

**Final Environmental Assessment
and
Finding of No Significant Impact
for the
Rio Chama Aquatic Habitat Project,
Rio Arriba County, New Mexico**

October 2019

Prepared by

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**US Army Corps
of Engineers®**
Albuquerque District



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Finding of No Significant Impact

Rio Chama Aquatic Habitat Project,

Rio Arriba County, New Mexico

The U.S. Army Corps of Engineers (USACE), Albuquerque District has conducted an environmental analysis in accordance with the National Environmental Policy Act of 1969, as amended. The final Environmental Assessment (EA) dated 10 October 2019, for the Rio Chama Aquatic Habitat Project, Rio Arriba County, New Mexico addresses fish habitat and ecosystem restoration opportunities and feasibility in the Rio Arriba County, New Mexico.

The Final EA, incorporated herein by reference, evaluated various alternatives that would improve fish and wildlife habitat conditions on the Rio Chama, and support increasing sport fish and wildlife recreation in the study area. The recommended plan includes:

- Excavate 2.25 acres of in-channel pools
- Construct attached bars with excavated materials for a narrower thalweg
- Place approximately 1044 rock features to provide 0.2 acres of cover
- Place approximately 67 woody debris features to provide 0.04 acres of cover
- Construct a rock riffle upstream of the USGS weir
- Plant native vegetation through the riparian zone

In addition to a “no action” plan, four habitat management alternatives were evaluated. The alternatives included importing clean gravel fill for the attached bars, terrace lowering of the bankline, replacement of the downstream diversion structure, and extending the project downstream of the proposed project area.

For all alternatives, the potential effects were evaluated, as appropriate. A summary assessment of the potential effects of the recommended plan are listed in Table 1:

All practicable and appropriate means to avoid or minimize adverse environmental effects were analyzed and incorporated into the recommended plan. Best management practices (BMPs) as detailed in the EA will be implemented, if appropriate, to minimize impacts. Best management measures (Section 5.12) include construction (November through February) to work at seasonally low flows and minimize effects to migratory breeding birds. Use appropriate fill materials excavated from the river channel. Clean and inspect all construction equipment to prevent the spread of invasive species, and manage fuels, lubricants, hydraulic fluids and other petrochemicals to avoid contamination of water and soils. Staging areas will be limited to minimum area required, located outside the active channel (flow of 1,800 cfs), and avoid sensitive riparian and cultural resources.

Table 1: Summary of Potential Effects of the Recommended Plan

	Insignificant effects	Insignificant effects as a result of mitigation*	Resource unaffected by action
Aesthetics	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Air quality	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Invasive species	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Historic properties	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Other cultural resources	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Floodplains	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Hazardous, toxic & radioactive waste	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Hydrology	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Land use	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Noise levels	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Public infrastructure	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Socio-economics	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Environmental justice	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Soils	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Tribal trust resources	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Water quality	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Climate change	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

Pursuant to section 7 of the Endangered Species Act of 1973, as amended, USACE determined that the recommended plan will have no effect on federally listed species or their designated critical habitat.

Pursuant to section 106 of the National Historic Preservation Act of 1966, as amended, USACE determined that historic properties would not be adversely affected by the recommended plan.

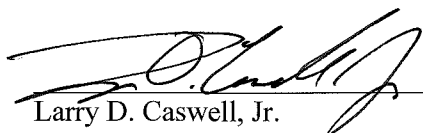
Pursuant to the Clean Water Act of 1972, as amended, the discharge of dredged or fill material associated with the recommended plan has been found to be compliant with section 404(b)(1) Guidelines (40 CFR 230). The Clean Water Act Section 404(b)(1) Guidelines evaluation is found in Appendix D of the EA.

A water quality certification pursuant to section 401 of the Clean Water Act will be obtained from the New Mexico Environmental Department by the New Mexico Department of Game and Fish. All conditions of the water quality certification shall be implemented in order to minimize adverse impacts to water quality.

All applicable environmental laws have been considered and coordination with appropriate agencies and officials has been completed.

Technical, environmental, and cost effectiveness criteria used in the formulation of alternative plans were those specified in the Water Resources Council's 1983 Economic and Environmental Principles and Guidelines for Water and Related Land Resources Implementation Studies. All applicable laws, executive orders, regulations, and local government plans were considered in evaluation of alternatives. Based on this report, the reviews by other Federal, State and local agencies, Tribes, input of the public, and the review by my staff, it is my determination that the recommended plan would not cause significant adverse effects on the quality of the human environment; therefore, preparation of an Environmental Impact Statement is not required.

11 October 2019
Date



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Table of Contents

1 - INTRODUCTION	1
1.1 Background and Location	1
1.2 Purpose and Need for Action	1
Recreation	2
1.3 Regulatory Compliance	3
1.4 Abiquiu Dam and Reservoir	4
Rio Chama Flood Regulation.....	5
Rio Chama Hydropower	6
San Juan Chama Water Storage.....	6
2 - DESCRIPTION OF THE PROPOSED ACTION AND ALTERNATIVES	8
2.1 Proposed Action.....	8
2.2 The No Action Alternative.....	9
2.3 Alternative Actions Evaluated	10
3 - EXISTING ENVIRONMENT AND FORESEEABLE EFFECTS	12
3.1 Environmental Resources Not Considered in Detail	12
Regional geology	12
Air Quality	12
Noise	13
Aesthetics.....	14
Demographics	14
Socioeconomics	15
Land Use.....	15
3.2 Climate	15
Existing Climate.....	15
3.3 Water Resources.....	17
Hydrology	17
Water Quality.....	18
Rio Chama Aquatic Habitat	19
3.4 Fish and Wildlife	20
Riverine Fish Community.....	20
Terrestrial Wildlife.....	21
Special Status Species.....	22

3.5	Floodplains and Wetlands	23
3.6	Terrestrial Vegetation Communities	24
3.7	Noxious Weeds and Invasive Species	24
3.8	Recreation	25
3.9	Cultural Resources	25
	Archaeological Surveys	26
3.10	Hazardous, Toxic, and Radioactive Waste (HTRW)	28
3.11	Environmental Justice	29
4	- FUTURE WITHOUT PROJECT	30
4.1	Environmental Resources Not Considered in Detail	30
4.2	Climate	30
4.3	Water Resources	31
	Hydrology	31
	Water Quality.....	31
	Rio Chama Aquatic Habitat	31
4.4	Fish and Wildlife	32
	Riverine Fish Community.....	32
	Terrestrial Wildlife.....	32
	Special Status Species.....	32
4.5	Floodplains and Wetlands	32
4.6	Vegetation Communities	32
4.7	Noxious Weeds and Invasive Species	32
4.8	Recreation	32
4.9	Cultural Resources	32
4.10	Hazardous, Toxic, and Radioactive Waste (HTRW)	32
4.11	Environmental Justice	33
4.12	Cumulative Impacts	33
5	- FUTURE WITH PROJECT	34
5.1	Climate	34
5.2	Water Resources	34
	Hydrology	34
	Water Quality.....	34
	Rio Chama Aquatic Habitat	35
5.3	Fish and Wildlife	35

Riverine Fish Community.....	35
Terrestrial Wildlife.....	36
Special Status Species.....	36
5.4 Floodplains and Wetlands	36
5.5 Vegetation Communities.....	36
5.6 Noxious Weeds and Invasive Species.....	36
5.7 Recreation	36
5.8 Cultural Resources.....	37
Construction.....	37
Changes in water flow	37
Recreation	37
5.9 Hazardous, Toxic, and Radioactive Waste (HTRW).....	38
5.10 Environmental Justice.....	38
5.11 Cumulative Impacts	38
5.12 Best Management Measures / Environmental Commitments.....	39
6 - CONCLUSIONS AND SUMMARY	41
7 - PREPARATION, CONSULTATION, AND COORDINATION	42
7.1 Preparation	42
7.2 Quality Control.....	42
7.3 Consultation and Coordination	42
7.4 Public Involvement.....	42
Scoping Letter.....	42
Summary of the Public Review and Comments	43
8 - REFERENCES	45
Appendix A.....	i
Appendix B.....	ii
Appendix C	iii
Appendix D.....	iv
Appendix E	v
Appendix F	vi

FIGURES

Figure 1 Map of the Rio Grande basin in New Mexico showing location of the four U.S. Army Corps of Engineers dams. USACE 2011.	5
Figure 2 Proposed Rio Chama Aquatic Habitat Project area.....	11
Figure 3 Area of Potential Effects (APE) for the proposed project, and land ownership.....	27

TABLES

Table 1 San Juan-Chama Project storage allocations at Abiquiu Reservoir, 2011 (USACE 2011).	7
Table 2 Points of Reference for Noise	13
Table 3 Demographic parameters by heritage and age for the project area (2017).....	14
Table 4 Projected County Population and Annual Average Growth Rate.....	15
Table 5 Rio Chama fish species.....	20
Table 6 Federally Threatened or Endangered Species that occur near the project area (USFWS iPaC accessed September 19, 2018).	23
Table 7 Historic Properties Documented within the APE.	28
Table 8 Summary of proposed aquatic habitat features.....	35

List of Acronyms

ABCWUA	Albuquerque Bernalillo County Water Utility Authority
ACE	Annual Chance Exceedance
ac	Acres
AF	Acre-feet
AFY	Acre-feet per year
APE	Area of potential effect
ARMS	Archaeological Records Management System
BMP	Best Management Practices
BLM	U.S. Bureau of Land Management
BOR	U.S. Bureau of Reclamation
CE-SPA	USACE, Albuquerque District
CEQ	Council on Environmental Quality
C.F.R.	Code of Federal Regulations
cfs	Cubic feet per second referring to stream flow
CGP	Construction General Permit
CWA	Clean Water Act
ESRI	Environmental Systems Research Institute
FISRWG	Federal Interagency Stream Restoration Working Group
FWS	U.S. Fish and Wildlife Service
GCS	Grade control structure
GIS	Geospatial Information System
HTRW	Hazardous, toxic, and radioactive waste
ITA	Indian Trust Asset
LiDAR	Light detection and ranging (aerial laser used to develop topography)
MBTA	Migratory Bird Treaty Act
MRG	Middle Rio Grande
MRGCD	Middle Rio Grande Conservancy District
NAAQS	National Ambient Air Quality Standards
NEPA	National Environmental Policy Act
NHPA	National Historic Preservation Act
NMCRIS	New Mexico Cultural Resources Information System

NMDGF	New Mexico Department of Game and Fish
NMISC	New Mexico Interstate Stream Commission
NMED	New Mexico Environment Department
NMLO	New Mexico Land Office
NMSHPO	New Mexico State Historic Preservation Office
NOAA	National Oceanic and Atmospheric Administration
NRHP	National Register of Historic Places
OHV	Off-Highway Vehicle
OSE	New Mexico Office of the State Engineer
PCEs	Primary constituent elements
PDT	Project development team
RED	Regional Economic Development
SHPO	State Historic Preservation Office/Officer
SJC	San Juan Chama
TCP	Traditional cultural property
THPO	Tribal Historic Preservation Office/Officer
TSP	Tentatively selected plan
URGWOPS	Upper Rio Grande Water Operations
USACE	U.S. Army Corps of Engineers
USEPA	U.S. Environmental Protection Agency
USFS	U.S. Forest Service
U.S.C.	U.S. Code
USGS	U.S. Geological Survey
WRDA	Water Resources Development Act
WSEL	Water surface elevation

1 - INTRODUCTION

1.1 Background and Location

The New Mexico Department of Game and Fish (NMDGF) in cooperation with the U.S. Army Corps of Engineers (USACE), U.S. Bureau of Land Management (BLM), U.S. Forest Service (USFS), US Fish and Wildlife Service (FWS), and the State of New Mexico Land Office (NMLO), has prepared this environmental assessment (EA) to analyze potential effects that may result from the proposed Rio Chama Aquatic Habitat Restoration Project. The project would be located on the Rio Chama River, immediately downstream of Abiquiu Dam. The Abiquiu Dam and Reservoir is situated on the Rio Chama about 32 river miles upstream from its confluence with the Rio Grande. Lands on both sides of the Rio Chama in the project area are managed by USACE, BLM, USFS, and NMLO.

Partial funding for this project would be provided to NMDGF through a grant under the Wildlife and Sport Fish Restoration (WSFR) Program, administered by the Service. The WSFR program provides funds to the states and insular areas fish and wildlife agencies for projects to restore, conserve, manage, and enhance wild birds and mammals and their habitat. The program is authorized by the Wildlife Restoration Act (Pittman-Robertson PR) of 1937.

1.2 *Purpose and Need for Action

The purpose of the proposed action is to improve fish and wildlife habitat conditions on the Rio Chama, and support increasing sport fish and wildlife recreation by the public. Trout fishing is popular on the Rio Chama downstream of Abiquiu Dam (NMDGF 2016). Currently, the tailwater river channel immediately below Abiquiu Dam has limited aquatic habitat and structure for fish, and riparian vegetation providing leaf litter for aquatic insects.

Historically, the Rio Chama supported a resilient ecosystem with diverse aquatic and riparian habitat. The Rio Chama downstream of Abiquiu Dam has been affected by channel degradation and loss of riparian habitat following dam construction. The channel has become hardened with coarser sediment, reducing aquatic habitat complexity. Flood operations limit the safe channel capacity flow to levels lower than the existing terrace elevation downstream of the dam necessary to support native riparian vegetation recruitment. As a result of incision and other changes, areas of healthy native riparian habitat, including wetlands, are rare and scattered in the project area. Loss of riparian habitat is an important conservation issue in the arid Southwest.

The NMDGF released its most current iteration of the Statewide Wildlife Action Plan (SWAP) for New Mexico in 2016 (NMDGF 2016). This plan identifies species of greatest conservation need, threats to the status of those species, and potential management actions to conserve those species. The project area is located within the Colorado Plateau Ecoregion. While numerous species of conservation need are identified for this Ecoregion, only Rio Grande Chub and northern leopard frog are likely to be affected by this project. Riparian and aquatic habitat manipulation to favor native species of concern is identified in the SWAP as an important tool for conservation of native fish and amphibians. Modification of existing aquatic habitat within this reach can benefit both species via establishment of aquatic macrophytes, creation of low current refugia, and development of off channel ponding.

The New Mexico Wildlife Center uses the project area to conduct hands-on place-based experiential science education for students from numerous schools in the Española school district, as part of their River Class program. The program has collected water quality data and aquatic

macro-invertebrates, with a goal of providing baseline data that can be compared to future surveys to quantify post-project results.

The proposed aquatic habitat restoration project complies with the letter or intent of several Federal laws, executive orders, and treaties, with which the USACE must comply, concerning restoration and conservation efforts, which include:

- North American Waterfowl Management Plan. The project would increase the amount and quality of resting, breeding, and foraging habitat for waterfowl.
- Executive Order No. 11990 (Protection of Wetlands) and North American Wetlands Conservation Act of 1989. The restoration project would conserve a significant portion of the project area, which is largely considered wetland habitat under the Executive Order and Act.
- Executive Order No. 11988 (Floodplain Management). Through restoration efforts, the project would improve, and in most cases restore, critical functions that provide for the health of the floodplain.
- Endangered Species Act of 1973, as amended. The project would have no adverse effects on endangered species or their critical habitat.
- Bald and Golden Eagle Protection Act of 1940. The restoration would indirectly benefit the eagle from water quality and higher fish availability.
- Migratory Bird Treaty Act of 1918, Migratory Bird Conservation Act of 1929, and associated treaties. Habitat improvements and diversification would benefit resident and migratory birds using the Rio Chama. Habitat improvements would benefit neotropical migrants by providing essential feeding and resting habitats along the Rio Grande flyway.
- Taos BLM Resource Management Plan 2.1.3.1 Fish. The project would expand recreational fisheries while protecting native fish populations and their habitat by developing and enhancing partnerships. The resource plan seeks to develop and/or implement one project per year to conserve, enhance, or restore fish populations and habitats, based on survey results.
- Taos BLM Resource Management Plan 2.1.7.1 Riparian Vegetation. The project would manage riparian areas with an emphasis on protection and restoration and focus treatments on reestablishment of willows and cottonwoods, as well as other riparian vegetation, to stabilize stream banks and promote sinuosity and width/depth ratios appropriate to the site.

Recreation

In addition to restoration efforts, opportunities exist to improve passive recreation opportunities associated with the restored aquatic habitat. Historically, the Rio Chama has been used by recreationists for fishing, hunting, hiking, bird watching, and picnicking.

NMDGF conducts statewide harvest and use surveys of anglers on a regular basis. The two most recent surveys (2015-16 and 2016-17 license years) indicate the Rio Chama below the Dam supports about 10,000 anglers annually for a total of 30,000-40,000 angler days (NMDGF data). This estimate is not specific to the area immediately below the dam, but observations of NMDGF

biologists and game wardens indicate the majority of angler use in this reach (Abiquiu Dam downstream to the Rio Grande) occurs between the Dam and the Village of Abiquiu.

The NMDGF received numerous comments in response to angler surveys supporting the trout fishery, emphasizing catch and release regulations. NMDGF manages the Rio Chama below Abiquiu Dam as a Special Trout Water with a bag limit restriction of two trout per day. Management objectives for this section include development and maintenance of a “Quality” trout water. This entails obtaining an overall trout density of 400 trout/acre with five percent of the trout population greater than twelve inches in length (NMDGF 2016). This fishery is dependent on wild Brown Trout reproduction and recruitment, with supplemental stocking of 12,000 catchable sized (>10”) Rainbow Trout (*Onchorhynchus mykiss*) annually.

The project area is open to hunting and is popular with waterfowl hunters in the fall. This section falls under Central Flyway regulations for waterfowl seasons and bag limits. Waterfowl hunting peaks in late October through November. Deer hunters also access public lands along County Road 162 on the south side of the Rio Chama.

1.3 Regulatory Compliance

This Environmental Assessment (EA) was prepared by the USACE, Albuquerque District, for project partners, including the BLM, USFS, FWS, and NMLO in compliance with all applicable Federal Statutes, Regulations, and Executive Orders, including the following:

- National Historic Preservation Act (16 U.S.C. § 470 *et seq.*)
- Archaeological Resources Protection Act (16 U.S.C. § 470 *et seq.*)
- Clean Water Act (33 U.S.C. § 1251 *et seq.*)
- Clean Air Act (42 U.S.C. 7401 § *et seq.*)
- Endangered Species Act (16 U.S.C. § 1531 *et seq.*)
- Executive Order 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations
- Occupational Safety and Health Act of 1970 (29 U.S.C. § 651 *et seq.*)
- Executive Order 11988, Floodplain Management
- National Environmental Policy Act (NEPA, 42 U.S.C. § 4321 *et seq.*)
- CEQ Regulations for Implementing the Procedural Provisions of NEPA (40 C.F.R. § 1500 *et seq.*)
- Native American Graves Protection and Repatriation Act (25 U.S.C. § 3001 *et seq.*)
- Executive Order 11593, Protection and Enhancement of the Cultural Environment
- Executive Order 11990, Protection of Wetlands
- U.S. Army Corps of Engineers’ Procedures for Implementing NEPA (33 C.F.R. § 230; ER 200-2-2)
- Farmland Protection Policy Act (7 U.S.C. § 4201 *et seq.*)
- Executive Order 13112, Invasive Species
- Federal Noxious Weed Act (7 U.S.C. § 2814)
- Migratory Bird Treaty Act (16 U.S.C. § 703 *et seq.*)
- Fish and Wildlife Coordination Act (48 Stat. 401; 16 USC § 661 *et seq.*)
- Section 438 of the Energy Independence and Security Act of 2007 (Pub. L. No. 110-140, § 438, 121 Stat. 1492, 1620)

- Executive Order 13514, Federal Leadership in Environmental, Energy, and Economic Performance
- National Forest Management Act of 1976 (Pub. L. No. 94-588)

The New Mexico Office of the State Engineer (OSE) is charged with administration of all water in the State of New Mexico pursuant to NMSA 1978, § 72-2-1 (1978). In the Rio Grande basin, the OSE performs numerous activities, some of which will be affected by the Project. Those activities include, but are not limited to basic water rights administration under state law and OSE Rules and Regulations, Active Water Resource Management (AWRM), conducting annual accounting of native Rio Grande and San Juan Chama (SJC) Project water, and addressing state water resource policy issues that may impact the river system.

The New Mexico Interstate Stream Commission (NMISC) is charged with administration of all interstate water compacts for New Mexico, as well as protecting, conserving and developing the waters and stream systems of the State. NMSA 1978, § 72-14-3 (1943). In the Rio Grande basin, the NMISC performs numerous activities, some of which will be affected by the Project. Those activities include monitoring water operations of the USACE and the U.S. Bureau of Reclamation (BOR), conducting annual accounting of native Rio Grande and SJC Project water, coordinating with the OSE and water users on Rio Chama water administration and active water resource management (shortage sharing), assessing and determining Rio Grande Compact compliance, and addressing federal natural resource policy issues that may impact the river system.

This EA also reflects compliance with all applicable State and local regulations, statutes, policies, and standards for conserving the environment, such as water and air quality, endangered plants and animals, and cultural resources.

1.4 Abiquiu Dam and Reservoir

The USACE is responsible for operation and maintenance of Abiquiu Dam for flood risk management (flood control) on the Rio Chama (Figure 1). The primary purpose of Abiquiu Dam is flood and sediment control, with water supply and hydropower generation as authorized by Congress. Two BOR-operated facilities at Heron Reservoir and El Vado Dam upstream of Abiquiu Reservoir play important roles regulating tributary flow on the Rio Chama.

The Abiquiu Dam and Reservoir Project is situated on the Rio Chama about 32 river miles upstream from its confluence with the Rio Grande. The project was authorized for construction by the Flood Control Act of 1948, (Pub. L. No. 80-858) and the Flood Control Act of 1950 (Pub. L. No. 81-516). Construction of Abiquiu Dam was initiated by the USACE in 1956 and the project was completed and placed into operation in 1963. The dam is a rolled earthfill structure with a crest length of 1,800 feet, and the maximum height above the stream bed is approximately 341 feet. The drainage area contributing flow to Abiquiu Reservoir comprises 2,146 square miles.

Subsequent legislation added authority for water supply storage (specifically, San Juan-Chama (SJC) Project water storage). The reservoir's storage allocations include 502,000 AF (acre-feet) for flood control and 77,039 AF for sediment retention. At the end of 2009, an estimated 40,616 AF of the initial 77,039 AF sediment reserve space remained unfilled. Storage of SJC water occurs within the flood control space and unused portion of the sediment reserve space.

Rio Chama Flood Regulation

Under current operating procedures, natural Rio Grande basin flow and releases from El Vado Reservoir upstream are passed through Abiquiu Reservoir without regulation. The only situation in which the USACE would take any action would be to maintain the safe channel capacity downstream. Due to reach-specific safe channel capacity constraints, releases from Abiquiu Reservoir are restricted to 1,800 cfs directly below the dam. Flows are regulated so as not to exceed 3,000 cfs at the Chamita gage or 10,000 cfs at the Otowi gage.

Operation of Abiquiu Dam for flood control is coordinated with Cochiti, Galisteo, and Jemez Canyon dams, which are jointly operated for a channel capacity of 7,000 cfs at Albuquerque (Central Avenue Bridge). Flood regulation is initiated at Abiquiu Dam when flows into the reservoir exceed the capacity of the Rio Chama downstream from the Dam or when flows on the Rio Grande equal or exceed its channel capacity. Flood regulation at Abiquiu Reservoir can be expected from April through June. The maximum water storage to date was 402,258 AF (elevation 6,261.1 feet), which occurred in June 1987.



Figure 1 Map of the Rio Grande basin in New Mexico showing location of the four U.S. Army Corps of Engineers dams. USACE 2011.

Rio Chama Hydropower

A hydroelectric power facility was constructed downstream of Abiquiu Dam in 1991. The power plant was constructed and is currently owned and maintained by the incorporated County of Los Alamos. Effectively, all dam releases above 75 cfs are currently diverted through the power plant for generation of electricity. However, a written agreement between the County and the USACE prior to constructing the plant stipulates that no releases will be made specifically for the benefit of the power plant (USACE 1995). The plant is a run-of-the-river facility and has no impact on reservoir storage or releases.

San Juan Chama Water Storage

BOR's SJC Project diverts water from the Navajo, Little Navajo, and Blanco rivers, which are upper tributaries of the San Juan River (of the Colorado River basin), for use in the Rio Grande basin in New Mexico (USACE, BOR, ISC 2007). After being diverted through an underground tunnel, this water is stored at Heron Reservoir, upstream from Abiquiu Dam. BOR delivers SJC Project water to users in the upper Rio Grande basin based on contracts with various water-management entities. Delivery of SJC Project water is authorized for municipal, domestic, industrial, recreation, irrigation, and fish and wildlife purposes. The following statutory conditions must be met for use of SJC Project water:

- Must be consumptively and beneficially used in New Mexico.
- Must have a downstream destination.
- Must not harm native Rio Grande water.
- Is not subject to provisions of the Rio Grande Compact.

SJC Project water is released from Heron Reservoir by BOR to a specific user, who can use such water immediately or store it in other facilities for future use. In 1981, Pub. L. No. 97-140 authorized the Secretary of the Army to enter into agreements with entities that have contracted with the Secretary of the Interior for water from the SJC Project. The authorization allows for up to 200,000 AF of this water to be stored in Abiquiu Reservoir within the flood control space and unused portion of the sediment reserve space. The USACE has entered into agreements with the Albuquerque-Bernalillo County Water Utility Authority (ABCWUA) and other entities for SJC water storage (Table 1.1). Up to 180,338 AF (elevation 6,220 ft.) is currently stored pursuant to storage easements held by the ABCWUA¹. When full, this pool creates a 4,100-surface-acre reservoir. The authorizing legislation stipulates that storage of this water shall not interfere with the authorized purposes of Abiquiu Reservoir (namely, flood and sediment control). Releases of SJC water from Abiquiu Reservoir represent individual decisions made by contractors to call for their water, without any discretionary action by the USACE. The USACE does ensure that such flows are passed in a manner that does not threaten the safety or structural integrity of flood control facilities.

¹ The upper limit of SJC storage is the 6,220-foot elevation, which corresponds to the vertical extent of ABCWUA's storage easements with surrounding landowners. The actual volume of allowable SJC storage decreases over time as sediment retention in the reservoir increases.

Table 1 San Juan-Chama Project storage allocations at Abiquiu Reservoir, 2011 (USACE 2011).

San Juan-Chama Project contractor	Allocation (AF)
Albuquerque.-Bernalillo County Water Utility Authority ¹	170,900
Middle Rio Grande Conservancy District	2,000
City of Santa Fe	4,732
City of Los Alamos	1,086
City of Española	905
Town of Bernalillo	362
County of Santa Fe	336
Twining Water & Sanitation District	14
Total	180,338

¹ BOR stores up to 20,000 AF of Supplemental Water within the ABCWUA's space.

In 1988, Pub. L. No. 100-522 authorized the storage of up to 200,000 AF of Rio Grande system water at Abiquiu Reservoir when space is no longer required for the storage of SJC Project water as authorized by Pub. L. No. 97-140. Presently, all water supply storage at Abiquiu Reservoir consists of SJC Project water; there are no agreements for storage of Rio Grande system water.

2 - DESCRIPTION OF THE PROPOSED ACTION AND ALTERNATIVES

2.1 Proposed Action

The NMDGF in cooperation with USACE, BLM, USFS, FWS, and the NMLO proposes to construct instream aquatic habitat features on the Rio Chama below Abiquiu Dam. The proposed action includes installation of instream fish habitat structures, two new boater access areas, and riparian vegetation improvements for wildlife. The proposed project area is about 58.7 acres through 2.7 miles of lands managed by NMDGF in cooperation with USACE, BLM, USFS, FWS, and the NMLO. The proposed project would construct instream aquatic habitat features for trout and other fish species and was designed by Riverbend Engineering based on techniques described in Cramer (2012) and the Federal Interagency Stream Restoration Working Group (FISRWG, 1998).

Limiting the project area to the active channel ensures that habitat features do not increase seepage or evaporative losses. Habitat designs emphasize in-channel features that reduce the wetted area with the substrate (wetted area) and the surface area with the atmosphere (surface area) over the range of flow volumes. Decreasing the wetted and surface areas for a flow volume (WSA:V), increases habitat depth for fish and provides more efficient water transport at flow less than 100 cfs than a wide, shallow wetted channel.

The proposed features (Figure 2) are designed to provide fish with low velocity refuge habitat at discharges between 50 and 1,800 cfs (USACE 1995). Several types of features are proposed to create different types of fish habitat. The features include: rock and wood sills, pools, rock grade control structures, rock habitat structures, rock deflectors, and riparian vegetation. Excavated substrate from pools would be redistributed along channel margins creating or expanding existing bank attached bars to form a narrower thalweg. The bed materials for the proposed features would require a determination of the size, gradation, and volume of bed material (Cramer 2012). An evaluation of the appropriate sized materials including channel slope, substrate size and gradation, and other hydraulic variables for each of the feature types would be conducted to ensure stability following construction.

A large rock riffle upstream of USGS weir would be excavated, and the rock moved upstream into a larger upstream grade control structure (GCS)/riffle. The new GCS would allow upstream fish passage and downstream boat passage. The GCS would be grouted to increase structure stability at higher flows. River gravel and crushed rock would be placed to form the boat access ramp from the access road to the river.

Pools are proposed for construction to create additional velocity refuge for fish (Cramer 2012). Placement of clean alluvial substrate is proposed along the margins of the channel to form shallow bank attached bars that incrementally increase water depth within the channel, with an increase in water velocity. The balanced cut-fill of substrate materials would maintain safe channel capacity (flow) in the project reach.

Rock habitat structures and deflectors are proposed to provide hydraulic roughness, habitat diversity, and velocity refuge for fish (Cramer 2012). The boulder rock structures would be partially buried within the bed to increase stability and maintain their location. The rock structures are distributed throughout the project area to provide velocity diversity under the range of flow conditions (50 cfs to 1,800 cfs).

Planting with native riparian vegetation along the bankline is proposed in selected areas primarily for allochthonous leaf litter inputs into the stream to support aquatic insects (Cramer 2012). The riparian vegetation would contribute to bank stability.

Boater access improvements would be made at two locations, one in the upper project reach adjacent to the exiting USACE recreational area and another in the lower project reach on USFS property. Access improvements would include constructing sloped concrete boat ramps (or compacted gravel), stream bank grading for vehicle access, and installing rip rap for structure protection. Boat ramps would be designed to accommodate access at most flows.

Construction of the proposed aquatic habitat features would require partial dewatering of the channel during construction (Cramer 2012). Construction would be scheduled during the non-irrigation season (November 1 to February 28), and coordinated with the BOR water deliveries to take advantage of consistent, lower winter flow downstream of Abiquiu Dam. The construction schedule is outside the irrigation season to support completion of the diversion structure for continued operation of the acequia, and outside breeding season for migratory birds that may use the project area.

In-channel work and habitat improvement structures would be constructed by utilizing heavy tracked and wheeled equipment. Excavators and back hoe loaders may be used for channel shaping and constructing large boulder habitat structures. Articulated dump trucks and loaders may be used to transport sediment for shaping the channel thalweg and point bar construction. A narrower thalweg would provide deeper habitat at the lower winter flows. Small graders and dozers may be used for point bar grading and shaping. End dump trucks may be used to transport large boulders and other rock materials. Wheeled water tank trucks may be used for dust control. Graders and dozers may be used for improving road and equipment access points. Small loaders, such as wheeled and tracked skid steers, may be used for grading smaller areas, equipment transportation, and tree replanting. Off-Highway Vehicles (OHVs) may be used for watering and transporting of seeding and tree plantings. Tractors and soil disk implements may be used for reseeding and topsoil placement.

All equipment would utilize existing roads where possible. Routine maintenance would be conducted on the existing roads within the project area to facilitate heavy equipment access and reduce adverse effects during construction. Maintenance would include grading, adding base course and gravel in a few locations, with installation of drainage culverts (minor improvements) at key locations to reduce erosion. All maintenance activities would occur within the existing road footprint. Access to river channel would be restricted to a few locations to reduce impacts to bank erosion. All immediate access points to the river channel would be temporary and only used during construction and would be reclaimed to pre-existing conditions post construction. Portions of the equipment access areas would be improved to control vehicular access. All Best Management Practices (e.g., refueling outside of riparian areas, sediment control devices deployed, minimizing destruction to native vegetation, etc.) would be used during construction.

2.2 The No Action Alternative

Under the no action alternative, the Rio Chama channel, bankline, adjacent riparian, and wetland vegetation would remain unchanged. The existing hardened, relatively smooth trapezoidal channel would continue to provide some instream fish habitat. There would be slower velocity flow in a relatively thin water layer adjacent to the cobble-boulder channel bed. The channel would have minimal roughness, and less area for fish to rest from the fast water velocities. The area of quality

habitat for fish would remain the same as the existing conditions. Fall spawning fish species would still be susceptible to having spawning beds desiccated during low flow periods.

2.3 Alternative Actions Evaluated

The following actions were considered as alternatives for inclusion as components of the proposed project. Each potential action is described briefly with an explanation why the action was not included in the proposed project.

Excavation of wetland features would increase plant and habitat diversity within the project area. Concerns communicated by the OSE (OSE, September 6, 2019) and NMISC (NMISC, September 6, 2019) regarding any new use of water must be offset pursuant to the Mesilla Valley Guidelines. Improvements to wetland habitat will be deferred until suitable offsets can be acquired and approved by OSE and NMISC.

Importing clean gravel and cobble fill could be placed to create a narrow thalweg at lower winter flows. The use of imported fill material would require additional hydraulic analysis to maintain safe channel capacity. Clean Water Act requirements for imported fill would result in extensive documentation. The use of imported material would increase transportation and construction costs. The use of imported fill would increase project costs without providing additional benefits or instream habitat above the proposed action.

Terrace lowering of the channel bankline could be implemented to provide fill material for placement to create a narrower thalweg at lower winter flows. The excavation of bankline materials would result in a balanced cut-fill that would maintain the current safe channel capacity. There would need to be additional Clean Water Act requirements for transferring sediment from the bankline into the river channel as fill. Terrace lowering would reduce riparian habitat adjacent to the river that would require mitigation. Terrace lowering would increase project costs without providing additional benefits or instream habitat above the proposed action.

Replacement of the downstream diversion structure with a more stable, fish friendly structure is being considered. NMDGF has coordinated with the downstream acequia association on possible replacement of the diversion structure. Replacement of the diversion structure would require additional engineering design and cultural resources consultation. The additional engineering and consultation activities would delay implementation of instream habitat construction, which may reduce project funding availability. Replacement of the diversion would also increase construction costs above the currently available funding. Replacement of the diversion structure remains under consideration for a subsequent phase of the project dependent on additional engineering design, cultural resources consultation, approval by the acequia association, and funding.

Construction of instream habitat downstream of the proposed project area was considered. The Santa Fe National Forest land adjacent to the Rio Chama extends further downstream from the project boundary. Lands on the opposite bank are privately owned. Coordinating habitat design with private landowners would increase cost and extend the compliance schedule. Extending the planning and compliance schedule may reduce project funding availability. The proposed project costs are within the anticipated budget.

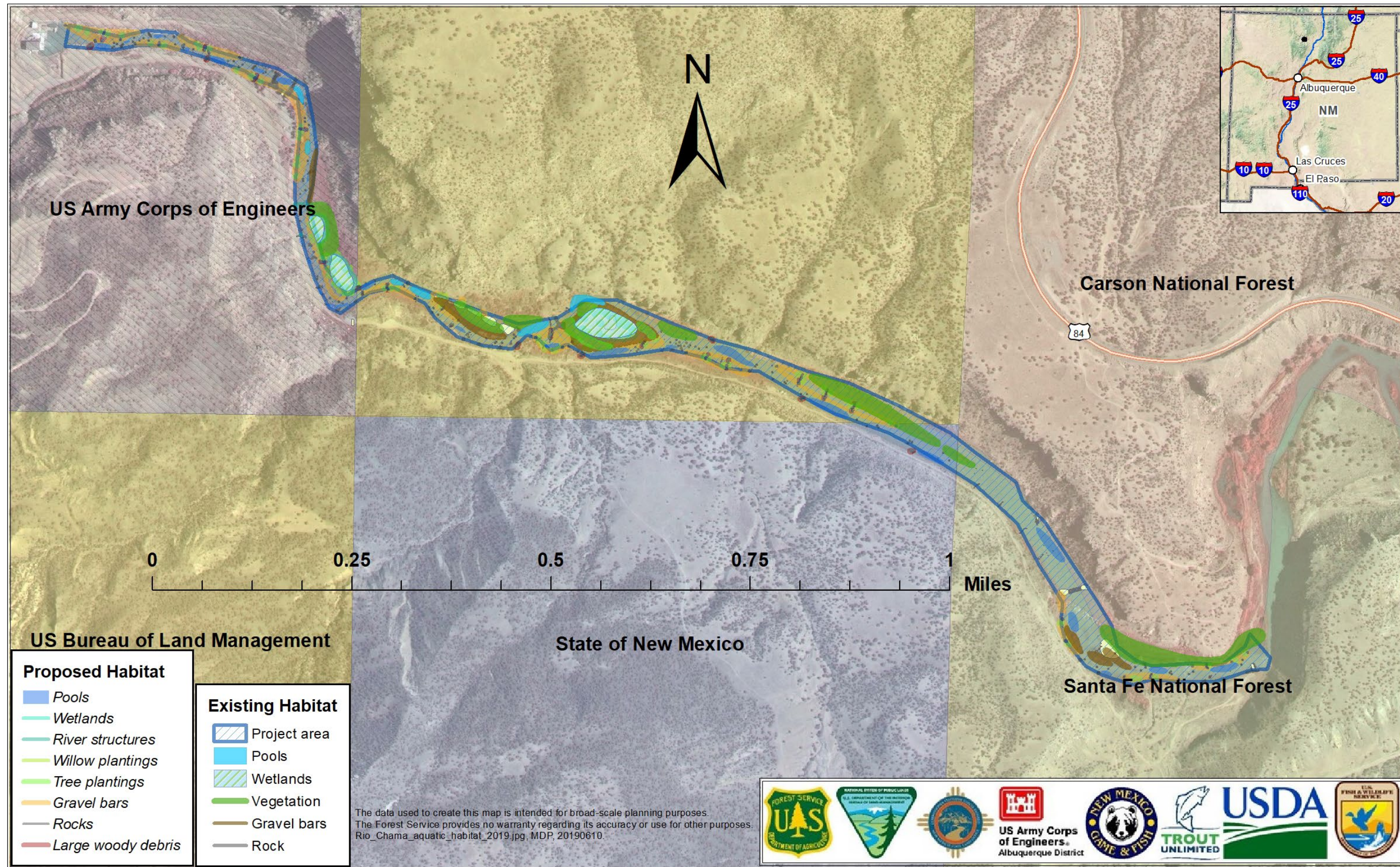


Figure 2 Proposed Rio Chama Aquatic Habitat Project area.

3 - EXISTING ENVIRONMENT AND FORESEEABLE EFFECTS

The following general summary of the physical environment of the Rio Chama downstream of Abiquiu Dam is sufficient for the purposes of analyzing the effects of habitat restoration.

The riparian areas downstream of Abiquiu Dam to the confluence with the Rio Grande were mapped in 2002–2003 for the Upper Rio Grande Water Operations (URGWOPs; USACE 2008). The Rio Chama downstream from Abiquiu Dam is characterized by a single-thread, coarse gravel-bed channel. Bank protection slows formation of in-channel habitat.

The water depth over the USGS weir for the Rio Chama below Abiquiu Dam, NM gage (USGS 2016) is between 1.5 and 5.0 feet.

This section describes the environmental resources in the project area. When necessary, mitigation measures are also proposed to avoid, reduce, minimize, or compensate for any significant effects.

3.1 Environmental Resources Not Considered in Detail

Initial evaluation of the effects of the project indicated that there would likely be little to no effect on several resources with implementation of the project. This analysis also considers the ‘No Action’ or ‘without project’ alternative where the proposed action is not implemented. These resources are discussed below to add to the overall understanding of the project area.

Regional geology

The project area lies within the Española Basin, a sediment-filled asymmetric west-tilted half-graben that formed as part of the Rio Grande Rift. The Rio Grande Rift created a series of north-south trending faults that resulted in uplifted mountains, widespread volcanism, and large sediment filled basins. The Española Basin is bounded by the Sangre de Cristo Mountains to the east, the Jemez Volcanic Field to the west, the San Luis Valley and Chama basins to the north, and the Albuquerque Basin to the south-southwest (USACE 2017).

The Rio Chama flows through a narrow canyon (~350 feet deep), varying in width from about 300 feet at the bottom to about 1,500 feet at the top (USACE 1987). The upper rim of the canyon is the Poleo Sandstone (Triassic age) underlain by the Abo formation (Permian age). Poleo Sandstone is dominantly white to buff colored, medium to coarse grained, quartzitic, well cemented, and highly jointed. Locally, there are thin seams and zones of conglomerate with cobbles up to four inches in diameter. All sand and gravel size material is well rounded. The upper Abo formation is a massive, red to brown mudstone with irregular lenses and masses of gray green sandy mudstone. The remainder of the Abo formation exposed at the dam site is a series of intermingled lenses of silty mudstone and silty sandstone. The dominant color is red-brown, but some units are purple to green. Implementation of the proposed action would not impact the geology of the project area.

Air Quality

The area is an attainment area for all criteria air pollutants. Non-criteria pollutants, such as those associated with Los Alamos National Laboratory and tailpipe emissions from increasing traffic will continue to be air quality issues. Bandelier National Monument is a Class I Federal air quality area. Future actions within the project area must account for and avoid potential degradation of the air quality at Bandelier.

There are no documented air quality non-attainment issues in Rio Arriba County, NM. The future air quality without project is expected to remain unchanged. Implementation of the proposed action would not impact the air quality of the project area.

Noise

The action area is located in Rio Arriba County, NM. The project area is generally quiet, rural settings, with only limited background noise from major highways, aircraft flyovers, sirens, or other urban noise. Background noise levels are not expected to change under the without project conditions.

Table 2 Points of Reference for Noise

dB (Decibels)	Activities
1	The softest sound a person can hear with normal hearing
9	normal breathing
29	soft whisper
40	quiet residential area
50	rainfall
60	normal conversation
70	freeway traffic
80	whistling kettle
85	heavy traffic, noisy restaurant
90	truck, shouted conversation
95-110	motorcycle
100	snowmobile
110	busy video arcade
110	car horn
112	personal cassette player on high
120	thunder
125	chain saw
130	stock car races
150	jet engine taking off
162	fireworks (at 3 feet)
170	shotgun

Source: LHH 2001

The lands adjacent to the reservoirs and rivers are relatively undeveloped, except where the river bisects established municipalities. Dominant sounds in the project area originate from natural sources: water, wind, and wildlife. Local traffic noise is generated by various highway crossings. Noise levels and patterns at developed recreation areas and frequently-used informal use areas are localized and typical of campground and day use recreational areas. Beyond these formal and informal recreation areas, the most conspicuous noise producers are power boats and jet skis on the reservoirs that allow these activities. Noise levels above 85 decibels (dB) will harm hearing over time. Noise levels above 140 dB can cause damage to hearing after just one exposure. Table

2 lists common noises and their decibel levels for reference. Implementation of the proposed action would have small, temporary impact on noise levels in the project area during construction.

Aesthetics

The NEPA and Council on Environmental Quality (CEQ) regulations identify aesthetics as one of the elements that must be considered in determining the effects of a project. Aesthetics include the presence and appearance of landforms, water surfaces, vegetation, and human created features relative to the surroundings and settings of the area. These features are primary characteristics of an area or project that determine visual character and the manner in which people view the setting. Aesthetics analysis considers the existing and future appearance, or perception of views, of the project site and areas surrounding the site, as well as viewer sensitivity. The existing condition for the aesthetics of the Rio Chama and adjacent riparian areas ranges from fair to good. Implementation of the proposed action would not impact the aesthetics of the project area.

Demographics

The project area and affected populations is in Rio Arriba County, NM. The population of Rio Arriba County has decreased slightly from 41,190 in 2000 (U.S. Census Bureau 2018). The majority of the surrounding project population is Hispanic/Latino followed by White (not Hispanic), Native American, Black and Asian (Table 3). New Mexico population projections were developed (Table 4) for the recently approved New Mexico State Water Plan to support regional water planning efforts (USACE 2006). Implementation of the proposed action would not impact the population trends of the project area.

Table 3 Demographic parameters by heritage and age for the project area (2017).

	Total Population	White, not Hispanic	Hispanic / Latino	Native American	African American	Asian
New Mexico	2,088,070	37.5%	48.8%	10.9%	2.5%	1.7%
Santa Fe County	148,750	43.0%	51.0%	4.3%	1.2%	1.6%
Los Alamos County	18,738	72.0%	17.8%	1.4%	1.2%	6.4%
Rio Arriba County	39,159	12.9%	71.3%	19.0%	0.8%	0.6%
United States	325,719,178	60.7%	18.1%	1.3%	13.4%	5.8%
	Total Population	0-17 years	18-64 years	65 and over	Below poverty level	
New Mexico	2,088,070	23.4%	59.7%	16.9%	19.7%	
Santa Fe County	148,750	18.4%	58.4%	23.2%	14.0%	
Los Alamos County	18,738	22.7%	59.9%	17.4%	4.0%	
Rio Arriba County	39,159	23.7%	57.6%	18.7%	22.5%	
United States	325,719,178	22.6%	61.8%	15.6%	12.3%	

Table 4 Projected County Population and Annual Average Growth Rate

2000 to 2040									
Counties/Key Municipalities	Total County Population by Projection Year (5 year increments)								
	2000	2005	2010	2015	2020	2025	2030	2035	2040
New Mexico Counties									
Rio Arriba	41,307	43,694	46,030	48,196	50,027	51,451	52,519	53,269	53,676
Los Alamos	18,359	18,722	19,122	19,122	20,099	20,565	20,866	21,034	21,224
Santa Fe	129,936	143,987	158,624	174,400	191,403	208,801	226,112	244,751	264,778

Socioeconomics

The leading employment sectors in Rio Arriba County (USACE 2017) are education, health care, and social services (20.9 percent), and public administration (16.4 percent). Agriculture employs about four percent of the county’s workers, while hospitality services and construction, each employs more than ten percent of the workforce. Implementation of the proposed action would not adversely impact the socioeconomics of the project area. Increased recreational use may contribute to the local economy.

Land Use

Lands on both sides of the Rio Chama in the project area are managed by USACE, BLM, USFS, and the NMLO. Permits are issued by BLM and USFS for cattle grazing on lands adjacent to the river. Water gaps that provide limited livestock access to the river would be maintained. Immediately downstream of the project area, private agricultural lands occupy one or both sides of the Rio Chama. These agricultural lands use acequias that divert irrigation water from the river. Sixteen irrigation diversion structures exist on the Rio Chama between Abiquiu Dam and the confluence with the Rio Grande (USACE 1996). Implementation of the proposed action would not impact land use in the project area.

3.2 Climate*

This section provides information on the existing climate in the project area, and on projected changes in future climate conditions. A detailed discussion of regional climate and climate change, along with an assessment of climate impacts to regional hydrology, riparian and aquatic ecosystems can be found in (USACE 2017, Appendix G).

Existing Climate

The climate of the Española Valley ranges from semi-arid (approximately 10" of precipitation/year) along the Rio Grande to alpine (approximately 40" of precipitation/year) at the highest elevations of the surrounding mountain peaks. Mountain areas retain snow during the winter months, and melting of the snowpack in spring contributes significantly to spring runoff flows on the Rio Grande and Rio Chama.

A National Oceanic and Atmospheric Administration (NOAA) National Weather Service Cooperative Observer station with a relatively complete record is located at Alcalde (Station

290245), along the Rio Grande northeast of Ohkay Owingeh Pueblo. The period of record for this station is 1953 through October 2012. The climate at Alcalde is arid continental with large daily and seasonal temperature differences (USACE 2017, Appendix G). Summers tend to be hot and dry; winters tend towards cool and humid. Peak precipitation occurs during the late summer/early fall (July, August, September) during the peak of the North American Monsoon (monsoon), with a secondary peak in winter. Spring and fall tends towards warm and dry.

The monthly period of record temperature summary at Alcalde (USACE 2017, Appendix G) shows that monthly average daytime maximum temperatures (Tmax) are above freezing in all months. Winter Tmax averages 47.7°F, with few winter days with Tmax \leq 32°F. Monthly overnight minimum temperatures (Tmin) average 17.1°F in winter, but can reach as low as -34°F. In summer, Tmax averages 87.4°F. July is the hottest month, with an average of 16 days with temperatures above 90°F and occasional days where temperatures peak as high as 102°F. Monthly overnight low temperatures average 69.9°F in summer.

At Alcalde, precipitation averages 10.01" per year (USACE 2017, Appendix G). In most months, precipitation is 0.75" or less, but is higher during the monsoon season: July receives an average of 1.37", August 1.89", September 1.26", and October 1.04". Precipitation may fall as snow from October through April, with average monthly snowfall peaking in December at 2.8".

Floods occur from April through October and are usually the result of rain alone, rain-augmenting snowmelt runoff, or in some rare cases, extremely high snowmelt runoff events. Local rain events caused by convective storms create flash floods on the tributaries, which accumulate in the Rio Grande's channel. Many of the flood-producing storms on the main stem Rio Grande occur during the transitional periods between spring and summer and between summer and fall. During these periods, the strong intrusion of cool northern air interacts with the moist tropical air to produce the widespread storms over the watershed.

Topography significantly influences local climate in winter and summer. In winter, the dominant pattern is for storms to move into the region from the west or northwest; much of the precipitation falls over the western and central portions of the Jemez Mountains, and the amount declines rapidly moving east of the Sierra de los Valles and down slope to the Rio Grande. During the monsoon season, thunderstorm development is encouraged by daytime surface heating over the Pajarito Plateau and Sierra de los Valles. Daytime surface heating causes air to rise, initiating convection that can pull in air from lower areas to the southeast (Bowen 1996). This convection leads to the formation of thunderstorms over the plateau. Westerly winds in the upper atmosphere can push these storms east towards the Rio Grande as well as advect precipitation into the area. The Sangre de Cristo Mountains prevent moisture from the Plains from entering the region. The region effectively lies in the rainshadow of the Sangre de Cristo Mountains with respect to moisture transported northwestward from the Gulf of Mexico.

Wind direction is generally from the southeast in summer and from the west in winter, but varies greatly because of local topography and mountain and valley breezes. Los Alamos National Laboratory researchers have deduced a diurnal pattern of wind movement from observations in the various Pajarito Plateau Canyon systems. During the day, the winds tend to blow up-canyon from the east; at night, the winds tend to blow down-canyon from the west. Shear winds have also been noted across the canyons (Bowen 1996).

