chíní, tributaries and washes do not contain adequate northern saw-whet owl habitat. There is potential for this species to occur in areas of Navajo Mountain, but treatments would not occur in these areas. It is highly unlikely northern saw-whet owls would occur in or near treated areas due to lack of habitat. There is no old-growth riparian woodlands and mixed-conifer forests preferred by this species within the project area. There would be no impacts to this species. This species will not be discussed further.
Anticlea vaginatus	Alcove death camas	G3	Hanging gardens and occasionally streamsides below; mostly in alcoves.	Y	A buffer zone of 200 ft is recommended to avoid disturbance (Section 5.4). This plant has elements occurring within 1 mile of the Chaiyahi Rim NE Quadrangle (Appendix B). The survey period is mid-July through August. To avoid direct effects to this plant, weed treatments should not occur in hanging garden sites.
Aquila chrysaetos	Golden eagle	G3, MBTA, BGEPA	This bird occurs in a variety of open habitats and nests mainly on cliffs. Golden eagles will also nest in trees and on telephone poles. Open country, which allows for foraging, is the most important component for Golden Eagle habitat. However, eagles will occasionally nest in forested habitats (e.g., small rock piles in ponderosa pine forests) and travel several miles to open areas for foraging (Glinski et al. 1998).	N	The project area contains potential foraging and nesting habitat; however, nesting is unlikely to occur in or near treated areas. The project would follow NNDFW Golden and Bald Eagle Nest Protection Regulations to prevent risks to golden eagles during the breeding season (see Recommendations and Conclusions below). There would be no direct or indirect impacts to golden eagles if the above regulations are followed. This species will not be discussed further.

Scientific name	Common name	Status*	Habitat	Potential Impacts (Y/N)	Comments
Astragalus cutleri	Cutler's milk-vetch	G2	Warm desert shrub communities on sandy seleniferous soils.	Y	A buffer zone of 200 ft is recommended to avoid disturbance (Section 5.4). The Chinle Formation does exist along portions of Bá'azh chíní and some tributaries. There are no elements occurring within the project area according to NNDFW, but there is potential on the north end of Bá'azh chíní and tributaries. Biological surveys are recommended in potential habitat during the flowering period, but major impacts are not expected.
Asclepias welshii	Welsh's milkweed	G3, ESA T	This plant occurs on active sand dunes derived from Navajo sandstone in Great Basin desertscrub, juniper, sagebrush, and ponderosa pine from 4,700–6,250 feet (1430–1905 m) elevation (Arizona Rare Plant Committee 2001, NNDFW 2020) in a few counties along the Arizona–Utah state line (Arizona Game and Fish Department 2005a). It flowers June to July. This plant is rare because of its narrow geographic range and specific habitat requirements. On Navajo Nation, this plant occurs in Coconino County north of Tuba City, and in Navajo and Apache counties south of Monument Valley but has potential to occur on all active sand dunes between Page and Tuba City and east to the Chinle Creek drainage (NNDFW 2020).	N	There are no known elements occurring within the project area for this species according to NNDFW. The biological survey found the requisite of active sand dunes derived from sandstones to be outside of the proposed treated areas. There would be no impact to this species. This species will not be discussed further.
Buteo regalis	Ferruginous hawk	G3, MBTA	This hawk nests in badlands, desert scrub, and grasslands on the Navajo Nation and nearby areas (NNDFW	N	Similar to the golden eagle, the project area offers foraging habitat, and potential nesting habitat for this species, but nesting is

Scientific name	Common name	Status*	Habitat	Potential Impacts (Y/N)	Comments
			2020). They prefer elevated substrates for nesting but will nest in haystacks, abandoned buildings, and on the ground in the absence of elevated substrates (New Mexico Game and Fish 2010). Badlands are preferred nesting sites in northwest New Mexico (Cartron et al. 2010). Ferruginous Hawks are often associated with prairie dog towns (Bechard and Schmutz 1995).		unlikely to occur in or near treated areas. Additionally, ground nesting is unlikely due to residences scattered throughout the project area, and some grazing activities. If loud activity is proposed to take place within 1.6 km of potential nesting habitat, nest surveys are recommended to verify activity. There would be no direct or indirect impacts to ferruginous hawks if the above regulations are followed. This species will not be discussed further.
Catostomus discobolus	Zuni bluehead sucker	G2	This fish occupies a wide range of water conditions within river/stream habitats, including variable water temperatures (16–26° C), and stream volumes (< 1 to several hundred m3/second). This fish often occupies the swift-water areas in mountain streams. Smaller tributaries adjacent to large rivers are often nursery areas (Minckley 1973). Propst et al. (2001) found evidence that spawning may be bimodal with most spawning occurring early in the season.	N	This fish does not occur in the San Juan River. More recent surveys (early to mid-1990s) determined the distribution of Zuni bluehead sucker in New Mexico to be limited mainly to the Zuni Mountains and the Rio Nutria drainage upstream of the mouth of the Nutria Box Canyon in McKinley County (Propst et al. 2001). There would be no impacts to this species. This species will not be discussed further.
Carex specuicola	Navajo sedge	G3, ESA T	Seeps and hanging gardens on vertical sandstone cliffs and alcoves.	Y	A buffer zone of 200 ft is recommended to avoid disturbance (Section 5.4). This plant has elements occurring within 1 and 3 miles of multiple quads (Appendix B). The Survey period is late June through September. To avoid direct effects to this plant, weed treatments should not occur in hanging garden sites.
Cinclus mexicanus	American dipper	G3, MBTA	Nests near clear streams with a variety of riffles, pools and	Y	A buffer zone of 1/8 mile is recommended to avoid disturbance during active nesting, Mar 15–Aug 15 (Section 5.2). Running

Scientific name	Common name	Status*	Habitat	Potential Impacts (Y/N)	Comments
			waterfalls with substrate of rock, sand and rubble.		streams with substratum preferred by this species was not observed during the biological survey and adequate habitat was not detected. However, this bird has elements occurring within 3 miles of the Oak Springs Quadrangle (Appendix B).
Cirsium rydbergii	Rydberg's thistle	G4	Hanging gardens and seeps and sometimes stream banks below hanging gardens.	Y	A buffer zone of 200 ft is recommended to avoid disturbance (Section 5.4). This plant has elements occurring within 1 mile of several Quadrangles (Appendix B). The survey season is late spring through September or October. To avoid direct effects to this plant, weed treatments should not occur in hanging garden sites.
Dipodomys spectabilis	Banner-tailed kangaroo rat	G4	Great Basin Desert grassland or desert scrub, particularly areas with heavier soils.	Y	A buffer zone of 60 m (200 ft) from occupied habitat is recommended to avoid disturbance (Section 5.3) This species could potentially occur in the area, but occupancy is unlikely due to the sparsity of grass, which is an important habitat component. Disturbance would be unlikely due to the brief nature of activities and because no habitat would be lost (i.e., no earth moving or vegetation clearing) in areas of potential habitat.
Empidonax traillii extimus	Southwestern willow flycatcher	G2, ESA E, MBTA	This subspecies nests in dense riparian vegetation near surface water or saturated soil; either in monotypic or mixed stands of native (e.g., willow) and/or exotic (e.g., tamarisk or Russian olive) species, with or without an over-story. Vegetation is typically ≥ 3 m high, and dense with a closed canopy, although the understory may be dispersed or clumped. Nesting	N	There are no known breeding sites along Bá'azh chíní. Furthermore, there is no dense riparian vegetation or streamside habitat with moist soils adjacent to perennial waterbodies that supports suitable nesting habitat in the planning area. However, southwestern willow flycatchers may use riparian areas or patches of riparian vegetation during migration that would be unsuitable for nesting (USFWS 2017).

Scientific name	Common name	Status*	Habitat	Potential Impacts (Y/N)	Comments
			habitat greatly varies in size and shape and may be as small at 0.8 ha but does not include linear riparian zones < 10 m wide. Migrant flycatchers may use riparian habitats unsuitable for breeding and non-riparian areas (NNDFW 2020).		There would be no impacts to this species. This species will not be discussed further.
Gila robusta	Roundtail chub	G2	This fish inhabits permanent waters in cool- to warm-water mid-elevation streams, and typically frequent open areas in the deepest pools and eddies of middle sized to larger streams adjacent to rapids and boulders (Carman 2006, White 2005, Minckley 1973). They are often found near cover such as rocks and plant roots and in pools behind irrigation diversions. Juveniles prefer the margins of flowing water and backwater areas. Spawning occurs over gravel bottoms in runs and pools with ≥ 25 cm water depth (Minckley 1973).	N	According to USFWS, this species is not listed in the San Juan Basin. There would be no impacts to this species. This species will not be discussed further.
Haliaeetus leucocephalus	Bald eagle	G2, MBTA, BGEPA	This bird typically nests within trees in forested areas, especially mature and old-growth stands, adjacent (usually < 2 km) to large bodies of water that contains suitable forage of waterfowl and fish. Bald eagles rarely use cliff face adjacent to large body of water. They winter roost in large trees in forests, river bottoms, or near canyon rims, usually within a few miles of ponds, lakes and rivers with adequate prey (NNDFW 2020).	N	The project area does not contain adequate foraging and nesting habitat due to lack of forested areas adjacent to large water bodies. Bald eagles may frequent the area during the winter. The project would follow NNDFW Golden and Bald Eagle Nest Protection Regulations to prevent risks to bald eagles during the breeding season (see Recommendations and Conclusions below). There would be no direct or indirect impacts to bald eagles if the above regulations are followed. This species will not be discussed further.

Scientific name	Common name	Status*	Habitat	Potential Impacts (Y/N)	Comments
Lithobates pipiens	Northern leopard frog	G2	Wetlands with permanent water and aquatic vegetation, ranging from irrigation ditches and small streams to rivers, small ponds, marshes, lakes or reservoirs.	Y	In occupied habitat, a buffer zone of 60 m (200 ft) from open water is recommended to avoid disturbance (Section 5.6) No applications of herbicides are recommended within 200 ft of occupied or potentially occupied habitat. This frog has elements occurring within 1 mile of the Oak Springs Quadrangle (Appendix B). If treatments are proposed near open water habitat, a biological survey is recommended to confirm presence.
Microtus mogollonensis	Navajo Mountain vole	G4	Dry grassy vegetation in conifer forests and dense shrub patches in ponderosa pine forests.	Y	A buffer zone of 60 m (200 ft) from occupied habitat is recommended to avoid disturbance (Section 5.3) This species could potentially occur in the area within 1 mile of portions of the project area, but occupancy is unlikely due to lack of grassy areas, and conifer and ponderosa pine forests. Additionally, weed treatments would mostly be restricted to canyons. Occurrence is most likely around Navajo Mountain.
Oxyloma kanabense	Kanab ambersnail	G4, ESA E	This snail is restricted to perennially wet soil surfaces or shallow standing water and decaying plant matter associated with seep-fed marshes and springs near sandstone or limestone cliffs. Vegetation cover is important such as cattails, monkeyflower, or watercress, but wetland grasses or sedges may also suffice (NNDFW 2020).	N	There were no perennially wet soil surfaces or standing water, and wetland vegetation cover observed in the project area during the biological survey. There would be no impact to this species due to lack of habitat. This species will not be discussed further.
Patagioenasa fasciata	Band-tailed pigeon	G4, MBTA	This bird nests mainly in montane conifer or mixed-species forests dominated by pines and oaks at elevations between 5,250-8,850	N	The project area does not contain the montane conifer or mixed-species forests preferred by this species. Most of the project area consists of pinyon-juniper and

Scientific name	Common name	Status*	Habitat	Potential Impacts (Y/N)	Comments
			feet. This pigeon prefers pine-Douglas-fir forests and spruce-fir with abundant shrubs that produce berries in northern Arizona, and Gambel's oak-dominated communities in southern Utah. Migration habitat is usually similar to nesting habitat (NNDFW 2020).		sagebrush communities. There would be no impact to this species due to lack of habitat. This species will not be discussed further.
Penstemon navajoa	Navajo beardtongue	G3	Rocky, open places in ponderosa pine, aspen, and Douglas fir communities.	Y	A buffer zone of 200 ft is recommended to avoid disturbance (Section 5.4). This plant has elements occurring within 1 mile of several Quadrangles (Appendix B). The survey period is from early July to early August. To avoid direct effects to this plant, noxious weed treatments should not occur on the upper slopes of Navajo Mountain.
Picoides dorsalis	Three-toed woodpecker	G4, MBTA	This woodpecker nests and winters mainly in spruce, fir, aspen or mixed conifer forests, sometimes adjacent to ponderosa pine habitats at elevations greater than 8,000 feet. Ideal habitat for this species consists of mature or old-growth stands, fire-killed trees, 42-52 snags per 100 acres, and/or large amounts of bark-boring beetles. There is low potential for this species to occur on Navajo Mountain (NNDFW 2020).	N	The project area does not contain the mixed conifer higher-elevation forests preferred by this species. There would be no impact to this species due to lack of habitat.
Platanthera zothecina	Alcove bog-orchid	G3	Seeps, hanging gardens, and moist stream areas from desert shrub to pinyon-juniper and ponderosa pine/mixed conifer communities.	Y	A buffer zone of 200 ft is recommended to avoid disturbance (Section 5.4). This plant has elements occurring within 1 mile of several Quadrangles (Appendix B). The survey season is July through August. To avoid direct effects to this plant, weed treatments should not occur in hanging garden sites.

