BUREAU OF RECLAMATION

Draft Environmental Assessment

Isleta Pueblo Bosque and Riverine Restoration Project, New Mexico

Upper Colorado Basin Region

U.S. Department of the Interior

July 2020

Mission Statements

The Department of the Interior (DOI) conserves and manages the Nation's natural resources and cultural heritage for the benefit and enjoyment of the American people, provides scientific and other information about natural resources and natural hazards to address societal challenges and create opportunities for the American people, and honors the Nation's trust responsibilities or special commitments to American Indians, Alaska Natives, and affiliated island communities to help them prosper.

The mission of the Bureau of Reclamation is to manage, develop, and protect water and related resources in an environmentally and economically sound manner in the interest of the American public.

Draft Environmental Assessment

Isleta Pueblo Bosque and Riverine Restoration Project, New Mexico

Upper Colorado Basin Region

Prepared for

Bureau of Reclamation, Albuquerque Area Office

On Behalf of

The Pueblo of Isleta

Prepared by

Tetra Tech

July 2020

Cover Photo: South end of Isleta Island Removal Project, looking south. (Tetra Tech)

Finding of No Significant Impact

U.S. Bureau of Reclamation

Environmental Assessment

Isleta Pueblo Bosque and Riverine Restoration Project, New Mexico

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Environment and Lands Division Manager Date

Albuquerque Area Office Manager Date

Based on the analysis of potential environmental impacts contained in the attached environmental assessment, it is my determination that the proposed action does not constitute a major Federal action significantly affecting the quality of the human environment and that an environmental impact statement is not required. Considering the significance criteria in 40 CFR 1508.27, I have determined that the Isleta Pueblo Bosque and Riverine Restoration Project will not have a significant effect.

FONSI Number AA0-20-004

Summary of the Proposed Action

The U.S. Department of the Interior, Bureau of Reclamation proposes to implement restoration activities described in the Pueblo of Isleta Bosque and Riverine Restoration and Implementation Plan which was finalized in 2019. This proposed work is supported by the Pueblo of Isleta and is a direct outcoming of the 2016 *Agreement of Compromise and Settlement Regarding the Isleta Diversion Dam* signed by the Pueblo of Isleta, the Bureau of Reclamation, and the Middle Rio Grande Conservancy District. The work will be primarily conducted by the Pueblo of Isleta or their contractors. The Pueblo of Isleta (POI) is located in Bernalillo and Valencia Counties, New Mexico on the Rio Grande.

The proposed action entails habitat restoration activities in the bosque and channel along the Rio Grande and would be implemented over a ten-year period. This includes invasive species management of approximately 817 acres of forestry treatment with follow up herbicide, 907 acres of herbicide treatment and excavated channel and bankline of approximately 1.7 acres of backwater habitat construction, 58 acres of bankline terrace, and 28 acres of willow swale construction.

A determination was made that the following resources would not be impacted or would not have the potential for significant affects from the proposed actions: water quality and water management; air quality and noise; ecological resources including native vegetation, invasive species, fire, floodplains and wetlands; wildlife, cultural resources, Indian Trust Assets, socioeconomic conditions or environmental justice, and aesthetics. The rational for this determination can be found in Chapter 3 of the attached Environmental Assessment (EA.)

It was determined that the proposed action may affect but is not likely to adversely affect the Rio Grande silvery minnow, the Southwestern Willow Flycatcher, the Yellow-billed Cuckoo, and the New Mexico meadow jumping mouse. There is no designated critical habitat for any of those species.

With the implementation of environmental commitments and BMPs, effects are considered neutral and only minor and/or temporary negative impacts have been identified.

Environmental Impacts

The following resources and socioeconomic factors were evaluated in this EA to determine the impacts that would result from the proposed work on the Pueblo of Isleta: Hydrology, hydraulics and geomorphology; Water quality; Air quality and noise; Ecological Resources; Wildlife; Special Status Species and their habitat; Cultural Resources; Indian Trust Assets; Socioeconomic environment and environmental justice; and Aesthetics.

Water Resources/Water Quality

The Proposed Action would cause some short-term increases in turbidity levels within the water column due to the construction activities, i.e., ground disturbance and exposed soils. The effects of the proposed action on erosion and water quality are considered minor and temporary in nature. Best Management Practices (BMPs)(i.e., initial steam cleaning of all the equipment and checking the equipment several times per day) would be followed to avoid the inadvertent risk of a discharge of

pollutants into surface waters while the equipment is being used in the vicinity of the river. Clean Water Act Section 401 water quality certification conditions and requirements would be followed to minimize impacts to water quality.

Air Quality and Noise

If the proposed action is implemented there may be slight and temporary impacts to air quality and noise in the proposed Project Area. The dust abatement BMPs described in the Environmental Commitments section will help to minimize particulate matter caused by soil disturbance and equipment operation. Equipment operation might also lead to increased noise levels in the Project Area, but these would cease when construction is complete.

Vegetation and Wetlands

The proposed action is intended to enhance and restore riparian and wetland habitat within the Rio Grande floodplain through the POI and therefore would result in a net increase in wetland habitat. Other specific management actions including removal of nonnative and invasive species, as well as seeding and irrigating native vegetation would promote a diversity of floodplain vegetation that would support and contribute to a functioning bosque ecosystem. There would be short term effects to vegetation as nonnative species are removed and native vegetation is planted or regenerates.

The proposed action would not place any structures or fill within the floodplain that would impede or redirect flood flows. Proposed soil excavation within the floodplain would not result in discharge of fill or dredged material into waters of the United States, including wetlands. No structures would be constructed within the floodplain, and minor soil disturbance would occur within the floodplain during project implementation. Therefore, a Clean Water Act Section 404 permit is not required per coordination with the U.S. Army Corps of Engineers.

Threatened and Endangered Species (Critical Habitat)

In accordance with Section 7(a) (2) of the Endangered Species Act of 1973, as amended, federally funded, constructed, permitted, or licensed projects must take into consideration impacts to federally listed and proposed threatened or endangered species. Implementing the proposed action could potentially affect the Rio Grande silvery minnow, the Southwestern Willow Flycatcher, the Yellow-billed Cuckoo, or the New Mexico meadow jumping mouse. There is no designated critical habitat for any of those species on the Pueblo of Isleta.

A determination was made that construction of the proposed project may affect but is not likely to adversely affect the minnow because of temporary disturbances to water quality that may result from on-shore construction activities. However, excavation activities would occur during winter low flow conditions to minimize the likelihood of disturbance. All equipment would remain on the bank and would never enter the water. Additional BMPs described in Chapter 4 would mitigate impacts.

Implementing the proposed action may affect but is not likely to adversely affect either the flycatcher or the cuckoo. Implementing the proposed action would enhance river-floodplain connectivity which would increase the amounts of potentially suitable habitat for the flycatcher by converting narrow riparian strips to larger patches. This is anticipated to have long-term beneficial effects for the flycatcher. The locations where territories previously existed are in areas where no

work is proposed or only the removal of nonnative vegetation would take place. In areas where saltcedar removal is proposed to occur, adjacent native habitat exists and would fill in either naturally or through replanting efforts. Borderline potential suitable cuckoo habitat is present in the project area and consists of mature cottonwood forest with well-developed understory of at least 50 acres in size and at least 325 feet in width. As with the flycatcher, there is the potential for cuckoo use in areas as stopover habitat that may not quite meet potential habitat requirements. Cuckoos are not presently known to inhabit the Project Area. Timing restrictions on construction activities would limit vegetation management to outside the nesting period for either species. Additional BMPs listed in Chapter 4 would mitigate impacts.

A determination of may affect, not likely to adversely affect was made for the New Mexico meadow jumping mouse. The mouse is not known to currently inhabit the Pueblo. The proposed action would implement activities in the Restoration Plan that would protect and enhance wildlife habitat quality and diversity and improve river-floodplain activities. These actions would result in the development of potentially suitable wetland habitat for the mouse, including marshes, wet meadows, and areas adjacent to willow wetlands. The proposed excavation of backwater channels and lowered banklines would contribute to the hydrologic conditions necessary for maintaining these habitats. This is all expected to have long-term beneficial impacts to the mouse. BMPs listed in Chapter 4 would mitigate impacts.

Cultural Resources

Management actions included in the proposed action would be implemented in such a way as to protect cultural resources on the Pueblo of Isleta. Pursuant to 36 CFR 800.13, should previously unknown artifacts or archaeological resources be encountered during construction, work would cease in the immediate vicinity of the resource. A determination of significance would be made, and a mitigation plan would be formulated in consultation with the THPO and American Indian Tribes that have cultural concerns in the area. Stipulations regarding avoidance of known historic properties eligible for nomination to, or listed on, the National Register of Historic Places will be included in construction contract plans and specifications.

Indian Trust Assets

Because the proposed action would occur on the Pueblo of Isleta, which is an Indian Trust Asset, any management action has the potential to impact these assets. Implementing the proposed action would enhance, rehabilitate, and to the extent possible improve floodplain and riverine habitat along the Rio Grande and in a manner consistent with the cultural and resource goals of the Pueblo. Impacts associated with implementing the proposed action would be beneficial.

Environmental Justice

Implementation of the proposed action is not expected to have any negative impact in terms of environmental justice. The proposed action is expected to improve the bosque and riverine ecosystem within the POI which may benefit tribal members. There would be no displacement, relocation, economic or adverse action to the POI.

Aesthetics

Implementation of the proposed action would promote natural ecological processes in the bosque and would lead to a mosaic of vegetation communities more similar to those that existed historically which would protect and enhance wildlife habitat quality and diversity as well as improve river-floodplain connectivity. It would also reduce wildfire risk. All of this would benefit aesthetic resources in the proposed project area in the long term. In the short term, there may be negative impacts to these resources while management actions such as jetty jack removal, reduction of hazardous fuels, construction of wet meadow habitats as well as willow shrublands. These impacts would resolve within a few growing seasons as native bosque vegetation develops.

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Chapter 1 Purpose and Need

Introduction

This Draft Environmental Assessment (DEA) was prepared to assess the potential effects of the proposed enhancement, rehabilitation, and to the extent possible, restoration of bosque and riverine habitat along the Rio Grande through the Pueblo of Isleta (POI). The proposed work is part of a settlement agreement between the Pueblo and the U.S. Bureau of Reclamation (Reclamation), Middle Rio Grande Conservancy District (MRGCD), and the Bureau of Indian Affairs associated with historic operation and management of the Isleta Diversion Dam (IDD).

The proposed restoration of bosque and riverine habitat is just one piece of the larger overall settlement agreement; other components include removal of sediment that has been dredged from IDD irrigation canals and stockpiled, and design and construction of modifications to the dam structure that will both reduce sediment entrainment in main canals and also provide for fish passage.

Background

The IDD was constructed in the 1930s on the POI and was rehabilitated by Reclamation in the 1950s. The IDD is operated by the MRGCD to supply irrigation deliveries to its Belen and Socorro Divisions. Since the IDD began operating, excessive sedimentation has become difficult and costly to manage and impairs the irrigation and traditional needs of the POI. Impacts include diverted sediment blocking the canals within minutes during high mainstem flows; dredged-sediment piles that have accumulated on POI lands for decades; agricultural lands upstream of the IDD that have become waterlogged by water levels elevated from sedimentation in the backwater from the dam; and channel narrowing that threatens bosque and riparian habitat because of island formation and development of vegetated, bank-attached bars downstream of the dam, many of which were removed during the Isleta Island Removal Project (Service 2013a).

In 2016, the POI, Reclamation, and MRGCD signed the *Agreement of Compromise and Settlement Regarding the Isleta Diversion Dam* (referred to as IDD Settlement). There are a number of elements in the IDD Settlement including reduce the sediment entrainment that has been dredged from the IDD irrigation canals and stockpiled; design and construction of modifications to the dam structure that remove sediment buildup and allow for fish passage; and bosque and riverine restoration planning on the POI. In March 2019, the *Pueblo of Isleta Bosque and Riverine Restoration and Implementation Plan* was finalized (Restoration Plan; McKenna et al. 2019). A copy of the Restoration Plan can be formally requested from the Pueblo. The purpose of the Restoration Plan is to provide a road map for enhancing, rehabilitating, and to the extent possible, restoring floodplain and riverine habitat along the Rio Grande through the POI. Four project goals were identified in a series of meetings (described below in Scoping, Coordination, and Public Review) and restoration recommendations are based on the goals. The four goals include:

1. Protect and enhance cultural resources;
2. Reduce fire risk;
3. Protect and enhance wildlife habitat quality and diversity; and
4. Improve river-floodplain connectivity.

The proposed action analyzed in this document also supports implementation of the 2016 *Final Biological and Conference Opinion for Bureau of Reclamation, Bureau of Indian Affairs, and Non-Federal Water Management and Maintenance Activities on the Middle Rio Grande, New Mexico* (2016 BiOp) (U.S. Fish and Wildlife Service [Service] 2016). While proposed bosque and riverine floodplain restoration on the POI is not specifically identified in the conservation measures listed in the 2016 BiOp, the restoration concepts presented here and in the Restoration Plan align well with measures in the BiOp.

Need for Proposal

The need for the proposed action is to ameliorate, to the extent possible, the ecological damage caused by the operation of Isleta Diversion Dam to the Rio Grande and its associated floodplain bosque on the POI.

Decision to be Made

This DEA has been prepared to evaluate the effects of the proposed action and no action alternatives, and to provide a basis for decision by Reclamation on whether to implement the proposed action. Under the proposed action, management actions would be implemented that would enhance, rehabilitate, and to the extent possible, restore riverine and floodplain habitat along the Rio Grande through the POI.

Agency Roles and Implementation

Reclamation is the lead federal agency and action agency for National Environmental Policy Act (NEPA) analysis and documentation as well as Endangered Species Act (ESA) consultation activities with the Service.

The POI is an active partner to support all fish, wildlife, and plant species through implementation of the Restoration Plan. Implementation of the Proposed Action is expected to be carried out over the long term (10 years) and be funded by a variety of sources including other agencies and grants. The POI will pursue funding in addition to the IDD Settlement and direct proposed management activities on POI land. The POI will ensure that implementation adheres to the descriptions of the Proposed Action and environmental commitments described in this document, reasonable and prudent measures and best management practices in the 2016 BiOp, as well as any additional requirements identified by other funding sources. The POI will also ensure that implementation meets any tribal requirements that apply.

Relationship to Other Projects

The proposed bosque and riverine restoration project is only part of the larger IDD Settlement; design and construction of modifications to the dam structure that remove sediment buildup and allow for fish passage are also planned. If any of the proposed management measures analyzed here are selected for implementation, and if they have the potential to be affected by changes in sediment loading from any modifications to IDD, then final design will be adjusted accordingly.

The POI has completed numerous bosque restoration projects in coordination with many agencies over the last 15 years. In addition, there have been nearby restoration projects led by other entities as well as river operation decisions that all have the potential to impact and interact with the proposed bosque and riverine restoration project.

- Environmental Assessment for the Bosque Wildfire Project, Bernalillo and Sandoval Counties, New Mexico (U.S. Army Corps of Engineers [Corps] 2004)
- Supplement II to the Environmental Assessment for the Bosque Wildfire Project, Bernalillo and Sandoval Counties, New Mexico (Corps 2006)
- Isleta Interim Forest Management Plan Finding of No Significant Impact (FONSI) (Bureau of Indian Affairs [BIA] 2014)
- Isleta Island Removal and Bank Stabilization Project Biological Opinion (SPA-2004-00406) (U.S. Fish and Wildlife Service [Service] 2013a)
- Isleta Island Removal Project Monitoring and Adaptive Management Plan (Tetra Tech 2017)
- Operation, Maintenance & Betterment of Middle Rio Grande Conservancy District (MRGCD) Irrigation Facilities—Six Middle Rio Grande Pueblos (BIA 2018)

The proposed project is planned to be implemented with Reclamation funding as well as other funding sources that the Pueblo will obtain in order to complete plan components within a 10+ year time frame. The Pueblo will perform all ongoing maintenance as described in the Restoration Plan.

Scoping, Coordination, and Public Review

Recommendations in the Restoration Plan, parts of which are presented here as the proposed action, were developed based on Isleta tribal goals conveyed during a series of meetings with traditional leaders; tribal elders; the Tribal Council; the Isleta Governor's office; directors from the Isleta Natural Resources, Water Resources, and Public Services departments; and Isleta community members. A total of seven meetings were held between December 2017 and April 2018 with various sectors of the Isleta community, including tribal elders; the Cultural Committee; traditional religious leaders; Tribal Administration; the Tribal Council; the community at-large; and the Isleta Department of Natural Resources, Department of Water Resources, and Department of Public Services. Meeting attendees were asked questions that focused on tribal member perspectives on the need for bosque and riverine restoration, specific areas of concern, and what should be prioritized and what should be avoided. Results of the survey were used to develop the Restoration Plan, which is the basis for the proposed action in this analysis (McKenna et al. 2019).

This DEA will be distributed for public review and comment.

Chapter 2 Proposed Action

Location and Environmental Setting of Proposed Action

The Pueblo of Isleta (POI) is located 15 miles south of Albuquerque, NM and covers 470 square miles between the Manzano Mountains (to the east) and the Rio Puerco (to the west). Approximately 8.7 miles of the Rio Grande runs through the POI, bisecting the land and providing bosque and riparian habitat that is essential to the cultural and traditional needs of the POI (Figure 1).

Proposed Action Alternative

The Pueblo, with support from Reclamation, proposes to implement actions within the Rio Grande and its floodplain on the POI in order to enhance, rehabilitate, and to the extent possible, restore habitat. These actions are in support of the four goals identified during scoping with tribal officials and members.

Protect cultural resources – The proposed action would address this goal by implementing several management actions. These include creating or increasing visual screens; providing water to ensure adequate river flows; strategically destabilizing vegetated channels bars and islands as needed; avoiding the use of mechanical forestry equipment in bosque areas that contain certain native plant species; and implementing revegetation using native plant species.

Reduce wildfire risk – In order to accomplish this goal, proposed restoration activities include reducing cover of fire-prone nonnative plant species, integrating defensible spaces in strategic locations, and removing jetty jacks to improve access in strategic locations for fire management personnel. Specific measures will be dependent on the current arrangement, density, and cover of nonnative species, potential fire ignition points, and the location and arrangement of jetty jack lines. Nonnative vegetation removal could include any combination of chainsaw treatment, herbicide application, and mastication. Mastication would be managed to avoid deep wood chip accumulations and care would be taken to minimize ground disturbance to the extent possible.

Protect and enhance wildlife habitat quality and diversity – The proposed action would achieve this goal by controlling invasive noxious weeds, increasing cover of native riparian shrub and tree species, expanding native floodplain grassland and savannah habitat, enhancing degraded marsh habitats, enhancing existing wet meadow habitats, and creating new willow wetlands and shrublands. During development of the Restoration Plan, a conceptual habitat mosaic was developed using existing vegetation, proximity to the active channel, soil conditions, HEC-RAS model outputs and terrain data (from LiDAR). Many of the habitats within the floodplain are already functioning at or near their assigned habitat potential, and therefore the proposed action would only implement management actions in those that are not. Specific management activities would be site specific but may include controlling nonnative invasive vegetation or planting or seeding native trees, shrubs, forbs, and grasses.