In recent decades, temperature increases have been observed regionally (USACE 2017, Appendix G). Annual temperatures in New Mexico warmed at an average rate of 0.219°F (0.10°C) per

decade from 1912 to 2011 but at the faster rate of 0.678°F (0.34°C) per decade since 1970 (Tebaldi et al. 2012). The same pattern of faster recent warming was also observed in annual average daytime maximum high temperature (Tmax) and annual average nighttime minimum temperature (Tmin). Higher rates of warming have been observed in high elevation areas, particularly in winter. There has been no detectable trend in precipitation.

In the vicinity of the project area, statistically-significant increases in temperature have been observed over the period 1971-2012, particularly in the months of January and March, and in the summer months from May through September. Daytime high temperatures have risen at about 1°F/decade from May through November in the Middle Rio Grande, and at approximately half that rate along the Rio Chama and Jemez River. Rates of warming have been slower in the Jemez Mountain stations. Only in March is there a significant, region-wide warming trend of approximately 1°F/decade.

Nighttime low temperatures have also risen significantly in many months, particularly in the period April through September when a warming trend of approximately 0.5°F/decade was observed. Increases in Tmin were particularly evident in the Jemez Mountains, with significant rates of increase in excess of >0.59°F/decade in all months except February and December. As a result of this warming, there has been a trend towards increasing numbers of late spring days with night time temperatures warmer than 32°F. Historic precipitation trends in the project area show little in the way of statistically significant trends. Implementation of the proposed action would not affect climate in the project area.

3.3 Water Resources

Hydrology

Water operations along the Rio Chama have four general purposes: flood control, irrigation supply, municipal and industrial supply, and environmental operations (USACE, USBR, NMISC 2007). Water operations also include downstream monitoring to ensure that desired flows are achieved. Little native Rio Grande flow is actually captured and stored in the major reservoirs in this system. On average, only 100,000 AF of native Rio Grande water (less than 10% of annual average flow at Otowi gage), is historically stored in El Vado Reservoir. Except for temporarily detained flows due to flood regulation, all of the water stored in Abiquiu Reservoir is imported SJC Project water. When Pub. L. No. 86-645 is triggered, Abiquiu Reservoir is required to retain carryover flood storage because no Rio Grande water may be withdrawn from storage after July 1 (exclusive of water from upstream storage) when the natural flow at the Otowi gage is less than 1,500 cfs. Rio Grande water that is locked into storage is not permanent: it must be released at the end of the irrigation season (November 1) and must be fully evacuated by March 31 of the following year.

Along the Rio Chama, Heron Reservoir manages imported SJC Project waters, passing all native Rio Grande flows (USACE, USBR, NMISC 2007). El Vado Reservoir regulates native Rio Grande waters for Prior and Paramount water needs and stores native Rio Grande water when allowed by the Rio Grande Compact for use by the Middle Rio Grande Conservancy District (MRGCD). When space is available, El Vado can also store SJC Project waters. Abiquiu Reservoir is Congressionally authorized for flood control, sediment control, and water supply storage of both SJC Project and native Rio Grande waters. However, Abiquiu Reservoir does not currently store native Rio Grande water except for flood control purposes.

Flood control operations adjust the rate of releases at Abiquiu Reservoir (USACE, USBR, NMISC 2007). Flood control operations are typically in effect during snowmelt runoff, when mountain snowpack is heavier than normal, and during unusually heavy summer monsoon seasons. Releases from Abiquiu reservoirs is adjusted to take into account flow from Cochiti, Galisteo, and Jemez Canyon reservoirs along the Rio Grande main stem and its tributaries. These four reservoirs are operated as a system to ensure that flows at critical downstream points are not exceeded.

The Rio Grande Compact, in effect, limits the amount of surface water than can be depleted in the Middle Rio Grande based upon the natural flow of the river measured at the Otowi gage downstream of the project area (Rio Grande Compact, 1939). In addition, the OSE has determined the Middle Rio Grande to be fully appropriated. Therefore, any increase in water use in one area of the river must be offset by a reduced use in another area of the river. The OSE requires that increases in water use from new habitat restoration projects must be offset by purchased or leased water rights. The New Mexico State Water Plan (OSE/NMISC 2003) further states “State Engineer permits are required for all habitat restoration activities that result in increased depletions of water.”

Water Quality

New Mexico Environment Department (NMED) periodically monitors water quality within the state’s waterbodies (i.e., lakes rivers, and streams) to determine whether attainment of water quality standards and supporting designated uses is occurring. The results of this assessment are used for reporting through the 303(d)/305(b) Integrated List and the development of total maximum daily load (TMDL) documents for each waterbody not meeting standards. The designated uses for the Rio Chama from Abiquiu Dam to the confluence with the Rio Grande include irrigation, livestock watering, wildlife habitat, coldwater fishery, warmwater fishery, and secondary contact (NMWCC 2017). The most recent survey for the project reach occurred between 2012 and 2014 (NMED 2015). From this assessment, it was determined that this reach fully supports the designated uses (NMED 2018). However, despite the previous exceedances in dissolved oxygen (DO) and pH (NMED 2004), neither discrete measurements nor the deployment of a multi-parameter sonde, which records diurnal variation in DO and pH and other water quality parameters (e.g., water temperature, turbidity, and salinity), did not occur during the most recent survey (NMED 2015). An additional identified gap in the most recent survey was the lack of diurnal temperature data during the summer, which was attributed to high-flow conditions that prevented sensor deployment and assessment during the hottest part of the year (NMED 2015).

The construction of Heron, El Vado, and Abiquiu dams, and the importation of Colorado River Basin water via SJC Project has had numerous effects on water quality in the Rio Chama watershed (Langman and Anderholm 2004). The coordinated storage and releases from the dams and the additional flows from the SJC Project decreased specific conductance and suspended-sediment concentration and increased pH (Langman and Anderholm 2004).The hypolimnetic release from Abiquiu Dam has impacted the thermal regime of the Rio Chama downstream. For example, during winter low-flow conditions, a negative water temperature gradient was observed, with values below the dam being the warmest and subsequently cooled in the downstream direction (Dudley and Platania 2001). The station below the dam also exhibited the least day-to-day variability (Dudley and Platania 2001). The trends observed on the Rio Chama below the single-point hypolimnetic withdrawal, which can artificially warm streams in the winter and dampen diurnal and daily variability throughout the year (Ward and Stanford 1979, Ward 1985). The two

stations further downstream (i.e., 3 and 27 miles) monitored by Dudley and Platania (2001) were less influenced by artificial warming from Abiquiu Reservoir and likely responded to very cold ambient air temperature and low-flow riverine conditions that influence the thermal regime of rivers (Ward and Stanford 1979, Caissie 2006). A positive temperature gradient, where water temperature is the coldest below Abiquiu Dam and subsequently warms in the downstream direction, has not been documented during warmer months, but is likely given the hypolimnetic release, and has been observed downstream on the Rio Grande below Cochiti Dam (Dahm et al. 2013, Reale 2014). The hypolimnetic release from Abiquiu Reservoir can also influence the dissolved oxygen (DO) regime on the Rio Chama. For example, exceedances of the water quality standard for DO (6 mg L^{-1} ; NMWCC 2017) occurred once during the summer and twice in the fall of 1999 (NMED 2004). The exceedances were attributed to documented summer stratification and formation of anoxic water within the hypolimnion (Davis and Joseph 1999, Davis 2007) that was subsequently released from the reservoir (NMED 2004). The hypolimnetic release, which dampens thermal regime downstream of the dam, may also facilitate elevated DO concentrations due to physical controls of the solubility of oxygen in water (Wetzel 2001).

It is unclear how the flow-through hydropower facility (See Section 1.4.2) impacts water quality on the Rio Chama downstream of Abiquiu Dam. However, it can be assumed the impacts are less severe than a typical hydroelectric peaking operation, where water is stored at night when electrical demand is relatively low and released through turbines during the day to satisfy demand, with considerable ecological effects downstream (Cushman 1985, Moog 1993, Friedl and Wüest 2002).

Rio Chama Aquatic Habitat

Aquatic habitat has been altered by the construction and operation of Abiquiu Dam. The hydrological alteration of flow have changed along with the channel morphology (Dudley and Platania 2001). The Rio Chama downstream from Abiquiu Dam is a canyon-bound, single-thread, gravel-bed channel, with coarse bed-material composed of cobbles and boulders (USACE 2007, Appendix K). The sediment supply at the upstream end of this reach was effectively eliminated by Abiquiu Dam, which has probably caused the coarsening of the bed material compared to pre-Abiquiu Dam conditions. The sediment supply derived from bank erosion has decreased over time due to the bank protection, slowing formation of in-channel habitat. The channel has hardened into a trapezoidal conveyance channel with little habitat diversity. Below the project reach, the Rio Chama exits the canyon and is influenced by erosion of alluvial fans transporting sand into the channel. These changes have modified the distribution and abundance of aquatic habitats available to native fish (Dudley and Platania 2001).

Most of the channel below Abiquiu Dam is characterized by intermittent riffles and runs with sizable pocket pools associated with large rocks in the channel. Substrate is characterized by a gravel, cobble bottom with accumulation of fines in back waters. About 1.7 miles downstream of the Dam, a large diversion structure bisects the channel and pools water for about 770 yards. Within this section, fines are the predominant substrate. Below the diversion structure, channel morphology is primarily riffle for the next half mile. Throughout the reach below Abiquiu Dam, fines are added to the system via numerous eroding washes and fill interstitial spaces within the cobble and gravel predominated substrate. Habitat variety and suitability for various fish species varies greatly seasonally due to large differences in discharge from Abiquiu Dam. Flows range from about 50 cfs (cubic feet per second) between January and February to over 1,000 cfs during much of the irrigation season (April through August). Notable deficiencies in fish habitat due to

these fluctuations are reduced spawning habitat for Brown Trout (*Salmo trutta*) from dewatering of suitable spawning gravels in the winter and a lack of low flow refugia for Rio Grande Chub during most flow regimes. The availability of deeper habitat at low flows and low velocity habitat is likely to change very slowly over time due to a lack of coarse substrate material inputs and the regulated hydrology from Abiquiu Dam.

3.4 Fish and Wildlife

The fish and wildlife species by taxa that potentially occur in Rio Arriba County (NMDGF, accessed September 20, 2018) are fish (33), amphibians (12), reptiles (28), birds (251), and mammals (89). The list of all wildlife potential species is provided in Appendix A.

Riverine Fish Community

Prior to the construction of Abiquiu Dam in 1963, the fish community consisted primarily of native species documented to include Rio Grande Chub (*Gila pandora*), Flathead Chub (*Platygobio gracilis*), Rio Grande Sucker (*Catostomus plebeius*), Longnose Dace (*Rhinichthys cataractae*), and Fathead Minnow (*Pimephales promelas*) (USACE 2007). Since construction of Abiquiu Dam, the community has shifted towards more headwater type fauna (Platania et al. 1996). Native and non-native fish species occurring in the Rio Chama are summarized in Table 5. Some native minnows, which persisted following dam construction, are generally considered headwater species adapted to cool waters with relatively high velocities. Dudley and Platania (2001) documented River Carpsucker (*Carpoides carpio*), Black Bullhead (*Ameiurus melas*), Western Mosquitofish (*Gambusia affinis*), and Smallmouth Bass (*Micropterus dolomeiui*).

Introduced Brown Trout are self-sustaining in the system, and Rainbow Trout occur, but are generally not self-sustaining. Hanson (1992) summarizes the findings of studies conducted from 1988 through 1991. Non-native species documented include Brown Trout, Rainbow Trout, White Sucker (*Catostomus commersoni*), Common Carp (*Cyprinus carpio*), and Green Sunfish (*Lepomis cyanellus*). Platania (1991) had similar results, with the exception of Brown Trout, which were not captured. Rainbow Trout are stocked periodically in the lower Rio Chama within the first 7.5 miles downstream of Abiquiu Dam.

Table 5 Rio Chama fish species.

Species	Common Name	Rio Chama
<i>Oncorhynchus mykiss</i>	Rainbow Trout	Non-native
<i>Salmo trutta</i>	Brown Trout	Non-native
<i>Cyprinella lutrensis</i>	Red Shiner	Native
<i>Cyprinus carpio</i>	Common Carp	Non-native
<i>Gila pandora</i>	Rio Grande Chub	Native
<i>Pimephales promelas</i>	Fathead Minnow	Native
<i>Platygobio gracilis</i>	Flathead Chub	Native
<i>Rhinichthys cataractae</i>	Longnose Dace	Native
<i>Carpoides carpio</i>	River Carpsucker	Native
<i>Catostomus commersoni</i>	White Sucker	Non-native
<i>Catostomus plebeius</i>	Rio Grande Sucker	Native
<i>Ameiurus melas</i>	Black Bullhead	Non-native
<i>Ictalurus punctatus</i>	Channel Catfish	Non-native
<i>Gambusia affinis</i>	Mosquitofish	Non-native

Species	Common Name	Rio Chama
<i>Lepomis cyanellus</i>	Green Sunfish	Non-native
<i>Micropterus dolomeiui</i>	Smallmouth Bass	Non-native
<i>Micropterus salmoides</i>	Largemouth Bass	Non-native
<i>Pomoxis nigromaculatus</i>	Black Crappie	Non-native
<i>Perca flavescens</i>	Yellow Perch	Non-native

Riverine habitat use criteria were developed for the URGWOPs (USACE 2007) using five representative aquatic species for the Rio Grande: Rio Grande Silvery Minnow (*Hybognathus amarus*), Flathead Chub, Longnose Dace, River Carpsucker, and Channel Catfish (*Ictalurus punctatus*) (Bohannon-Huston et al. 2004); for the Rio Chama, Brown Trout was substituted for the longnose dace. Platania et al. (1996) found that Brown Trout occupy a wide range of depths (20–110 cm) but are typically found in water less than 40 cm deep and in a wide range of velocities (0–140 cm/s) but mostly occur in water velocities less than 60 cm/s. Furthermore, the majority of Brown Trout (71.5%) were present over gravel or cobble substrates, with a small percentage (11%) occurring over sand and silt substrates. Turner (1982) conducted a study to determine instream flow requirements for fish species in this reach. The findings state that ideal flow for juvenile and fry Brown Trout is 200 cfs, with at least 65% of the maximum usable area occurring at flows between 50 and 1500 cfs. The ideal flow for adult Brown Trout is 1500 cfs, with at least 75% of the maximum usable area occurring at flows between 100 and 750 cfs.

NMDGF conducted an electrofishing survey of the Rio Chama below Abiquiu Dam on March 15, 2016 (Frey 2017). NMDGF surveyed two locations in 2016, consistent with previous surveys of this reach (Hansen et al. 2010). NMDGF personnel conducted a single electrofishing pass of 300-400 m reaches using four backpack electrofishers. Relative abundance was assessed and compared with catch per unit of effort (CPUE) (fish/hr) to assess the fish community. Salmonids were the predominant group captured. Rainbow Trout were detected in appreciable abundance due to implementation of stocking within the area in the mid 2000’s. Overall fish CPUE was greater in 2016 (102 ±22 fish/hr) than in 2009 (39 ±2 fish/hr). Species captured in 2016 and not in 2009 were Green Sunfish, Fathead Minnow, and Rainbow Trout.

Terrestrial Wildlife

Avifauna that may be found in the Abiquiu Reservoir area include the American Kestrel (*Falco sparverius*), Prairie Falcon (*Falco mexicanus*), Mourning Dove (*Zenaida macroura*), Great Horned Owl (*Bubo virginianus*), Common Nighthawk (*Chordeiles minor*), Cordilleran Flycatcher (*Empidonax occidentalis*), Horned Lark (*Eremophila alpestris*), Cliff Swallows (*Petrochelidon pyrrhonota*), Rock Wren (*Salpinctes obsoletus*), Canyon Towhee (*Melospiza fusca*), House Finch (*Haemorhous mexicanus*), and Western Meadowlark (*Sturnella neglecta*). Flocks of cormorants and wintering Bald Eagles (*Haliaeetus leucocephalus*) utilize the shallow waters, and lands at lower elevations along portions of the northern shoreline. Bald Eagle winter roosting sites have been noted along the Rio Chama drainage, although not in the immediate vicinity of the dam or reservoir. Western Grebe (*Aechmophorus occidentalis*), Great Blue Heron (*Ardea herodias*), Common Merganser (*Mergus merganser*), and Mallard (*Anas platyrhynchos*) are among the most frequently observed waterfowl utilizing the river area.

The Rio Grande is a major migratory flyway for avian species (Yong and Finch, 2002). The peak nesting season for birds is April 15 through August 15. The Migratory Bird Treaty Act (MBTA)

(16 U.S.C. § 703 *et seq.*) is the primary legislation in the United States established to conserve migratory birds (USFWS 2004). The list of the species protected by the MBTA appears in Title 50, Section 10.13, of the Code of Federal Regulations (50 C.F.R. § 10.13). The MBTA prohibits taking, killing, or possessing of migratory birds unless permitted by regulations promulgated by the Secretary of the Interior. The USFWS and the Department of Justice are the Federal agencies responsible for administering and enforcing the statute.

More than 160 bird species, which are federally protected under the Migratory Bird Treaty Act, may be found in the Rio Chama valley. Since 2001, 152 bird species have been observed at the Los Luceros Important Bird Area (IBA, Audubon Society) on the Rio Grande. Hink and Ohmart (1984) recorded 277 species of birds in the bosque ecosystem. Highest bird densities and species diversity were found in edge habitat vegetation with a cottonwood overstory and an understory of Russian olive (*Elaeagnus angustifolia*) (Hink and Ohmart 1984). Emergent marsh and other wetland habitats also had relatively high bird density and species richness. Thirty of the forty-six species of breeding birds found in the bosque used cottonwood forest habitat. No bird species showed a strong preference for Russian olive stands (Hink and Ohmart 1984).

Mammals associated with the riparian corridors include raccoon (*Procyon lotor*), striped skunk (*Mephitis mephitis*), beaver (*Castor canadensis*), muskrat (*Ondatra zibethicus pallidus*), and Botta's pocket gopher (*Thomomys bottae actuosus*). Bobcat (*Lynx rufus*) and other large carnivores occur infrequently in the area due to disturbances by humans.

Most reptiles are found in areas adjacent to the reservoir, while amphibious species generally inhabit marginal lakeside habitats. Amphibian and reptilian species which may occur in the area include the Spadefoot Toads (*Spea multiplicata* and *S. bombifrons*), Northern Sagebrush Lizard (*Sceloporus graciosus*), and Plateau Fence Lizard (*Sceloporus tristichus*). Herptile abundance and diversity was found to be greatest in habitats that lacked dense canopy cover and that were characterized by sandy soils and sparse ground cover (Hink and Ohmart 1984). Many of the species found in the bosque were representative of drier upland habitats. Hink and Ohmart (1984) did describe a distinct assemblage of species associated with denser vegetation cover in mesic or hydric habitats. Common species included tiger salamander (*Ambystoma mavortium*), boreal chorus frog (*Pseudacris maculate*), bullfrog (*Lithobates catesbeianus*), northern leopard frog (*Lithobates pipiens*), many-lined skink (*Plestiodon multivirgatus*), black-necked garter snake (*Thamnophis cyrtopsis*), and western painted turtle (*Chrysemys picta*).

Special Status Species

Three agencies have a primary responsibility for the conservation of animal and plant species in New Mexico: the FWS, under the authority of the Endangered Species Act of 1973 (as amended); the NMDGF, under the authority of the Wildlife Conservation Act of 1974; and the New Mexico Energy, Minerals and Natural Resources Department, under authority of the New Mexico Endangered Plant Species Act and 19.21.2 NMAC. In addition, the USFS and the BLM recognize species of concern for their management as well. Each agency maintains a list of animal and/or plant species that have been classified or are candidates for classification as endangered or threatened based on present status and potential threat to future survival and recruitment.

There are several Federal and State listed threatened or endangered species, species of concern, and rare plants that occur, or could potentially occur, in Rio Arriba County (BISON-M, accessed September 20, 2018); however, habitat is not present along the Rio Chama for these species. Seven

Federally listed species potentially may be present in or near the Rio Chama are listed in Table 6.

Table 6 Federally Threatened or Endangered Species that occur near the project area (USFWS iPaC accessed September 19, 2018).

Common Name	Scientific Name	Status	Present	Critical Habitat
Canada Lynx	<i>Lynx canadensis</i>	E	N	N
New Mexico Meadow Jumping Mouse	<i>Zapus hudsonius luteus</i>	E	N	N
Interior Least Tern	<i>Sternula antillarum athalassos</i>	E	N	N
Mexican Spotted Owl	<i>Strix occidentalis lucida</i>	T	N	N
Southwestern Willow Flycatcher	<i>Empidonax traillii extimus</i>	E	N	N
Western Yellow-Billed Cuckoo	<i>Coccyzus americanus</i>	T	N	N
Jemez Mountain Salamander	<i>Plethodon neomexicanus</i>	E	N	N

A Biological Assessment (BA 2019) for the USFS Española and El Rito Ranger Districts and the BLM evaluates the potential effects of the proposed action on all proposed, endangered, and threatened fish, wildlife, and plant species known or suspected to occur within or near the project area (Appendix B).

3.5 Floodplains and Wetlands

Executive Order 11988 (Floodplain Management) provides Federal guidance for activities within the floodplains of inland and coastal waters. Federal agencies are required to “ensure that its planning programs and budget requests reflect consideration of flood hazards and floodplain management.” Removal of the non-native vegetation may allow the active floodplain to expand. Preservation of the natural values of floodplains is of critical importance to the nation and the State of New Mexico. These natural values include preservation of wetlands.

Wetlands consist of marshes, wet meadows, and seasonal ponds that typically support hydrophytic plants such as cattails, sedges and rushes. Wetlands are a critical component of bosque diversity. Wet meadows were the most extensive wetland habitat type in the Rio Grande valley prior to irrigation. The construction of the MRGCD drains and ditches led to substantial decreases in wetland habitat: from 1918 to present, wetland-associated habitats have undergone a 93% reduction (Hink and Ohmart, 1984; Scurlock, 1998). Wetlands are an integral component of the bosque ecosystem, not only increasing its diversity, but also enhancing the value of surrounding plant communities for wildlife. Wetlands have experienced the greatest historical decline of any floodplain plant community. Among the greatest needs of the riparian ecosystem is the preservation of existing wetlands and expansion or creation of additional wetlands (Crawford et al. 1993).

Wetlands are lands transitional between terrestrial and aquatic ecosystems where the water table is at or near the surface or the land is covered by shallow water (Cowardin et al. 1979). Saturation with water determines the nature of soil development and, in turn, the types of plant and animals inhabiting these areas. Wetlands occurring within the riparian zone may be dominated by the same plant species common in the bosque; however, wetlands exhibit wetter soils and support many additional plant and animal species.

Jurisdictional wetlands (relative to Section 404 of the Clean Water Act) do occur in the Recommended Plan Area. Most wetlands within the floodway have developed in areas with a high

groundwater table. Those in shallow basins or relatively far from the river are likely seasonally or temporarily flooded; that is, inundated during the majority, or just a portion, of the growing season, respectively. Within the Rio Grande floodway, most islands, point bars, and side channels are periodically inundated by river flows and support marsh, meadow, or shrub wetland communities.

Scurlock (1998) has summarized trends for historic Rio Grande riparian communities over the last 150 years. The riparian ecosystem has changed with the decline of cottonwood gallery forest, encroachment of upland junipers, and invasion of salt cedar (*Tamarix ramosissima*), Russian olive, and Siberian Elm (*Ulmus pumila*).

3.6 Terrestrial Vegetation Communities

The Rio Chama downstream from Abiquiu Dam previously supported substantial growths of cottonwoods, willows, New Mexico olives, shrubs, and wetlands. The area has been mapped to classify vegetation, primarily through photo-interpretation from Abiquiu Dam to the confluence with the Rio Grande (USACE 2007). Classification of Rio Grande basin riparian vegetation relies on plant community designations developed by Hink and Ohmart (1984). Approximately 14 percent of the mapped riparian vegetation is composed of mature and mid-aged cottonwood forest, while over half of the mapped vegetation consists of intermediate and young stands of native trees with dense shrubby understory vegetation (Hink and Ohmart Types 3, 4, and 5; USACE 2017). These riparian forest areas are interspersed with about 20 percent openings vegetated with grasses, forbs, and 13 percent composed of brushy vegetation between 5 and 15 feet tall. Native species comprise almost 22 percent of the riparian vegetation of the Rio Chama Section, with areas dominated by non-native species like Russian olive and saltcedar accounting for about 60 percent.

The upland vegetation above the river corridor is typical of the Great Basin Conifer Woodland and Desert Scrub biotic communities (USACE 2017). One-seed juniper is prominent on the steeper slopes of dissected terraces or plateaus. Juniper and piñon pine are both prominent on the shallow, sandy soils found on outcroppings and foothills.

3.7 Noxious Weeds and Invasive Species

The majority of non-native species within the project area are plants. Though some non-native fish and other wildlife may exist, they are not of major concern. The invasive tree species of concern include salt cedar, Russian olive, and Siberian elm. These species outcompete the native species and can eliminate the native riparian bosque resulting in a drier, more upland habitat.

Executive Order 13112 directs Federal agencies to prevent the introduction of invasive (exotic) species and provides for their control to minimize the economic, ecological, and human health impacts that invasive species cause.

In addition, the New Mexico Department of Agriculture designates and lists certain weed species as being noxious (Nellessen 2000). “Noxious” in this context means plants not native to New Mexico that may have a negative impact on the economy or environment, and are targeted for management or control. Class C listed weeds are common, widespread species that are fairly well established within the state. Management and suppression of Class C weeds is at the discretion of the lead agency. Class B weeds are considered common within certain regions of the state, but are not widespread. Control objectives for Class B weeds are to prevent new infestations, and in areas where they are already abundant, to contain the infestation and prevent their further spread. Class A weeds have limited distributions within the state. Preventing new infestations and eliminating

existing infestations is the priority for Class A weeds. In order to prevent this, all equipment would be cleaned with a high-pressure water jet before leaving an area and entering a new area.

3.8 Recreation

The Rio Chama offers trout fishing below Abiquiu Dam on 2.7 miles of river through lands managed by USACE, BLM, USFS, and the NMLO. Local flow rates are important to the quality of fishing conditions (Hanson 1992). Other recreational activities may include camping, walking, biking, hiking, wildlife viewing, and picnicking.

3.9 Cultural Resources

Section 106 of the National Historic Preservation Act (NHPA) [54 U.S.C. § 300101 *et seq.*] and its implementing regulations (36 C.F.R. § 800) require Federal agencies to take into account the effects of their undertakings (e.g., projects or permits) on historic properties.

Historic properties are legally considered to be those properties (cultural resources) eligible for listing on the National Register of Historic Places (NRHP). To be eligible for listing, a property must have "the quality of significance in American history, architecture, archeology, engineering, and culture" that can be "present in districts, sites, buildings, structures, and objects," must "possess integrity of location, design, setting, materials, workmanship, feeling, and association," and must meet at least one of a set of four criteria relating to (A) association with historical events; (B) historically significant people; (C) distinctive characteristics of a period or style; and/or (D) are likely to yield information important to prehistory or history. There are many possible examples of historic properties, including archaeological sites, historic buildings, traditional cultural properties (TCPs), and historic districts. As such, the identification and evaluation of historic properties (including archaeological sites, historic buildings, and other features constructed or modified by humans in the past) is an important component of this project.

The Section 106 process includes the identification of historic properties that might be affected by a project, the evaluation of those properties, determinations of effect on those properties, consultation with various parties (including the New Mexico State Historic Preservation Officer (NMSHPO), Tribes, local governments, and the public) about those effects, and resolution of any adverse effect on historic properties. Because the proposed project involves multiple agencies, both Federal and State, USACE has been designated as the lead Federal agency for purposes of making these determinations and conducting consultation under Section 106.

There is a long history of human occupation in the Chama Valley, extending from more than 10,000 years ago to the present day. The prehistory and history of the Chama are divided by archaeologists into the following periods, with associated dates:

- Paleoindian: c. 12,500-5500 BC
- Archaic: 5500 BC – AD 400/600
- Developmental Period: AD 400/600-1200
- Coalition Period: AD 1200-1325
- Classic Period: AD 1325-1540
- Historic Period: AD 1540-Present

Each of these periods is characterized by different lifeways, subsistence strategies, and technologies. These periods can be grouped into two major divisions: Prehistoric (dating before contact with Europeans), and Historic (dating after contact with Europeans).

Archaeological Surveys

The Area of Potential Effect (APE) is considered here to be the area encompassing the proposed restoration features themselves, any area around those features where mechanical equipment might be expected to operate, any areas where the proposed features might be expected to cause future changes in the surrounding landscape or flow of water, and any areas used for access routes or staging. The currently-defined APE for the proposed project is shown in Table 7 and is approximately 75 acres in size.

Two archaeological surveys were conducted in order to identify possible historic properties within the APE for the proposed project. NMDGF contracted with SWCA Environmental Consultants to conduct a survey of portions of the project area on USFS, BLM, and State-owned lands, and USACE archaeologists conducted a survey of the portion on USACE-owned land (Figure 3). Ten resources in total were documented within the APE (Table 7). SWCA documented a total of nine sites within or intersecting the project area. These nine include seven prehistoric artifact scatters, one Twentieth-Century railroad grade, and the Abeyta-Trujillo Acequia diversion structure and a segment of the irrigation ditch. Six of the nine sites have been recommended as eligible for listing on the National Register of Historic Places (NRHP). A single resource was documented on USACE land: HCPI 47037, a concrete weir constructed by USGS in 1961 (Table 7). Concurrent with the preparation of the Draft EA, these determinations of eligibility have been coordinated with the landowning agencies and will be submitted to NMSHPO for their consideration and concurrence. Section 106 consultation has been completed for the final EA and FONSI. Consultation documentation is included in Appendix B.

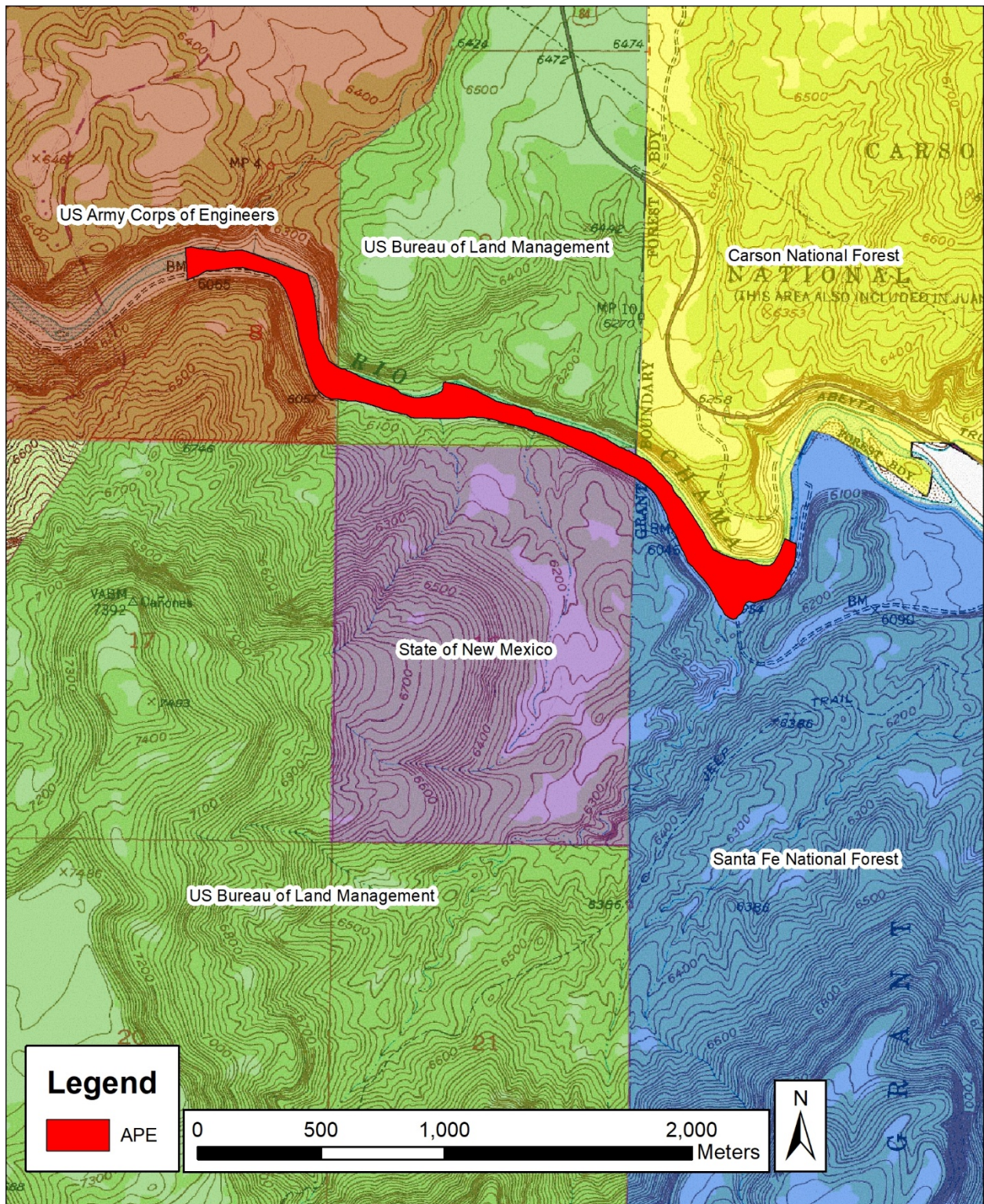


Figure 3 Area of Potential Effects (APE) for the proposed project, and land ownership.

Table 7 Historic Properties Documented within the APE.

Site/Historic Property Number	Site Type	Cultural Affiliation and Age	Land Owner	Eligibility Status	Eligibility Criteria
HCPI 47037	Concrete weir	Recent Historic (1961)	USACE	Not eligible	
LA 51720	Artifact scatter with feature	Unspecified Prehistoric	BLM	Eligible	D
LA 51721	Artifact scatter	Unspecified Prehistoric	BLM	Eligible	D
LA 75570	Railroad grade	Recent Historic (post-AD 1945)	SFNF	Not eligible	
LA 82827 / HCPI 33400	The Abeyta-Trujillo Acequia (diversion and irrigation system)	EuroAmerican/US Territorial; Pre-AD 1870	CNF	Eligible	A, C
LA 193665	Artifact scatter	Unknown Prehistoric	BLM	Not eligible	
LA 193666	Artifact scatter	Middle Archaic (5000-3000 BC)	BLM	Eligible	D
LA 193667	Artifact scatter	Unknown Prehistoric	BLM	Not eligible	
LA 193668	Artifact scatter	Late Archaic (1000 BC – AD 300) and Historic (AD 1821-1912)	CNF	Eligible	A, C, D
LA 193669	Artifact scatter	Unspecified Prehistoric	BLM	Eligible	D

BLM=Bureau of Land Management; CNF = Carson National Forest; SFNF = Santa Fe National Forest

3.10 Hazardous, Toxic, and Radioactive Waste (HTRW)

Due to the low potential of hazardous, toxic, or radioactive waste (HTRW) in the project area, a Phase I Environmental Site Assessment (ESA) was not conducted. If HTRW concerns arise prior to construction, an ESA will be completed following ASTM 2247-02. The results of an ESA will be incorporated into a supplemental EA.

Despite the low risk of encountering HTRW within the proposed project, a site visit was conducted by environmental professionals who regularly conducted ESAs to document the general existing conditions for this project (Appendix E). Solid waste, such as plastic bottles, bags, cups, and glass, was observed in low concentrations along the Rio Chama within the project area. The source waste was either aeolian or by the users of the trail and observation areas. The greatest density of solid was in close proximity to picnicking/wildlife viewing areas. Several hand-dug fire pits were observed adjacent to the river. Ash within may provide a de minimis source of metals (Cerrato et al. 2016) and other contaminants (Smith et al. 2011) if transported into the Rio Chama. Campfires in non-designated areas can also impact the aesthetics and the environment (Reid and Marion 2005). Vehicular traffic near the river along a non-marked two-track road was also observed. The road may provide a source of sediment, metals, and dissolved solids to the Rio Chama following

localized rain events that generate surface water runoff (Grayson et al. 1993, Lane and Sheridan 2002).

3.11 Environmental Justice

Executive Order 12898: Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations (11 February 1994) was designed to focus the attention of Federal agencies on the human health and environmental conditions of minority and low-income communities. It requires Federal agencies to adopt strategies to address environmental justice concerns within the context of agency operations and proposed actions. The 1995 Environmental Protection Agency (EPA) guidance document, Environmental Justice Strategy: Executive Order 12898, defines the approaches by which the EPA will ensure that disproportionately high environmental and/or socioeconomic effects on minority and low-income communities are identified and addressed. Further, it establishes agency-wide goals for all Native Americans with regard to environmental justice issues and concerns. These goals are designed to:

- Focus the attention of federal agencies on human health and general environmental conditions in minority and low-income communities with the goal of achieving environmental justice;
- Foster nondiscrimination in federal programs that could substantially affect human health or the environment; and
- Give minority and low-income communities greater opportunities for public participation on matters relating to human health and safety.

Environmental justice addresses the issue of disproportionate impacts on minority and/or low-income populations. Therefore, the locations of these populations must be known in order to evaluate potential environmental justice issues. For this analysis, populations with a high percentage of people of Hispanic origin, a high percentage of Native Americans, and a high percentage of low-income households or high poverty rates are identified. The locations of these identified populations are used to evaluate Environmental Justice concerns.

4 - FUTURE WITHOUT PROJECT

As discussed in chapter 3, without the project there would likely be little to no effect on regional geology, air quality, ambient noise, aesthetics, hazardous waste, demographics, socioeconomics, and land use.

4.1 Environmental Resources Not Considered in Detail

Initial evaluation of the effects of the project indicated that there would likely be little to no effect on regional geology, air quality, noise, aesthetics, demographics, socioeconomics and land use with the “without project” alternative.

4.2 Climate*

Recent overviews of climate change in the Southwestern United States have been provided (Garfin et al. 2013, NOAA 2013, Melillo et al. 2014), with important syntheses of climate change impacts to New Mexico (OSE 2006; BOR et al. 2013). These sources indicate that observed trends are likely to continue. Models project substantial warming over the 21st Century of 5-7°F by 2100 as compared to late 20th averages; warming may reach as much as 8.5 to 10°F by 2100 under plausible high emissions (large radiative forcing) scenarios. Even with no net changes in total precipitation, warming will affect regional hydrology through changes in the snowpack (Elias et al. 2015). Higher temperatures will delay the date at which precipitation falls as snow in the fall and cause a 4-6 week earlier shift in the date at which precipitation reverts to rain in the spring. The altitude at which a winter snowpack will develop is anticipated to rise. The combination of these trends is an overall reduction in snowpack volume to support ecologically-essential spring runoff flows, as well as reductions in baseflows during the remainder of the year. For the Rio Grande basin above Elephant Butte, declines in snow water equivalence, annual runoff, December-March runoff, and April-July runoff are all anticipated (BOR 2011). Increases in the frequency, intensity, and duration of both droughts and floods are expected (BOR et al. 2013).

Riparian and aquatic ecosystems along the Rio Chama are likely to be affected by changes in stream flow that alter water quantity, seasonal water availability, water quality, and increases in riparian evaporation. Projected reductions in annual maximum monthly flows are likely to reduce the spring runoff hydrograph, and, therefore, reduce the average amount and extent of spring runoff flooding of restoration measures on the floodplain. However, the amount of this projected reduction is small relative to the interannual variability, adding considerable uncertainty to estimates of ecological impacts. Projected impacts to the Middle Rio Grande riparian areas (Friggens et al. 2013) that are likely to be broadly applicable to northern New Mexico riparian areas include:

- Reduced riparian habitat due to decreased stream flows and longer drought;
- Decline in cottonwood gallery forests due to lower flows, more frequent wildfires, disease;
- Loss/reduction of native vegetation and replacement by invasive tree and grass species due to fire and lower water tables, and changes in spring runoff timing/volumes;
- Increasingly arid conditions would favor replacement of grassland and woodland habitats with scrubland, accompanied by reductions in vegetation cover; and

- Increased duration of drought, with increases in droughts lasting 5 years or more and increases in drought intensity.

There would be no change to the regional climate in the future without project.

4.3 Water Resources

Hydrology

The future without project would not change water management or hydrology in the project area.

Water Quality

If the project is not implemented, the potential short-term contribution of sediment to the Rio Chama during and after construction would be eliminated and the long-term water quality would remain unchanged. Nevertheless, water quality could be impacted under the No Action Alternative as a result of changing climate (Langman and Nolan 2005, Vörösmarty et al. 2000, Murdoch et al. 2000, Whitehead et al. 2009, and van Vliet et al. 2013). Lakes and reservoirs are considered sentinels, integrators, and regulators of a changing climate (Williamson et al. 2009). For example, the El Niño Southern Oscillation, reservoir inflows, and reservoir oxygen content series oscillated in common periods and decreasing inflows reduced the oxygen content by 20% in a Mediterranean reservoir (Marcè et al. 2010). Stefan et al. (2001) quantified the potential reduction of habitat for cold and cool water fishes that is likely to become drastically reduced under conditions of atmospheric CO₂ concentration doubling in greater than 200 North American lakes. Other climate-mediated disturbances such as wildfire activity, which has increased in each of the last two decades in the southwestern U.S. (Westerling 2016), and impacted water quality of streams and rivers within the Rio Grande basin (Dahm et al. 2015, Reale et al. 2015, Sherson et al. 2015). Wildfires can also impact the physical, biological, and chemical processes in lake ecosystems, but has been less studied than flowing waters (McCullough et al.). However, the hypolimnetic release may dampen the impacts of a wildfire on water quality immediately downstream of the dam (Dahm et al. 2015).

Although important for recreation, tailwater fisheries such as the Rio Chama below Abiquiu Dam are also a form of thermal pollution (see Dodds and White 2010), differ substantially from the thermal regime of natural river systems (Vanicek and Kramer 1969, Krenkel et al. 1979, Ward and Stanford 1979, Ward 1985) and are often detrimental to native fish species (Neves and Angermeier 1990, Clarkson and Childs 2000). The current operation of Abiquiu Dam will likely result in continued thermal pollution on the Rio Chama downstream and potential impacts to the native fish community. Although, the hypolimnetic releases may reduce thermal impacts from a warming climate (Sherman et al. 2007, Hester and Doyle 2011), but would require coordination (e.g., scheduling of water releases to coincide with peak summer temperatures in the Rio Chama).

Rio Chama Aquatic Habitat

Under the No Action Alternative, there would be no potential improvement to aquatic habitat altered by Abiquiu Dam. The hydrological patterns of flow and water temperature along with the channel morphology would remain unchanged. The Rio Chama downstream from Abiquiu Dam would remain single-thread, gravel-bed channel, with coarse bed-material composed cobbles and boulders.

4.4 Fish and Wildlife

Riverine Fish Community

The aquatic habitat downstream of Abiquiu Dam would be unchanged with minimal low velocity habitat for fish during low winter flows, and few areas to avoid higher velocities during other times of the year. The channel would not have pools or boulders for fish refugial or resting areas.

Terrestrial Wildlife

There would be no changes to terrestrial wildlife or their habitat along the Rio Chama.

Special Status Species

There are no special status species that would benefit from the proposed Rio Chama aquatic habitat project at this time.

4.5 Floodplains and Wetlands

There would be no change to wetland habitat area. Loss of wetland habitat also would continue due to the reduction of inundation events.

4.6 Vegetation Communities

The Rio Chama corridor vegetation downstream from Abiquiu Dam would remain unchanged from the sparse riparian and upland trees and plants.

4.7 Noxious Weeds and Invasive Species

The few invasive tree species of concern, including salt cedar, Russian olive, and Siberian Elm, would not be removed. There would be no change to the invasive tree species in the project area.

4.8 Recreation

Recreational fishing below Abiquiu Dam, and other activities, including camping, walking, biking, hiking, wildlife viewing, and picnicking, are anticipated to continue at recent levels without the project.

4.9 Cultural Resources

Cultural and historic resources identified within the project area include ten resources as described in Section 3.9, including seven prehistoric artifact scatters, one Twentieth-Century railroad grade, one Twentieth-Century concrete weir, and the Abeyta-Trujillo Acequia diversion structure and a segment of the irrigation ditch. Six of the ten sites have been recommended as eligible for listing on the NRHP. None of these resources would be affected in any way in the absence of the proposed USACE project; in other words, the “future without project” condition of these resources would remain approximately constant and consistent with the current conditions.

4.10 Hazardous, Toxic, and Radioactive Waste (HTRW)

Given the future land use and enforcement within the project area, the current hazardous, toxic, and radiological waste is unlikely to change significantly in the future. Existing household waste

would remain and accumulate over time, and illegal dumping would likely continue in high-use and unrestricted areas.

4.11 Environmental Justice

The future without project would not result in any adverse environmental or socioeconomic effects on minority and low-income communities living near the project area.

4.12 Cumulative Impacts

There would be no cumulative impacts under the future without project alternative different from the existing conditions.

5 - FUTURE WITH PROJECT

As discussed in Section 3, with the Future with Project Alternative, there would likely be little to no effect on regional geology, air quality, ambient noise, aesthetics, hazardous waste, demographics, socioeconomics, and land use.

5.1 Climate*

There would be no change to the regional climate in the future with project. The rate of localized warming may change water operations at Abiquiu Dam reducing winter flows. The availability of deeper pool habitat would provide refugia for fish at lower flows.

5.2 Water Resources

Hydrology

The future with project would not change water management or hydrology in the project area. The balanced cut/fill approach for constructing the proposed features is designed to maintain current safe channel capacity during flood control operations, and produce a narrower, deeper channel at the lowest flows.

Water Quality

Short-term soil disturbance would result from the proposed actions (e.g., plantings). Denuded soils would be susceptible to erosion by wind and water. To minimize the discharge of pollutants including sediment in stormwater, the selected contractor and local sponsor will apply for coverage under the National Pollutant Discharge Elimination System (NPDES) Construction General Permit (CGP). A Storm Water Pollution Prevention Plan (SWPPP) will be completed prior to earth disturbing activities and followed until coverage under the CGP is terminated. Short-term sediment disturbance would also result from the proposed actions (e.g., excavation of in-stream features, boulder placement, and rock habitat). To minimize the transport of soil and sediment from the project areas to the Rio Chama, down-gradient sediment controls (e.g., buffers, perimeter controls, exit controls, dewatering, and turbidity curtains) that control discharges from the initial activities that disturb soil or sediment will be designed, installed, and maintained until coverage under the CGP is terminated. During the excavation of water or near-water features the connections adjacent to the main channel of the Rio Chama would be completed last to provide a physical buffer and serve as perimeter control. Per the CGP, disturbed areas would be stabilized, with the exception of features that were designed to remain unvegetated or unstabilized (i.e., rip-rap, gravel habitat features). All stormwater controls at locations designed to remain unvegetated or unstabilized would be removed immediately following construction. Potential short-term contributions of sediment to the Rio Chama are possible during the removal of the physical buffers and following construction of water or near-water features.

Mechanical equipment, such as excavators or backhoes, could potentially leak oil, fuel, or hydraulic fluid, which could reach the Rio Grande and affect surface water quality. Spills of such materials could similarly contaminate surface water in the river or riverside drain. The SWPPP will identify locations where potential spills and leaks could occur that could contribute pollutants to stormwater discharges. Pollution prevention requirements (Section 2.3 of the CGP) including spill prevention and response procedures will be documented in the SWPPP and implemented until coverage under the CGP is terminated.

Section 404 of the Clean Water Act requires analysis under the EPA’s 404(b)(1) Guidelines if USACE proposed to discharge fill material into a water or wetlands of the United States. The 404(b)(1) analysis will be completed by NMDGF for the Nationwide Permit 27 (Aquatic Habitat Restoration) for the proposed restoration measures listed above. All conditions under Nationwide Permit 27 would be adhered to during construction. State of New Mexico Section 401 Water Quality Certification is also required. NMED has provided conditional certification for USACE’s 2017 Nationwide Permits (<https://www.env.nm.gov/swqb/404/2017NWPcert.pdf>). All applicable Best Management Practices (BMPs) provided by NMED will be included in project construction plans and specifications. USACE and non-federal sponsors will ensure the terms and conditions of the Section 401 permit are followed for the duration of construction.

There would be no change to long-term water quality within the reach if the project is implemented. Climate-mediated impacts to water quality (Section 4.2.2) would remain if the project is implemented.

Rio Chama Aquatic Habitat

Under the Future with Project Alternative, there would be temporary construction effects on the gravel-cobble substrate producing an increase in the quality of benthic aquatic habitat for sport and native fish along with aquatic insects and macro-invertebrates that comprise their food (Table 8). Reduced sediment on the cobble-gravel substrate and additional leaf litter from riparian trees would increase habitat quality for aquatic macro-invertebrates. Native riparian plants would benefit from supplemental vegetation plantings along the channel.

Table 8 Summary of proposed aquatic habitat features.

Habitat Feature	Approximate Area
River channel (existing)	36 acres(ac)
In-channel pools	2.25 ac
Woody debris	67 features providing 0.04 ac cover
Boulders	1044 features providing 0.2 ac cover
Other features	0.74 ac

5.3 Fish and Wildlife

Riverine Fish Community

Under the Future with Project alternative, the excavated pools, boulders and deflector structures would increase the range of fish habitat. The lower water velocity in the pools, and downstream of the boulders and deflector structures provides resting areas for fish. The reduced channel area at lower flows is expected to increase fine sediment transport improving the condition of spawning gravels and cobble habitats (for smaller fish). Increasing the adjacent bankline riparian vegetation would increase shading and organic material inputs to the Rio Chama. The combined increased bank vegetation and slow water refugia would increase habitat quality for the extant Rio Grande Chub population.

There would be a temporary effect on the Brown Trout population due to dewatering and sediment displacement during their spawning season and subsequent incubation period. The modified channel profile would result in a narrower and deeper thalweg. The narrower thalweg would increase the long term expectation of improved spawning success by reducing the probability of dewatering during winter low flow. Anticipated increase in sediment transport would improve the condition of spawning gravels (trout) and cobble habitats (for smaller fish). Improved bank vegetation and slow water refugia would be important to extant Rio Grande Chub population, increasing habitat quality for this species.