Scientific name	Common name	Status*	Habitat	Potential Impacts (Y/N)	Comments
Primula specuicola	Cave primrose	G4	Hanging gardens and occasionally Streamsides below, mostly in alcoves.	Y	A buffer zone of 200 ft is recommended to avoid disturbance (Section 5.4). This plant has elements occurring within 1 and 3 miles of several Quadrangles (Appendix B). The flowering season is March through April, but plants can be identified throughout the growing season by experienced botanists. To avoid direct effects to this plant, weed treatments should not occur in hanging garden sites.
Ptchocheilus lucius	Colorado pikeminnow	G2	Backwaters and flooded riparian areas during spring runoff and migrates large distances (15–64 km in the San Juan River) to spawn in riffle-run areas with cobble/gravel substrates.	Y	A buffer zone of 300 ft near occupied habitat is recommended to avoid disturbance (Section 5.5). This fish has potential to use the aquatic habitat of the San Juan River and its tributaries located throughout the proposed project area. To avoid impacts, weed removal projects would require restoration of native vegetation to prevent erosion, and weed removal activities in the riparian zone would be conducted in patches in order to prevent erosion.
Puccinellia parishii	Parish's alkali grass	G4	Alkaline seeps, springs, and seasonally wet areas such as washes.	Y	A buffer zone of 200 ft is recommended to avoid disturbance (Section 5.4). There is potential for this rare plant to occur near the project area. The survey period is mid-April–early June. To avoid direct effects to this plant, weed treatments should not occur near alkaline seeps and springs.
Sauromalus ater	Chuckwalla	G4	Low desert lands and rocky canyons, and margins of grass-oak woodlands.	Y	Avoidance measures include no surface disturbance within occupied habitat that could result in take of individuals or habitat alteration. This reptile has elements occurring within 1 mile of the Navajo Begay Quadrangle (Appendix B). Proposed

Scientific name	Common name	Status*	Habitat	Potential Impacts (Y/N)	Comments
					treatments would not likely occur in areas that could provide habitat for this species.
Strix occidentalis lucida	Mexican spotted owl	G3, ESA T, MBTA	Inhabits mature mixed-conifer forests and is typically associated with steep slopes and cliff/canyon complexes.	Y	A buffer zone of ¼ mile of known nest/roost site during Mar 1-Aug 31 is recommended to avoid disturbance (Section 5.2). This bird has elements occurring within 3 miles of portions of the project area (Appendix B). The project area likely contains adequate Mexican spotted owl habitat in some of the canyons in the southern and northwestern portions of the project area. There is potential for wintering habitat. Mixed conifer forests are important components for breeding and wintering habitats.
Symphyotrichum welshii	Welsh's American-aster	G4	Wet meadows, stream banks, seeps, and hanging gardens.	Y	A buffer zone of 200 ft is recommended to avoid disturbance (Section 5.4). This plant has potential to occur in the project area (Appendix B). It flowers August through October. To avoid direct effects to this plant, weed treatments should not occur in seeps and hanging garden sites.
Xyrauchen texanus	Razorback sucker	G2, ESA E	Occupies low-flow areas; shallow to deep runs over sandbars and seasonally flooded shorelines are also important in mainstream portions of rivers for pre- and post-spawning suckers especially during spring runoff.	Y	A buffer zone of 300 ft near occupied habitat is recommended to avoid disturbance (Section 5.5). This fish has potential to use the aquatic habitat of the San Juan River and its tributaries located throughout the proposed project area. To avoid impacts, weed removal projects would require restoration of native vegetation to prevent erosion, and weed removal activities in the riparian zone would be conducted in patches in order to prevent erosion.

*G 2–4 = Navajo Endangered Species List rankings: G 2 = endangered, G 3 = threatened, G 4 = candidate. G 4 species are not protected under Tribal Code but should be considered in project planning. ESA E and T = Endangered Species Act endangered and threatened. MBTA = Migratory Bird Treaty Act, BGEPA = Bald and Golden Eagle Protection Act.

5.1 Critical Habitat

Final designated critical habitat for the Mexican spotted owl exists north of Bá'azh chíní on the northern side of the San Juan River, outside of the project area. In addition, final designated critical habitat for the Colorado pikeminnow and razorback sucker exists within the San Juan River north of Bá'azh chíní (USFWS 2022). Impacts to critical habitat for the fishes will not be discussed further since it is north of the proposed project area.

5.2 Birds

American dipper—This bird prefers to nest near clear, unpolluted streams typically less than 15 meters in width and 2 meters in depth with a variety of riffles, pools and waterfalls and substrate of rocks, sand and rubble. Instream and streamside boulders are important for perches. In winter, this bird used streams that may be larger or deeper, but lack of ice is preferred (NNDFW 2020). It nests in a variety of typically streamside structures such as rocks, bank crevices, tree roots, and logs (Wilson and Kingery 2011).

American dippers may be impacted by chemical, mechanical and manual noxious weed treatments. Direct impacts from noxious weed treatments would not occur to nesting dippers if the guidelines for buffers listed below are followed. Herbicides used in the riparian areas would be registered for aquatic use and would be practically non-toxic to small birds and their aquatic invertebrate prey (White 2007). Aquatic herbicide treatment will not be conducted; thus, water quality will not be affected. Additionally, noxious weeds in riparian areas would be treated with aquatic approved herbicides, so they are nearly non-toxic to aquatic amphibians. Impacts to water quality could include trampling and impacts to dipper habitat could occur during mechanical or manual treatments. However, these impacts would be short in duration and minimal. Direct and indirect effects would be avoided for nesting dippers by implementing the buffers to nests listed below. Dippers would benefit from the long-term effects of noxious weed removal and native species planting by improving water quality and creating habitat.

This bird has elements occurring within 3 miles of the Oak Springs Quadrangle (Appendix B). A qualified biologist would conduct surveys in areas of potential habitat to confirm presence. Herbicide application must follow strict safety protocols, including chemical label instructions and project mitigation measures. Mechanical treatments require a 50–200 ft (15-60 m) buffer from occupied nesting habitat outside of breeding season. No mechanical, mechanized ground, low or high aerial chemical treatments within 1/8 mile (0.2 km) from the active nest during March 15- August 15. Spot chemical spraying or manual treatments require a buffer of 330 ft (0.1 km) from the active nest during March 15- August 15. Small migratory birds- Class 2 or Class 3 herbicides require 30 ft (9 m) buffer for spot and mechanized ground application of herbicide, 150 ft (50 m) with low aerial chemical treatments, and 1/8 mi (200 m) for high aerial chemical treatments near the species habitat.

Mexican Spotted Owl—This owl subspecies is patchily distributed throughout Mexico, Arizona, New Mexico, and southern Utah and Colorado (Gutiérrez et al. 1995). It inhabits mature mixed-conifer forests and is typically associated with steep slopes and cliff/canyon complexes. The winter habitats of Mexican spotted owls include lower-elevation piñon–juniper habitat and mixed, uneven-aged coniferous forests. There is also a preference for downed woody debris and snags. High canopy closure and tree density is an important component in breeding and wintering habitats. Mixed-age forests are often preferred along with proximity to water (Gutiérrez et al. 1995).

Although there are no Mexican spotted owl Protected Activity Centers (PACs) within the project area, potential habitat may occur in canyon complexes and forested areas where weed treatments are proposed. It is unlikely owls would come in direct contact with herbicide application or from brushing against freshly sprayed vegetation because owls are nocturnal and spraying would be completed during the day. Additionally, owl prey, primarily rodents, are typically nocturnal so they are also unlikely to be directly sprayed, further reducing the opportunity for owls to ingest herbicides when capturing prey where treatments have occurred. Mechanical treatments may provide temporary noise disturbances, but this would

also be conducted during the day and would not affect owls active at night. The herbicides chosen for use within Mexican spotted owl habitat would be those with low ecotoxicity rating and with no eye irritation to predatory birds. The combination of low herbicide toxicity, low potential for herbicide exposure, and low likelihood of direct disturbance reduces the possibility for adverse effects, making the proposed alternative not likely to have major impacts to Mexican spotted owl individuals and habitat.

This bird has elements occurring within 3 miles of portions of the project area (Appendix B). The breeding season for this owl is from March 1 through August 30. Owl surveys would be recommended in areas of potential habitat if treatments occur during the breeding season. All treatments require a ¼ mile (0.4 km) buffer from suitable nesting habitat. Specified herbicides may be applied along road and utility rights-of-way in MSO PACS during the breeding season, but applicators should make sure that pesticide spray drift does not occur beyond right-of-way.

Migratory birds—Implementation of the Proposed Action during the avian breeding season could result in impacts to migratory birds protected by the MBTA. The proposed action alternative would potentially affect multiple territories of multiple species. Most of this is undeveloped, montane (pinyon-juniper) habitat and would involve the removal of noxious vegetation. Shrub and tree-nesting species would potentially be impacted. There are no other NNDFW bird Species of Concern not shown in Table 3 that would be impacted by the proposed action alternative.

Noxious weed treatments may affect wildlife directly by causing injury or death, and indirectly by impacting cover and food resources. Direct impacts could include the physical disturbance of active nests or territories during herbicide or mechanical treatments. Indirect impacts could include the disturbance of nesting birds and territories by noise, human presence, and habitat alteration. However, removal of noxious weeds may promote habitat for migratory birds. These effects could be mitigated by limiting activities to outside the avian breeding season as much as possible.

Mechanical treatments within the buffer zone would be conducted outside of the breeding season (March through August), unless MBTA surveys are conducted by a qualified biologist in treated areas to confirm nesting. For non-endangered raptors- All treatments require a 490 ft (0.15 km) buffer from the active nest from March-August or until juveniles have left the nest. Predatory birds- Spot and mechanized ground herbicide treatments with Class 2 or Class 3 liquid formulation herbicides require a 300 ft (90 m) buffer from an active nest from March- August or until juveniles have left the nest. Low and high aerial treatments require a 1/8 mi (200 m) buffer from an active nest. Small migratory birds- Class 2 or Class 3 herbicides require 30 ft (9 m) buffer for spot and mechanized ground application of herbicide, 150 ft (50 m) with low aerial chemical treatments, and 1/8 mi (200 m) for high aerial chemical treatments near the species habitat. Waterfowl- avoid using Class 2 or 3 herbicides in areas where waterfowl are concentrated and wait until birds have migrated for the season. Applications of liquid formulations of Class 2 and 3 herbicides require a 30 ft (9m) buffer for spot applications, 60 ft (20 m) for mechanized ground, 200 ft (60 m) for low aerial spraying, and 1/8 mi (200 m) for high aerial spraying. Prescribed pile burning outside of a breeding patch would be conducted outside of the migrating and breeding season.

5.3 Mammals

Banner-tailed kangaroo rat—This species occurs in Great Basin desert grassland or desert scrub, preferring areas with heavier soils to construct elaborate, distinctive burrow systems usually with 3–12 burrow openings on a discrete, raised mound. Presence of a grass component is important, but habitats with extreme vegetation and height are avoided. This rat could potentially occur near Navajo Mountain, and desert lands in San Juan County, UT (NNDFW 2020).

This species could potentially occur near Navajo Mountain, but no burrows were observed during surveys, and burrows are unlikely in the canyons where treatments are proposed. Occupancy is unlikely due to the sparsity of grass, which is an important habitat component (NNDFW 2020). Rats could become established between surveys and the proposed activities, but disturbance would be unlikely due to the brief nature of

activities and because no habitat would be lost (i.e., no earth moving or vegetation clearing) in areas of potential habitat. It is unlikely that weed treatments would have a significant impact on the species, but surveys would be conducted in potential habitat by a qualified biologist to determine if any populations are present in proposed treatment sites. Any populations found would have avoidance buffers placed at least 200 ft away from their habitat to prevent direct effects while implementing weed treatments. Indirect effects could occur from herbicide overspray and smoke impacts during prescribed burning. Buffer zones and preference for selective application methods near kangaroo rat habitat would reduce the risk of rats ingesting herbicide. Best management practices to reduce herbicide overspray would protect non-target plant species from impacts, reducing impacts to kangaroo rats.

Navajo Mountain vole—This vole usually occupies dry grassy vegetation in conifer forests and dense prostrate shrub patches in ponderosa pine forests around Navajo Mountain. Ground cover is an essential component. Avoidance measures for this species includes no activity within 60 meters of occupied habitat that could result in destruction of burrows/runways and take of individuals (NNDFW 2020).

This species could potentially occur in the area within 1 mile of portions of the project area, particularly near Navajo Mountain. No burrows were observed during surveys, and burrows are unlikely in the canyons where treatments are proposed. Occupancy is unlikely due to the sparsity of grass in canyons, which is an important habitat component (Mikesic and Roth 2020). Surveys would be conducted in potential habitat by a qualified biologist to determine if any populations are present in proposed treatment sites. Any populations found would have avoidance buffers placed at least 200 ft away from their habitat to prevent direct effects while implementing weed treatments. Indirect effects could occur from herbicide overspray and smoke impacts during prescribed pile burning. Proposed herbicides are slightly to moderately toxic to small mammals. Buffer zones and preference for selective herbicide application methods near habitat would reduce the risk of voles ingesting herbicide. Best management practices to reduce herbicide overspray would protect non-target plant species from impacts, reducing further impacts to voles.

Heavy machinery during mechanical control and trampling could compact potential habitat and destroy burrows, but these effects would be temporary. Furthermore, noxious weed removal would improve overall habitat for the voles in the long-term by promoting the growth of native grasses and forbs preferred by this species. Targeted livestock grazing could result in trampling or consumption of grasses and forbs preferred by this vole. Revegetating the habitat with native grass and forb seeds would help further encourage the growth of native species desired by this species.

5.4 Plants

Alcove death camas—This plant, formally placed in the lily family but recently assigned to the Melanthiaceae family, occurs in hanging gardens in seeps and alcoves, mainly on Navajo Sandstone from 3,700–6,700 feet (m) elevation (NNDFW 2020). On Navajo Nation, it occurs in sandstone canyons surrounding Navajo Mountain Coconino County, AZ, and San Juan County, UT, and in Canyon de Chelly National Monument (Mikesic and Roth 2020). This plant has elements occurring within 1 mile of the Chaiyahi Rim NE Quadrangle (Appendix B). The survey period is mid-July through August.

There will be no direct effects to alcove death camas if weed treatments do not occur in hanging garden sites. Indirect effects would include herbicide drift from chemical treatments. Implementing the species conservation measures and best management practices listed below would reduce the indirect effect of herbicide drift from chemical treatments. Additionally, the majority of habitat where alcove death camas may occur, within hanging gardens and seeps, are located in remote and inaccessible areas where it is unlikely weed treatments will occur. If treatments do occur in these areas, wind drift herbicide would not reach the populations. It is unlikely that these species would be impacted by mechanical treatments or trampling during manual treatments. However, recommended buffers listed below would be implemented and avoid the effects of these treatments on this species.