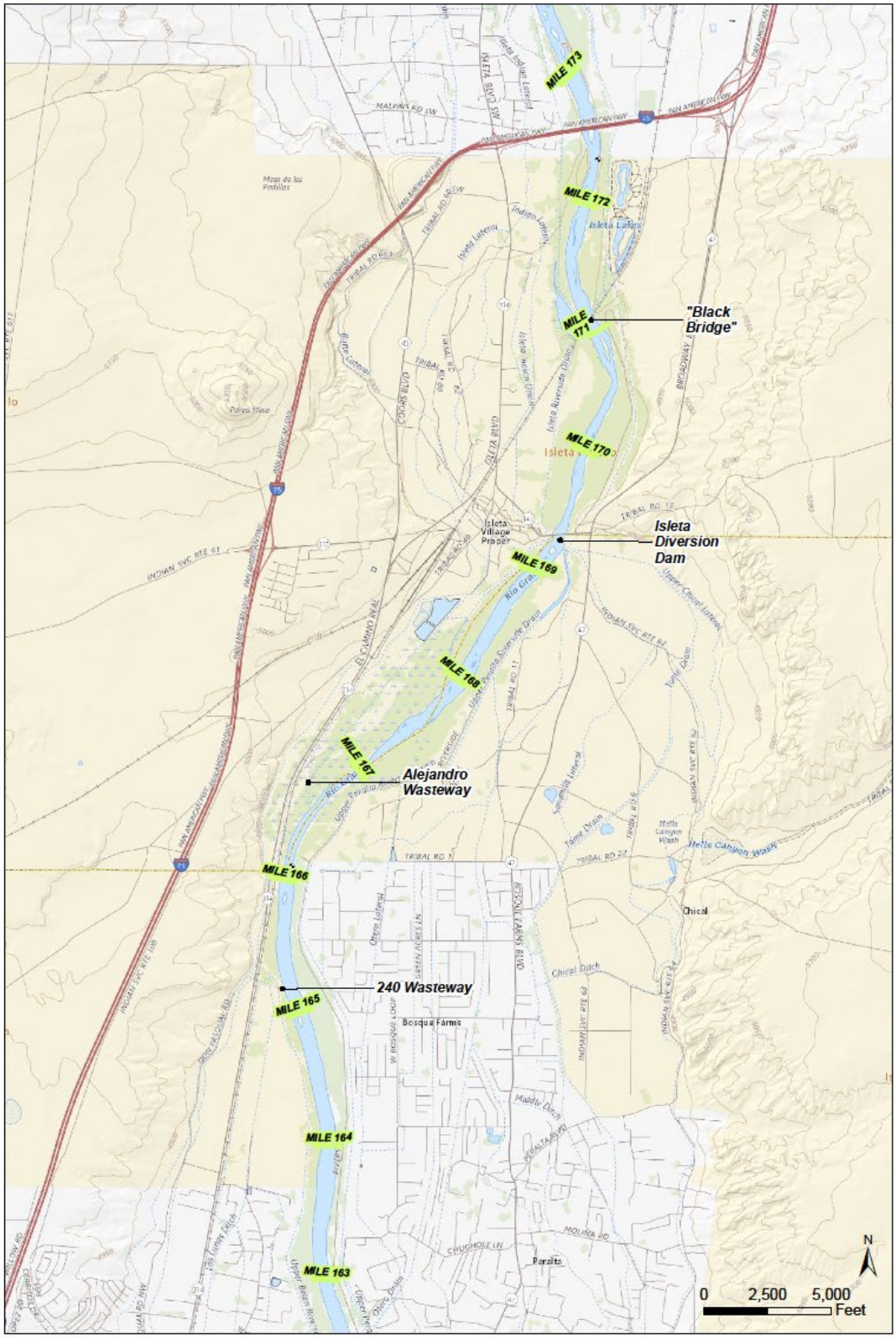

Figure 1. Pueblo of Isleta general location map.

Improve river-floodplain connectivity – To do this, the proposed action would implement restoration activities that lower banklines and excavate backwater channels; promote overbank flood return drainage to the river; and remove jetty jacks along channel banklines and berms. The Restoration Plan has identified areas of the bosque where the proposed management actions might be best suited, but the final design would rely on site-specific conditions. In addition, final design of river-floodplain connectivity measures would depend on sediment volume that passes the IDD both currently and in the future with proposed modifications to the dam.

More specific detail of the proposed actions are described below and shown in Figure 3 through Figure 7 and Table 1:

Exotic vegetation treatment - To meet the goal of reducing wildfire risk, removal of nonnative trees and weeds will be completed to reduce hazardous fuels. All treatments will be performed in accordance with Migratory Bird Treaty Act (MBTA) timing requirements. Field observations of past Isleta bosque wildfires indicate that ignition points are typically concentrated along roadsides, railroad tracks, and reservation boundaries. Isleta and BIA firefighting crews will increase their chances of quickly controlling fires by establishing designated areas managed as "defensible space," where forest management emphasizes low forest fuel loads/understory forest cover. Also, several locations in the Isleta bosque lack sufficient open space for staging equipment and access for wildland firefighters during an active wildfire incident. Strategic locations have been identified by Isleta's Department of Natural Resources where defensible spaces and staging areas should be established.

Methods will include mechanical mastication treatment, handsaws and chainsaws, and herbicide application (to include cut stump treatment and basal bark treatment, girdling, and hack and squirt followed by foliar treatment) and are noted as Forestry Treatment, Follow-up Herbicide or both on the associated figures.

Treatment of Weeds - In addition to nonnative tree species, nonnative annual weeds—most notably kochia (*Bassia scoparia*) — contribute substantially to wildfire risk in portions of the Isleta floodplain (McKenna et al. 2019, Map A12 and A13). Furthermore, kochia and Russian thistle (*Salsola tragus*) control will ideally focus on manually uprooting or spraying new seedlings in spring/early summer while the plants are of manageable size and well before they set seed. Monitoring of resprouts and re-treatment of weeds will be required after the initial treatments of weeds.

Methods will include hand tools and excavation, mowing, removal with heavy equipment, and herbicide treatment where appropriate.

Revegetation - Floodplain mapping results indicated relatively low diversity, density, and distribution of native riparian tree and shrub species across the Isleta floodplain. This may be attributed to competition from invasive trees along the floodplain, which is particularly evident by the sparse density of riparian shrubs found in some areas where Isleta forestry crews have previously implemented fuels treatments. Therefore, revegetation with native tree and shrub species would help to restore the native plant community composition and structure. All revegetation efforts would require subsequent irrigation until the tree and shrub plantings become established.

The proposed action calls for planting riparian trees (Rio Grande cottonwood [*Populus deltoides* ssp. *Wislizeni*] and Goodding's willow [*Salix gooddingii*]), riparian shrubs (including False indigobush

[*Amorpha fruticose*], Golden currant [*Ribes aureum*], New Mexico olive [*Foresteriera pubescens*], Seep willow/willow baccharis [*Baccaris* spp.], Silver buffaloberry [*Shepherdia argentea*], Threeleaf sumac [*Rhus trilobata*], Wolfberry [*Lycium torreyi*], and Woods rose [*Rosa woodsia*]), and native grasses and forbs (including Alkali Sacaton [*Sporobolus airoides*], Annual Sunflower [*Helianthus annuus*], Blue Gramma [*Bouteloua gracilis*], Bottlebrush Squirreltail [*Elymus elymoides*], Galleta [*Pleuraphis jamesii*], Giant Dropseed [*Sporobolus giganteus*], Gooseberry Leaf Globemallow [*Sphaeralcea grossulariifolia*], Green Sprangletop [*Leptochloa dubia*], Hairy Goldenaster [*Heterotheca vilosa*], Hoary Tansyaster [*Machaeranthera canescens*], Indian Ricegrass [*Achnatherum hymenoides*], Indian Tea [*Thelesperma megapotamicum*], Mesa Dropseed [*Sporobolus flexuosus*], Pale Evening Primrose [*Oenothera pallida*], Prairie Coneflower [*Ratibida tagetes*], Rocky Mountain Bee Plant [*Cleome serrulate*], Sand Dropseed [*Sporobolus cryptandrus*], Scarlet Globemallow [*Sphaeralcea coccinea*], Side Oats Gramma [*Bouteloua curtipendula*], Spike Sacaton [*Sporobolus contractus*], Western Wheatgrass [*Pascopyrum smithii*], Whitestem Blazing Star [*Mentzelia albicaulis*], Wild Four O'clock [*Mirabilis multiflora*], and Wild Tarragon [*Artemisia dracunculus*]). The Restoration Plan identifies appropriate locations for all proposed vegetation plantings (McKenna et al. 2019, Maps A42 through A49).

Floodplain Connection Actions - Habitat enhancement features are designed to create or enhance marshes, wet meadows, willow wetland/shrublands by connecting to groundwater or surface water through excavation actions within the floodplain or bankline lowering (McKenna et al. 2019). These include:

- Enhancing degraded marsh habitats;
- Enhancing existing wet meadow habitats;
- Creating new willow wetlands and shrublands;
- Lowering banklines and excavating backwater channels;
- Implementing projects that promote overbank flood return drainage to the river; and
- Removal of jetty jacks.

Table 1. Proposed Action treatment types and associated acreages over 10-year plan implementation.

Treatment type	Acres
Excavation Actions	
Backwater	1.7
Bankline terrace	58.4
Willow swale	27.7
Exotic Vegetation Treatment Actions	
Follow-up herbicide	906.9
Forestry treatment and follow-up herbicide	817.2

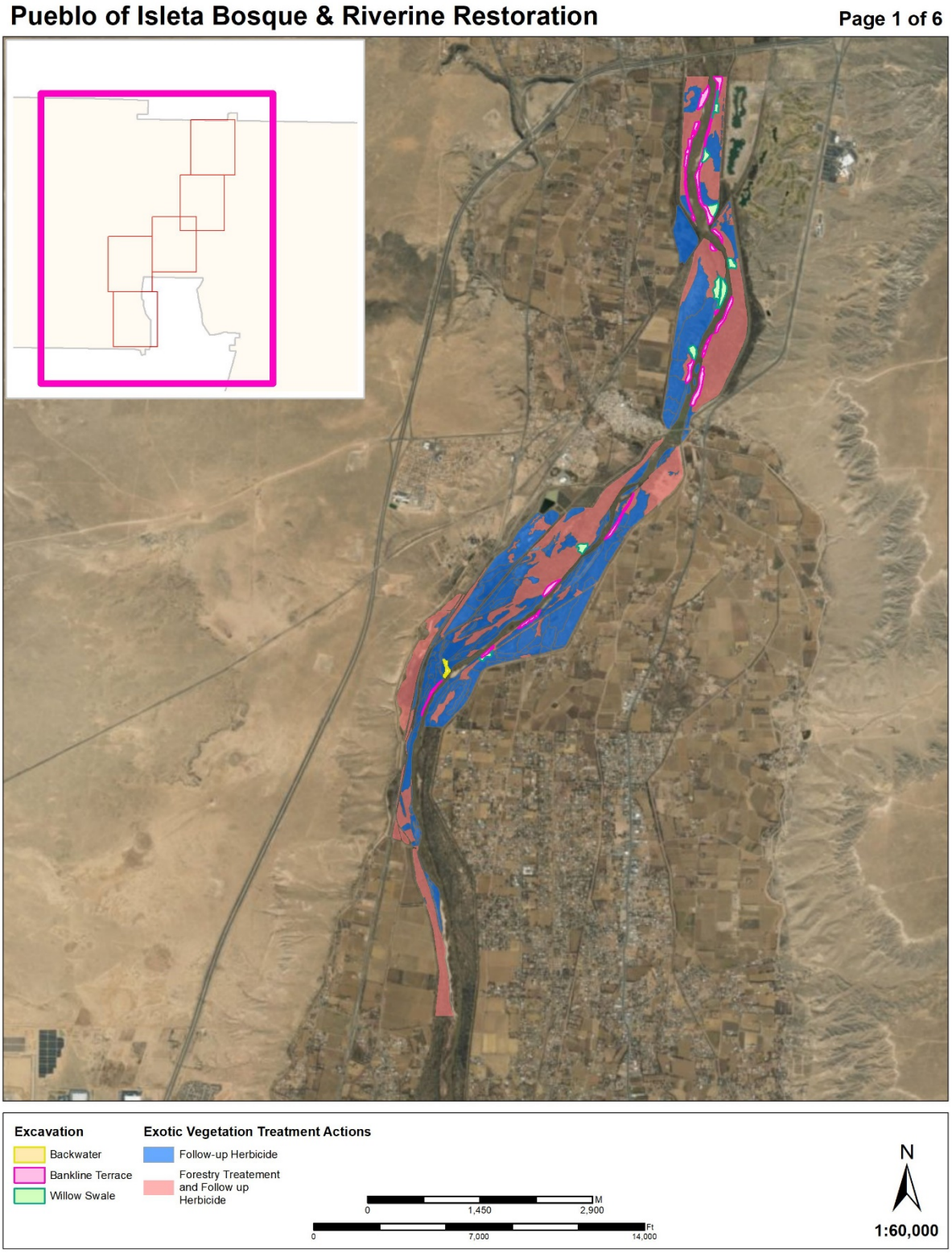

Figure 2. Overview map of Proposed Action showing locations and treatment types on the Pueblo of Isleta.

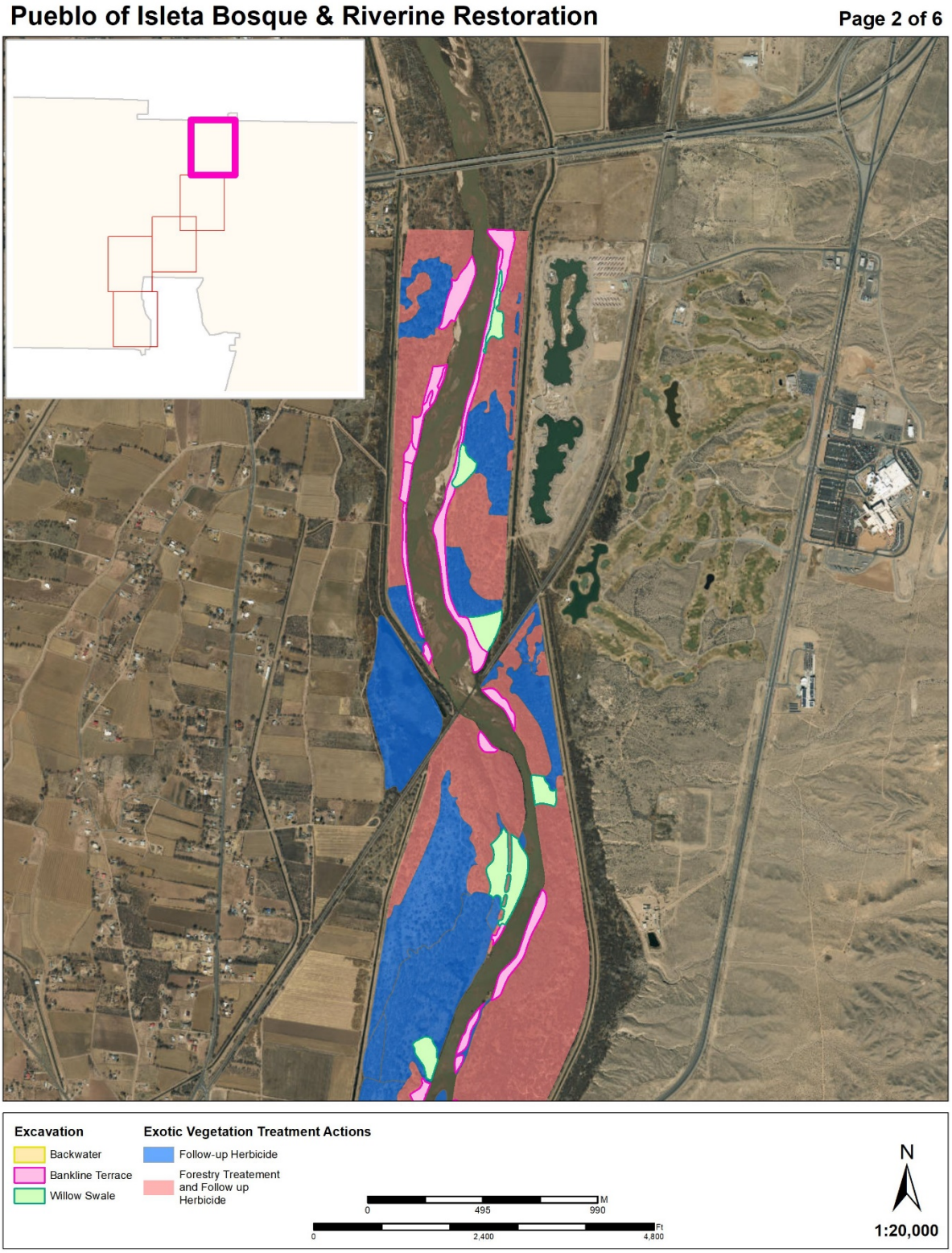

Figure 3. Proposed Action map 1 showing locations and treatment types on the Pueblo of Isleta

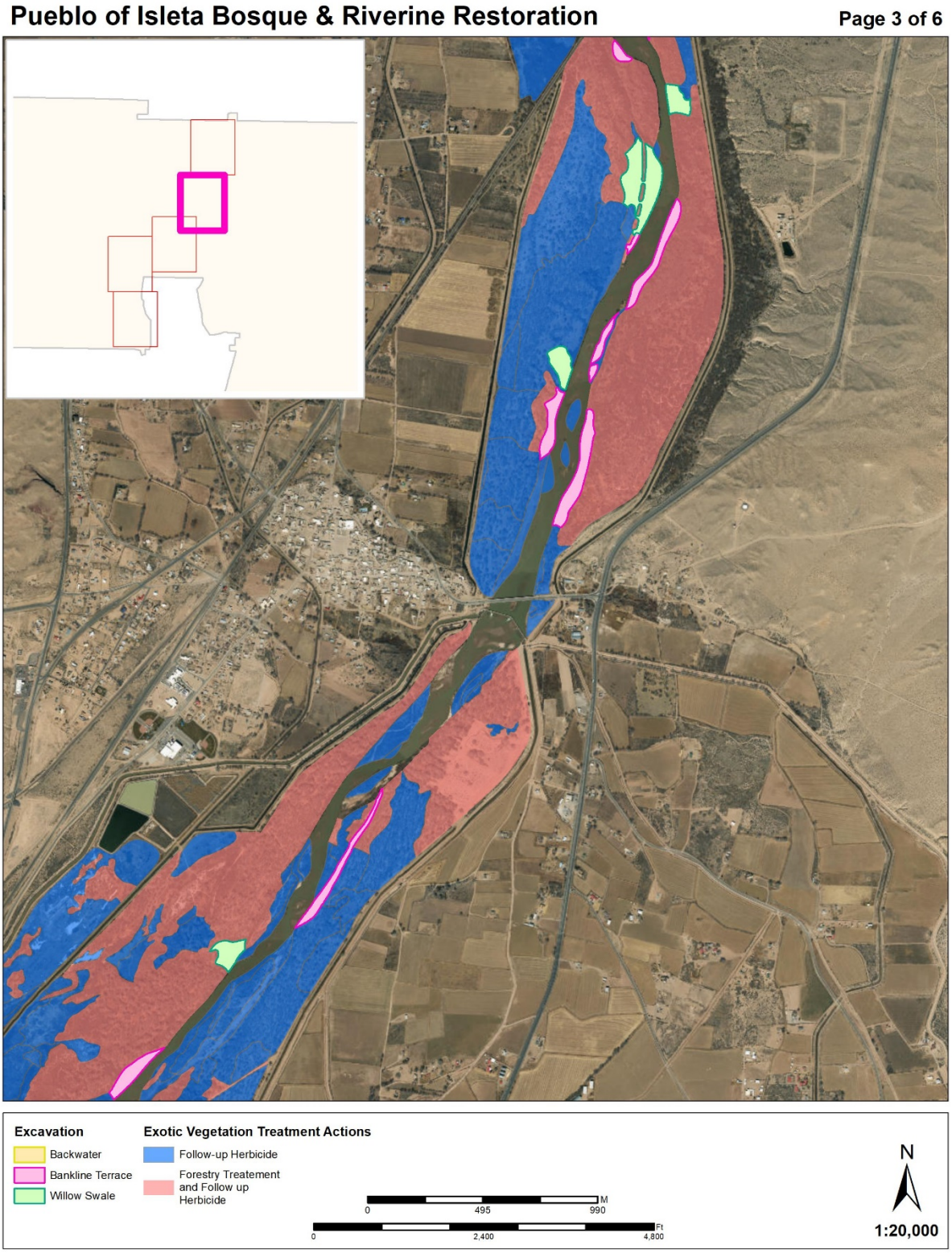

Figure 4. Proposed Action map 2 showing locations and treatment types on the Pueblo of Isleta

