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**Environmental Assessment
for the
Rock Lake State Fish Hatchery
Expansion Project, Phase II,
Guadalupe County, New Mexico**

14 December 2015

Prepared for



New Mexico Department of Game and Fish
Fisheries Management Division



U.S. Fish and Wildlife Service

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1.0 PURPOSE OF AND NEED FOR THE PROJECT

1.1 Introduction

The U.S. Fish and Wildlife Service (Service), in cooperation with the New Mexico Department of Game and Fish (Game and Fish), has prepared this Environmental Assessment (EA) to analyze potential effects to physical, biological, and cultural resources and socioeconomic conditions that may result from expansion of the Rock Lake State Fish Hatchery in Guadalupe County, New Mexico. This EA will be used by the Service to decide whether or not the expansion will be undertaken as proposed, if the proposed action requires refinement or additional mitigation measures, or if further analyses are needed through preparation of an environmental impact statement. If the proposed action is selected as described or with minimal changes and no further environmental analyses are needed, a Finding of No Significant Impact will be prepared.

Funds for this project would be provided through a federal aid program managed by the U.S. Fish and Wildlife Service Division of Wildlife and Sport Fish Restoration and New Mexico state legislative funding. Therefore, the proposal is subject to the National Environmental Policy Act (NEPA) provisions to analyze potential environmental effects that may result from the proposed action. This EA has been prepared pursuant to the requirements of the National Environmental Policy Act of 1969 (NEPA) as implemented by the Council on Environmental Quality regulations (40 C.F.R. 1500, et seq.), Department of Interior NEPA procedures. The EA also incorporates other federal, state, and local environmental policies and regulations.

1.2 Proposed Action

The Rock Lake State Fish Hatchery (hereafter referred to as “the hatchery”) is located adjacent to the Pecos River in Guadalupe County, New Mexico (Figure 1). The facility is approximately three miles south of downtown Santa Rosa, New Mexico on River Road (County Road 3Be; Figure 2). The Service and Game and Fish propose to complete expansion of the hatchery, which was initiated approximately 10 years ago, to make it suitable for raising and producing warm-water fish species. The hatchery historically raised cold-water fish species such as rainbow trout. After acquiring an additional 140 acre-feet of water rights and approximately 30 acres of undeveloped land adjacent to the existing hatchery property, Game and Fish in 2006 began Phase I renovations to provide the facilities and capability for spawning and rearing of warm- and cool-water fish species including catfish, bass, walleye, bluegill, tiger muskie, and crappie. Phase I of the expansion project included construction of a one-acre settling pond, 11 one-acre warm-water fish rearing ponds, and raceway covering (Figure 3).

Figure 1. Location of the Rock Lake State Fish Hatchery project area in central Guadalupe County, New Mexico.

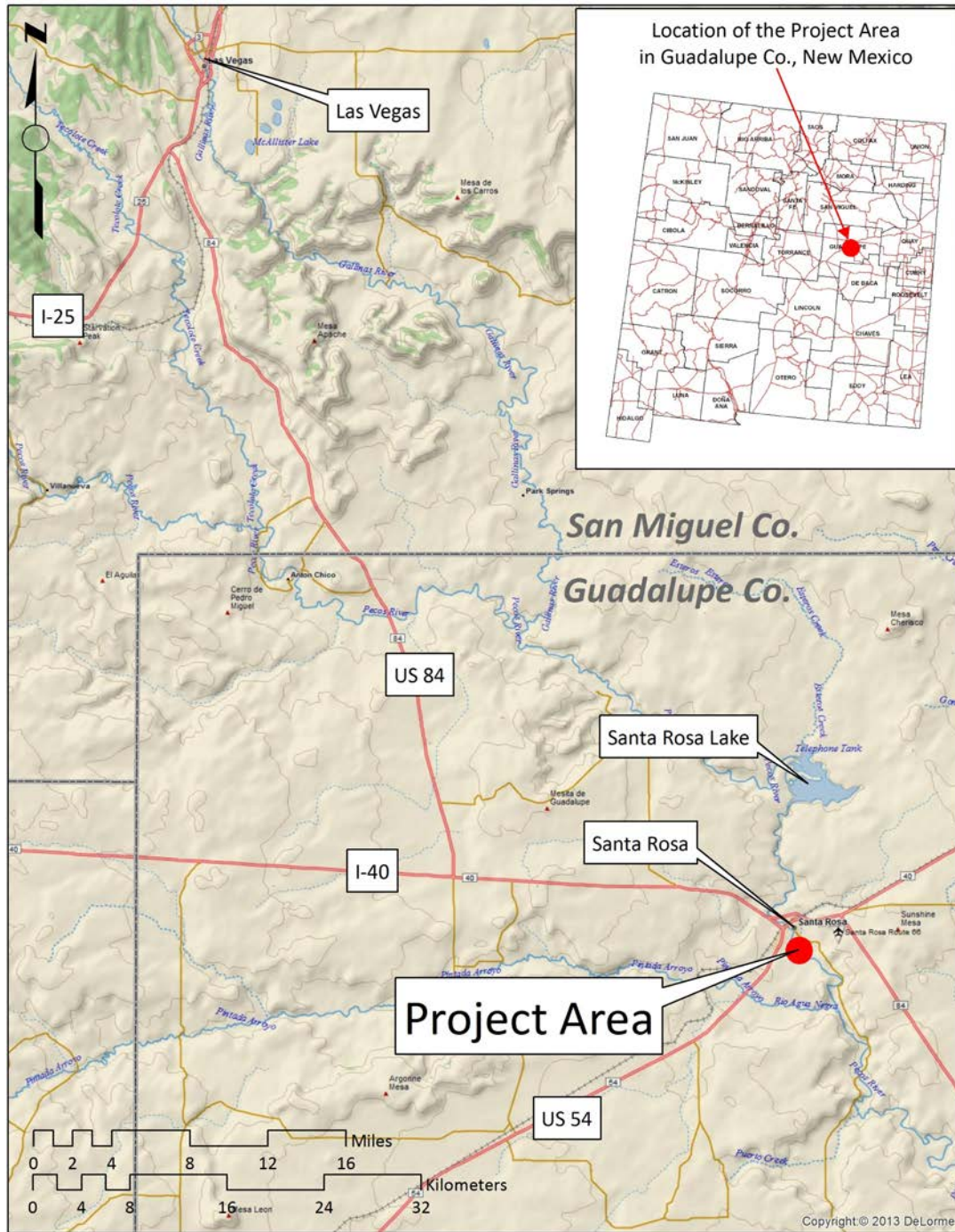


Figure 2. Vicinity map of the Rock Lake State Fish Hatchery project area. The approximate center of the project area is located at 34° 54' 45" N latitude, 104° 40' 20" W longitude (North American Datum of 1983), and 529949 meters E, 3863384 meters N (UTM Zone 13 North, North American Datum of 1983; Figure 2). The project area is located in T.8 N, R. 21 E, Section 13, SW 1/4, and can be located on the Santa Rosa, New Mexico, 7.5-minute U.S. Geological Survey topographic quadrangle (1963, map number 34104-H6-TF-024, DMA 5053 I NW - Series V881).