Terrestrial Wildlife

Under the Future with Project alternative, construction would occur from November through February, outside the breeding season for migratory birds. Overwintering migratory birds using the area would be able to move away from construction to avoid any disturbance. The effects of construction would be minor for overwintering birds, while the increase of riparian habitat would benefit birds that breed in the area during the spring and summer.

The formation of bank attached gravel bars along the margins of the Rio Chama would benefit terrestrial wildlife. The gravel bars would provide a gradual transition from the river banks to the water at lower flows. Increasing riparian habitat would provide additional food, cover, and structure for terrestrial wildlife. The proposed project would benefit terrestrial wildlife.

Special Status Species

There are no special status wildlife species that would benefit from the proposed Rio Chama aquatic habitat project at this time.

5.4 Floodplains and Wetlands

Existing delineated wetlands would be avoided to the maximum extent possible during construction. The existing wetland habitat would benefit terrestrial, amphibious, and aquatic animals. No wetlands would be created or modified until a water right is available to offset depletions.

5.5 Vegetation Communities

The Rio Chama corridor vegetation downstream from Abiquiu Dam would remain unchanged from the sparse riparian and upland trees and plants.

5.6 Noxious Weeds and Invasive Species

Invasive tree species including salt cedar, Russian olive, and Siberian Elm within the construction area would be removed from the construction footprint for habitat features. Construction BMPs include documented seed sourcing and construction equipment cleaning prior to arrival at staging areas to prevent introduction of noxious weeds and other invasive plant species.

5.7 Recreation

The effects of this project are expected to include better river access, with increased capability to meet public demand for sport fishing. Increasing the area of pools would provide more habitat to support an overall trout density of 400 trout/acre in the Rio Chama below Abiquiu Dam. It would improve the quality of the fishing experience of the anglers using the area, possibly leading to an increase in angler visits and duration of use. Improvements to both terrestrial and aquatic habitat

may also result in increased visits for camping, walking, biking, hiking, wildlife viewing, water sports, and picnicking.

5.8 Cultural Resources

The proposed project includes a wide variety of proposed measures, all of which would be constructed within the existing river channel. Three primary sources of potential impacts to these resources have been considered: direct impacts from construction; indirect impacts from potential changes in flow regime; and potential impacts from increased recreational use of the area. These are each discussed below.

Construction

The proposed project has been designed to avoid placement of any restoration measures within any of these sites, or in any area that might potentially impact these sites. The majority of the proposed restoration measures would be constructed within the active river channel itself, and would not directly impinge on any documented site.

During project planning, one possible restoration measure that was considered was the replacement of the diversion for the Abeyta-Trujillo Acequia. The Acequia is a historic property eligible for listing on the NRHP under criteria A (association with events that have made a significant contribution to broad patterns of our history, namely the history of agriculture in the Chama Valley and New Mexico) and C (embodying the distinctive characteristics of a type, namely traditional acequias). While this option will continue to be considered for future implementation, it is not currently part of the planned project. If, pending further study, alteration or replacement of the diversion is selected for a future phase of the project, Section 106 consultation would be completed, determinations of effect would be made, and any potential adverse effects to the acequia would be resolved before any work impacting the acequia would begin.

Staging will take place in already-developed areas outside of archaeological sites, and vehicle access will occur mostly using existing roads. Pathways for vehicle and equipment access to the channel for construction work will be selected to avoid all documented cultural resources.

Changes in water flow

The primary way that changes in water flow might impact most of these sites would be through affecting the stability or rate of bank erosion, or by increasing water levels beyond their current range of typical elevations. While many of the proposed measures would create small-scale local changes in water flow direction and speed, none of these are anticipated to lead to increased bank erosion or instability. By directing flow more toward the center of the channel, measures like construction of gravel bars and small rock deflectors may have the additional benefit of reducing bank erosion and thereby decreasing erosional risk to sites. No impacts on the integrity or function of the Abeyta-Trujillo Acequia are anticipated. No changes in flow regime are anticipated downstream of the project area.

Recreation

While one of the purposes of the proposed project is to enhance opportunities for recreation, especially fishing, any likely increases in recreational use are not expected to adversely affect these sites. The entire project area has been open to recreation for many years, and the proposed

enhancements should not substantially change the nature or range of recreational activities in the area. Increases in recreational use have the potential to increase foot traffic across these sites, but it is not expected that this would introduce substantially new or adverse impacts to them.

Given the above information, USACE has determined that the proposed project would have **no adverse effect** to historic properties from the proposed project. Section 106 consultation is ongoing; this determination was submitted to NMSHPO for their review and concurrence on August 14, 2019, and Section 106 consultation is ongoing with Tribes and with the Abeyta-Trujillo Acequia. NMSHPO concurrence was received on September 3, 2019.

5.9 Hazardous, Toxic, and Radioactive Waste (HTRW)

Given the proposed action, and no identified HTRW concerns within the project area, there are no anticipated changes to HTRW as result of this proposed project. If HTRW is encountered during construction, the Contractor will halt work and contact USACE. USACE and non-federal partners will verify the Contractor's claim and inform the local sponsor of the issue. Per Engineering Regulation (ER) 1165-2-132, for cost-shared projects such as the proposed, the local sponsor shall be responsible for ensuring that the development and execution of Federal, State, and/or Locally required HTRW response actions are accomplished at 100% non-project cost. No cost sharing credit will be given for the cost of response actions.

5.10 Environmental Justice

Implementation of the proposed project would improve habitat quality in the project area. The proposed project would increase recreational opportunities for local minority and low-income communities, but not result in any adverse environmental or socioeconomic effects on minority and low-income communities living near the project area.

5.11 Cumulative Impacts

The project proposed by NMDGF in cooperation with USACE, BLM, USFS, FWS, and the NMLO would improve about 58.7 acres of aquatic habitat through 2.7 miles of lands managed by USACE, BLM, USFS, and the NMLO (Figure 2). The instream aquatic habitat features for trout and other fish species were designed by Riverbend Engineering based on techniques described in Cramer (2012) and the FISRWG (1998). Proposed features are designed to provide several types of low velocity instream habitat for trout and other fish species at discharges between 50 and 1,800 cfs (USACE 1995). Features would include rock and wood sills, pools, rock grade control structures, rock habitat structures, rock deflectors, and riparian vegetation.

The large rock riffle upstream of USGS weir would be excavated and the rocks redistributed into a larger upstream grade control structure (GCS)/riffle for improving upstream fish passage. The GCS would be grouted to increase structure stability at higher flows. Rock habitat structures and deflectors would provide hydraulic roughness, habitat diversity, and velocity refuge for flows from 50 to 1,800 cfs throughout the project area for fish.

Pools are proposed for construction to create additional velocity refuge for fish. Placement of excavated clean alluvial substrate is proposed along the margins of the channel to form shallow bank attached bars that incrementally increase water depth within the channel, with an increase in water velocity at lower flow volumes. The balanced cut-fill of substrate materials would maintain

safe channel capacity (flow) in the project reach. Planting with native riparian vegetation along the bankline would contribute to bank stability.

All BMPs (e.g., refueling outside of riparian areas, sediment control devices deployed, minimizing destruction to native vegetation, etc.) will be used during construction. Construction would be scheduled during the non-irrigation season (November 1 to February 28), and coordinated with the BOR water deliveries to take advantage of consistent, lower winter flow downstream of Abiquiu Dam outside the breeding season for migratory birds that may use the project area. All equipment will utilize existing roads where possible. Access to river channel will be restricted to a few locations to reduce impacts to bank erosion. All immediate access points to the river channel will be temporary and only used during construction and will be reclaimed to pre-existing conditions post construction. Portions of the equipment access areas will be improved to control vehicular access.

5.12 Best Management Measures / Environmental Commitments

The following is a list of conservation measures and stipulations that would be complied with during construction of the proposed action to protect water resources and endangered species habitat from degradation:

1. Aquatic habitat construction would occur during the non-irrigation season (November through February). Adjacent terrestrial habitat construction may occur November through April 15th.
2. Work in the project area will not occur during migratory bird breeding season (approximately April 15 to August 15). Vegetation removal and clearing-and-grubbing activities would only be performed between September 1 and April 15.
3. Work would be performed below the elevation of the ordinary high water mark only during low-flow periods. No erodible fill materials would be placed below the elevation of the ordinary high water mark.
4. Cleaning of all equipment to prevent the spread of invasive species is required prior to entering the project area (National Invasive Species Council 2008).
5. All construction equipment and large trucks would limit engine noise levels to 60 dB or less.
6. Fuels, lubricants, hydraulic fluids and other petrochemicals would be stored outside the 1%-chance floodplain, if practical. At the least, staging and fueling areas would be located outside of the floodway, landward of the existing spoil bank alignment, and at least 100 feet from any surface water or channel. All storage areas would include spill prevention and containment features.
7. Construction equipment would be inspected daily to ensure that no leaks or discharges of lubricants, hydraulic fluids or fuels occur in the aquatic or riparian ecosystem. Any petroleum or chemical spills would be contained and removed, including any contaminated soil.
8. Equipment operators will be required to carry an oil spill kit or spill blanket at all times and must be knowledgeable in the use of spill containment equipment. The contractor will develop a spill contingency plan prior to initiation of construction. The plan will identify where storage and dispensing fuels, lubricants, hydraulic fluids, and other petrochemicals will be located outside the active channel at 1,800 cfs. The contractor will inspect construction equipment daily for petrochemical leaks. All spills will be contained

immediately and all contaminated media will be disposed of following the Resource Conservation and Recovery Act. If a reportable quantity is released, the contractor will notify NMED and U.S. EPA as soon as possible after learning of a discharge, but in no event more than twenty-four (24) hours thereafter.

9. The staging areas will be located outside the active channel at 1,800 cfs. The construction equipment will be parked outside the active channel at 1,800 cfs during periods of inactivity for an extended period or based on weather conditions. The equipment operators will place drip-pans underneath vehicles at the end of each work day.
10. All work and staging areas will be limited to the minimum amount of area required. Existing roads and right-of-ways and staging areas will be used to the greatest extent practicable to transport equipment and construction materials to the project site, and described in the USACE's project description. Designated areas for vehicle turn around will be provided and maneuvering conducted so as to protect cultural resources and riparian areas from unnecessary damage.
11. Cultural sites, riparian areas, and mature cottonwood trees will be protected from damage during clearing of non-native species or other construction activities using fencing, or other appropriate materials.
12. Local genetic stock will be used wherever possible in the native plant species establishment throughout the riparian area.
13. Only uncontaminated earth or crushed rock for backfills would be used.
14. Silt curtains, cofferdams, dikes, straw bales and other suitable erosion control measures would be employed to prevent sediment-laden runoff or contaminants from entering any watercourse.
15. Stormwater controls will be installed and maintained during excavation activities as appropriate for the NPDES Construction General Permit and Stormwater Pollution Prevention Plan. Silt fence will be installed adjacent to the riverbank where needed for stormwater control.

6 - CONCLUSIONS AND SUMMARY

The project proposed by NMDGF in cooperation with USACE, BLM, USFS, FWS, and the NMLO would have temporary construction effects to brown trout spawning and benthic aquatic habitat producing improved long-term habitat quality. The proposed project would increase low velocity habitat for trout, native fish species, and macro-invertebrates. Improving trout habitat would increase recreation opportunities for local and regional fishermen and women.

The proposed project would not change water management or hydrology in the project area. The balanced cut/fill approach for constructing the proposed features is designed to maintain current safe channel capacity during flood control operations, and produce a narrower, deeper channel at the lowest flows.

Best Management Practices shall be implemented during construction to avoid adverse effects to hydrology, water quality, native plants, terrestrial wildlife, cultural resources, and recreation. Invasive tree species would be removed from the construction footprint for habitat features. Disturbed terrestrial areas will be re-vegetated with native trees, shrubs, and wetland plants.

The proposed project would not affect regional geology, climate, hydrology, water management, air quality, noise, aesthetics, land use, local demographics, socioeconomics, and environmental justice. There would be no anticipated concerns with HTRW in the project area.

7 - PREPARATION, CONSULTATION, AND COORDINATION

7.1 Preparation

This environmental assessment was prepared by the USACE, Albuquerque District. Personnel primarily responsible for preparation include:

- Michael D. Porter, Fishery Biologist
- Jonathan Van Hoose, Archaeologist
- Justin Reale, Environmental Engineering

7.2 Quality Control

This Draft EA has been reviewed for quality control purposes. Reviewers include:

- Jessica Gisler, Archaeologist
- Summer Schultz, Biologist

7.3 Consultation and Coordination

NMDGF has coordination with USACE Regulatory Branch and NMED Surface Water Quality Bureau on CWA requirements. USACE has coordinated with NMSHPO on cultural resources.

7.4 Public Involvement

Scoping Letter

Letters were sent to the organizations and agencies below on November 15, 2018. Responses to the Scoping Letter are included in Appendix D.

Non-Governmental Organizations	New Mexico State Agencies
Audubon New Mexico	New Mexico Department of Agriculture
Center for Biological Diversity	New Mexico Department of Game and Fish
Defenders of Wildlife	New Mexico Energy, Minerals and Natural Resources Department
East Rio Arriba	New Mexico Environment Department
Ghost Ranch	New Mexico Interstate Stream Commission
Land of Enchantment Guides	New Mexico Office of State Engineer
Los Rios River Runners	
New Mexico Trout	
New Mexico Wilderness Alliance	Federal Agencies
Rio Arriba Concerned Citizens	U.S. Bureau of Land Management
Rio Arriba County	U.S. Bureau of Reclamation
Rio Chama Acequias Association	U.S. Environmental Protection Agency
Rio Grande Restoration	U.S. Fish and Wildlife Service
The Reel Life	U.S. Forest Service
Trout Unlimited	U.S. Geological Survey
Wild Watershed	USDA Natural Resources Conservation Service
WildEarth Guardians	

Summary of the Public Review and Comments

The Notice of Availability was sent to agencies and stakeholders for public review from August 16 to September 6, 2019. The public review was extended to September 19th by publication of the Notice of Availability in the Albuquerque Journal and the Santa Fe New Mexican. Comments received from the public review of the Draft Environmental Assessment are included in Appendix D.

The Draft Environmental Assessment was made available online at: <http://www.spa.usace.army.mil/Missions/Environmental/EnvironmentalComplianceDocuments/EnvironmentalAssessmentsFONSI.aspx>.

The public can also request a copy of the Draft Environmental Assessment from Michael Porter at Michael.D.Porter@usace.army.mil or 505-342-3264.

The NMED provided useful comments regarding air quality standards, ground and surface water protection, and solid waste management to protect the environment. Their comments will be incorporated into the appropriate documents for permitting.

The OSE and NMISC commented on water depletions by proposed wetland features. The proposed wetland features were removed from the proposed action until appropriate offsets can be obtained. Additional information regarding the role of the OSE and the NMISC was included during revision of the Environmental Assessment. A description of OSE and NMISC responsibilities was added to Section 1.3 Regulatory Compliance. A paragraph was added under Section 2.1 Proposed Action to clarify how limiting habitat features to the active channel would not result in increasing depletions. The discussion describes how reducing the wetted surface and water surface areas relative to volume provide more efficient water transport at flow less than 100 cfs compared to a wide, shallow wetted channel. Based on the concerns raised by OSE/NMISC, the proposed construction of depressional wetlands has been relocated from the area described in the Section 2.1 Proposed Action to the area described in Section 2.3 Alternative Actions Evaluated. A description of the limits of the Rio Grande Compact was added to the hydrology section under Section 3.3 Water Resources.

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Appendix A
RIO ARRIBA COUNTY WILDLIFE SPECIES OF CONCERN
US FOREST SERVICE
BUREAU OF LAND MANAGEMENT
BIOLOGICAL ASSESSMENT

Appendix B
STATE HISTORIC PRESERVATION OFFICE
CORRESPONDENCE

Appendix C

Project Drawings

Appendix D
PUBLIC INVOLVEMENT

Appendix E

Hazardous, Toxic, and Radioactive Waste

Appendix F
404(B)(1) EVALUATION

2670 Threatened, Endangered
& Sensitive Species

**BIOLOGICAL ASSESSEMENT FOR
RIO CHAMA AQUATIC HABITAT
PROJECT**

ESPAÑOLA RANGER DISTRICT
SANTA FE NATIONAL FOREST
RIO ARRIBA COUNTY, NEW MEXICO

EL RITO RANGER DISTRICT
CARSON NATIONAL FOREST
RIO ARRIBA COUNTY, NEW MEXICO

BUREAU OF LAND MANAGEMENT
TAOS FIELD OFFICE
RIO ARRIBA COUNTY, NEW MEXICO

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List of Acronyms

APE	Area of potential effect
BA	Biological Assessment
BLM	U.S. Bureau of Land Management
BOR	U.S. Bureau of Reclamation
CEQ	Council on Environmental Quality
CFR	Code of Federal Regulations
cfs	Cubic feet per second referring to stream flow
CWA	Clean Water Act
EPA	U.S. Environmental Protection Agency
ESA	Endangered Species Act
FWS	U.S. Fish and Wildlife Service
HTRW	Hazardous, toxic, and radioactive waste
IPaC	Information, Planning, and Conservation system
ITA	Indian Trust Asset
MRG	Middle Rio Grande
NEPA	National Environmental Policy Act
NHPA	National Historic Preservation Act
NMED	New Mexico Environment Department
NMLO	New Mexico Land Office
NRHP	National Register of Historic Places
SHPO	State Historic Preservation Office/Officer
USACE	U.S. Army Corps of Engineers
USFS	U.S. Forest Service
USGS	U.S. Geological Survey
WSEL	Water surface elevation

**BIOLOGICAL ASSESSMENT
FOR
RIO CHAMA AQUATIC HABITAT**

**ESPAÑOLA RANGER DISTRICT
SANTA FE NATIONAL FOREST
RIO ARRIBA COUNTY, NEW MEXICO**

**EL RITO RANGER DISTRICT
CARSON NATIONAL FOREST
RIO ARRIBA COUNTY, NEW MEXICO**

**BUREAU OF LAND MANAGEMENT
TAOS FIELD OFFICE
RIO ARRIBA COUNTY, NEW MEXICO**

Introduction:

This Biological Assessment (BA) addresses the potential effects of the proposed action on all proposed, endangered and threatened fish, wildlife and plant species known or suspected to occur within the area of influence. The purpose of this BA is to evaluate these species and their habitat, and to ensure that this information is available to the decision maker prior to making land management decisions.

In accordance with the Endangered Species Act Section 7 and FSM 2671.4, the Santa Fe and Carson National Forests are required to review U. S. Fish and Wildlife Service's IPAC system (USDI Fish and Wildlife Service 2019) regarding the determination of adverse effects on threatened, endangered or proposed species.

The findings of this BA are based on the best data and scientific information available at the time of preparation. If new information reveals effects that may impact these species or their habitats in a manner or to an extent not considered in this evaluation; or if a new species is listed or habitat identified that may be affected by the action, a revised BA should be prepared or amended.

Description of Project:

The proposed features are designed to provide fish with low velocity refuge habitat at discharges between 50 and 1800 cfs (USACE 1995). Several types of features are proposed to create different types of fish habitat. The features include rock and wood sills, pools, rock grade control structures, rock habitat structures, rock deflectors, and riparian vegetation. Excavated substrate from pools would be redistributed along channel margins creating or expanding existing bank attached bars. The acequia diversion structure at the downstream end of the project is proposed to be removed and replaced with a similar structure or modify the existing structure to allow fish and boater passage. Two new boater access improvement areas would be created. The bed materials for the proposed features would require a determination of the size, gradation, and volume of bed material (Cramer 2012). An evaluation of the appropriate sized materials including channel slope, substrate size and gradation, and other hydraulic variables for each of the feature types would be conducted to ensure stability following construction.

Excavate large rock riffle upstream of US Geological Survey (USGS) weir and redistribute rocks into a larger upstream grade control structure (GCS)/riffle. The new GCS would allow upstream fish passage

and downstream boat passage. The GCS would be grouted to increase structure stability at higher flows. River gravel and crushed rock would be placed to form the boat access ramp from the access road to the river.

Pools are proposed for construction to create additional velocity refuge for fish (Cramer 2012). Placement of clean alluvial substrate is proposed along the margins of the channel to form shallow bank attached bars that incrementally increase water depth within the channel, with an increase in water velocity. The balanced cut-fill of substrate materials would maintain safe channel capacity (flow) in the project reach.

Rock habitat structures and deflectors are proposed to provide hydraulic roughness, habitat diversity, and velocity refuge for fish (Cramer 2012). The boulder rock structures would be partially buried within the bed to increase stability and maintain their location. The rock structures are distributed throughout the project area to provide velocity diversity under the range of flow conditions (100 cfs to 1800 cfs).

The instream aquatic habitat features for trout and other fish species were designed by Riverbend Engineering based on techniques described in Cramer (2012) and the Federal Interagency Stream Restoration Working Group (FISRWG, 1998). The proposed project is about 61.7 acres through 2.7 miles of lands managed by US Army Corps of Engineers (USACE), Bureau of Land Management (BLM), US Forest Service (USFS), and the New Mexico Land Office (NMLO).

Planting with native riparian vegetation along the bankline is proposed in selected areas primarily for allochthonous leaf litter inputs into the stream to support aquatic insects (Cramer 2012). The riparian vegetation would contribute to bank stability, while the native wetland species would increase habitat diversity.

Remove topsoil from existing wetland to stockpile location, excavate substrate to lower elevation, place and grade topsoil to form depressional (groundwater) wetland. Plant with obligate wetland species (plugs), riparian shrubs and trees (willows and cottonwoods), and seed with appropriate wetland species.

The existing acequia diversion structure would be removed or modified with materials stockpiled for the replacement structure. Large rock and stockpiled materials would be placed upstream to form the acequia diversion structure. The diversion structure would be grouted to increase stability at higher flows. The headbox would be replaced and the irrigation canal would be aligned and graded.

Boater access improvements would be made at two locations, one in the upper project reach adjacent to the exiting USACE recreational area and another in the lower project reach on USFS property. Access improvements would include constructing sloped concrete boat ramps (or compacted gravel), stream bank grading for vehicle access, and installing rip rap for structure protection. Boat ramps would be designed to accommodate access at most flows.

Construction of the proposed aquatic habitat features would require partial dewatering of the channel during construction (Cramer 2012). Construction would be scheduled during the non-irrigation season (November 1 to February 28), and coordinated with the U.S. Bureau of Reclamation water deliveries to take advantage of consistent, lower winter flow downstream of Abiquiu Dam. The construction schedule is outside the irrigation season to support completion of the diversion structure for continued operation of the acequia, and outside breeding season for migratory birds that may use the project area.

In-channel work and habitat improvement structures will be constructed by utilizing heavy tracked and wheeled equipment. Excavators and back hoe loaders may be used for channel shaping and constructing large boulder habitat structures. Articulated dump trucks and loaders may be used to transport sediment for channel shaping and point bar construction. Small graders and dozers may be used for depressional wetland and point bar grading and shaping. End dump trucks may be used to transport large boulders

and other rock materials. Wheeled water tank trucks may be used for dust control. Graders and dozers may be used for improving road and equipment access points. Small loaders, such as wheeled and tracked skid steers, may be used for grading smaller areas, equipment transportation, and tree replanting. Off-Highway Vehicles (OHVs) may be used for watering and transporting of seeding and tree plantings. Tractors and soil disk implements may be used for reseeding and topsoil placement.

All equipment will utilize existing roads where possible. Access to river channel will be restricted to a few locations to reduce impacts to bank erosion. All access points will be temporary and only used during construction and will be reclaimed to pre-existing conditions post construction. All Best Management Practices (e.g., refueling outside of riparian areas, sediment control devices deployed, minimizing destruction to native vegetation, etc.) will be used during construction.

The purpose and need for this proposal is to:

To increase the diversity and quality of riparian and aquatic habitat for fish and invertebrates in a two mile reach of the Rio Chama on public lands downstream from Abiquiu Dam near Abiquiu, NM. Riparian restoration will include removal of invasive tree species.

Legal Location:

Upstream 36°14'22.63 N, 106°25'16.27 W
Downstream 36°12'23.08 N, 106°20'42.64 W
Please see attached map.

Elevation/Range of Elevation: 6,040.00 feet above NGVD29

Description of Analysis Area:

The analysis area is the Rio Chama from Abiquiu Dam downstream approximately 2.7 miles, through USACE, NMLO, BLM, and Santa Fe and Carson National Forests lands. The project would occur in and adjacent to the Rio Chama. The adjacent terrestrial habitat is riparian and pinyon-juniper habitat.

Description of Habitat in Vicinity of Project (on site):

The terrestrial habitat consists of pinyon-juniper on the upslope and riparian vegetation along the Rio Chama. The aquatic habitat consists primarily of riffle and run habitat with few pools or other structure for fish and aquatic invertebrates.

KNOWN OCCURRENCES AND HABITAT

Threatened and endangered (T&E) species are managed under the authority of the Federal Endangered Species Act (ESA), (PL 93-205, as amended) and the National Forest Management Act (PL 94-588). The ESA requires federal agencies to ensure that all action, which they “authorize, fund, or carry out”, are not likely to jeopardize the continued existence of any T&E species. The US Fish and Wildlife Service list of federally listed species (Table 1, USFWS April 4, 2019), Ranger District and Regional Forest (US Forest Service 2013) records were reviewed to develop the list of species habitats, which occur or may occur within the project area. Seven species of migratory birds were identified as probably using the project area. Six of the seven species are unlikely to occur during the winter construction season. Bald Eagles may be present during the construction season.

Table 1. Federally Threatened or Endangered Species List for project area (Fish and Wildlife Service 2019). No suitable habitat for these species occurs within the project area. Construction will occur between November and February during the winter lower flow period.

Common Name	Scientific Name	Status	IPaC	Proposed action
Canada Lynx	<i>Lynx canadensis</i>	T	Y	No suitable habitat, no effect.
Canada Lynx Critical Habitat			Outside	CL require large boreal forest with sufficient high quality snowshoe hare habitat, and ensure that lynx may move freely among patches of suitable habitat among subpopulations of lynx. Since there is no known occurrence of CL, and no critical habitat in the project area, there will be no effect to the CL or its habitat. No further analysis.
New Mexico Meadow Jumping Mouse	<i>Zapus hudsonius luteus</i>	E	Y	No suitable habitat, no effect.
New Mexico Meadow Jumping Mouse Critical Habitat			Outside	NMMJM is a riparian obligate species and is rarely found away from water. It requires tall grasses for hiding cover near perennial water courses. Since there is no known occurrence of the NMMJM and there is no critical habitat for the NMMJM in the project area, there will be no effect to the NMMJM or its habitat. No further analysis.
Least Tern	<i>Sterna antillarum</i>	E	Y	No Effect
Least Tern Critical Habitat			Outside	LT habitat consists of vegetation-free sand beaches. There is no established LT critical habitat in the project area. There will be no effect to LT. No further analysis.
Mexican Spotted Owl	<i>Strix occidentalis lucida</i>	T	Y	No suitable habitat, construction (November-February) outside breeding season, no effect.
Mexican Spotted Owl Critical Habitat			Outside	MSO habitat consists of mixed conifer habitat on steep slopes with large, mature trees present, downed logs and understory vegetation present for prey species. There are no established MSO PACs or MSO critical habitat in the area. Since there are no known occurrences, no MSO PACs or suitable habitat, there will be No Effect to MSO or their habitat. No further analysis.
Southwestern Willow Flycatcher	<i>Empidonax trailii extimus</i>	E	Y	No suitable habitat, construction (November-February) outside breeding season, no effect.
Southwestern Willow Flycatcher Critical Habitat			Outside	The southwestern willow flycatcher requires extensive riparian habitat with large groups/clumps of contiguous vegetation such as willows. Since there are no known occurrences of the flycatcher or there is no critical habitat within the project area there will be no effects to the flycatcher or its habitat. No further analysis.
Western Yellow-Billed Cuckoo	<i>Coccyzus americanus occidentalis</i>	T	Y	No suitable habitat, construction (November-February) outside breeding season, no effect.
Western Yellow-Billed Cuckoo Critical Habitat			Outside	Cuckoo habitat consists of deciduous riparian woodland, especially including dense stands of cottonwood and willow. Since there is no critical habitat within the project area there will be no effect to the cuckoo or its habitat. No further analysis.
Jemez Mountains Salamander	<i>Plethodon neomexicanus</i>	E	Y	No suitable habitat, no effect.
Jemez Mountains Salamander Critical Habitat			Outside	JMS inhabits higher elevations mixed-conifer forest consisting of fir, spruce, pine, maple, and aspen. Since there is no known occurrence of the JMS and there is no critical habitat for the JMS in the project area, there will be no effect to the JMS or its habitat. No further analysis.

DIRECT AND INDIRECT EFFECTS- THREATENED AND ENDANGERED SPECIES

The area where the proposed activity will occur will **not affect any species described above, their habitats or critical habitat**. There is no habitat or species occurrences/or they are not known to occur within the planning area for the species listed above.

CUMULATIVE EFFECTS- THREATENED AND ENDANGERED SPECIES

Cumulative effects are analyzed at planning area scale; the proposed project will have no immediate or cumulative effects on listed Threatened and Endangered Species or Critical Habitat on USFS, BLM, USACE, and SLO lands for the following reasons:

Canada Lynx, New Mexico Meadow Jumping Mouse, Least Ten, Mexican Spotted Owls, Southwestern Willow Flycatcher, Western Yellow-Billed Cuckoo, and Jemez Mountains Salamander do not occur, do not have critical habitat or any suitable habitat within the larger project area (including the USFS, BLM, USACE, or SLO sections). The temporally ephemeral effects of aquatic habitat construction are limited to the project area outside the breeding season for these species, and do not extend to adjacent lands. Therefore adverse cumulative effects for these species would not occur in the project area footprint or the adjacent area.

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**BIOLOGICAL EVALUATION FOR THE
RIO CHAMA AQUATIC HABITAT**

**ESPAÑOLA RANGER DISTRICT
SANTA FE NATIONAL FOREST
RIO ARRIBA COUNTY, NEW MEXICO**

**EL RITO RANGER DISTRICT
CARSON NATIONAL FOREST
RIO ARRIBA COUNTY, NEW MEXICO**

**BUREAU OF LAND MANAGEMENT
TAOS FIELD OFFICE
RIO ARRIBA COUNTY, NEW MEXICO**

Introduction:

The purpose of this Biological Evaluation (BE) is to analyze the proposed activities associated with the Rio Chama Aquatic Habitat Project, and to determine the effects upon Forest Service Region 3 Sensitive species, and to determine whether the activities would lead toward the federal listing on the Endangered Species Act of 1973 as amended. This BE conforms to the requirements in Forest Service Manual Direction (FSM 2672.42).

Description of Project:

The proposed features are designed to provide fish with low velocity refuge habitat at discharges between 50 and 1800 cfs (USACE 1995). Several types of features are proposed to create different types of fish habitat. The features include rock and wood sills, pools, rock grade control structures, rock habitat structures, rock deflectors, and riparian vegetation. Excavated substrate from pools would be redistributed along channel margins creating or expanding existing bank attached bars. The acequia diversion structure at the downstream end of the project is proposed to be removed and replaced with a similar structure or modify the existing structure to allow fish and boater passage. Two new boater access improvement areas would be created. The bed materials for the proposed features would require a determination of the size, gradation, and volume of bed material (Cramer 2012). An evaluation of the appropriate sized materials including channel slope, substrate size and gradation, and other hydraulic variables for each of the feature types would be conducted to ensure stability following construction.

Excavate large rock riffle upstream of USGS weir and redistribute rocks into a larger upstream grade control structure (GCS)/riffle. The new GCS would allow upstream fish passage and downstream boat passage. The GCS would be grouted to increase structure stability at higher flows. River gravel and crushed rock would be placed to form the boat access ramp from the access road to the river.

Pools are proposed for construction to create additional velocity refuge for fish (Cramer 2012). Placement of clean alluvial substrate is proposed along the margins of the channel to form shallow bank attached bars that incrementally increase water depth within the channel, with an increase in water velocity. The balanced cut-fill of substrate materials would maintain safe channel capacity (flow) in the project reach.

Rock habitat structures and deflectors are proposed to provide hydraulic roughness, habitat diversity, and velocity refuge for fish (Cramer 2012). The boulder rock structures would be partially buried within

the bed to increase stability and maintain their location. The rock structures are distributed throughout the project area to provide velocity diversity under the range of flow conditions (100 cfs to 1800 cfs).

The instream aquatic habitat features for trout and other fish species were designed by Riverbend Engineering based on techniques described in Cramer (2012) and the Federal Interagency Stream Restoration Working Group (FISRWG, 1998). The proposed project is about 61.7 acres through 2.0 miles of lands managed by US Army Corps of Engineers (USACE), Bureau of Land Management (BLM), US Forest Service (USFS), and the New Mexico Land Office (NMLO).

Planting with native riparian vegetation along the bankline is proposed in selected areas primarily for allochthonous leaf litter inputs into the stream to support aquatic insects (Cramer 2012). The riparian vegetation would contribute to bank stability, while the native wetland species would increase habitat diversity.

Remove topsoil from existing wetland to stockpile location, excavate substrate to lower elevation, place and grade topsoil to form depressional (groundwater) wetland. Plant with obligate wetland species (plugs), riparian shrubs and trees (willows and cottonwoods), and seed with appropriate wetland species.

The existing acequia diversion structure would be removed or modified with materials stockpiled for the replacement structure. Large rock and stockpiled materials would be placed upstream to form the acequia diversion structure. The diversion structure would be grouted to increase stability at higher flows. The headbox would be replaced and the irrigation canal would be aligned and graded.

Boater access improvements would be made at two locations, one in the upper project reach adjacent to the exiting USACE recreational area and another in the lower project reach on USFS property. Access improvements would include constructing sloped concrete boat ramps (or compacted gravel), stream bank grading for vehicle access, and installing rip rap for structure protection. Boat ramps would be designed to accommodate access at most flows.

Construction of the proposed aquatic habitat features would require partial dewatering of the channel during construction (Cramer 2012). Construction would be scheduled during the non-irrigation season (November 1 to February 28), and coordinated with the U.S. Bureau of Reclamation water deliveries to take advantage of consistent, lower winter flow downstream of Abiquiu Dam. The construction schedule is outside the irrigation season to support completion of the diversion structure for continued operation of the acequia, and outside breeding season for migratory birds that may use the project area.

In-channel work and habitat improvement structures will be constructed by utilizing heavy tracked and wheeled equipment. Excavators and back hoe loaders may be used for channel shaping and constructing large boulder habitat structures. Articulated dump trucks and loaders may be used to transport sediment for channel shaping and point bar construction. Small graders and dozers may be used for depressional wetland and point bar grading and shaping. End dump trucks may be used to transport large boulders and other rock materials. Wheeled water tank trucks may be used for dust control. Graders and dozers may be used for improving road and equipment access points. Small loaders, such as wheeled and tracked skid steers, may be used for grading smaller areas, equipment transportation, and tree replanting. Off-Highway Vehicles (OHVs) may be used for watering and transporting of seeding and tree plantings. Tractors and soil disk implements may be used for reseeding and topsoil placement.

All equipment will utilize existing roads where possible. Access to river channel will be restricted to a few locations to reduce impacts to bank erosion. All access points will be temporary and only used during construction and will be reclaimed to pre-existing conditions post construction. All Best Management Practices (e.g., refueling outside of riparian areas, sediment control devices deployed, minimizing destruction to native vegetation, etc.) will be used during construction.

The purpose and need for this proposal is to:

- To increase the diversity and quality of aquatic and riparian habitat for fish and invertebrates in the Rio Chama downstream from Abiquiu Dam to the vicinity of Highway 84 (near Abiquiu, NM).

Legal Location:

Upstream	36°14'22.63 N,	-106°25'16.27 W
Downstream	36°12'23.08 N,	-106°20'42.64 W

Elevation/Range of Elevation: 6,040.00 feet National Geodetic Vertical Datum 1929 (NGVD29)

Description of Analysis Area:

The analysis area is the Rio Chama from Abiquiu Dam downstream approximately 2.0 miles, through USACE, NMLO, BLM, and Santa Fe and Carson National Forests lands. The project would occur in and adjacent to the Rio Chama. The adjacent terrestrial habitat is riparian and pinyon-juniper habitat.

Description of Habitat in Vicinity of Project (on site):

The terrestrial habitat consists of pinyon-juniper on the upslope and riparian vegetation along the Rio Chama. The river channel is predominantly run habitat with few pools or other structure that produce lower velocity habitat for fish and aquatic invertebrates.

SPECIES BEING EVALUATED AND THEIR LEGAL STATUS

The species listed below are derived from the 2017 Regional Forester's Sensitive Species list. The following table displays all sensitive species that are known to occur on the Coyote Ranger District (Table 2).

DIRECT AND INDIRECT EFFECTS- SENSITIVE SPECIES

The area where the proposed activity will occur will **not lead towards the federal listing of, or result in the loss of viability of any Forest Service sensitive species.** There is no habitat or species occurrences/or they are not known to occur within the planning area for the species listed above.

There will be no further discussion of the species listed above in this biological evaluation.

CUMULATIVE EFFECTS- SENSITIVE SPECIES

Cumulative effects are analyzed at planning area scale. The proposed project will have no immediate or cumulative effects on Regional Forester's Sensitive Species for the following reasons:

- Most of the sensitive species do not occur or do not have any habitat within the project area. Therefore cumulative effects would not occur in the project area footprint or just outside the project area footprint.
- The project would improve aquatic habitat for the Rio Grande Chub and Rio Grande Sucker.

Table 2. US Forest Service Sensitive Animal Species that have the potential to occur or have habitat in the project area (US Forest Service 2013, US Bureau of Land Management 2019). Agencies are Carson National Forest, Santa Fe National Forest, and Taos Bureau of Land Management Field Office.

Common Name	Scientific Name	Agency	Proposed action
Northern goshawk	<i>Accipiter gentilis</i>	Carson NF, Santa Fe NF	Species occurs within ponderosa pine, spruce-fir / mixed conifer transitional areas, aspen forests and meadows. The proposed action will not lead towards the federal listing or result in the loss of viability of this species.
Mexican Whip-poor-will	<i>Antrastomus arizonae</i>	Taos BLM	Rare transient in areas of pinon/juniper woodlands, ponderosa/oak forests, and mixed conifer forests. November-February construction unlikely to affect species. Species does not generally use riparian forest or riverine habitat. The proposed action will not lead towards the federal listing or result in the loss of viability of this species.
Western Burrowing Owl	<i>Athene cunicularia</i>	Taos BLM	Inhabits desert grasslands, co-occurring with prairie dogs. Rare transient in montane regions. Species does not generally use riparian forest or riverine habitat. The proposed action will not lead towards the federal listing or result in the loss of viability of this species.
McCown's Longspur	<i>Calcarius mccownii</i>	Taos BLM	Uses open to dense vegetation of shrubs, low trees, and succulents, or alpine meadows above treeline. November-February construction unlikely to affect species. Species does not generally use riparian forest or riverine habitat. The proposed action will not lead towards the federal listing or result in the loss of viability of this species.
Chestnut-collared Longspur	<i>Calcarius ornatus</i>	Taos BLM	Accidental transient in areas of desert scrub/ rocky slopes and juniper savannas near montane regions. November-February construction unlikely to affect species. Species does not generally use riparian forest or riverine habitat. The proposed action will not lead towards the federal listing or result in the loss of viability of this species.
Flannelmouth sucker	<i>Catostomus latipinnis</i>	Taos BLM	This species is unlikely to be found in this watershed or the project area. The proposed action will not lead towards the federal listing or result in the loss of viability of this species.
Rio Grande sucker	<i>Catostomus plebeius</i>	Carson NF, Santa Fe NF, Taos BLM	The proposed action will construct more low velocity habitat that would benefit this species. The proposed action will not lead towards the federal listing or result in the loss of viability of this species.
Pale Townsend's big-eared bat	<i>Corynorhinus townsendii pallescens</i>	Carson NF, Santa Fe NF, Taos BLM	Rock Outcrops, Mountain Shrub, Ponderosa Pine, Caves/Mines Species may benefit from increased aquatic macroinvertebrates. The proposed action will not lead towards the federal listing or result in the loss of viability of this species.
Gunnison's prairie dog (prairie) includes montane	<i>Cynomys gunnisoni</i> , <i>Cynomys gunnisoni pop</i>	Carson NF, Santa Fe NF, Taos BLM	Inhabitat intermountain valleys, mountain meadows with montane or desert grassland, juniper savanna, or plains-mesa grassland. The proposed action will not lead towards the federal listing or result in the loss of viability of this species.
Black tailed prairie dog	<i>Cynomys ludovicianus</i>	Taos BLM	Inhabitat intermountain valleys, mountain meadows with montane or desert grassland, juniper savanna, or plains-mesa grassland. The proposed action will not lead towards the federal listing or result in the loss of viability of this species.
Spotted bat	<i>Euderma maculatum</i>	Carson NF, Santa Fe NF, Taos BLM	Cliffs, Ponderosa Pine and Mixed Conifer Forests. Species may benefit from increased aquatic macroinvertebrates. The proposed action will not lead towards the federal listing or result in the loss of viability of this species.
American peregrine falcon	<i>Falco peregrinus anatum</i>	Carson NF, Santa Fe NF	Roosts and nests among rock outcrops and cliffs. Forages across various habitat types. Species habitat in area surrounding project. The proposed action will not lead towards the federal listing or result in the loss of viability of this species.
Ruidoso Snaggletooth snail	<i>Gastrocopta ruidosensis</i>	Santa Fe NF	Species restricted to Sacramento Mountains, This species is unlikely to be found in this watershed or the project area. The proposed action will not lead towards the federal listing or result in the loss of viability of this species.
Rio Grande chub	<i>Gila pandora</i>	Carson, Santa Fe, Taos FO	Occur in perennial mainstream and tributary habitat at higher elevations. The proposed action will construct more low velocity habitat that would benefit this species. The proposed action will not lead towards the federal listing or result in the loss of viability of this species.
Roundtail Chub	<i>Gila robusta</i>	Taos BLM	Species occurs in San Juan and Gila River basins. This species is unlikely to be found in this watershed or the project area. The proposed action will not lead towards the federal listing or result in the loss of viability of this species.
Piñon Jay	<i>Gymnorhinus cyanocephalus</i>	Taos BLM	May inhabit pinyon-juniper habitat around perimeter of project. November-February construction unlikely to affect species. Species may benefit from increased aquatic macroinvertebrates. The proposed action will not lead towards the federal listing or result in the loss of viability of this species.

Common Name	Scientific Name	Agency	Proposed action
Bald eagle	<i>Haliaeetus leucocephalus</i>	Carson NF, Santa Fe NF	There are no roosts in the project area used by this species. The species may benefit from an increased fish density in the project area using the river. The proposed action will not lead towards the federal listing or result in the loss of viability of this species.
Northern leopard frog	<i>Lithobates pipiens</i>	Carson NF, Santa Fe NF, Taos BLM	Riparian areas such as slow moving streams, marshy areas, wet meadows. The proposed action will construct more wetland habitat that would benefit this species. The proposed action will not lead towards the federal listing or result in the loss of viability of this species.
Southwestern river otter	<i>Lontra canadensis sonora</i>	Carson NF, Santa Fe NF, Taos BLM	Occur in permanent flowing water or ponds with overhanging bank vegetation, and haul-out sites suitable for leaving and entering water. The proposed action will construct riverine habitat that may benefit this species. The proposed action will not lead towards the federal listing or result in the loss of viability of this species.
Rio Grande cutthroat trout	<i>Oncorhynchus clarki virginalis</i>	Carson NF, Santa Fe NF	The proposed action will construct more low velocity habitat that would benefit this species. The proposed action will not lead towards the federal listing or result in the loss of viability of this species.
Lilljeborg Peaclam	<i>Pisidium lilljeborgi</i>	Santa Fe NF	Species occurs in cold, alpine lakes, vegetation of spruce, fir, and grass-sedge-forb communities. This species is unlikely to be found in the project area. The proposed action will not lead towards the federal listing or result in the loss of viability of this species.
Cinereus (masked) shrew	<i>Sorex cinereus</i>	Carson NF, Santa Fe NF	Species occurs in subalpine Coniferous Forest, along cold streams and springy meadows. This species is unlikely to be found in the project area. The proposed action will not lead towards the federal listing or result in the loss of viability of this species.
Western water shrew	<i>Sorex navigator</i>	Carson NF, Santa Fe NF	Occurs in mesic, boreal habitat, with permanent, year round water of small ponds and slow flowing streams. Project may benefit species. The proposed action will not lead towards the federal listing or result in the loss of viability of this species.
Preble's shrew	<i>Sorex preblei</i>	Santa Fe NF	This species is found in drier, mesic habitat associated with Ponderosa pine, Gambel oak, grass, and forb understory. The proposed action will not lead towards the federal listing or result in the loss of viability of this species.
Bendire's Thrasher	<i>Toxostoma bendirei</i>	Taos BLM	Occur in open to dense vegetation of shrubs, low trees, and succulents in flat terrain at lower elevations. This species is unlikely to be found in the project area. The proposed action will not lead towards the federal listing or result in the loss of viability of this species.
Virginia's Warbler	<i>Vermivora virginiae</i>	Taos BLM	Transient in areas of pinon/juniper woodlands, ponderosa/oak forests, and mixed conifer forests. Breeding habitat in steep draws, drainages, or slopes. This species is unlikely to be found in the project area. The proposed action will not lead towards the federal listing or result in the loss of viability of this species.
Bell's Vireo	<i>Vireo bellii arizonae</i>	Taos BLM	Species uses scrubby thickets of Russian olive, willow, and salt cedar. Range in southern NM, unlikely to occur in project area. The proposed action will not lead towards the federal listing or result in the loss of viability of this species.
Gray Vireo	<i>Vireo vicinior</i>	Carson NF, Santa Fe NF	Occurs in mixed juniper, pinyon, and oak scrub associations, chaparral in hot, arid mountains, and high plains scrubland. November-February construction unlikely to affect species. The proposed action will not lead towards the federal listing or result in the loss of viability of this species.

Table 3. US Forest Service Sensitive Plant Species that have the potential to occur or have habitat in the project area (US Forest Service 2013, US Bureau of Land Management 2019). Agencies are Carson National Forest, Santa Fe National Forest, and Taos Bureau of Land Management Field Office.

Common Name	Scientific Name	Agency	Proposed action
Tufted sand verbena	<i>Abronia bigelovii</i>	Carson NF, Santa Fe NF	Occurrence restricted to gypsum or strongly gypseous soils derived from gypsum outcrops. The proposed action will not lead towards the federal listing or result in the loss of viability of this species.
Sand verbena	<i>Abronia bigelovii</i>	Taos BLM	Occurrence restricted to gypsum or strongly gypseous soils derived from gypsum outcrops. The proposed action will not lead towards the federal listing or result in the loss of viability of this species.
Chaco milkvetch	<i>Astragalus micromerius</i>	Santa Fe NF	Occurs in gypseous or limy sandstones in pinon-juniper woodland. The proposed action will not lead towards the federal listing or result in the loss of viability of this species.
Ripley milkvetch	<i>Astragalus ripleyi</i>	Taos BLM	Occurs in sagebrush, pinyon-juniper woodland at elevations of 7,000-8,250 ft. The proposed action will not lead towards the federal listing or result in the loss of viability of this species.
Taos springparsley	<i>Cymopterus spellenbergii</i>	Taos BLM	Grows among basalt boulders, and soils derived from metamorphic rock, or in sandy draws. The plant community is open pinon-juniper woodland or Douglas fir-ponderosa pine forest at elevations of 6,200-8,800 ft. The proposed action will not lead towards the federal listing or result in the loss of viability of this species.
Yellow lady's-slipper	<i>Cypripedium parviflorum pubescens calceolus var.</i>	Carson NF, Santa Fe NF	Species occurs throughout US, with a peripheral distribution in NM. The proposed action will not lead towards the federal listing or result in the loss of viability of this species.
Robust larkspur	<i>Delphinium robustum</i>	Carson NF, Santa Fe NF	Grows in canyon bottoms and aspen groves in lower and upper montane coniferous forest above 7,200 ft. The proposed action will not lead towards the federal listing or result in the loss of viability of this species.
Heil's alpine whitlowgrass	<i>Draba heilii</i>	Santa Fe	Grows in alpine tundra above 12,100 ft. The proposed action will not lead towards the federal listing or result in the loss of viability of this species.
Pecos fleabane	<i>Erigeron subglaber</i>	Carson NF, Santa Fe NF	Grows in rocky, open meadows in subalpine coniferous forest at elevations of 10,000-11,500 ft. The proposed action will not lead towards the federal listing or result in the loss of viability of this species.
Clipped wildbuckwheat	<i>Eriogonum lachnogynum var. colobum</i>	Taos BLM	Grows on open sandy or gypseous limestone ridges and edges of mesas in pinon-juniper woodland at elevations of 6,820-7,540 ft. The proposed action will not lead towards the federal listing or result in the loss of viability of this species.
Chama blazing star	<i>Mentzelia conspicua</i>	Carson NF, Santa Fe NF, Taos BLM	Grows on road cuts and barren hillsides, in pinon-juniper woodland at elevations of 5,900-7,200 ft. The proposed action will not lead towards the federal listing or result in the loss of viability of this species.
Springer's blazing star	<i>Mentzelia springeri</i>	Santa Fe	Grows on volcanic pumice and unconsolidated pyroclastic ash in pinon-juniper woodland and lower montane coniferous forest at elevations of 7,000-8,000 ft. The proposed action will not lead towards the federal listing or result in the loss of viability of this species.
Todilito Stickleaf	<i>Mentzelia todiltoensis</i>	Taos BLM	Grows on gypsum outcrops at 5,600-5,840 ft elevation. The proposed action will not lead towards the federal listing or result in the loss of viability of this species.
Santa Fe cholla	<i>Opuntia x viridiflora</i>	Taos BLM	Grows on gravelly rolling hills in pinion-juniper woodland between 5,800-7,200 ft elevation. The proposed action will not lead towards the federal listing or result in the loss of viability of this species.
Arizona Willow	<i>Salix arizonica</i>	Carson NF, Santa Fe NF	Occurs in sedge meadows and wet drainage ways in subalpine coniferous forest at elevations of 10,000-11,200 ft. The proposed action will not lead towards the federal listing or result in the loss of viability of this species.

MANAGEMENT INDICATOR SPECIES ANALYSIS

The Santa Fe and Carson National Forests Plan (USFS 1987) or Land Resource Management Plan (LRMP) designated 8 species known as Management Indicator Species (MIS). The intent was to select species that would indicate possible effects of changing plant communities and associated seral habitats on each species. These species were selected for their association with plant communities or seral stages, which management activities are expected to affect.