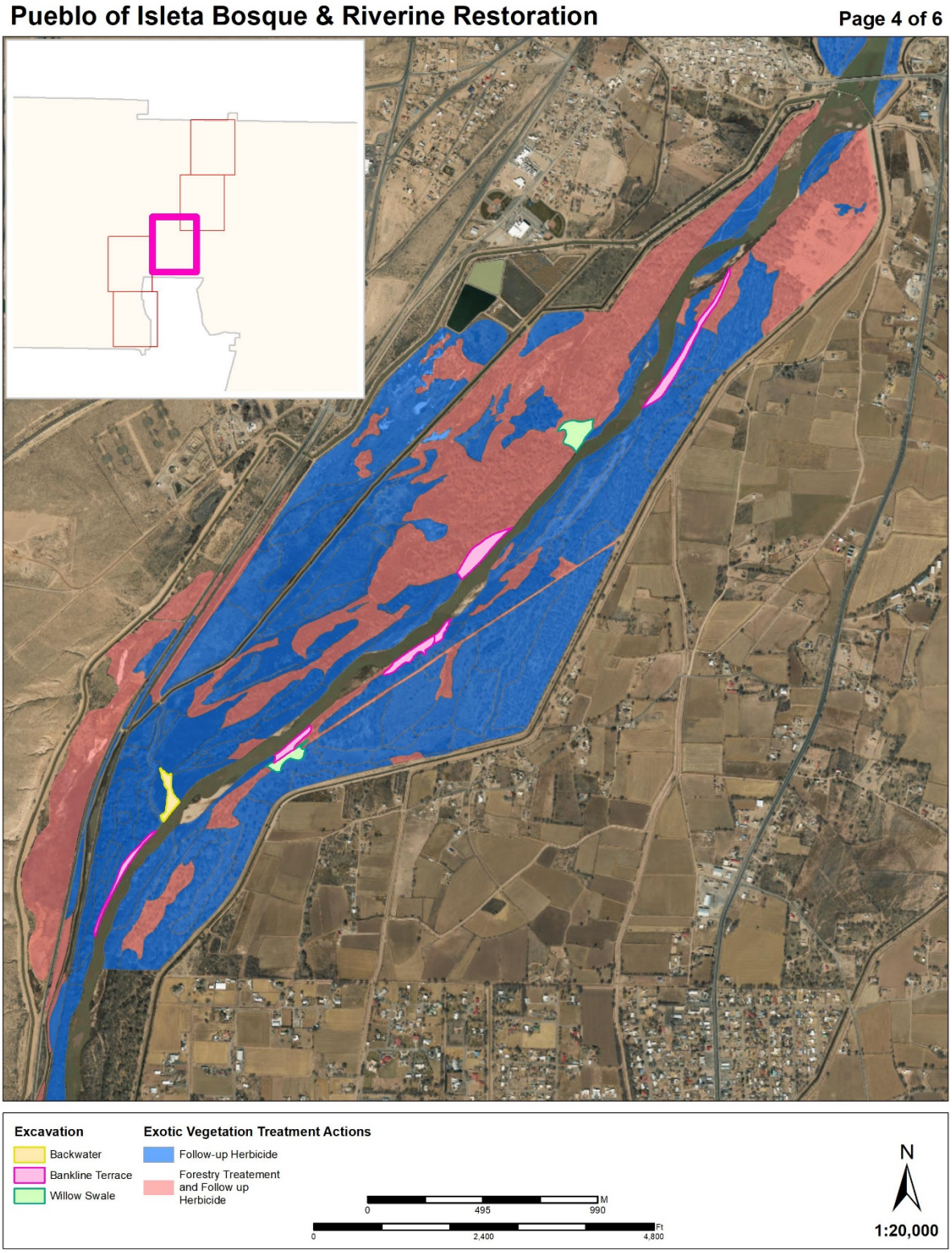

Figure 5. Proposed Action map 3 showing locations and treatment types on the Pueblo of Isleta

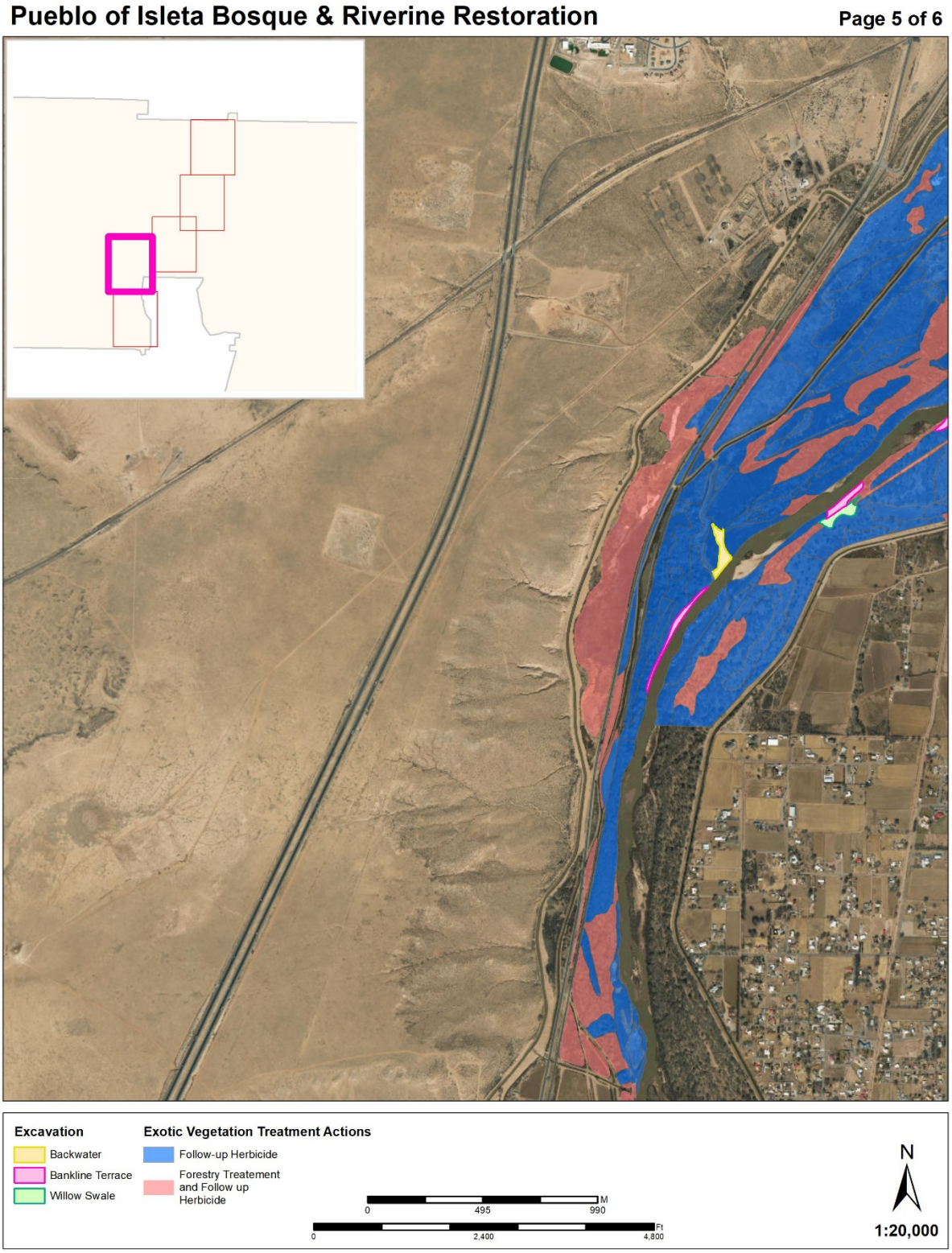

Figure 6. Proposed Action map 4 showing locations and treatment types on the Pueblo of Isleta

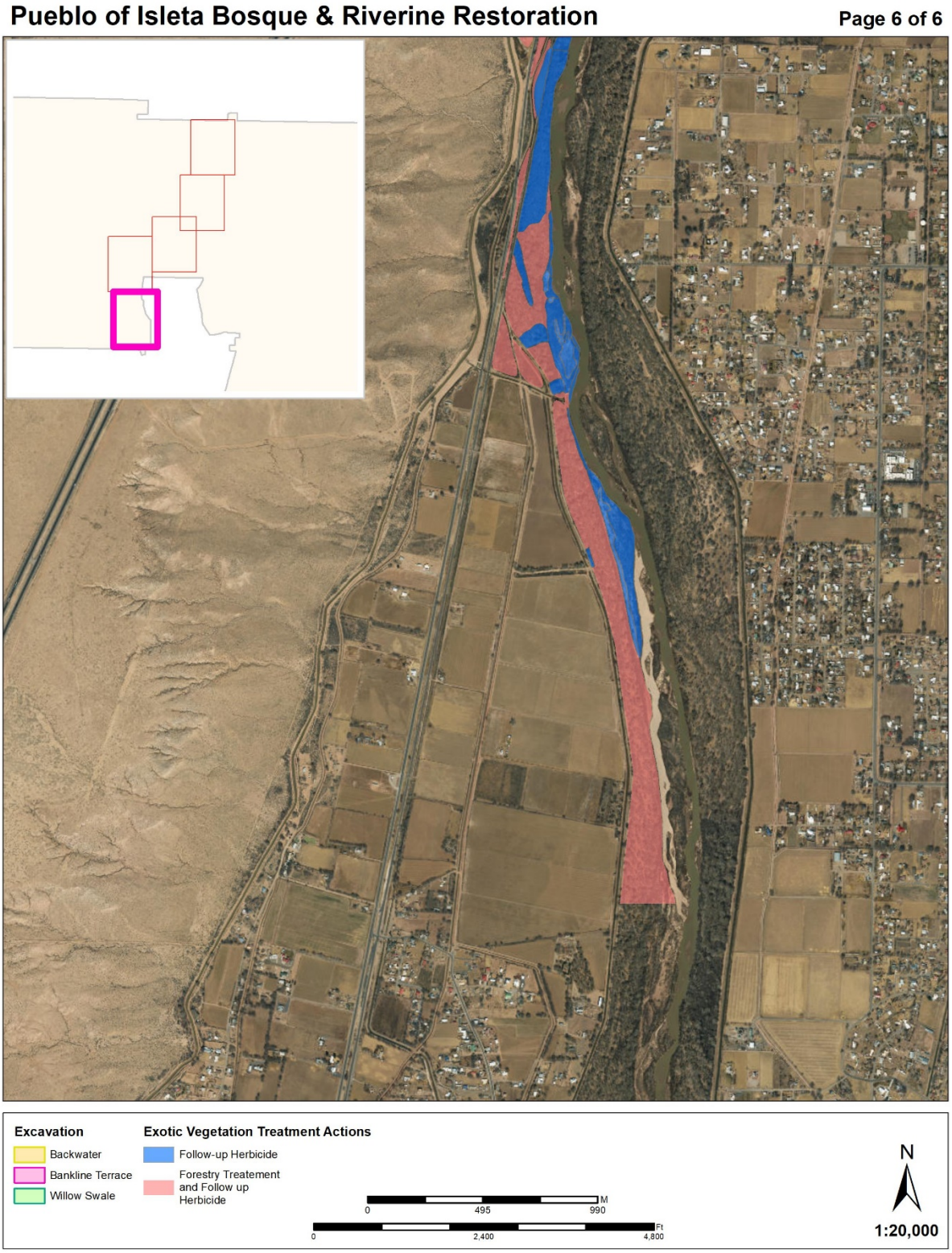

Figure 7. Proposed Action map 5 showing locations and treatment types on the Pueblo of Isleta

Chapter 4 lists the environmental commitments that would apply to the proposed action. These have been developed in accordance with the U.S. Fish and Wildlife Service and are designed to protect not only threatened and endangered species that may be present in the area, but all fish and wildlife resources.

No Action Alternative

Under the no action alternative, none of the proposed management activities to enhance, rehabilitate, and, to the extent possible, restore habitat would be implemented. Other elements of the IDD Settlement, including the design and construction of modifications to the dam structure that remove sediment entrainment in main canals and allow for fish passage may still be proposed and analyzed in a separate document and implemented. However, none of the restoration work described here would occur.

Chapter 3 Affected Environment and Environmental Consequences

In order to streamline this EA, only resources with the potential to experience more than negligible adverse effects were retained for analysis. CEQ and Department of Interior regulations (40 CFR 1500.4(n) and 43 CFR 46.120(d)) indicate that Federal agencies should reduce duplication by adopting appropriate environmental documents prepared by other agencies. In many instances, resource analysis in other final NEPA documentation was reviewed and the Responsible Official determined them to be applicable to this proposed action. Where appropriate, that analysis has been incorporated by reference here.

Environmental Resources Considered but Excluded from Analysis

The rationale for excluding resources from further analysis is as follows:

Geology. The proposed project will not have any effect on the geology of the project area. There may be effects to geomorphology and those are addressed below.

Land Use. Current land use in the bosque on the POI is limited and it includes recreation, wood-cutting, cultural activities, or other unspecified activities. The proposed project would not have any effect on these uses.

Recreational Resources. While developed recreation in the floodplain on the POI is strictly prohibited and limited to tribal members, surveyed tribal members cited recreation and woodcutting as the primary reason for spending time in the bosque (McKenna et al. 2019). The proposed project will not have any effect on the recreational use of the area.

Hydrology, Hydraulics, and Geomorphology

Descriptions of the current hydrology including surface water, ground water, river drying, depletions, and infrastructure can be found in the 2016 BiOp (Service 2016a). In summary, peak flows on the Middle Rio Grande occur in the spring from snow melt runoff, which is dependent on snowpack available. There are five water storage reservoirs: Heron, El Vado, Abiquiu, Cochiti, and Elephant Butte. Of the five, four occur upstream of the POI. Operation of these reservoirs affect the timing of water availability in the Middle Rio Grande. In addition to reservoirs, three diversion dams divert irrigation water from the main channel of the Middle Rio Grande, including the Isleta Diversion Dam located in the proposed project area.

Detailed analysis of the hydrology, hydraulics, and geomorphology of the Middle Rio Grande from river mile (RM) 185.0 (the Interstate 40 bridge crossing) to RM 169.3 (the New Mexico highway 309 crossing) which encompasses the proposed project area is presented in the Preliminary Engineering Analysis Report (PEAR) as part of the IDD Settlement (Tetra Tech 2019). There are two tributary confluences in this reach: treated effluent from the Albuquerque Bernalillo County Water Utility Authority's Southside Reclamation Facility (at RM 177.7) and the South Diversion Channel (at RM

177.1). The former does not deliver appreciable quantities of sediment while the latter episodically delivers some smaller sand-sized material to the Rio Grande.

The PEAR (Tetra Tech, Inc 2019) describes the geomorphology in detail, but in summary the Rio Grande channel has narrowed both upstream and downstream of IDD, bed material gradations have fluctuated slightly without appreciable progressive change, thalweg elevations have remained stable, and mean bed elevations have increased. Channel narrowing was driven by expansion of bank-attached bars and islands. As these features grew, vegetation encroached into the channel and anchored the bars. Since the early 2000s, the USGS gage at Central Avenue records decreased annual flow volumes but increased suspended sediment loads. This geomorphic response was manifested as substantial channel narrowing as the additional bed material was stored along the channel banks. Because of the noted sparse gravel throughout the POI reach, if flows increase without commensurate increases in bed material supply, future incision is likely because the peak flow reduction provided by Cochiti, Galisteo, and Jemez Canyon Dams limits shear stresses to values too low to remove vegetated bars and islands (MEI 2006).

During development of the Restoration Plan, the mapping team used 2012 LiDAR grid to characterize floodplain topography (McKenna et al. 2019). A description of the processing techniques employed is in McKenna et al. (2019). Inundation maps were generated using the Corps Hydrologic Engineering Center River Analysis System (HEC-RAS). The starting geometry input to the HEC-RAS models was developed from (1) the 2012 Reclamation aggradation/degradation data, which includes cross sections spaced approximately 500 feet from the IDD to the south boundary of the Pueblo or (2) 2012 surveys for Reclamation, spaced approximately 500 feet from the IDD to the north boundary of the Pueblo (McKenna et al. 2019). The inundation mapping was used to develop restoration activities included in the proposed action.

No Action

Under the no action alternative, no bosque or riverine restoration activities would take place. Hydrology, hydraulics and local geomorphology in the Middle Rio Grande would continue to be influenced by the factors as described above.

Proposed Action

The proposed action will have no effect on the hydrology or the hydraulics of the Middle Rio Grande. Implementation of bosque and riverine restoration activities will have no impact on snowpack or runoff, upstream water storage or diversions, or summer monsoonal flows. There might be some localized effects to geomorphology (specifically, lowering banklines and creating overbank habitat; listed under floodplain connection actions above). However, specific design elements will be informed by ongoing sediment analysis, proposed changes to the Isleta Diversion Dam, and proposed fish passage at the IDD.

Water Quality

A detailed description of the existing status of water quality in the Middle Rio Grande, including the proposed project area, can be found in the Sandia Pueblo to Isleta Pueblo New Mexico Ecosystem Feasibility Study and Environmental Assessment (Corps 2019). The Rio Grande through the POI is

exempt from state of New Mexico water quality standards; however, the Pueblo has its own water quality standards (POI 2002). Designated uses for the Rio Grande through the POI include warmwater fishery use, primary contact ceremonial use, primary contact recreational use, agricultural water supply use, industrial water supply use, and wildlife usage (POI 2002). The importance of clean river water for ceremonial uses cannot be understated.