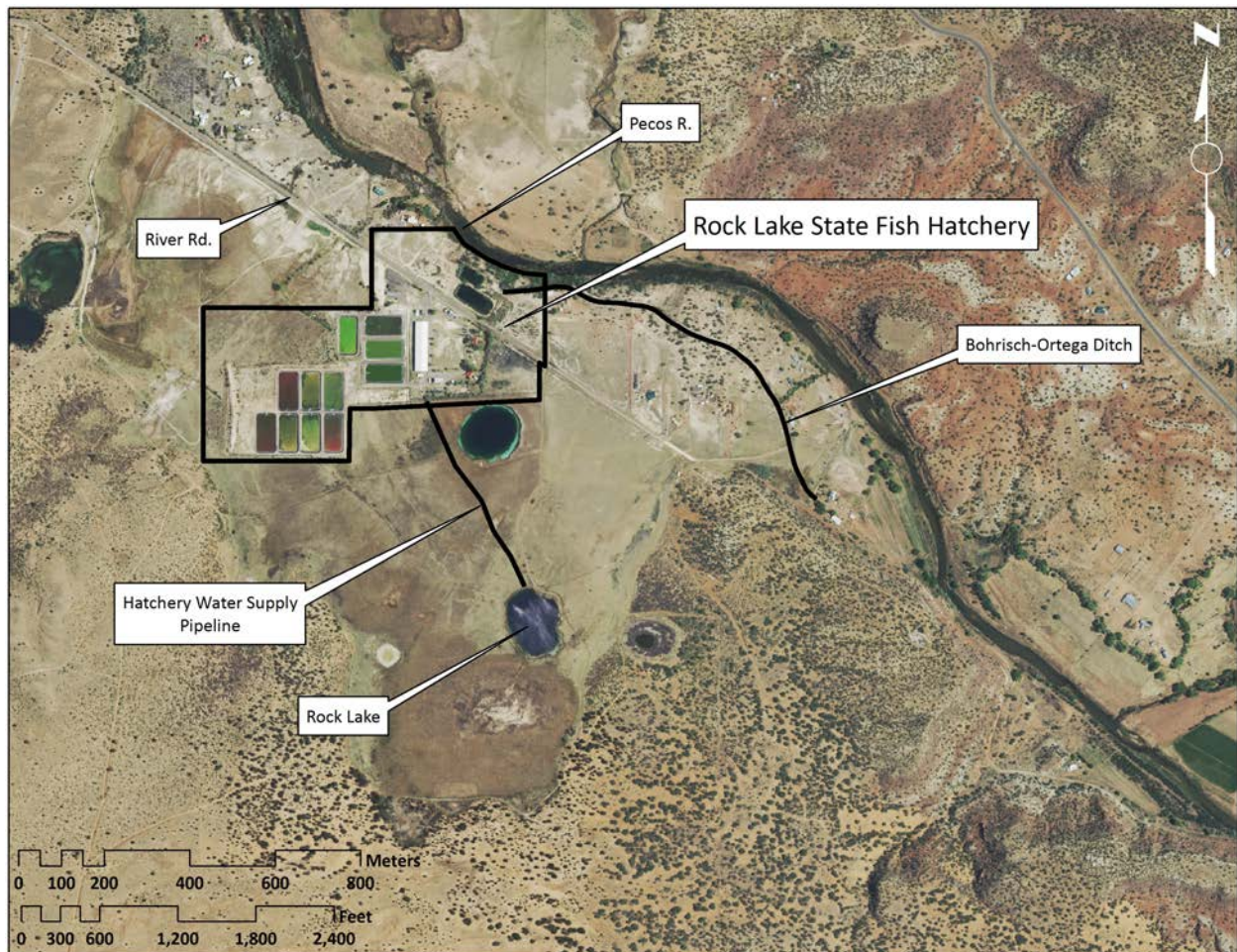
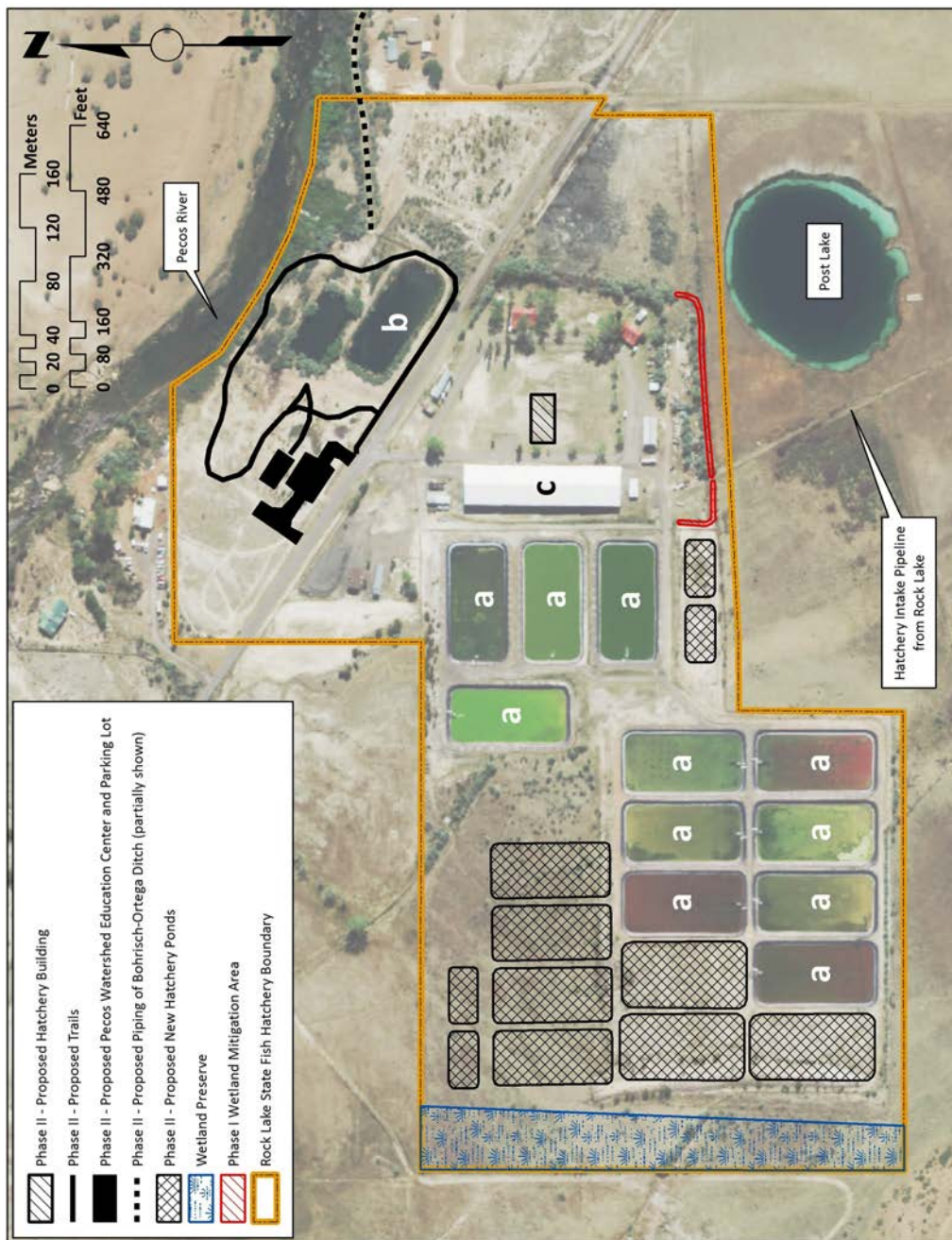