Table 4 displays MIS species, briefly describes their habitat association/indicator and also discloses if the habitat quantity or quality is being altered under the alternatives. The 2012 MIS assessment contains more specific information regarding species trends (USFS 2012) and was utilized to build this brief summary and MIS analysis.

Table 4. MIS Impact Table. Rationale for omission from further analysis.

Vegetation Type/Species Occurring in the Planning Area	Is the Forest wide quantity of habitat impacted?		Is the Indicated Habitat quality being altered?		Rationale for Omission
	YES	NO	YES	NO	
Pinyon-Juniper habitat					
Pinyon Jay		X		X	A few individual trees may be removed from the riparian zone, but would not result in large scale tree removal.
Riparian, stream and water quality					
Rio Grande cutthroat trout		X	X		Riparian, stream, and water quality would benefit from the project and would follow forest wide BMPs.

Table 5 shows MIS species, population trend, habitat trend, total acres of MIS habitat on the Forest by species, acres of each habitat type within the planning area and the percent of the planning area MIS habitat acres when compared to total Forest acres. The 2012 MIS assessment contains more specific information regarding species trends (USFS 2012) and was utilized to build this brief summary and MIS analysis. For information regarding why habitat trends or population trends are in a specific status, see the 2012 MIS analysis. All acre estimates are approximate.

DIRECT AND INDIRECT EFFECTS- MANAGEMENT INDICATOR SPECIES

The implementation of the proposed action (PA) would not impact the Forest wide quantity or quality of habitat because the acres of MIS habitat which overlap with the PA represent less than 1% of available habitat across the Forest. The aquatic habitat construction would improve habitat for the forest wide population trend or the forest wide habitat trend for the MIS species listed below.

CUMULATIVE EFFECTS- MANAGEMENT INDICATOR SPECIES

Cumulative effects are analyzed at a planning area scale of the Rio Chama footprint. Since this project would not impact areas outside of these administrative boundaries, this analysis boundary is appropriate. The proposed action may have positive cumulative effects to the MIS species listed above, because there would be improvement to habitat available for these MIS species within the footprint of the project area. The acres of MIS habitat within the proposed action represent less than 1% of the available acres Forest wide and would not impact the quantity of available habitat forest wide or forest population trends.

Table 5. MIS population trend, habitat trend (2012 MIS assessment data) and total acres of MIS habitat on Forest, Planning area and Determination.

Trends, (FW) and Total Forest/ Planning Area Acres, and Determination Table						
Vegetation Type/Species	MIS Population Trend (FW)	Habitat Trend (HT)	Total Forest Acres (TFA)	Planning Area Acres (PAA)**	% PAA of TFA*	Determination
Pinyon-Juniper habitat						
El Rito Ranger District			280,700	16.5	0.0059	NE
Espanola Ranger District			366,000	17.1	0.0047	NE
Pinyon Jay	S	D				NE
Riparian, stream and water quality						
El Rito Ranger District			280,700	16.5	0.0059	WC
Espanola Ranger District			366,000	17.1	0.0047	WC
Rio Grande cutthroat trout	S	D		0.52 miles		WC
KEYS						
MIS population trend column key: FW- Forest wide I - Increasing trend for MIS population Forest wide U - Unknown trend for MIS population Forest wide S – Stable trend for MIS population Forest wide D – Decreasing trend for MIS population Forest wide - All Forest Wide data here is based on the 2012 MIS species assessment.			Habitat trend column key: S - Static trend for KHC Forest wide U - Upward trend for KHC Forest wide D – Downward trend for KHC Forest wide S – Stable trend for KHC Forest wide NC- No change for KHC Forest wide			
Determination column key: NE- No effect to the FW trends – i.e., any impacts would not alter the existing trends, regardless of the impacts in relation to the trends. WC- Would Contribute to the current FW trends – i.e., any impacts are in the direction of the current trend. WA- Would Alter the current FW trends.					Acreeage Calculation: *- Planning Area Acres is calculated by (PAA / TFA = % of TFA **Planning area acres only includes acres of merged polygons of the PA (Alt 2).	
References: MIS species and 2012 MIS assessment updated for the Santa Fe National Forest USDA Forest Service (USFS). 2011. Carson National Forest Management Indicator Species Assessment. Carson National Forest Supervisor’s Office, Taos, NM USDA Forest Service (USFS). 1987. Santa Fe National Forest Plan, as amended. Albuquerque, NM: USDA Forest Service. USDA Forest Service (USFS). 2012. Santa Fe National Forest Management Indicator Species Assessment. Santa Fe National Forest Supervisor’s Office, Santa Fe, NM						

MIGRATORY BIRD ANALYSIS

Direction for management and protection of migratory birds and their habitats within the continental United States exists in several forms.

- ❖ The Migratory Bird Treaty Act (MBTA) enacted in 1918 established Federal prohibition, unless permitted by regulations, to pursue, hunt, take, capture, kill any migratory bird, any part, nest, or egg of any such bird.
- ❖ Executive Order (EO) 13186 signed January 10, 2001 directed Federal agencies to avoid or minimize adverse impacts (to the extent practical) on migratory bird resources when conducting agency actions (among many items within the “Federal Agency Responsibilities” section of the EO.
- ❖ Pursuant to the EO, agencies were to develop Memorandum of Understanding (MOU) to strengthen and promote migratory bird conservation and collaboration with the U.S. Fish and Wildlife Service. The original 2008 MOU was extended and signed in 2016.

- ❖ Bald and Golden Eagle Protection Act (1940 as amended) protects eagles from actions of anyone (or entity) which would “take” eagles to the point of causing nest failure or reduce productivity (unless you or your entity have obtained a permit issued by the Secretary of the Interior).

There have not been specific USFS policies provided to direct migratory bird analyses into the NEPA process. However, the Southwestern Regional Office (R3 USFS) direction on migratory bird analysis is as follows.

- 1) Analyze effects to Species of Concern which are developed by the local (State) Partners In Flight Office with an emphasis on “high priority species”.
- 2) Analyze effects of project action on Important Bird Areas (IBA’s) and
- 3) Analyze effects of project actions to important overwintering areas on USFS lands.

Table 6 shows Species of Concern (SOC) which have been identified by the State of New Mexico Partners in Flight and were considered for this analysis. These species are shown by habitat type and nest substrate, nest type, usual nest height and nesting period. This table was utilized to guide effects analysis. The National Information Resource System (NRIS) and eBird was utilized to evaluate occurrence of species for this analysis.

Table 6. Species Account Table for Migratory Bird Analysis (Species of Concern). Winter project construction would occur outside the nesting season for these birds. No impacts are likely.

SPECIES ACCOUNTS				
Santa Fe and Carson National Forests migratory bird species of concern. We assume the following migratory bird species of concern may occur in the activity area because their habitats also are within the activity area.				
Species	Nest Substrate^b	Nest type^b	Usual nest height range^b (feet)	Nesting Period^c
Middle- Elevation Riparian: Deciduous woodlands <7,500 feet elevation. Cottonwood – willow associations.				
Flycatcher, southwestern willow	shrub, deciduous tree	cup	2 to 10	Jun to Aug
Vireo, Bell's ^a	shrub	cup	1 to 5	Mar to Sep
Warbler, Lucy's	snag	cavity	3 to 11	Apr to Jul
Woodpecker, Lewis's ^a	deciduous tree, snag	cavity	5 to 100	May to Aug
Pinyon – Juniper woodland				
Jay, pinyon	conifer	cup	3 to 26	Apr to Aug
Titmouse, juniper	deciduous tree, snag	cavity	3 to 10	Apr to Jul
Thrasher, Bendire's	shrub	cup	2 to 4	Mar to Aug
Vireo, gray ^a	shrub	cup	2 to 6	Apr to Aug
Montane Shrub: Chaparral and shrub habitat ranging from 5,500 to 8,000 feet elevation.				
Sparrow, black-chinned	shrub	cup	1.5 to 3	Apr to Aug
Vireo, gray ^a	shrub	cup	2 to 6	Apr to Aug
Warbler, Virginia's ^a	ground	cup	0	Apr to Aug
^a Species occur in other habitat categories too				
^b Source: Ehrlich and others 1988				
^c Source: Corman and Wise-Gervais 1995				

DIRECT AND INDIRECT EFFECTS- Migratory Birds

Species of Concern

NM Avian Conservation Partners considers eight risk factors in identifying conservation priority species: Global Abundance, NM Breeding Abundance, Global Breeding Distribution, NM Breeding Distribution, Threats to Breeding in NM, Importance of NM to Breeding, Global Winter Distribution, and Threats on Wintering Grounds. A list of species at the highest risk are classified as “highest priority” for conservation action. This evaluation addresses general effects to migratory birds, and effects to Highest Priority species for the main habitat types found in the planning area (New Mexico Partners in Flight, 2007).

The Rio Chama Aquatic Habitat footprint covers 118.5 acres, therefore, only a few high priority species are evaluated below. Table 7 displays the anticipated impacts for SOCs and their habitats.

Temporary impacts to some habitat categories that support some SOC. Building demolition would have some negative impact on migratory birds if they nested in/near or on buildings, but not intentionally to individuals, specifically those which occur in pinyon juniper woodland or montane shrub habitats.

Table 7. Anticipated Impact on Species of Concern

	Species	Nest Substrate^b	Nest type^b	Effects from aquatic habitat new construction
Middle Elevation Riparian	Flycatcher, southwestern willow	shrub, deciduous tree	cup	None. Construction occurs from November through February. Planting of native riparian vegetation will improve habitat
	Vireo, Bell's ^a	shrub	cup	
	Warbler, Lucy's	snag	cavity	
Pinyon juniper woodland	Woodpecker, Lewis's ^a	deciduous tree, snag	cavity	None. No construction will occur in Pinyon juniper woodland
	Jay, pinyon	conifer	cup	
	Titmouse, juniper	deciduous tree, snag	cavity	
	Thrasher, Bendire's	shrub	cup	
	Vireo, gray ^a	shrub	cup	
Montane Shrub	Sparrow, black-chinned	shrub	cup	None. No construction will occur in Montane Shrub
	Vireo, gray ^a	shrub	cup	
	Warbler, Virginia's ^a	ground	cup	

Important Bird Areas

The IBAs on or adjacent to the Santa Fe and Carson National Forests are shown in Table 8.

Table 8. Important Bird Areas and Mileage to Planning Area.

Important Bird Area Name	Ownership	Distance to Planning Area
Chama River Gorge / Golondrino Mesa	USFS (Santa Fe); Bureau of Land Management	>12 miles
Caja del Rio	USFS (Santa Fe); Bureau of Land Management	>35 miles
Valles Caldera National Preserve	National Park Service	>18 miles
Bandelier National Monument	National Park Service	>25 miles
Randall Davey Center	The Nature Conservancy; NM Audubon	>45 miles
Santa Fe Canyon Preserve	The Nature Conservancy	>45 miles

There is no association or important link between the bird communities in this planning area and these IBAs.

Overwintering Areas

Several areas are recognized on the Santa Fe and Carson National Forests as being overwintering areas. Generally, they are lower elevation sites with perennial water sources that provide for adequate cover and mast production during winter months. The Rio Grande corridor overwintering area is located approximately 20 miles from the project area. The project area is not located near any known overwintering areas for birds.

DETERMINATION OF EFFECT- MIGRATORY BIRDS

It is possible that the proposed action would cause some migratory birds to flush from ground nesting areas, nearby trees during project implementation, nests on buildings (building destruction, infrastructure construction). However, this anticipated effect is highly unlikely. This is because there are few invasive trees/shrubs that would be targeted for removal. Efforts to minimize impacts such as surveys prior to construction identifying nests to avoid will occur prior to implementation of the project. Overall, this effect is not measurable or intentional and would not lead to any adverse impacts to the SOC and their habitats discussed within this section.

Adaptive management is recommended to maintain native trees and minimize establishment of non-native trees adjacent to habitat restoration features. Currently, non-native Saltcedar, Russian olive, and Siberian elm are rare within the project area. Annual surveys (5-10 years post-project) and removal are recommended for seedlings of these species to minimize establishment. Seedlings can be removed by excavation of the entire plant or mechanical removal of the trunk.

CUMULATIVE EFFECTS- MIGRATORY BIRDS

Cumulative effects are analyzed at a planning area scale. The proposed action would have minimal cumulative effects to the migratory birds listed above based on the effects to terrestrial habitat and the construction schedule. Habitat effects would be minimal because few trees/shrubs are targeted for removal in the footprint of the project area. The construction schedule from November through February is outside the breeding season for most migratory birds. The effects from this project would be minimal and temporary.

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United States Department of the Interior



FISH AND WILDLIFE SERVICE
New Mexico Ecological Services Field Office
2105 Osuna Road Ne
Albuquerque, NM 87113-1001
Phone: (505) 346-2525 Fax: (505) 346-2542
<http://www.fws.gov/southwest/es/NewMexico/>
http://www.fws.gov/southwest/es/ES_Lists_Main2.html

In Reply Refer To:

April 04, 2019

Consultation Code: 02ENNM00-2019-SLI-0606

Event Code: 02ENNM00-2019-E-01292

Project Name: Rio Chama Aquatic Habitat

Subject: List of threatened and endangered species that may occur in your proposed project location, and/or may be affected by your proposed project

To Whom It May Concern:

Thank you for your recent request for information on federally listed species and important wildlife habitats that may occur in your project area. The U.S. Fish and Wildlife Service (Service) has responsibility for certain species of New Mexico wildlife under the Endangered Species Act (ESA) of 1973 as amended (16 USC 1531 et seq.), the Migratory Bird Treaty Act (MBTA) as amended (16 USC 701-715), and the Bald and Golden Eagle Protection Act (BGEPA) as amended (16 USC 668-668c). We are providing the following guidance to assist you in determining which federally imperiled species may or may not occur within your project area and to recommend some conservation measures that can be included in your project design.

FEDERALLY-LISTED SPECIES AND DESIGNATED CRITICAL HABITAT

Attached is a list of endangered, threatened, and proposed species that may occur in your project area. Your project area may not necessarily include all or any of these species. Under the ESA, it is the responsibility of the Federal action agency or its designated representative to determine if a proposed action "may affect" endangered, threatened, or proposed species, or designated critical habitat, and if so, to consult with the Service further. Similarly, it is the responsibility of the Federal action agency or project proponent, not the Service, to make "no effect" determinations. If you determine that your proposed action will have "no effect" on threatened or endangered species or their respective critical habitat, you do not need to seek concurrence with the Service. Nevertheless, it is a violation of Federal law to harm or harass any federally-listed threatened or endangered fish or wildlife species without the appropriate permit.

If you determine that your proposed action may affect federally-listed species, consultation with the Service will be necessary. Through the consultation process, we will analyze information contained in a biological assessment that you provide. If your proposed action is associated with Federal funding or permitting, consultation will occur with the Federal agency under section 7(a)(2) of the ESA. Otherwise, an incidental take permit pursuant to section 10(a)(1)(B) of the ESA (also known as a habitat conservation plan) is necessary to harm or harass federally listed threatened or endangered fish or wildlife species. In either case, there is no mechanism for authorizing incidental take "after-the-fact." For more information regarding formal consultation and HCPs, please see the Service's Consultation Handbook and Habitat Conservation Plans at www.fws.gov/endangered/esa-library/index.html#consultations.

The scope of federally listed species compliance not only includes direct effects, but also any interrelated or interdependent project activities (e.g., equipment staging areas, offsite borrow material areas, or utility relocations) and any indirect or cumulative effects that may occur in the action area. The action area includes all areas to be affected, not merely the immediate area involved in the action. Large projects may have effects outside the immediate area to species not listed here that should be addressed. If your action area has suitable habitat for any of the attached species, we recommend that species-specific surveys be conducted during the flowering season for plants and at the appropriate time for wildlife to evaluate any possible project-related impacts.

Candidate Species and Other Sensitive Species

A list of candidate and other sensitive species in your area is also attached. Candidate species and other sensitive species are species that have no legal protection under the ESA, although we recommend that candidate and other sensitive species be included in your surveys and considered for planning purposes. The Service monitors the status of these species. If significant declines occur, these species could potentially be listed. Therefore, actions that may contribute to their decline should be avoided.

Lists of sensitive species including State-listed endangered and threatened species are compiled by New Mexico state agencies. These lists, along with species information, can be found at the following websites:

Biota Information System of New Mexico (BISON-M): www.bison-m.org

New Mexico State Forestry. The New Mexico Endangered Plant Program:
www.emnrd.state.nm.us/SFD/ForestMgt/Endangered.html

New Mexico Rare Plant Technical Council, New Mexico Rare Plants: nmrareplants.unm.edu

Natural Heritage New Mexico, online species database: nhnm.unm.edu

WETLANDS AND FLOODPLAINS

Under Executive Orders 11988 and 11990, Federal agencies are required to minimize the destruction, loss, or degradation of wetlands and floodplains, and preserve and enhance their natural and beneficial values. These habitats should be conserved through avoidance, or mitigated to ensure that there would be no net loss of wetlands function and value.

We encourage you to use the National Wetland Inventory (NWI) maps in conjunction with ground-truthing to identify wetlands occurring in your project area. The Service's NWI program website, www.fws.gov/wetlands/Data/Mapper.html integrates digital map data with other resource information. We also recommend you contact the U.S. Army Corps of Engineers for permitting requirements under section 404 of the Clean Water Act if your proposed action could impact floodplains or wetlands.

MIGRATORY BIRDS

The MBTA prohibits the taking of migratory birds, nests, and eggs, except as permitted by the Service's Migratory Bird Office. To minimize the likelihood of adverse impacts to migratory birds, we recommend construction activities occur outside the general bird nesting season from March through August, or that areas proposed for construction during the nesting season be surveyed, and when occupied, avoided until the young have fledged.

We recommend review of Birds of Conservation Concern at website www.fws.gov/migratorybirds/CurrentBirdIssues/Management/BCC.html to fully evaluate the effects to the birds at your site. This list identifies birds that are potentially threatened by disturbance and construction.

BALD AND GOLDEN EAGLES

The bald eagle (*Haliaeetus leucocephalus*) was delisted under the ESA on August 9, 2007. Both the bald eagle and golden eagle (*Aquila chrysaetos*) are still protected under the MBTA and BGEPA. The BGEPA affords both eagles protection in addition to that provided by the MBTA, in particular, by making it unlawful to "disturb" eagles. Under the BGEPA, the Service may issue limited permits to incidentally "take" eagles (e.g., injury, interfering with normal breeding, feeding, or sheltering behavior nest abandonment). For information on bald and golden eagle management guidelines, we recommend you review information provided at www.fws.gov/midwest/eagle/guidelines/bgepa.html.

On our web site www.fws.gov/southwest/es/NewMexico/SBC_intro.cfm, we have included conservation measures that can minimize impacts to federally listed and other sensitive species. These include measures for communication towers, power line safety for raptors, road and highway improvements, spring developments and livestock watering facilities, wastewater facilities, and trenching operations.

We also suggest you contact the New Mexico Department of Game and Fish, and the New Mexico Energy, Minerals, and Natural Resources Department, Forestry Division for information regarding State fish, wildlife, and plants.

Thank you for your concern for endangered and threatened species and New Mexico's wildlife habitats. We appreciate your efforts to identify and avoid impacts to listed and sensitive species in your project area. For further consultation on your proposed activity, please call 505-346-2525 or email nmesfo@fws.gov and reference your Service Consultation Tracking Number.

Attachment(s):

- Official Species List
 - Migratory Birds
-

Official Species List

This list is provided pursuant to Section 7 of the Endangered Species Act, and fulfills the requirement for Federal agencies to "request of the Secretary of the Interior information whether any species which is listed or proposed to be listed may be present in the area of a proposed action".

This species list is provided by:

New Mexico Ecological Services Field Office

2105 Osuna Road Ne

Albuquerque, NM 87113-1001

(505) 346-2525

Project Summary

Consultation Code: 02ENNM00-2019-SLI-0606

Event Code: 02ENNM00-2019-E-01292

Project Name: Rio Chama Aquatic Habitat

Project Type: LAND - RESTORATION / ENHANCEMENT

Project Description: Rio Chama in-channel habitat construction to benefit fish and aquatic invertebrates downstream of Abiquiu Dam. Work on USACE, BLM, USFS, and NM State Land Office lands. Most work in the river, and along the adjacent banks.

Project Location:

Approximate location of the project can be viewed in Google Maps: <https://www.google.com/maps/place/36.23446842060038N106.40730574782627W>



Counties: Rio Arriba, NM

Endangered Species Act Species

There is a total of 7 threatened, endangered, or candidate species on this species list.

Species on this list should be considered in an effects analysis for your project and could include species that exist in another geographic area. For example, certain fish may appear on the species list because a project could affect downstream species.

IPaC does not display listed species or critical habitats under the sole jurisdiction of NOAA Fisheries¹, as USFWS does not have the authority to speak on behalf of NOAA and the Department of Commerce.

See the "Critical habitats" section below for those critical habitats that lie wholly or partially within your project area under this office's jurisdiction. Please contact the designated FWS office if you have questions.

-
1. [NOAA Fisheries](#), also known as the National Marine Fisheries Service (NMFS), is an office of the National Oceanic and Atmospheric Administration within the Department of Commerce.

Mammals

NAME	STATUS
Canada Lynx <i>Lynx canadensis</i> Population: Wherever Found in Contiguous U.S. There is final critical habitat for this species. Your location is outside the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/3652	Threatened
New Mexico Meadow Jumping Mouse <i>Zapus hudsonius luteus</i> There is final critical habitat for this species. Your location is outside the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/7965	Endangered

Birds

NAME	STATUS
<p>Least Tern <i>Sterna antillarum</i> Population: interior pop. No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/8505</p>	Endangered
<p>Mexican Spotted Owl <i>Strix occidentalis lucida</i> There is final critical habitat for this species. Your location is outside the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/8196</p>	Threatened
<p>Southwestern Willow Flycatcher <i>Empidonax traillii extimus</i> There is final critical habitat for this species. Your location is outside the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/6749</p>	Endangered
<p>Yellow-billed Cuckoo <i>Coccyzus americanus</i> Population: Western U.S. DPS There is proposed critical habitat for this species. Your location is outside the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/3911</p>	Threatened

Amphibians

NAME	STATUS
<p>Jemez Mountains Salamander <i>Plethodon neomexicanus</i> There is final critical habitat for this species. Your location is outside the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/4095</p>	Endangered

Critical habitats

THERE ARE NO CRITICAL HABITATS WITHIN YOUR PROJECT AREA UNDER THIS OFFICE'S JURISDICTION.

Migratory Birds

Certain birds are protected under the Migratory Bird Treaty Act¹ and the Bald and Golden Eagle Protection Act².

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

-
1. The [Migratory Birds Treaty Act](#) of 1918.
 2. The [Bald and Golden Eagle Protection Act](#) of 1940.
 3. 50 C.F.R. Sec. 10.12 and 16 U.S.C. Sec. 668(a)

The birds listed below are birds of particular concern either because they occur on the [USFWS Birds of Conservation Concern](#) (BCC) list or warrant special attention in your project location. To learn more about the levels of concern for birds on your list and how this list is generated, see the FAQ [below](#). This is not a list of every bird you may find in this location, nor a guarantee that every bird on this list will be found in your project area. To see exact locations of where birders and the general public have sighted birds in and around your project area, visit the [E-bird data mapping tool](#) (Tip: enter your location, desired date range and a species on your list). For projects that occur off the Atlantic Coast, additional maps and models detailing the relative occurrence and abundance of bird species on your list are available. Links to additional information about Atlantic Coast birds, and other important information about your migratory bird list, including how to properly interpret and use your migratory bird report, can be found [below](#).

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

NAME	BREEDING SEASON
<p>Bald Eagle <i>Haliaeetus leucocephalus</i> This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities. https://ecos.fws.gov/ecp/species/1626</p>	Breeds Dec 1 to Aug 31
<p>Brewer's Sparrow <i>Spizella breweri</i> This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA https://ecos.fws.gov/ecp/species/9291</p>	Breeds May 15 to Aug 10

NAME	BREEDING SEASON
Clark's Grebe <i>Aechmophorus clarkii</i> This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/3914	Breeds Jan 1 to Dec 31
Olive-sided Flycatcher <i>Contopus cooperi</i> This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/3914	Breeds May 20 to Aug 31
Pinyon Jay <i>Gymnorhinus cyanocephalus</i> This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/9420	Breeds Feb 15 to Jul 15
Rufous Hummingbird <i>selasphorus rufus</i> This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/8002	Breeds elsewhere
Virginia's Warbler <i>Vermivora virginiae</i> This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/9441	Breeds May 1 to Jul 31

Probability Of Presence Summary

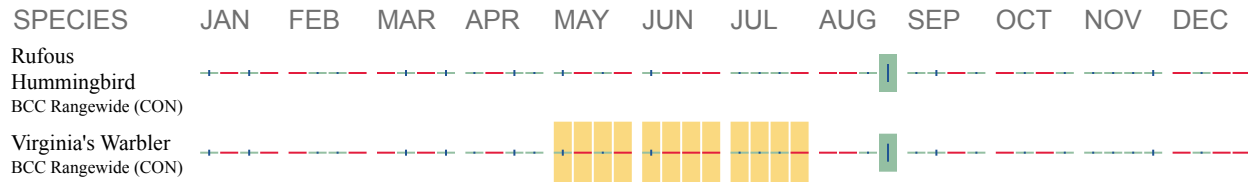
The graphs below provide our best understanding of when birds of concern are most likely to be present in your project area. This information can be used to tailor and schedule your project activities to avoid or minimize impacts to birds. Please make sure you read and understand the FAQ "Proper Interpretation and Use of Your Migratory Bird Report" before using or attempting to interpret this report.

Probability of Presence (■)

Each green bar represents the bird's relative probability of presence in the 10km grid cell(s) your project overlaps during a particular week of the year. (A year is represented as 12 4-week months.) A taller bar indicates a higher probability of species presence. The survey effort (see below) can be used to establish a level of confidence in the presence score. One can have higher confidence in the presence score if the corresponding survey effort is also high.

How is the probability of presence score calculated? The calculation is done in three steps:

1. The probability of presence for each week is calculated as the number of survey events in the week where the species was detected divided by the total number of survey events for that week. For example, if in week 12 there were 20 survey events and the Spotted Towhee



Additional information can be found using the following links:

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

Migratory Birds FAQ

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

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

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

The Migratory Bird Resource List is comprised of USFWS [Birds of Conservation Concern \(BCC\)](#) and other species that may warrant special attention in your project location.

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

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

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

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

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

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

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

What are the levels of concern for migratory birds?

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

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

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

Details about birds that are potentially affected by offshore projects

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

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

What if I have eagles on my list?

If your project has the potential to disturb or kill eagles, you may need to [obtain a permit](#) to avoid violating the Eagle Act should such impacts occur.

Proper Interpretation and Use of Your Migratory Bird Report

The migratory bird list generated is not a list of all birds in your project area, only a subset of birds of priority concern. To learn more about how your list is generated, and see options for identifying what other birds may be in your project area, please see the FAQ “What does IPaC use to generate the migratory birds potentially occurring in my specified location”. Please be aware this report provides the “probability of presence” of birds within the 10 km grid cell(s) that overlap your project; not your exact project footprint. On the graphs provided, please also look carefully at the survey effort (indicated by the black vertical bar) and for the existence of the “no data” indicator (a red horizontal bar). A high survey effort is the key component. If the survey effort is high, then the probability of presence score can be viewed as more dependable. In contrast, a low survey effort bar or no data bar means a lack of data and, therefore, a lack of certainty about presence of the species. This list is not perfect; it is simply a starting point for identifying what birds of concern have the potential to be in your project area, when they might be there, and if they might be breeding (which means nests might be present). The list helps you know what to look for to confirm presence, and helps guide you in knowing when to implement conservation measures to avoid or minimize potential impacts from your project activities, should presence be confirmed. To learn more about conservation measures, visit the FAQ “Tell me about conservation measures I can implement to avoid or minimize impacts to migratory birds” at the bottom of your migratory bird trust resources page.

All Species Rio Arriba

<u>Taxonomic Group</u>	<u># Species</u>	<u>Taxonomic Group</u>	<u># Species</u>
Fish	33	Ephemeroptera; mayflies	19
Amphibians	12	Odonata; dragonflies	50
Reptiles	28	Orthoptera; grasshoppers & crickets	63
Birds	251	Coleoptera; beetles	18
Mammals	89	Lepidoptera; moths and butterflies	156
Molluscs	22	Spiders	9
Crustaceans	4	Misc. Arachnids	7

TOTAL SPECIES: 761

<u>Common Name</u>	<u>Scientific Name</u>	<u>NMGE</u>	<u>USFWS</u>	<u>Critical Habitat</u>	<u>SGCN</u>	<u>Photo</u>
Plateau Fence Lizard	Sceloporus tristichus					View
Eastern Whip-poor-will	Antrostomus vociferus					No Photo
Pacific Spiketail	Cordulegaster dorsalis					No Photo
Taiga Bluet	Coenagrion resolutum					No Photo
Blue-eyed Darner	Rhionaeschna multicolor					No Photo
Paddle-tailed Darner	Aeshna palmata					No Photo
Common Green Darner	Anax junius					No Photo
Shadow Darner	Aeshna umbrosa					No Photo
Western Pondhawk	Erythemis collocata					No Photo
Checkered Setwing	Dythemis fugax					No Photo
Flame Skimmer	Libellula saturata					View
Common Whitetail	Plathemis lydia					View
Roseate Skimmer	Orthemis ferruginea					View
Blue Dasher	Pachydiplax longipennis					No Photo
Eastern Amberwing	Perithemis tenera					No Photo
Black Saddlebags	Tamea lacerata					View
Pale-faced Clubskimmer	Brechmorhoga mendax					No Photo
Four-spotted Skimmer	Libellula quadrimaculata					No Photo
Wandering Glider	Pantala flavescens					No Photo
Brimstone Clubtail	Stylurus intricatus					No Photo
Black Meadowhawk	Sympetrum danae					No Photo

All Species Rio Arriba

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Cardinal Meadowhawk	Sympetrum illotum					No Photo
Cherry-faced Meadowhawk	Sympetrum internum					No Photo
Striped Meadowhawk	Sympetrum pallipes					No Photo
Band-winged Meadowhawk	Sympetrum semicinctum					No Photo
Red Saddlebags	Tamea onusta					No Photo
Sulphur-tipped Clubtail	Phanogomphus militaris					No Photo
Variable Darner	Aeshna interrupta					No Photo
White-belted Ringtail	Erpetogomphus compositus					View
Pale Snaketail	Ophiogomphus severus					No Photo
Variable Tiger Beetle	Cicindela terricola					No Photo
Dwarf Shrew	Sorex nanus					View
Masked Shrew	Sorex cinereus					No Photo
Merriam's Shrew	Sorex merriami					No Photo
Dusky Shrew	Sorex monticola					No Photo
Western Water Shrew	Sorex navigator					No Photo
Pale Townsend's Big-eared Bat	Corynorhinus townsendii				Y	View
Big Brown Bat	Eptesicus fuscus					No Photo
California Myotis	Myotis californicus					No Photo
Fringed Myotis	Myotis thysanodes					No Photo
Hoary Bat	Lasiurus cinereus					No Photo
Long-eared Myotis	Myotis evotis					No Photo
Long-legged Myotis	Myotis volans					View
Pallid Bat	Antrozous pallidus					View
Canyon Bat	Parastrellus hesperus					View
Silver-haired Bat	Lasionycteris noctivagans					No Photo
Western Small-footed Myotis	Myotis dilobum					View
Spotted Bat	Euderma maculatum		T		Y	View
Yuma Myotis	Myotis yumanensis					View
Big Free-tailed Bat	Nyctinomops macrotis					No Photo
Brazilian Free-tailed Bat	Tadarida brasiliensis					View

All Species Rio Arriba

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Coyote	Canis latrans					View
Common Gray Fox	Urocyon cinereoargenteus					View
Kit Fox	Vulpes macrotis					No Photo
Red Fox	Vulpes vulpes					View
Bobcat	Lynx rufus					View
Mountain Lion	Puma concolor					View
Canada Lynx	Lynx canadensis		T			No Photo
American Badger	Taxidea taxus					View
Pacific Marten	Martes caurina	T			Y	View
North American River Otter	Lontra canadensis				Y	View
Ermine Weasel	Mustela erminea					No Photo
Long-tailed Weasel	Mustela frenata					View
Western Spotted Skunk	Spilogale gracilis					No Photo
Striped Skunk	Mephitis mephitis					View
Common Raccoon	Procyon lotor					View
Ringtail	Bassariscus astutus					View
Black Bear	Ursus americanus					View
Feral Horse	Equus caballus					No Photo
Mule Deer	Odocoileus hemionus					View
White-tailed Deer (Texas)	Odocoileus virginianus texana					View
Moose	Alces alces					View
Elk	Cervus canadensis nelsoni					View
Pronghorn	Antilocapra americana americana					View
Rocky Mtn. Bighorn Sheep	Ovis canadensis canadensis					View
Colorado Chipmunk	Neotamias quadrivittatus quadrivittatus; australis; oscuraensis					View
Least Chipmunk	Neotamias minimus atristriatus; operarius; chuskaensis					View
Gunnison's prairie dog (prairie subspecies)	Cynomys gunnisoni zuniensis				Y	View
Gunnison's Prairie Dog (montane subspecies)	Cynomys gunnisoni gunnisoni				Y	No Photo

All Species Rio Arriba

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Yellow-bellied Marmot	Marmota flaviventris					View
Abert's Squirrel	Sciurus aberti aberti; chuscensis; ferreus					View
Golden-mantled Ground Squirrel	Callospermophilus lateralis					View
Spotted Ground Squirrel	Xerospermophilus spilosoma					No Photo
Thirteen-lined Ground Squirrel	Ictidomys tridecemlineatus arenicola; blanca; hollisteri					View
Red Squirrel	Tamiasciurus hudsonicus fremonti; lychnuchus; mogollonensis					View
Rock Squirrel	Otospermophilus variegatus grammurus					View
American Beaver	Castor canadensis					No Photo
Botta's Pocket Gopher	Thomomys bottae actuosus; alienus; aureus; collis; connectens; cultellus; fulvus; guadalupensis; lachuguilla; mearnsi; morulus; opulentus; paguatae; pectoralis; peramplus; pervagus; planorum; rufidulus; ruidosae; tol					No Photo
Northern Pocket Gopher	Thomomys talpoides fossor; kaibabensis					No Photo
Plains Pocket Mouse	Perognathus flavescens					No Photo
Silky Pocket Mouse	Perognathus flavus flavus; hopiensis					No Photo
Ord's Kangaroo Rat	Dipodomys ordii					No Photo
Meadow Jumping Mouse	Zapus luteus luteus	E	E	Y	Y	View
Western Jumping Mouse	Zapus princeps					No Photo
Brush Mouse	Peromyscus boylii					No Photo
Canyon Mouse	Peromyscus crinitus					No Photo
Deer Mouse	Peromyscus maniculatus					No Photo
N. Grasshopper Mouse	Onychomys leucogaster					No Photo
Western Harvest Mouse	Reithrodontomys megalotis megalotis; aztecus					No Photo
House Mouse	Mus musculus					View
Pinyon Mouse	Peromyscus truei					No Photo
Northern Rock Mouse	Peromyscus nasutus					No Photo

All Species Rio Arriba

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White-footed Mouse	Peromyscus leucopus					View
Common Muskrat	Ondatra zibethicus pallidus; osoyooensis; cinnamominus					View
Bushy-tailed Wood Rat	Neotoma cinerea					No Photo
Mexican Wood Rat	Neotoma mexicana mexicana; inopinata; pinetorum; scopulorum					No Photo
S. Plains Wood Rat	Neotoma micropus canescens					No Photo
Stephen's Wood Rat	Neotoma stephensi					No Photo
White-throated Wood Rat	Neotoma albigula					View
Heather Vole	Phenacomys intermedius					No Photo
Long-tailed Vole	Microtus longicaudus longicaudus; alticola; baileyi; mordax					No Photo
Montane Vole	Microtus montanus fusus					No Photo
Southern Red-backed Vole	Myodes gapperi					No Photo
Common Porcupine	Erethizon dorsatum					View
American Pika	Ochotona princeps incana; saxatilis				Y	View
Desert Cottontail Rabbit	Sylvilagus audubonii					View
Nuttall's Cottontail Rabbit	Sylvilagus nuttallii					No Photo
Snowshoe Hare	Lepus americanus					View
Black-tailed Jackrabbit	Lepus californicus					View
White-tailed Jackrabbit	Lepus townsendii					No Photo
Bufflehead Duck	Bucephala albeola					View
Canvasback Duck	Aythya valisineria					View
Gadwall Duck	Mareca strepera					View
Barrow's Goldeneye Duck	Bucephala islandica					View
Common Goldeneye Duck	Bucephala clangula					View
Mallard Duck	Anas platyrhynchos					View
Common Merganser Duck	Mergus merganser					View
Hooded Merganser Duck	Lophodytes cucullatus					View
Northern Pintail	Anas acuta					View
Redhead Duck	Aythya americana					View
Ring-necked Duck	Aythya collaris					View

All Species Rio Arriba

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Ruddy Duck	Oxyura jamaicensis					View
Lesser Scaup Duck	Aythya affinis					View
Northern Shoveler Duck	Spatula clypeata					View
Blue-winged Teal Duck	Spatula discors					View
Cinnamon Teal Duck	Spatula cyanoptera					View
Green-winged Teal Duck	Anas crecca					View
American Wigeon Duck	Mareca americana					View
Wood Duck	Aix sponsa					View
Canada Goose	Branta canadensis					View
Dusky Grouse	Dendragapus obscurus					View
White-tailed Ptarmigan	Lagopus leucura	E			Y	View
Wild Turkey	Meleagris gallopavo merriami; intermedia; silvestris					View
Gambel's Quail	Callipepla gambelii					View
Scaled Quail	Callipepla squamata					View
Common Loon	Gavia immer					No Photo
Clark's Grebe	Aechmophorus darkii				Y	View
Eared Grebe	Podiceps nigricollis				Y	View
Horned Grebe	Podiceps auritus					No Photo
Pied-billed Grebe	Podilymbus podiceps					View
Western Grebe	Aechmophorus occidentalis					View
Brown Pelican	Pelecanus occidentalis	E				View
American White Pelican	Pelecanus erythrorhynchos					View
American Bittern	Botaurus lentiginosus				Y	View
Least Bittern	Ixobrychus exilis exilis					View
Snowy Egret	Egretta thula					View
Great Blue Heron	Ardea herodias					View
Black-crowned Night-Heron	Nycticorax nycticorax					View
White-faced Ibis	Plegadis chihi					View
Common Black Hawk	Buteogallus anthracinus	T			Y	View
Bald Eagle	Haliaeetus leucocephalus	T			Y	View

All Species Rio Arriba

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Golden Eagle	Aquila chrysaetos					View
Northern Goshawk	Accipiter gentilis					View
Northern Harrier	Circus hudsonius					View
Broad-winged Hawk	Buteo platypterus					View
Cooper's Hawk	Accipiter cooperii					View
Ferruginous Hawk	Buteo regalis					View
Red-tailed Hawk	Buteo jamaicensis					View
Rough-legged Hawk	Buteo lagopus					View
Sharp-shinned Hawk	Accipiter striatus					View
Swainson's Hawk	Buteo swainsoni					View
Zone-tailed Hawk	Buteo albonotatus					View
Mississippi Kite	Ictinia mississippiensis					View
Turkey Vulture	Cathartes aura					View
Peregrine Falcon	Falco peregrinus	T			Y	View
Arctic Peregrine Falcon	Falco peregrinus tundrius	T				No Photo
Prairie Falcon	Falco mexicanus					View
American Kestrel	Falco sparverius					View
Osprey	Pandion haliaetus					View
American Coot	Fulica americana					View
Virginia Rail	Rallus limicola					View
Sora	Porzana carolina					View
Sandhill Crane	Antigone canadensis					View
Killdeer	Charadrius vociferus					View
Mountain Plover	Charadrius montanus				Y	View
American Avocet	Recurvirostra americana					View
Long-billed Curlew	Numenius americanus				Y	View
Wilson's Phalarope	Phalaropus tricolor					View
Least Sandpiper	Calidris minutilla					View
Spotted Sandpiper	Actitis macularius					View
Upland Sandpiper	Bartramia longicauda					No Photo

All Species Rio Arriba

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Western Sandpiper	Calidris mauri					View
Wilson's Snipe	Gallinago delicata					View
Bonaparte's Gull	Choricocephalus philadelphia					View
California Gull	Larus californicus					View
Ring-billed Gull	Larus delawarensis					View
Black Tern	Chlidonias niger					View
Least Tern	Sternula antillarum	E	E		Y	View
Double-crested Cormorant	Phalacrocorax auritus					View
Mourning Dove	Zenaida macroura					View
Band-tailed Pigeon	Patagioenas fasciata					View
Yellow-billed Cuckoo (western pop)	Coccyzus americanus occidentalis		T		Y	View
Greater Roadrunner	Geococcyx californianus					View
Boreal Owl	Aegolius funereus	T			Y	No Photo
Burrowing Owl	Athene cunicularia				Y	View
Flammulated Owl	Psiloscops flammeolus				Y	View
Great Horned Owl	Bubo virginianus					View
Long-eared Owl	Asio otus					View
Northern Pygmy Owl	Glaucidium gnoma					View
Western Screech-Owl	Megascops kennicottii					View
Mexican Spotted Owl	Strix occidentalis lucida		T	Y	Y	View
Common Nighthawk	Chordeiles minor				Y	View
Common Poorwill	Phalaenoptilus nuttalli					No Photo
Mexican Whip-poor-will	Antrostomus arizonae				Y	View
Black Swift	Cypseloides niger				Y	View
Chimney Swift	Chaetura pelagica					No Photo
White-throated Swift	Aeronautes saxatalis					View
Black-chinned Hummingbird	Archilochus alexandri					View
Broad-tailed Hummingbird	Selasphorus platycercus					View
Rivoli's Hummingbird	Eugenes fulgens					View
Rufous Hummingbird	Selasphorus rufus					View

All Species Rio Arriba

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Northern Flicker	Colaptes auratus					View
Red-naped Sapsucker	Sphyrapicus nuchalis					View
Williamson's Sapsucker	Sphyrapicus thyroideus				Y	View
Yellow-bellied Sapsucker	Sphyrapicus varius					View
Downy Woodpecker	Picoides pubescens					View
Hairy Woodpecker	Picoides villosus					View
Ladder-backed Woodpecker	Picoides scalaris					View
Lewis's Woodpecker	Melanerpes lewis				Y	View
Red-headed Woodpecker	Melanerpes erythrocephalus				Y	View
American Three-toed Woodpecker	Picoides dorsalis					No Photo
Ash-throated Flycatcher	Myiarchus cinerascens					View
Cordilleran Flycatcher	Empidonax occidentalis					View
Dusky Flycatcher	Empidonax oberholseri					View
Gray Flycatcher	Empidonax wrightii					View
Hammond's Flycatcher	Empidonax hammondii					View
Olive-sided Flycatcher	Contopus cooperi				Y	View
Willow Flycatcher	Empidonax traillii brewsteri; adastus					View
Southwestern Willow Flycatcher	Empidonax traillii extimus	E	E	Y	Y	View
Cassin's Kingbird	Tyrannus vociferans					View
Eastern Kingbird	Tyrannus tyrannus					View
Western Kingbird	Tyrannus verticalis					View
Western Wood Pewee	Contopus sordidulus					View
Black Phoebe	Sayornis nigricans					View
Eastern Phoebe	Sayornis phoebe					View
Say's Phoebe	Sayornis saya					View
Loggerhead Shrike	Lanius ludovicianus				Y	View
Northern Shrike	Lanius borealis					No Photo
Gray Vireo	Vireo vicinior	T			Y	View
Red-eyed Vireo	Vireo olivaceus					View
Blue-headed Vireo	Vireo solitarius					View

All Species Rio Arriba

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Cassin's Vireo	Vireo cassinii					View
Plumbeous Vireo	Vireo plumbeus					View
Warbling Vireo	Vireo gilvus					View
American Crow	Corvus brachyrhynchos					View
Blue Jay	Cyanocitta cristata					View
Gray Jay	Perisoreus canadensis					View
Pinyon Jay	Gymnorhinus cyanocephalus				Y	View
Woodhouse's Scrub Jay	Aphelocoma woodhouseii					View
Steller's Jay	Cyanocitta stelleri					View
Black-billed Magpie	Pica hudsonia					View
Clark's Nutcracker	Nudifraga columbiana				Y	View
Common Raven	Corvus corax					View
Horned Lark	Eremophila alpestris					View
Purple Martin	Progne subis					View
Bank Swallow	Riparia riparia				Y	View
Barn Swallow	Hirundo rustica					View
Cliff Swallow	Petrochelidon pyrrhonota					View
N. Rough-winged Swallow	Stelgidopteryx serripennis					View
Tree Swallow	Tachycineta bicolor					View
Violet-green Swallow	Tachycineta thalassina					View
Black-capped Chickadee	Poecile atricapillus					View
Mountain Chickadee	Poecile gambeli					View
Juniper Titmouse	Baeolophus ridgwayi				Y	View
Bushtit	Psaltriparus minimus					View
Pygmy Nuthatch	Sitta pygmaea				Y	View
Red-breasted Nuthatch	Sitta canadensis					View
White-breasted Nuthatch	Sitta carolinensis					View
Brown Creeper	Certhia americana					View
Bewick's Wren	Thryomanes bewickii					View
Canyon Wren	Catherpes mexicanus					View

All Species Rio Arriba

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House Wren	Troglodytes aedon					View
Marsh Wren	Cistothorus palustris					View
Rock Wren	Salpinctes obsoletus					View
Winter Wren	Troglodytes hemialis					No Photo
American Dipper	Cinclus mexicanus					View
Golden-crowned Kinglet	Regulus satrapa					No Photo
Ruby-crowned Kinglet	Regulus calendula					View
Blue-gray Gnatcatcher	Poliophtila caerulea					View
Eastern Bluebird	Sialia sialis					View
Mountain Bluebird	Sialia currucoides				Y	View
Western Bluebird	Sialia mexicana				Y	View
American Robin	Turdus migratorius					View
Townsend's Solitaire	Myadestes townsendi					View
Hermit Thrush	Catharus guttatus					View
Swainson's Thrush	Catharus ustulatus					View
Gray Catbird	Dumetella carolinensis					View
Northern Mockingbird	Mimus polyglottos					View
Bendire's Thrasher	Toxostoma bendirei				Y	View
Brown Thrasher	Toxostoma rufum					View
Sage Thrasher	Oreoscoptes montanus					View
European Starling	Sturnus vulgaris					View
American Pipit	Anthus rubescens					View
Bohemian Waxwing	Bombycilla garrulus					No Photo
Cedar Waxwing	Bombycilla cedrorum					View
Yellow-breasted Chat	Icteria virens					View
Ovenbird	Seiurus aurocapilla					No Photo
Northern Parula	Setophaga americana					No Photo
Grace's Warbler	Setophaga graciae				Y	View
Black-throated Gray Warbler	Setophaga nigrescens				Y	View
Black-throated Green Warbler	Setophaga virens					View

All Species Rio Arriba

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Hooded Warbler	Setophaga citrina					View
Macgillivray's Warbler	Geothlypis tolmiei					View
Orange-crowned Warbler	Oreothlypis celata					View
Palm Warbler	Setophaga palmarum					View
Virginia's Warbler	Oreothlypis virginiae				Y	View
Wilson's Warbler	Cardellina pusilla					View
Yellow Warbler	Setophaga petechia					View
Yellow-rumped Warbler	Setophaga coronata					View
Common Yellowthroat	Geothlypis trichas					View
Lark Bunting	Calamospiza melanocorys					View
Dark-eyed Junco	Junco hyemalis					View
Baird's Sparrow	Ammodramus bairdii	T			Y	View
Black-throated Sparrow	Amphispiza bilineata					View
Brewer's Sparrow	Spizella breweri					View
Chipping Sparrow	Spizella passerina					View
Lark Sparrow	Chondestes grammacus					View
Lincoln's Sparrow	Melospiza lincolnii					View
Sagebrush Sparrow	Artemisiospiza nevadensis				Y	View
Savannah Sparrow	Passerculus sandwichensis nevadensis; anthinus					View
Song Sparrow	Melospiza melodia					View
Swamp Sparrow	Melospiza georgiana					View
Vesper Sparrow	Poocetes gramineus				Y	View
White-crowned Sparrow	Zonotrichia leucophrys					View
Canyon Towhee	Melospiza fuscata					View
Green-tailed Towhee	Pipilo chlorurus					View
Spotted Towhee	Pipilo maculatus					View
Indigo Bunting	Passerina cyanea					View
Lazuli Bunting	Passerina amoena					View
Dickcissel	Spiza americana					View
Black-headed Grosbeak	Pheucticus melanocephalus					View

All Species Rio Arriba

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Blue Grosbeak	Passerina caerulea					View
Brewer's Blackbird	Euphagus cyanocephalus					View
Red-winged Blackbird	Agelaius phoeniceus					View
Rusty Blackbird	Euphagus carolinus					View
Yellow-headed Blackbird	Xanthocephalus xanthocephalus					View
Bobolink	Dolichonyx oryzivorus					No Photo
Brown-headed Cowbird	Molothrus ater					View
Common Grackle	Quiscalus quiscula					View
Great-tailed Grackle	Quiscalus mexicanus					View
Western Meadowlark	Sturnella neglecta					View
Bullock's Oriole	Icterus bullockii					View
Baltimore Oriole	Icterus galbula					View
Scott's Oriole	Icterus parisorum					View
Red Crossbill	Loxia curvirostra					View
Cassin's Finch	Haemorhous cassinii				Y	View
House Finch	Haemorhous mexicanus					View
Black Rosy-Finch	Leucosticte atrata					View
Brown-capped Rosy-Finch	Leucosticte australis				Y	View
Evening Grosbeak	Coccothraustes vespertinus				Y	View
Pine Grosbeak	Pinicola enucleator					No Photo
House Sparrow	Passer domesticus					View
American Goldfinch	Spinus tristis					View
Lesser Goldfinch	Spinus psaltria					View
Pine Siskin	Spinus pinus					View
Northern Waterthrush	Parkesia noveboracensis					View
Hepatic Tanager	Piranga flava					View
Summer Tanager	Piranga rubra					View
Western Tanager	Piranga ludoviciana					View
Belted Kingfisher	Megaceryle alcyon					View
Western Painted Turtle	Chrysemys picta					View