Many agencies and entities collect water quality data throughout the Middle Rio Grande, including in the proposed project area. The U.S. Fish and Wildlife Service (Service) has identified the following factors as known to cause poor fish habitat: temperature changes, sedimentation, runoff, erosion, organic loading, reduced oxygen content, pesticides, toxic and hazardous substances (Service 2013a).

The Clean Water Act (CWA) regulates discharges of pollutants into waters of the United States. Different types of pollution are regulated by different sections of the CWA and require specific permitting and compliance.

No Action

Under the no action alternative, no bosque or riverine restoration activities would take place. Water quality would continue to be affected as described in Corps (2019). No restoration activities would be implemented, no CWA permitting would be required, and there would be no short- or long-term effects to water quality in the proposed project area.

Proposed Action

Implementation of the proposed action has the potential to lead to short-term impacts to water quality (i.e. increased turbidity). Prior to any construction occurring, the Pueblo will obtain all required permits in compliance with the CWA, including the National Pollutant Discharge Elimination System Construction General Permit and a Storm Water Pollution Prevention Plan. In addition, the best management practices described in the Environmental Commitments section would minimize these impacts to water quality by preventing runoff or disturbed soil from entering the Rio Grande, to the extent possible.

Air Quality and Noise

The proposed project area is within the Albuquerque-Mid Rio Grande Intrastate Air Quality Control Region 152 (USEPA 2019a). Tribes have the authority to manage air quality on their reservations under the Clean Air Act and the Tribal Authority Rule. In general, air quality on the POI is good; summarized air quality index data from Bernalillo County in 2018 show that air quality was good 160 days, moderate for 186 days, unhealthy for sensitive groups 18 days, and unhealthy 1 day (USEPA 2019b). Air Quality Index pollutants for this station included ozone and particulate material (USEPA 2019b). Bernalillo County contains New Mexico's largest city, Albuquerque, and the POI is located due south of Albuquerque.

Sound levels in the proposed project area are low, which is typical in rural, agrarian areas. Major sources of intermittent noise in the area are attributed to automobile traffic, aircraft from the Albuquerque Sunport and Kirtland Air Force Base, farm operations, railroad operations, and MRGCD's maintenance operations.

No Action

Under the no action alternative, no bosque or riverine restoration activities would take place. There would be no impacts to air quality or noise beyond those described above.

Proposed Action

If the proposed action is implemented, there may be slight and temporary impacts to air quality and noise in the proposed project area. The dust abatement Best Management Practice (BMP) described in the Environmental Commitments section will help to minimize particulate matter caused by soil disturbance and equipment operation. Equipment operation might also lead to increased noise levels in the project area, but these would cease when construction is complete.

Ecological Resources

Native Bosque Vegetation

The structure and composition of riparian vegetation is determined by several factors and is very closely associated with hydraulic and hydrologic regimes of the associated river. The narrowing and incision of the Rio Grande have effectively separated the riparian vegetation community from the river and the regulation of flows from upstream dams and diversions have reduced inundation. The result has been a loss of the hydrological conditions necessary for regeneration of native riparian plants and increasing abundance of nonnative species in many areas of the Middle Rio Grande. A detailed description of the ecological processes and conditions can be found in Corps 2019.

Vegetation in the proposed project area was extensively mapped during development of the Restoration Plan in 2018. Remotely-sensed satellite imagery, processed into a four-band image with 1-meter pixel size was used as the basis for field mapping activities. The POI bosque (2,012 acres total) was then divided into 384 discreet map units and ascribed a representative vegetation type using the Hink and Ohmart classification system (Hink and Ohmart 1984), which characterizes vegetation communities based on overstory and understory species dominance and vertical distribution of foliage. Approximately 40% (807 acres) was identified as forest with relatively dense understory, 18% (323 acres) was identified as dense shrublands, and 15% (300 acres) was forest with little to no understory. Other highly desirable maps units identified included marshes (109 acres), wet meadows (92 acres), and grasslands (17 acres). Approximately 2% (44 acres) were designated open/barren areas and these were overgrown by annual weeds. Sparse shrublands, open water, and sandbars made up the rest of the mapped area. Table 2 lists the dominant tree and shrub species encountered; note that in many map units there were co-dominant species and therefore the total acreage for all species exceeds the acreage of the area mapped.

Table 2. Dominant tree and shrub species acreage summary.

Species	Native Status	Acres	Number of Map Units
Rio Grande Cottonwood	Native	1012.1	140
Russian Olive (*Elaeagnus angustifolia*)	Nonnative	786.6	152
Coyote Willow (*Salix exigua*)	Native	529.6	165
Saltcedar (*Tamarix* spp.)	Nonnative	384.9	80
Siberian Elm (*Ulmus pumila*)	Nonnative	129.5	38
Tree Willow (*Salix gooddingii* and *S. amygdaloides*)	Native	99.7	33
Mulberry (*Morus* spp.)	Nonnative	35.2	13
False Indigobush	Native	13.2	3
Tree of Heaven (*Ailanthus altissima)*	Nonnative	7.0	3
Wolfberry	Native	5.5	3
Honey Locust (*Gleditsia triacanthos*)	Nonnative	4.2	2
Box Elder (*Acer negundo*)	Native	1.4	1
Fourwing Saltbush (*Atriplex canescens*)	Native	0.4	1
Catalpa (*Catalpa speciosa*)	Nonnative	0.2	1

The floodplain mosaic in the Isleta bosque is especially unique for this region because it supports extensive herbaceous-dominated habitat types such as marshes, grasslands, and wet meadows. As documented during the 2018 mapping, marsh habitats were dominated by cattail, bulrush, and common reed; some had standing water during the fieldwork and a portion and had recently been affected by wildfire. Wet meadows were dominated by yerba mansa, saltgrass, scratch muhly, and rushes and typically occurred in areas with fine-textured soils and relatively shallow groundwater. Salt deposits were sometimes observed on the soil surface. Grasslands included herbaceous plant communities dominated by saltgrass, scratch muhly, vine mesquite, and alkali sacaton with a variety of soil types from sand- to clay-dominated areas. Detailed maps in Appendix A of the Restoration Plan (McKenna et al. 2019) show the spatial distribution and delineation of the 384 vegetation map units.

Invasive Species and Noxious Weeds

The hydrological and geomorphic conditions discussed previously have allowed for the proliferation of nonnative vegetation in the bosque. Saltcedar, Russian olive, and other nonnative tree species are abundant in many areas because of their ability to colonize and thrive in water-stressed, high-salinity, or frequently disturbed areas (Corps 2019). These species can outcompete native species and are more likely to be fire-adapted, withstanding ignitions that native riparian vegetation cannot.

The survey team identified numerous herbaceous noxious weed species in the Isleta bosque. State-listed species observed include Ravenna grass (*Saccharum ravennae*), perennial pepperweed (*Lepidium latifolium*), bull thistle (*Cirsium vulgare*), yellow toadflax (*Linaria vulgaris*), Russian knapweed (*Rhaponticum repens*), Canada thistle (*Cirsium arvense*), and giant cane (*Arundo donax*). While cheatgrass (*Bromus tectorum*) is listed as a Class C noxious weed in New Mexico, its presence was not formally documented at the map-unit level because it is widespread and common throughout the Middle Rio Grande bosque (and throughout the state). Its abundance varies significantly on an annual basis depending on rainfall, the species is not actively managed at Isleta or in nearby bosque areas, and aggressive management is not currently necessary.

Under current conditions, kochia is the principal annual weed of management concern primarily because of its flammability and the fact that it is relatively widespread. Russian thistle is also abundant in certain areas and could become more of a management concern over time. Table 3 presents the number and acreage of map units where these annual weed species were dominant and maps in Appendix A of the Restoration Plan (McKenna et al. 2019) show spatial distribution of all herbaceous noxious weeds and annual weed cover by map unit. The Restoration Plan also has detailed descriptions of noxious weed life history, threats to native vegetation, distribution in the POI bosque.

Table 3. Nonnative herbaceous weed species documented in the Isleta Floodplain.

Species	Map Unit Acreage	Number of Map Units
Perennial Pepperweed	554.5	93
Ravenna Grass	207.9	57
Bull Thistle	106.9	25
Annual Weeds (Kochia and Russian Thistle)b	105.2	17
Canada Thistle	56.9	7
Russian Knapweed	41.5	2
Giant Cane	18.0	1
Yellow Toadflax	3.9	1

Notes:

[a]The spatial extent of the map units where noxious weed species currently occur (not the total number of acres dominated by the weed species).

[b]Only map units where annual weeds comprised at least 25% cover are included in this table. Kochia cover exceeded 25% in each of these map units, and Russian thistle was also sometimes present in varying degrees of dominance.

Fire

Fire is not a natural process in most low-elevation riparian ecosystems of the southwest. However, the conversion of native bosque vegetation to drier, nonnative vegetation as well as accumulation of fuels and an increase in human-caused fire ignitions have created conditions where uncontrolled fire are a very real threat and a major disturbance agent in these ecosystems. Since 1972, BIA has documented approximately 84 fires within or near the Isleta floodplain (Parametrix 2007). The precise location and extent of each fire is difficult to ascertain from the BIA database, although the locations of two relatively recent large fires—the Lucero Fire of 2000 and the Valentine Fire of 2006—are well documented (Maps A14 and A15 in Appendix A of the Restoration Plan). The

Lucero Fire burned approximately 470 acres of dense cottonwood, Russian olive, and saltcedar forest on both the west and east sides of the river immediately upstream of the IDD. The Valentine Fire burned approximately 316 acres in February 2006, including cattail marsh and native-dominated riparian habitat on the west side of the river downstream of the IDD.

The vast majority of bosque wildfires at Isleta are fueled by dense stands of nonnative trees. To prevent further devastating bosque fires, Isleta has focused considerable effort on reducing nonnative tree cover throughout various portions of their bosque using funding received from federal and state government agencies. Extensive areas of nonnative tree cover in the Isleta bosque have been reduced by tribal forestry crews using a combination of mechanical (primarily mastication) and chainsaw treatments. The survey team documented the location of these fuel treatment areas and the degree and condition of nonnative root sprouts during the floodplain habitat mapping for this project.

Mapping documented a total of 96 individual map units (612.1 acres) impacted by past wildfires, most notably across the 2000 Lucero Burn Area, which remains severely degraded. Vegetation has naturally recovered more favorably in the other burn scars mapped in the Isleta bosque. Previous thinning treatments implemented by Isleta were detected in 80 map units (519.8 acres), although it is likely that additional fuels treatments have been implemented outside those areas. Figures 3-7 display map units for which previous fire and/or thinning continues to affect maintenance needs and/or the vegetation community, either positively or negatively.

Floodplain and Wetlands

The proposed project area is located within the Rio Grande floodplain. Wetland areas occur where the water table is at or near the surface or where land is covered by water at least part of the year. Wetlands in the Middle Rio Grande Valley included wet meadows, marshes, sloughs, ponds, and small lakes. Wetlands were formed in part by the meandering nature of the river and partly by the high-water table in the valley. In some areas, the water table existed at the ground surface, supporting water-loving plants. Because of changes in hydrology and climate, the wetlands have been greatly reduced. From 1935 to 1989, surface area covered by wet meadows, marshes, and ponds declined by 73% along the Middle Rio Grande floodplain.

The depth to ground water at most points along the Rio Grande is the result of a complex set of factors that input and extract water, including flows laterally into and out of the river, acequias, irrigation canals and the system of drains that exist in the Middle Rio Grande Valley, plus extraction from wells for domestic and agricultural use, irrigation inputs, evaporation, and transpiration from vegetation (Tetra Tech 2004; Crawford et al. 1993).

Since the depth to water table determines the type and abundance of vegetation present, several studies have been conducted on shallow water level within the Middle Rio Grande basin (Bartolino and Niswonger 1999; Bowman et al. 2002; Eichhorst et al. 2002). These studies found that in general the depth to the ground water table within the bosque ranges from several inches near the riverbank to more than 10 feet near the riverside drains as the terrain slowly rises moving away from the channel.

As described above, vegetation in the proposed project area was extensively mapped during development of the Restoration Plan. This mapping effort identified wetlands and riparian areas in the project area including marshes (109 acres), wet meadows (92 acres), and open water. Detailed maps in Appendix A of the Restoration Plan (McKenna et al. 2019) show the spatial distribution and of the wetland vegetation map units.

Jurisdictional waters of the United States, including wetlands, are protected under several rules and regulations including federal guidelines outlined by the CWA; Sections 401, 402, and 404, Executive Order (E.O.) 11988 (Floodplain Management), E.O. 11990 (Protection of Wetlands) and by the review process of the New Mexico Environment Department Surface Water Quality Bureau.

The Isleta floodplain supports extensive habitats that could be characterized as jurisdictional wetlands. Any actions conducted along the bank of the river or within the river may also require a permit and would have to be evaluated based upon potential impacts to the aquatic environment (both during and after construction).

No Action

Under the no action alternative none of the bosque or riverine restoration activities would be implemented. Vegetation communities in the project area would continue to be influenced by the hydrologic and geomorphic conditions described and there would be a continuing dwindling of native vegetation patches, including wetlands, in the bosque on the POI. Nonnative and invasive species would continue to have a competitive advantage over native riparian vegetation and the risk of uncontrolled fire would not be mitigated. No thinning activities would occur and hydrologic connections between the bosque and the Rio Grande would not be restored. Therefore, there would be no increase in wetland habitat.

Proposed Action

The overarching goals for the Restoration Plan are centered on treating vegetation communities within the bosque on the POI. Implementation of the proposed action would have little impact on the hydrologic conditions that have led to the present condition of vegetation communities; however, local changes to river geomorphology, including lowering banklines, excavating backwater channels (noted as floodplain connection actions above), and removing jetty jacks and berms would create conditions that would allow for persistence of native riparian vegetation. The proposed action is intended to enhance and restore riparian and wetland habitat where floodplain connection actions occur within the Rio Grande floodplain through the POI and therefore would result in a net increase in wetland habitat. Other specific management actions including removal of nonnative and invasive species through forestry treatments described above, as well as seeding and irrigating native vegetation would promote a diversity of floodplain vegetation that would support and contribute to a functioning bosque ecosystem.

A net increase in wetlands and increase in floodplain connectivity may improve floodplain functions and values such as providing flood storage and conveyance, filtering of nutrients and impurities from runoff, reducing flood velocities and flood peaks, moderating water temperature, reducing sedimentation, and promoting infiltration and aquifer recharge. The proposed action would not place any structures or fill within the floodplain that would impede or redirect flood flows. Proposed

soil excavation within the floodplain would not result in discharge of fill or dredged material into waters of the United States, including wetlands. No structures would be constructed within the floodplain, and minor soil disturbance would occur within the floodplain during project implementation. Any interactions with non-engineered levees will be considered and impacts will be avoided.

The Restoration Plan (McKenna et al. 2019) includes SMART management objectives which are defined as specific, measurable, attainable, relevant, and time bound. Developing these objectives included defining quantitative thresholds to be used as triggers for prescribing certain management actions or, conversely, for evaluating restoration success. All of these would guide implementation of management activities in such a way as to achieve the four goals initially identified: protection of cultural resources, reduced wildfire risk, protection and enhancement of wildlife habitat, and improved river-floodplain connectivity (McKenna et al. 2019). This will contribute to a functioning bosque and riverine ecosystem.

The proposed action has been coordinated with the Corps and because the work that would take place within Corps-regulated features will primarily involve surface removal of invasive species or clean excavation it is not anticipated that it will result in more than incidental fallback. Incidental fallback is defined as "the incidental soil movement from excavation, such as the soil that is disturbed when dirt is shoveled, or the back-spill that comes off a bucket and falls into the same place from which it was removed." activities involving only "incidental fallback" do not require a Section 404 permit. Appendix A includes all of the CWA Section 404 coordination documentation.

Wildlife

The Middle Rio Grande bosque and the river provide important habitat for a variety of fish and wildlife species. A detailed description of these resources can be found in the U.S. Army Corps of Engineers *Sandia Pueblo to Isleta Pueblo Ecosystem Restoration Feasibility Study and Environmental Assessment* (Corps 2019). The POI is within the area analyzed as part of that effort and those findings are summarized here. Species abundance and diversity depends on the specific habitat type available within the bosque; herptile abundance and diversity was found to be higher in areas that lacked dense canopy cover and had sandy soils with sparse ground cover (Hink and Ohmart 1984). On the other hand, bird diversities and abundances were highest in mature cottonwood or Russian olive stands or in dense, intermediate-aged cottonwood/coyote willow stands (Hink and Ohmart 1984). Other studies indicate that bird diversity in the midstory nest guild decline following treatment and removal of invasive plant species (Finch et al. 1995). A variety of mammal species have been recorded in the bosque and their densities and abundances also vary with the specific habitat available (Hink and Ohmart 1984). The Rio Grande is occupied by at least 19 species of native and nonnative fish which can tolerate the periods of low flow, extremes in habitat characteristics including depth, velocity, temperature, dissolved oxygen concentration, and suspected sediment (Crawford et al. 1993).

Historically the bosque was a dynamic mosaic of riparian wetlands, channels, woodlands, shrub thickets, and periodically wet meadows (Pittenger 2003, Crawford et al. 1993). Periodic flood events maintained a dynamic bosque with a mosaic of patches diverse in size, age, and species composition

(Corps 2019). These dynamic patches allowed for a wide variety of bird, mammal, herptile, and fish species to inhabit the bosque. Changes in land use, water use, and the introduction of invasive species have in many places decreased the availability of different habitat types and have instead led to a more homogenous bosque. The loss of specific habitat features, e.g. dense understory of shrub vegetation preferred by Southwestern Willow Flycatchers (*Empidonax traillii extimus*; flycatcher), has led to the decline of many native species.

Pueblo members were surveyed during development of the Restoration Plan and 80% indicated that improving wildlife habitat conditions in the bosque was very important (McKenna et al. 2019). The Pueblo is particularly interested in the presence of elk in the southern part of the proposed project area, mule deer in the north, and black bears around the Isleta Diversion Dam.

No Action

Under the no action alternative, no bosque or riverine restoration activities would take place. There would be no impact to wildlife habitat within the bosque on the POI. Factors affecting wildlife habitat would continue as described above and in other sources (e.g. Finch et al. 2003, Pittenger 2003, Corps 2019, Finch et al. 2000).

Proposed Action

A conceptual habitat mosaic was developed in order to prioritize and streamline recommended restoration activities in the Restoration Plan (McKenna et al. 2019). Site potential to support different habitat types and/or management actions was assessed at the map unit-level and were informed by a variety of GIS datasets. The analysis conducted, including assessments of underrepresented habitats, underrepresented attributes within existing habitats, proximity to high-value habitats, and the need for mitigating wildfire risk (McKenna et al. 2019). Implementation of the management activities included in the proposed action in the map units identified in the Restoration Plan would promote and sustain a diverse mosaic of habitats for wildlife within the proposed project area. This will include varying-aged cottonwood communities (cottonwood-mesquite savannah, cottonwood-willow, gallery forests), open woodlands, coyote willow shrublands, native shrublands, grasslands, marshes, wet meadows, and open water areas. These habitat patches simulate the natural dynamism of the Rio Grande bosque and will foster and promote diverse assemblages of fish and wildlife.