Figure 3. Phase I and II elements of the Rock Lake State Fish Hatchery expansion project. Construction of the Phase I elements was initiated in 2006 and they are existing at the site. Phase I elements are labeled as: **a** = warm-water fish rearing ponds; **b** = settling pond; and **c** = raceway cover. Phase II elements are shown in the legend. The entire alignment of the Bohrisch-Ortega Ditch is shown in Figure 2.



Phase II would complete the remaining elements the expansion project, which includes an additional seven warm-water fish rearing ponds, four small bass ponds, a pipe to convey outflow of the cold-water settling pond to inflow of the warm-water settling pond, a new hatchery building, and the new Pecos Watershed Environmental Education Center (Figure 3). Excavated material not used in construction would be hauled off-site for disposal. All ponds would be lined with impermeable membrane. Additionally, placing approximately 3,227 feet of the open hatchery outfall ditch (which is also the Bohrisch-Ortega Ditch) in a closed pipe would be undertaken. The volume of water currently drawn from Rock Lake for hatchery operations would remain unchanged. The project is expected to begin in March 2016 and would be completed by October 2016.

1.3 Project Background

The Rock Lake State Fish Hatchery began operation in 1965 on an approximately 40-acre site next to the Pecos River. The original purpose of the hatchery was for raising cold-water fish species, primarily rainbow trout, for stocking waters in eastern New Mexico. The facility now supplies rainbow trout for stocking throughout New Mexico.

In 2002, Game and Fish purchased a 30-acre parcel adjacent to the west boundary of the existing hatchery with plans to expand the hatchery to include rearing and production of warm-water fish (Figure 3). That year, Game and Fish also purchased 140 acre-feet of water rights for operation of the warm-water hatchery components. An EA for the project was completed in 2005 (Blue Earth Ecological Consultants, Inc., 2005). As part of the EA development, which included Clean Water Act permitting, the U.S. Army Corps of Engineers made a jurisdictional determination that included an approximately 3.58-acre wetland area along the western boundary of the hatchery site. This area was fenced by Game and Fish and was designated as a wetland preserve at the hatchery site. Construction plans were altered in 2005 to protect this wetland preserve. The original plans specified 20 one-acre warm-water fish rearing ponds. The total number of ponds was reduced and revised to 14 one-acre ponds, four 0.9-acre ponds, and four 0.25-acre bass ponds to avoid impacts to the wetland preserve. Additional mitigation was implemented to compensate for wetland impacts associated with construction of Phase I elements. This mitigation consisted of 0.15 acres and was accomplished by creating two shallow drainage swales approximately 10 ft wide along the south boundary of the hatchery on each side of the intake pipeline (Figure 3).

The hatchery expansion project was phased to accommodate funding availability. In 2006-2007, Phase I of the project was undertaken with construction of 11 warm-water rearing ponds and one settling pond, and the 18 raceways were covered. The hatchery has been operating the 11 new warm-water ponds since 2008. Average annual fish production from these ponds consists of: 1) 15,000 15-inch and 150,000 three-to-four-inch channel catfish; 2) 20,000,000 walleye fry up to one-half inch; 3) 30,000 one- to one-and-a-half-inch largemouth bass; and 4) 10,000 one-inch tiger muskie.

Existing facilities at the hatchery include 18 covered raceways, 11 one-acre warm-water fish production ponds, buildings for operating the water system and storing supplies, two settling ponds, visitor parking and an interpretive sign, two permanent homes and several mobile homes (Figure 3). The hatchery has five full-time employees. Water for operation of the hatchery is supplied from Rock Lake, which is about 0.3 miles

south of the hatchery. Water arrives at the hatchery via a buried pipeline. The hatchery discharges water into the concrete-lined Bohrisch-Ortega Ditch at the southeastern corner of the hatchery property (Figure 3).

Because warm-water fish stocking demands exceed current hatchery production, Game and Fish continues to purchase about 32,000 pounds of catfish per year from out-of-state hatcheries to stock in several urban fisheries each summer. Game and Fish also receives up to 6,000,000 walleye fry, 500,000 catfish fry, 1,000,000 largemouth bass fry, 1,000,000 striped bass fry, and 250,000 tiger muskie fry each year from out-of-state hatcheries for stocking in various water bodies throughout the state. Purchase of these fish is contingent on their availability and the cooperation of hatcheries in other states. Game and Fish cannot control the quality, timing, or varieties of fish available from other government or commercial hatcheries. The agency also has no control over the cost of the fish purchasing program (Montgomery Watson, 1999).

1.4 Project Purpose

The purpose of the proposed action is to complete the construction of remaining components that would allow Game and Fish to conduct warm-water fish rearing and production to help meet statewide stocking demands. By constructing and operating a warm-water fish hatchery, Game and Fish would be less dependent on other states in their ability to obtain and stock warm-water fish. Game and Fish would also have greater control over the quality and varieties of fish to stock and greater management flexibility in the use of warm-water fish to satisfy the demands of New Mexico anglers.