All Species Rio Arriba

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Eastern Collared Lizard	Crotaphytus collaris					View
Common Lesser Earless Lizard	Holbrookia maculata maculata; bunkerii; ruthveni					View
Round-tailed Horned Lizard	Phrynosoma modestum					View
Northern Sagebrush Lizard	Sceloporus graciosus					View
Hernandez's Short-horned Lizard	Phrynosoma hernandesi					View
Common Side-blotched Lizard	Uta stansburiana					View
Northern Tree Lizard	Urosaurus ornatus					View
Many-lined Skink	Plestiodon multivirgatus					View
New Mexico Whiptail	Aspidoscelis neomexicana					View
Chihuahuan Spotted Whiptail	Aspidoscelis exsanguis					View
Plateau Striped Whiptail	Aspidoscelis velox					View
Coachwhip	Coluber flagellum					View
Great Plains Rat Snake	Pantherophis emoryi					View
Black-necked Gartersnake	Thamnophis cyrtopsis					View
New Mexico Gartersnake	Thamnophis sirtalis					View
Wandering Gartersnake	Thamnophis elegans					View
Glossy Snake	Arizona elegans					View
Gophersnake	Pituophis catenifer					View
Smooth Greensnake	Opheodrys vernalis					View
Plains Hog-nosed Snake	Heterodon nasicus					View
Milk Snake	Lampropeltis gentilis					View
Mountain Patchnose Snake	Salvadora grahamiae					View
Desert Striped Whipsnake	Coluber taeniatus					View
Texas Blind Snake	Rena dissecta					View
Western Diamond-backed Rattlesnake	Crotalus atrox					View
Prairie Rattlesnake	Crotalus viridis					View
Boreal Toad	Anaxyrus boreas boreas		E		Y	View
Great Plains Toad	Anaxyrus cognatus					View
Red-spotted Toad	Anaxyrus punctatus					View
Woodhouse's Toad	Anaxyrus woodhousii					View

All Species Rio Arriba

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Boreal Chorus Frog	Pseudacris maculata				Y	View
Bullfrog	Lithobates catesbeianus					View
Northern Leopard Frog	Lithobates pipiens				Y	View
Plains Leopard Frog	Lithobates blairi				Y	View
New Mexico Spadefoot	Spea multiplicata					View
Plains Spadefoot	Spea bombifrons					View
Tiger Salamander	Ambystoma mavortium mavortium; nebulosum					View
Jemez Mountains Salamander	Plethodon neomexicanus	E	E	Y	Y	View
Common Carp	Cyprinus carpio					View
Flathead Chub	Platygobio gracilis					View
Rio Grande Chub	Gila pandora				Y	View
Roundtail Chub (upper basin populations)	Gila robusta	E			Y	No Photo
Longnose Dace	Rhinichthys cataractae					View
Speckled Dace (Non-Gila pop.)	Rhinichthys osculus					No Photo
Fathead Minnow	Pimephales promelas					View
Red Shiner	Cyprinella lutrensis					View
River Carpsucker	Carpionodes carpio					View
Bluehead Sucker	Catostomus discobolus discobolus					No Photo
Flannelmouth Sucker	Catostomus latipinnis					No Photo
Rio Grande Sucker	Catostomus plebeius				Y	View
White Sucker	Catostomus commersoni					View
Black Bullhead	Ameiurus melas					View
Channel Catfish	Ictalurus punctatus					View
Northern Pike	Esox lucius					View
Kokanee Salmon	Oncorhynchus nerka					View
Brook Trout	Salvelinus fontinalis					View
Brown Trout	Salmo trutta					View
Rio Grande Cutthroat Trout	Oncorhynchus darkii virginalis					View
Cutthroat Trout	Oncorhynchus darkii					No Photo

All Species Rio Arriba

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Lake Trout	Salvelinus namaycush					View
Rainbow Trout	Oncorhynchus mykiss					View
Plains Killifish	Fundulus zebrinus					No Photo
Western mosquitofish	Gambusia affinis					No Photo
Mottled Sculpin	Cottus bairdi					No Photo
Largemouth Bass	Micropterus salmoides					View
Smallmouth Bass	Micropterus dolomieu					View
Bluegill	Lepomis macrochirus					View
White Crappie	Pomoxis annularis					View
Green Sunfish	Lepomis cyanellus					View
Yellow Perch	Perca flavescens					View
Walleye	Sander vitreus					View
Brown Hive Snail	Euconulus fulvus					No Photo
Glossy Pillar Snail	Cionella lubrica					No Photo
Rocky Mtn. Column Snail	Pupilla blandi					No Photo
Vertigo Snail	Vertigo arizonensis					No Photo
Widespread Column Snail	Pupilla muscorum					No Photo
Ribbed Dagger Snail	Pupoides hordaceus					No Photo
Montane Snaggletooth Snail	Gastrocopta pilsbryana					No Photo
Vertigo Snail	Vertigo concinnula					No Photo
Silky Vallonia Snail	Vallonia cyclophorella					No Photo
Multirib Vallonia Snail	Vallonia gradilicosta					No Photo
Mexican Coil Snail	Helicodiscus eigenmani					No Photo
Rocky Mountainsnail	Oreohelix strigosa					View
Socorro Mountainsnail	Oreohelix neomexicana					No Photo
Suboval Ambersnail	Catinella vermeta					No Photo
Quick Gloss Snail	Zonitoides arboreus					No Photo
Amber Glass Snail	Nesovitrea hammonis					No Photo
Minute Gem Snail	Hawaiiia minuscula					No Photo
Western Glass Snail	Vitrina pellucida					No Photo

All Species Rio Arriba

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Meadow Slug Snail	Deroceras laeve					No Photo
Jemez Woodlandsnail	Ashmunella ashmuni				Y	No Photo
Spruce Snail	Microphysula ingersolli					No Photo
Forest Disc Snail	Discus whi tneyi					No Photo
Northern Crayfish	Orconectes virilis					View
Colorado Fairy Shrimp	Branchinecta coloradensis				Y	No Photo
Versatile Fairy Shrimp	Branchinecta lindahli				Y	No Photo
Scud	Hyalella azteca					No Photo
False Ameletus Mayfly	Ameletus falsus					No Photo
Mayfly	Acentrella insignificans					No Photo
Mayfly	Baetis tricaudatus					No Photo
Mayfly	Callibaetis pictus					No Photo
Mayfly	Ephemera simulans					No Photo
Mayfly	Epeorus albertae					No Photo
Mayfly	Epeorus longimanus					No Photo
Mayfly	Epeorus margarita					No Photo
Mayfly	Nixe criddlei					No Photo
Mayfly	Nixe simplicioides					No Photo
Mayfly	Rhi throgena undulata					No Photo
Mayfly	Paraleptophlebia heteronea					No Photo
Mayfly	Paraleptophlebia memorialis					No Photo
Mayfly	Drunella doddsi					No Photo
Mayfly	Ephemerella inermis					No Photo
Mayfly	Serratella micheneri					No Photo
Mayfly	Timpanoga hecuba					No Photo
Mayfly	Leptohyphes apache					No Photo
Mayfly	Tricorythodes explicatus					No Photo
Common Spreadwing	Lestes disjunctus					No Photo
Southern Spreadwing Damselfly	Lestes australis					No Photo
Blue-fronted Dancer	Argia apicalis					View

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Boreal Bluet	Enallagma boreale					No Photo
Northern Bluet	Enallagma annexum					View
American Rubyspot	Hetaerina americana					View
Great Spreadwing	Archilestes grandis					View
Spotted Spreadwing	Lestes congener					View
Emerald Spreadwing	Lestes dryas					No Photo
Western Red Damselfly	Amphiagrion abbreviatum					No Photo
Springwater Dancer	Argia plana					View
Vivid Dancer	Argia vivida					View
Double-striped Bluet	Enallagma basidens					No Photo
Familiar Bluet	Enallagma civile					View
Arroyo Bluet	Enallagma praevarum					No Photo
Painted Damselfly	Hesperagrion heterodoxum					No Photo
Plains Forktail	Ischnura damula					No Photo
Mexican Forktail	Ischnura demorsa					View
Widow skimmer	Libellula luctuosa					View
Twelve-spotted Skimmer	Libellula pulchella					View
Boreal Whiteface	Leucorrhinia borealis					View
Variegated meadowhawk	Sympetrum corruptum					View
Green Bird Grasshopper	Schistocerca alutacea shoshone					No Photo
Green Streak Grasshopper	Hesperotettix viridis					No Photo
Grasshopper	Hesperotettix speciosus					No Photo
Bruner's Spur-Throat Grasshopper	Melanoplus bruneri					No Photo
Grasshopper	Melanoplus cumbres					No Photo
Differential Grasshopper	Melanoplus differentialis					No Photo
Two-Striped Grasshopper	Melanoplus bivittatus					No Photo
Northern Spur-Throat Grasshopper	Melanoplus borealis					No Photo
Grasshopper	Melanoplus lakinus					No Photo
Little Pasture Spur-Throat Grasshopper	Melanoplus confusus					No Photo
Tiny Spur-Throat Grasshopper	Melanoplus infantilis					No Photo

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Red-Legged Grasshopper	Melanoplus femurrubrum					No Photo
Narrow-Winged Spur-Throat Grasshopper	Melanoplus angustipennis					No Photo
Bowditch's Spur-Throat Grasshopper	Melanoplus bowditchi					No Photo
Glaucous-Legged Grasshopper	Melanoplus glaucipes					No Photo
Flabellate Grasshopper	Melanoplus occidentalis					No Photo
Packard's Grasshopper	Melanoplus packardi					No Photo
Grasshopper	Melanoplus foedus					No Photo
Gladston's Spur-Throat Grasshopper	Melanoplus gladstoni					No Photo
Kennicott's Spur-Throat Grasshopper	Melanoplus kennicott's					No Photo
Grasshopper	Melanoplus bohemani					No Photo
Grasshopper	Mermiria texana					No Photo
Obscure Grasshopper	Opeia obscura					No Photo
Velvet-Striped Grasshopper	Eritettix simplex					No Photo
Spotted Wing Grasshopper	Cordillacris occipitalis					No Photo
Striped Slant-Faced Grasshopper	Amphitornus coloradus					No Photo
Club-Horned Grasshopper	Aeropedellus clavatus					No Photo
Rufous Grasshopper	Heliaula rufa					No Photo
Cream Grasshopper	Cibolacris parviceps					No Photo
White Cross Grasshopper	Aulocara femoratum					No Photo
Elliott Grasshopper	Aulocara ellioti					No Photo
Grasshopper	Psoloessa texana					No Photo
Brown Spotted Range Grasshopper	Psoloessa delicatula					No Photo
White Whiskers Grasshopper	Ageneotettix deorum					No Photo
Clear-Winged Grasshopper	Camnula pellucida					No Photo
Northern Green-Striped Locust Grasshopper	Chortophaga viridifasciata					No Photo
Dusky Grasshopper	Encoptolophus costalis					No Photo
Carolina Grasshopper	Dissosteira carolina					No Photo
Red-Winged Grasshopper	Arphia pseudonietana					No Photo
Speckled Rangeland Grasshopper	Arphia conspersa					No Photo

All Species Rio Arriba

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Mottled Sand Grasshopper	Spharagemon collare					No Photo
Campestral Grasshopper	Spharagemon campestris					No Photo
Grasshopper	Hippopedon capito					No Photo
Kiowa Range Grasshopper	Trachyrhachys kiowa					No Photo
Platte Range Grasshopper	Mestobregna plattei					No Photo
Grasshopper	Mestobregna terricolor					No Photo
Arroyo Grasshopper	Heliastus benjamini					No Photo
Blue-Winged Grasshopper	Lepus intermedius					No Photo
Pronotal Range Grasshopper	Cratypedes neglectus					No Photo
Grasshopper	Xanthippus montanus					No Photo
Red Shanks Grasshopper	Xanthippus corallipes					No Photo
Wrangler Grasshopper	Circotettix rabula					No Photo
Groove-Headed Grasshopper	Conozoa sulcifrons					No Photo
Grasshopper	Conozoa texana					No Photo
Grasshopper	Trimerotropis barnumi					No Photo
Strenuous Grasshopper	Trimerotropis californica					No Photo
Crackling Forest Grasshopper	Trimerotropis verruculata					No Photo
Grasshopper	Trimerotropis inconspicua					No Photo
Thomas' Slender Grasshopper	Trimerotropis gracilis					No Photo
Grasshopper	Trimerotropis fratercula					No Photo
Barren Land Grasshopper	Trimerotropis pristrinaria					No Photo
Grasshopper	Trimerotropis modesta					No Photo
Grasshopper	Melanoplus splendidus					No Photo
Tiger Beetle	Cicindela nigrocoerulea					No Photo
Nevada Tiger Beetle	Ellipsoptera nevadica tubensis					No Photo
Tiger Beetle	Cicindela fulgida fulgida; pseudowillistoni					No Photo
Tiger Beetle	Cicindela hirticollis					No Photo
Tiger Beetle	Cicindela lengi lengi; jordai					No Photo
Dainty Tiger Beetle	Cicindela lepida					No Photo
Tiger Beetle	Cicindela longilabris laurentii					No Photo

All Species Rio Arriba

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Tiger Beetle	Cicindela marutha					No Photo
Tiger Beetle	Cicindela obsoleta obsoleta; santadarae					No Photo
Tiger Beetle	Cicindela oregona					No Photo
Tiger Beetle	Cicindela pulchra					No Photo
Tiger Beetle	Cicindela punctulata					No Photo
Tiger Beetle	Cicindela purpurea					No Photo
Tiger Beetle	Cicindela repanda					No Photo
Tiger Beetle	Cicindela sedecimpunctata					No Photo
Tiger Beetle	Cicindela sperata					No Photo
Tiger Beetle	Cicindela tranquebarica					No Photo
Silver-Spotted Skipper	Epargyreus darus darus					View
Sleepy Duskywing Skipper	Erynnis brizo					View
Pacuvius Duskywing Skipper	Erynnis pacuvius					No Photo
Loki Grizzled Skipper	Pyrgus centaureae					No Photo
Saltbush Sootywing Skipper	Hesperopsis alpheus					No Photo
Uncas Skipper	Hesperia uncas uncas					No Photo
Colorado Branded Skipper	Hesperia comma colorado					No Photo
Pahaska Skipper	Hesperia pahaska pahaska					No Photo
Sandhill Skipper	Polites sabuleti					No Photo
Napa Woodland Skipper	Ochlodes sylvanoides					No Photo
Kiowa Dun Skipper	Euphyes vestris					View
Colorado Giant Skipper	Megathymus coloradensis coloradensis					No Photo
Strecker's Giant Skipper	Megathymus streckeri streckeri					View
Roger's False Parnassian Butterfly	Parnassius phoebus					View
Black Swallowtail Butterfly	Papilio polyxenes asterius					View
Anise Swallowtail Butterfly	Papilio zelicaon zelicaon					No Photo
Nitra Swallowtail Butterfly	Papilio zelicaon nitra					No Photo
Western Tiger Swallowtail Butterfly	Pterourus rutulus rutulus					View
Pale Swallowtail Butterfly	Pterourus eurymedon					No Photo

All Species Rio Arriba

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Pine White Butterfly	Neophasia menapia					View
Spring White Butterfly	Pontia sisymbrii elivata					No Photo
Western White Butterfly	Pontia occidentalis					View
McDunnough's White Butterfly	Pieris napi mcdunnoughi					No Photo
Colorado Marble Butterfly	Euchloe ausonides					No Photo
Southern Marble Butterfly	Euchloe hyantis					No Photo
Ingham's Orangetip Butterfly	Anthocharis sara					View
Western Common Sulphur Butterfly	Colias philodice					View
Queen Alexandra's Sulphur Butterfly	Colias alexandra alexandra					View
Mead's Sulphur Butterfly	Colias meadii					No Photo
Scudder's Willow Sulphur Butterfly	Colias scudderii					No Photo
Southern Dogface Butterfly	Zerene cesonia					No Photo
Shellbach's Copper Butterfly	Tharsalea arota					View
Sirius Copper Butterfly	Chalceria rubida					No Photo
Blue Copper Butterfly	Chalceria heteronea					No Photo
Colorado Hairstreak Butterfly	Hypaurotis crysalus					View
Great Purple Hairstreak Butterfly	Atlides halesus					No Photo
Immaculate Hairstreak Butterfly	Satyrium titus immaculosus					No Photo
Cross's Hairstreak Butterfly	Satyrium behrii					No Photo
Itys Hairstreak Butterfly	Satyrium sylvinum					No Photo
Godart's Hairstreak Butterfly	Satyrium calanus					No Photo
Rocky Mountain Green Hairstreak Butterfly	Callophrys affinis homoperplexa					No Photo
Sheridan's Hairstreak Butterfly	Callophrys sheridanii sheridanii					No Photo
Juniper Hairstreak Butterfly	Mitoura siva					No Photo
Western Elfin Butterfly	Incisalia augustinus iroides					No Photo
Obscure Elfin Butterfly	Incisalia polia					No Photo
Western Pine Elfin Butterfly	Incisalia eryphon					No Photo
Frank's Common Hairstreak Butterfly	Strymon melinus					No Photo
Reakirt's Blue Butterfly	Hemiargus isola					View
Arizona Blue Butterfly	Celastrina ladon cinerea					No Photo

All Species Rio Arriba

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Square-spotted Blue Butterfly	Euphilotes battoides centralis					No Photo
Silvery Blue Butterfly	Glaucoopsyche lygdamus oro					No Photo
Melissa Blue Butterfly	Lycaeides melissa					No Photo
Whitmer's Blue Butterfly	Plebejus saepiolus whitmeri					View
Lycea Blue Butterfly	Plebejus icarioides lycea					View
Texas Blue Butterfly	Plebejus acmon					View
Rustic Blue Butterfly	Agriades rusticus					View
Mormon Metalmark Butterfly	Apodemia mormo mormo					No Photo
Southern Snout Butterfly	Libytheana bachmanii					No Photo
Great Spangled Fritillary Butterfly	Speyeria cybele					No Photo
Nikias Fritillary Butterfly	Speyeria hesperis nikias					View
Electa Fritillary Butterfly	Speyeria hesperis electa					View
Eurynome Silverspot Butterfly	Speyeria mormonia					View
Tolland Fritillary Butterfly	Clossiana selene					No Photo
Brown's Fritillary Butterfly	Clossiana freija					No Photo
Helena Fritillary Butterfly	Clossiana titania					View
Montane Penstemon Checkerspot Butterfly	Poladryas minuta arachne					No Photo
Fulvia Checkerspot Butterfly	Thessalia fulvia					View
Carlota Checkerspot Butterfly	Chlosyne gorgone					No Photo
Drusius Checkerspot Butterfly	Charidryas nycteis					View
Pearly Checkerspot Butterfly	Charidryas acastus acastus					No Photo
Pearl Crescent Butterfly	Phyciodes tharos Type B					No Photo
Painted Crescent Butterfly	Phyciodes pictus					View
Mylitta Crescent Butterfly	Phyciodes mylitta					View
Alena Checkerspot Butterfly	Occidryas anicia alena					No Photo
Mead's Checkerspot Butterfly	Occidryas anicia eurytion					No Photo
Satyr Anglewing Butterfly	Polygonia satyrus					No Photo
Green Comma Butterfly	Polygonia faunus					View
California Tortoise Shell Butterfly	Nymphalis californica					View
Mourning Cloak Butterfly	Nymphalis antiopa					View

All Species Rio Arriba

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Milbert's Tortoise Shell Butterfly	Aglais milberti					View
Red Admiral Butterfly	Vanessa atalanta					View
Viceroy Butterfly	Limenitis archippus archippus					No Photo
Weidemeyer's Admiral Butterfly	Limenitis weidemeyeri weidemeyeri					View
Arizona Sister Butterfly	Adelpha bredowii					View
Canyonland Satyr Butterfly	Cyllopsis pertepida dorothea					No Photo
Ochre Ringlet Butterfly	Coenonympha ochracea ochracea					View
Common Wood-Nymph Butterfly	Cercyonis pegala					View
Mead's Wood Nymph Butterfly	Cercyonis meadii meadii					No Photo
Charon Satyr Butterfly	Cercyonis oetus					View
Common Alpine Butterfly	Erebia epipsodea					View
Ridings' Satyr Butterfly	Neominois ridingsii ridingsii					No Photo
Chryxus Arctic Butterfly	Oeneis chryxus chryxus					View
Uhler's Arctic Butterfly	Oeneis uhleri					No Photo
CO Melissa Arctic Butterfly	Oeneis melissa					No Photo
Bruce's Arctic Butterfly	Oeneis polixenes					No Photo
Striated Queen Butterfly	Danaus gilippus					View
Moth	Hemileuca nuttalli					No Photo
Twin-spot Sphinx Moth	Smerinthus jamaicensis					No Photo
White-lined Sphinx Moth	Hyles lineata					View
Short-Tailed Skipper	Zestusa dorus					No Photo
Northern Cloudwing Skipper	Thorybes pylades					View
Mexican Cloudwing Skipper	Thorybes mexicanus					No Photo
Dreamy Duskywing Skipper	Erynnis icelus					No Photo
Rocky Mtn Duskywing Skipper	Erynnis telemachus					View
Horace's Duskywing Skipper	Erynnis horatius					No Photo
Afranius Duskywing Skipper	Erynnis afranius					No Photo
Persius Duskywing Skipper	Erynnis persius					No Photo
Mountain Checkered Skipper	Pyrgus xanthus					No Photo
Common Checkered Skipper	Pyrgus communis					View

All Species Rio Arriba

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Northern White Skipper	Heliopetes ericetorum					No Photo
Russet Skipperling Skipper	Piruna pirus					View
Garita Skipperling Skipper	Oarisma garita					View
Rhesus Skipper	Yvretta rhesus					No Photo
Morrison's Skipper	Stinga morrisoni					No Photo
Juba Skipper	Hesperia juba					No Photo
Apache Skipper	Hesperia woodgatei					No Photo
Green Skipper	Hesperia viridis					View
Nevada Skipper	Hesperia nevada					No Photo
Draco Skipper	Polites draco					View
Tawny-Edged Skipper	Polites themistodes					View
Taxiles Skipper	Poanes taxiles					View
Viereck's Skipper	Atrytonopsis vierecki					No Photo
Python Skipper	Atrytonopsis python					No Photo
Simius Roadside Skipper	Amblyscirtes simius					No Photo
Cassus Roadside Skipper	Amblyscirtes cassus					No Photo
Bronze Roadside Skipper	Amblyscirtes aenus					No Photo
Oslar's Roadside Skipper	Amblyscirtes oslari					No Photo
Roadside Skipper	Amblyscirtes vialis					No Photo
Orange-headed Roadside Skipper	Amblyscirtes phylace					No Photo
Baird's Swallowtail Butterfly	Papilio bairdii					No Photo
Two-Tailed Swallowtail Butterfly	Pterourus multicaudatus					View
Becker's White Butterfly	Pontia beckerii					No Photo
Checkered White Butterfly	Pontia protodice					View
Cabbage White Butterfly	Pieris rapae					View
Orange Sulphur Butterfly	Colias eurytheme					View
Mexican Yellow Butterfly	Eurema mexicanum					No Photo
Sleepy Orange Butterfly	Eurema nicippe					View
Dainty Sulphur Butterfly	Nathalis iole					View
Purplish Copper Butterfly	Epidemia helloides					View

All Species Rio Arriba

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Leda Hairstreak Butterfly	Ministrymon leda					No Photo
Thicket Hairstreak Butterfly	Mitoura spinetorum					View
Western Pygmy Blue Butterfly	Brephidum exile					No Photo
Marine Blue Butterfly	Leptotes marina					View
Western Tailed Blue Butterfly	Everes amyntula					View
Spalding's Blue Butterfly	Euphilotes spaldingi					No Photo
Nais Metalmark Butterfly	Apodemia nais					No Photo
Variegated Fritillary Butterfly	Euptoieta daudia					View
Edwards' Fritillary Butterfly	Speyeria edwardsii					No Photo
Camillus Crescent Butterfly	Phyciodes pulchella					View
Chuska Mountains Checkerspot Butterfly	Euphydryas anicia chuskae					No Photo
Hoary Comma Butterfly	Polygonia gracilis					View
American Lady Butterfly	Vanessa virginiensis					View
Painted Lady Butterfly	Vanessa cardui					View
West Coast Lady Butterfly	Vanessa annabella					View
Buckeye Butterfly	Junonia coenia					View
Monarch Butterfly	Danaus plexippus					View
Comb-Footed Spider	Theridion neomexicanum					No Photo
Comb-Footed Spider	Theridion ohlerti					No Photo
Orb Weaver Spider	Araneus bicentenarius					No Photo
Thin-legged Wolf Spider	Pardosa coloradensis					No Photo
Thin-legged Wolf Spider	Pardosa distincta					No Photo
Thin-legged Wolf Spider	Pardosa fuscula					No Photo
Thin-legged Wolf Spider	Pardosa ourayensis					No Photo
Thin-legged Wolf Spider	Pardosa sternalis					No Photo
Spider	Varacosa gosiuta					No Photo
Pseudoscorpion	Mundochthonius montanus					No Photo
Pseudoscorpion	Lechytia pacifica					No Photo
Pseudoscorpion	Syarinus obscurus					No Photo
Pseudoscorpion	Chitrella transversa					No Photo

All Species Rio Arriba

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Pseudoscorpion	Hesperochnes utahensis					No Photo
Pseudoscorpion	Dinocheirus athleticus					No Photo
Pseudoscorpion	Parachelifer persimilis					No Photo

Appendix B
CULTURAL RESOURCES COMPLIANCE AND
CORRESPONDENCE



DEPARTMENT OF THE ARMY
CORPS OF ENGINEERS, ALBUQUERQUE DISTRICT
4101 JEFFERSON PLAZA NE
ALBUQUERQUE, NM 87109-3435

August 14, 2019

Planning, Project and Program Management Division
Planning Branch
Environmental Resources Division

kh AUG 15 2019
LG# 111209

Dr. Jeff Pappas
State Historic Preservation Officer
New Mexico Department of Cultural Affairs
Historic Preservation Division
Bataan Memorial Building
407 Galisteo Street, Suite 236
Santa Fe, New Mexico 87501

Dear Dr. Pappas:

Pursuant to 36 CFR Part 800, the U.S. Army Corps of Engineers (Corps), Albuquerque District, in partnership with the New Mexico Department of Game and Fish (NMDGF); the Bureau of Land Management (BLM); and the U.S. Forest Service (USFS), including both the Santa Fe National Forest (SFNF) and the Carson National Forest (CNF), proposes to undertake an aquatic ecosystem restoration project on the Chama River immediately downstream of Abiquiu Dam, on land owned by the Corps, BLM, USFS, and the State of New Mexico (Enclosures 1 and 2). Abiquiu Dam was constructed in the late 1950s and early 1960s as a flood control project on the Rio Chama about 32 miles upstream from the confluence of the Rio Chama and the Rio Grande and became operational in 1963. The project is located on the Cañones, New Mexico (36106-B4) 7.5' USGS quad map. The Corps is the Lead Federal Agency for the purposes of Section 106 consultation.

The proposed restoration project is intended to provide fish with low velocity refuge habitat at discharges between 50 and 1800 cfs. Several types of features are proposed to create different types of fish habitat. The features include rock and wood sills, pools, rock grade control structures, rock habitat structures, rock deflectors, and riparian vegetation. Excavated substrate from pools would be redistributed along channel margins creating or expanding existing bank attached bars (see Enclosure 3 for schematic examples of proposed features). Details of the proposed project include:

- Excavation of large, naturally-occurring **rock riffle** and redistribution of rocks into a larger upstream grade control structure (GCS)/riffle. The new GCS would allow upstream fish passage and downstream boat passage. The GCS would be grouted to increase structure stability at higher flows. River gravel and crushed rock would be placed to form the boat access ramp from the access road to the river.
- **Pools** are proposed for construction to create additional velocity refuge for fish. Placement of clean alluvial substrate is proposed along the margins of the channel to form shallow bank attached bars that incrementally increase water depth within the channel, with an increase in water velocity.

Correspondence with New Mexico State Historic Preservation Officer (NMSHPO; Page 1 of 5)

- **Rock habitat structures and deflectors** are proposed to provide hydraulic roughness, habitat diversity, and velocity refuge for fish. The boulder rock structures would be partially buried within the bed to increase stability and maintain their location.
- **Planting with native riparian vegetation** along the bankline is proposed in selected areas primarily for allochthonous leaf litter inputs into the stream to support aquatic insects. The riparian vegetation would contribute to bank stability, while the native wetland species would increase habitat diversity.
- **Remove topsoil** from existing wetland to stockpile location, excavate substrate to lower elevation, place and grade topsoil to form depressional (groundwater) wetland. Plant with obligate wetland species (plugs), riparian shrubs and trees (willows and cottonwoods), and seed with appropriate wetland species.
- **Boater access improvements** would be made at two locations, one in the upper project reach adjacent to the exiting USACE recreational area and another in the lower project reach on USFS property. Access improvements would include constructing sloped concrete boat ramps (or compacted gravel), stream bank grading for vehicle access, and installing rip rap for structure protection. Boat ramps would be designed to accommodate access at most flows.
- In-channel work and habitat improvement structures will be constructed by utilizing heavy tracked and wheeled equipment. All equipment will utilize existing roads where possible. Access to river channel will be restricted to a few locations to reduce impacts to bank erosion. All immediate access points to the river channel will be temporary and only used during construction and will be reclaimed to pre-existing conditions post construction. Portions of the equipment access areas will be improved to control vehicular access.

The Corps considers the Area of Potential Effect (APE) to be the area encompassing the proposed restoration features themselves, any area around those features where mechanical equipment might be expected to operate, any areas where the proposed features might be expected to cause future changes in the surrounding landscape or flow of water, and any areas used for staging. The currently-defined APE for the proposed project is shown in Enclosure 1 and is approximately 75 acres in size.

Two archaeological surveys were conducted in order to identify possible historic properties within the APE for the proposed project. NMDGF contracted with SWCA Environmental Consultants to conduct a survey of portions of the project area on USFS, BLM, and State-owned lands (Healy 2019, NMCRIS 142601), and USACE archaeologists conducted a survey of the portion on USACE-owned land (Van Hoose 2019, NMCRIS 143623). Reports for both surveys are enclosed for your review. Enclosure 4 presents an overview map of resources documented by these surveys within the APE. Enclosures 5 through 11 show proposed restoration feature locations in relation to cultural resources identified by these surveys.

Ten resources were documented within the APE (Enclosure 4 and Table 1). SWCA documented a total of nine sites within or intersecting the project area. These nine include seven prehistoric artifact scatters, one Twentieth-Century railroad grade, and the Abeyta-Trujillo Acequia diversion structure and a segment of the irrigation ditch. Six of the nine sites have been recommended as eligible for listing on the National Register of Historic Places (NRHP), and the Corps accepts these recommendations formally as our determinations of eligibility. A single resource was documented on Corps land: HCPI 47037, a concrete weir constructed by USGS in 1961 (see enclosed HPCI form). No resources were documented on State land. The Corps determines that this weir is not eligible for NRHP listing. These resources are

summarized below in Table 1 with our eligibility determinations. We seek your concurrence in these determinations.

Table 1. Historic Properties Documented within the APE.

Site/Historic Property Number	Site Type	Cultural Affiliation and Age	Land Owner	Eligibility Determination	Eligibility Criteria
HCPI 47037	Concrete weir	Recent Historic (1961)	USACE	Not eligible	
LA 51720	Artifact scatter with feature	Unspecified Prehistoric	BLM	Eligible	D
LA 51721	Artifact scatter	Unspecified Prehistoric	BLM	Eligible	D
LA 75570	Railroad grade	Recent Historic (post-AD 1945)	SFNF	Not eligible	
LA 82827 / HCPI 33400	The Abeyta-Trujillo Acequia (diversion and irrigation system)	EuroAmerican/US Territorial; Pre-AD 1870	CNF	Eligible	A, C
LA 193665	Artifact scatter	Unknown Prehistoric	BLM	Not eligible	
LA 193666	Artifact scatter	Middle Archaic (5000-3000 BC)	BLM	Eligible	D
LA 193667	Artifact scatter	Unknown Prehistoric	BLM	Not eligible	
LA 193668	Artifact scatter	Late Archaic (1000 BC – AD 300) and Historic (AD 1821-1912)	CNF	Eligible	A, C, D
LA 193669	Artifact scatter	Unspecified Prehistoric	BLM	Eligible	D

BLM=Bureau of Land Management; CNF = Carson National Forest; SFNF = Santa Fe National Forest; USACE = U.S. Army Corps of Engineers

In addition to these properties, five isolated occurrences (IOs) were documented by SWCA, and one IO was documented by the Corps (see attached reports). The Corps determines that none of these IOs are eligible for NRHP listing.

Table 2. Isolated Occurrences.

IO Number	Description
1 (SWCA)	4 artifacts: two chalcedony flakes and two manos
2 (SWCA)	1 mano (rhyolite)
3 (SWCA)	1 mano (sandstone)
4 (SWCA)	2 artifacts: one historic transfer ware ceramic, and one obsidian projectile point
5 (SWCA)	2 chalcedony flakes
1 (USACE)	1 chalcedony flake

Locations for proposed measures have been selected to avoid the boundaries of all archaeological sites noted above. A single high-flow gravel bar is proposed to be added to the end of the diversion for the Abeyta-Trujillo Acequia diversion. Individual and resource-specific potential impacts are discussed in more detail below.

Three primary sources of potential impacts to these resources have been considered: direct impacts from construction; indirect impacts from potential changes in flow regime; and potential impacts from increased recreational use of the area:

Construction. The proposed project has been designed to avoid placement of any restoration measures within any of these sites, or in any area that might potentially impact these sites. The majority of the proposed restoration measures would be constructed within the active river channel itself, and would not directly impinge on any documented site. With the exception of the Abeyta-Trujillo Acequia, all documented resources would be avoided by construction activities.

We propose to construct a high-flow gravel bar at the western end of the diversion for the Abeyta-Trujillo Acequia by placing excavated channel material on the end of the diversion abutment (Enclosure 11). The river is currently channeling around the diversion at this location, and adding gravel to the end would lessen the likelihood of the diversion washing out. The Acequia is a historic property eligible for listing on the NRHP under criteria A (due to its association with the history of agriculture in the Chama Valley and New Mexico) and C (embodying the distinctive characteristics of traditional New Mexico acequias). The Acequia's primary significance lies in its continued functioning and in its role as a central feature in Abiquiu culture since the 1700s. Further, the diversion itself has been continually modified and reconstructed over time. The proposed addition of material to the end of the existing diversion would support its continued functioning without altering other elements of the system, and the Corps determines that the project would result in **no adverse effect** to this resource.

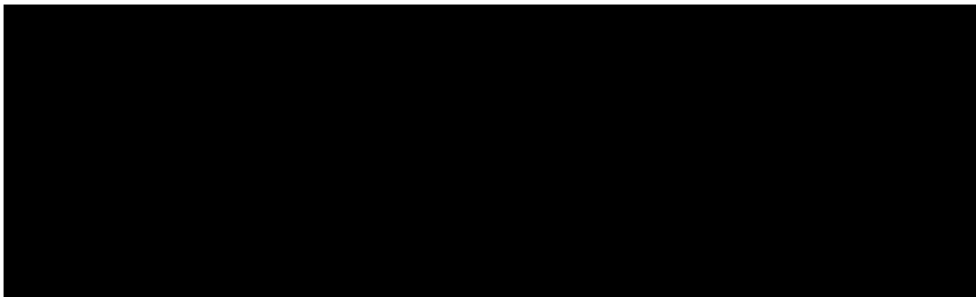
During project planning, another possible restoration measure that was considered was the entire replacement of the diversion for the Abeyta-Trujillo Acequia. While this option will continue to be considered for future implementation, it is not currently part of the planned project. The Corps is currently of the opinion that replacement of the diversion would also result in **no adverse effect** based on the same reasoning as in the previous paragraph. If, pending further study, alteration or replacement of the diversion is selected for a future phase of the project, Section 106 consultation would be fully completed (including consultation both with your office and with the Acequia association) before any further work impacting the Acequia would begin.

Staging will take place in already-developed areas outside of archaeological sites, and vehicle access will occur mostly using existing roads. Pathways for vehicle and equipment access to the channel for construction work will be selected to avoid all documented cultural resources. LA 75570, a railroad grade, traverses the overall APE (Enclosure 10) but will not be impacted by staging or vehicle traffic. The Corps determines that LA 75570 is **not eligible** for NRHP listing; nonetheless, it will be avoided by project activities.

Changes in water flow. The primary way that changes in water flow might impact most of these sites would be through affecting the stability or rate of bank erosion, or by increasing water levels beyond their current range of typical elevations. While many of the proposed measures will create small-scale local changes in water flow direction and speed, none of these are anticipated to lead to increased bank erosion or instability. By directing flow more toward the center of the channel, measures like construction of gravel bars and small rock deflectors may have the additional benefit of reducing bank erosion and thereby decreasing erosional risk to sites. No impacts on the integrity or function of the Abeyta-Trujillo Acequia are anticipated. No changes in flow regime are anticipated downstream of the project area.

Recreation. While one of the purposes of the proposed project is to enhance opportunities for recreation, especially fishing, any likely increases in recreational use are not expected to adversely affect these sites. The entire project area has been open to recreation for many

years, and the proposed enhancements should not substantially change the nature or range of recreational activities in the area. Increases in recreational use have the potential to increase foot traffic across these sites, but it is not expected that this would introduce substantially new or adverse impacts to them.



Given the above information, USACE has determined that the proposed project would have **no adverse effect** to historic properties from the proposed project. We seek your concurrence with this determination.

In addition to your office, Section 106 consulting parties for this project include Tribes with interests in the area and the Abeyta-Trujillo Acequia Association.

In sum, the Corps determines that the proposed aquatic ecosystem restoration project would result in **no adverse effect** to historic properties. The Corps seeks your concurrence in these determinations. If you have any questions or require additional information concerning the Rio Chama Aquatic Restoration Project at Abiquiu, please contact Jonathan Van Hoose, archaeologist at (505) 342-3687 or by e-mail at jonathan.e.vanhoose@usace.army.mil, or me at (505) 342-3281. You may also provide comments to the above address.

Sincerely,

George H. MacDonell
Chief, Environmental Resources Section

9/3/2012
Date

I CONCUR

JEFF PAPPAS
NEW MEXICO STATE HISTORIC
PRESERVATION OFFICER

Enclosures



DEPARTMENT OF THE ARMY
CORPS OF ENGINEERS, ALBUQUERQUE DISTRICT
4101 JEFFERSON PLAZA NE
ALBUQUERQUE, NM 87109-3435

August 14, 2019

Planning, Project and Program Management Division
Planning Branch
Environmental Resources Division

Timothy Seaman
Commissioner, Abeyta-Trujillo Acequia
President, Rio Chama Acequia Association
Via email

Dear Mr. Seaman,

Pursuant to 36 CFR Part 800, the U.S. Army Corps of Engineers (Corps), Albuquerque District, in partnership with the New Mexico Department of Game and Fish (NMDGF); the Bureau of Land Management (BLM); and the U.S. Forest Service (USFS), including both the Santa Fe National Forest (SFNF) and the Carson National Forest (CNF), proposes to undertake an aquatic ecosystem restoration project on the Chama River immediately downstream of Abiquiu Dam, on land owned by the Corps, BLM, USFS, and the State of New Mexico (Enclosures 1 and 2). Abiquiu Dam was constructed in the late 1950s and early 1960s as a flood control project on the Rio Chama about 32 miles upstream from the confluence of the Rio Chama and the Rio Grande and became operational in 1963. The project is located on the Cañones, New Mexico (36106-B4) 7.5' USGS quad map. The Corps is the Lead Federal Agency for the purposes of Section 106 consultation. As you are aware, one of the resources potentially affected by this project is the diversion structure for the Abeyta-Trujillo Acequia.

The proposed restoration project is intended to provide fish with low velocity refuge habitat at discharges between 50 and 1800 cfs. Several types of features are proposed to create different types of fish habitat. The features include rock and wood sills, pools, rock grade control structures, rock habitat structures, rock deflectors, and riparian vegetation. Excavated substrate from pools would be redistributed along channel margins creating or expanding existing bank attached bars (see Enclosure 3 for schematic examples of proposed features). Details of the proposed project include:

- Excavation of large, naturally-occurring **rock riffle** and redistribution of rocks into a larger upstream grade control structure (GCS)/riffle. The new GCS would allow upstream fish passage and downstream boat passage. The GCS would be grouted to increase structure stability at higher flows. River gravel and crushed rock would be placed to form the boat access ramp from the access road to the river.
- **Pools** are proposed for construction to create additional velocity refuge for fish. Placement of clean alluvial substrate is proposed along the margins of the channel to form shallow bank attached bars that incrementally increase water depth within the channel, with an increase in water velocity.
- **Rock habitat structures and deflectors** are proposed to provide hydraulic roughness, habitat diversity, and velocity refuge for fish. The boulder rock structures would be partially buried within the bed to increase stability and maintain their location.

- **Planting with native riparian vegetation** along the bankline is proposed in selected areas primarily for allochthonous leaf litter inputs into the stream to support aquatic insects. The riparian vegetation would contribute to bank stability, while the native wetland species would increase habitat diversity.
- **Remove topsoil** from existing wetland to stockpile location, excavate substrate to lower elevation, place and grade topsoil to form depressional (groundwater) wetland. Plant with obligate wetland species (plugs), riparian shrubs and trees (willows and cottonwoods), and seed with appropriate wetland species.
- **Boater access improvements** would be made at two locations, one in the upper project reach adjacent to the exiting USACE recreational area and another in the lower project reach on USFS property. Access improvements would include constructing sloped concrete boat ramps (or compacted gravel), stream bank grading for vehicle access, and installing rip rap for structure protection. Boat ramps would be designed to accommodate access at most flows.
- **In-channel work and habitat improvement structures** will be constructed by utilizing heavy tracked and wheeled equipment. All equipment will utilize existing roads where possible. Access to river channel will be restricted to a few locations to reduce impacts to bank erosion. All immediate access points to the river channel will be temporary and only used during construction and will be reclaimed to pre-existing conditions post construction. Portions of the equipment access areas will be improved to control vehicular access.

The Corps considers the Area of Potential Effect (APE) to be the area encompassing the proposed restoration features themselves, any area around those features where mechanical equipment might be expected to operate, any areas where the proposed features might be expected to cause future changes in the surrounding landscape or flow of water, and any areas used for staging. The currently-defined APE for the proposed project is shown in Enclosure 1 and is approximately 75 acres in size.

Two archaeological surveys were conducted in order to identify possible historic properties within the APE for the proposed project. NMDGF contracted with SWCA Environmental Consultants to conduct a survey of portions of the project area on USFS, BLM, and State-owned lands (Healy 2019, NMCRIS 142601), and USACE archaeologists conducted a survey of the portion on USACE-owned land (Van Hoose 2019, NMCRIS 143623).

Ten resources were documented within the APE. SWCA documented a total of nine sites within or intersecting the project area. These nine include seven prehistoric artifact scatters, one Twentieth-Century railroad grade, and the Abeyta-Trujillo Acequia diversion structure and a segment of the irrigation ditch. Six of the nine sites have been recommended as eligible for listing on the National Register of Historic Places (NRHP), and the Corps accepts these recommendations formally as our determinations of eligibility. A single resource was documented on Corps land: HCPI 47037, a concrete weir constructed by USGS in 1961 (see enclosed HPCI form). No resources were documented on State land. The Corps determines that this weir is not eligible for NRHP listing. These resources are summarized below in Table 1 with our eligibility determinations.

Table 1. Historic Properties Documented within the APE.

Site/Historic Property Number	Site Type	Cultural Affiliation and Age	Land Owner	Eligibility Determination	Eligibility Criteria
HCPI 47037	Concrete weir	Recent Historic (1961)	USACE	Not eligible	
LA 51720	Artifact scatter with feature	Unspecified Prehistoric	BLM	Eligible	D
LA 51721	Artifact scatter	Unspecified Prehistoric	BLM	Eligible	D
LA 75570	Railroad grade	Recent Historic (post-AD 1945)	SFNF	Not eligible	
LA 82827 / HCPI 33400	The Abeyta-Trujillo Acequia (diversion and irrigation system)	EuroAmerican/US Territorial; Pre-AD 1870	CNF	Eligible	A, C
LA 193665	Artifact scatter	Unknown Prehistoric	BLM	Not eligible	
LA 193666	Artifact scatter	Middle Archaic (5000-3000 BC)	BLM	Eligible	D
LA 193667	Artifact scatter	Unknown Prehistoric	BLM	Not eligible	
LA 193668	Artifact scatter	Late Archaic (1000 BC – AD 300) and Historic (AD 1821-1912)	CNF	Eligible	A, C, D
LA 193669	Artifact scatter	Unspecified Prehistoric	BLM	Eligible	D

BLM=Bureau of Land Management; CNF = Carson National Forest; SFNF = Santa Fe National Forest; USACE = U.S. Army Corps of Engineers

Eligibility criteria: A = association with important events; B = association with important individuals in history; C = embodying the distinctive characteristics of a type, period, or method of construction; D = is likely to yield important information about history or prehistory

In addition to these properties, five isolated occurrences (IOs) were documented by SWCA, and one IO was documented by the Corps. The Corps determines that none of these IOs are eligible for NRHP listing.

Table 2. Isolated Occurrences.

IO Number	Description
1 (SWCA)	4 artifacts: two chalcedony flakes and two manos
2 (SWCA)	1 mano (rhyolite)
3 (SWCA)	1 mano (sandstone)
4 (SWCA)	2 artifacts: one historic transfer ware ceramic, and one obsidian projectile point
5 (SWCA)	2 chalcedony flakes
1 (USACE)	1 chalcedony flake

Locations for proposed measures have been selected to avoid the boundaries of all archaeological sites. A single high-flow gravel bar is proposed to be added to the end of the

diversion for the Abeyta-Trujillo Acequia diversion. Individual and resource-specific potential impacts are discussed in more detail below.

Three primary sources of potential impacts to these resources have been considered: direct impacts from construction; indirect impacts from potential changes in flow regime; and potential impacts from increased recreational use of the area:

Construction. The proposed project has been designed to avoid placement of any restoration measures within any of these sites, or in any area that might potentially impact these sites. The majority of the proposed restoration measures would be constructed within the active river channel itself, and would not directly impinge on any documented site. With the exception of the Abeyta-Trujillo Acequia, all documented resources would be avoided by construction activities.

We propose to construct a high-flow gravel bar at the western end of the diversion for the Abeyta-Trujillo Acequia by placing excavated channel material on the end of the diversion abutment (Enclosures 4 and 5). The river is currently channeling around the diversion at this location, and adding gravel to the end would lessen the likelihood of the diversion washing out. The Acequia is a historic property eligible for listing on the NRHP under criteria A (due to its association with the history of agriculture in the Chama Valley and New Mexico) and C (embodying the distinctive characteristics of traditional New Mexico acequias). The Acequia's primary significance lies in its continued functioning and in its role as a central feature in Abiquiu culture since the 1700s. Further, the diversion itself has been continually modified and reconstructed over time. The proposed addition of material to the end of the existing diversion would support its continued functioning without altering other elements of the system, and the Corps determines that the project would result in **no adverse effect** to this resource.

During project planning, another possible restoration measure that was considered was the entire replacement of the diversion for the Abeyta-Trujillo Acequia. While this option will continue to be considered for future implementation, it is not currently part of the planned project. If, pending further study, alteration or replacement of the diversion is selected for a future phase of the project, Section 106 consultation would be fully completed (including consultation both with the Abeyta-Trujillo Acequia association and with the State Historic Preservation Officer) before any work impacting the Acequia would begin. We welcome your comment on these proposed activities, and look forward to continued consultation with you regarding the possible future design of a diversion replacement.

Staging will take place in already-developed areas outside of archaeological sites, and vehicle access will occur mostly using existing roads. Pathways for vehicle and equipment access to the channel for construction work will be selected to avoid all documented cultural resources. LA 75570, a railroad grade, traverses the overall APE but will not be impacted by staging or vehicle traffic. The Corps determines that LA 75570 is **not eligible** for NRHP listing; nonetheless, it will be avoided by project activities.

Changes in water flow. The primary way that changes in water flow might impact most of these sites would be through affecting the stability or rate of bank erosion, or by increasing water levels beyond their current range of typical elevations. While many of the proposed measures will create small-scale local changes in water flow direction and speed, none of these are anticipated to lead to increased bank erosion or instability. By directing flow more toward the center of the channel, measures like construction of gravel bars and small rock deflectors may have the additional benefit of reducing bank erosion and thereby decreasing erosional risk

to sites. No impacts on the integrity or function of the Abeyta-Trujillo Acequia are anticipated. No changes in flow regime are anticipated downstream of the project area.

Recreation. While one of the purposes of the proposed project is to enhance opportunities for recreation, especially fishing, any likely increases in recreational use are not expected to adversely affect these sites. The entire project area has been open to recreation for many years, and the proposed enhancements should not substantially change the nature or range of recreational activities in the area. Increases in recreational use have the potential to increase foot traffic across these sites, but it is not expected that this would introduce substantially new or adverse impacts to them.

Two eligible sites are relatively close to areas proposed as access routes to the river during construction, which would then be improved for use by anglers. Both of these sites, LA 51720 and LA 193669, are eligible sites on BLM land. NMDGF estimates visitation from approximately 1,300 people at each of these access points per year, an increase from the estimated 1,050 each year currently. While some potential exists for increased pedestrian visitation in particular to LA 51720, the improvements at these areas also may be expected to funnel traffic toward the developed areas and away from the undeveloped archaeological sites themselves. The Corps determines that this would not adversely affect either site.

Given the above information, USACE has determined that the proposed project would have **no adverse effect** to historic properties.

In addition to your organization, Section 106 consulting parties for this project include the State Historic Preservation Officer (SHPO) and Tribes with interests in the project area. Pursuant to 36 C.F.R. 800.13, should previously unknown artifacts or historic properties be encountered during construction, work would cease in the immediate vicinity of the resource. A determination of significance would be made, and further consultation would be conducted to determine the best course of action.

In addition to any comments about the cultural aspects of the proposed project, we also welcome comments regarding any concerns you may have regarding the environment such as natural, biological, or cultural resources; wildlife, vegetation, and special status species; air, water, or sound quality; aesthetics; health and safety; or Traditional Cultural Properties (TCPs) that may occur within or adjacent to the proposed project area.

In sum, the Corps determines that the proposed aquatic ecosystem restoration project would result in **no adverse effect** to historic properties. If you have any questions or require additional information concerning the Rio Chama Aquatic Restoration Project at Abiquiu, please contact Jonathan Van Hoose, archaeologist at (505) 342-3687 or by e-mail at jonathan.e.vanhoose@usace.army.mil, or me at (505) 342-3281. You may also provide comments to the above address.