Special Status Species

Reclamation and the POI manage special status species (federally endangered, threatened, or candidate species) in the Isleta floodplain and in the adjacent Rio Grande. In accordance with Section 7(a)(2) the Endangered Species Act (ESA), as amended, federally funded, constructed, permitted, or licensed projects must take into consideration impacts to federally threatened and endangered species. This proposed action falls within the suite of activities that were addressed in the *Final Biological and Conference Opinion for Bureau of Reclamation, Bureau of Indian Affairs, and Non-Federal Water Management and Maintenance Activities on the Middle Rio Grande, New Mexico* (2016 BiOp; Service 2016a). Those activities included continuation of ongoing water management, river maintenance (including habitat restoration), and other maintenance activities. Conservation

measures in the 2016 BiOp included specific measures such as facilitating fish passage at the IDD (conservation measure [CM] #17), best management practices (BMPSs) to minimize effects to listed species (CM #51), as well as habitat restoration techniques within the project footprint (CM #52)(Service 2016a). The proposed action addresses several of the conservation measures. The BMPs were developed in coordination with the Service and are intended to minimize the risk of effects from construction and maintenance activities related to river infrastructure maintenance and restoration. They apply generally to construction and/or maintenance activities. Updates to these BMPs will be provided to the U.S. Fish and Wildlife Service as adaptive management indicates the need. BMPs specific to each species are described below.

Additionally, the POI has two management plans concerning the management of endangered species. The objective of the *Pueblo of Isleta Riverine Management Plan* is to protect, conserve, and promote the management of the flycatcher, Rio Grande silvery minnow (*Hybognathus amarus*; minnow), and the New Mexico meadow jumping mouse (*Zapus hudsonius luteus*; jumping mouse) and their associated habitats within the Pueblo's boundaries (Parametrix 2014). Moreover, under the Riverine Management Plan, the POI conducted a variety of voluntary measures, restoration projects, and management actions to conserve riparian vegetation, including not allowing cattle to graze within the bosque, protecting riparian habitat from fire, maintaining native vegetation, and preventing habitat fragmentation.

The *Isleta Island Removal Project Monitoring and Adaptive Management Plan* was developed provide a method to evaluate the goals of the Isleta Island Removal Project (IIRP) by measuring success criteria through specific, on the ground monitoring of project components at the IIRP site as well as mitigation sites to the north of and within the project area (Tetra Tech 2017). The goals of this project included providing perennial flows along the west bank of the Rio Grande below the Isleta Diversion Dam (IDD); improving habitat for the minnow, flycatcher, and cuckoo; improved sediment transport downstream of the IDD; control of weedy and exotic woody plant species; and growth and survival of native riparian trees, shrubs, and grasses.

Rio Grande Silvery Minnow

Reduction in the range of the minnow and threats to its continued existence in the Middle Rio Grande were central to this species being listed as endangered (Service 1994). The final rule, establishing minnow critical habitat, was published in the Federal Register on February 19, 2003, and designated the entire middle Rio Grande as critical habitat (Service 2003). The Pueblo lands of Santo Domingo, Santa Ana, Sandia, and Isleta within this area were not included in the final critical habitat designation. Descriptions of the minnow's biology, the status of the species, and critical habitat can be found in the Recovery Plan (Service 2010).

The minnow travels in schools and tolerates a wide range of habitats. Adults are most commonly found in shallow and braided runs over sand substrate. Young-of-year occupy shallow, low-velocity backwaters with sand-silt substrates. Dudley and Platania (1997) reported that the minnow was most commonly collected in habitats with depth less than 8 inches or between 12 and 16 inches and were not found in habitats with water depths greater than 20 inches. More than 85 percent were collected from low-velocity habitats (less than 0.325 ft/sec). Habitat for the minnow includes stream margins, side channels, and off-channel pools where water velocities are low or reduced from main-channel

velocities. Areas with detritus and algal-covered substrates are preferred. Lee sides of islands and debris piles often serve as good habitat. During the winter, the minnow tends to concentrate in low-velocity areas in conjunction with vegetation and debris piles for cover (Tetra Tech 2013).

The minnow is the only surviving endemic cyprinid fish species of the Rio Grande in New Mexico that produces semi-buoyant eggs (Porter and Massong 2004). The species is a pelagic spawner. Individual females may produce more than 3,000 semi-buoyant, non-adhesive eggs during a spawning event. While spawning is understood to peak during about a 2-month period in late spring-early summer (May-June) associated with spring snowmelt runoff, data indicate that the silvery minnow may also spawn multiple times during the summer, concurrent with flow spikes (Archdeacon presentation as cited in Noon et al. 2017). The majority of the spawning fish are 1 year old. Two-year-old fish comprise less than 10 percent of the spawning population (Tetra Tech 2013).

Sampling efforts by Reclamation in the Isleta reach show that the occurrence and abundance of minnow in the Middle Rio Grande, and in the project area, has fluctuated widely over the past two decades (1993–2018) (i.e., order of magnitude changes). Long-term data has shown that estimated density of minnow increased with maximum discharge, number of days with discharge exceeding a threshold value, estimated inundation of the river channel and floodplain, delayed onset of low flows, and increased mean daily discharge (Dudley et al. 2017). Conversely, estimated minnow density was found to be very low when conditions were dry (Dudley et al. 2018).

No Action

Under the no action alternative, no bosque or riverine restoration activities would take place. Under the no action alternative there would be no change to the current state of declining habitat value to fish and wildlife. However, the risk for wildfire would remain high which could result in adverse effects to fish and wildlife species in the Project Area.

Proposed Action

The proposed action would implement habitat restoration activities as described in the Restoration Plan. The Restoration Plan identifies specific locations within the Isleta bosque for floodplain connection actions such as bankline lowering, excavation of backwater channels, and removing jetty jacks and berms that would provide habitats that inundate during periods of higher river flow and would create the shallow, low-velocity habitats required by the minnow (Service 2010). The proposed action would also reduce the risk of wildfire in the bosque which would alleviate concerns about water quality degradation following runoff of ash or other debris. Implementation of the proposed action, particularly bank-lowering and backwater channel creation, would have long-term beneficial effects for the minnow by creating habitat elements of particular importance during periods of high flow (Service 2010).

Implementation of the proposed action does have the potential to cause short-term direct and indirect effects to minnows in the vicinity. The following BMPs, coordinated with the Service for the 2016 BiOp, would be exercised during construction that would minimize the disturbance of sediments in the Rio Grande.

- When operating equipment within the wetted channel during bankline lowering and/or jetty jack removal, efforts would be taken to minimize the movement of equipment as well as minimizing contact with the riverbed.
- Measures will be taken to minimize the impact of hydrocarbons.

A complete list of BMPs can be found in Chapter 4. Excavation activities would be timed during winter, low-flow periods in order to minimize disturbance to the main channel. All equipment would remain on the bank and would never enter the water. Therefore, the proposed action may affect, but is not likely to adversely affect the Rio Grande silvery minnow.

Southwestern Willow Flycatcher

The flycatcher was listed as endangered in February 1995 (Service 1995). Critical habitat for the flycatcher was designated in July 1997, redesignated in 2005 (Service 2005), and redesignated again in 2013 (Service 2013c). There is no designated critical habitat within the POI as stated in the *Amended Pueblo of Isleta Riverine Management Plan* (Parametrix 2014).

The current range of the flycatcher includes Arizona, New Mexico, southern California, extreme western Texas, southwestern Colorado, and southern portions of Nevada and Utah (Service 2002). In New Mexico, flycatchers are known to breed along the Rio Grande, and in the Zuni, San Francisco, and Gila River drainages. A recovery plan for the flycatcher has been completed (Service 2002).

The flycatcher is an obligate riparian species and nests in thickets associated with rivers, streams and wetlands where dense growth of willow, buttonbush, boxelder, Russian olive, saltcedar, or other plants are present (Finch and Stoleson 2000). Nests are frequently associated with an overstory of scattered cottonwood. Throughout the flycatcher's range, these riparian habitats are now reduced, widely separated, and occur in small and/or linear patches. Flycatchers nest in thickets of trees and shrubs approximately 6 to 23 feet in height or taller, with a densely vegetated understory approximately 12 feet or more in height. Surface water or saturated soil is usually present beneath or adjacent to occupied thickets (Muiznieks et al. 1994). Habitats not selected for nesting include narrow (less than 30 feet wide) riparian strips, small willow patches, and stands with low stem density (Service 2002). Areas not utilized for nesting may still be used during migration (Yong and Finch 1997).

Surveys have been conducted on various locations throughout the POI on and off since 1994. Flycatchers have been known to nest on the POI since 1994 (Parametrix 2014). Flycatchers utilize many portions of the POI for stopover habitat during migration, but nesting surveys have not been conducted since 2007. Most recent surveys were conducted within the IIRP boundaries and flycatchers have not been detected for the past three surveys seasons (2017-2019).

No Action

Under the no action alternative, no bosque or riverine restoration activities would take place. The current state of declining habitat value to fish and wildlife and increased fire risk due to the presence of nonnative vegetation would remain.

Proposed Action

The Restoration Plan was developed to enhance, rehabilitate, and to the extent possible, restore habitat along the Rio Grande bosque on the POI. Implementing the proposed action would enhance river-floodplain connectivity which would increase the amounts of potentially suitable habitat for the flycatcher by converting narrow riparian strips to larger patches. This is anticipated to have long-term beneficial effects for the flycatcher. The locations where territories previously existed are in areas where no work is proposed or only the removal of nonnative vegetation would take place. In areas where saltcedar removal is proposed to occur, adjacent native habitat exists and would fill in either naturally or through replanting efforts. Native habitat in these areas includes coyote willow, seep willow, Rio Grande cottonwood and Goodding's willow. Where needed, these areas would be supplemented with planting of these species to encourage potential native habitat.

There is the potential for short-term adverse effects to the flycatcher during construction activities. The following BMPs, as coordinated with the Service for the 2016 BiOp, would be followed during implementation of the proposed action in order to minimize these effects:

- Potential impacts to suitable or potentially suitable migratory bird habitat will be avoided during the construction activities, utilizing the most current annual survey results in conjunction with habitat suitability. Coordination and consultation with the Service will occur prior to such work activities.
- The proposed action work would take place between August 16 and April 30 (work would stop between May 1 and August 15). Work would resume after the nesting season. Therefore, work would not occur when flycatchers might be using the area as stopover or breeding habitat.

A complete list of BMPs can be found in Chapter 4. Therefore, the proposed action may affect but is not likely to adversely affect the Southwestern Willow Flycatcher.

Yellow-billed Cuckoo

The western population of the Yellow-Billed Cuckoo (*Coccyzus americanus*; cuckoo) was listed as a threatened species on November 3, 2014 (Service 2014a). In August 2014, the Service proposed designated critical habitat for the cuckoo which was never finalized. In February 2020, the Service proposed revised designated critical habitat for the cuckoo which included approximately 493,665 acres in Arizona, California, Colorado, Idaho, New Mexico, Texas, and Utah (Service 2020). Included in this designation is the MRG unit NM-6B which is 61,343 acres (24,825 ha) and includes a continuous segment of the lower Rio Grande from Elephant Butte Reservoir in Sierra County at approximately river mile 38, upstream through Socorro, Valencia, and Bernalillo Counties. Unit 6A includes the Rio Grande from Highway 165 in Bernalillo, NM north to below Cochiti Dam in Cochiti Pueblo in Sandoval County, New Mexico. These units are consistently occupied by a large number of breeding cuckoos and currently is the largest breeding group of the species north of Mexico. The unit also provides a movement corridor for cuckoos moving farther north. Proposed critical habitat is not present with the POI.

The cuckoo is an obligate riparian species occurring in scattered locations in the western U.S. during the breeding season. The cuckoo nests almost exclusively in low to moderate elevation riparian woodlands with native, broadleaf trees and shrubs that are at least 50 acres in size and at least 325

feet (100 m) in width (Service 2013c). They arrive in New Mexico beginning in late April and early May and nest from late May through August (Howe 1986). Mature cottonwood forest with well-developed willow understory appear to be important characteristics of habitat for cuckoo (Buffington et al. 1997; Gaines and Laymon 1984). While willows appear to be a preferred nest tree, the species will also nest in dense saltcedar stands (Howe, 1986). In addition, as the proportion of saltcedar increases, the suitability of the habitat for cuckoos decreases, and sites with a monoculture of saltcedar are unsuitable for breeding cuckoos (Service 2014b).

Borderline potential suitable cuckoo habitat is present in the project area and consists of mature cottonwood forest with well-developed understory of at least 50 acres in size and at least 325 feet in width. As with the flycatcher, there is the potential for cuckoo use in areas as stopover habitat that may not quite meet potential habitat requirements.

While some surveys have been conducted within the project area in support of other projects, annual surveys across the project area have not been conducted due to lack of potential habitat. Cuckoos were not detected during surveys conducted in the IIRP area in 2017 and are not known to be present in the project area. Only occasional migrant cuckoos have been detected within the Albuquerque reach of the Middle Rio Grande.

No Action

Under the no action alternative, no bosque or riverine restoration activities would take place. The current state of declining habitat value to fish and wildlife and increased fire risk due to the presence of nonnative vegetation would remain.

Proposed Action

Implementing the proposed action would enhance river-floodplain connectivity which would increase the amounts of potentially suitable habitat for the flycatcher by converting narrow riparian strips to larger patches. This is anticipated to have long-term beneficial effects for the cuckoo and result in improved potential habitat. Proposed areas where saltcedar and Russian olive removal is to occur would fill in with existing native habitat in the area including coyote willow, seep willow, Rio Grande cottonwood and Goodding's willow. Where needed, these areas would be supplemented with planting of these species and other native understory to encourage potential native habitat. The project would result in long-term improvements to the habitat quality for cuckoos.

As discussed above, there is currently limited potential for cuckoos to be present in the project area. However, there is the potential for short-term adverse effects to any cuckoo that might be present during construction activities. The following BMPs, as coordinated with Service for the 2016 BiOp, would be followed, during implementation of the proposed action, in order to minimize these effects:

- Potential impacts to suitable or potentially suitable migratory bird habitat will be avoided during the construction activities, utilizing the most current annual survey results in conjunction with habitat suitability. Coordination and consultation with the Service will occur prior to such work activities.
- The proposed action work would take place between August 16 and April 30 (work would stop between May 1 and August 15). Work would resume after the nesting season.

Therefore, work would not occur when cuckoos might be using the area as stopover or breeding habitat.

A complete list of BMPs can be found in Chapter 4. Therefore, the proposed action may affect but is not likely to adversely affect the Yellow-Billed Cuckoo.

New Mexico Meadow Jumping Mouse

The New Mexico meadow jumping mouse (*Zapus hudsonius luteus*; mouse) was listed as endangered on June 10, 2014 (Service 2014c). Initially, the POI was included within proposed critical habitat (Service 2013d) but was excluded from the final designation (Service 2016b) based on their Riverine Management Plan (Parametrix 2014) and a demonstrated productive working relationship on a Government-to-Government basis with the Service.

The mouse is a small, nocturnal, solitary mammal and an obligate riparian subspecies. The mouse hibernates about 8 or 9 months out of the year, which is longer than most other mammals. Conversely, it is only active 3 or 4 months during the summer. Within this short timeframe, it must breed, birth and raise young, and store sufficient fat reserves to survive the next year's hibernation period. In addition, jumping mice only live 3 years or less, and have one small litter annually, with seven or fewer young, so the subspecies has limited capacity for high population growth rates due to this low fecundity (reproductive potential (Service 2014c).

The subspecies chiefly uses patches or narrow strips of riparian vegetation composed of well-developed tall (24 inches), dense riparian herbaceous vegetation (plants with no woody tissue) primarily composed of sedges and forbs. This suitable habitat is found only when wetland vegetation achieves full growth potential associated with saturated soils along the edge of open, perennial flowing water. This vegetation is important for the mouse because it provides vital food sources (insects and seeds), as well as the structural material for building day nests that are used for shelter from predators. In addition, individual mice also need intact upland areas (areas up gradient and beyond the floodplain of rivers and streams) adjacent to riparian wetland areas because this is where they build nests or use burrows to give birth to young in the summer and to hibernate over the winter (Service 2014c and 2014d).

Historically, these wetland habitats would have been in large patches located intermittently along long stretches of stream allowing mice to disperse to other habitat patches within stream segments. Connectivity between patches of suitable habitat is necessary to facilitate daily and seasonal movements, and dispersal to increase the likelihood of long-term viability of jumping mouse populations (Service 2014c).

Much of the proposed critical habitat on the POI was historically occupied as recently as 1988, however surveys by Reclamation within parts of the proposed critical habitat segments during 2014 did not detect the mouse. The entire area was considered unoccupied at the time of listing (Service 2016b). The Service Recovery Outline for the New Mexico meadow jumping mouse also states that to address the current status of the mouse and work toward long-term viability and recovery of the subspecies, recovery efforts should preferentially focus on restoring habitats and increasing the connectivity among suitable areas. The dynamic nature of early seral stage riparian vegetation, with protection, can promote rapid development into suitable habitat within several years, with an expected tandem response of increased mouse populations (Service 2014e).

The mouse was originally recorded on the POI in the early 1980s (Hink and Ohmart 1984) but have not been documented since that time (Parametrix 2007; Parametrix 2014). No surveys have been conducted since the 1990s. A preliminary assessment of habitat was conducted in 2014 (Parametrix 2014). Vegetation assessments (Hink and Ohmart 1984 methodology) were also conducted in 2018.

No Action

Under the no action alternative, no bosque or riverine restoration activities would take place. The current state of declining habitat value to fish and wildlife and increased fire risk due to the presence of nonnative vegetation would remain.

Proposed Action

The proposed action would implement activities in the Restoration Plan that would protect and enhance wildlife habitat quality and diversity and improve river-floodplain activities. These actions would result in the development of potentially suitable wetland habitat for the mouse, including marshes, wet meadows, and areas adjacent to willow wetlands. The proposed excavation of backwater channels and lowered banklines would contribute to the hydrologic conditions necessary for maintaining these habitats. This is all expected to have long-term beneficial impacts to the mouse.

As with the other species analyzed, there is the potential for short-term adverse impacts. While the project area is not known to be occupied by the mouse at the current time, habitat mapped as 'marsh' in 2018 (using Hink and Ohmart 1984 methodology) would be avoided during implementation and are not included in any floodplain connection habitat sites. The following BMPs from the 2016 BiOp would be followed to minimize effects to the mouse during implementation of the proposed action:

- Mouse habitat surveys will occur in early summer (June or July) or when vegetation that characterizes mouse habitat is most likely to be at its peak growth, prior to implementation of project construction for that year.
- If suitable mouse habitat is found, Reclamation and/or the appropriate project partner(s) will coordinate with the Service prior to work.
- No work activities would occur from August 15 to October 31 if suitable mouse habitat is found during mouse habitat surveys conducted prior to work.