Climate change is a concern for species dependent on small seeps, within hanging garden habitat. Many of the species occurring in these rare habitats rely on moisture for their existence. Removing noxious weeds from areas adjacent to alcove death camas populations would help to protect these populations from the potential threat of noxious weed invasion. The implementation of species conservation measures, including buffers identified for each treatment, and best management practices would avoid risk to alcove death camas and make weed treatments not likely to adversely affect the species.

According to NNDFW, there is potential for this rare plant to occur within the project area. Biological surveys would be conducted during the flowering period in potential habitat to confirm presence for this plant. Low and high aerial spraying of herbicides requires a one-mile (1.6 km) buffer from identified listed species locations. Mechanical, cultural, prescribed burn, and chemical ground treatments require a 200ft (60 m) buffer from identified listed species locations. Manual treatments (low impact treatments) require a 20 ft (6 m) buffer from identified listed species locations. When doing treatments, flagging and fencing would be placed around listed plant populations. The field crew administering weed treatments would be educated on the listed plants and how to avoid them.

Cutler's milk-vetch—This plant inhabits warm desert shrub communities on sandy, seleniferous soils with level to moderate slopes on the Shinarump and Chinle Formations. The flowering period for this species occurs from April through early June (NNDFW 2020).

The Navajo Nation requires surveys for Cutler's milk-vetch in areas with potential habitat. All identified populations would be flagged, and designated buffers would be established, making it unlikely that weed treatments will have direct impacts on Cutler's milk-vetch individuals and habitat. This species may be indirectly impacted from trampling, mechanical equipment, and herbicide overspray from adjacent habitats. These effects would be reduced or avoided by implementing species conservation measures and best management practices listed below. Flagging or fencing the species in the treatment area would prevent mechanical or human foot traffic from trampling the species. Pre-emergent herbicide treatments should not be applied in suitable habitat for this species. Herbicides should not be sprayed during high wind or humid conditions to prevent overspray.

The largest threats to this species are drought/climate change and rodent and insect herbivory in their known habitat. Trampling from burros in combination with herbicide overspray may cause a synergistic effect to the species. However, the introduction and spread of noxious weeds such as red brome and common Mediterranean grass may more seriously impact the milk-vetch as these species compete for nutrients, water, and sunlight in the shallow soils where these plants grow; thus, eliminating noxious weeds could promote growth for this species. The conservation measures would reduce the risk of impacts from herbicide overspray, mechanical equipment, and trampling. Shifts in species composition and the continued spread of many non-native noxious plant species could affect conditions needed for the milkvetch to germinate and grow. With the continuance of drought and climate change, this species will be impacted by reduced water availability in its habitat and the frequency between wet and dry periods. Climate change with the combination of herbicide overspray, mechanical impacts, or trampling may cause cumulative impacts to the population. Implementing buffers and mitigation measures would reduce the risk of impacts from herbicide overspray, mechanical equipment, and trampling.

The Chinle Formation does exist along portions of Bá'azh chíní and some tributaries. There are no elements occurring within the project area according to NNDFW, but there is potential on the north end of Bá'azh chíní and tributaries. A biological survey would be conducted in areas containing potential habitat during the flowering period to confirm presence. Low and high aerial spraying of herbicides requires a one-mile buffer from identified listed species locations. Mechanical, cultural, prescribed burn, and chemical ground treatments require a 200 ft (60 m) buffer from identified listed species locations. Manual treatments (low impact treatments) require a 20 ft (6 m) buffer from identified listed species locations. When doing treatments, flagging and fencing would be placed around listed plant populations. The field crew administering weed treatments would be educated on the listed plants and how to avoid them.

Navajo sedge—This plant occurs in seeps and hanging gardens on vertical Navajo Sandstone cliffs and alcoves from 4400–7,000 feet (1330–2120 m) elevation (Arizona Rare Plant Committee 2001). On Navajo Nation, the sedge is found from the Navajo Creek drainage in Coconino County east to the Tsegi Canyon watershed in Navajo County, south to the Rock Point/Mexican Water and Canyon de Chelly National Monument in Apache County, and in Chinle Creek, San Juan County, UT (NNDFW 2020). This species is rare because of its limited range and the rarity of its habitat. Threats include water diversion projects, groundwater pumping, capping of well sites, overgrazing, climate change, and drought (Arizona Game and Fish Department 2005b). This plant has elements occurring within 1 mile of several Quadrangles (Appendix B). Survey period is late June through September.

There will be no direct effects to Navajo sedge if weed treatments do not occur in hanging garden sites. Indirect effects would include herbicide drift from chemical treatments. Implementing the species conservation measures and best management practices listed below would reduce the indirect effect of herbicide drift from chemical treatments. Additionally, the majority of habitat where Navajo sedge may occur, within hanging gardens and seeps, are located in remote and inaccessible areas where it is unlikely weed treatments will occur. If treatments do occur in these areas, wind drift herbicide would not reach the populations. It is unlikely that these species would be impacted by mechanical treatments or trampling during manual treatments. However, recommended buffers listed below would be implemented and avoid the effects of these treatments on this species.

Climate change is a concern for species dependent on small seeps, within hanging garden habitat. Many of the species occurring in these rare habitats rely on moisture for their existence. Removing noxious weeds from areas adjacent to Navajo sedge populations would help to protect these populations from the potential threat of noxious weed invasion. The implementation of species conservation measures, including buffers identified for each treatment, and best management practices would avoid risk to Navajo sedge and make weed treatments not likely to adversely affect the species.

According to NNDFW, there is potential for this rare plant to occur within the project area. Biological surveys would be conducted in potential habitat during the flowering period if treatments are proposed near hanging garden sites. Vehicles would use only established roads for accessing project sites in listed plant habitat. Vehicles would be parked at previously disturbed parking areas located 20feet (ft) (60 meter (m)) from suitable habitat for federally listed species when treating. Parking areas would be near established roadways. Mechanical, cultural, chemical, and prescribed burn requires a 200 ft (60 m) buffer from identified listed species locations. Manual treatments (low impact treatments) require a 20ft (6 m) buffer from identified listed species locations. When doing treatments, flagging and fencing will be placed around listed plant populations. The NNDFW botanist will be notified of any positive results of rare plant surveys. BIA would also notify the NNDFW botanist as to whether they are proceeding with the proposed weed treatment near the listed plant, and if so, the buffers and other avoidance measures that will be implemented. The field crew administering weed treatments will be educated on the listed plants and how to avoid them.

Rydberg's thistle—This plant grows in hanging gardens and seeps and occasionally along stream banks below hanging gardens from 3,300–6,500 feet (1,005–1,980 m) elevation (NNDFW 2020). On Navajo Nation it occurs in southern San Juan County, UT, and northern Coconino and Apache Counties, AZ (NNDFW 2020). This species is rare because of its limited range and the rarity of its habitat. This plant has elements occurring within 1 mile of several Quadrangles (Appendix B). The survey season is late spring through September or October.

There will be no direct effects to Rydberg's thistle if weed treatments do not occur in hanging garden sites. Indirect effects would include herbicide drift from chemical treatments. Implementing the species conservation measures and best management practices listed below would reduce the indirect effect of herbicide drift from chemical treatments. Additionally, the majority of habitat where Rydberg's thistle may occur, within hanging gardens and seeps, are located in remote and inaccessible areas where it is unlikely weed treatments will occur. If treatments do occur in these areas, wind drift herbicide would not reach the

populations. It is unlikely that these species would be impacted by mechanical treatments or trampling during manual treatments. However, recommended buffers listed below would be implemented and avoid the effects of these treatments on this species.

Climate change is a concern for species dependent on small seeps, within hanging garden habitat. Many of the species occurring in these rare habitats rely on moisture for their existence. Removing noxious weeds from areas adjacent to Rydberg's thistle populations would help to protect these populations from the potential threat of noxious weed invasion. The implementation of species conservation measures, including buffers identified for each treatment, and best management practices would avoid risk to Rydberg's thistle and make weed treatments not likely to adversely affect the species.

According to NNDFW, there is potential for this rare plant to occur within the project area. Biological surveys would be conducted in areas of potential habitat during the flowering period if treatments are proposed near hanging garden sites. Low and high aerial spraying of herbicides requires a one-mile buffer from identified listed species locations. Mechanical, cultural, prescribed burn, and chemical ground treatments require a 200 ft (60 m) buffer from identified listed species locations. Manual treatments (low impact treatments) require a 20 ft (6 m) buffer from identified listed species locations. When doing treatments, flagging and fencing would be placed around listed plant populations. The field crew administering weed treatments would be educated on the listed plants and how to avoid them.

Navajo beardtongue—This plant inhabits rocky, open areas in ponderosa pine, aspen, and Douglas-fir communities from 7,000 to 10,3000 feet elevation (NNDFW 2020). This plant has elements occurring within 1 mile of several Quadrangles (Appendix B). The survey period is from early July to early August, but potential habitat can be identified year-round.

Navajo beardtongue is restricted to the mountains and plateaus in the Utah portion of the Navajo Nation; thus, its rarity makes it unlikely that weed treatments would occur in areas where Navajo beardtongue is found. The Navajo Nation requires surveys for this species in areas with potential habitat. All identified populations would be flagged, and designated buffers would be established. The conservation measures listed below would further minimize or avoid the risk of weed treatments directly or indirectly impacting the Navajo beardtongue in its known habitat. A burn plan would be developed for each project using prescribed pile burn treatments, which will include specific treatment buffers. Mitigation measures would reduce indirect impacts from trampling, damage from prescribed burning, and herbicide overspray into non-treated areas, which could cause damage to plants. Herbicides would also not be utilized when windy conditions or precipitation are forecasted in the area, which can prevent and reduce herbicide drift to non-treatment sites.

According to NNDFW, there is potential for this rare plant to occur within the project area. Biological surveys would be conducted in areas of potential habitat during the flowering period if treatments are proposed on the upper slopes of Navajo Mountain. Low and high aerial spraying of herbicides requires a one-mile (1.6 km) buffer from identified listed species locations. Mechanical, cultural, prescribed burn, and chemical ground treatments require a 200ft (60 m) buffer from identified listed species locations. Manual treatments (low impact treatments) require a 20 ft (6 m) buffer from identified listed species locations. When doing treatments, flagging and fencing would be placed around listed plant populations. The field crew administering weed treatments would be educated on the listed plants and how to avoid them.

Alcove bog-orchid—This plant occurs along seeps and streamsides and in hanging gardens and wet canyon alcoves from 5,000–9,000 feet (1,525–2,750 m) elevation (Arizona Rare Plant Committee 2001). General habitats include desert shrub to piñon–juniper, ponderosa pine, and mixed-conifer communities (NNDFW 2020). On Navajo Nation, it occurs in the headwaters of Oljeto Wash, Tsegi Canyon watershed, hanging gardens surrounding Navajo Mountain, and Chinle Wash drainages (NNDFW 2020). This species is rare because of its limited range and the rarity of its habitat. This plant has elements occurring within 1 mile of several Quadrangles (Appendix B). The survey season is July through August.

There will be no direct effects to Alcove bog-orchid if weed treatments do not occur in hanging garden sites. Indirect effects would include herbicide drift from chemical treatments. Implementing the species conservation measures and best management practices listed below would reduce the indirect effect of herbicide drift from chemical treatments. Additionally, the majority of habitat where Alcove bog-orchid may occur, within hanging gardens and seeps, are located in remote and inaccessible areas where it is unlikely weed treatments will occur. If treatments do occur in these areas, wind drift herbicide would not reach the populations. It is unlikely that these species would be impacted by mechanical treatments or trampling during manual treatments. However, recommended buffers listed below would be implemented and avoid the effects of these treatments on this species.

Climate change is a concern for species dependent on small seeps, within hanging garden habitat. Many of the species occurring in these rare habitats rely on moisture for their existence. Removing noxious weeds from areas adjacent to Alcove bog-orchid populations would help to protect these populations from the potential threat of noxious weed invasion. The implementation of species conservation measures, including buffers identified for each treatment, and best management practices would avoid risk to Alcove bog-orchid and make weed treatments not likely to adversely affect the species.

According to NNDFW, there is potential for this rare plant to occur within the project area. Biological surveys would be conducted in areas of potential habitat during the flowering period if treatments are proposed near hanging garden sites. Low and high aerial spraying of herbicides requires a one-mile (1.6 km) buffer from identified listed species locations. Mechanical, cultural, prescribed burn, and chemical ground treatments require a 200ft (60 m) buffer from identified listed species locations. Manual treatments (low impact treatments) require a 20 ft (6 m) buffer from identified listed species locations. When doing treatments, flagging and fencing would be placed around listed plant populations. The field crew administering weed treatments would be educated on the listed plants and how to avoid them.

Cave primrose—This plant occurs in hanging gardens and occasionally streamsides below hanging gardens. These are mostly located in alcoves in Entrada and Navajo Sandstone formations at 3,500 to 7,200 feet (1,065–2,195 m) elevation (NNDFW 2020). It is known from seeps in Kaibab and Redwall limestone in the Grand Canyon (NNDFW 2020). On Navajo Nation, it occurs in the Chinle Wash area and canyons surrounding Navajo Mountain (NNDFW 2020). The flowering season is March through April, but plants can be identified throughout the growing season by experienced botanists (NNDFW 2020).

There will be no direct effects to cave primrose if weed treatments do not occur in hanging garden sites. Indirect effects would include herbicide drift from chemical treatments. Implementing the species conservation measures and best management practices listed below would reduce the indirect effect of herbicide drift from chemical treatments. Additionally, the majority of habitat where cave primrose may occur, within hanging gardens and seeps, are located in remote and inaccessible areas where it is unlikely weed treatments will occur. If treatments do occur in these areas, wind drift herbicide would not reach the populations. It is unlikely that these species would be impacted by mechanical treatments or trampling during manual treatments. However, recommended buffers listed below would be implemented and avoid the effects of these treatments on this species.

Climate change is a concern for species dependent on small seeps, within hanging garden habitat. Many of the species occurring in these rare habitats rely on moisture for their existence. Removing noxious weeds from areas adjacent to cave primrose populations would help to protect these populations from the potential threat of noxious weed invasion. The implementation of species conservation measures, including buffers identified for each treatment, and best management practices would avoid risk to cave primrose and make weed treatments not likely to adversely affect the species.