Replacing the existing open irrigation ditch with a closed pipe is proposed to increase efficiency of water delivery and reduce the labor required to maintain water delivery to downstream irrigators. Currently, the open ditch can become clogged with tumbleweeds and other debris, causing the ditch to overflow and impair downstream water delivery. The open ditch also requires regular cleaning due to significant algae buildup. Cleaning the ditch detracts from time available for hatchery staff to dedicate to fish-rearing activities and other hatchery maintenance. Enclosing the ditch in a pipe will address both of these issues and thereby increase overall operational efficiency.

The new environmental education center and nature trails are proposed for two purposes. First, the facility would provide watershed education to the general public (*e.g.* adult visitors as well as school groups). In the longer term, it is envisioned that the facility would evolve as part of a potential partnership between Game and Fish and Luna Community College to educate and train students in aquatic science and fish-rearing, thereby helping to diversify the workforce in the Santa Rosa area.

The pipe connection from the outflow of the cold-water settling pond to the inflow of the warm-water settling pond would reduce high concentrations of total dissolved solids that develop in the warm-water settling pond due to growth of algae. Effluent from the warm-water facilities typically contains high nutrient levels that foster the development of phytoplankton, which is algae suspended in the water. Diluting this water with settled effluent from the cold-water settling pond, which has much lower nutrient concentrations, would enable the hatchery to improve effluent water quality and consistently meet discharge permit criteria.

1.5 Related Laws, Authorizations, and Plans

Game and Fish has a priority water right dating to 1875 for 5.52 acre-feet per year (State Engineer permit number 01829). Storage for this right is limited to 4,342 acre-feet with a maximum surface area of 0.966 acres. The full amount of water under this right is utilized for production of cold-water fish. In 2002, Game and Fish acquired a water right for an additional 140 acre-feet per year to enable operation of the expanded warm-water hatchery facilities. Game and Fish has an agreement with the Borisch-Casaus Ditch Association to deliver 6.65 cubic feet per second to the ditch year round.

1.6 Scoping Summary

A project mailing list of 60 neighboring property owners, government officials, and other potentially-interested individuals and organizations was developed by Game and Fish. A project scoping letter was mailed on 24 March 2015 to all names on the mailing list. The letter outlined major elements of the proposal and requested comments and concerns to be submitted by 24 April 2015.

A flyer announcing a public information meeting to be held on 15 April 2015 was also included with the scoping letter. The public meeting was conducted in an open house format with aerial photo and engineering plan displays of existing and proposed facilities. Game and Fish staff were on hand to discuss the proposed project. Ten individuals attended the open house.

Eleven comment forms and letters were received for the project with only three making any comment other than requesting to be retained on the project mailing list. No issues or concerns that are within the jurisdiction and decision process of Game and Fish for this project were identified. One commentor suggested development of a training program in aquaculture and fisheries in conjunction with Santa Rosa schools and Luna Community College, a suggestion that is already a purpose of the proposal. Another commentor expressed concern about the condition of the road to the hatchery (River Road) in that it is narrow, winding, and lanes are not striped, which may be a particular concern with the expectation of increased use by school buses traveling this route to the proposed environmental education center.

The full-length letter was sent by the Mayordomo of the Borisch-Casaus Ditch (a.k.a. Bohrisch-Ortega Ditch). The main concern of the ditch owners was maintaining the quantity and quality of water delivered from the hatchery to the ditch. This concern was expressed in the context of both construction of Phase II elements and continued operation of the hatchery.

1.7 Permits Required

The following permits are required for expansion and operation of the hatchery.

- The existing Clean Water Act §402 National Pollutant Discharge Elimination System (NPDES) permit for the Rock Lake State Fish Hatchery from the U.S. Environmental Protection Agency would be amended to incorporate conveyance of settled effluent from the cold-water settling pond to the warm-water settling pond under normal operations.
- Clean Water Act section 404 permit authorization from the U.S. Army Corps of Engineers.
- A Notice of Intent would be submitted electronically to the U.S. Environmental Protection Agency at least 14 calendar days prior to commencing earth-disturbing activities for coverage under the NPDES Construction General Permit.

2.0 ALTERNATIVES, INCLUDING THE NO ACTION ALTERNATIVE

This chapter discusses potential actions (alternatives), identifies objectives of the proposed action, and summarizes the environmental consequences of the alternatives.

2.1 Alternatives Considered but Eliminated from Detailed Evaluation

Several alternatives for producing and raising warm-water fish species at the hatchery were studied at the feasibility level in the early project planning stages. A 1999 feasibility study screened approximately nine locations as potential sites for a warm-water hatchery (Montgomery Watson, 1999). This feasibility study included four sites in Socorro, New Mexico, Brantley Farm in southeastern New Mexico, a site at Elephant Butte State Park, a site at New Mexico State University in Las Cruces, New Mexico, and two sites in Santa Rosa including the Rock Lake State Fish Hatchery. The feasibility study recommended the two Santa Rosa sites for further investigation (Montgomery Watson, 1999). The remaining sites were eliminated from further analysis as they were technically or financially infeasible.

A second study was commissioned by Game and Fish in 2000 to further compare the two sites at Santa Rosa, which were located near Blue Hole and at the Rock Lake State Fish Hatchery. The Rock Lake State Fish Hatchery site was recommended as the best site for the proposed facilities based on several factors including land ownership, adjacent land use, water quality and quantity, and topography (FishPro, 2000).

A draft design was developed in 2004 that included 20 one-acre fish rearing ponds, which utilized most of the new 30-acre addition to the hatchery. After a wetland determination by the U.S. Army Corps of Engineers identified approximately 3.58 acres of wetlands on the western project boundary that would be affected by this design, the warm-water hatchery expansion project design was revised to avoid impacts to those wetlands.

2.2 No Action Alternative

This alternative would not expand or change the existing facilities at the hatchery. The existing facilities would be utilized and current operations would continue. Without completion of Phase II of the expansion, Game and Fish would be able to raise only a portion of the warm-water fish that are needed in the state and would continue to rely on purchases from out-of-state resources when available.

2.3 Proposed Action

Phase II of the project would consist of construction of the remaining elements of the proposed hatchery expansion project for spawning and rearing of warm-water fish species, including catfish, bass, walleye, and crappie. These remaining elements, which are shown in Figure 4, include:

- seven one-acre warm-water fish rearing ponds;
- four 0.25-acre bass ponds;
- grading of surface drainage ditches around the ponds;
- a new hatchery building;
- the Pecos Watershed Environmental Education Center and associated parking lot;
- nature trails at the education center;
- placing an approximately 3,227-ft segment of the open, concrete-lined hatchery outfall (Bohrisch-Ortega Ditch) in a closed pipe; and
- constructing a pipe connection between the warm-water and cold-water settling ponds.