A complete list of BMPs can be found in Chapter 4. Therefore, the proposed action may affect but is not likely to adversely affect the New Mexico meadow jumping mouse.

Cultural Resources

Section 106 of the National Historic Preservation Act (NHPA) and its implementing regulations require Federal agencies to consider 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. 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"

and which must "possess integrity of location, design, setting, materials, workmanship, feeling, and association" and meet at least one of a set of four criteria relating to association with historical events, historically significant people, distinctive characteristics of a period or style, and/or are likely to yield information important to prehistory or history. There are many of examples of historic properties, including archaeological sites, historic structures, traditional cultural properties (TCPs), and historic districts.

In order to comply with Section 106 of the NHPA, Federal agencies must consult on the effects of their undertakings on historic properties with the State Historic Preservation Officer, Native American Tribes, other stakeholders, and the public. In the case of undertakings on tribal lands of Tribes that have assumed the role of the SHPO pursuant to Section 101(d)(2) of the NHPA, the Tribal Historic Preservation Officer (THPO) for the POI will be consulted.

Considerable information is available from archeological resources within the Middle Rio Grande Valley. Archeological sites in the valley span nearly the entire known period of human occupation in North America. Appendix C of the Corps *Sandia Pueblo to Isleta Pueblo Ecosystem Restoration Feasibility Study and Environmental Assessment* (Corps 2019) contains a detailed cultural history narrative of the Middle Rio Grande Valley.

The POI has their own Tribal Historic Preservation Officer (THPO) and staff who have intimate knowledge of cultural sites and uses within the POI.

No Action

Under the no action alternative, no bosque or riverine restoration activities would take place. Cultural resources within the proposed project area would be expected to remain in approximately their current condition.

Proposed Action

Management actions included in the proposed action would be implemented in such a way as to protect cultural resources on the POI. Pursuant to 36 CFR 800.13, should previously unknown artifacts or archaeological resources be encountered during construction, work would cease in the immediate vicinity of the resource. A determination of significance would be made, and a mitigation plan would be formulated in consultation with the THPO and American Indian Tribes that have cultural concerns in the area. Stipulations regarding avoidance of known historic properties eligible for nomination to, or listed on, the National Register of Historic Places will be included in construction contract plans and specifications.

Indian Trust Assets

Indian trust assets (ITA) are legal interests in property held in trust by the United States for Indian tribes or individuals. ITAs include lands, minerals, hunting and fishing rights, and water rights. The United States has a responsibility to protect and maintain ITAs and Reclamation is charged with carrying out activities in a manner which protects trust assets and avoids adverse impacts when possible.

No Action

Under the no action alternative, no bosque or riverine restoration activities would take place and there would be no impact to ITAs.

Proposed Action

Because land within the POI are ITAs, any management action has the potential to impact these assets. Implementing the proposed action would enhance, rehabilitate, and to the extent possible improve floodplain and riverine habitat along the Rio Grande and in a manner consistent with the cultural and resource goals of the Pueblo. Impacts associated with implementing the proposed action would be beneficial.

Socioeconomic Environment and Environmental Justice

The proposed project area is located entirely within the borders of the POI in the Rio Grande bosque. Approximately 3,809 people live in the POI (674,855 in all of Bernalillo County, 2,088,070 in the state of New Mexico) and the mean household income in 2018 inflation-adjusted dollars was $48,448, compared to $73,158 for Bernalillo County, $87,864 for the United States as a whole or $66,752 for the state of New Mexico (U.S. Census Bureau 2018).

Environmental justice is the fair treatment and meaningful involvement of all people regardless of race, color, national origin, or income. Executive Order 12898 directs all Federal agencies to ensure that no group of people should bear a disproportionate share of the negative environmental consequences resulting from industrial, municipal, and commercial operations or the execution of Federal, state, tribal and local programs and policies. The proposed project area is located entirely within the POI and nearly 95% of the population of the POI identifies as non-white, whereas 26% percent of Bernalillo County identifies as non-white (U.S. Census Bureau 2018).

No Action

Under the no action alternative, no bosque or riverine restoration activities would take place and there would be no additional impacts to socioeconomic conditions. There would be no impacts to the people within the POI in terms of environmental justice.

Proposed Action

Implementation of the proposed action is not likely to have any impact on the population size of the Pueblo of Isleta or Bernalillo County; however, it may have a slight impact on the local economy if construction crews were to patronize local businesses for fuel or food.

Implementation of the proposed action is not expected to have any negative impact in terms of environmental justice. The proposed action is expected to improve the bosque and riverine ecosystem within the POI which may benefit tribal members. There would be no displacement, relocation, economic or adverse action to the POI.

Aesthetics

The proposed project location is within the bosque on the POI and is visible from the spoil banks on both sides of the river as well as numerous access roads, including those in the vicinity of the Isleta Diversion Dam. This is area is valued for the mature forest vegetation, flowing water, and wildlife resources. While approximately 73% of the area is mapped as forest or shrubland, open/barren areas account for 2% and these areas are often dominated by annual weeds (McKenna et al. 2019). Some areas have experienced heavy disturbance, such as high-intensity fire, and this has negatively affected visual resources.

No Action

Under the no action alternative, no bosque or riverine restoration activities would take place. The visual resources of the area would not be impacted.

Proposed Action

Implementation of the proposed action would promote natural ecological processes in the bosque and river on the POI. These processes would lead to a mosaic of vegetation communities more similar to those that existed historically which would protect and enhance wildlife habitat quality and diversity as well as improve river-floodplain connectivity. It would also reduce wildfire risk. All of this would benefit aesthetic resources in the proposed project area in the long term. In the short term, there may be negative impacts to these resources while management actions such as jetty jack removal, reduction of hazardous fuels, construction of wet meadow habitats as well as willow shrublands. These impacts would resolve within a few growing seasons as native bosque vegetation develops.

Cumulative Effects

The Council on Environmental Quality regulations implementing NEPA define cumulative impacts as:

> The impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (Federal or non-Federal) or person undertakes such actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time.

The existing condition of the affected environment is largely a product of the cumulative effects of a variety of Federal and non-Federal actions in the Middle Rio Grande more broadly and the POI in particular. River management activities, including the construction and operation of flood control and agricultural diversion dams have contributed to the hydrologic, hydraulic, and geomorphic conditions described above. This, in combination with the widespread introduction of invasive species have led to an altered riparian ecosystem which no longer provides the habitat needed for many native fish and wildlife species. Implementation of the proposed action, when considered with other similar habitat restoration activities on the POI as well as elsewhere in the Middle Rio Grande, is expected to contribute to a mosaic of functioning native riparian habitat in the area.

Other elements of the IDD Settlement agreement are reasonably foreseeable future actions and include design and construction of modifications to the dam structure that will both reduce sediment entrainment in main canals and also provide for fish passage. Planning for that element has not begun yet, but when it does it will be informed by this decision and implementation of this proposed action, if appropriate.

Chapter 4 Environmental Commitments

BMPs related to the 2016 BiOp were described in the Special Status Species as it relates to those specific species. BMPS were also described in relation to CWA commitments. A cumulative list of BMPs that will be implemented during implementation are as follows:

Timing of the Proposed Action

1. The Action Agency/Project Proponent/Implementing Party will seek to avoid impacts to birds protected by the Migratory Bird Treaty Act (16 United States Code [U.S.C.] 703; MBTA), including the flycatcher and cuckoo, by conducting work activities outside of the normal breeding and nesting season (April 15 to August 15, or September 1 for work in suitable cuckoo habitat).

    1.1. If work is necessary between April 15 and August 15 (or September 1 for work in suitable cuckoo habitat), suitable/occupied migratory bird habitat will be avoided during the construction activities as much as possible, utilizing the most current annual survey results in conjunction with habitat suitability. The Action Agency will use current flycatcher and cuckoo monitoring data to avoid work within 0.25 miles of an active nest as much as possible. Coordination and consultation with the Service will occur prior to such work activities.
    1.2. Reseeding or revegetation may be accomplished by hand or by mechanized means, such as using a Truax imprinter followed by hand or tractor broadcast seeding (see section Vegetation Planting and Control below). Planting via mechanized means, includes using a hand-held or tractor-mounted auger. If mechanized means are used for either reseeding or replanting in the April 15 to August 15 timeframe (or September 1 for work in suitable cuckoo habitat), migratory bird surveys would be conducted immediately prior to the work to determine if any breeding birds are present. If birds are detected, Reclamation and/or the appropriate project partner(s) would coordinate with the Service to determine appropriate next steps.

2. The Action Agency will seek to avoid impacts to the New Mexico meadow jumping mouse by not conducting work activities from August 15 to October 31 if suitable mouse habitat is found during mouse habitat surveys conducted prior to work. Mouse habitat surveys will occur in early summer (June or July) or when vegetation that characterizes mouse habitat is most likely to be at its peak growth. If suitable mouse habitat is found, Reclamation and/or the appropriate project partner(s) will coordinate with the Service prior to work. Road maintenance such as grading and washout repair may be performed throughout the year to maintain safe access to and from the river, but vegetation control will not occur between April 15 and August 15 (or September 1 for work in suitable cuckoo habitat), as per MBTA measure 1 above.

Water Quality

3. The Action Agency will obtain all applicable permits prior to implementation of the project, including Clean Water Act permits (CWA). The Action Agency will comply with the requirements of the CWA and other permits associated with the project, including required

reporting to the appropriate authorities as needed and will not begin work until all required permits are obtained.

4. Silt fences and/or appropriate erosional controls will be used around the project site to manage water runoff in the site in accordance with CWA requirements.

5. The Action Agency will visually monitor for water quality in the areas below areas of river work before and during the workday. Water quality will be monitored during construction and after equipment operates in the river channel. Monitoring will include visual observations and may include direct sampling, as appropriate.

    5.1. If direct sampling is needed, water-quality parameters to be tested include pH, temperature, dissolved oxygen, and turbidity. Parameters will be measured both upstream and downstream of the work area.

    5.2. Responses to changes in water-quality measures exceeding the applicable standards would include reporting the measurements to the New Mexico Environment Department Surface Water Quality Bureau and moving construction activities away from the shore.

Equipment and Operations

6. Reclamation-led work activities that have the potential for adverse impacts will be monitored by properly trained Reclamation personnel in order to ensure compliance. Non-Reclamation partners will have an onsite environmental monitor during all work activities that have the potential for adverse impacts in order to ensure compliance. Also, an environmental monitor will regularly assess other activities to ensure compliance.

7. The Action Agency will operate equipment in an area as little as possible to minimize disturbance of sediments. When operating equipment within the wetted channel, the following practices will be used to minimize disturbance of sediments:

    7.1. Minimize movement of equipment, and;

    7.2. Minimize contact with the riverbed when not operating equipment.

8. Each individual operator will be briefed on local environmental considerations specific to the project tasks.

9. Minimize impact of hydrocarbons: To minimize potential for spills into or contamination of aquatic habitat:

    9.1. Hydraulic lines will be checked each morning for leaks and periodically throughout each workday. Any leaky or damaged hydraulic hoses will be replaced.

    9.2. All fueling will take place outside the active floodplain with a spill kit ready. Fuel, hydraulic fluids, and other hazardous materials may be stored on site overnight, but outside the normal floodplain, not near the river or any location where a spill could affect the river.

    9.3. All equipment will undergo high-pressure spray cleaning and inspection prior to initial operation in the project area.

    9.4. Equipment will be parked on pre-determined locations on high ground away from the river overnight, on weekends, and holidays.

9.5. Spill protection kits will be onsite, and operators will be trained in the correct deployment of the kits.

9.6. External hydraulic lines are composed of braided steel covered with rubber. When there is increased risk of puncture such as during mastication while removing vegetation, external hydraulic lines will be covered with additional puncture-resistant material, such as steel-mesh guards, Kevlar, etc. to offer additional protection.

10. Equipment will be removed from the channel in the event of high storm surges.

11. To allow fish time to leave the area before in-water work begins, equipment will initially enter the water slowly. In-water work will be fairly continuous during workdays, so that fish are less likely to return to the area once work has begun.

12. Riprap to be placed in the water will be reasonably clean to the extent possible. If there are large clumps of soil bigger than 1 foot within the riprap, those clumps will be set aside during the loading or placing operations.

13. Whenever possible, airboats will be operated through the center of the channel to minimize disturbance to aquatic species, including minnows.

Access and Staging

14. Impacts to terrestrial habitats will be minimized by using existing roads whenever possible. In general, equipment operation will take place in the most open area available, and all efforts will be made to minimize damage to native vegetation and wetlands (also see section titled Vegetation Replanting and Control below).

15. All necessary permits for access points, staging areas, and study sites would be acquired prior to construction activity.

Vegetation Replanting and Control

16. A variety of revegetation strategies may be used: stem and pole cuttings (Los Lunas Plant Materials Center 2007b; long stem transplants (Los Lunas Plant Materials Center 2007a); and upland planting with and without a polymer, zeolite, or similar compound to maximize soil water retention (Dreesen 2008). Planting techniques may vary from site to site, and may consist of buckets, augers, stingers, and/or water jets mounted on construction equipment. In some areas, a trench may be constructed to facilitate the placement of a significant number of plants, specifically stem and pole cuttings. Seeding would be accomplished using a native seed drill, where feasible, and spread with a protective covering which would provide moisture to the seeds.

17. Vegetation control may consist of mechanical removal, burning, mowing, and/or herbicide treatment. Herbicides will be used when non-chemical methods are unsuccessful or are not economically feasible (see section Herbicide and Pesticide Use below).

17.1. Vegetation control will be completed between August 15 (or September 1 for work in suitable cuckoo habitat) and April 15. Any need for deviations from this work window would be considered on a project-specific basis and coordinated with the Service. If work is planned within two weeks before April 15 or after August 15 (or September 1 for work in suitable cuckoo habitat), the Action Agency will conduct additional surveys, if warranted, to determine the presence of breeding flycatchers, cuckoos, or other breeding birds.

Reclamation and/or the appropriate project partner will coordinate monitoring and work activities with the Service, as appropriate, if bird nests are found.

18. Native vegetation at work sites will be avoided to the extent possible. If large, native woody vegetation (primarily cottonwood), needs to be trimmed or removed, they will be replaced at a ratio of 10:1. When and where possible, small, native woody vegetation will be removed or harvested at the appropriate season to use for revegetation work at another location in the project area or at another project site. Native vegetation that cannot be replanted may be mulched (mulch will be removed or spread on site at a depth of three inches or less) or temporarily stockpiled and used to create dead tree snags or brush piles in the project area upon completion.
19. Nonnative vegetation that is removed at work sites will be mulched, burned, or removed offsite to an approved location. Mulched vegetation may also be spread on site at a depth of three inches or less.

Herbicide and Pesticide Use

20. The use of chemical herbicides or pesticides may be necessary to control undesirable plant species around stockpile sites and storage yards and also to prevent the spread of invasive species in areas cleared for maintenance activities. Since the application of herbicides and chemical spraying is tightly controlled by State and Federal agencies, Reclamation will follow all State and Federal laws and regulations applicable to the application of herbicides, including guidelines described by White (2007). Herbicides or pesticides will not be directly applied to or near water unless they are labeled for aquatic use and appropriate buffers will be observed. Communication with the Service would occur prior to any application to sites with threatened or endangered wildlife species. Reclamation would follow the Albuquerque Area Office Integrated Pest Management Plan and Pesticide General Permit (Reclamation 2015) when applying herbicides or pesticides. The non-Reclamation project partners will follow their agencies' herbicide/pesticide guidance, if applicable. Herbicides or pesticides may be applied using low pressure spray rigs mounted to OHVs, trucks and trailers with spray bars, or backpack sprayers (for spot applications). Treatments will be conducted by trained and approved personnel observing appropriate buffer distances and label directions. Treatment will not take place when winds exceed 10 miles per hour or when rain is forecasted for the local area within 48 hours of application. Care will be taken when mixing or applying any herbicide to avoid runoff onto the ground or into the water. Surfactants may also be added to certain herbicides to maximize herbicide/pesticide performance and minimize retreatments.

Dust Abatement

21. If water is needed for dust abatement or to facilitate grading of roads, water may be pumped from the Rio Grande, irrigation drains, sumps, or secondary channels adjacent to the river. During irrigation season (March 1 to October 31), water will not be pumped from the river but will be pumped from the irrigation drains if possible. Pumping from the river is not expected to be needed between April 15 and August 15 (or September 1 in suitable cuckoo habitat); however, if pumping is needed between May 1 and July 1 (emergencies only), Reclamation and/or the appropriate project partner(s) will coordinate with the Service to avoid impacts to minnow eggs and larvae. Outside of the irrigation season, an amount not to exceed 5% of river flows at the time of pumping may be drawn from the Rio Grande. Pumping is short duration (minutes) for filling whatever water transport equipment is used. Sumps or secondary channels

adjacent to the river will be used, whenever feasible. Pump intake pipes will use a 0.25 in (0.64 cm) mesh screen at the opening of the intake hose to minimize entrainment of aquatic organisms.

Other Measures

22. All treatment and control areas will be monitored for three years following construction to determine the effectiveness of the methods implemented and identify project-related hydrologic and geomorphic alterations. The monitoring will consist of biological, vegetation, geomorphic, and hydrologic monitoring, as appropriate to the project design and purpose.
23. The BA partners will monitor flows for two years following construction of side channels and, if flows at the nearest gage exceed the target inundation flows, will monitor the side channel for minnow entrapment in accordance with the appropriate protocol. After two years, it may be determined in coordination with the Service that further monitoring is unnecessary.
24. All project spoils and waste will be disposed of offsite at approved locations or may be used on site as appropriate to the project purpose, consistent with applicable environmental requirements.
25. All work projects will have a contract in place for the rental of portable restroom facilities during the duration of the project.

Chapter 5 Consultation and Coordination

Consultation

The following laws, regulations and executive orders were adhered to during development of this DEA:

Endangered Species Act

Migratory Bird Treaty Act

Fish and Wildlife Coordination Act

Clean Water Act, Section 404 and 401

National Historic Preservation Act, and other Cultural Resource compliance

Indian Trust Assets

Indian Sacred Sites (EO 13007)

Environmental Justice (EO 12898)

Wetlands and Floodplains Executive Orders

Coordination

U.S. Army Corps of Engineers

U.S. Bureau of Reclamation

Pueblo of Isleta

References

Bartolino, J. and R. Niswonger. 1999. Numerical simulation of vertical ground-water flux of the Rio Grande form ground-water temperature profiles, central New Mexico. U.S. Geological Survey Water-Resources Investigation Report, 99-4212.

Bowman, R., L. Wilcox, L. and T. Newton. 2002. Evaluation of groundwater/surface water interactions in the Middle Rio Grande basin (San Acacia watershed study). Presentation at the WRRI Conference in Socorro, New Mexico. August 13, 2002.

Buffington, J.M., J.C. Kilgo, R.A. Sargent, K.V. Miller, and B. R. Chapman. 1997. Comparison of breeding bird communities in bottomland hardwood forests of different successional stages. Wilson Bulletin 109:314-319.

Bureau of Indian Affairs [BIA]. 2014. Environmental Assessment for the Isleta Forest Management Plan. Bureau of Indian Affairs Southern Pueblo Agency, Albuquerque, NM.