There is potential for this rare plant to occur within the project area. Biological surveys would be conducted in areas of potential habitat during the flowering period if treatments are proposed near hanging garden sites. Low and high aerial spraying of herbicides requires a one-mile buffer from identified listed species locations. Mechanical, cultural, prescribed burn, and chemical ground treatments require a 200 ft (60 m)

buffer from identified listed species locations. Manual treatments (low impact treatments) require a 20 ft (6 m) buffer from identified listed species locations. When doing treatments, flagging and fencing would be placed around listed plant populations. The field crew administering weed treatments would be educated on the listed plants and how to avoid them.

Parish's alkali grass—This grass is restricted to alkaline or salty moist soils that form a white crust on the surface (Arizona Rare Plant Committee 2001). It is typically found along seeps and streams in piñon–juniper and desert shrub communities from 2,950–6,070 feet (900–1,850 m) elevation (Arizona Rare Plant Committee 2001). On Navajo Nation, it occurs near Tuba City in Coconino County, AZ, near Shonto in Navajo County, AZ, near Tees Nos Pos in Apache County, AZ, in Monument Valley, south of Red Valley, and in San Juan County, NM, east of Beclabito and in the vicinity of Two Grey Hills (NNDFW 2020). Threats to this plant are mainly loss of habitat due to grazing and water loss (Arizona Game and Fish Department 2004). The survey period is mid-April–early June.

Parish's alkali grass does not grow in dense vegetation; thus, it is unlikely that weed treatments would occur directly in this species habitat. Therefore, there would be no direct effects to this species if treatments do not occur in potential habitat. Noxious weed invasion is a threat to this species; thus, weed treatments in adjacent habitats would help prevent the spread of noxious weeds into Parish's alkali grass habitat. There may be indirect effects to this species from herbicide drift from chemical treatments or trampling and destruction of habitat from manual or mechanical treatments during site access. Implementing the species conservation measures and best management practices listed below would reduce the indirect effects of herbicide drift from chemical treatments and unintentional trampling.

Climate change is a concern for Parish's alkali grass because it is dependent on moist soils. The proposed action for this project may help mitigate some of the cumulative impacts that may occur with the threat of noxious weed invasion, and climate change. By removing noxious weed species from areas adjacent to Parish's alkali grass populations would help to protect these populations from the potential threat of noxious weed invasion. The implementation of buffers identified for each treatment, and best management practices would avoid the risk to Parish's alkali grass and make weed treatments not likely to adversely affect the species.

There is potential for this rare plant to occur near the project area. Biological surveys would be conducted in areas of potential habitat during the survey period if treatments are proposed near potential habitat. Low and high aerial spraying of herbicides requires a one-mile buffer from identified listed species locations. Mechanical, cultural, prescribed burn, and chemical ground treatments require a 200 ft (60 m) buffer from identified listed species locations. Manual treatments (low impact treatments) require a 20 ft (6 m) buffer from identified listed species locations. When doing treatments, flagging and fencing would be placed around listed plant populations. The field crew administering weed treatments would be educated on the listed plants and how to avoid them.

Welsh's American-aster—This plant occurs in wet meadows, along stream banks, and in seeps and hanging gardens from 4,300 to 8,000 feet (1,310–2,440 m) elevation (NNDFW 2020). On Navajo Nation, it is known only from one population in the Tsegi watershed in northern Navajo County, AZ (NNDFW 2020). This plant has potential to occur in the project area (Appendix B). It flowers August through October.

There will be no direct effects to Welsh's American-aster if weed treatments do not occur in hanging garden sites. Indirect effects would include herbicide drift from chemical treatments. Implementing the species conservation measures and best management practices listed below would reduce the indirect effect of herbicide drift from chemical treatments. Additionally, the majority of habitat where Welsh's American-aster may occur, within hanging gardens and seeps, are located in remote and inaccessible areas where it is unlikely weed treatments will occur. If treatments do occur in these areas, wind drift herbicide would not reach the populations. It is unlikely that these species would be impacted by mechanical treatments or trampling during manual treatments. However, recommended buffers listed below would be implemented and avoid the effects of these treatments on this species.

Climate change is a concern for species dependent on small seeps, within hanging garden habitat. Many of the species occurring in these rare habitats rely on moisture for their existence. Removing noxious weeds from areas adjacent to Welsh's American-aster populations would help to protect these populations from the potential threat of noxious weed invasion. The implementation of species conservation measures, including buffers identified for each treatment, and best management practices would avoid risk to Welsh's American-aster and make weed treatments not likely to adversely affect the species.

There is potential for this rare plant to occur near the project area. Biological surveys would be conducted in areas of potential habitat during the flowering period if treatments are proposed near seeps and hanging garden sites. Low and high aerial spraying of herbicides requires a one-mile buffer from identified listed species locations. Mechanical, cultural, prescribed burn, and chemical ground treatments require a 200 ft (60 m) buffer from identified listed species locations. Manual treatments (low impact treatments) require a 20 ft (6 m) buffer from identified listed species locations. When doing treatments, flagging and fencing would be placed around listed plant populations. The field crew administering weed treatments would be educated on the listed plants and how to avoid them.

5.5 Fish

Colorado pikeminnow—This fish uses backwaters and flooded riparian areas during spring runoff and migrates large distances (15–64 km in the San Juan River) to spawn in riffle-run areas with cobble/gravel substrates. During spawning, adults move hundreds of kilometers to and from spawning areas and require long sections of river with unimpeded passage which occurs after spring runoff at water temperatures typically between 18 and 23°C (USFWS 2002). Post-spawning adults typically use run habitats, with eddies and slackwater also being important. Young-of-year (< 120 mm length) use warm backwaters along shorelines. Deeper backwater areas (> 1 m deep at confluence with main channel) are the preferred habitat of young fish into the sub-adult stage (> 3 yrs. age and 200–400 mm length). (USFWS 2002, Minckley 1973).

This fish is endemic to the Colorado River Basin and was once widespread and abundant in warm-water rivers and tributaries (USFWS 2002). This fish has potential to use the aquatic habitat of the San Juan River and its tributaries located throughout the proposed project area. Designated critical habitat for this species is north of the project area. Weed removal projects would require restoration of native vegetation to prevent erosion. Weed removal activities in the riparian zone would be conducted in patches in order to prevent erosion. Best Management Practices would be used to reduce sedimentation and chemical run-off from mechanical and chemical weed treatments along bank lines within the 100-year floodplain. Pile burning and prescribed burning would be conducted 300 ft outside of the floodplain. Approved herbicides (aquatic formulations only): 2,4-D, Glyphosate, Triclopyr and Imazapyr would exclusively be used within 25-feet of the daily high-water mark. Herbicides that have relatively low aquatic toxicity to fish and mollusks require a 25 ft (7.6 m) buffer from the daily high-water mark in the riparian zone, including: Aminopyralid, Chlorsulfuron methyl, Clopyralid, Diflufenzopyr, Imazapic, and Thifensulfuron-methyl. Non-aquatic approved and moderate to high aquatic toxicity herbicides require a 300 ft (90 m) buffer from the daily high-water mark.

Colorado pikeminnow and its critical habitat will not be directly affected as long as only terrestrial weed species are treated. Indirect effects to pikeminnow and critical habitat could include increased turbidity during mechanical treatments using heavy machinery and prescribed pile burning within the riparian areas adjacent to their habitat. These effects would be reduced when implementing erosion control mitigation measures, such as erosion control measures to stabilize and limit erosion along bank lines in riparian areas. Impacts from turbidity caused by mechanical impacts would be minimal and temporary. Long term measures include planting native vegetation to stabilize soils and prevent noxious weed re-growth after weed treatments, which would also improve critical habitat for this species. Indirect effects from herbicide overspray would be discountable if herbicide buffers are followed. Only herbicides that are practically non-toxic to fish species will be used within the riparian zone. Only aquatic approved herbicides will be used

for aerial applications by either fixed wing or rotary aircraft in riparian areas, and all herbicide applications would follow required protection measures. Implementing these features will minimize herbicide exposure to such small levels that the effect would be immeasurable to the species or critical habitat. Furthermore, long-term benefits to habitat and critical habitat floodplain areas and its riparian vegetation would include improved function, reduced erosion, and an improved invertebrate food base because native riparian vegetation would be improved.

Razorback sucker—This fish mostly uses low-flow areas (backwaters over sand and silt substrate, deep eddies, and impoundments), but shallow to deep runs over sandbars and seasonally flooded shorelines are also important in mainstream portions of rivers for pre- and post-spawning suckers especially during spring runoff (Tyus and Karp 1990). They travel mainly during the spring spawning season and are more sedentary during the remainder of the year. Spawning generally occurs in areas with shallow, swift riffles over gravel or cobble substrate, and they may also use backwater habitats (USFWS 1998). Young-of-year use warm, flooded bottomlands and backwaters. Ponds connected to the San Juan River may be potential habitat for this species (USFWS 1998, Minckley 1973).

This fish has potential to use the aquatic habitat of the San Juan River and its tributaries throughout the proposed project area. There is also designated critical habitat for this species adjacent to portions of the project area. Weed removal projects would require restoration of native vegetation to prevent erosion. Weed removal activities in the riparian zone would be conducted in patches in order to prevent erosion. Best Management Practices would be used to reduce sedimentation and chemical run-off from mechanical and chemical weed treatments along bank lines within the 100-year floodplain. Pile burning and prescribed burning would be conducted 300 ft outside of the floodplain. Approved herbicides (aquatic formulations only): 2,4-D, Glyphosate, Triclopyr and Imazapyr would exclusively be used within 25-feet of the daily high-water mark. Herbicides that have relatively low aquatic toxicity to fish and mollusks require a 25 ft (7.6 m) buffer from the daily high-water mark in the riparian zone, including: Aminopyralid, Chlorsulfuron methyl, Clopyralid, Diflufenzopyr, Imazapic, and Thifensulfuron-methyl. Non-aquatic approved and moderate to high aquatic toxicity herbicides require a 300 ft (90 m) buffer from the daily high-water mark.

Razorback sucker and its critical habitat will not be directly affected as long as only terrestrial weed species are treated. Indirect effects to razorback sucker and critical habitat would include increased turbidity during mechanical treatments using heavy machinery and prescribed burning within the riparian areas adjacent to their habitat. These effects would be reduced when implementing erosion control mitigation measures, such as erosion control measures to stabilize and limit erosion along bank lines in riparian areas. Impacts from turbidity caused by mechanical impacts would be minimal and temporary. Long term measures include planting native vegetation to stabilize soils and prevent noxious weed re-growth after weed treatments, which would also improve critical habitat for this species. Indirect effects from herbicide overspray would be discountable if herbicide buffers are followed. Only herbicides that are practically non-toxic to fish species will be used within the riparian zone. Only aquatic approved herbicides will be used for aerial applications by either fixed wing or rotary aircraft in riparian areas, and all herbicide applications would follow required protection measures. Implementing these features will minimize herbicide exposure to such small levels that the effect would be immeasurable to the species or critical habitat. Furthermore, long-term benefits to habitat and critical habitat floodplain areas and its riparian vegetation would include improved function, reduced erosion, and an improved invertebrate food base because native riparian vegetation would be improved.

5.6 Amphibians

Northern leopard frog—This frog is found around streams, rivers, lakes, marshes, and irrigation ditches from 3,670–10,000 feet (1,120–3050 m; Degenhardt et al. 1996). There are records from the San Juan River and Animas River valleys in New Mexico (Degenhardt et al. 1996).

Frogs may be impacted by herbicide overspray and trampling during noxious weed treatments; no aquatic herbicide treatments will be conducted. Riparian noxious weeds would be treated with aquatic approved

herbicides, that are nearly non-toxic for aquatic amphibians (White 2007). Trampling to northern leopard frog habitat may occur when treatments are being implemented by personnel. These effects would be reduced by implementing the conservation measures listed below. These impacts would be temporary and short term. Northern leopard frogs would benefit in the long-term from the removal of noxious weeds that could encroach into potential habitat.

This frog has elements occurring within 1 mile of the Oak Springs Quadrangle (Appendix B). Biological surveys are recommended if treatments occur in potential habitat. There were no isolated potential wetlands that contain flowing and standing water that could provide potential habitat for this frog observed within the project area during the biological survey. However, it is possible that adequate rainfall could contribute to suitable habitat for this species. Proposed treatments would not likely occur in or near standing water that could provide habitat for this species. Mechanical and manual treatments require a 200 ft (60 m) buffer zone from open water habitats. Prescribed pile burning requires a 200 ft (60 m) buffer zone from the edge of the wetland vegetation. No applications of herbicides would be used inside occupied or potentially occupied aquatic habitat. Mitigation measures would be applied in dispersal and migration corridors after rain events. All projects in riparian/wetland habitats near occupied habitat would require native riparian/wetland vegetation restoration following invasive species removal. Only herbicides labeled for aquatic use and the cut-stump method on tree species would be used in potential habitat. No target grazing would be used in the habitat. All equipment and boots be cleaned with bleach before and after treatments within 200 ft (60 m) of occupied habitat to prevent the spread of chytrid fungus.

5.7 Reptiles

Chuckwalla—Typical habitat for this reptile includes low desert lands, especially with volcanic alluvia and lava flows or desert hardpan, and rocky canyons with large boulders. This species is also known to use margins of grass-oak woodlands in Southern Utah. Range on Navajo Nation is not well known, but likely includes deep canyons and adjacent desert lands of Little Colorado River, Marble Canyon area of Colorado River and San Juan River in Utah (NNDFW 2020). No mechanical treatments (surface disturbance) would take place within occupied habitats.

This reptile has elements occurring within 1 mile of the Navajo Begay Quadrangle (Appendix B). Proposed noxious weed treatments would not likely occur in areas that could provide habitat for this species. Biological, cultural, or manual treatments would not likely impact the chuckwalla. The treatment method that poses the most risk of impacting the chuckwalla would be mechanical treatments, specifically those that move or dig up large quantities of earth while removing vegetation. The chuckwalla is sensitive to habitat degradation, especially near the rock crevices it uses as its home; thus implementing the species conservation measures would avoid potential negative effects to the species.