Sincerely,

MACDONELL.GEOR
GE.HOWELL.10453
19667

Digitally signed by
MACDONELL.GEORGE.HOWELL.1
045319667
Date: 2019.08.14 14:59:01 -06'00'

George H. MacDonell
Chief, Environmental Resources Section

Enclosures

From: [Tim Seaman](#)
To: [Van Hoose, Jonathan F CIV USARMY CESPA \(USA\)](#)
Subject: Re: [Non-DoD Source] Re: Rio Chama aquatic restoration project / Abeyta-Trujillo Acequia
Date: Thursday, September 12, 2019 2:49:23 PM

Hello Jonathan,

The Abeyta-Trujillo Acequia is fully in support of the proposed fish habitat improvements and we hope that the second phase of this project can include replacement of our presa and headgate. The Corps delineation of the APE, NR eligibility determinations, and determination of "no adverse effect" are appropriate in our view. Please keep us informed on the project construction schedule and any Native American consultations that might arise.

Call me if you have questions or need a more formal communication from the Acequia Commission concerning this project.

Best regards,

Timothy J. Seaman
Commission Treasurer
Abeyta-Trujillo Acequia

Response from Abeyta-Trujillo Acequia



DEPARTMENT OF THE ARMY
CORPS OF ENGINEERS, ALBUQUERQUE DISTRICT
4101 JEFFERSON PLAZA NE
ALBUQUERQUE, NM 87109-3435

August 21, 2019

Planning, Project and Program Management Division
Planning Branch
Environmental Resources Division

Honorable «FName» «LName»
«Title», «Tribe»
«Address»
«CityStateZip»

Dear «Title» «LName»:

Pursuant to 36 CFR Part 800, the U.S. Army Corps of Engineers (Corps), Albuquerque District, in partnership with the New Mexico Department of Game and Fish (NMDGF); the Bureau of Land Management (BLM); and the U.S. Forest Service (USFS), including both the Santa Fe National Forest (SFNF) and the Carson National Forest (CNF), proposes to undertake an aquatic ecosystem restoration project on the Chama River immediately downstream of Abiquiu Dam, on land owned by the Corps, BLM, USFS, and the State of New Mexico (Enclosures 1 and 2). Abiquiu Dam was constructed in the late 1950s and early 1960s as a flood control project on the Rio Chama about 32 miles upstream from the confluence of the Rio Chama and the Rio Grande and became operational in 1963. The project is located on the Cañones, New Mexico (36106-B4) 7.5' USGS quad map. The Corps is the Lead Federal Agency for the purposes of Section 106 consultation.

The proposed restoration project is intended to provide fish with low velocity refuge habitat at discharges between 50 and 1800 cfs. Several types of features are proposed to create different types of fish habitat. The features include rock and wood sills, pools, rock grade control structures, rock habitat structures, rock deflectors, and riparian vegetation. Excavated substrate from pools would be redistributed along channel margins creating or expanding existing bank attached bars (see Enclosure 3 for schematic examples of proposed features). Details of the proposed project include:

- Excavation of large, naturally-occurring **rock riffle** and redistribution of rocks into a larger upstream grade control structure (GCS)/riffle. The new GCS would allow upstream fish passage and downstream boat passage. The GCS would be grouted to increase structure stability at higher flows. River gravel and crushed rock would be placed to form the boat access ramp from the access road to the river.
- **Pools** are proposed for construction to create additional velocity refuge for fish. Placement of clean alluvial substrate is proposed along the margins of the channel to form shallow bank attached bars that incrementally increase water depth within the channel, with an increase in water velocity.
- **Rock habitat structures and deflectors** are proposed to provide hydraulic roughness, habitat diversity, and velocity refuge for fish. The boulder rock structures would be partially buried within the bed to increase stability and maintain their location.

- **Planting with native riparian vegetation** along the bankline is proposed in selected areas primarily for allochthonous leaf litter inputs into the stream to support aquatic insects. The riparian vegetation would contribute to bank stability, while the native wetland species would increase habitat diversity.
- **Remove topsoil** from existing wetland to stockpile location, excavate substrate to lower elevation, place and grade topsoil to form depressional (groundwater) wetland. Plant with obligate wetland species (plugs), riparian shrubs and trees (willows and cottonwoods), and seed with appropriate wetland species.
- **Boater access improvements** would be made at two locations, one in the upper project reach adjacent to the exiting USACE recreational area and another in the lower project reach on USFS property. Access improvements would include constructing sloped concrete boat ramps (or compacted gravel), stream bank grading for vehicle access, and installing rip rap for structure protection. Boat ramps would be designed to accommodate access at most flows.
- **In-channel work and habitat improvement structures** will be constructed by utilizing heavy tracked and wheeled equipment. All equipment will utilize existing roads where possible. Access to river channel will be restricted to a few locations to reduce impacts to bank erosion. All immediate access points to the river channel will be temporary and only used during construction and will be reclaimed to pre-existing conditions post construction. Portions of the equipment access areas will be improved to control vehicular access.

The Corps considers the Area of Potential Effect (APE) to be the area encompassing the proposed restoration features themselves, any area around those features where mechanical equipment might be expected to operate, any areas where the proposed features might be expected to cause future changes in the surrounding landscape or flow of water, and any areas used for staging. The currently-defined APE for the proposed project is shown in Enclosure 1 and is approximately 75 acres in size.

Two archaeological surveys were conducted in order to identify possible historic properties within the APE for the proposed project. NMDGF contracted with SWCA Environmental Consultants to conduct a survey of portions of the project area on USFS, BLM, and State-owned lands (Healy 2019, NMCRIS 142601), and USACE archaeologists conducted a survey of the portion on USACE-owned land (Van Hoose 2019, NMCRIS 143623). Reports for both surveys are enclosed for your review.

Ten resources were documented within the APE. SWCA documented a total of nine sites within or intersecting the project area. These nine include seven prehistoric artifact scatters, one Twentieth-Century railroad grade, and the Abeyta-Trujillo Acequia diversion structure and a segment of the irrigation ditch. Six of the nine sites have been recommended as eligible for listing on the National Register of Historic Places (NRHP), and the Corps accepts these recommendations formally as our determinations of eligibility. A single resource was documented on Corps land: HCPI 47037, a concrete weir constructed by USGS in 1961 (see enclosed HPCI form). No resources were documented on State land. The Corps determines that this weir is not eligible for NRHP listing. These resources are summarized below in Table 1 with our eligibility determinations.

Table 1. Historic Properties Documented within the APE.

Site/Historic Property Number	Site Type	Cultural Affiliation and Age	Land Owner	Eligibility Determination	Eligibility Criteria
HCPI 47037	Concrete weir	Recent Historic (1961)	USACE	Not eligible	
LA 51720	Artifact scatter with feature	Unspecified Prehistoric	BLM	Eligible	D
LA 51721	Artifact scatter	Unspecified Prehistoric	BLM	Eligible	D
LA 75570	Railroad grade	Recent Historic (post-AD 1945)	SFNF	Not eligible	
LA 82827 / HCPI 33400	The Abeyta-Trujillo Acequia (diversion and irrigation system)	EuroAmerican/US Territorial; Pre-AD 1870	CNF	Eligible	A, C
LA 193665	Artifact scatter	Unknown Prehistoric	BLM	Not eligible	
LA 193666	Artifact scatter	Middle Archaic (5000-3000 BC)	BLM	Eligible	D
LA 193667	Artifact scatter	Unknown Prehistoric	BLM	Not eligible	
LA 193668	Artifact scatter	Late Archaic (1000 BC – AD 300) and Historic (AD 1821-1912)	CNF	Eligible	A, C, D
LA 193669	Artifact scatter	Unspecified Prehistoric	BLM	Eligible	D

BLM=Bureau of Land Management; CNF = Carson National Forest; SFNF = Santa Fe National Forest; USACE = U.S. Army Corps of Engineers

Eligibility criteria: A = association with important events; B = association with important individuals in history; C = embodying the distinctive characteristics of a type, period, or method of construction; D = is likely to yield important information about history or prehistory

In addition to these properties, five isolated occurrences (IOs) were documented by SWCA, and one IO was documented by the Corps. The Corps determines that none of these IOs are eligible for NRHP listing.

Locations for proposed measures have been selected to avoid the boundaries of all archaeological sites. A single high-flow gravel bar is proposed to be added to the end of the diversion for the Abeyta-Trujillo Acequia diversion. Individual and resource-specific potential impacts are discussed in more detail below.

Three primary sources of potential impacts to these resources have been considered: direct impacts from construction; indirect impacts from potential changes in flow regime; and potential impacts from increased recreational use of the area:

Construction. The proposed project has been designed to avoid placement of any restoration measures within any of these sites, or in any area that might potentially impact these sites. The

majority of the proposed restoration measures would be constructed within the active river channel itself, and would not directly impinge on any documented site. With the exception of the Abeyta-Trujillo Acequia, all documented resources would be avoided by construction activities.

We propose to construct a high-flow gravel bar at the western end of the diversion for the Abeyta-Trujillo Acequia by placing excavated channel material on the end of the diversion abutment. The river is currently channeling around the diversion at this location, and adding gravel to the end would lessen the likelihood of the diversion washing out. The Acequia is a historic property eligible for listing on the NRHP under criteria A (due to its association with the history of agriculture in the Chama Valley and New Mexico) and C (embodying the distinctive characteristics of traditional New Mexico acequias). The Acequia's primary significance lies in its continued functioning and in its role as a central feature in Abiquiu culture since the 1700s. Further, the diversion itself has been continually modified and reconstructed over time. The proposed addition of material to the end of the existing diversion would support its continued functioning without altering other elements of the system, and the Corps determines that the project would result in **no adverse effect** to this resource.

During project planning, another possible restoration measure that was considered was the entire replacement of the diversion for the Abeyta-Trujillo Acequia. While this option will continue to be considered for future implementation, it is not currently part of the planned project. If, pending further study, alteration or replacement of the diversion is selected for a future phase of the project, Section 106 consultation would be fully completed (including consultation both with your office and with the Acequia association) before any work impacting the Acequia would begin.

Staging will take place in already-developed areas outside of archaeological sites, and vehicle access will occur mostly using existing roads. Pathways for vehicle and equipment access to the channel for construction work will be selected to avoid all documented cultural resources. LA 75570, a railroad grade, traverses the overall APE but will not be impacted by staging or vehicle traffic. The Corps determines that LA 75570 is **not eligible** for NRHP listing; nonetheless, it will be avoided by project activities.

Changes in water flow. The primary way that changes in water flow might impact most of these sites would be through affecting the stability or rate of bank erosion, or by increasing water levels beyond their current range of typical elevations. While many of the proposed measures will create small-scale local changes in water flow direction and speed, none of these are anticipated to lead to increased bank erosion or instability. By directing flow more toward the center of the channel, measures like construction of gravel bars and small rock deflectors may have the additional benefit of reducing bank erosion and thereby decreasing erosional risk to sites. No impacts on the integrity or function of the Abeyta-Trujillo Acequia are anticipated. No changes in flow regime are anticipated downstream of the project area.

Recreation. While one of the purposes of the proposed project is to enhance opportunities for recreation, especially fishing, any likely increases in recreational use are not expected to adversely affect these sites. The entire project area has been open to recreation for many years, and the proposed enhancements should not substantially change the nature or range of recreational activities in the area. Increases in recreational use have the potential to increase foot traffic across these sites, but it is not expected that this would introduce substantially new or adverse impacts to them.

Two eligible sites are relatively close to areas proposed as access routes to the river during construction, which would then be improved for use by anglers. Both of these sites, LA 51720 and LA 193669, are eligible sites on BLM land. NMDGF estimates visitation from approximately 1,300 people at each of these access points per year, an increase from the estimated 1,050 each year currently. While some potential exists for increased pedestrian visitation in particular to LA 51720, the improvements at these areas also may be expected to funnel traffic toward the developed areas and away from the undeveloped archaeological sites themselves. The Corps determines that this would not adversely affect either site.

Given the above information, USACE has determined that the proposed project would have **no adverse effect** to historic properties. In addition to your office, Section 106 consulting parties for this project include the State Historic Preservation Officer (SHPO), other Tribes with interests in the area, and the Abeyta-Trujillo Acequia Association.

Pursuant to 36 C.F.R. 800.13, should previously unknown artifacts or historic properties be encountered during construction, work would cease in the immediate vicinity of the resource. A determination of significance would be made, and further consultation would be conducted to determine the best course of action.

In addition to any comments about the cultural aspects of the proposed project, we also welcome comments regarding any concerns you may have regarding the environment such as natural, biological, or cultural resources; wildlife, vegetation, and special status species; air, water, or sound quality; aesthetics; health and safety; Traditional Cultural Properties (TCPs); or Indian Trust Assets that may occur within or adjacent to the proposed project area.

In sum, the Corps determines that the proposed aquatic ecosystem restoration project would result in **no adverse effect** to historic properties. If you have any questions or require additional information concerning the Rio Chama Aquatic Restoration Project at Abiquiu, please contact Jonathan Van Hoose, archaeologist at (505) 342-3687 or by e-mail at jonathan.e.vanhoose@usace.army.mil, or me at (505) 342-3281. You may also provide comments to the above address.

Sincerely,

George H. MacDonell
Chief, Environmental Resources Section

Enclosures



DEPARTMENT OF THE ARMY
CORPS OF ENGINEERS, ALBUQUERQUE DISTRICT
4101 JEFFERSON PLAZA NE
ALBUQUERQUE, NM 87109-3435

10 October 2019

CESPA-PM-LE

MEMORANDUM FOR RECORD

Subject: Section 106 consultation with Pueblo of Tesuque, Rio Chama Aquatic Habitat Project

1. Consultation under Section 106 of the National Historic Preservation Act (NHPA) for this project included consultation with a number of Tribes with interests in the project area. The Corps sent initial letters to Tribes on 21 August 2019.
2. On 28 August, the Corps received a letter from Bernard Mora, Pueblo of Tesuque Tribal Historic Preservation Officer (THPO), requesting additional information regarding archaeological site locations, including the archaeological survey reports produced for the project by SWCA, Inc. and the Corps, as well as further information about local flora and fauna. Corps archaeologist Jonathan Van Hoose provided Mr. Mora a copy of the draft Environmental Assessment (EA) and sought permission from the Bureau of Land Management (BLM) to provide further site location information and the SWCA report, because most of the archaeological sites within the project area are on BLM land.
3. After subsequent conversations with BLM staff, the BLM granted permission to share information about archaeological sites via email on 4 September. Van Hoose provided copies of all reports and materials to the Tesuque THPO both via email and hard copy on 4 September.
4. On 26 September, Mr. Mora provided the Corps via email with the comment that "as some sites are within areas of pedestrian traffic there need to be measures to protect or avoid these sites altogether." In the following days, Van Hoose coordinated possible ideas for site protection with Mr. Mora and other project team members via email. On 2 October, Mr. Mora and team members expressed agreement with an approach to limit pedestrian traffic across sites via the installation of boulders and native vegetation plantings in areas designed to channel foot traffic toward fishing areas. Information and maps about the locations of these proposed measures were sent to Eric Frey of the New Mexico Department of Game and Fish (NMDGF) on 2 October and 10 October for incorporation into project drawings. Additional details were discussed among project team members between 3 October and 7 October, with Mr. Mora approving via email on 6 October and 7 October. BLM staff agreed to the approach via email on 10 October.
5. On 2 October and on 10 October, the Corps determined that the proposed site protection measures would have no adverse effect to historic properties, and the New Mexico State Historic Preservation Officer (NMSHPO) concurred with this determination for various iterations of the proposed plans via email on 3 October and on 4 October, and finally via email on 10 October (HPD Logs No. 111592 and 111600).

Jonathan E. Van Hoose
Archaeologist, Environmental Resources Section
CESPA-PM-LE

Memorandum for Record (MFR) on Tribal consultation and site protection measures

Rio Chama Aquatic Habitat Project

Abiquiu, New Mexico

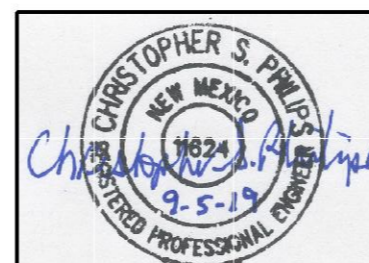
Prepared For

New Mexico Department of Game & Fish



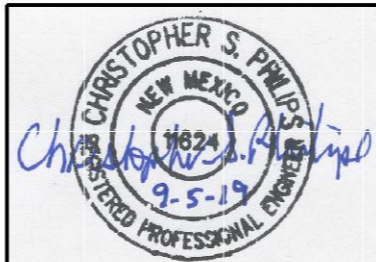
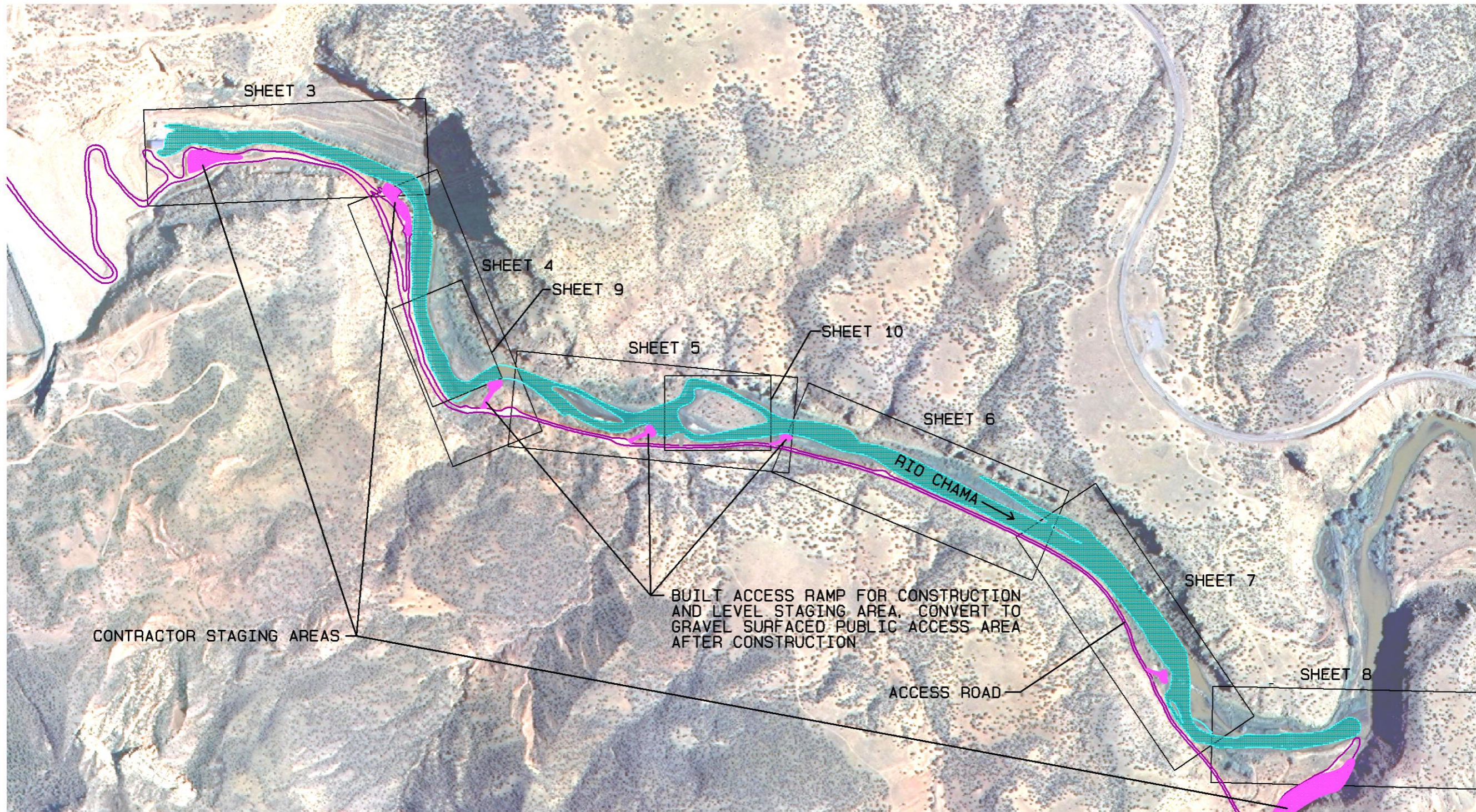
Index of Drawings

1. Cover Sheet, Location Map & Index of Drawings
2. Project Overview, Sheet Layout & Staging & Access Plan
3. River Plan Station 0+00 - 15+50
4. River Plan Station 15+50 - 34+50
5. River Plan Station 34+50 - 53+86
6. River Plan Station 53+86 - 72+00
7. River Plan Station 72+00 - 91+50
8. River Plan Station 91+50 - 101+17
9. Floodplain Grading Area #1 & #2 Planting Plan
10. Floodplain Grading Area #3 Planting Plan
11. Grade Control Structure Detail Sheet
12. Rock Sill & Gravel Bar Grading Detail Sheet
13. Rock Deflector, Rock Bank Protection & Habitat Rock Detail Sheet
14. Woody Debris Detail Sheet
15. Channel Fill & Floodplain Grading Detail Sheet
16. Planting Detail Sheet
17. Project Sign Detail Sheet



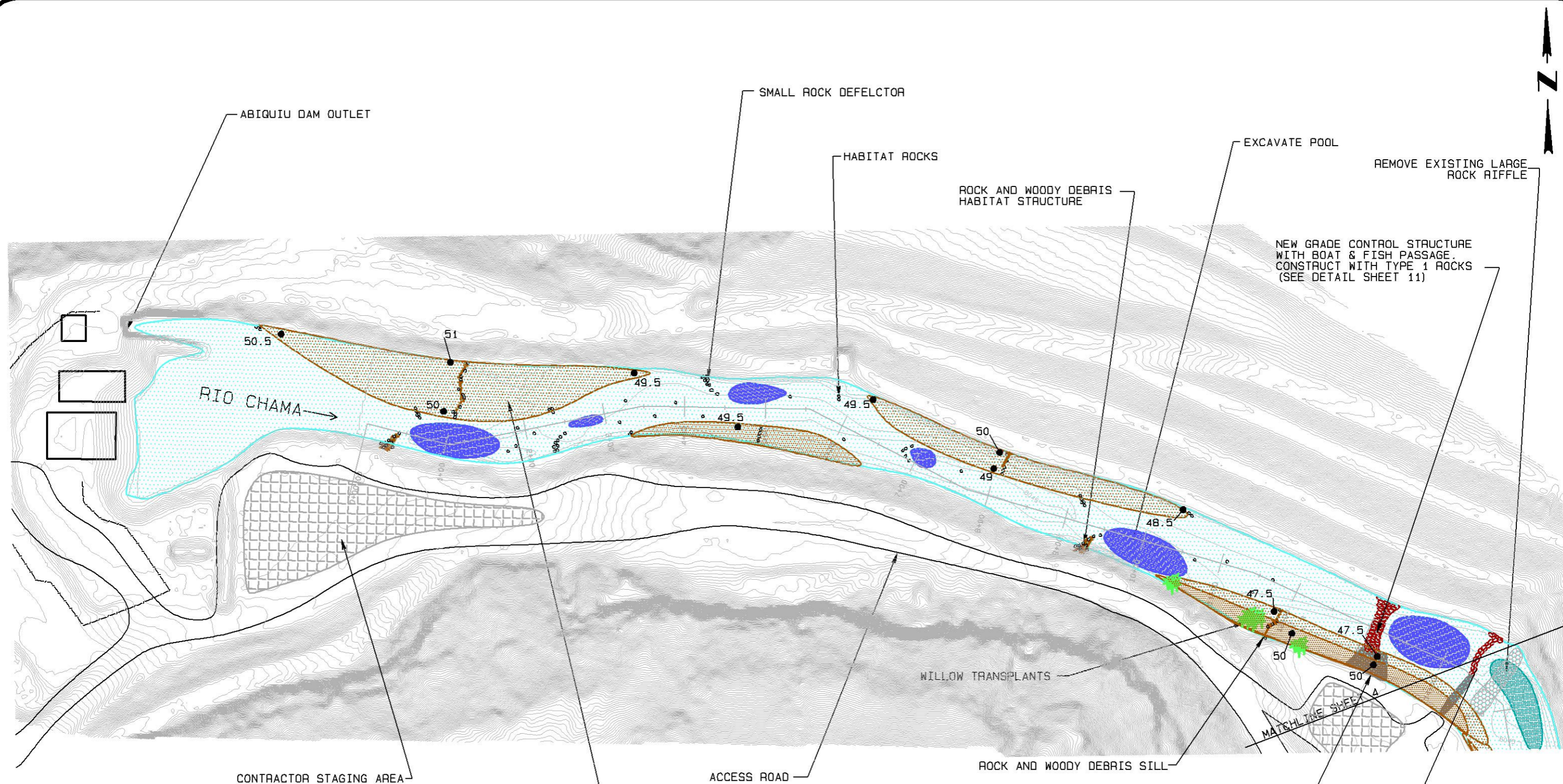
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Rio Chama Aquatic Habitat Project	
Abiquiu, New Mexico	Sheet
COVER SHEET, INDEX OF DRAWINGS AND LOCATION MAP	1
	of
	17
NTS	9-5-2019

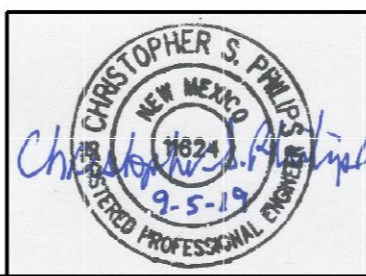


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Rio Chama Aquatic Habitat Project	
Abiquiu, New Mexico	Sheet
PROJECT OVERVIEW, SHEET LAYOUT & STAGING & ACCESS PLAN	2
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17	
1" = 700 Feet	9-5-2019

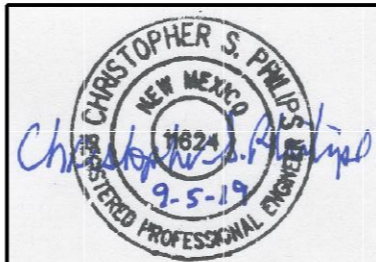
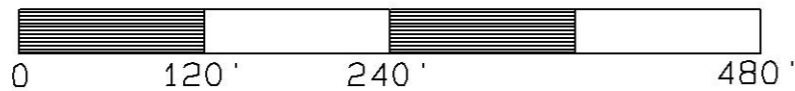
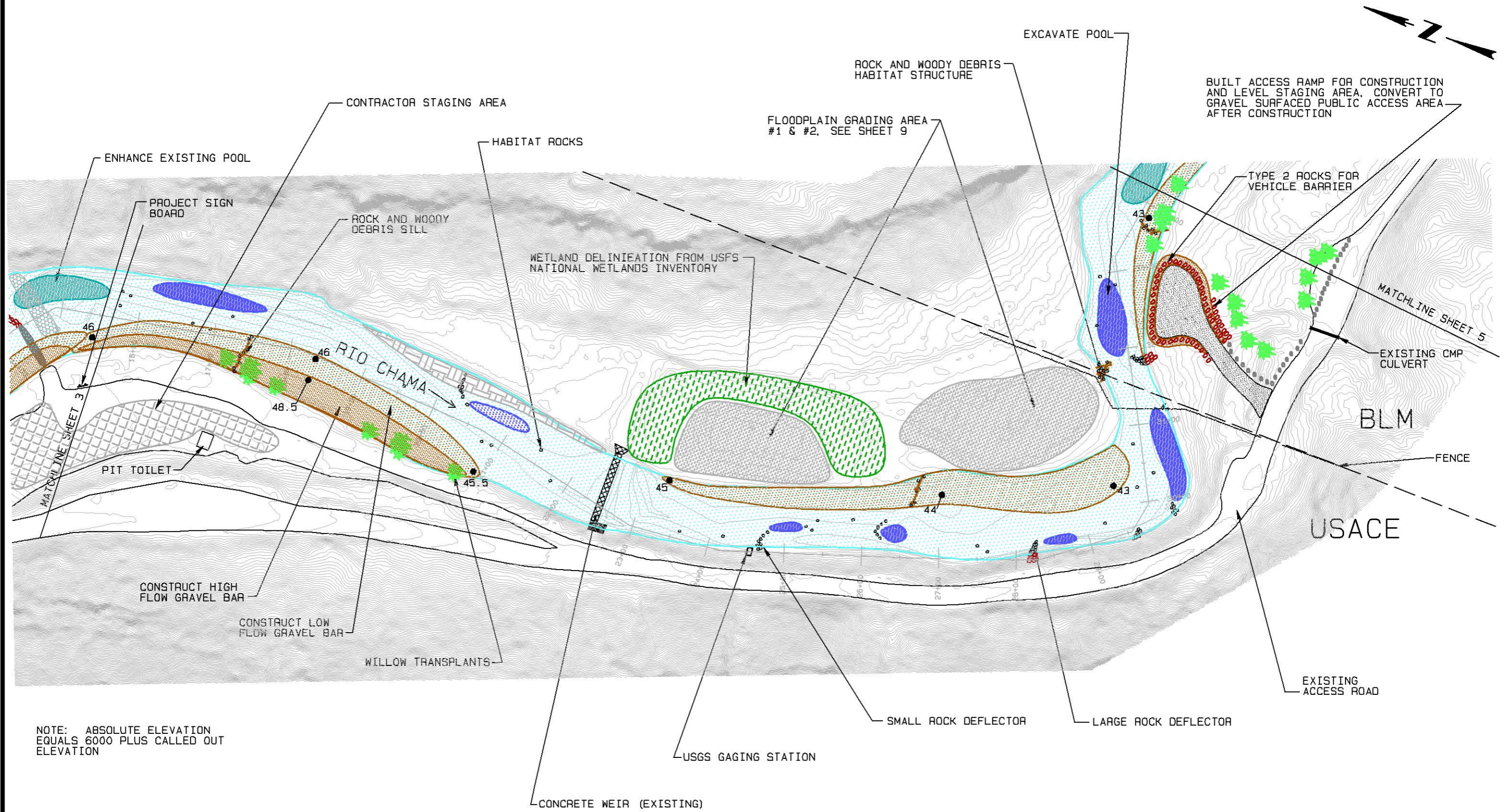


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Rio Chama Aquatic Habitat Project	
Abiquiu, New Mexico	Sheet
RIVER PLAN STATION 0+00 - 15+50	3
	of
17	
1" = 120 Feet	9-5-2019

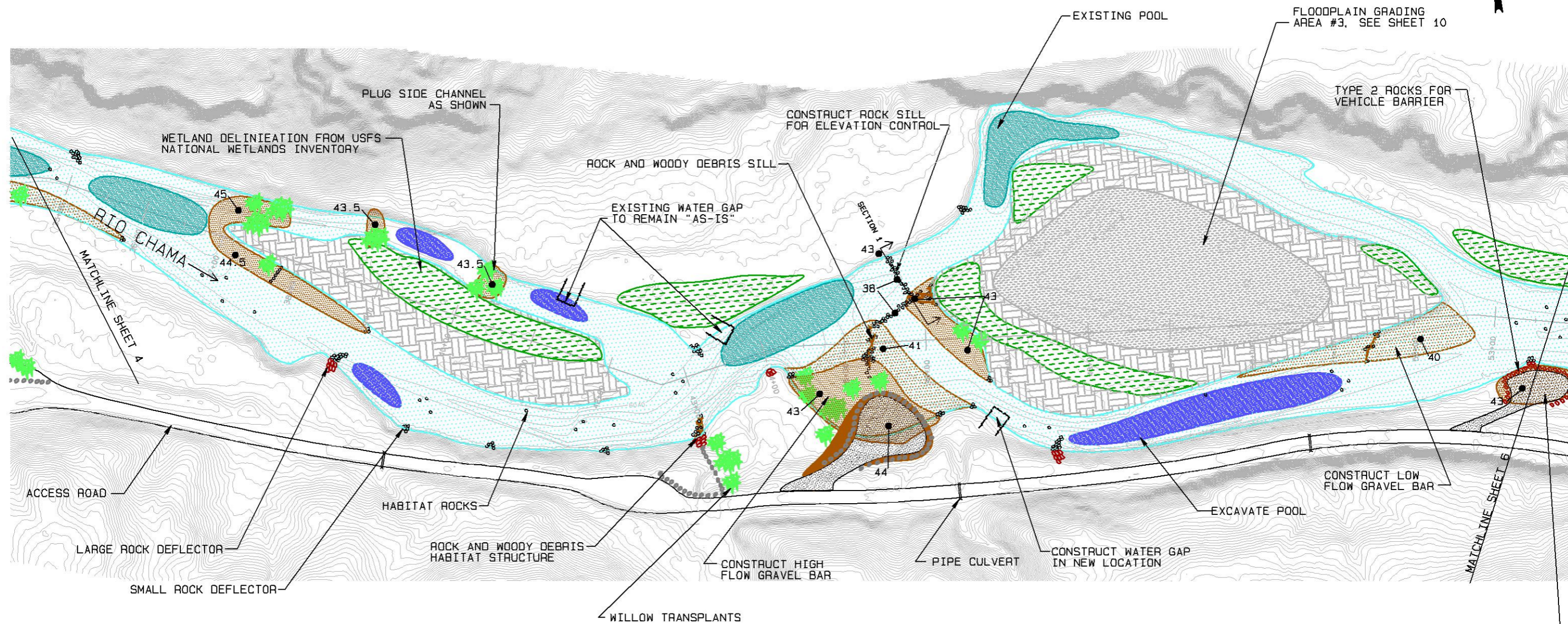
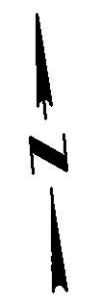


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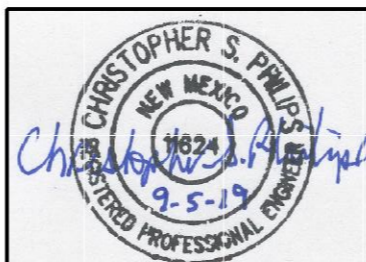
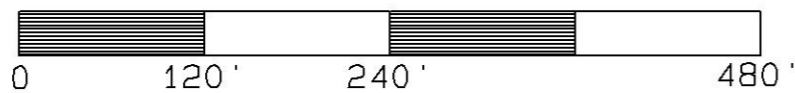
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Rio Chama Aquatic Habitat Project	
Abiquiu, New Mexico	Sheet
RIVER PLAN STATION 15+50 - 34+50	4 of 17
1" = 120 Feet	9-5-2019



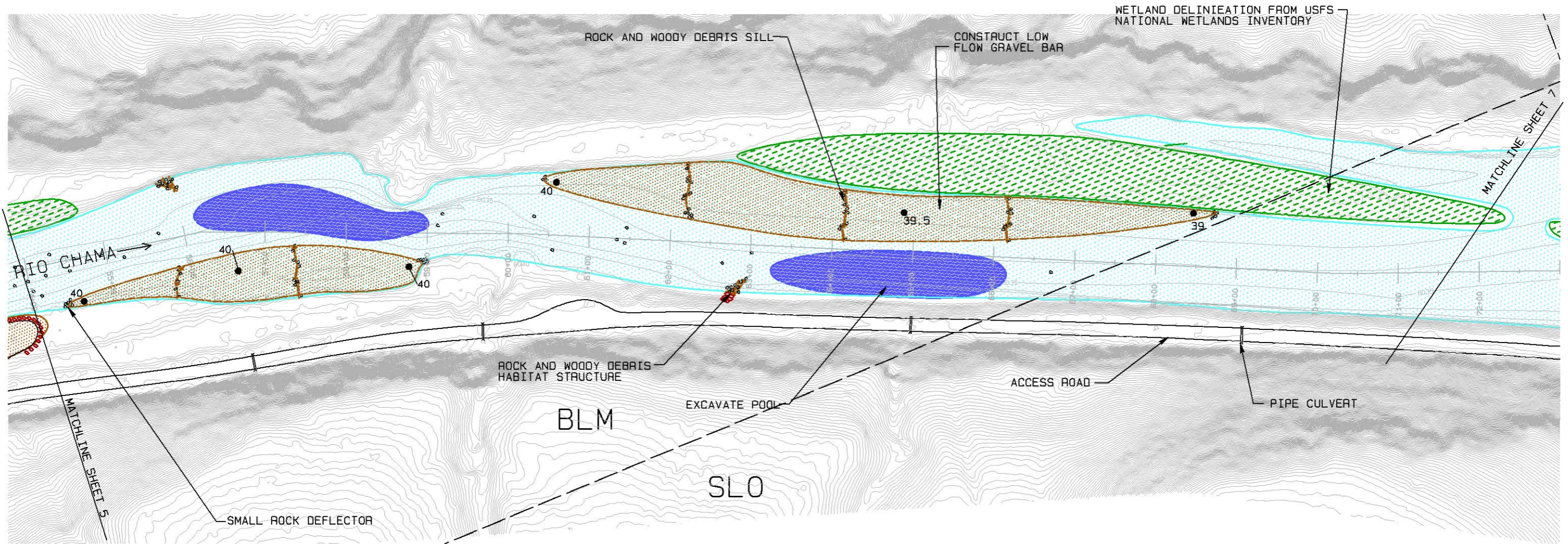
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AND LEVEL STAGING AREA, CONVERT TO
GRAVEL SURFACED PUBLIC ACCESS AREA
AFTER CONSTRUCTION

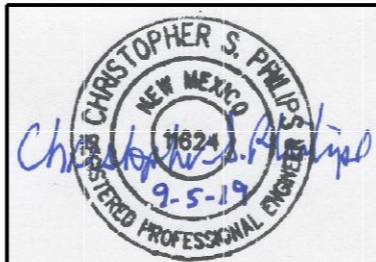
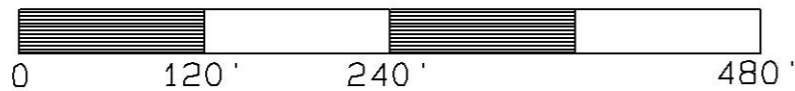


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Rio Chama Aquatic Habitat Project	
Abiquiu, New Mexico	Sheet
RIVER PLAN STATION 34+50 - 53+86	5 of 17
1" = 120 Feet	9-5-2019

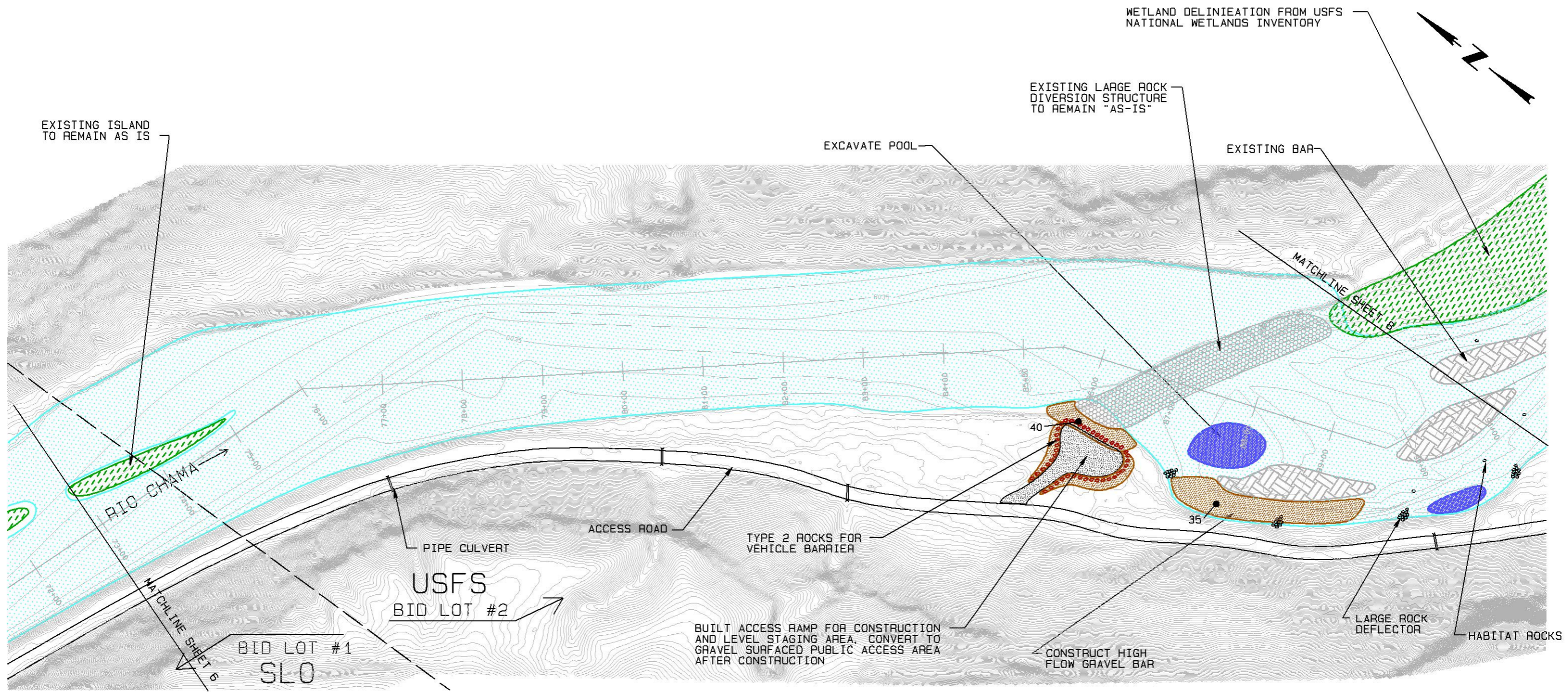


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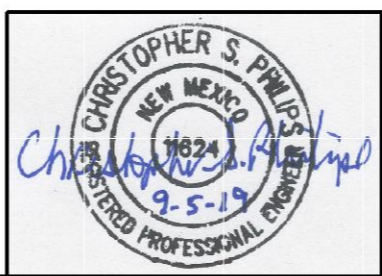
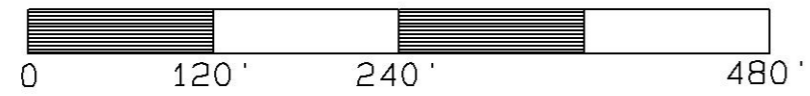


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Rio Chama Aquatic Habitat Project	
Abiquiu, New Mexico	Sheet
RIVER PLAN STATION 53+86 - 72+00	6
	of
17	
1" = 120 Feet	9-5-2019



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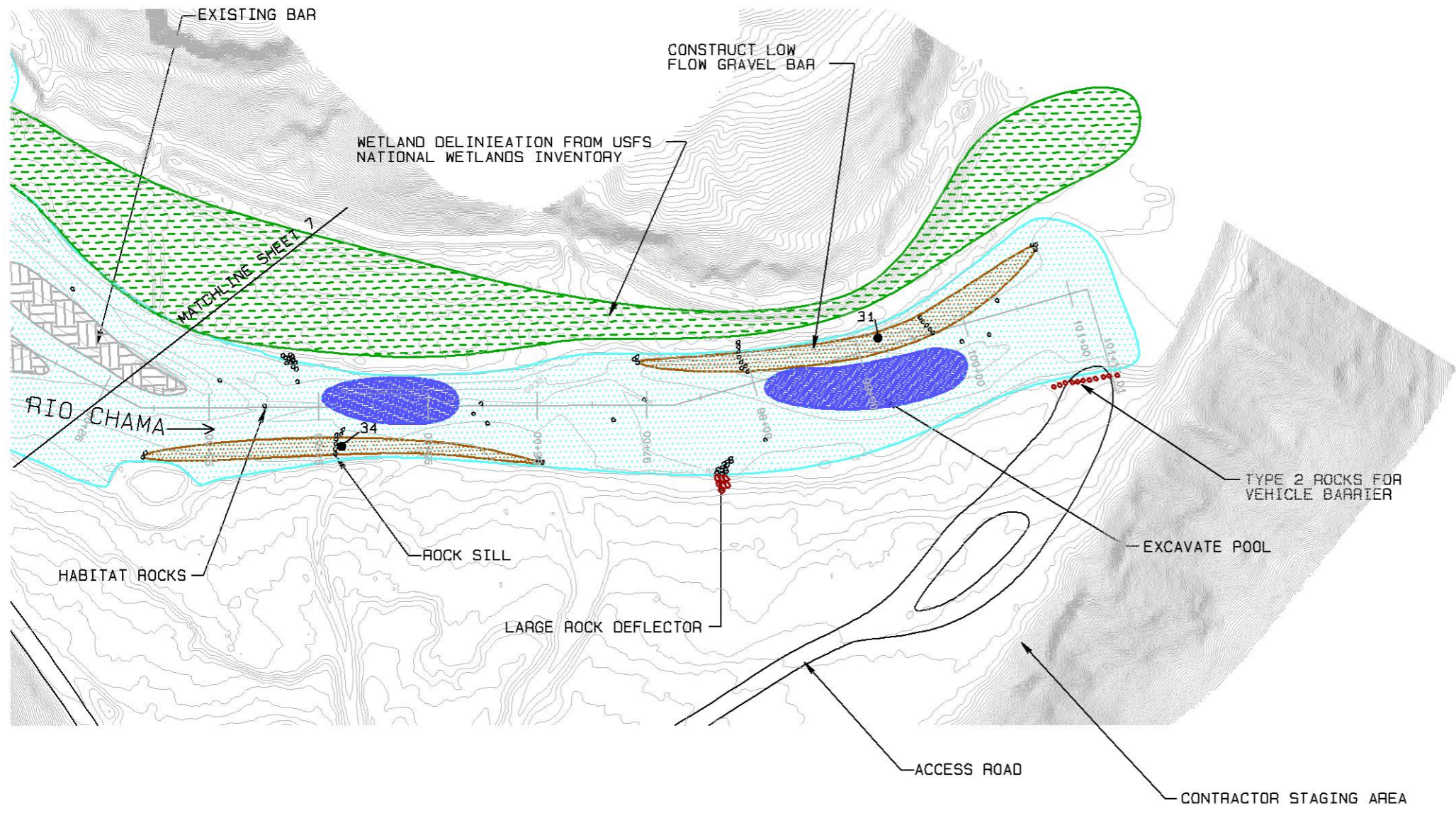
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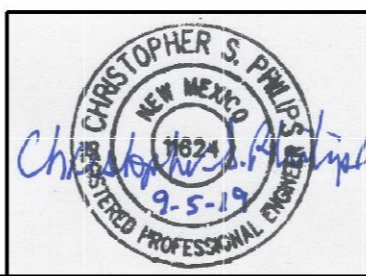
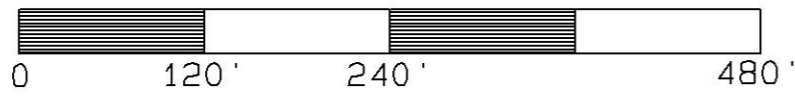
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Rio Chama Aquatic Habitat Project	
Abiquiu, New Mexico	Sheet
RIVER PLAN STATION 72+00 - 91+50	7 of 17
1" = 120 Feet	9-5-2019

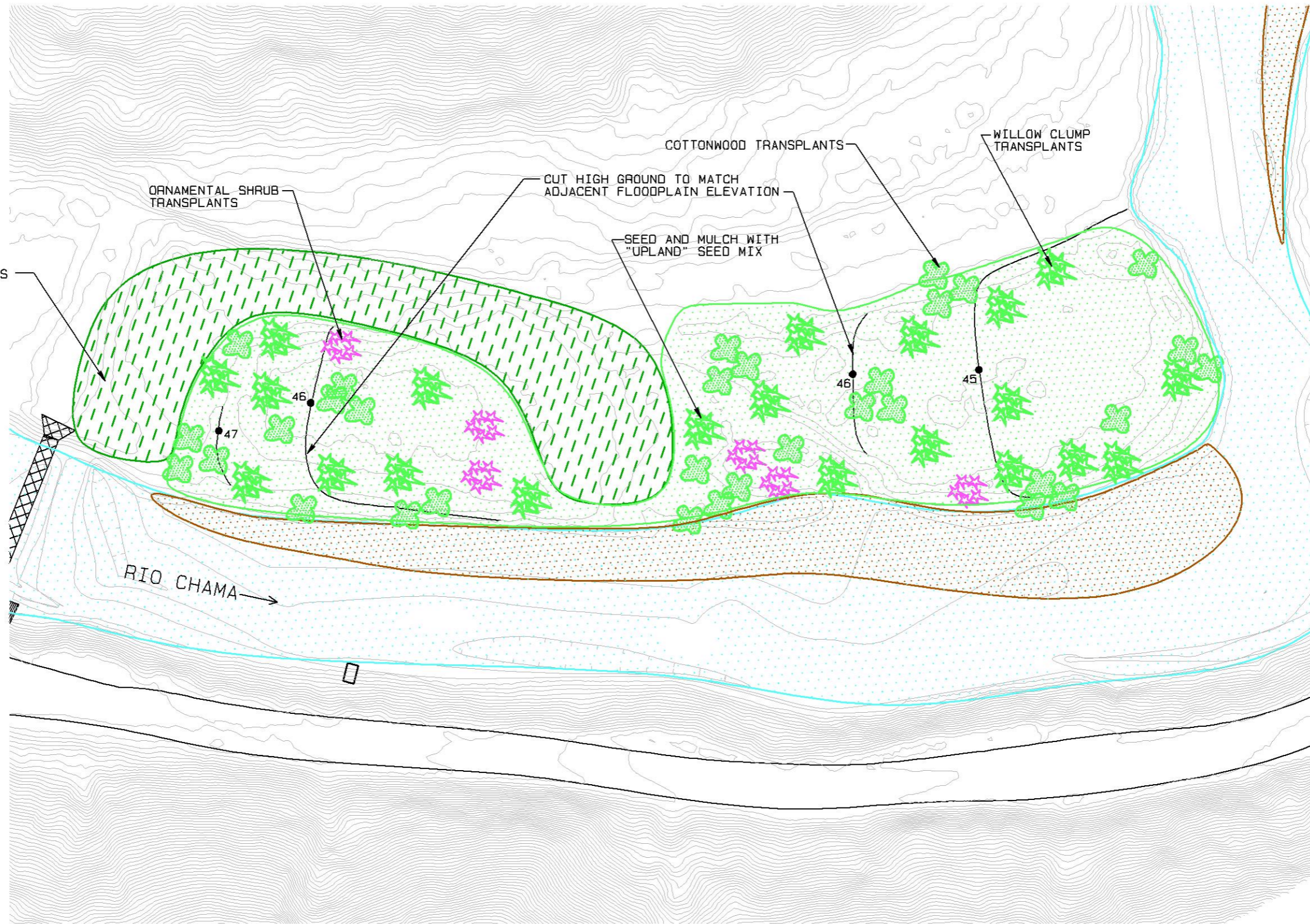


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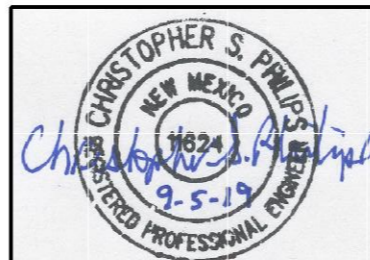
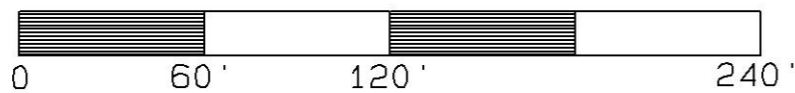
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Rio Chama Aquatic Habitat Project	
Abiquiu, New Mexico	Sheet
RIVER PLAN STATION 91+50 - 101+17	8 of 17
1" = 120 Feet	9-5-2019



