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

July 11, 2019

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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
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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 dusk 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	36º14’22.63 N,	106º25’16.27 W
Downstream	36º12’23.08 N,	106º20’42.64 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	*Lynx canadensis*	**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	*Zapus hudsonius luteus*	**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	*Sterna antillarum*	**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	*Strix occidentalis lucida*	**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	*Empidonax trailii extimus*	**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	*Coccyzus americanus occidentalis*	**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	*Plethodon neomexicanus*	**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

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CARSON NATIONAL FOREST
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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 dusk 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	36º14'22.63 N,	-106º25'16.27 W
Downstream	36º12'23.08 N,	-106º20'42.64 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	*Accipiter gentilis*	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	*Antrostomus arizonae*	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	*Athene cunicularia*	Taos BLM	Inhabits desert grasslands, co-occuring 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	*Calcarius mccownii*	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	*Calcarius ornatus*	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	*Catastomus latipinnis*	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	*Catostomus plebeius*	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	*Corynorhinus townsendii pallescens*	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	*Cynomys gunnisoni, Cynomys gunnisoni pop*	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	*Cynomys ludovicianus*	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	*Euderma maculatum*	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	*Falco peregrinus anatum*	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	*Gastrocopta ruidosensis*	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	*Gila pandora*	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	*Gila robusta*	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.
Piñyon Jay	*Gymnorhinus cyanocephalus*	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	*Haliaeetus leucocephalus*	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	*Lithobates pipiens*	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	*Lontra canadensis sonora*	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	*Oncorhynchus clarki virginalis*	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	*Pisidium lilljeborgi*	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	*Sorex cinereus*	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	*Sorex navigator*	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	*Sorex preblei*	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	*Toxostoma bendirei*	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	*Vermivora virginiae*	Taos BLM	Transient in areas of pinon/juniper woodlands, ponderosa/oak forests, and mixed confer 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	*Vireo bellii arizonae*	Taos BLM	Species uses scrubby thickets of Russian olive, willow, and salt cedar. Range in southern NM, unlikley 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	*Vireo vicinior*	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	*Abronia bigelovii*	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	*Abronia bigelovii*	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	*Astragalus micromerius*	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	*Astragalus ripleyi*	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	*Cymopterus spellenbergii*	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	*Cypripedium parviflorum pubescens calceolus var.*	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	*Delphinium robustum*	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	*Draba heilii*	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	*Erigeron subglaber*	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	*Eriogonum lachnogynum var. colobum*	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	*Mentzelia conspicua*	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	*Mentzelia springeri*	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	*Mentzelia todiltoensis*	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	*Opuntia x viridiflora*	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	*Salix arizonica*	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.

Acreage 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

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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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