Use of herbicides may pose some risk to the chuckwalla, as it uses a wide variety of vegetation for its main diet. The proposed herbicides are all rated as being either slightly to moderately toxic to reptile species or non-toxic (White 2007), and best management practices for chemical treatment methods would reduce the risk of chuckwallas consuming contaminated vegetation that may result in adverse effects. These measures include use of only aquatic approved herbicide near open water, restrictions on the application of herbicides during adverse weather conditions, restrictions on where herbicides can be mixed and stored, and adherence to the herbicide label. This should also include restrictions on how much herbicide is used for each application method. These restrictions would limit the amount of herbicide an animal would be exposed to; thus, limiting the risk of drift in non-target areas. Therefore, weed treatments would likely not adversely affect the chuckwalla on the Navajo Nation. Furthermore, removal and treatment of noxious weeds in occupied habitats would benefit the chuckwalla by providing more diverse native plant communities for chuckwalla foraging.

6.0 CUMULATIVE IMPACTS

The proposed action does not increase negative impacts to the surrounding environment but actually reduces them. Noxious weed treatments would aid in eliminating non-native vegetation. On-going routine maintenance will control reestablishment of noxious weeds that will be removed as part of this action. In summary, the proposed action should reduce impacts to the environment by improving and promoting native vegetation.

There are no cumulative impacts expected to any of the listed species from implementation of the proposed action.

Noxious weed treatments may indirectly impact threatened and endangered species in the short-term by altering habitat and seasonal habitat use. These animals could be displaced to less secure habitat as a result of treatment activities, but the effects of habitat alteration on the land may range from beneficial to adverse, depending on the ecological context of the treatment. However, treatments may stimulate growth of favored foods for preferred prey species. In addition, the removal of noxious weeds would benefit the overall area in the long-term and promote native vegetation growth. The annual spatial extent of the project areas would keep cumulative impacts of the proposed action to a minimum.

Grazing and browsing can affect structure and composition of native plant communities, and livestock use of riparian areas may reduce forage availability for certain predators and their prey. Livestock grazing will continue despite the proposed action, and the proposed action is not likely to contribute to cumulative effects from grazing in terms of impacts to mammals. Livestock grazing during treatment will not be permitted. Livestock owners and Navajo Nation Grazing Official will remove livestock when weed treatment will be occurring. Livestock grazing deferment will be included so that vegetation returns. The local community wants to fence off the exterior boundary to prevent livestock entering the canyonlands.

Access roads may facilitate erosion since they may be used for recreational activities such as fishing, hunting, hiking, riding ATVs, and berry picking. Thus, existing roads and trails can provide easy access to protected species habitat and facilitate their illegal harvest as they continue to be utilized in the future. In addition, roads may increase human activity in the area and increase the mortality risk for protected species. All seasonal road closures should be followed. The proposed action is not likely to contribute to these issues since no new roads will be constructed.

7.0 RECOMMENDED EFFECTS DETERMINATIONS

7.1 Target Species

There would be *no effects* to the following species because of lack of habitat, based on field surveys, or because the project area is outside the principal range of the species, both of which make occurrence in the project area unlikely: northern saw-whet owl, golden eagle, Welsh's milkweed, ferruginous hawk, Zuni bluehead sucker, southwestern willow flycatcher, roundtail chub, bald eagle, Kanab ambersnail, band-tailed pigeon, and three-toed woodpecker.

Alcove death camas—The proposed action *may affect but is not likely to adversely affect* Alcove death camas. This plant has elements occurring within 1 mile of the Chaiyahi Rim NE Quadrangle. Biological surveys would be recommended and conducted during the survey period from mid-July through August if noxious weed treatments are proposed within or near potential habitat.

Cutler's milk-vetch—The proposed action *may affect but is not likely to adversely affect* Cutler's milk-vetch. There are no elements occurring within the project area according to NNDFW, but there is potential on the north end of Bá'azh chíní and tributaries. Biological surveys would be recommended and conducted during the survey period from April through early June if noxious weed treatments are proposed within or near potential habitat.

Navajo sedge—The proposed action *may affect but is not likely to adversely affect* Navajo sedge. This plant has elements occurring within 1 mile of portions of the project area. Biological surveys would be recommended and conducted during the survey period from June through September if noxious weed treatments are proposed within or near potential habitat.

Rydberg's thistle—The proposed action *may affect but is not likely to adversely affect* Rydberg's thistle. This plant has elements occurring within 1 mile of portions of the project area. Biological surveys would be recommended and conducted during the survey period from late spring through September or October if noxious weed treatments are proposed within or near potential habitat.

Navajo beardtongue—The proposed action *may affect but is not likely to adversely affect* Navajo beardtongue. This plant has elements occurring within 1 mile of portions of the project area. Biological surveys would be recommended and conducted during the survey period from early July to early August if noxious weed treatments are proposed within or near potential habitat.

Alcove bog-orchid—The proposed action *may affect but is not likely to adversely affect* Alcove bog-orchid. This plant has elements occurring within 1 mile of portions of the project area. Biological surveys would be recommended and conducted during the survey period from July through August if noxious weed treatments are proposed within or near potential habitat.

Cave primrose—The proposed action *may affect but is not likely to adversely affect* cave primrose. This plant has elements occurring within 1 mile of portions of the project area. Biological surveys would be recommended and conducted during the survey period from March through April if noxious weed treatments are proposed within or near potential habitat.

Parish's alkali grass—The proposed action *may affect but is not likely to adversely affect* Parish's alkali grass. There are no elements occurring within the project area according to NNDFW, but there is potential habitat within the project area. Biological surveys would be recommended and conducted during the survey period from mid-April through early June if noxious weed treatments are proposed within or near potential habitat.

Welsh's American-aster—The proposed action *may affect but is not likely to adversely affect* Welsh's American-aster. There are no elements occurring within the project area according to NNDFW, but there is potential habitat. Biological surveys would be recommended and conducted during the survey period from August through October if noxious weed treatments are proposed within or near potential habitat.

American dipper—The proposed action *may affect but is not likely to adversely affect* American dipper. This bird has elements occurring within 3 miles of the Oak Springs Quadrangle. A qualified biologist would conduct surveys in areas of potential habitat to confirm presence. Buffers would be implemented around nest sites; thus, no direct impacts would occur. Dippers could be impacted by noxious weed treatments during non-breeding season from temporary displacement near treatment areas. Only aquatic approved herbicides that are practically non-toxic to small birds and their aquatic prey (White 2007) would be used in riparian areas.

Mexican spotted owl—The proposed action *may affect but is not likely to adversely affect* Mexican spotted owls. This bird has elements occurring within 3 miles of portions of the project area. The breeding season for this owl is from March 1 through August 30. Owl surveys would be recommended in areas of potential habitat if treatments occur during the breeding season.

Migratory birds—The alternatives would have *no impact* to migratory birds because pre-treatment nest surveys would be required during the breeding season in suitable habitat, or disturbance of vegetation would be restricted to the nonbreeding season.

Banner-tailed kangaroo rat—The proposed action *may affect but is not likely to adversely affect* banner-tailed kangaroo rat with implementation of conservation measures to avoid impacts from proposed noxious weed treatments. There are no elements occurring within the project area according to NNDFW, but there

is potential within the project area. A qualified biologist would conduct surveys in areas of potential habitat to confirm presence. Direct spray from proposed herbicide treatments would impact this kangaroo rat as proposed herbicides are slightly to moderately toxic to small mammals and could impact food sources. Indirect impacts from noxious weed treatments would be temporary and direct impacts would be avoided with implementation of recommended 200-foot buffer around occupied habitat.

Navajo Mountain vole—The proposed action *may affect but is not likely to adversely affect* Navajo Mountain vole with implementation of conservation measures to avoid direct impacts. A qualified biologist would conduct surveys in areas of potential habitat to confirm presence. Direct spray from proposed herbicide treatments would impact voles as proposed herbicides are slightly to moderately toxic to small mammals. Indirect impacts from noxious weed treatments would be temporary and direct impacts would be avoided with implementation of recommended 200-foot buffer around occupied habitat.

Northern leopard frog—The proposed action *may affect but is not likely to adversely affect* northern leopard frogs. Biological surveys are recommended if treatments occur in potential habitat. There were no isolated potential wetlands that contain flowing and standing water that could provide potential habitat for this frog observed within the project area during the biological survey. However, it is possible that adequate rainfall could contribute to suitable habitat for this species. No direct impacts would occur, and indirect impacts would be avoided with implementation of recommended conservation measures (i.e., only using aquatic approved herbicides in riparian areas, buffers). Impacts could occur to individuals, but this would not likely cause a trend toward loss of species viability.

Colorado pikeminnow—The proposed action *may affect but is not likely to adversely affect* Colorado pikeminnows. This fish has potential to use the aquatic habitat of the San Juan River and its tributaries, Bá'azh chíní, that is located in the proposed project area. There would be no direct impacts to Colorado pikeminnows from noxious weed treatments since there will be no aquatic treatments. Indirect impacts include increased erosion and sedimentation from mechanical treatments using heavy machinery within riparian areas adjacent to suitable habitat, but mitigation measures to control erosion would limit impacts. Pile burning would be conducted 300 feet outside of floodplains. Additionally, impacts from herbicide treatments would be immeasurable with implementation of buffers and mitigation measures. Indirect impacts from noxious weed treatment activities would be localized and temporary and will not restrict or limit fish access to water. In the long-term, riparian vegetation structure would be improved through noxious weed removal and re-establishment of native riparian species resulting in improvements to suitable habitat for Colorado pikeminnow.

Razorback sucker—The proposed action *may affect but is not likely to adversely affect* razorback suckers. This fish has potential to use the aquatic habitat of the San Juan River and its tributaries, Bá'azh chíní, that is located in the proposed project area. There would be no direct impacts to razorback suckers from noxious weed treatments since there will be no aquatic treatments. Indirect impacts include increased erosion and sedimentation from mechanical treatments using heavy machinery within riparian areas adjacent to suitable habitat, but mitigation measures to control erosion would limit impacts. Pile burning would be conducted 300 feet outside of floodplains. Additionally, impacts from herbicide treatments would be immeasurable with implementation of buffers and mitigation measures. Indirect impacts from noxious weed treatment activities would be localized and temporary and will not restrict or limit fish access to water. In the long-term, riparian vegetation structure would be improved through noxious weed removal and re-establishment of native riparian species resulting in improvements to suitable habitat for razorback sucker.

Chuckwalla—The proposed action *may affect but is not likely to adversely affect* chuckwallas with implementation of conservation measures to avoid direct impacts from proposed noxious weed treatments and best management practices for herbicide treatments. No mechanical treatments would occur in occupied habitat. Manual, cultural, or biological treatments would not be expected to impact chuckwallas. Herbicide treatments would only use aquatic approved herbicide near open water, restrict application of herbicides during adverse weather conditions, restrict on where herbicides could be mixed and stored, and follow all

herbicide labels, which includes restrictions on how much herbicide used for each application method, which would limit the amount of herbicide exposure and limit the risk of drift in non-target areas. Treatments in potential habitat would not have any significant or long-term impacts on individuals or their habitat.

8.0 CONCLUSIONS AND RECOMMENDATIONS

Any work activities outside of Bá'azh chíní and its tributaries, such as staging areas would have to be surveyed before use.

A hazardous spill plan would be prepared and implemented.

Actions would be taken to avoid spills. Equipment would be refueled at least 100 feet from surface water and drainages. Fuel, oil, hydraulic fluid, or substances of this nature would be stored within sealed, storage containers or facilities that are located outside the floodplain. Leaking equipment would be removed from the project site until repaired and cleaned.

Staging areas would be limited to existing roads, designated pullouts and parking areas, and already disturbed areas. Any disturbed slopes would be reseeded with native upland species placed down to the ordinary high-water mark.

Best management practices would be used to discourage the introduction of noxious weeds during and after the proposed action. Equipment would be cleaned and free of plant and soil residue. All equipment would be pressure washed and/or steam cleaned before entering the watershed to ensure that all equipment, machinery, rocks, gravel, and other materials are cleaned and weed free and inspected daily for leaks. If equipment is used in an area containing invasive or noxious weeds, it would be cleaned before it is moved to another location.

The San Juan River is within the watershed in which the Colorado pikeminnow and razorback sucker reside. Impacts to fish could be indirect if treatments occur near suitable habitats. The beginning of treatment activities would depend on water levels and would be conducted during low-flow conditions and/or winter when fish are less active. This is the best method for minimizing any impacts during application.

Erosion-control best management practices for drainage and sediment control would be implemented to prevent or reduce nonpoint-source pollution and minimize soil loss and sedimentation of aquatic habitats used by Colorado pikeminnow and razorback sucker. These may include but are not limited to turbidity barrier or fiber logs placed at the toe of any disturbed slopes, just above the ordinary high-water mark to prevent additional sedimentation until vegetation has stabilized the slopes.

Caution should be taken if noxious weed management activities occur during the principal avian breeding season (March 1–August 15). If conducted during the avian breeding season, disturbance of soil and vegetation could result in the destruction of bird nests and/or the mortality of eggs or nestlings. Noxious weed management activities should occur outside the principal avian breeding season to reduce potential impacts on nesting birds. NNDFW does not allow activities during this time period without first performing migratory bird nest surveys. NNDFW stipulates no disturbance within 165 feet (50 m) of active songbird nests during incubation to fledging (as determined by direct field observation or qualified literature source specific for nesting dates in the Southwestern U.S.). Avoiding treatments during the breeding season is perhaps the easiest solution because nest searching over such a large area would be time and labor intensive and locating all active nests in the project area would be nearly impossible.

There is suitable habitat for cliff-nesting raptors along cliffs throughout portions of the project area. This area could host golden eagles, red-tailed hawks, and ferruginous hawks. A nest survey before work in these areas would determine if there are any nesting raptors in the vicinity.

The NNDFW Golden and Bald Eagle Nest Protection Regulations apply on Navajo lands. These regulations stipulate that for active eagle nests during January 15–July 15, there be no brief activity within 0.37 mile

(600 m), no light activity within 0.5 mile, no heavy activity within 0.6 mile, and no loud activity within 0.75 mile. No infrequent-use permanent structures within 0.5 mile, and no daily use permanent structures with 0.6 mile of any nest year-round. See the NNDFW Golden and Bald Eagle Nest Protection Regulations for definitions of activity types (http://www.nndfw.org/nnhp/docs_reps/gben_sm.pdf).