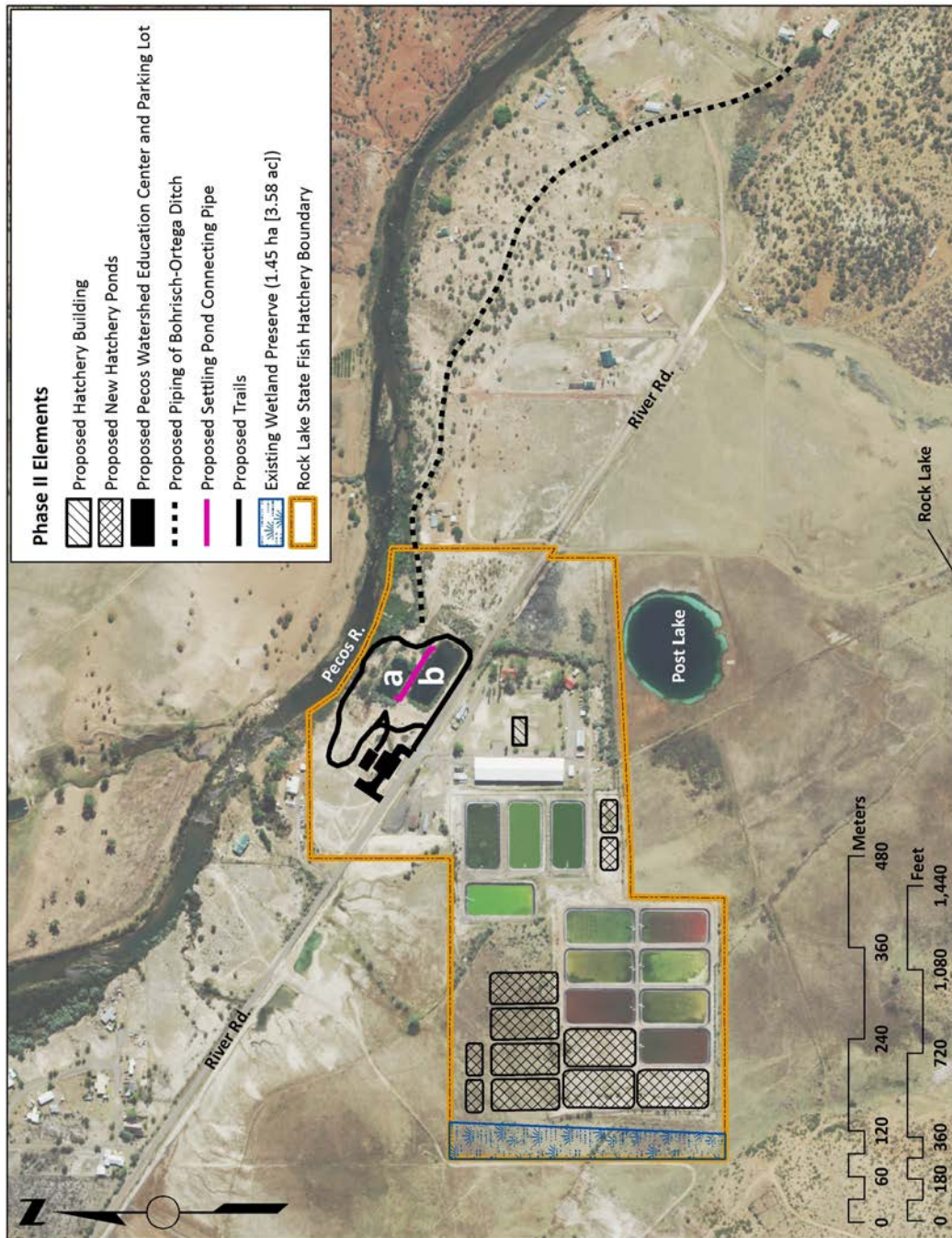
Existing water rights would be used for the proposed Phase II expansion. No additional water rights would be needed for the project. The 3.58-acre wetland preserve would be maintained in its present spatial configuration (Figure 5). Excavated material not used in construction would be hauled off-site for disposal. All ponds would be lined with impermeable membrane.

With completion of Phase II of the expansion of hatchery facilities, the hatchery anticipates producing the following approximate numbers of fish annually:

<u>Species</u>	<u>Length</u>	<u>Number</u>
channel catfish	16" - 18"	30,000
channel catfish	4" - 8"	40,000
channel catfish	3" - 4"	250,000
walleye fry	½"	10,000,000
walleye fingerlings	1" - 2"	100,000
largemouth bass	1"	500,000
largemouth bass	4" - 8"	30,000
other fry	1" - 2"	500,000

Cost of construction for the entire project would not exceed \$6,000,000. Construction of Phase II is expected to be completed within a six-month time frame, beginning in fall of 2015. The existing warm- and cold-water fish rearing facilities would continue to operate during all construction periods.

Figure 4. Plan view of the Rock Lake State Fish Hatchery project area showing proposed hatchery expansion elements for Phase II. The hatchery settling ponds are labeled as: **a** = warm-water settling pond and **b** = cold-water settling pond.



2.4 Mitigation Measures

Mitigation measures are prescribed to avoid, reduce, or compensate for adverse effects of an action on natural, cultural, and socioeconomic resources. If the proposed action is implemented, the Service and Game and Fish will also implement the following mitigation measures:

- The 3.58-acre wetland preserve on the western boundary of the hatchery property would be avoided during construction. Clean Water Act section 404 authorization would be received from the U.S. Army Corps of Engineers inadvertent placement of fill in approximately 0.21 acres of linear, jurisdictional wetlands. Game and Fish would compensate for the 0.21-acre wetland impact by creating 0.14 acres of similar wetland features on site and by enhancing 3.58 acres of wetlands on site through individual plant cut-stump treatments to control Russian olive and salt cedar.
- If any previously-unrecorded cultural resources are encountered during construction, work at that location would stop and the Service and Game and Fish archaeologists and other responsible parties would be contacted.
- To reduce temporary construction noise, construction contracts would require that construction equipment and activities comply with state and local noise control ordinances.
- Construction-related effects to air quality would be minimized by requiring the contractor to: 1) have emission control devices on all equipment; and 2) employ the use of Best Management Practices to control wind erosion, including wetting of soils within the construction zone and compliance with local soil sedimentation and erosion-control regulations. Construction and operation would conform with air quality control regulations as established by the Clean Air Act and the New Mexico Air Quality Control Act.
- Appropriate erosion and sediment controls and pollution prevention will be implemented pursuant to the requirements of the NPDES Construction General Permit. A Stormwater Pollution Prevention Plan will be developed prior to submitting the Notice of Intent. The plan will describe stormwater and sediment control measures to be implemented at the site.
- The three existing patches of Pecos sunflower would be protected from inadvertent construction impacts by installing high-visibility construction fencing around the perimeter of each patch. The fencing would be installed before construction begins and it would be removed after construction is completed.
- Impacts to 5.6 acres of potentially suitable habitat for Pecos sunflower and Great Plains ladies-tresses orchid would be reduced by attempting to establish patches of Pecos sunflower in the wetland preserve by passive means through control of saltcedar and Russian olive in the wetland preserve.