BIA. 2018. Operation, Maintenance & Betterment of Middle Rio Grande Conservancy District Irrigation Facilities—Six Middle Rio Grande Pueblos. Categorical Exclusion.

Crawford, C.S., A.C. Culley, R. Leutheuser, M.S. Sifuentes, L.H. White, and J.P. Wilber. 1993. Middle Rio Grande ecosystem: bosque biological management plan. U.S. Fish and Wildlife Service Report. 291 pp.

Dudley, R.K. and S.P. Platania. 1997. Habitat Use of the Rio Grande Silvery Minnow. Prepared for New Mexico Department of Game and Fish and U.S. Bureau of Reclamation. December. 88 pp

Dudley, R.K., S.P. Platania, and G.C. White. 2017. Rio Grande Silvery Minnow Population Monitoring Results from February to December 2016. Report to the U.S. Bureau of Reclamation, Albuquerque, NM.

Dudley, R.K. and S.P. Platania. 2018. Rio Grande Silvery Minnow Population Monitoring Results from October 2018. Report to the U.S. Bureau of Reclamation, Albuquerque, NM.

Dudley, R.K., S.P. Platania, and G.C. White. 2018. Rio Grande Silvery Minnow Population Monitoring Results from February to December 2017. Report to the U.S. Bureau of Reclamation, Albuquerque, NM.

Eichhorst, K. M. Steuver, M. Dwyer, D. Shaw, and C. Crawford. 2002. Bosque ecosystem monitoring program (BEMP): first annual supplement: 2001. University of New Mexico Open File Report 02-2. December 2002.

Finch D. M., G. L. Wolters, W. Yong, and M. J. Mund. 1995. Plants, arthropods, and birds of the Rio Grande. Pages 133-164 in: Finch, D. M. and J. A. Tainter (tech. eds.). Ecology, diversity, and sustainability of the Middle Rio Grande Basin. General Technical Report RM-GTR-268, U.S. Department of Agriculture, Forest Service, Rocky Mountain and Range Experiment Station, Fort Collins, Colorado.

Finch, D.M. and S.H. Stoleson (eds.). 2000. Status, ecology, and conservation of the Southwestern Willow Flycatcher. General Technical Report RMRS-GTR-60. U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station, Ogden, Utah.

Gaines, D. and S. A. Laymon. 1984. Decline, status, and preservation of yellow-billed cuckoo in California. *Western Birds* 15: 49-80.

Hink, V.C., and R.D. Ohmart. 1984. Middle Rio Grande Biological Survey. Final Report. Prepared for the U.S. Army Corps of Engineers, Albuquerque, NM.

Howe, W. H. 1986. *Status of the Yellow-Billed Cuckoo (Coccyzus americanus) in New Mexico*. New Mexico Department of Game and Fish, Santa Fe, New Mexico.

McKenna, C., T. Caplan, and O. Hummel. 2019. Pueblo of Isleta Bosque and Riverine Restoration and Implementation Plan. Prepared for Pueblo of Isleta by GeoSystems Analysis, Inc., and Tetra Tech, Inc., Albuquerque, NM.

Muiznieks, B., S. Sferra, T. Corman, M. Sogge, and T. Tibbitts. 1994. Arizona partners in flight Southwestern Willow Flycatcher survey, 1993. Draft technical report: Nongame and Endangered Wildlife Program, Arizona Game and Fish Department, Phoenix, Arizona. April 1994.

Musseter Engineering, Inc. [MEI]. 2006. Evaluation of Bar Morphology, Distribution and Dynamics as Indices of Fluvial Processes in the Middle Rio Grande, New Mexico. Report prepared for the New Mexico Interstate Stream Commission and Middle Rio Grande Endangered Species Act Collaborative Program, March.

New Mexico Water Quality Control Commission. 2000. State of New Mexico standards for interstate and intrastate streams. New Mexico Environment Department. Santa Fe, New Mexico.

Noon, B., D. Hankin, T. Dunne, and G. Grossman. 2017. Independent Science Panel Findings Report: Rio Grande Silvery Minnow Key Scientific Uncertainties and Study Recommendations. Prepared for the U.S. Army Corps of Engineers, Albuquerque District on Behalf of the Middle Rio Grande Endangered Species Collaborative Program. Prepared by GeoSystems Analysis, Inc. Albuquerque, NM. June 2017. Contract No. W912PP-15-C-0008.

Parametrix. 2007. Pueblo of Isleta Final Master Restoration Plan. Prepared for the Pueblo of Isleta by Parametrix, Albuquerque, NM.

Parametrix. 2014. Amended Pueblo of Isleta Riverine Management Plan: Rio Grande Silvery Minnow, Southwestern Willow Flycatcher, and New Mexico Meadow Jumping Mouse. Prepared by Parametrix, Albuquerque, New Mexico. May 2014.

Pittenger, J.S. 2003. Assessment of ecological processes, historical reference conditions, and existing ecological situation for the Bosque Ecosystem Restoration at Route 66 Project, Rio Grande from Interstate 40 to Bridge Street, Albuquerque, New Mexico. Prepared for Bohannan-

Huston, Inc. and the U.S. Army Corps of Engineers, Albuquerque District, by Blue Earth Ecological Consultants, Inc., Santa Fe, New Mexico.

Porter, M.D. and T.M. Massong. 2004. Habitat fragmentation and modifications affecting distribution of the Rio Grande silvery minnow. GIS and Spatial Analyses in Fishery and Aquatic Sciences Volume 2: 421-432.

Pueblo of Isleta [POI]. 2002. Surface Water Quality Standards, amended March 18, 2002. 34 pgs.

Tetra Tech. 2004. Habitat Restoration Plan for the Middle Rio Grande. Prepared for: Middle Rio Grande Endangered Species Collaborative Program Habitat Restoration Subcommittee.

Tetra Tech. 2013. Biological Assessment Isleta Island Removal Project (IRP) and West Bank Stabilization (WBS) Project Pueblo of Isleta, Sandoval County, New Mexico. Prepared for Pueblo of Isleta.

Tetra Tech, 2017. Final Isleta Island Removal Project Monitoring and Adaptive Management Plan. Prepared for the Pueblo of Isleta.

Tetra Tech, Inc. 2019. Isleta Diversion Dam Preliminary Engineering Analysis Report. Prepared for Pueblo of Isleta, Isleta, NM.

U.S. Army Corps of Engineers [Corps]. 2004. Environmental Assessment for the Bosque Wildfire Project, Bernalillo and Sandoval Counties, New Mexico. Prepared by Albuquerque District, Albuquerque, NM.

Corps. 2006. Supplement II to the Environmental Assessment for the Bosque Wildfire Project, Bernalillo and Sandoval Counties, New Mexico. Prepared by Albuquerque District, Albuquerque, NM.

Corps. 2019. Final Rio Grande Environmental Management Program, CO, NM, TX: Sandia Pueblo to Isleta Pueblo, New Mexico Ecosystem Restoration Feasibility Study and Environmental Assessment. Prepared by Corps Albuquerque District, Albuquerque, NM.

U.S. Census Bureau. 2018. American Community Survey data for Isleta Pueblo. Retrieved 19 December 2019: www.data.census.gov.

U.S. Environmental Protection Agency [USEPA]. 2019a. Air Quality Control Regions. https://aqs.epa.gov/aqsweb/documents/codetables/aqcrs.html.

USEPA. 2019b. Air Quality Index Report, New Mexico, Summarized by County, 2018. Generated December 18, 2019. https://www.epa.gov/outdoor-air-quality-data/air-quality-index-report.

U.S. Fish and Wildlife Service [Service]. 1994. Endangered and Threatened Wildlife and Plants; Final Rule to List the Rio Grande Silvery Minnow as an Endangered Species. Federal Register 59(138):36988-36995.

Service. 1995. 50 CFR Part 17 Endangered and threatened wildlife and plants: Final rule to list the Southwestern willow Flycatcher (*Empidonax traillii extimus*) as endangered with proposed

critical habitat. U.S. Fish and Wildlife Service, Department of the Interior. (27 February 1995), Vol. 60, pp 10694-10715.

Service. 2002. Final Southwestern Willow Flycatcher recovery plan. U.S. Fish and Wildlife Service, Albuquerque, N. M.

Service. 2003. Endangered and Threatened Wildlife and Plants; Designation of Critical Habitat for the Rio Grande Silvery Minnow; Final Rule. Federal Register 68(33):8088-8135.

Service. 2005. 50 CFR Part 17 Endangered and threatened wildlife and plants; Designation of critical habitat for the Southwestern Willow Flycatcher (*Empidonax traillii extimus*). U.S. Fish and Wildlife Service, Department of the Interior. (19 October 2005), Vol. 70, pp. 60886-61009.

Service. 2010. Rio Grande Silvery Minnow (*Hybognathus amarus*) recovery plan, first revision. January 15, 2010. Albuquerque, New Mexico. 221 pp.

Service. 2013a. Biological Opinion on the effects of the Isleta Pueblo Island Removal and Bank Stabilization Project (SPA-2004-00406). September 20, 2013. Albuquerque, NM.

Service. 2013b. Endangered and threatened wildlife and plants; designation of critical habitat for the Southwestern Willow Flycatcher. Federal Register volume 78, number 2, pages 344-534.

Service. 2013c. Endangered and Threatened Wildlife and Plants: Threatened Status for the Western Distinct Population Segment of the Yellow-billed Cuckoo (*Coccyzus americanus*); Proposed Rule. Federal Register 78(192):61622-61666.

Service. 2013d. Endangered and Threatened Wildlife and Plants: Proposed Designation of Critical Habitat for the New Mexico Meadow Jumping Mouse. Federal Register 78(119): 37328-37363.

Service. 2014a. Endangered and Threatened Wildlife and Plants: Determination of threatened status for the western distinct population segment of the Yellow-billed Cuckoo (*Coccyzus americanus*); Final Rule. Federal Register 79(192):59992-60038.

Service. 2014b. Endangered and Threatened Wildlife and Plants: Designation of Critical Habitat for the Western Distinct Population Segment of the Yellow-billed Cuckoo (*Coccyzus americanus*); Proposed Rule. Federal Register 79(158):48548-48652.

Service. 2014c. Endangered and Threatened Wildlife and Plants: Determination of endangered status for the New Mexico Meadow Jumping Mouse throughout Its Range; Final Rule. Federal Register 79(111):33119-33137.

Service. 2014d. Species Status Assessment Report New Mexico meadow jumping mouse (*Zapus hudsonius luteus*).

Service. 2014e. Recovery Outline New Mexico meadow jumping mouse (*Zapus hudsonius luteus*).

Service. 2016a. Final biological and conference opinion for the Bureau of Reclamation, Bureau of Indian Affairs, and non-federal water management and maintenance activities on the Middle Rio Grande, New Mexico. December 2, 2016. Albuquerque, NM.

Service. 2016b. Endangered and Threatened Wildlife and Plants: Designation of Critical Habitat for the New Mexico Meadow Jumping Mouse; Final Rule. Federal Register 81(51):14264-14325.

Service. 2020. Endangered and threatened wildlife and plants; Revised designation of critical habitat for the Western Distinct Population Segment of the Yellow-billed Cuckoo (proposed rule). Federal Register volume 85, number 39, pages 11458-11594.

Yong, W. and D.M. Finch. 1997. Migration of the Willow Flycatcher along the Middle Rio Grande. Wilson Bulletin 109:253-268.

Appendix A: Clean Water Act Section 404 Coordination

From:	Roethle, Stephen R CIV USARMY CESPA (USA)
To:	Hummel, Ondrea
Cc:	Cody Walker (poi36004@isletapueblo.com); poi36002@isletapueblo.com
Subject:	RE: SPA-2019-00311-SRR (Pueblo of Isleta - Bosque & Riverine (B&R) Restoration and Implementation Plan Update (UNCLASSIFIED)
Date:	Tuesday, March 10, 2020 8:56:28 AM

CAUTION: This email originated from an external sender. Verify the source before opening links or attachments.

CLASSIFICATION: UNCLASSIFIED

Good morning, Ondrea.

I apologize for the delay in my response.

Based off of your descriptions your project will primarily involve activates outside of Corps Regulated features. Work that will take place within Corps regulated features will primarily involve surface removal of invasive species or clean excavation. The proposed project will not result in more than incidental fallback. Incidental fallback is defined as "the incidental soil movement from excavation, such as the soil that is disturbed when dirt is shoveled, or the back-spill that comes off a bucket and falls into the same place from which it was removed." activities involving only "incidental fallback" do not require a Section 404 permit.

Sidecasting, which involves placing removed soil alongside a ditch, and sloppy disposal practices involving significant discharges into waters, are subject to Section 404, further if any materials are disposed of within waters the activity becomes regulated. If material is stockpiled within waters before removal this becomes a regulated activity.

Further activates that take place above of the Ordinary High Water Mark of an aquatic resource are not regulated by the Corps. The fact that your project is not regulated by the Corps does not obviate the need to obtain other Federal, state, or local authorizations required by law.

If you think that your project does not fit the above description of clean excavation please contact Corps Regulatory as early as possible. Failures to disclose discharges may result in a violation of the Clean Water Act. Legislation provides for administrative fines as well as civil or criminal penalties for violations of the Clean Water Act and/or civil or criminal penalties for violations of the Rivers and Harbors Act of 1899. Violations of the Clean Water Act are punishable by civil or criminal fines of up to $25,000 per day of violation and/or imprisonment for up to one year.

If you are unsure if an activity may or may not be regulated we should schedule a site visit at your earliest convince.

V/r,
Stephen

Stephen R Roethle
Regulatory Project Manager (Biologist)
U.S. Army Corps of Engineers Regulatory Division
4101 Jefferson Plz NE, Albuquerque, NM 87109
Office: (505) 342-3280
Cell: (505) 423-3003

-----Original Message-----
From: Hummel, Ondrea [mailto:Ondrea.Hummel@tetratech.com]
Sent: Wednesday, March 4, 2020 1:48 PM

To: Roethle, Stephen R CIV USARMY CESPA (USA) <Stephen.R.Roethle@usace.army.mil>
Cc: Cody Walker (poi36004@isletapueblo.com) <poi36004@isletapueblo.com>; poi36002@isletapueblo.com
Subject: [Non-DoD Source] SPA-2019-00311-SRR (Pueblo of Isleta - Bosque & Riverine (B&R) Restoration and Implementation Plan Update

Hi Stephen, attached is a set of maps of the sites that were double checked on the ground per our discussion on February 13, 2020.

a) Sites were inventoried to determine if wetland indicators were present.

b) There was only one site with 'potential' hydric indicators. This is an attached bar (shown on page 2; appears more island like in the photo). The work at this site would be limited to just hand removal of invasive species and no terracing/excavation would take place.

c) Therefore, we believe that there is not a need for a CWA permit for the project but of course are looking for your input.

Please let us know if we need to provide additional information to verify. And we're also happy to take you out to some sites to verify if you would like. Please let me know how you would like to proceed. Thank you!

Ondrea Hummel | Senior Environmental Scientist
Direct: 505-404-3131 | Cell: 505.235.6470 | Fax: 505.881.3283

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CLASSIFICATION: UNCLASSIFIED

WETLAND DETERMINATION DATA FORM

Project/Site: Pueblo of Isleta Bosque and Riverine Restoration City/County: Valencia Sampling Date: February 21, 2020

Applicant/Owner: Pueblo of Isleta State: NM Sampling Point: Bankline terrace 1.04

Investigator(s): Chris Sanderson and Alaina Pershall Lat: 3861479 Long: 344113 Datum: NAD 1983 UTM Zone 13N

Hydrophytic Vegetation Present?	Yes	No	Is the Sampled Area within a Wetland?	Yes	No
Hydric Soil Present?	Yes	No			
Wetland Hydrology Present?	Yes	No X			

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 1.04 acres)	Absolute % Cover	Dominant Indicator Species?
1. Tree of heaven (*Ailanthus altissima*)	5	FACU
2. Russian olive (*Elaeagnus angustifolia*)	15	FAC
3. coyote willow (Salix exigua)	<1	FACW
4.		
	21	= Total Cover
Sapling/Shrub Stratum (Plot size: 1.04 acres)		
1. coyote willow (*Salix exigua*)	10	FACW
2.		
3.		
4.		
5.		
	10	= Total Cover
Herb Stratum (Plot size: 1.04 acres)		
1. Sedges (*Carex spp.*)	5	OBL/FAC/FACU/FACW
2. Canadian horseweed (*Conyza canadensis*)	5	FACU
3. scratchgrass (*Muhlenbergia asperifolia*)	5	FACW
4.		
5.		
	15	= Total Cover
% Bare Ground in Herb Stratum	85	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)

Total Number of Dominant Species Across All Strata: 0 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:	
OBL species	x 1 =	
FACW species 21	x 2 =	63
FAC species 15	x 3 =	45
FACU species 10	x 4 =	40
UPL species	x 5 =	
Column Totals: 46 (A)		148 (B)

Prevalence Index = B/A = 3.2

Hydrophytic Vegetation Indicators:

Dominance Test is >50%

Prevalence Index is ≤3.0[1]

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

SOIL

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (Inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
not recorded due to lack of other indicators, lack of saturation, and minimal evidence of redox features.								
Bankline higher than test pit, almost saturated at 24 inches, <1% redox								

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

Surface Water (A1)	Salt Crust (B11)	Water Marks (B1) (**Riverine**)
High Water Table (A2)	Biotic Crust (B12)	Sediment Deposits (B2) (**Riverine**)
Saturation (A3)	Aquatic Invertebrates (B13)	Drift Deposits (B3) (**Riverine**)
Water Marks (B1) (**Nonriverine**)	Hydrogen Sulfide Odor (C1)	Drainage Patterns (B10)
Sediment Deposits (B2) (**Nonriverine**)	Oxidized Rhizospheres along Living Roots (C3)	Dry-Season Water Table (C2)
Drift Deposits (B3) (**Nonriverine**)	Presence of Reduced Iron (C4)	Crayfish Burrows (C8)
Surface Soil Cracks (B6)	Recent Iron Reduction in Tilled Soils (C6)	Saturation Visible on Aerial Imagery (C9)
Inundation Visible on Aerial Imagery (B7)	Thin Muck Surface (C7)	Shallow Aquitard (D3)
Water-Stained Leaves (B9)	Other (Explain in Remarks)	FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes	No	Depth (inches):
Water Table Present?	Yes	No	Depth (inches): greater than 24 inches
Saturation Present?	Yes	No	Depth (inches):

Wetland Hydrology Present? Yes No X

WETLAND DETERMINATION DATA FORM

Project/Site: Pueblo of Isleta Bosque and Riverine Restoration City/County: Valencia Sampling Date: February 21, 2020

Applicant/Owner: Pueblo of Isleta State: NM Sampling Point: Bankline terrace 1.07

Investigator(s): Chris Sanderson and Alaina Pershall Lat: 3865093 Long: 346444 Datum: NAD 1983 UTM Zone 13N

Hydrophytic Vegetation Present?	Yes	No	Is the Sampled Area within a Wetland? Yes No
Hydric Soil Present?	Yes	No	
Wetland Hydrology Present?	Yes	No X	