9.0 List of Preparers

Prepared by Randy Seeley, BRIC, LLC.

CERTIFICATION

It is believed by BRIC that the proposed action would not violate any of the provisions of the Endangered Species Act of 1973, as amended, or Navajo Nation code requirements for endangered species (17NNC507). Conclusions of this report are based on actual field examination and are correct to the best of my knowledge. I certify that I have conducted field surveys for the proposed Bá'azh chíní Canyon noxious weed treatments in Coconino and Navajo Counties, AZ, and San Juan County, UT.

Randy Seeley, Wildlife Biologist, BRIC, LLC

10.0 LITERATURE CITED

Arizona Game and Fish Department. 2005a. *Asclepias welshii*. Unpublished abstract compiled and edited by the Heritage Data Management System, AZGFD, Phoenix, AZ.

——. 2005b. *Carex specuicola*. Unpublished abstract compiled and edited by the Heritage Data Management System, AZGFD, Phoenix, AZ.

——. 2004. *Puccinellia parishii*. Unpublished abstract compiled and edited by the Heritage Data Management System, AZGFD, Phoenix, AZ.

Arizona Rare Plant Committee. 2001. Arizona rare plant field guide: a collaboration of agencies and organizations. U.S. Government Printing Office, Washington, D.C.

Audubon. Important bird areas program. Online: http://web4.audubon.org/bird/iba/index.html. Accessed 26 June 2022.

Bechard, M. J. and J. K. Schmutz. 1995. Ferruginous Hawk (*Buteo regalis*), the birds of North America online (A. Poole, Ed.). Cornell Lab of Ornithology, Ithaca, NY. Online: http://bna.birds.cornell.edu/bna/species/172doi:10.2173/bna.172.

Bureau of Indian Affairs (BIA). 2022a. Final Programmatic Biological Assessment for the Navajo Nation Integrated Weed Management Plan. Prepared by BIA Navajo Region Office, Gallup, NM.

Bureau of Indian Affairs (BIA). 2022b. Final Programmatic Environmental Impact Statement for the Navajo Nation Integrated Weed Management Plan: Volume I—Final PEIS. Prepared by BIA Navajo Region Office, Gallup, NM.

Carman, S.M. 2006. Colorado River Basin Chubs Recovery Plan. New Mexico Department of Game and Fish. Conservation Services Division. 65 Pp.

Cartron, J. E. (Ed.). 2010. Raptors of New Mexico. University of New Mexico Press, Albuquerque, NM.

Glinski, R. L. (Ed.). 1998. The raptors of Arizona. The University of Arizona Press, Tucson, AZ, and the Arizona Game and Fish Department, Phoenix, AZ.

Degenhardt, W. G., C. W. Painter, and A. H. Price. 1996. Amphibians and reptiles of New Mexico. University of New Mexico Press, Albuquerque, NM.

Gutiérrez, R. J., A. B. Franklin, and W. S. Lahaye. 1995. Spotted Owl (*Strix occidentalis*), the birds of North America online (A. Poole, Ed.). Cornell Lab of Ornithology, Ithaca, New York. Online: http://bna.birds.cornell.edu.bnaproxy.birds.cornell.edu/bna/species/179.

Minckley, W.L. 1973. Fishes of Arizona. Arizona Game and Fish Department, Sims Printing Co., Inc. Phoenix, AZ. (description p.170).

Navajo Nation Department of Fish and Wildlife (NNDFW). 2020. Navajo Nation Endangered Species List Species Accounts. Prepared by David Mikesic, Daniela Roth, and Nora Talkington. Distributed by Navajo Natural Heritage Program. Version 4.20.

New Mexico Game and Fish. 2010. Biotic information system of New Mexico, species reports: Ferruginous Hawk (*Buteo regalis*). Online: http://www.bison-m.org/speciesbooklet.aspx.

Propst, D. L., A. L. Hobbes, and T. L. Stroh. 2001. Distribution and notes on the biology of Zuni bluehead sucker, *Catostomus discobolus yarrowi*, in New Mexico. The Southwestern Naturalist 46:158–70.

Richard, S. M., S. J. Reynolds, J. E. Spencer, and P. A. Pearthree. 2000. Geologic map of Arizona: Arizona Geological Survey Map M-35, scale 1:1,000,000.

Tyus, H.M. and C.A. Karp. 1990. Spawning and movements of the razorback sucker *Xyrauchen fexanus* (Abbott) in the Green and Yampa rivers, Colorado and Utah. Southwestern Naturalist 35:427-433.

U.S. Department of Agriculture Natural Resources Conservation Service Soil Survey Staff. 2022. Web soil survey: Custom Soil Resource Report for Glen Canyon National Recreation Area; Navajo Mountain Area, Arizona, Parts of Apache, Coconino and Navajo Counties; and San Juan County, Utah, Navajo Indian Reservation. Online: http://websoilsurvey.nrcs.usda.gov/. Accessed 21 June 2022.

U.S. Department of Interior Fish and Wildlife Service. 1994. Federal Register 59 FR 13374 13400. U .S. Fish and Wildlife Service, Washington, D.C.

U.S. Department of Interior Fish and Wildlife Service. 1998. Razorback sucker (*Xyrauchen fexanus*) Recovery Plan. Denver, Colorado. 81 pp.

U.S. Department of Interior Fish and Wildlife Service. 2002. Colorado pikeminnow (*Ptychocheilus lucius*) Recovery Goals: amendment and supplement to the Colorado Squawfish Recovery Plan. U.S. Fish and Wildlife Service, Mountain-Prairie Region (6), Denver, Colorado.

U.S. Department of Interior Fish and Wildlife Service. 2017. Southwestern Willow Flycatcher *Empidonax traillii extimus*) 12-month Petition Finding and 5-year Review: Summary and Evaluation. U.S. Fish and Wildlife Service, Arizona Ecological Services, Phoenix, AZ.

U.S. Department of the Interior Fish and Wildlife Service. Critical habitat portal. Online: http://criticalhabitat.fws.gov/crithab/. Accessed 21 June 2022.

White, J.N. 2005. Habitat improvement, augmentation, and monitoring of roundtail chub (*Gila robusta*) in the Navajo River, Jicarilla Apache Nation, New Mexico. Jicarilla National, Tribal Landowner Incentive Program Grant – 2003: Third Quarter Report 2005. Jicarilla Game and Fish Department, Dulce, New Mexico.

White, J.A. 2007. Recommended protection measures for pesticide applications in Region 2 of the U.S. Fish and Wildlife Service. U.S. Fish and Wildlife Service, Region 2, Environmental Contaminants Program, Austin, Texas.

Willson, M. F., and H. E. Kingery. 2011. American Dipper (*Cinclus mexicanus*), the birds of North America online (A. Poole, Ed.). Cornell Lab of Ornithology, Ithaca, NY. Online: http://bna.birds.cornell.edu/bna/species/229doi:10.2173/bna.229.

APPENDIX A. Photographs of the Bá'azh chíní Canyon project area and tributaries.

Photo 1. Photo facing north along Bá'azh chíní (Easting: 530029, Northing: 4104060).

Photo 2. Photo facing south along Bá'azh chíní (Easting: 530029, Northing: 4104060).

Photo 3. Photo facing north along Bá’azh chíní (Easting: 528938, Northing: 4105582).

Photo 4. Photo facing south along Bá’azh chíní (Easting: 528938, Northing: 4105582).

Photo 5. Photo facing south near Bá'azh chíní (Easting: 526971, Northing: 4104147).

Photo 6. Photo facing west near Bá'azh chíní (Easting: 526971, Northing: 4104147).

Photo 7. Photo facing east near west end of Bá'azh chíní Canyon HUC 10 (Easting: 521580, Northing: 4086520).

Photo 8. Photo facing west near west end of Bá'azh chíní Canyon HUC 10 (Easting: 521580, Northing: 4086520).

Photo 9. Photo facing east near south end of Bá’azh chíní Canyon HUC 10 (Easting: 526899, Northing: 4070831).

Photo 10. Photo facing south near south end of Bá’azh chíní Canyon HUC 10 (Easting: 526899, Northing: 4070831).

APPENDIX B. Navajo Nation Department of Fish and Wildlife T&E data request code 22bric101.

NNHP
Navajo Natural Heritage Program

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22bric101

12-May-2022

Stephanie Lee
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505-563-4702
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SUBJECT: Ba eschini (Piute Creek HUC 10) Watershed Restoration Plan Project

Stephanie Lee,

NNHP has performed an analysis of your project in comparison to known biological resources of the Navajo Nation and has included the findings in this letter. The letter is composed of seven parts. The sections as they appear in the letter are:

1. **Known Species –** a list of all species within relative proximity to the project
2. **Potential Species –** a list of potential species based on project proximity to respective suitable habitat
3. **Quadrangles –** an exhaustive list of quads containing the project
4. **Project Summary –** a categorized list of biological resources within relative proximity to the project grouped by individual project site(s) or quads
5. **Conditional Criteria Notes –** additional details concerning various species, habitat, etc.
6. **Personnel Contacts –** a list of employee contacts
7. **Resources –** identifies sources for further information

Known Species lists "species of concern" known to occur within proximity to the project area. Planning for avoidance of these species is expected. If no species are displayed then based upon the records of the Navajo Nation Department of Fish and Wildlife (NNDFW) there are no "species of concern" within proximity to the project. Refer to the Navajo Endangered Species List (NESL) Species Accounts for recommended avoidance measures, biology, and distribution of NESL species on the Navajo Nation (https://www.nndfw.org/nnhp/sp_account.htm).

Potential Species lists species that are potentially within proximity to the project area and need to be evaluated for presence/absence. If no species are found within the Known or Potential Species lists, the project is not expected to affect any federally listed species, nor significantly impact any tribally listed species or other species of concern. Potential for species has been determined primarily on habitat characteristics and species range information. A thorough habitat analysis, and if necessary, species specific surveys, are required to determine the potential for each species.

Species of concern include protected, candidate, and other rare or otherwise sensitive species, including certain native species and species of economic or cultural significance. For legally protected species, the

following tribal and federal statuses are indicated: NESL, federal Endangered Species Act (ESA), Migratory Bird Treaty Act (MBTA), and Eagle Protection Act (EPA). No legal protection is afforded species with only ESA candidate, NESL group 4 status, and species listed on the Sensitive Species List. Please be aware of these species during surveys and inform the NNDFW of observations. Reported observations of these species and documenting them in project planning and management is important for conservation and may contribute to ensuring they will not be up listed in the future.

In any and all correspondence with NNDFW or NNHP concerning this project please cite the Data Request Code associated with this document. It can be found in this report on the top right corner of the every page. Additionally please cite this code in any biological evaluation documents returned to our office.

1. Known Species *(NESL=Navajo Endangered Species List, FE=Federally Endangered, FT=Federally Threatened, FC=Federal Candidate)*

Species

ANVA = Anticlea vaginatus / Alcove Death Camas NESL G3
CASP = Carex specuicola / Navajo Sedge NESL G3 FT
CIME = Cinclus mexicanus / American Dipper NESL G3
CIRY = Cirsium rydbergii / Rydberg's Thistle NESL G4
LIPI = Lithobates pipiens / Northern Leopard Frog NESL G2
MIMO = Microtus mogollonensis / Navajo Mountain Vole NESL G4
PENA = Penstemon navajoa / Navajo Beardtongue NESL G3
PLZO = Platanthera zothecina / Alcove Bog-orchid NESL G3
PRSP = Primula specuicola / Cave Primrose NESL G4
SAAT = Sauromalus ater / Chuckwalla NESL G4
STOCLU = Strix occidentalis lucida / Mexican Spotted Owl NESL G3 FT

2. Potential Species

Species

AEAC = Aegolius acadicus / Northern Saw-whet Owl NESL G4
ANVA = Anticlea vaginatus / Alcove Death Camas NESL G3
AQCH = Aquila chrysaetos / Golden Eagle NESL G3
ASCU = Astragalus cutleri / Cutler's Milk-vetch NESL G2
ASWE = Asclepias welshii / Welsh's Milkweed NESL G3 FT
BURE = Buteo regalis / Ferruginous Hawk NESL G3
CADI = Catostomus discobolus / Zuni Bluehead Sucker NESL G2
CASP = Carex specuicola / Navajo Sedge NESL G3 FT
CIME = Cinclus mexicanus / American Dipper NESL G3
CIRY = Cirsium rydbergii / Rydberg's Thistle NESL G4
DISP = Dipodomys spectabilis / Banner-tailed Kangaroo Rat NESL G4
EMTREX = Empidonax traillii extimus / Southwestern Willow Flycatcher NESL G2 FE
GIRO = Gila robusta / Roundtail Chub NESL G2
HALE = Haliaeetus leucocephalus / Bald Eagle NESL G2
LIPI = Lithobates pipiens / Northern Leopard Frog NESL G2
MIMO = Microtus mogollonensis / Navajo Mountain Vole NESL G4
OXKA = Oxyloma kanabense / Kanab Ambersnail NESL G4 FE
PAFA = Patagioenasa fasciata / Band-tailed Pigeon NESL G4

PENA = Penstemon navajoa / Navajo Beardtongue NESL G3
PIDO = Picoides dorsalis / Three-toed Woodpecker NESL G4
PLZO = Platanthera zothecina / Alcove Bog-orchid NESL G3
PRSP = Primula specuicola / Cave Primrose NESL G4
PTLU = Ptchocheilus lucius / Colorado Pikeminnow NESL G2
PUPA = Puccinellia parishii / Parish's Alkali Grass NESL G4
STOCLU = Strix occidentalis lucida / Mexican Spotted Owl NESL G3 FT
SYWE = Symphyotrichum welshii / Welsh's American-aster NESL G4
XYTE = Xyrauchen texanus / Razorback Sucker NESL G2 FE

3. Quadrangles (7.5 Minute)

Quadrangles

Cattle Canyon (36110-H5) / AZ, UT
Chaiyahi Flat (36110-H8) / AZ, UT
Chaiyahi Rim NE (36110-H7) / AZ, UT
Chaiyahi Rim SE (36110-G7) / AZ
Deep Canyon North (37110-B6) / UT
Deep Canyon South (37110-A6) / UT, AZ
Navajo Begay (37110-A7) / UT, AZ
No Mans Mesa South (37110-A5) / UT, AZ
Oak Springs (36110-G6) / AZ
Tall Mountain (36110-G5) / AZ
Tall Mountain NW (36110-H6) / AZ, UT