2.5 Comparison of Alternatives

Table 1 summarizes the two alternatives and the primary environmental consequences of each as a basis for comparison.

Table 1. Summary of environmental consequences by alternative.

Resource Objective or Issue	Alternative	
	No Action	Proposed Action
Surface Water and Groundwater	No change from existing conditions.	<p>Effluent discharge from the hatchery would not increase. The NPDES permit would be revised to reflect changes in management of hatchery effluent water. Conveying settled effluent water from the cold-water settling pond to the warm-water settling pond would improve the quality of hatchery effluent discharged to the ditch and Pecos River.</p> <p>Regular monitoring of effluent water quality would continue to ensure that effluent criteria are met and surface water quality is not impaired. Lining of ponds and piping of effluent to settling ponds would prevent impacts to shallow groundwater. Delivery of 6.65 cfs year-round to the Bohrisch-Ortega Ditch would continue.</p>
Soils and Vegetation	No change from existing conditions.	<p>Ground disturbance would occur over approximately 22.82 acres. Approximately 13.28 acres of Bluholl loam and 9.54 acres of Hollomex-Reeves Complex soils would be affected. Neither of these soils is unique and both are widespread in the vicinity of the project area.</p> <p>Approximately 5.6 acres of relatively undisturbed grassland vegetation and 17.22 acres of previously disturbed land (which is typically sparsely vegetated) would be affected.</p>
Wetlands	No change	Approximately 0.21 acres of jurisdictional wetlands would be filled. Impacts would be compensated by creating 0.14 acres of wetland and conducting wetland enhancement on 3.58 acres.
Wildlife and Fish	No change	Loss of approximately 5.6 acres of saltgrass and alkali sacaton grassland. This habitat is widespread in the vicinity of the project area.
Special Status Species	No change	Approximately 5.6 acres of potentially suitable habitat for Pecos sunflower and Great Plains ladies-tresses orchid would be impacted. Conservation measures would be implemented for both species.

Resource Objective or Issue	Alternative	
	No Action	Proposed Action
Cultural Resources	No change	No effect
Socioeconomic Conditions	No change	Short-term increases in purchase of goods and services at local businesses during construction. No disproportionate adverse effects on minority or low-income populations. Beneficial effect on community educational services through provision of Pecos Watershed Environmental Education Center.
Recreation	Game and Fish may be unable to obtain sufficient supply of warm-water fish to meet recreational fishing demand.	Improved ability for Game and Fish to consistently stock warm-water fish species to meet existing and future recreational fishing demands.
Noise Levels	No change	Short-term, sometimes intense increases in noise levels during construction; minor long-term increases in noise for expanded hatchery operations.
Air Quality	No change	Localized, temporary increases in dust and emissions during construction.
Traffic	No change	Truck trips to and from hatchery would double from 100 to 200 per year.

3.0 AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES

In this section, the affected environment description is limited to factors pertinent to understanding the resource issues and environmental consequences of the alternatives.