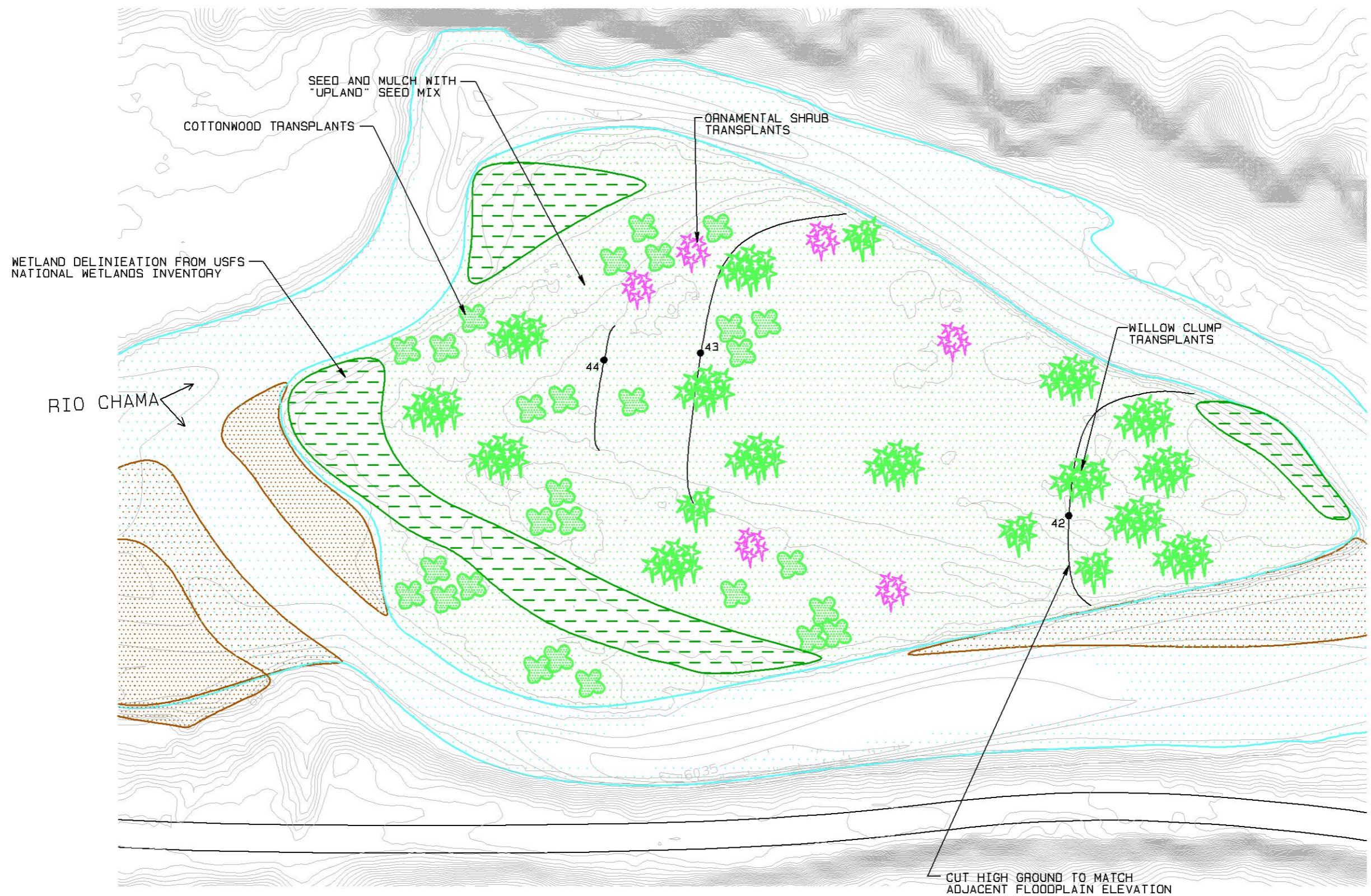
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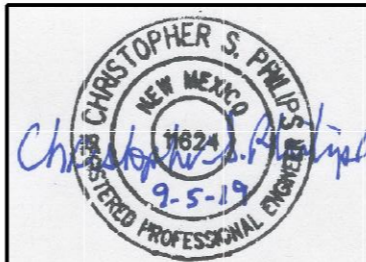
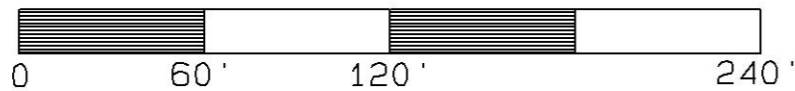


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Rio Chama Aquatic Habitat Project	
Abiquiu, New Mexico	Sheet
FLOODPLAIN GRADING AREA #1 & #2 PLANTING PLAN	9
	of
17	
1" = 60 Feet	9-5-2019

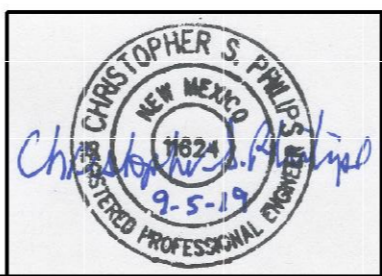
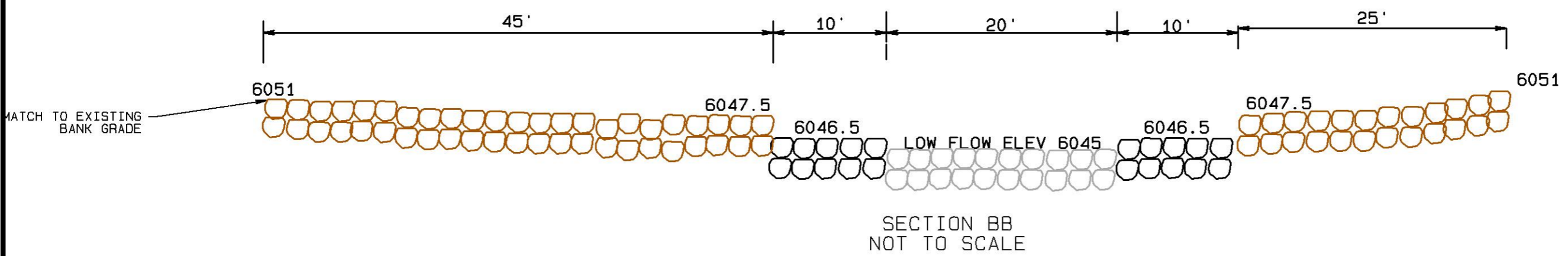
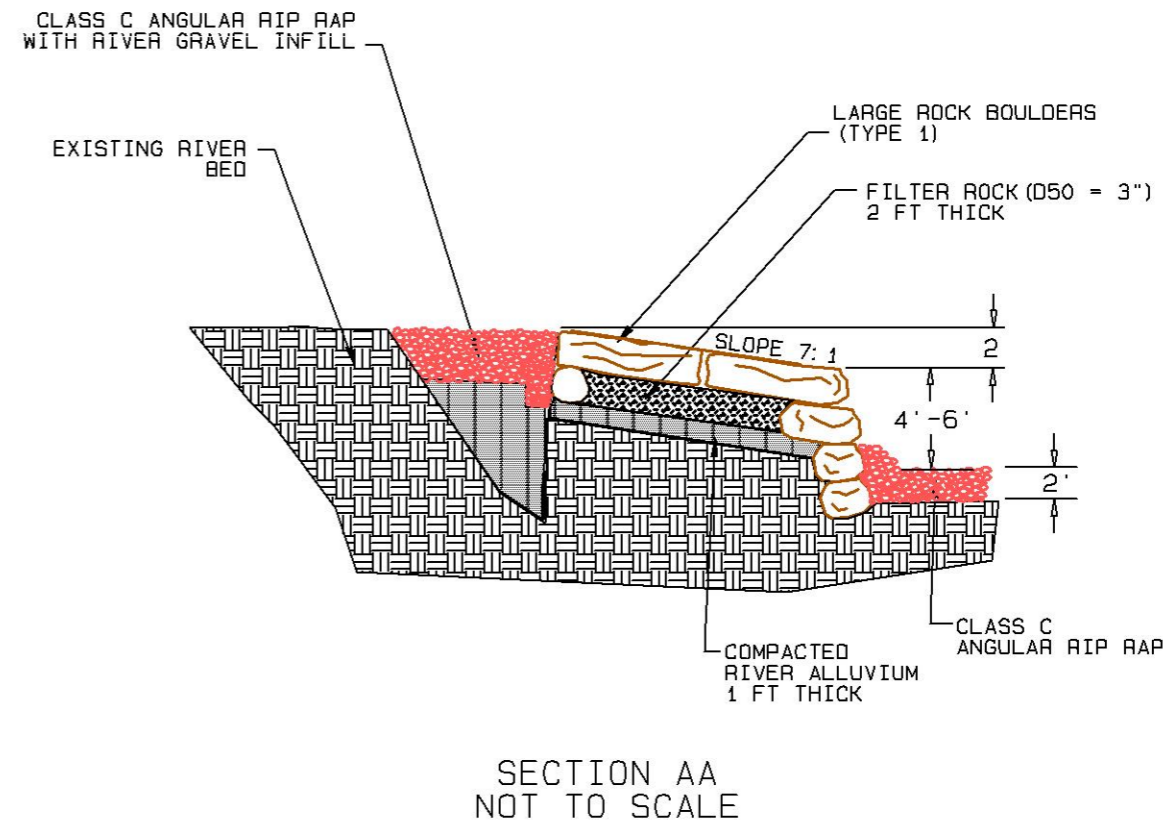
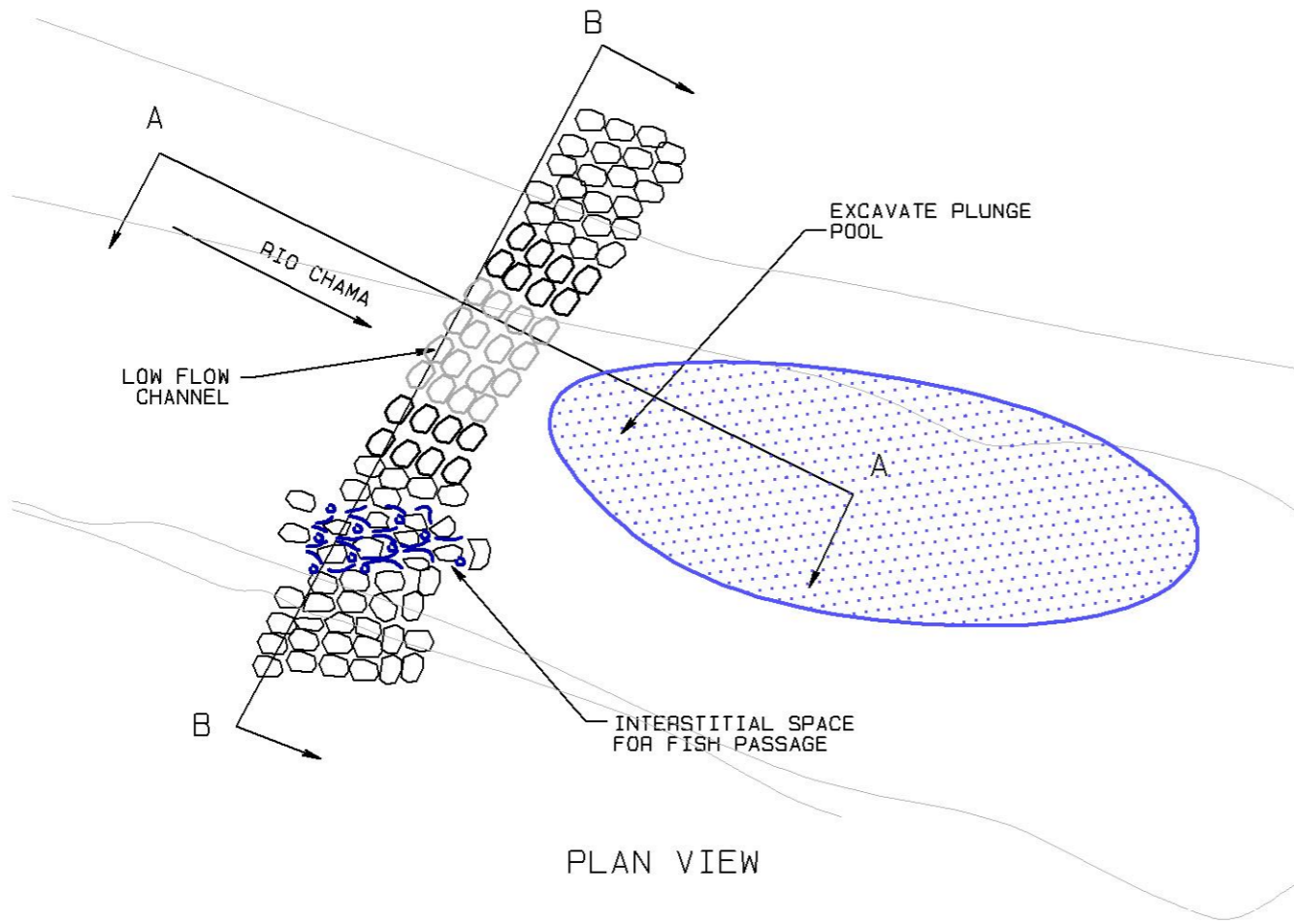


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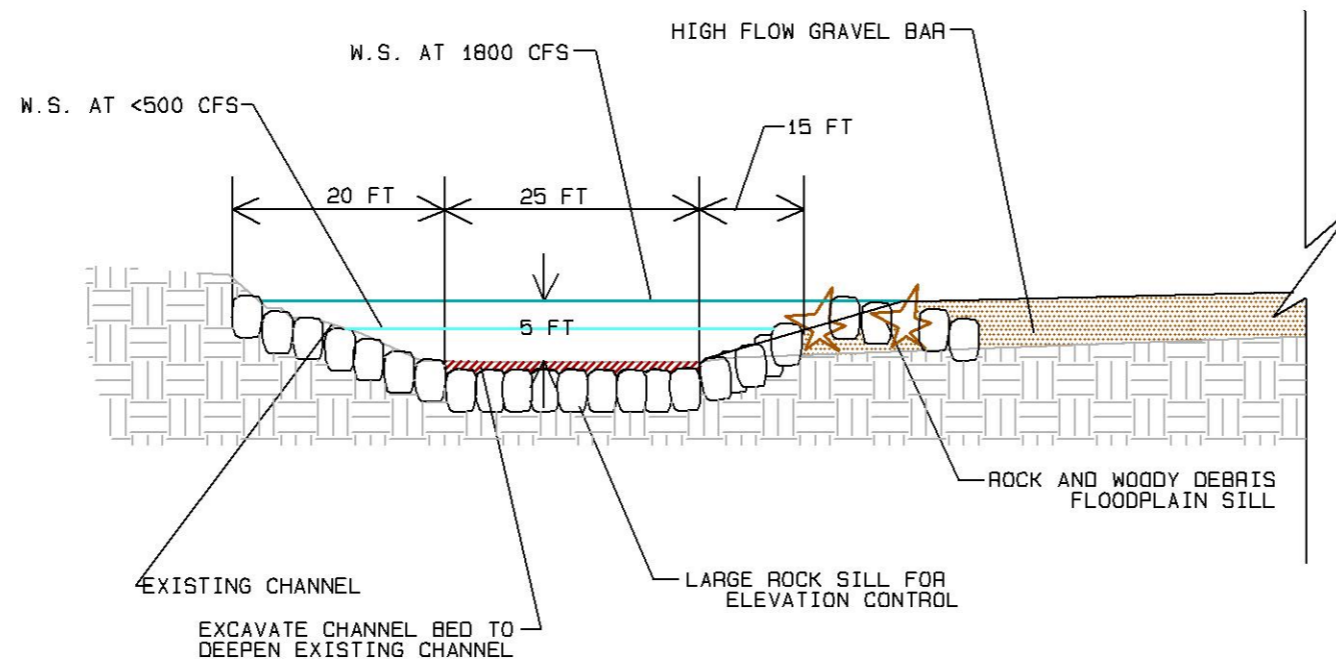
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Rio Chama Aquatic Habitat Project	
Abiquiu, New Mexico	Sheet
FLOODPLAIN GRADING AREA #3 PLANTING PLAN	10
	of
1" = 60 Feet	17
9-5-2019	

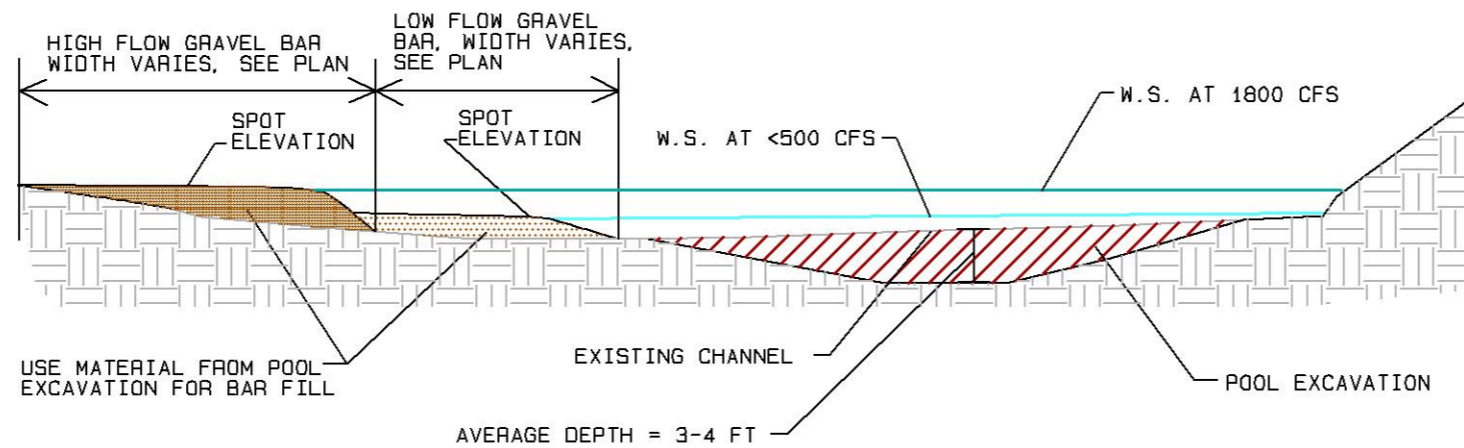


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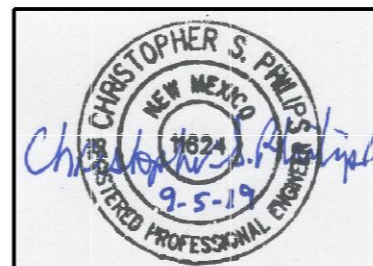
Rio Chama Aquatic Habitat Project	
Abiquiu, New Mexico	Sheet
GRADE CONTROL STRUCTURE DETAIL SHEET	11
	of
17	
SCALE AS SHOWN	9-5-2019



ROCK SILL ELEVATION CONTROL STRUCTURE: SECTION 1

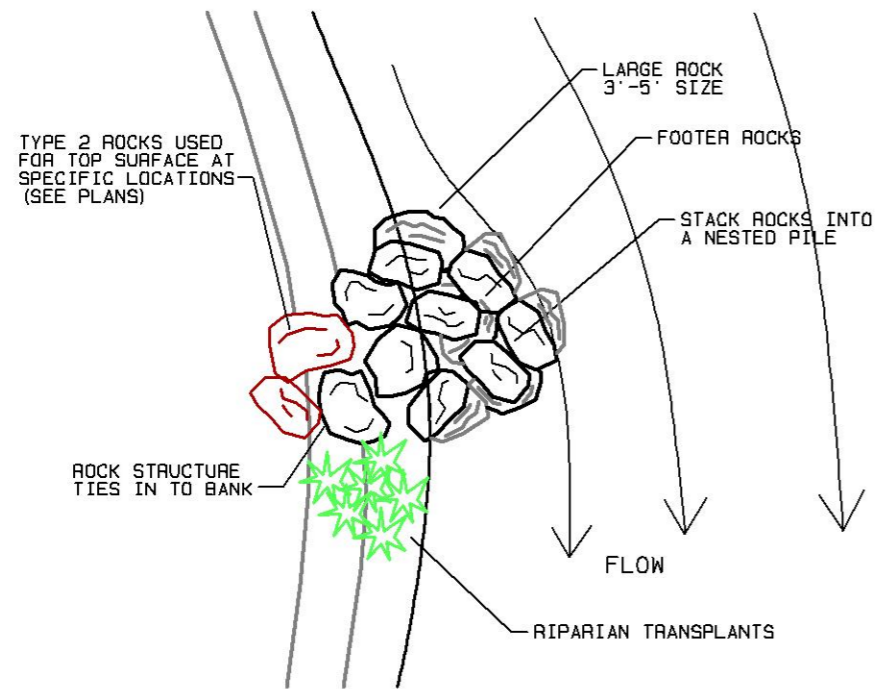


GRAVEL BAR GRADING: SECTION

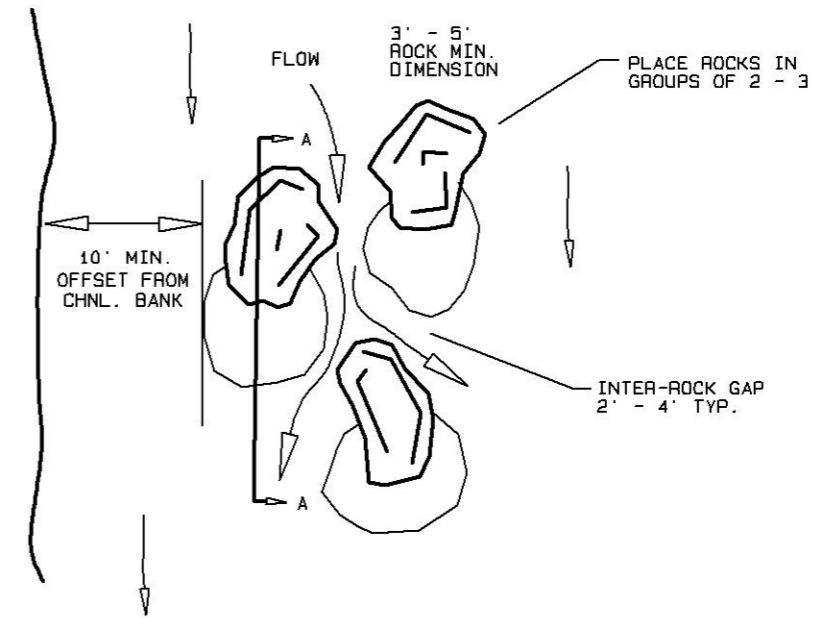


Riverbend Engineering, LLC
 1309 Rio Grande Blvd. Albuquerque, NM 87104
 Tel: 505.344.3315 FAX: 505.344.0698 Email: cphilips@frontier.net
 102 Third St., P. O. Box 2979, Pagosa Springs, CO 81147
 Tel: 970.264.1195 FAX: 970.264.1196 WWW.riverrestoration.com

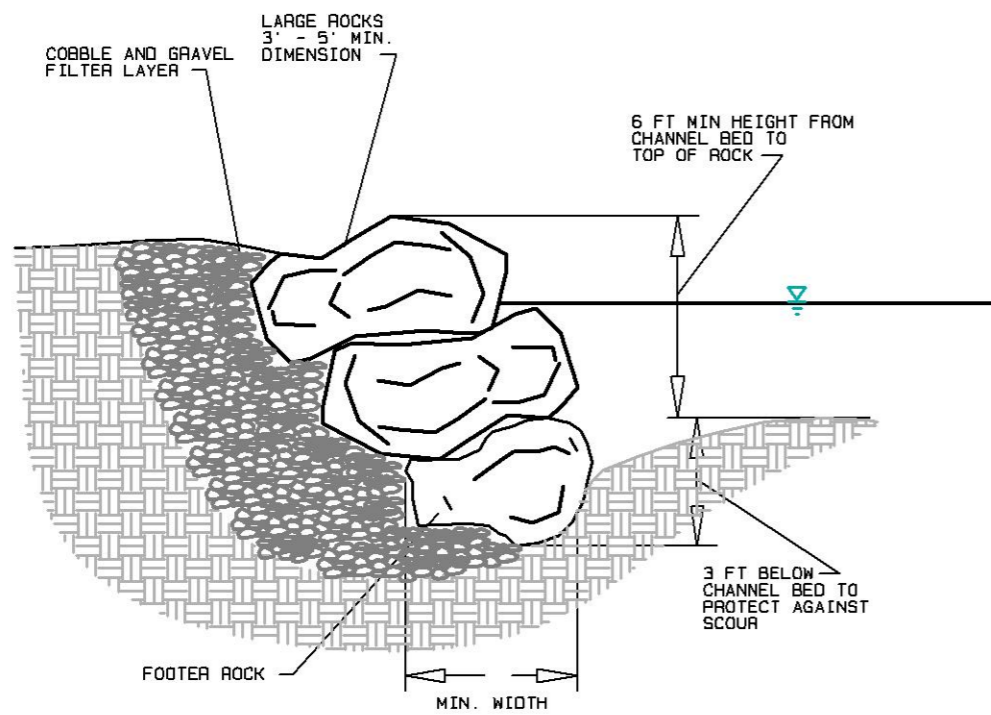
Rio Chama Aquatic Habitat Project	
Abiquiu, New Mexico	Sheet
ROCK SILL & GRAVEL BAR GRADING DETAIL SHEET	12
	of
NTS	17
9-5-2019	



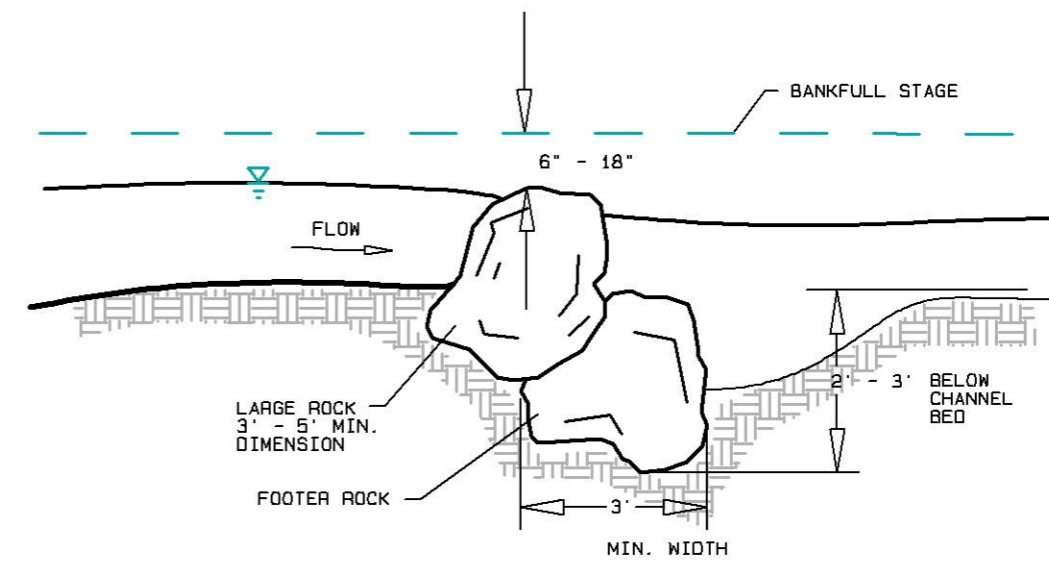
ROCK DEFLECTOR: PLAN



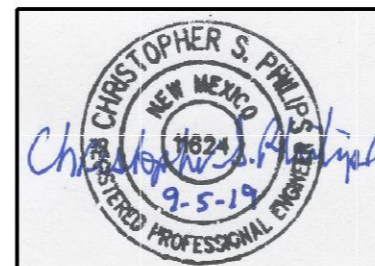
HABITAT ROCK: PLAN



ROCK BANK PROTECTION: SECTION

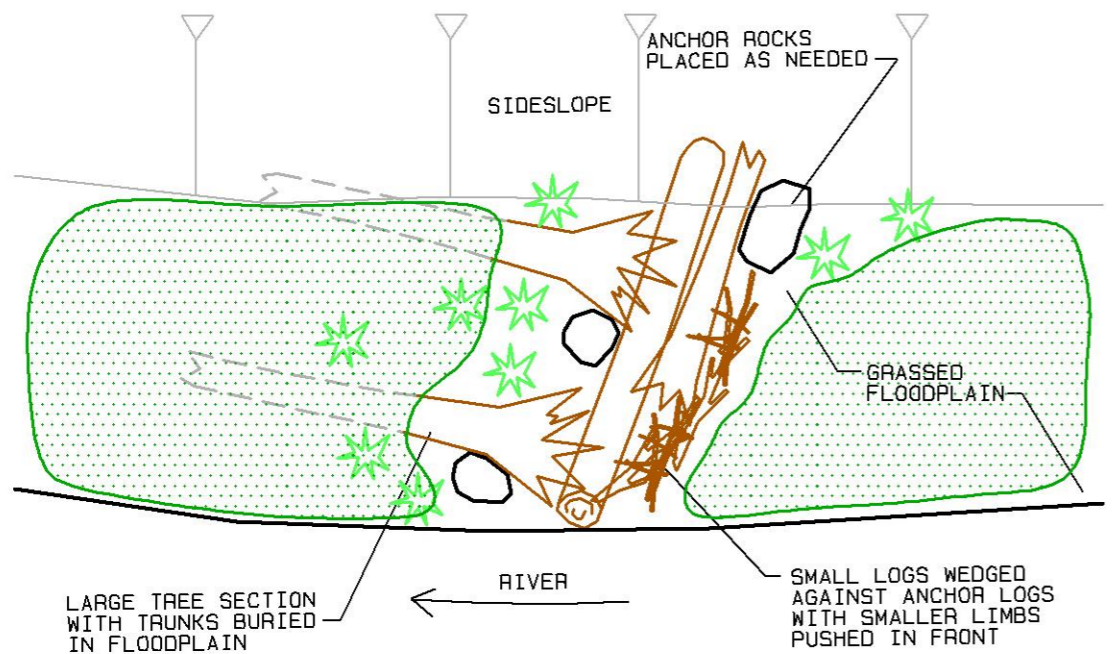


HABITAT ROCK: SECTION A

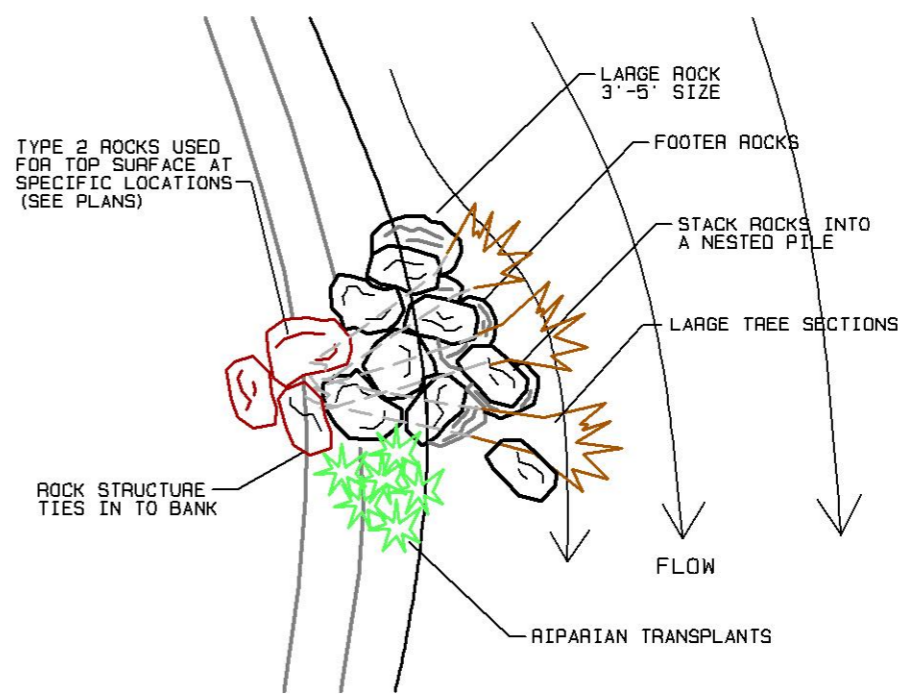


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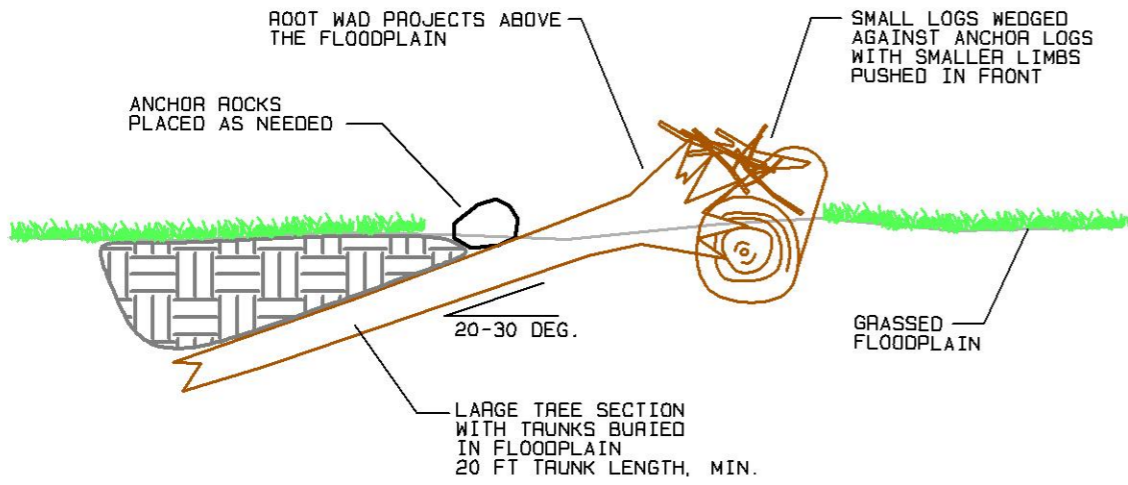
Rio Chama Aquatic Habitat Project	
Abiquiu, New Mexico	Sheet
ROCK DEFLECTOR, ROCK BANK PROTECTION & HABITAT ROCK DETAIL SHEET	13
	of
NTS	17
9-5-2019	



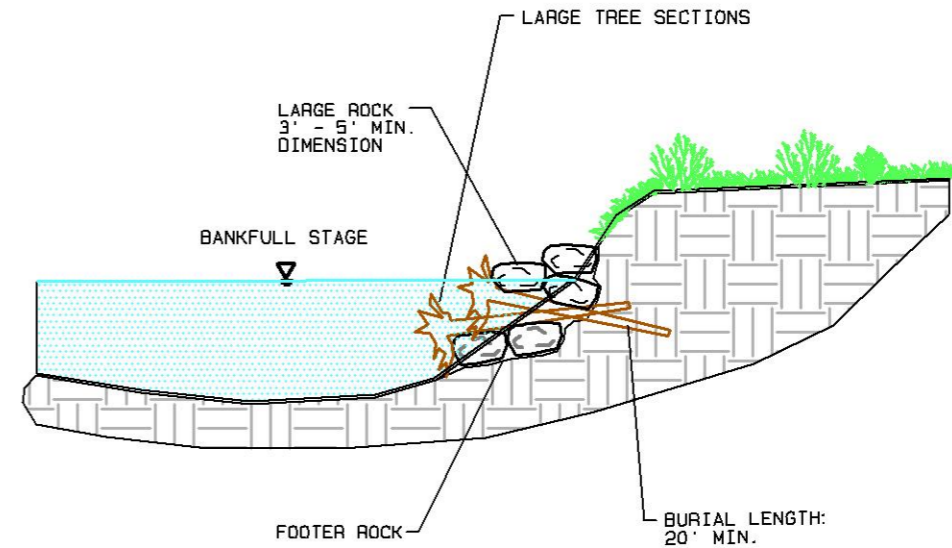
WOODY DEBRIS FLOODPLAIN: PLAN



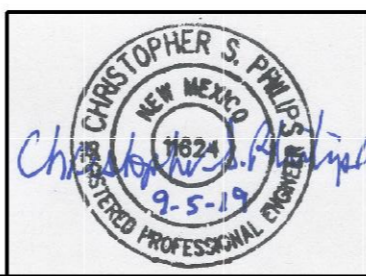
LARGE WOOD HABITAT: PLAN



WOODY DEBRIS FLOODPLAIN: SECTION



LARGE WOOD HABITAT: SECTION



Riverbend Engineering, LLC

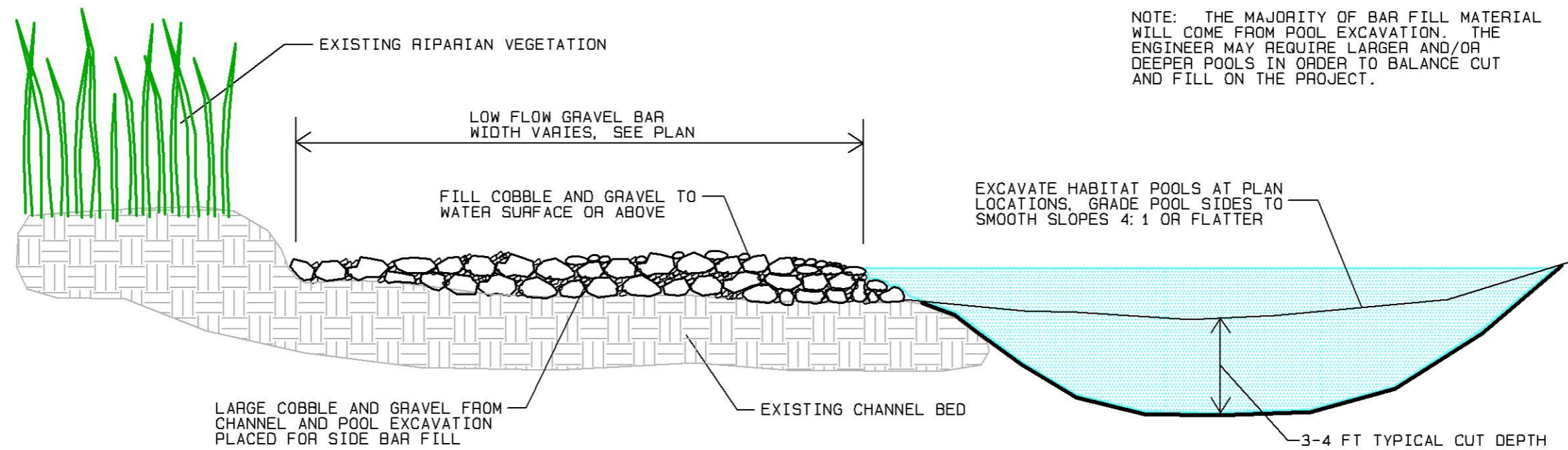
1309 Rio Grande Blvd. Albuquerque, NM 87104

Tel: 505.344.3315 FAX: 505.344.0698 Email: cphilips@frontier.net

102 Third St., P. O. Box 2979, Pagosa Springs, CO 81147

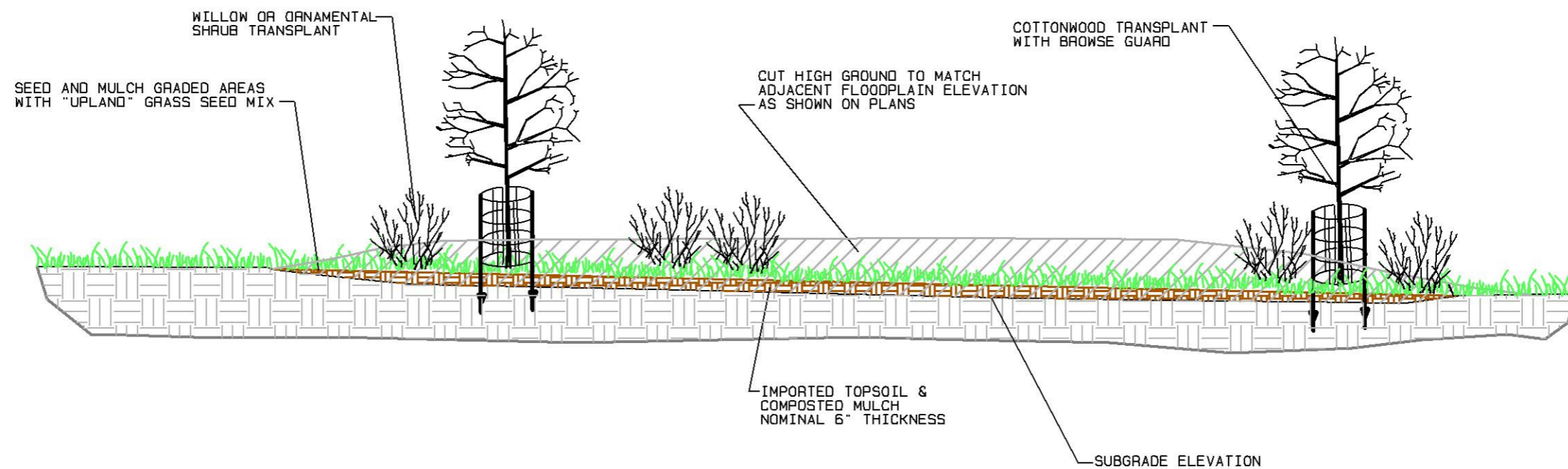
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Rio Chama Aquatic Habitat Project	
Abiquiu, New Mexico	Sheet
WOODY DEBRIS DETAIL SHEET	14
	of
NTS	17
9-5-2019	

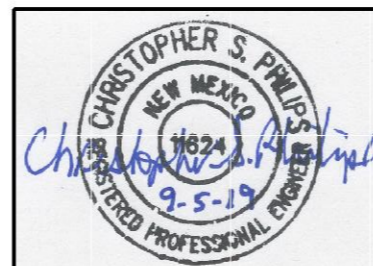


NOTE: THE MAJORITY OF BAR FILL MATERIAL WILL COME FROM POOL EXCAVATION. THE ENGINEER MAY REQUIRE LARGER AND/OR DEEPER POOLS IN ORDER TO BALANCE CUT AND FILL ON THE PROJECT.

POOL EXCAVATION: SECTION

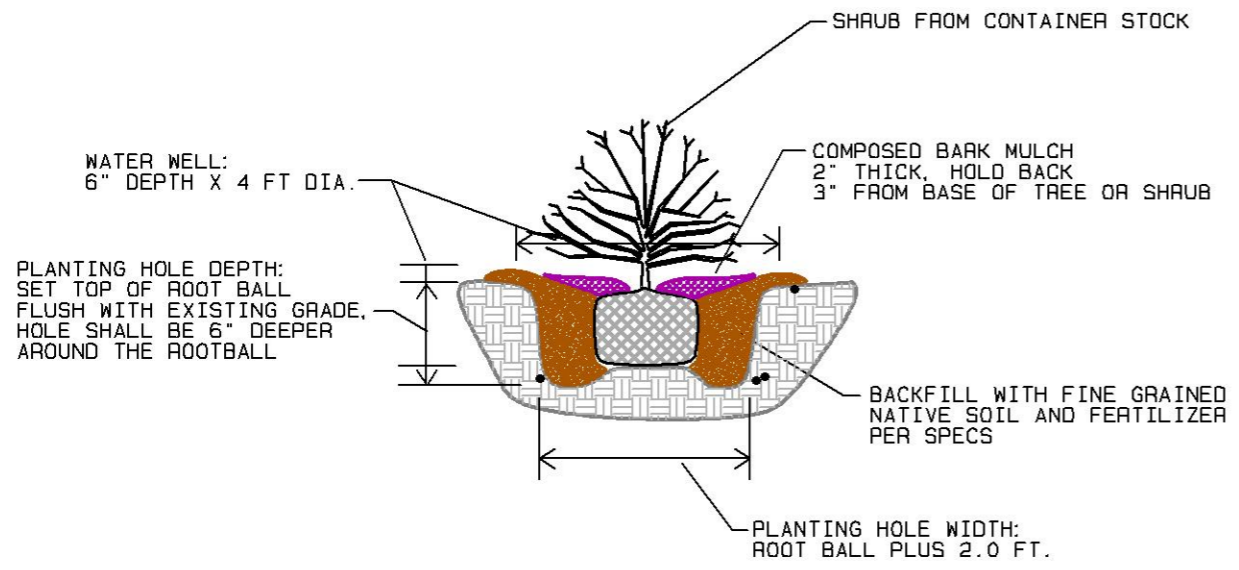


FLOODPLAIN GRADING: TYPICAL SECTION

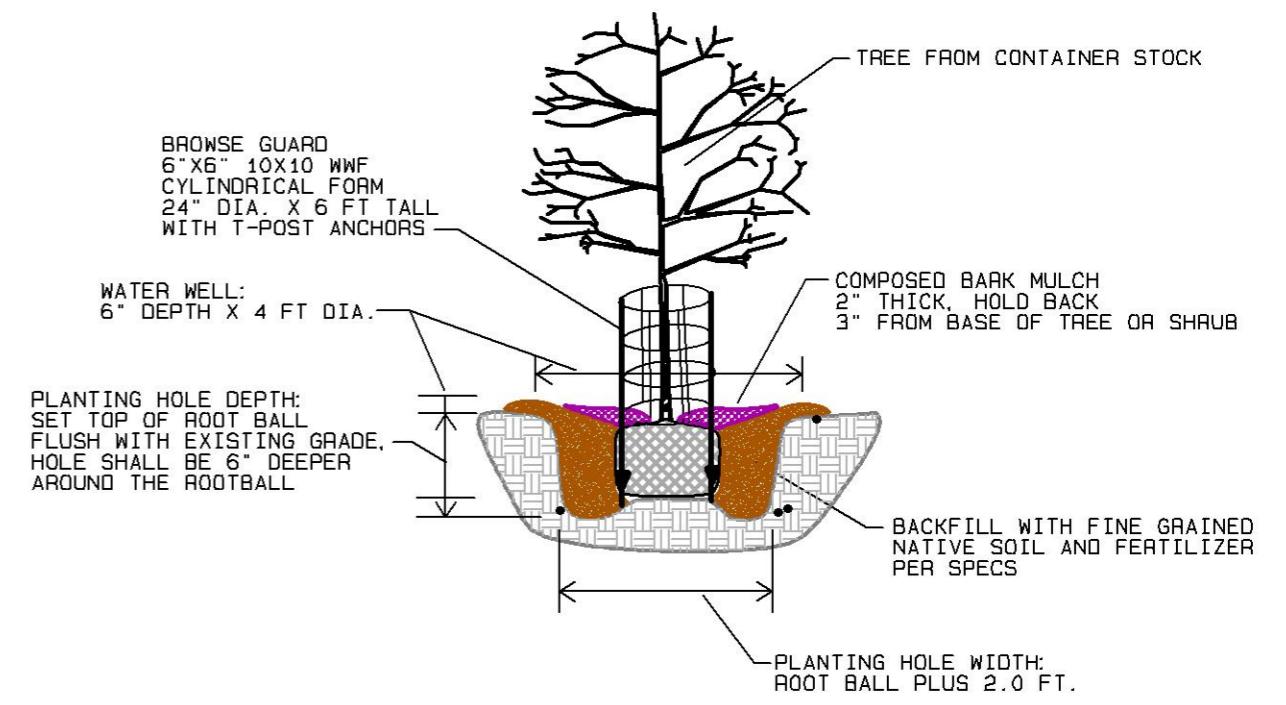


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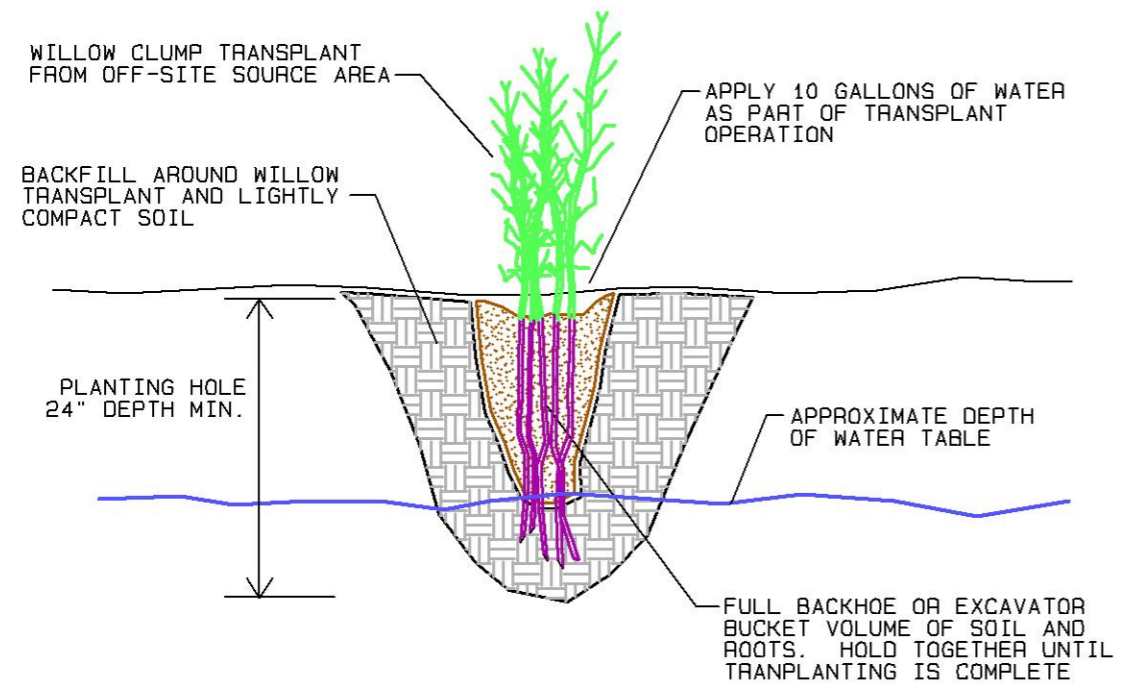
Rio Chama Aquatic Habitat Project	
Abiquiu, New Mexico	Sheet
CHANNEL FILL & FLOODPLAIN GRADING DETAIL SHEET	15
	of
NTS	17
9-5-2019	



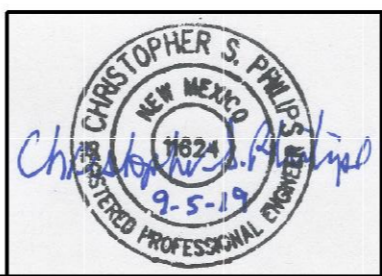
SHRUB TRANSPLANT: SECTION



TREE TRANSPLANT: SECTION

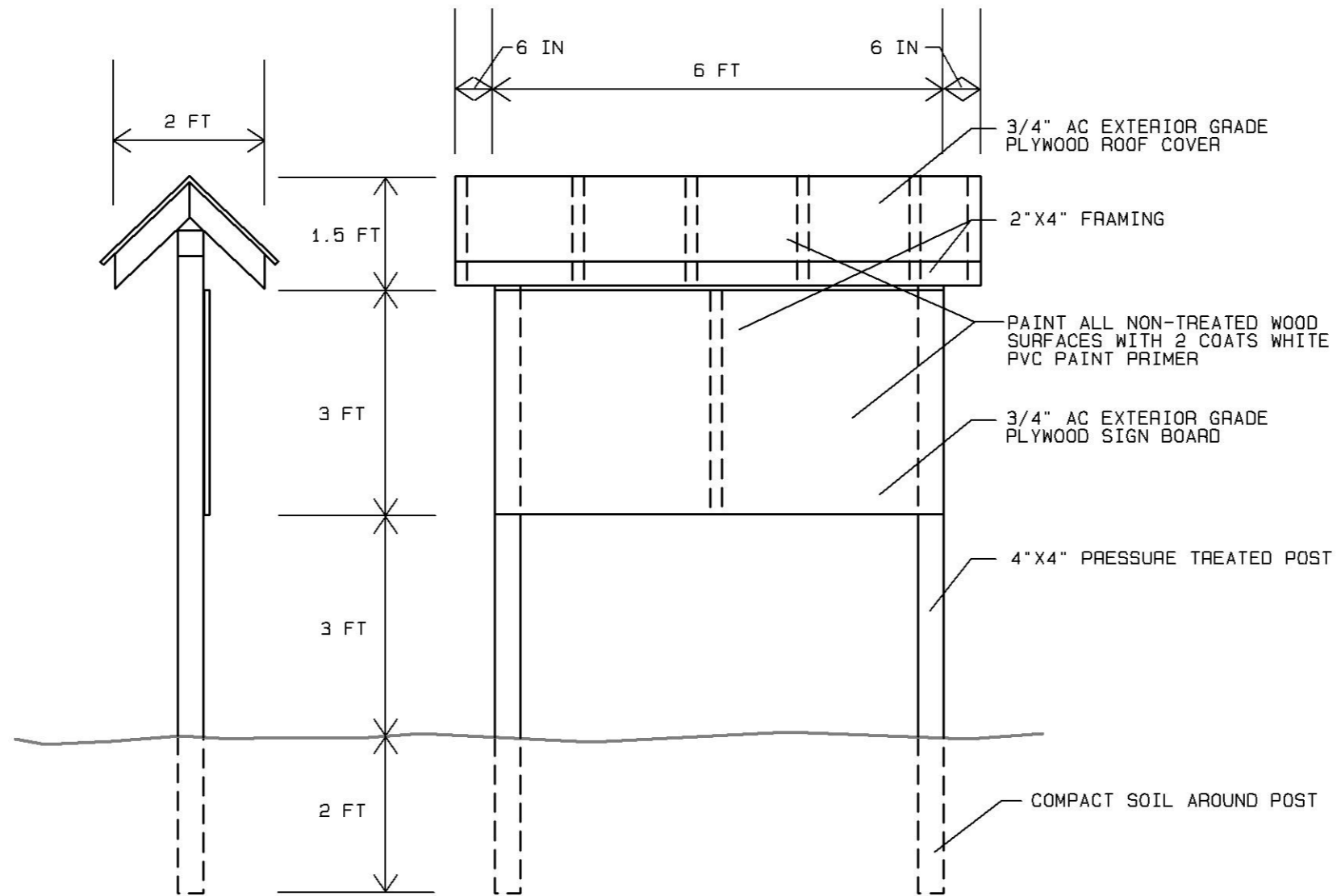


WILLOW TRANSPLANT: SECTION

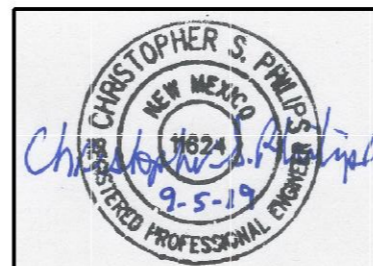


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Rio Chama Aquatic Habitat Project	
Abiquiu, New Mexico	Sheet
PLANTING DETAIL SHEET	16
	of
17	
NTS	9-5-2019



PROJECT SIGN: SECTION



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Rio Chama Aquatic Habitat Project	
Abiquiu, New Mexico	Sheet
PROJECT SIGN DETAIL SHEET	17
	of
NTS	9-5-2019

Appendix D
PUBLIC INVOLVEMENT



DEPARTMENT OF THE ARMY
ALBUQUERQUE DISTRICT, USACE OF ENGINEERS
4101 JEFFERSON PLAZA NE
ALBUQUERQUE NM 87109-3435

November 15, 2018

Planning, Project and Program Management Division
Planning Branch
Environmental Resources Section

Mr. Rolf Schmidt-Peterson
New Mexico Interstate Stream Commission
PO Box 25102
Santa Fe, NM 87504-5102

Dear Mr. Schmidt-Peterson,

The U.S. Army Corps of Engineers (Corps), Albuquerque District is seeking comments on a proposal to improve aquatic habitat in the Rio Chama. The proposed project would begin immediately downstream of Abiquiu Dam, and extend downstream approximately 2.7 miles through lands managed by the Corps, U.S. Bureau of Land Management, and USDA Forest Service.