4. Project Summary *(EO1 Mile/EO 3 Miles=elements occuring within 1 & 3 miles., MSO=mexican spotted owl PACs, POTS=potential species, RCP=Biological Areas)*

SITE	EO1MI	EO3MI	QUAD	MSO	POTS	RCP
Plute Creek HUC 10 Watershed	PLZO	CIRY, PLZO	Cattle Canyon (36110-H5) / AZ, UT	None	ANVA, AQCH, CASP, CIRY, EMTREX, PLZO, PRSP, STOCLU, SYWE	Area 1, Area 2, Area 3
Plute Creek HUC 10 Watershed	MIMO	MIMO	Chaiyahi Flat (36110-H8) / AZ, UT	None	ANVA, AQCH, ASWE, BURE, CASP, CIRY, DISP, EMTREX, LIPI, PLZO, PRSP, SYWE	Area 3
Plute Creek HUC 10 Watershed	ANVA, CASP, CIRY, MIMO, PENA, PRSP	ANVA, CASP, CIRY, LIPI, MIMO, PENA, PLZO, PRSP, SAAT	Chaiyahi Rim NE (36110-H7) / AZ, UT	None	ANVA, AQCH, ASWE, BURE, CASP, CIRY, DISP, EMTREX, MIMO, PLZO, PRSP, STOCLU, SYWE	Area 1, Area 3

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SITE	EO1MI	EO3MI	QUAD	MSO	POTS	RCP
Plute Creek HUC 10 Watershed	CASP, CIRY, PLZO, PRSP	ANVA, CASP, CIRY, LIPI, MIMO, PLZO, PRSP	Chaiyahi Rim SE (36110-G7) / AZ	None	ANVA, AQCH, ASWE, CASP, CIRY, EMTREX, LIPI, PLZO, PRSP, STOCLU, SYWE	Area 1, Area 3
Plute Creek HUC 10 Watershed	None	CIRY, PRSP	Deep Canyon North (37110-B6) / UT	None	ANVA, AQCH, ASCU, CADI, CASP, CIRY, EMTREX, GIRO, HALE, LIPI, OXKA, PLZO, PRSP, PTLU, STOCLU, XYTE	Area 1, Area 3
Plute Creek HUC 10 Watershed	MIMO	MIMO	Deep Canyon South (37110-A6) / UT, AZ	None	ANVA, AQCH, ASCU, CASP, CIRY, EMTREX, LIPI, PLZO, PRSP, STOCLU	Area 1, Area 2, Area 3
Plute Creek HUC 10 Watershed	MIMO, PENA, SAAT	CASP, MIMO, PENA, SAAT, STOCLU	Navajo Begay (37110-A7) / UT, AZ	None	AEAC, ANVA, AQCH, BURE, CASP, CIME, CIRY, DISP, EMTREX, LIPI, MIMO, PAFA, PENA, PIDO, PLZO, PRSP, STOCLU, SYWE	Area 1, Area 3, Area 5
Plute Creek HUC 10 Watershed	None	None	No Mans Mesa South (37110-A5) / UT, AZ	None	ANVA, AQCH, CASP, CIRY, EMTREX, PLZO	Area 3
Plute Creek HUC 10 Watershed	CASP, CIRY, LIPI, PLZO, PRSP	ANVA, CASP, CIME, CIRY, LIPI, PLZO, PRSP, STOCLU	Oak Springs (36110-G6) / AZ	None	ANVA, AQCH, ASWE, CASP, CIME, CIRY, EMTREX, LIPI, PLZO, PRSP, PUPA, STOCLU, SYWE	Area 1, Area 3
Plute Creek HUC 10 Watershed	CIRY, PLZO	CIME, CIRY, PLZO	Tall Mountain (36110-G5) / AZ	None	ANVA, AQCH, CASP, CIRY, EMTREX, LIPI, PLZO, PRSP, PUPA, SYWE	Area 1, Area 3
Plute Creek HUC 10 Watershed	CASP, CIRY, MIMO, PLZO	ANVA, CASP, CIRY, LIPI, MIMO, PLZO, PRSP	Tall Mountain NW (36110-H6) / AZ, UT	None	ANVA, AQCH, ASWE, BURE, CASP, CIRY, DISP, EMTREX, PLZO, PRSP, STOCLU, SYWE	Area 1, Area 2, Area 3

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5. Conditional Criteria Notes *(Recent revisions made please read thoroughly. For certain species, and/or circumstances, please read and comply)*

A. Biological Resource Land Use Clearance Policies and Procedures (RCP) - The purpose of the RCP is to assist the Navajo Nation government and chapters ensure compliance with federal and Navajo laws which protect, wildlife resources, including plants, and their habitat resulting in an expedited land use clearance process. After years of research and study, the NNDFW has identified and mapped wildlife habitat and sensitive areas that cover the entire Navajo Nation.
The following is a brief summary of six (6) wildlife areas:
1. **Highly Sensitive Area** – recommended no development with few exceptions.
2. **Moderately Sensitive Area** – moderate restrictions on development to avoid sensitive species/habitats.
3. **Less Sensitive Area** – fewest restrictions on development.
4. **Community Development Area** – areas in and around towns with few or no restrictions on development.
5. **Biological Preserve** – no development unless compatible with the purpose of this area.
6. **Recreation Area** – no development unless compatible with the purpose of this area.
None - outside the boundaries of the Navajo Nation
This is not intended to be a full description of the RCP please refer to the our website for additional information at https://www.nndfw.org/clup.htm.

B. Raptors – If raptors are known to occur within 1 mile of project location: Contact the NNHP zoologist at 871-7070 regarding your evaluation of potential impacts and mitigation.
Golden and Bald Eagles- If Golden or Bald Eagle are known to occur within 1 mile of the project, decision makers need to ensure that they are not in violation of the *Golden and Bald Eagle Nest Protection Regulations* found at https://www.nndfw.org/nnhp/docs_reps/gben.pdf.
Ferruginous Hawks – Refer to *Navajo Nation Department of Fish and Wildlife's Ferruginous Hawk Management Guidelines for Nest Protection* (https://www.nndfw.org/nnhp/docs_reps.htm) for relevant information on avoiding impacts to Ferruginous Hawks within 1 mile of project location.
Mexican Spotted Owl - Please refer to the *Navajo Nation Mexican Spotted Owl Management Plan* (https://www.nndfw.org/nnhp/docs_reps.htm) for relevant information on proper project planning near/within spotted owl protected activity centers and habitat.

C. Surveys – Biological surveys need to be conducted during the appropriate season to ensure they are complete and accurate please refer to NN Species Accounts https://www.nndfw.org/nnhp/sp_account.htm. Surveyors on the Navajo Nation must be permitted by the Director, NNDFW. Contact Jeff Cole at (928) 871-6450 for permitting procedures. Questions pertaining to surveys should be directed to the NNDFW the NNHP Zoologist for animals, and the NNHP Botanist for plants. Questions regarding biological evaluation should be directed to Jeff Cole at 871-6450.

D. Oil/Gas Lease Sales – Any settling or evaporation pits that could hold contaminants should be lined and covered. Covering pits, with a net or other material, will deter waterfowl and other migratory bird use. Lining pits will protect ground water quality.

E. Power line Projects – These projects need to ensure that they do not violate the regulations set forth in the *Navajo Nation Raptor Electrocution Prevention Regulations* found at https://www.nndfw.org/nnhp/docs_reps/repr.pdf.

F. Guy Wires – Does the project design include guy wires for structural support? If so, and if bird species may occur in relatively high concentrations in the project area, then guy wires should be equipped with highly visual markers to reduce the potential mortality due to bird-guy wire collisions. Examples of visual markers include aviation balls and bird flight diverters. Birds can be expected to occur in relatively high concentrations along migration routes (e.g., rivers, ridges or other distinctive linear topographic features) or where important habitat for breeding, feeding, roosting, etc. occurs. The U.S. Fish and Wildlife Service recommends marking guy wires with at least one marker per 100 meters of wire.

G. San Juan River – On 21 March 1994 (Federal Register, Vol. 59, No. 54), the U.S. Fish and Wildlife Service designated portions of the San Juan River (SJR) as critical habitat for Ptychocheilus lucius (Colorado pikeminnow) and Xyrauchen texanus (Razorback sucker). Colorado pikeminnow critical habitat includes the SJR and its 100-year floodplain from the State Route 371 Bridge in T29N, R13W, sec. 17 (New Mexico Meridian) to Neskahai Canyon in the San Juan arm of Lake Powell in T41S, R11E, sec. 26 (Salt Lake Meridian) up to the full pool elevation. Razorback sucker critical habitat includes the SJR and its 100-year floodplain from the Hogback Diversion in T29N, R16W, sec. 9 (New Mexico Meridian) to the full pool elevation at the mouth of Neskahai Canyon on the San Juan arm of Lake Powell in T41S, R11E, sec. 26 (Salt Lake Meridian). All actions carried out, funded or authorized by a federal agency which may alter the constituent elements of critical habitat must undergo section 7 consultation under the Endangered Species Act of 1973, as amended. Constituent elements are those physical and biological attributes essential to a species conservation and include, but are not limited to, water, physical habitat, and biological environment as required for each particular life stage of a species.

H. Little Colorado River - On 21 March 1994 (Federal Register, Vol. 59, No. 54) the U.S. Fish and Wildlife Service designated Critical Habitat along portions of the Colorado and Little Colorado Rivers (LCR) for Gila cypha (humpback chub). Within or adjacent to the Navajo Nation this critical habitat includes the LCR and its 100-year floodplain from river mile 8 in T32N R6E, sec. 12 (Salt and Gila River Meridian) to its confluence with the Colorado River in T32N R5E sec. 1 (S&GRM) and the Colorado River and 100-year floodplain from Nautuloid Canyon (River Mile 34) T36N R5E sec. 35 (S&GRM) to its confluence with the LCR. All actions carried out, funded or authorized by a federal agency which may alter the constituent elements of Critical Habitat must undergo section 7 consultation under the Endangered Species Act of 1973, as amended. Constituent elements are those physical and biological attributes essential to a species conservation and include, but are not limited to, water, physical habitat, and biological environment as required for each particular life stage of a species.

I. Wetlands – In Arizona and New Mexico, potential impacts to wetlands should also be evaluated. The U.S. Fish & Wildlife Service's National Wetlands Inventory (NWI) maps should be examined to determine whether areas classified as wetlands are located close enough to the project site(s) to be impacted. In cases where the maps are inconclusive (e.g., due to their small scale), field surveys must be completed. For field surveys, wetlands identification and delineation methodology contained in the "Corps of Engineers Wetlands Delineation Manual" (Technical Report Y-87-1) should be used. When wetlands are present, potential impacts must be addressed in an environmental assessment and the Army Corps of Engineers, Phoenix office, must be contacted. NWI maps are available for examination at the Navajo Natural Heritage Program (NNHP) office, or may be purchased through the U.S. Geological Survey (order forms are available through the NNHP). The NNHP has complete coverage of the Navajo Nation, excluding Utah, at 1:100,000 scale; and coverage at 1:24,000 scale in the southwestern portion of the Navajo Nation. In Utah, the U.S. Fish & Wildlife Service's National Wetlands Inventory maps are not yet available for the Utah portion of the Navajo Nation, therefore, field surveys should be completed to determine whether wetlands are located close enough to the project site(s) to be impacted. For field surveys, wetlands identification and delineation methodology contained in the "Corps of Engineers Wetlands Delineation Manual" (Technical Report Y-87-1) should be used. When wetlands are present, potential impacts must be addressed in an environmental assessment and the Army Corps of Engineers, Phoenix office, must be contacted. For more information contact the Navajo Environmental Protection

Agency's Water Quality Program.

J. Life Length of Data Request – The information in this report was identified by the NNHP and NNDFW's biologists and computerized database, and is based on data available at the time of this response. If project planning takes more than two (02) years from the date of this response, verification of the information provided herein is necessary. It should not be regarded as the final statement on the occurrence of any species, nor should it substitute for on-site surveys. Also, because the NNDFW information is continually updated, any given information response is only wholly appropriate for its respective request.

K. Ground Water Pumping - Projects involving the ground water pumping for mining operations, agricultural projects or commercial wells (including municipal wells) will have to provide an analysis on the effects to surface water and address potential impacts on all aquatic and/or wetlands species listed below. NESL Species potentially impacted by ground water pumping: Carex specuicola (Navajo Sedge), Cirsium rydbergii (Rydberg's Thistle), Primula specuicola (Cave Primrose), Platanthera zothecina (Alcove Bog Orchid), Puccinellia parishii (Parish Alkali Grass), Zigadenus vaginatus (Alcove Death Camas), Perityle specuicola (Alcove Rock Daisy), Symphyotrichum welshii (Welsh's American-aster), Coccyzus americanus (Yellow-billed Cuckoo), Empidonax traillii extimus (Southwestern Willow Flycatcher), Rana pipiens (Northern Leopard Frog), Gila cypha (Humpback Chub), Gila robusta (Roundtail Chub), Ptychocheilus lucius (Colorado Pikeminnow), Xyrauchen texanus (Razorback Sucker), Cinclus mexicanus (American Dipper), Speyeria nokomis (Western Seep Fritillary), Aechmophorus clarkia (Clark's Grebe), Ceryle alcyon (Belted Kingfisher), Dendroica petechia (Yellow Warbler), Porzana carolina (Sora), Catostomus discobolus (Bluehead Sucker), Cottus bairdi (Mottled Sculpin), Oxyloma kanabense (Kanab Ambersnail)

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Dexter D Prall, GIS Supervisor - Natural Heritage Program
Navajo Nation Department of Fish and Wildlife

7. Resources

Navajo Endangered Species List:
https://www.nndfw.org/nnhp/endangered.htm

Species Accounts:
https://www.nndfw.org/nnhp/sp_account.htm

Biological Investigation Permit Application
https://www.nndfw.org/nnhp/study_permit.htm

Navajo Nation Sensitive Species List
https://www.nndfw.org/nnhp/trackinglist.htm

Various Species Management and/or Document and Reports
https://www.nndfw.org/nnhp/docs_reps.htm

Consultant List
https://www.nndfw.org/bi_consult_list_2014.pdf

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APPENDIX C. Approved Herbicide List for Use on the Navajo Nation

The BIA WNA would also be able to use new active ingredients that are developed in the future if: 1) they are registered by the EPA for use on one or more land types (e.g., rangeland, aquatic, etc.) managed by the BIA; 2) the BIA Navajo Nation Region determines that the benefits of use on public lands outweigh the risks to human health and the environment; and 3) they meet evaluation criteria to ensure that the decision to use the active ingredient is supported by scientific evaluation and NEPA documentation. These evaluation criteria are discussed in more detail in the FPEIS (Appendix K; BIA 2022b).