3.1 Surface Water and Groundwater

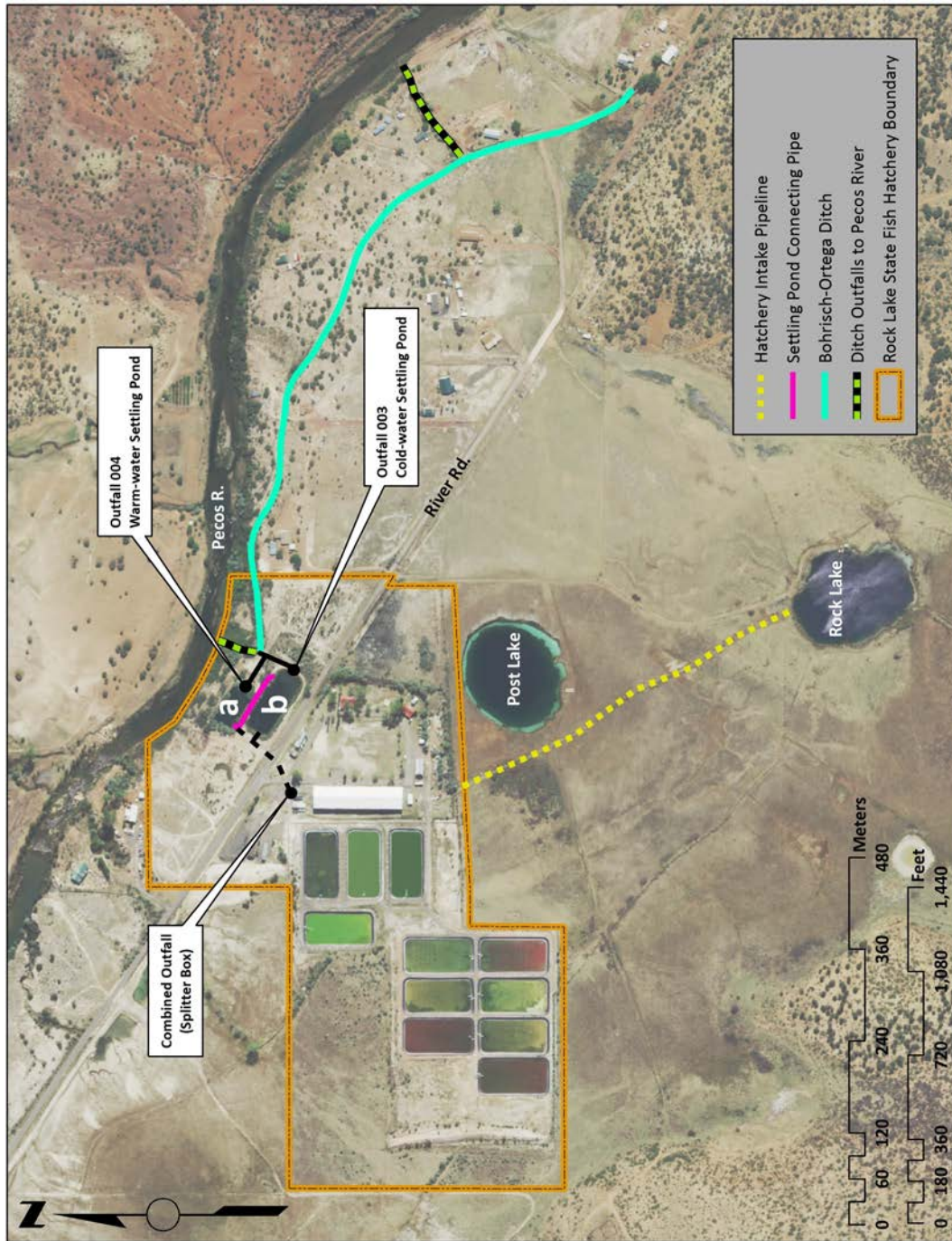
3.1.1 Existing Conditions

Water Supply Water supply for the hatchery is Rock Lake, which is located approximately 1,800 feet south of the hatchery (Figure 5). Water is conveyed from Rock Lake to the hatchery by gravity flow via a buried, 30-inch diameter pipe. The pipe is located in a 20-foot wide easement across private land. Game and Fish originally had a 5.52 acre-foot/year water right from Rock Lake, with a priority date of 1875 (New Mexico Office of the State Engineer permit number 01829). A water right for an additional 140 acre-foot/year from Rock Lake was acquired in 2002 (New Mexico Office of the State Engineer permit number 02595 with a priority date of 1865). Consequently, the hatchery has a total water right of 145.52 acre-foot/year, which is adequate to supply the existing facilities as well as the proposed Phase II elements.

Effluent Discharge Water from the hatchery is discharged to two settling ponds in the northeast portion of the site (Figure 5). These ponds allow for settling of particulate matter in the hatchery effluent before it is discharged to the Bohrisch-Ortega Ditch and then to the Pecos River. The Bohrisch-Ortega Ditch was placed into service in 1964 (Townsend, 2004). Effluent water flows from the settling ponds via one of two outfalls (003 for the cold-water settling pond and 004 for the warm-water settling pond; Figure 5) into the Bohrisch-Ortega Ditch. Currently, discharge from the two outfalls may be combined on an intermittent basis when the settling ponds are being cleaned or repaired. Any use of the combined outfall may not last for longer than a two-month period (U.S. Environmental Protection Agency, 2013). The design discharge for the existing hatchery is approximately 8 million gallons per day (New Mexico Environment Department, 2013), which is equal to a flow of approximately 12.4 cubic feet per second.

Once water is discharged from the hatchery into the Bohrisch-Ortega Ditch, it is controlled by the Borisch-Casaus Ditch Association and is conveyed to agricultural fields or is discharged to the Pecos River from either of two points along the ditch (Figure 5). The Borisch-Casaus Ditch Association signed an agreement with Game and Fish in 1963 in which they agreed to a proposal by the State Game Commission to combine the Casaus and Ortega ditch headings into one ditch that would flow through the then-new trout-rearing station (New Mexico Game Commission, 1963). This agreement also stated that Game and Fish would maintain the Bohrisch-Ortega Ditch, which is approximately 3,227 feet long (Figure 5). Game and Fish also agreed to deliver 6.65 cubic feet per second of water to the ditch year-round (M. Sloane, Game and Fish, pers. comm. 26 June 2015).

Figure 5. Hatchery water management features in the project area. Hatchery discharge settling ponds are indicated by **a** (warm-water settling pond) and **b** (cold-water settling pond).



Effluent Water Quality Game and Fish is authorized to discharge to the Bohrisch-Ortega Ditch, and subsequently to the Pecos River, under National Pollutant Discharge Elimination System (NPDES) permit number NM0030155. This permit, issued pursuant to section 402 of the Federal Clean Water Act (33 U.S.C. 1251 *et seq.*), provides limitations for pollutants in water discharged from the hatchery. The NPDES permit for the hatchery specifies that total suspended solids may not exceed 433 pounds per day or 10 milligrams per liter on a 30-day average, with a daily maximum concentration not to exceed 15 milligrams per liter. Settleable solids may not exceed 0.1 milliliters per liter on a 30-day average, with a daily maximum concentration not to exceed 0.5 milliliters per liter. The pH of the effluent water is required to be between 6.6 and 9.0 and discharged water is not allowed to contain floating solids or visible foam in greater than trace amounts.

The NPDES permit also requires Game and Fish to measure and report the 30-day average and daily maximum flow rate, the 30-day average and daily maximum total nitrogen (only at the warm-water settling pond outfall 004), daily maximum total residual chlorine, and daily maximum temperature. The toxicity of effluent water is monitored annually between April 1 and June 30 using zooplankton (*Ceriodaphnia dubia*) and fathead minnow (*Pimephales promelas*).

As described above under the “Effluent Discharge” sub-heading, water may be discharged by the Borisch-Casas Ditch Association to the Pecos River at either of two points along the ditch (Figure 5). The segment of the Pecos River that could receive discharge from the ditch is in water quality segment 211. Designated uses for this segment of the Pecos River include fish culture, irrigation, marginal warm-water aquatic life, livestock watering, wildlife habitat, and secondary contact (20 New Mexico Administrative Code 6.4.211). The discharge limitations specified in the NPDES permit for the hatchery were developed to maintain water quality and support these designated uses.

The most recent inspection of the hatchery concluded with an overall rating of satisfactory for NPDES permit verification (New Mexico Environment Department, 2013). However, beginning in May 2014, Game and Fish began detecting high concentrations of total suspended solids in effluent at Outfall 004 (the warm-water settling pond outfall; Timmons, 2014a). High concentrations of total suspended sediment persisted through 2014 and into 2015, and exceeded effluent limits set by the NPDES permit (Timmons, 2014b and 2015). The high concentrations of total suspended sediment were caused by growth of phytoplankton¹. The growth and abundance of phytoplankton in the warm-water settling pond was the result of high nutrient levels and low flow into the warm-water settling pond.

Groundwater Groundwater in the project area is relatively shallow. Ditches were excavated in the 1960s on the south and east sides of the project area when the hatchery was constructed to drain the shallow water table at the site. Shallow groundwater in the project area has a high salt concentration. Past groundwater monitoring at the hatchery showed a winter-season high water table resulting in soil saturation at the surface or shallow inundation. The monitoring showed that the water table dropped well below 1.0 ft depth at the onset of and through the growing season except at the wetland preserve where the shallow water table was

¹ Phytoplankton are microscopic algae suspended in the water.

within one foot of the surface during at least part of the growing season (New Mexico Department of Game and Fish, 2005).

3.1.2 Effects on Surface Water and Groundwater

No Action The amount of water discharged by the hatchery, and the quality of the discharged water, would not change from the existing conditions with selection of the no action alternative. Existing problems with high concentrations of total suspended sediment in the warm-water settling pond would not be addressed. The Bohrisch-Ortega Ditch would remain in its current condition as an open, concrete-lined conveyance channel.