Background

The USDA Forest Service (Forest Service), U.S. Bureau of Land Management (Land Management), and Corps manage federal lands on both sides of Rio Chama for about 2.7 miles downstream of Abiquiu Dam. The New Mexico Department of Game and Fish (Game and Fish) with Trout Unlimited, the National Fish Habitat Partnership (Partnership), and the federal agencies are interested in riparian and riverine fish habitat improvement in this section of the Rio Chama.

What is Being Proposed?

The Corps in cooperation with the Forest Service, Land Management, U.S. Fish and Wildlife Service, Game and Fish, and Trout Unlimited are proposing to construct fish habitat in the Rio Chama in the 2.7 mile reach downstream of Abiquiu Dam. The Partnership may provide funding for habitat construction. Fish habitat would be created by placing rock clusters, excavating small pools and constructing cobble bars. The attached map and conceptual design provide preliminary information on the location of the project.

Why Have I Received this Letter?

The purpose of this scoping letter is to inform you about this proposed project, and to give you the opportunity to communicate any issues, concerns, problems and opportunities you may have regarding this project. We request any information you may have within the proposed project area or surrounding area, such as existing conditions, studies, Environmental Assessments, and Environmental Impact Statements. This information will assist the Corps with determining the scope of issues to be discussed in the Environmental Assessment (EA) for this proposed project. Comments received, including contact information such as names and addresses, will be part of the public record and available for public inspection.

Comment Submittal

Send written comments and questions to Dr. Michael Porter, U.S. Army Corps of Engineers.

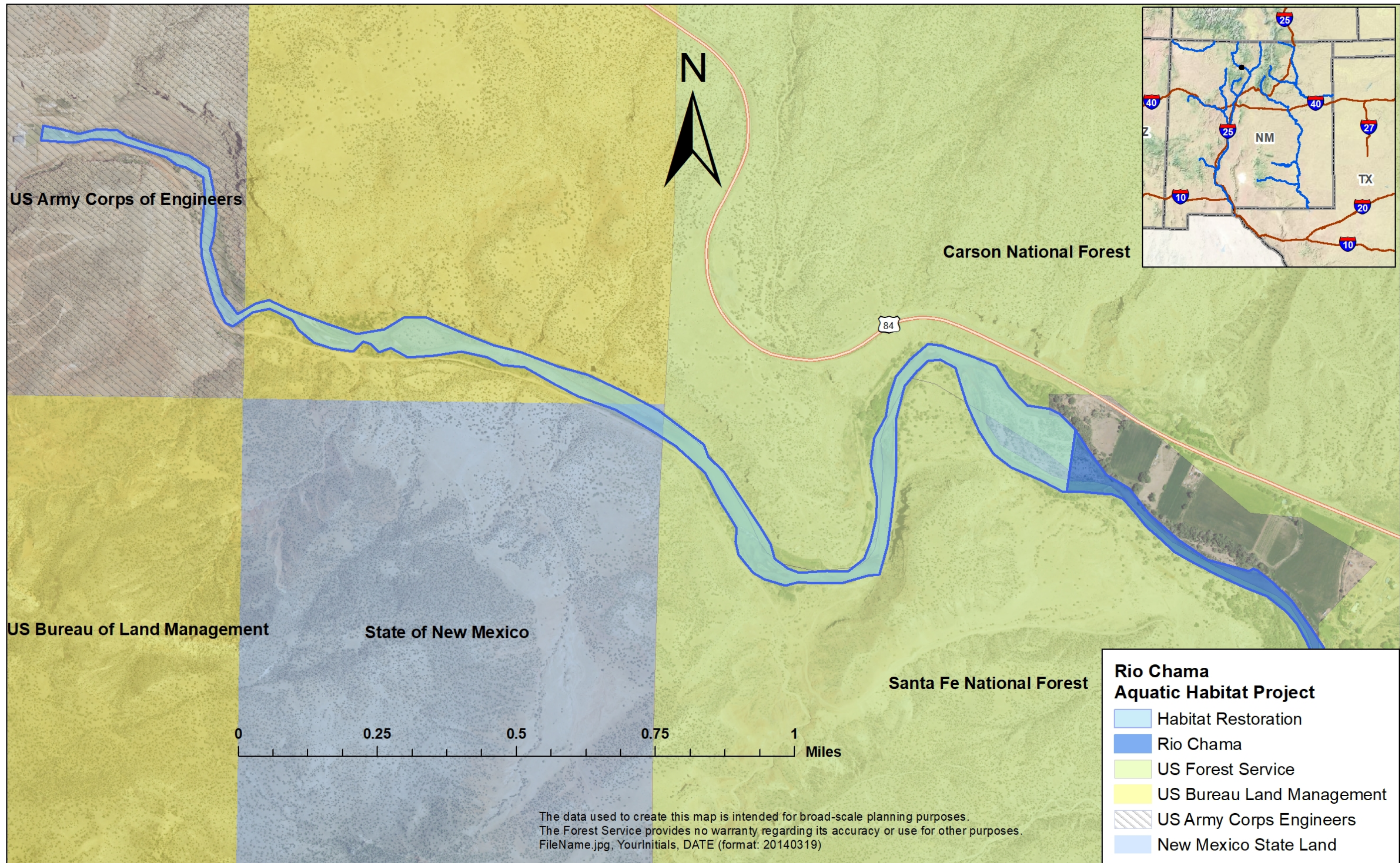
Dr. Michael Porter
U.S. Army Corps of Engineers
Albuquerque District
4101 Jefferson Plaza NE
Albuquerque, NM 87109
Michael.D.Porter@usace.army.mil

Phone: 505-343-3264

Please include Rio Chama Aquatic Habitat Project in the subject line of the email or letter. Indicate whether or not you would like to receive further correspondence from the Corps electronically. We would appreciate receiving initial comments for this proposed project by December 15, 2018.

Sincerely,

George MacDonell, Chief
Environmental Resources Section



GOVERNOR
Susana Martinez



DIRECTOR AND SECRETARY
TO THE COMMISSION
Michael B. Sloane

DEPUTY DIRECTOR
Vacant

STATE OF NEW MEXICO
DEPARTMENT OF GAME & FISH

One Wildlife Way, Santa Fe, NM 87507
Post Office Box 25112, Santa Fe, NM 87504
Tel: (505) 476-8000 | Fax: (505) 476-8123
For information call: (888) 248-6866

www.wildlife.state.nm.us

STATE GAME COMMISSION

PAUL M. KIENZLE III
Chairman
Albuquerque
BILL MONTOYA
Vice-Chairman
Alto
CHANCE CHASE
Artesia
CRAIG PETERSON
Farmington
RALPH RAMOS
Las Cruces
BOB RICKLEFS
Cimarron
THOMAS "DICK" SALOPEK
Las Cruces

November 27, 2018

Dr. Michael Porter
U.S. Army Corps of Engineers
Albuquerque District
4101 Jefferson Plaza NE
Albuquerque, NM 87109-3435

RE: Rio Chama Aquatic Habitat Project, NMDGF Project #18812

Dear Dr. Porter:

I have received your letter requesting comments on the proposed project to improve riparian and riverine fish habitat on the Rio Chama downstream of Abiquiu Dam. This stretch of the Rio Chama is a very popular recreational fishery, especially during winter months, and has limited habitat quality and quantity due to fluctuating flow regimes. The conceptual project design will address habitat limitations and should help improve this popular fishery. The proposed improvements will provide critical overwintering habitat for resident fish species such as brown trout and Rio Grande chub, create holding areas for stocked rainbow trout, improve water quality by increasing sediment transportation and reducing water temperatures, improve riparian health by stabilizing stream banks and encouraging native riparian plant development, and increase overall habitat complexity.

The Department fully supports the conceptual project and the effort to improve fish habitat within the Rio Chama. The Department has been identified as a partner in the project and we look forward to working with the Corps to successfully complete this project.

Please feel free to contact Eric Frey, Sportfish Program Manager, by telephone at 505-476-8102 or by email at eric.frey@state.nm.us if you have any questions.

Sincerely,

Kirk Patten
Chief, Fisheries Management Division



NOAH PARKER

LAND OF ENCHANTMENT GUIDES

EMAIL: trout@loeflyfishing.com ~ WEBSITE: www.loeflyfishing.com

Saturday, December 1, 2018

Dr. Michael Porter
US Army Corps of Engineers ~ ABQ District
4101 Jefferson Plaza NE
Albuquerque, NM 87109

re. Rio Chama Aquatic Habitat Project

Dear Dr. Porter,

Thank you for reaching out to me. I would like to let you and the "powers that be" know how much in favor I am of the Rio Chama Aquatic Habitat Project. I think that for both individual recreation and local businesses, this project will be incredibly beneficial. The Abiquiu stretch of the Chama River, where the project is slated to be done, has become increasingly popular with anglers over the years and any improvement to this section of the river would be an amazing help to all concerned.

From an environmental perspective, more holding water (i.e. deeper pools and runs) and possible spawning gravels will be a terrific help to the existing fishery. As things stand now in this area, there are not that many spots that hold fish, especially when the releases from Abiquiu Dam are at lower levels. As I am sure you know, this stretch of water also has a fair population of wild brown trout - the proposed stream improvements will be a big benefit towards sustaining (and hopefully increasing) this biomass of wild trout.

From an economic perspective, this project's improvement of the river can only help. Our business employs 7 year-round fishing guides and making the Abiquiu stretch of the Chama River a better fishery will directly benefit our business. I am also sure that once the project is finished it will indirectly help many of the local stores and business as well.

Please don't hesitate to contact me if you have any questions or if we can be of any assistance in making this project happen. Thank you for your work and efforts.

Sincerely,

A handwritten signature in black ink, appearing to read "Noah Parker". The signature is fluid and cursive, with a long horizontal stroke at the end.

Noah Parker

Received December 5, 2018.

Dear Dr. Porter,

I'm a board member of Trout Unlimited Truchas Chapter and have been following this project for a long time. I'm glad to see that things are rolling along. I've been fishing for 70 years all over the western states and have seen a great many rivers. I see that this has the making of a good one with some work to improve it. I've also been a little involved with River Bend and the Dept. Of Game and Fish with there work on the Pecos River. That work has improved the river 100% and I've seen a lot more people fishing it now. The town of Pecos is real happy with the extra revenue it has brought in. I fish the Rio Chama and would be a happy camper if it got a make over from the dam clear to the 2.7 miles proposed. I know that the fly shops and businesses would appreciate it also. If there is anything that I can do please drop me an email or call. Thank you for your work and reading my email.

William (Bill) Zenger
Trout Unlimited

Received December 14, 2018

Dear Mr. Porter,

Please include the Abeyta-Trujillo Acequia in any future communications regarding this project. Our concerns are twofold:

1. Our diversion dam spans the river in the middle of the proposed project. The dam is primitive, consisting of large basalt boulders and rock, with a settling pond and several headgates on the north bank of the river (river-left). Any construction activity near our diversion must be evaluated and approved by the Commissioners of the Acequia before action is taken. We would welcome the addition of local basalt rock to our diversion if it is compatible with habitat improvements, but we need to be intimately involved in all construction planning in this area.

2. The Acequia maintains access roads along the river-left bank and mesa. Use of any of these access roads must also be approved by the Acequia Commission. The main access road from US 84 is included in our USFS easement and overlies a buried water pipeline that may be damaged by large equipment. We would expect some maintenance of this road during the project if it is used.

There are a considerable number of relevant environmental studies that have been performed by the USACE and Carson National Forest in relation to our Acequia, including archaeological surveys and assessments. We would be happy to provide references to these publications. Please note that our Acequia was established in 1735 and is eligible for listing on the National Register of Historic Places. While this can add some complexity working with Federal funding, we are only interested in keeping the acequia operating efficiently. It seems to us that this project can actually enhance the performance of our irrigation system if we communicate effectively.

Respectfully,

Timothy J. Seaman
Commission Treasurer
Abeyta-Trujillo Acequia
PO Box 149
Abiquiu, NM 87510

Received January 8, 2019.
Good Afternoon,

We just received your letter date November 15, 2018 regarding the scoping of the Corps Rio Chama Aquatic Habitat Project below Abiquiu Reservoir. It looks like we missed the December 15th, 2018 deadline for initial comments and hope that we are not too late to be included in the scoping of the project and specifically how the project might affect State water rules and regulations as well as important water resource infrastructure.

As you know the NMISC is charged with maintaining New Mexico's compliance under the Rio Grande Compact and protecting the water resources of the State of New Mexico with our sister agency the OSE under the rules of state water law. We are also concerned about channel capacity and flood control issues in the Rio Chama through this stretch as drought and wildfires amongst other factors have begun to alter the hydrology and geomorphology of this important river system.

It is under these two major categories of concern that the Rio Grande Bureau of the NMISC would like to be included in the scoping process of this project moving forward. Please use myself as a primary point of contact for this effort and please update your mailing list as Page Pegram is now the Rio Grande Bureau Chief should any higher level communications be necessary.

Thanks for your time and I look forward to providing whatever assistance might be necessary from our office for this project.

Anders Lundahl
NM Interstate Stream Commission

Rio Chama meeting log

Date	Location	Participants	Purpose
4/11/18	Abiquiu Dam	TU, USACE, NMDGF, USFS, BLM, NFWF, Riverbend Eng., Ed Lucero (wave surfer)	Initial project “kick off” meeting to identify interest and partners
6/25/18	Abiquiu Dam	USACE, NMDGF, BLM, USFS (SF and Carson), TU, and Riverbend Eng.	Define project needs/scope and partner roles
3/27/19	Abiquiu Dam	USACE, NMDGF, BLM, Riverbend Eng., Daniel Manzanares (Abeyta Trujillo Acequia), Steve Harris (Rio Grande Restoration), and Ed Lucero (wave surfer)	Present preliminary designs
4/18/19	Canjilon Ranger District Office	NMDGF and Michael Gatlin (Carson NF)	Present preliminary designs and discuss comments
4/29/19	Santa Fe NF Supervisor Office	NMDGF and Cecil Rich (SFNF)	Present preliminary designs and discuss comments
5/6/19	Rio Arriba Co. Rural Event Center	NMDGF, Riverbend Engineering, and Abeyta-Trujillo Acequia members	Discuss habitat project and potential to improve/replace diversion
5/16/19	Conference call	USACE and NMDGF	Discussion on hazardous materials and water quality
7/1/19	Abiquiu Dam	USACE, NMDGF, and NMED	404/401 permit discussion

**Notice of Availability
Draft Environmental Assessment (DEA)
and
Finding of No Significant Impact (FONSI)
Rio Chama Aquatic Habitat Project,
Rio Arriba County, New Mexico Project**

The New Mexico Department of Game and Fish, in cooperation with the U.S. Army Corps of Engineers (Corps), Albuquerque District, U.S. Forest Service, the Bureau of Land Management, and the New Mexico State Land Office has released the **“Rio Chama Aquatic Habitat Project, Draft Environmental Assessment”**. The Draft Environmental Assessment describes the proposed aquatic habitat measures on the Rio Chama downstream of Abiquiu Dam on state and federal lands.

Public review of the DEA will begin on August 16, 2019 and will run for 20 days until September 6. The document will also be available on the Corps web site at <http://www.spa.usace.army.mil/Missions/Environmental/EnvironmentalComplianceDocuments/EnvironmentalAssessmentsFONSI.aspx> . A hard copy will be sent upon written request.

Comments on the DEA / FONSI should be sent to:

*U.S. Army Corps of Engineers
Albuquerque District
Environmental Resources Section
Attn: CESP-PM-LE (Michael Porter)
4101 Jefferson Plaza NE
Albuquerque, New Mexico 87109-3435*

For more information contact Michael Porter at Michael.D.Porter@usace.army.mil or (505) 342-3264.

#####

Notice of Availability
Draft Environmental
Assessment (DEA)

and
Finding of No Significant
Impact (FONSI)
Rio Chama Aquatic
Habitat Project,
Rio Arriba County,
New Mexico Project

The New Mexico Department of Game and Fish, in cooperation with the U.S. Army Corps of Engineers (Corps), Albuquerque District, U.S. Forest Service, the U.S. Bureau of Land Management, U.S. Fish and Wildlife Service, and the New Mexico State Land Office has released the "Rio Chama Aquatic Habitat Project, Draft Environmental Assessment". The Draft Environmental Assessment describes the proposed aquatic habitat measures on the Rio Chama downstream of Abiquiu Dam on state and federal lands.

Public review of the DEA will begin on September 3, 2019 and will run until September 19. The document is available on the Corps web site at <http://www.spa.usace.army.mil/Missions/Environmental/EnvironmentalComplianceDocuments/EnvironmentalAssessmentsFONSI.aspx>. A hard copy will be sent upon written request.

Comments on the DEA / FONSI should be sent to: U.S. Army Corps of Engineers Albuquerque District Environmental Resources Section
Attn: CESPA-PM-LE (Michael Porter)
4101 Jefferson Plaza NE
Albuquerque, New Mexico 87109-3435

For more information contact Michael Porter at Michael.D.Porter@usace.army.mil or (505) 342-3264.

Journal: September 5, 8, 2019

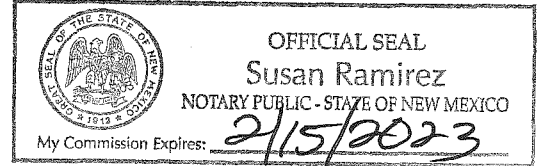
AFFIDAVIT OF PUBLICATION

STATE OF NEW MEXICO

County of Bernalillo SS

Elise Rodriguez, the undersigned, on oath states that she is an authorized Representative of The Albuquerque Journal, and that this newspaper is duly qualified to publish legal notices or advertisements within the meaning of Section 3, Chapter 167, Session Laws of 1937, and that payment therefore has been made of assessed as court cost; that the notice, copy of which hereto attached, was published in said paper in the regular daily edition, for 2 time(s) on the following date(s):

09/05/2019, 09/08/2019



Elise Rodriguez

Sworn and subscribed before me, a Notary Public, in and for the County of Bernalillo and State of New Mexico this 9 day of September of 2019

PRICE \$125.29

Statement to come at the end of month.

ACCOUNT NUMBER 1009517



Michelle Lujan Grisham
Governor

Howie C. Morales
Lt. Governor

NEW MEXICO ENVIRONMENT DEPARTMENT

Harold Runnels Building
1190 Saint Francis Drive, PO Box 5469
Santa Fe, NM 87502-5469
Telephone (505) 827-2855
www.env.nm.gov



James C. Kenney
Cabinet Secretary

Jennifer J. Pruett
Deputy Secretary

August 30, 2019

Michael Porter Ph.D.
U.S. Army Corps of Engineers
Albuquerque District
4101 Jefferson Plaza NE
Albuquerque, NM 87109
Via email: Michael.D.Porter@usace.army.mil

Dear Dr. Porter,

The New Mexico Environment Department (NMED) has reviewed the scoping letter for the Rio Chama Aquatic Habitat Project and offers the following comments:

NMED Air Quality Bureau Comments

Potential exists for temporary increases in dust and emissions from any activities that involve earthmoving, construction equipment and other vehicles; however, the increases should not result in non-attainment of air quality standards. Dust control measures should be taken to minimize the release of particulates due to vehicular traffic and any construction or harvesting type of activities. Areas disturbed by these activities, within and adjacent to the project area should be reclaimed to avoid long-term problems with erosion and fugitive dust.

To further ensure air quality standards are met, applicable local or county regulations requiring smoke, noise and/or dust control must be followed.

Any asphalt, concrete, quarrying, crushing, and screening facilities that may be contracted in conjunction with any proposed projects in the plan must have current and proper air quality permits. For more information on air quality permitting and modeling requirements, please refer to 20.2.72 NMAC.

With the appropriate dust control measures in place, the project is not anticipated to result in nonattainment of the New Mexico or National Ambient Air Quality Standards or contribute negatively to air quality on a long-term basis.

NMED Ground Water Quality Bureau Comments

The purpose of the proposed action is to improve fish and wildlife habitat conditions on the Rio Chama, and support increasing sport fish and wildlife recreation by the public. Trout fishing is popular on the Rio Chama downstream of Abiquiu Dam (NMDGF 2016). Currently, the tailwater river channel immediately below Abiquiu Dam has limited aquatic habitat and structure for fish, and riparian vegetation providing leaf litter for aquatic insects.

Implementation of the project may involve the use of heavy equipment leading to a possibility of contaminant releases associated with equipment malfunctions (e.g., fuel, hydraulic fluid, etc.). The GWQB advises all parties

involved in the project to be aware of notification requirements for accidental discharges as specified at 20.6.2.1203 NMAC.

A copy of the Ground and Surface Water Protection Regulations, 20.6.2 NMAC, is available at <http://164.64.110.239/nmac/parts/title20/20.006.0002.pdf>.

NMED Solid Waste Bureau Comments

The NMED's Solid Waste Bureau (SWB) advises that some of the work detailed in this project may result in the knowing or inadvertent generation of regulated asbestos waste, as the project includes excavation activity, road maintenance and construction (e.g., boat ramps, etc.). Accordingly, there is the potential to impact asbestos-containing materials, such as asbestos-cement pipes (sewer, water or conduit). Suspect pipes, fragments or soils contaminated with related fragments or fines need to be sampled and analyzed by Polarized Light Microscopy to determine if the materials contain greater than one percent (1%) asbestos. If so, the pipes, fragments and/or contaminated soils require management as regulated asbestos waste per the New Mexico Solid Waste Rules (SWR), 20.9.2 – 20.9.10 NMAC, to include proper containerization, labeling, manifesting, transport by an approved commercial hauler and disposal at a permitted solid waste facility specifically permitted to accept regulated asbestos waste. Additionally, trenching, excavation and related construction activity has the potential to impact known or unknown areas buried solid waste. If more than 120 cubic yards of solid waste from any one contiguous area requires excavation, the SWB may require submission of a Waste Excavation Plan pursuant to the SWR, 20.9.2.10.A(15) NMAC.

NMED Surface Water Quality Bureau Comments

The New Mexico Department of Game and Fish (NMDGF) in cooperation with the U.S. Army Corps of Engineers (USACE), U.S. Bureau of Land Management (BLM), U.S. Forest Service (USFS), U.S. Fish and Wildlife Service (FWS), and the State of New Mexico Land Office (NMLO), has prepared this environmental assessment (EA) to analyze potential effects that may result from the proposed Rio Chama Aquatic Habitat Restoration Project. The project would be located on the Rio Chama River, immediately downstream of Abiquiu Dam. The Abiquiu Dam and Reservoir is situated on the Rio Chama about 32 river miles upstream from its confluence with the Rio Grande. Lands on both sides of the Rio Chama in the project area are managed by USACE, BLM, USFS, and NMLO.

This project could have impacts to surface water quality. As stated in the draft EA:

State of New Mexico Section 401 Water Quality Certification is also required. NMED has provided conditional certification for Corps' 2017 Nationwide Permits (<https://www.env.nm.gov/swqb/404/2017NWPcert.pdf>). All applicable Best Management Practices (BMPs) provided by NMED will be included in project construction plans and specifications. USACE and non-federal sponsors will ensure the terms and conditions of the Section 401 permit are followed for the duration of construction.

NMED SWQB staff will review the project separately under Section 401 of the Clean Water Act to confirm consistency with the State's Section 401 certification of Nationwide Permit 27 for Aquatic Habitat Restoration. The consistency determination will be provided to the applicant for Section 404 permit coverage via email.

Thank you for providing NMED with the opportunity to review and comment on this proposed project.

Sincerely,
Michaelene Kyrala
Director of Policy
New Mexico Environment Department
Office: 505.827.2892
E-mail: michaelene.kyrala@state.nm.us

NEW MEXICO INTERSTATE STREAM COMMISSION

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September 6, 2019

U.S. Army Corps of Engineers
Albuquerque District
Environmental Resources Section
Attn: CESP-PM-LE Michael D. Porter
4101 Jefferson Plaza NE
Albuquerque, New Mexico 87109-3435

Via [https://Michael.D.Porter@usace.army.mil](mailto:Michael.D.Porter@usace.army.mil)

RE: Draft Environmental Assessment and Finding of No Significant Impact for the Rio Chama Aquatic Habitat Project, Rio Arriba County New Mexico

Introduction and Interest of Party

The New Mexico Interstate Stream Commission ("NMISC") hereby submit these formal comments (hereinafter "Comments") pursuant to the National Environmental Policy Act, 42 U.S.C. §§ 4321-4370h ("NEPA"). These Comments address the legal sufficiency of the U.S. Army Corps of Engineers ("USACE") Draft Environmental Assessment ("DEA") and Finding of No Significant Impact ("FONSI") for the Rio Chama Aquatic Habitat Project ("Project"), Rio Arriba County, New Mexico (August, 2019).

The NMISC is charged with administration of all interstate water compacts for New Mexico, as well as protecting, conserving and developing the waters and stream systems of the State. NMSA 1978, § 72-14-3 (1943). In the Rio Grande basin, the NMISC performs numerous activities, some of which will be affected by the Project. Those activities include monitoring water operations of the USACE and the U.S. Bureau of Reclamation ("Reclamation"), conducting annual accounting of native Rio Grande and San Juan Chama Project (SJC) water, coordinating with the Office of the State Engineer and water users on Rio Chama water administration and active water resource management (shortage sharing), assessing and determining Rio Grande Compact ("Compact") compliance, and addressing federal natural resource policy issues that may impact the river system.

The NMISC reviewed the Project DEA and FONSI to determine whether the USACE has met the requirements of the NEPA. As a general statement, the NMISC is supportive of habitat restoration projects, including this Project. However, based on our review, the NMISC is

concerned that neither the DEA nor the FONSI adequately address the Compact administration, water management and water operations consequences of the proposed action required to make a fully informed and well-considered decision. The NMISC submitted comments, dated June 15, 2015 in response to the April 24, 2015 scoping letter. In those comments, the NMISC raised the following interrelated issues:

- The Rio Grande basin is fully appropriated and any new use of water must be offset by a decrease in water use somewhere else in the basin;
- Without offsets, Project depletions will impact the administration of the Rio Grande Compact;
- Securing water rights to offset increased Project depletions is needed but will be complicated by existing water management agreements.

Issues Of Concern

The NMISC's current comments are based upon the same issues we raised in our June 15, 2015 scoping process comments. The DEA and FONSI fail to fully examine or address those comments on the water resource and hydrological effects on Rio Grande Compact administration, and fail to fully address the effects on water management and operations. In particular, it does not acknowledge the requirement to apply for a water right transfer and receive a water right permit under state law. We incorporate by reference our June 15, 2015 scoping process comment letter.

Statement explaining how the USACE acted in error

An Environmental Assessment is required to rigorously explore and objectively evaluate all reasonable alternatives in the analysis. NEPA §§ 1502.16 (a),(b),(d) and (h). In this instance the USACE did not adequately address NMISC comments related to the effects on Rio Grande Compact administration and the Project's effect on water management and operations.

For example, the USACE reliance upon water quality regulations to analyze Project water resource effects does not address the NMISC's Compact administration and water management and operation concerns that the proposed action will increase depletions of the surface water.

More specifically, under the terms of the Rio Grande Compact ("Compact"):

1. Article IV requires, in part, that appropriate adjustment of New Mexico's delivery schedule be made to account for post 1929 depletions of water above Otowi gage. Creating new wetlands and open water ponding on the Rio Chama will increase depletions and those must be offset through the application and transfer process for water rights required under state law.
2. Water management in the Rio Chama will be affected. Flows in the Chama are a combination of native Rio Grande and trans-mountain San Juan-Chama (SJC) water. SJC water is already contracted to entities downstream of the Project area and the

USACE does not hold an SJC contract. Unless the Project obtains a sublease of SJC water to offset increased depletions at the project, only native water would be available for offsets. Any natural flow on the Chama of 100 cfs or less, which commonly occurs during irrigation season, belongs to senior water rights irrigators on the lower Chama and must not be depleted. The USACE failed to analyze this issue. There are also formal and informal shortage-sharing agreements in place between senior priority native water rights holders and others on the Rio Chama system that the DEA failed to address. Securing the necessary water rights to offset this Project will be complicated by those existing agreements.

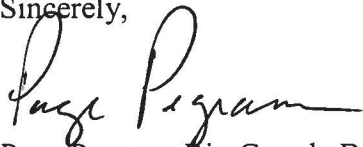
Given that the DEA and FONSI do not address the above items, they are based upon incomplete hydrologic information and do not comply with applicable laws, regulations, policies, and planning procedures. The USACE failed to take a hard look at the NMISC's water resource, water management and Compact administration comments in the scoping.

Conclusion

In sum, we believe that the Project DEA and FONSI analysis of effects on water resources is legally deficient. As such we file these formal comments and request that those deficient portions of the DEA related to water management and water operations be remedied, and that an analysis of effects on Compact administration be included as well as an acknowledgment that permits to transfer water rights from the Office of the State Engineer will be required prior to construction of the Project. Specifically, we request that a Record of Decision not be issued until those impacts are adequately addressed. We request that the USACE circulate a revised Environmental Assessment that specifically addresses Project impacts to water management and operations and Project impacts to the administration of the Rio Grande Compact.

We thank you again for this opportunity to provide comments on the Rio Chama Habitat Project DEA and FONSI, and look forward to a positive response from you on our comments. Please do not hesitate to call me at 505-383-4051 if you have questions about this letter and our request, and please keep me informed of any decisions and actions related to the Rio Chama Aquatic Habitat Project.

Sincerely,



Page Pegram, Rio Grande Basin Manager
New Mexico Interstate Stream Commission

cc: Rolf Schmidt-Petersen, Director, NMISC
Ariane Singer, General Counsel, NMISC
Chris Stageman, NMISC
John Romero, NMOSE Water Rights Administration Acting Director
Brian Gallegos, NMOSE District 6 Manager

NEW MEXICO INTERSTATE STREAM COMMISSION

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June 15, 2015

Submitted Electronically and via United States First Class Mail

U. S. Department of the Army
Albuquerque District, Corps of Engineers
Planning, Project, and Program Management Division
Environmental Resources Section
Attn: Dr Michael D. Porter
4101 Jefferson Plaza NE
Albuquerque, NM 87109-3435

Re: New Mexico Interstate Stream Commission scoping input on the Rio Chama Wetland Project

Dear Dr. Porter:

The New Mexico Interstate Stream Commission (ISC or "Commission") submits the following comments on the proposed Rio Chama Wetlands Project (the "Proposed Project") downstream of Abiquiu Dam, Rio Arriba County, New Mexico. The ISC appreciates the opportunity to comment on the Proposed Project.

The ISC is interested in the Proposed Project because it is statutorily mandated to ensure compliance with the interstate river compacts to which New Mexico is a party, and to develop, conserve, and protect New Mexico's water and stream systems. NMSA 1978, § 72-14-3 (1953).

In the Rio Grande basin, the ISC performs numerous activities, some of which may be affected by the proposed project. Those activities include, but are not limited to, monitoring water operations of the U.S. Army Corps of Engineers (Corps) and Reclamation, conducting annual accounting of native Rio Grande and San Juan Chama Project (SJC) water, assessing and determining Rio Grande Compact compliance, and addressing federal natural resource policy issues that may impact the river system. With these activities in mind, we reviewed the conceptual plan of the Proposed Project. Based on that review the ISC provides the following written comments.

OFFICE OF THE STATE ENGINEER PERMIT

The Upper Rio Grande basin is fully appropriated and the Rio Grande Compact limits the amount of water that can be depleted in the Upper Rio Grande. Creating a new wetland and open water pond will create a new diversion and increase depletions from the Rio Chama system. Therefore, any new use of water must be permitted and offset by acquisition of an existing water right and decrease in water use somewhere else. The Office of the State Engineer (OSE) will likely require a water rights permit to do so. A permit application should be submitted to the District 6 Office of the OSE for the proposed project.

Dr. Michael Porter
June 15, 2015
Page 2

RIO CHAMA WATER MANAGEMENT AND MEASUREMENT

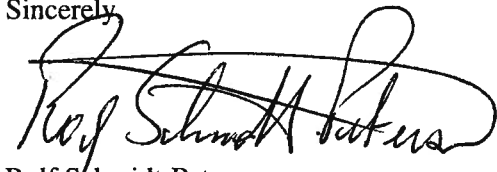
Water management in the Rio Chama is complicated by the fact that there is a combination of native Rio Grande and transmountain diversion (SJC) water in the river. The SJC water is contracted to entities downstream of the Project area. There are times when the vast majority of water in the Rio Chama is SJC water and that water couldn't be used for the wetland project. In addition, for native Rio Grande water, there are formal and informal shortage-sharing agreements in place between high priority native water rights holders and others on the Rio Chama system. Securing water rights to offset this Project will be complicated by those existing agreements.

Finally, the accurate measurement of water is critical to efficient and effective water management and the ISC is concerned about the impact that the wetlands project may have on the Rio Chama Below Abiquiu gaging station (#08287000) operated by the U.S. Geological Survey (USGS). Diverting water for the proposed pond upstream of the gaging station and routing it to a pond downstream would result in water bypassing the gage without being measured. Additionally the two "large rock habitat structures" immediately upstream of the existing concrete weir are in the general vicinity of where the USGS and others conduct discharge measurements and could possibly reduce the quality of measurements, further impacting the gage's rating.

The ISC reserves the right to supplement these comments to provide new information which is obtained or developed prior to the completion of this proposed project.

Please do not hesitate to contact me at (505) 827-6125 or Anders Lundahl at (505) 383-4047 should you have any questions. Thank you for the opportunity to comment on this project.

Sincerely



Rolf Schmidt-Petersen
Rio Grande Basin Manager
New Mexico Interstate Stream Commission

cc: Deborah K. Dixon, P.E., Director, NMISC
Brian Gallegos, NMOSE
Frank Scott, NMOSE
Anders Lundahl, NMISC
Page Pegram, NMISC
Ryan Gronewald, Corps of Engineers
Fred Vigil, RCAA
Tim Seaman, RCAA
RGB file



STATE OF NEW MEXICO
OFFICE OF THE STATE ENGINEER
District VI Office, Santa Fe, NM

JOHN R. D'ANTONIO JR., P.E.
STATE ENGINEER

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September 6, 2019

U. S. Army Corps of Engineers
Attn: Michael D. Porter
Albuquerque District
4101 Jefferson Plaza NE
Albuquerque, New Mexico 87109

Via <https://Michael.D.Porter@usace.army.mil>

Re: Draft Environmental Assessment and Finding of No Significant Impact, for the Rio Chama Aquatic Habitat Project, Rio Arriba County, New Mexico

Dear Mr. Porter:

The New Mexico Office of the State Engineer ("OSE") hereby submits these formal comments (hereinafter "Comments") pursuant to the National Environmental Policy Act, 42 U.S.C. §§ 4321-4370h ("NEPA"). These Comments address the legal sufficiency of the U. S. Army Corps of Engineers ("USACE") Draft Environmental Assessment ("DEA") and Finding of No Significant Impact ("FONSI") for the Rio Chama Aquatic Habitat Project ("Project"), Rio Arriba County, New Mexico (August, 2019).

The OSE is charged with administration of all water in the State of New Mexico pursuant to NMSA 1978, § 72-2-1 (1978). In the Rio Grande basin, the OSE performs numerous activities, some of which will be affected by the Project. Those activities include, but are not limited to basic water rights administration under state law and OSE Rules and Regulations, Active Water Resource Management (AWRM), conducting annual accounting of native Rio Grande and San Juan Chama Project (SJC) water, and addressing state water resource policy issues that may impact the river system.

The DEA description of the proposed action, states in relevant part: The New Mexico Department of Game and Fish (NMDGF) in cooperation with USACE, U.S. Bureau of Land Management (BLM), U.S. Forrest Service (USFS), U.S. Fish and Wildlife Service (FWS), and the State of New Mexico Land Office (NMLO) propose to construct instream aquatic habitat features on the Rio Chama below Abiquiu Dam. The proposed action includes installation of instream fish habitat structures, two new boater access areas, wetland improvements, and riparian vegetation improvements for wildlife. The proposed project area is about 58.7 acres

through 2.7 miles of lands managed by NMDGF in cooperation with USACE, BLM, USFS, FWS, and the NMLO. The proposed project would construct instream aquatic habitat features for trout and other fish species. The proposed wetland improvements include but are not limited to constructing 2.1 acres of groundwater wetlands and plant native vegetation through the riparian zone.

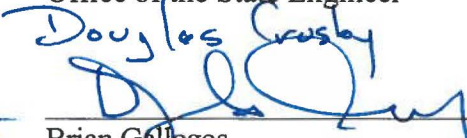
The Rio Grande basin is fully appropriated and any new use of water must be offset pursuant to the Mesilla Valley Guidelines. New appropriations must be offset by water rights transfers from other sources through permanent or temporary retirement or surface or groundwater rights or permitted import of interbasin transfer water. The Project will construct 2.1 acres of wetlands which will increase depletions from the river system. In this role, the OSE reviewed the Project DEA and FONSI to determine whether the project will meet the OSE surface and groundwater water rules and regulations including, but not limited to, Section 19.26.2.15 (B) of the State Engineer's Regulations Governing the Appropriation and Use of the Surface Waters of New Mexico.

Based on our review of the Project description in the DEA, impounding water in a constructed wetland will create a depletion that must be offset pursuant to OSE rules and regulations.

We thank you for this opportunity to provide comments on the Project DEA and FONSI, and look forward to a positive response from you on our comments. Please keep us informed of any decisions and actions related to the Project. Please don't hesitate to contact me at (505) 827-6120 if you have any questions.

Sincerely,

Office of the State Engineer


for Brian Gallegos
District VI Manager

cc: John Romero, OSE, Water Rights Director
Doug Crosby, OSE, AWRM Supervisor
Page Pegram, NMISC, Rio Grande Basin Manager



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September 20, 2019

Planning, Project and Program Management Division
Planning Branch
Environmental Resources Section

Attn:

Brian Gallegos
New Mexico Office of State Engineer
PO Box 25102
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Page Pegram
New Mexico Interstate Stream Commission
PO Box 25102
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RE: Agency Comments on the Draft Environmental Assessment and Finding of No Significant Impact for the Rio Chama Aquatic Habitat Project, Rio Arriba County, New Mexico

Thank you for your comments. The U.S. Army Corps of Engineers (USACE), Albuquerque District sent Scoping Letters to interested agencies and stakeholders on November 14, 2018, and a Notice of Availability for the Draft Environmental Assessment (DEA) on August 16, 2019. The New Mexico Office of the State Engineer (OSE) and New Mexico Interstate Stream Commission (NMISC) provided comments on the DEA.

In cooperation with the New Mexico Department of Game and Fish (NMDGF), USACE provides the following responses:

1. Two paragraphs describing OSE and NMISC responsibilities were added to Section 1.3 Regulatory Compliance.
2. A paragraph was added under Section 2.1 Proposed Action to clarify how limiting habitat features to the active channel would not result in increasing depletions. The discussion describes how reducing the wetted surface and water surface areas relative to volume provide more efficient water transport at flow less than 100 cfs compared to a wide, shallow wetted channel.
3. Following discussion with NMDGF, the proposed construction of depressional wetlands has been relocated from the area described in the Section 2.1 Proposed Action to the area described in Section 2.3 Alternative Actions Evaluated. This move was based on the concerns raised by OSE/NMISC.
4. A paragraph describing the limits of the Rio Grande Compact was added to the hydrology section under Section 3.3 Water Resources.

These changes should address the issues that were raised through your review. Again, thank you for your comments.

Sincerely,

George MacDonell, Chief
Environmental Resources Section

Memorandum for Record

To: Justin Reale, Environmental Engineering Section (EC-GE)

From:

Santiago Gallegos, Environmental Engineering Section (EC-GE)

John Stomp, Environmental Engineering Section (EC-GE)

Donnie Kelly, Environmental Engineering Section (EC-GE)

Date: 18 June 2019

Subject: Environmental conditions site visit for the proposed aquatic restoration on the Rio Chama below Abiquiu Dam.

On June 14, 2019, members of the Environmental Engineering Branch (Donnie Kelly, John Stomp, and Santiago Gallegos) traveled to Abiquiu Dam in support of Environmental Engineering's portion of the Environmental Assessment for the Rio Chama Aquatic Habitat Restoration Project.

The team departed from the Albuquerque District Office at 0630 and arrived at Abiquiu Dam at approximately 0830. Prior to driving to the proposed project site, the team checked in with John Mueller, Abiquiu Dam Project Manager. Upon arrival to the site, the team examined the drawings provided by Riverbend Engineering, LLC. The drawings identified the proposed construction limits and three staging areas (**Figure 1**).

Solid waste such as plastic bottles, bags, cups and glass were discovered in low concentrations along the Rio Chama. The waste was either deposited by the wind or by the users of the trail and observation areas. Most of this waste was contained in the picnicking/wildlife viewing areas. Further findings in these areas were garbage receptacles, one restroom, picnic tables, shade structures and signage. Additionally, when walking the site, some small (~2 feet in diameter) hand-made fire pits were discovered along the river. The fire pits did contain ashes, but they were all extinguished. In the event of a flood event that inundates this land, waste and/or the extinguished ashes could potential pose a threat by entering the river. Also, in the road along the river, which is an earthen road, tire tracts we observed indicating vehicular traffic. The deepest tracts were approximately 6 inches deep into the road. Site visit photos are provided in Appendix A.

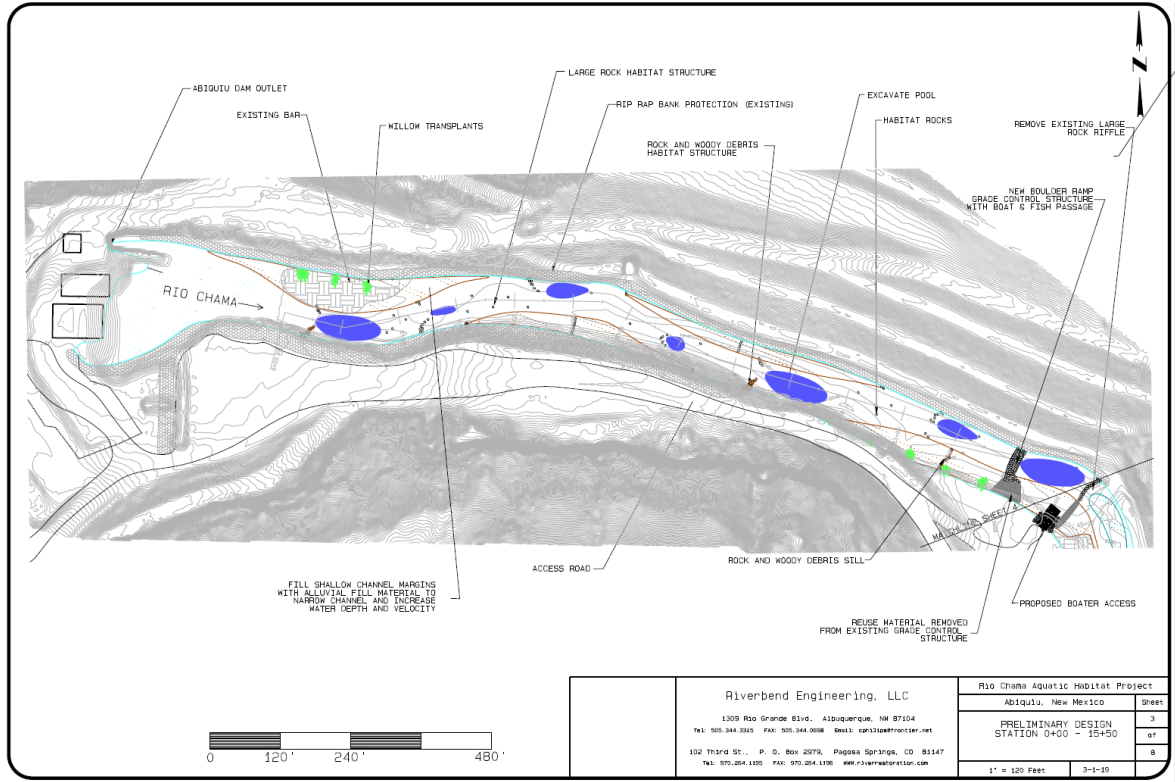


Figure 1: Overview of the proposed restoration project on the Rio Chama downstream of Abiquiu Dam (Riverbend Engineering, LLC. 2019)