Approved Herbicides on the Navajo Nation and their recommended land uses in the Bá'azh chíní Canyon Watershed Planning Area

Herbicide	Selectivity	Riparian	Rangeland	Agricultural Lands
2,4-D	Broadleaf Weeds	X	X	X
Aminopyralid	Broadleaf Weeds	X	X	X
Atrazine	• Broadleaf Weeds • Grasses		X	X
Chlorsulfuron	• Perennial Broadleaf Weeds • Grasses		X	X
Clopyralid	Broadleaf Weeds		X	X
Dichlobenil	• Annual and Perennial Grasses • Broadleaf Weeds • Woody Plants		X	X
Fluroxypyr	Broadleaf Weeds		X	
Fluazifop-p butyl	Annual and Perennial Grasses			X
Glyphosate	Non-selective	X	X	X
Imazapic	Broadleaf Weeds		X	X
Imazapyr	• Annual and Perennial Grasses • Broadleaf Weeds		X	
Isoxaben	• Annual and Broadleaf Weeds • Grasses • Vines			X
Metsulfuron methyl	• Annual, Biennial, Perennial and Broadleaf Weeds • Brush		X	X
Metribuzin	• Broadleaf Weeds • Grasses			X
Paraquat	• Annual Broadleaf Weeds • Grasses		X	X
Pendimethalin	• Broadleaf Weeds • Annual Grasses			X

Herbicide	Selectivity	Riparian	Rangeland	Agricultural Lands
Picloram	• Annual and Biennial Broadleaf Weeds • Brush		X	X
Prodiamine	• Broadleaf Weeds • Grasses			
Thifensulfuronmethyl	Broadleaf Weeds		X	X
Triclopyr	• Broadleaf Weeds • Woody Plants	X	X	X

*Shaded rows are herbicides that would be used for noxious weed treatments in the Bá'azh chíní Canyon Watershed Project

APPENDIX D. Species Conservation Measures

The FPEIS for the NNIWMP includes conservation measures designed to limit impacts to resources from weed management actions and externally proposed projects. The following conservation measures from the FPEIS Navajo Nation Integrated Weed Management Plan planning document that applies to this proposal are listed below.

Species Conservation Measures

The Navajo Natural Heritage and Historic Program (NNHHP) encourages treatment of noxious weeds within sensitive species populations as a tool to improve habitat for NESL species, with proper consultation with NNHP and USFWS, as applicable. If the goal of the weed treatment project is to improve habitat for threatened and sensitive species, the conservation measures below can be modified for individual species through consultation with NNHP and USFWS on a project-specific basis. Additionally, buffers for mechanical, cultural, manual (low impact), and non-aerial herbicide use treatments can be modified on a project-by-project basis with approval from NNHP but will require the presence of a qualified biologist on-site during all stages of project implementation. Flagging and fencing around listed plant species will also be required.

Federally Listed Species

General Project BMPs

1. Submit a Biological Consultant Data Request Form to the NNHP NNDFW to initiate the BRCF process prior to project implementation for background information on species habitat and occupancy (the form and instructions can be accessed here: https://www.nndfw.org/nnhp/drs.htm). A brief report should be submitted with the BRCF request that includes the following: a. Description and map of the project location and treatment activities proposed.

b. Consideration of the intersection of the project site with potential habitat of potential and known species listed in the Data Response.

c. Description of survey timing and methodology (including buffers) and species-specific surveys performed.

d. Conservation measures that will be applied for the project, if applicable

2. If preliminary analysis based on maps, aerial photos, and other knowledge of the project site indicates that potential habitat for listed species is present, a qualified biologist will conduct a habitat assessment and a qualified Biologist may be required on site during all stages of project implementation as determined by the BRCF process.

3. If suitable habitat is present, the project will apply the conservation measures, including buffers established for that species or a qualified biologist will conduct additional surveys for species' presence.

4. Qualified biologists should obtain federally listed species permits from USFWS and be on the permitted consultants list for NNDFW prior to conducting species surveys on Navajo Nation land.

5. If the species is present at the site, the species-based protection measures will be employed. If protocol surveys do not detect the species, there will be no buffers.

6. Where specified, species breeding season timing restrictions and buffers apply to all treatment methods.

7. Where two or more species' habitats overlap, the more restrictive measures will take priority.

8. Consult the Required Protection Measures for Herbicide applications for federally and Navajo Nation-listed species below for herbicide-specific mitigation and avoidance measures.

Navajo Nation Endangered Species List

General Project BMPs

1. Submit a Biological Consultant Data Request Form to the NNHP NNDFW to initiate the BRCF process prior to project implementation for background information on species habitat and occupancy (the form and instructions can be accessed here: https://www.nndfw.org/nnhp/drs.htm). A brief report should be submitted with the BRCF request that includes the following: a. Description and map of the project location and treatment activities proposed.

b. Consideration of the intersection of the project site with potential habitat of potential and known species listed in the Data Response.

c. Description of survey timing and methodology (including buffers) and species-specific surveys performed.

d. Conservation measures that will be applied for the project, if applicable.

2. Include General Project BMPs species conservation measures listed above.

3. If preliminary analysis based on maps, aerial photos, and other knowledge of the project site indicates that potential for habitat for Group 2 and 3 species is present, a qualified biologist will conduct species surveys.

4. Species surveys are preferred for Group 4 species but not required. A qualified biologist will conduct Group 4 species surveys concurrently with Group 2 and 3 species surveys.

5. Obtain Biological Investigation Permits from NNDFW prior to conducting species surveys.

Wildlife Species Conservation Measures

Birds

American Dipper (G3)

- Breeding season occurs March 1 – July 31 (Navajo Nation Endangered Species List: species accounts).
- Mechanical treatments require a 50–200-foot (ft) (15–60-meter (m)) buffer from occupied nesting habitat outside of breeding season.
- No mechanical, mechanized ground, low or high aerial chemical treatments within 1/8 mile (0.2 kilometer (km)) from an active nest during March 15–August 15.
- Spot chemical spraying or manual treatments require a buffer of 330 ft (0.1 km) from an active nest during March 15- August 15.
- Class 2 or Class 3 herbicides require a 30 ft (9 m) buffer foe spot and mechanized ground application of herbicide; 150 ft (50 m) buffer for low aerial chemical treatments; and 1/8-mile (200 m) buffer for high aerial chemical treatments near American Dipper habitat.

Mexican Spotted Owl (ESA T, G2)

- Breeding season occurs May 1 – August 1 (Navajo Nation Endangered Species List: species accounts).
- Chemical spot and manual treatments require a 330 ft (0.1 km) buffer from active nest.
- Mechanical, mechanized ground and low and high aerial chemical treatments require a 1/4-mile (0.4 km) buffer from suitable nesting habitat during breeding season.

Mammals

Banner-tailed kangaroo rat and Navajo Mountain Vole (G4s)

- Mechanical and target grazing treatments require a 200 ft (60 m) buffer from occupied habitats year-round.

Fish

Colorado pikeminnow (ESA E, G2)

- Weed removal projects would require restoration of native vegetation to prevent erosion. Weed removal activities in the riparian zone would be conducted in patches to prevent erosion. Patch size would be determined in consultation with NNDFW.
- Best Management Practices would be used to reduce sedimentation and chemical run-off from mechanical and chemical weed treatments along bank lines within the 100-year floodplain.
- Pile burning would be conducted 300 ft (90 m) outside of the floodplain.
- Approved aquatic formulation herbicides only: 2,4-D, glyphosate, triclopyr and imazapyr would exclusively be used within 25 ft (7.6 m) of the daily high-water mark.
- Herbicides with relatively low aquatic toxicity to fish require a 25 ft (7.6 m) buffer from the daily high-water mark in the riparian zone, including: aminopyralid, chlorsulfuron methyl, clopyralid, imazapic, and thifensulfuron-methyl.

Razorback sucker (ESA E, G2)

- Weed removal projects would require restoration of native vegetation to prevent erosion. Weed removal activities in the riparian zone would be conducted in patches to prevent erosion. Patch size would be determined in consultation with NNDFW.
- Best Management Practices would be used to reduce sedimentation and chemical run-off from mechanical and chemical weed treatments along bank lines within the 100-year floodplain.
- Pile burning would be conducted 300 ft (90 m) outside of the floodplain.
- Approved aquatic formulation herbicides only: 2,4-D, glyphosate, triclopyr and imazapyr would exclusively be used within 25 ft (7.6 m) of the daily high-water mark.
- Herbicides with relatively low aquatic toxicity to fish require a 25 ft (7.6 m) buffer from the daily high-water mark in the riparian zone, including: aminopyralid, chlorsulfuron methyl, clopyralid, imazapic, and thifensulfuron-methyl.
- Non-aquatic approved and moderate to high aquatic toxicity herbicides require a 300 ft (90 m) buffer from the daily high-water mark.

Amphibians and Reptiles

Northern Leopard Frog (G2)

- Mechanized and manual treatments require a 200 ft (60 m) buffer from open water habitats.
- Prescribed fire requires a 200 ft (60 m) buffer zone from the edge of the wetland vegetation.
- No applications of herbicides will be used inside occupied or potentially occupied aquatic habitat.
- Mitigation measures will be applied in dispersal and migration corridors after rain events.
- All projects in riparian/wetland habitats near occupied habitat will require native riparian/wetland vegetation restoration following invasive species removal.
- Only herbicides labeled for aquatic use and the cut-stump method on tree species will be used in potential habitat.
- No target grazing will be used in the habitat.

- All equipment and boots will be cleaned with bleach before and after treatments within 200 ft (60 m) of occupied habitat to prevent the spread of chytrid fungus.

Chuckwalla (G4))

- No mechanical treatments (surface disturbance) within occupied habitats

Federal and Navajo Listed Plant Species Conservation Protection Measures

Alcove bog-orchid and Alcove death camas (G3)

- Mechanical, cultural, and chemical ground treatments require a 200ft (60 m) buffer from identified listed species locations.
- Aerial herbicide application requires a 1-mile (1.6 km) buffer from identified listed species locations.
- Manual treatments (low impact treatments) require a 20ft (6 m) buffer from identified listed species locations.
- When doing treatments, flagging and fencing would be placed around listed plant populations.
- Vehicles would use only established roads for accessing project sites in listed plant habitat.
- The NNDFW botanist would be notified of any positive results of rare plant surveys. BIA would also notify the NNDFW botanist as to whether they are proceeding with the proposed weed treatment near the listed plant, and if so, the buffers and other avoidance measures that would be implemented.
- The field crew administering weed treatments would be educated on the listed plants and how to avoid them.

Navajo sedge (ESA T, G3) and Cutler's milk-vetch (ESA T, G2)

- Vehicles would use only established roads for accessing project sites in listed plant habitat.
- Vehicles would be parked at previously disturbed parking areas located 20ft from suitable habitat for federally listed species when treating. Parking areas would be near established roadways.
- Mechanical, cultural, and chemical treatments require a 200-foot (ft) (60-meter (m)) buffer from identified listed species locations.
- Aerial herbicide application requires a 1-mile (1.6 km) buffer from identified listed species locations.
- Manual treatments (low impact treatments) require a 20 ft (6 m) buffer from identified listed species locations.
- When doing treatments, flagging and fencing would be placed around listed plant populations.
- The NNDFW botanist would be notified of any positive results of rare plant surveys. BIA would also notify the NNDFW botanist as to whether they are proceeding with the proposed weed treatment near the listed plant, and if so, the buffers and other avoidance measures that would be implemented.
- No pre-emergent herbicide application would be used (Navajo sedge only).
- The field crew administering weed treatments would be educated on the listed plants and how to avoid them.

Navajo Beardtongue (G3)

- Mechanical, cultural, and chemical treatments require a 1-mile (1.6 km) buffer from identified listed species locations. A burn plan must be developed for prescribed pile burns, which will include specific treatment buffers.

- Aerial herbicide application requires a 1-mile (1.6 km) buffer from identified listed species locations.
- Manual treatments (low impact treatments) require a 20 ft (6 m) buffer from identified listed species locations.
- Vehicles would use only established roads for accessing project sites in listed plant habitat.
- When doing treatments, flagging and fencing would be placed around listed plant populations.
- The NNDFW botanist would be notified of any positive results of rare plant surveys. BIA would also notify the NNDFW botanist as to whether they are proceeding with the proposed weed treatment near the listed plant, and if so, the buffers and other avoidance measures that would be implemented.
- No pre-emergent herbicide application would be used (Navajo sedge only).
- The field crew administering weed treatments would be educated on the listed plants and how to avoid them.

Welsh's American-aster, Rydberg's thistle, Cave primrose, and Parish's alkali grass (G4)

- Mechanical, cultural, and chemical ground treatments require a 200 ft (60 m) buffer from identified listed species locations.
- Aerial herbicide application requires a 1-mile (1.6 km) buffer from identified listed species locations.
- Manual treatments (low impact treatments) require a 20 ft (6 m) buffer from identified listed species locations.
- When doing treatments, flagging and fencing would be placed around identified plant populations.
- The field crew administering weed treatments would be educated on the listed plants and how to avoid them.

Migratory Birds

- Mechanical treatments within the buffer zone would be conducted outside of the breeding season (March through August).
- Non-endangered raptors—All treatments require a 490ft (0.15km) buffer from the active nest from March–August.
- Migratory birds—All treatments require a 165ft (50m) from the active nest from March–August.