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 1.07 acres)	Absolute % Cover	Dominant Indicator Species?
1. Siberian elm (*Ulmus pumila*)	40	UPL
2. Russian olive (*Elaeagnus angustifolia*)	20	FAC
3. Coyote willow (*Salix exigua*)	10	FACW
4.		
	70	= Total Cover
Sapling/Shrub Stratum (Plot size: 1.07 acres)		
1. Russian olive (*Elaeagnus angustifolia*)	10	FAC
2. Saltcedar (*Tamarix chinensis*)	5	FAC
3.		
4.		
5.		
	15	= Total Cover
Herb Stratum (Plot size: 1.07 acres)		
1. Sedges (*Carex spp.*)	85	OBL/FAC/FACU/FACW
2. Canadian horseweed (*Conyza canadensis*)	5	FACU
3. Cattail (*Typha spp.*)	5	OBL
4.		
5.		
	95	= Total Cover
% Bare Ground in Herb Stratum 5		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 33 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	5	x 1 =	5
FACW species	95	x 2 =	190
FAC species	35	x 3 =	105
FACU species	5	x 4 =	20
UPL species	40	x 5 =	200
Column Totals:	180 (A)		520 (B)

Prevalence Index = B/A = 2.88

Hydrophytic Vegetation Indicators:

Dominance Test is >50%

Prevalence Index is ≤3.0[1]

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

SOIL

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (Inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
1-6	5YR 5/3	99	5YR 6/8	1%	CS	PL		
6-12	5YR 3/1	100						
18-24	5YR 3/1	100						

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- Surface Water (A1)
- High Water Table (A2)
- Saturation (A3)
- Water Marks (B1) (**Nonriverine**)
- Sediment Deposits (B2) (**Nonriverine**)
- Drift Deposits (B3) (**Nonriverine**)
- Surface Soil Cracks (B6)
- Inundation Visible on Aerial Imagery (B7)
- Water-Stained Leaves (B9)
- Salt Crust (B11)
- Biotic Crust (B12)
- Aquatic Invertebrates (B13)
- Hydrogen Sulfide Odor (C1)
- Oxidized Rhizospheres along Living Roots (C3)
- Presence of Reduced Iron (C4)
- Recent Iron Reduction in Tilled Soils (C6)
- Thin Muck Surface (C7)
- Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- Water Marks (B1) (**Riverine**)
- Sediment Deposits (B2) (**Riverine**)
- Drift Deposits (B3) (**Riverine**)
- Drainage Patterns (B10)
- Dry-Season Water Table (C2)
- Crayfish Burrows (C8)
- Saturation Visible on Aerial Imagery (C9)
- Shallow Aquitard (D3)
- FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes	No	Depth (inches):
Water Table Present?	Yes	No	Depth (inches):
Saturation Present?	Yes	No	Depth (inches): 18 inches

Wetland Hydrology Present? Yes No X

WETLAND DETERMINATION DATA FORM

Project/Site: Pueblo of Isleta Bosque and Riverine Restoration City/County: Valencia Sampling Date: February 21, 2020

Applicant/Owner: Pueblo of Isleta State: NM Sampling Point: Bankline terrace 1.38

Investigator(s): Chris Sanderson and Alaina Pershall Lat: 3861061 Long:343574 Datum:NAD 1983 UTM Zone 13N

Hydrophytic Vegetation Present?	Yes	No	Is the Sampled Area within a Wetland? Yes No
Hydric Soil Present?	Yes	No	
Wetland Hydrology Present?	Yes	No X	

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 1.38 acres)	Absolute % Cover	Dominant Indicator Species?
1. NA		
2.		
3.		
4.		
		= Total Cover
Sapling/Shrub Stratum (Plot size: 1.38 acres)		
1. coyote willow (*Salix exigua*)	30	FACW
2. ravennagrass (*Saccharum ravennae*)	10	FAC
3.		
4.		
5.		
	40	= Total Cover
Herb Stratum (Plot size: 1.38 acres)		
1. Sedges (*Carex spp.*)	75	OBL/FAC/FACU/FACW
2. Canadian horseweed (*Conyza canadensis*)	5	FACU
3. squirreltail (*Elymus elymoides*)	5	FACU
4.		
5.		
	80	= Total Cover
% Bare Ground in Herb Stratum	20	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:	
OBL species	x 1 =	
FACW species 105	x 2 =	210
FAC species 10	x 3 =	30
FACU species 10	x 4 =	80
UPL species	x 5 =	
Column Totals: 125 (A)		320 (B)

Prevalence Index = B/A = 2.56

Hydrophytic Vegetation Indicators:

Dominance Test is >50%

Prevalence Index is ≤3.0[1]

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

SOIL

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (Inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
not recorded due to lack of other indicators, lack of saturation, and no evidence of redox features.								

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

Surface Water (A1)	Salt Crust (B11)	Water Marks (B1) (**Riverine**)
High Water Table (A2)	Biotic Crust (B12)	Sediment Deposits (B2) (**Riverine**)
Saturation (A3)	Aquatic Invertebrates (B13)	Drift Deposits (B3) (**Riverine**)
Water Marks (B1) (**Nonriverine**)	Hydrogen Sulfide Odor (C1)	Drainage Patterns (B10)
Sediment Deposits (B2) (**Nonriverine**)	Oxidized Rhizospheres along Living Roots (C3)	Dry-Season Water Table (C2)
Drift Deposits (B3) (**Nonriverine**)	Presence of Reduced Iron (C4)	Crayfish Burrows (C8)
Surface Soil Cracks (B6)	Recent Iron Reduction in Tilled Soils (C6)	Saturation Visible on Aerial Imagery (C9)
Inundation Visible on Aerial Imagery (B7)	Thin Muck Surface (C7)	Shallow Aquitard (D3)
Water-Stained Leaves (B9)	Other (Explain in Remarks)	FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes	No	Depth (inches):
Water Table Present?	Yes	No	Depth (inches): greater than 24 inches
Saturation Present?	Yes	No	Depth (inches):

Wetland Hydrology Present? Yes No X

WETLAND DETERMINATION DATA FORM

Project/Site: Pueblo of Isleta Bosque and Riverine Restoration City/County: Valencia Sampling Date: February 21, 2020

Applicant/Owner: Pueblo of Isleta State: NM Sampling Point: Bankline Terrace 2.03

Investigator(s): Chris Sanderson and Alaina Pershall Lat: 3862743 Long: 345271 Datum: NAD 1983 UTM Zone 13N

Hydrophytic Vegetation Present?	Yes	No	Is the Sampled Area within a Wetland? Yes No
Hydric Soil Present?	Yes	No	
Wetland Hydrology Present?	Yes X	No	

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 2.03 acres)	Absolute % Cover	Dominant Indicator Species?
1. Goodding's willow (*Salix gooddingii*)	5	FACW
2. Cottonwood (*Populus deltoides*)	20	FAC
3. Russian olive (*Elaeagnus angustifolia*)	25	FAC
4.		
	45	= Total Cover
Sapling/Shrub Stratum (Plot size: 2.03 acres)		
1. coyote willow (*Salix exigua*)	<1%	FACW
2.		
3.		
4.		
5.		
	<1	= Total Cover
Herb Stratum (Plot size: 2.03 acres)		
1. Sedges (*Carex spp.*)	5	OBL/FAC/FACU/FACW
2. ravennagrass (*Saccharum ravennae*)	5	FAC
3. smooth horsetail (*Equisetum laevigatum*)	<1%	FACW
4.		
5.		
	11	= Total Cover
% Bare Ground in Herb Stratum 90		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)

Total Number of Dominant Species Across All Strata: 0 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:	
OBL species	x 1 =	
FACW species 12	x 2 =	24
FAC species 45	x 3 =	135
FACU species	x 4 =	
UPL species	x 5 =	
Column Totals: 57 (A)		159 (B)

Prevalence Index = B/A = 2.78

Hydrophytic Vegetation Indicators:

Dominance Test is >50%

Prevalence Index is ≤3.0[1]

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

SOIL

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (Inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
not recorded due to lack of other indicators, lack of saturation, and no evidence of redox features.								

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

Surface Water (A1)	Salt Crust (B11)	Water Marks (B1) (**Riverine**)
High Water Table (A2)	Biotic Crust (B12)	Sediment Deposits (B2) (**Riverine**)
Saturation (A3)	Aquatic Invertebrates (B13)	Drift Deposits (B3) (**Riverine**)
Water Marks (B1) (**Nonriverine**)	Hydrogen Sulfide Odor (C1)	Drainage Patterns (B10)
Sediment Deposits (B2) (**Nonriverine**)	Oxidized Rhizospheres along Living Roots (C3)	Dry-Season Water Table (C2)
Drift Deposits (B3) (**Nonriverine**)	Presence of Reduced Iron (C4)	Crayfish Burrows (C8)
Surface Soil Cracks (B6)	Recent Iron Reduction in Tilled Soils (C6)	Saturation Visible on Aerial Imagery (C9)
Inundation Visible on Aerial Imagery (B7)	Thin Muck Surface (C7)	Shallow Aquitard (D3)
Water-Stained Leaves (B9)	Other (Explain in Remarks)	FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes	No	Depth (inches):
Water Table Present?	Yes	No	Depth (inches): greater than 24 inches
Saturation Present?	Yes	No	Depth (inches):

Wetland Hydrology Present? Yes X No

WETLAND DETERMINATION DATA FORM

Project/Site: Pueblo of Isleta Bosque and Riverine Restoration City/County: Valencia Sampling Date: February 21, 2020

Applicant/Owner: Pueblo of Isleta State: NM Sampling Point: Bankline terrace 2.03

Investigator(s): Chris Sanderson and Alaina Pershall Lat: 3862743 Long: 345271 Datum: NAD 1983 UTM Zone 13N

Hydrophytic Vegetation Present?	Yes	No	Is the Sampled Area within a Wetland?	Yes	No
Hydric Soil Present?	Yes	No			
Wetland Hydrology Present?	Yes X	No			

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 2.03 acres)	Absolute % Cover	Dominant Indicator Species?
1. Russian olive (*Elaeagnus angustifolia*)	20	FAC
2. coyote willow (*Salix exigua*)	25	FACW
3.		
4.		
	45	= Total Cover
Sapling/Shrub Stratum (Plot size: 2.03 acres)		
1.		
2.		
3.		
4.		
5.		
		= Total Cover
Herb Stratum (Plot size: 2.03 acres)		
1. Canadian horseweed (*Conyza canadensis*)	5	FACU
2. Sedges (*Carex spp.*)	5	OBL/FAC/FACU/FACW
3. ravennagrass (*Saccharum ravennae*)	5	FAC
4.		
5.		
	15	= Total Cover
% Bare Ground in Herb Stratum 80		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)

Total Number of Dominant Species Across All Strata: 0 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:	
OBL species	x 1 =	
FACW species 30	x 2 =	60
FAC species 25	x 3 =	75
FACU species 5	x 4 =	20
UPL species	x 5 =	
Column Totals: 60 (A)		155 (B)

Prevalence Index = B/A = 2.58

Hydrophytic Vegetation Indicators:

Dominance Test is >50%

Prevalence Index is ≤3.0[1]

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

SOIL

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (Inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
not recorded due to lack of other indicators, lack of saturation, and minimal evidence of redox features.								
Bankline higher than test pit, almost saturated at 24 inches, <1% redox								

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

Surface Water (A1)	Salt Crust (B11)	Secondary Indicators (2 or more required)
High Water Table (A2)	Biotic Crust (B12)	Water Marks (B1) (**Riverine**)
Saturation (A3)	Aquatic Invertebrates (B13)	Sediment Deposits (B2) (**Riverine**)
Water Marks (B1) (**Nonriverine**)	Hydrogen Sulfide Odor (C1)	Drift Deposits (B3) (**Riverine**)
Sediment Deposits (B2) (**Nonriverine**)	Oxidized Rhizospheres along Living Roots (C3)	Drainage Patterns (B10)
Drift Deposits (B3) (**Nonriverine**)	Presence of Reduced Iron (C4)	Dry-Season Water Table (C2)
Surface Soil Cracks (B6)	Recent Iron Reduction in Tilled Soils (C6)	Crayfish Burrows (C8)
Inundation Visible on Aerial Imagery (B7)	Thin Muck Surface (C7)	Saturation Visible on Aerial Imagery (C9)
Water-Stained Leaves (B9)	Other (Explain in Remarks)	Shallow Aquitard (D3)
		FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes	No	Depth (inches):	
Water Table Present?	Yes	No	Depth (inches): greater than 24 inches	
Saturation Present?	Yes	No	Depth (inches):	Wetland Hydrology Present? Yes X No

WETLAND DETERMINATION DATA FORM

Project/Site: Pueblo of Isleta Bosque and Riverine Restoration City/County: Valencia Sampling Date: February 21, 2020

Applicant/Owner: Pueblo of Isleta State: NM Sampling Point: Bankline Terrace 2.89

Investigator(s): Chris Sanderson and Alaina Pershall Lat: 3865500 Long: 346573 Datum: NAD 1983 UTM Zone 13N

Hydrophytic Vegetation Present?	Yes	No	Is the Sampled Area within a Wetland?	Yes	No
Hydric Soil Present?	Yes	No			
Wetland Hydrology Present?	Yes	No X			

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 2.89 acres)	Absolute % Cover	Dominant Indicator Species?
1. Siberian elm (*Ulmus pumila*)	15	UPL
2. Russian olive (*Elaeagnus angustifolia*)	5	FAC
3.		
4.		
	20	= Total Cover
Sapling/Shrub Stratum (Plot size: 2.89 acres)		
1. coyote willow (*Salix exigua*)	10	FACW
2.		
3.		
4.		
5.		
	10	= Total Cover
Herb Stratum (Plot size: 2.89 acres)		
1. Sedges (*Carex spp.*)	80	OBL/FAC/FACU/FACW
2.		
3.		
4.		
5.		
	80	= Total Cover
% Bare Ground in Herb Stratum		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 1 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:	
OBL species	x 1 =	
FACW species 90	x 2 =	180
FAC species 5	x 3 =	15
FACU species	x 4 =	
UPL species 15	x 5 =	75
Column Totals: 110 (A)		270 (B)

Prevalence Index = B/A = 2.45

Hydrophytic Vegetation Indicators:

Dominance Test is >50%

Prevalence Index is ≤3.0[1]

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

SOIL

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (Inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
not recorded due to lack of other indicators, lack of saturation, and no evidence of redox features.								

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

Surface Water (A1)	Salt Crust (B11)	Water Marks (B1) (**Riverine**)
High Water Table (A2)	Biotic Crust (B12)	Sediment Deposits (B2) (**Riverine**)
Saturation (A3)	Aquatic Invertebrates (B13)	Drift Deposits (B3) (**Riverine**)
Water Marks (B1) (**Nonriverine**)	Hydrogen Sulfide Odor (C1)	Drainage Patterns (B10)
Sediment Deposits (B2) (**Nonriverine**)	Oxidized Rhizospheres along Living Roots (C3)	Dry-Season Water Table (C2)
Drift Deposits (B3) (**Nonriverine**)	Presence of Reduced Iron (C4)	Crayfish Burrows (C8)
Surface Soil Cracks (B6)	Recent Iron Reduction in Tilled Soils (C6)	Saturation Visible on Aerial Imagery (C9)
Inundation Visible on Aerial Imagery (B7)	Thin Muck Surface (C7)	Shallow Aquitard (D3)
Water-Stained Leaves (B9)	Other (Explain in Remarks)	FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes	No	Depth (inches):
Water Table Present?	Yes	No	Depth (inches): greater than 24 inches
Saturation Present?	Yes	No	Depth (inches):

Wetland Hydrology Present? Yes No X

WETLAND DETERMINATION DATA FORM

Project/Site: Pueblo of Isleta Bosque and Riverine Restoration City/County: Valencia Sampling Date: February 21, 2020

Applicant/Owner: Pueblo of Isleta State: NM Sampling Point: Willow swale 1.61

Investigator(s): Chris Sanderson and Alaina Pershall Lat: 3866095 Long: 346756 Datum: NAD 1983 UTM Zone 13N

Hydrophytic Vegetation Present?	Yes	No	Is the Sampled Area within a Wetland? Yes / No
Hydric Soil Present?	Yes	No	
Wetland Hydrology Present?	Yes	No X	

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 1.61 acres)	Absolute % Cover	Dominant Indicator Species?
1. Russian olive (*Elaeagnus angustifolia*)	10	FAC
2. Siberian elm (*Ulmus pumila*)	20	UPL
3.		
4.		
	30	= Total Cover
Sapling/Shrub Stratum (Plot size: 1.61 acres)		
1. coyote willow (*Salix exigua*)	5	FACW
2.		
3.		
4.		
5.		
		= Total Cover
Herb Stratum (Plot size: 1.61 acres)		
1. annual rabbitsfoot grass (*Polypogon monspeliensis*)	5	FACW
2. ravennagrass (*Saccharum ravennae*)	5	FAC
3. vine mesquite (*Panicum obtusum*)	20	FAC
4. knot weed (*Polygonum persicaria*)	5	FACW
5. Canadian horseweed (*Conyza canadensis*)	20	FACU
dead rushes (*Schoenoplectus spp.*) OBL	30	85 = Total Cover
% Bare Ground in Herb Stratum 15		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 1 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	30	x 1 =	30
FACW species	15	x 2 =	30
FAC species	35	x 3 =	105
FACU species	20	x 4 =	80
UPL species	20	x 5 =	100
Column Totals:	120 (A)		(B)

Prevalence Index = B/A = 2.87

Hydrophytic Vegetation Indicators:

Dominance Test is >50%

Prevalence Index is ≤3.0[1]

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

SOIL

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (Inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
not recorded due to lack of other indicators, lack of saturation, and no evidence of redox features.								
probably saturated at times of the year during high flow								
small patches of *Anemopsis californica* OBL								

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- Surface Water (A1)
- High Water Table (A2)
- Saturation (A3)
- Water Marks (B1) (**Nonriverine**)
- Sediment Deposits (B2) (**Nonriverine**)
- Drift Deposits (B3) (**Nonriverine**)
- Surface Soil Cracks (B6)
- Inundation Visible on Aerial Imagery (B7)
- Water-Stained Leaves (B9)
- Salt Crust (B11)
- Biotic Crust (B12)
- Aquatic Invertebrates (B13)
- Hydrogen Sulfide Odor (C1)
- Oxidized Rhizospheres along Living Roots (C3)
- Presence of Reduced Iron (C4)
- Recent Iron Reduction in Tilled Soils (C6)
- Thin Muck Surface (C7)
- Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- Water Marks (B1) (**Riverine**)
- Sediment Deposits (B2) (**Riverine**)
- Drift Deposits (B3) (**Riverine**)
- Drainage Patterns (B10)
- Dry-Season Water Table (C2)
- Crayfish Burrows (C8)
- Saturation Visible on Aerial Imagery (C9)
- Shallow Aquitard (D3)
- FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes	No	Depth (inches):
Water Table Present?	Yes	No	Depth (inches): greater than 24 inches
Saturation Present?	Yes	No	Depth (inches):

Wetland Hydrology Present? Yes No X