Proposed Action The proposed action would not alter the hatchery water supply. The pipeline from Rock Lake to the hatchery would not be affected, and the amount of water drawn from Rock Lake would not change.

Construction activities would not affect surface or groundwater in the project area. Construction would not entail any discharges to surface waters. Stormwater controls would be implemented as required by the NPDES Construction General Permit. These controls would be described in the Stormwater Pollution Prevention Plan developed for the project. Stormwater controls would prevent any construction-related impacts to surface water quality of the Pecos River or any other water body in the vicinity of the project area. All earth disturbances associated with the proposed action would be located 50 feet or further from any surface water body, which complies with the buffer requirement of the NPDES Construction General Permit (§2.1.1.1a.i).

The NPDES permit for discharge of hatchery effluent would be amended to address changes in effluent management. Effluent would no longer be discharged from the cold-water settling pond directly to the ditch at Outfall 003. Instead, settled effluent would be conveyed from the cold-water settling pond to the inflow area of the warm-water settling pond by the connecting pipe (Figure 5). The addition of settled, low-nutrient effluent to the warm-water settling pond would result in lower concentrations of total suspended sediment. All hatchery effluent would be discharged to the ditch from the warm-water settling pond (Outfall 004), except during periods of settling pond maintenance. During these periods, the cold-water settling pond outfall may be used for short periods of time. The net result of these changes in effluent management would be improved quality of effluent and attainment of criteria specified in the NPDES discharge permit.

With implementation of the Proposed action, the approximately 3,227-ft segment of the Bohrisch-Ortega Ditch would be converted from an open, concrete-lined ditch to a closed pipeline. Enclosing the ditch in a pipe would not alter effluent water quality or the quantity of water delivered to the Borisch-Casaus Ditch Association. The pipeline would be installed in the existing ditch maintenance easement.

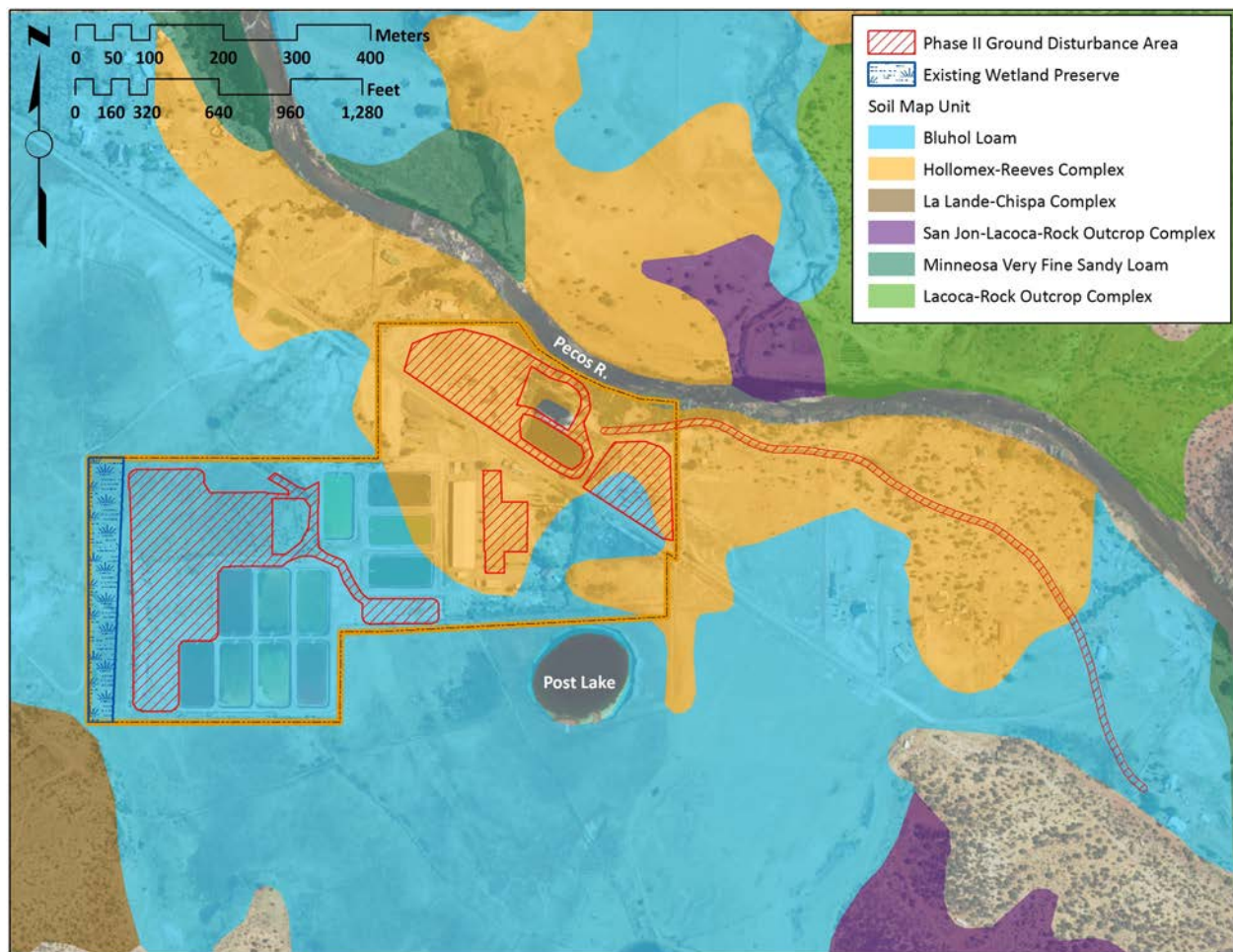
The proposed new warm-water fish rearing ponds and bass ponds would be lined with a water-impermeable membrane, the same as the existing ponds. Consequently, there would not be any impacts to shallow groundwater.

3.2 Soils and Vegetation

3.2.1 Existing Conditions

The project area is located at an elevation of approximately 4,570 feet. Soils in the project area are mapped as Hollomex-Reeves complex and Bluhol loam, 0 to 2 percent slopes (Figure 6; Natural Resources Conservation Service, 2015). Both soil types are formed in alluvium derived from gypsiferous materials. Hollomex-Reeves complex occurs on benches and hills. These soils are deep and well drained and permeability is moderate (0.6 to 2.0 inches per hour). Susceptibility of Hollomex-Reeves complex surface soils to water erosion is moderate. Bluhol loam consists of deep, poorly drained soils typically found in depressions and low terraces.

Figure 6. Soils in the project area.



A water table may be present at one to three feet from the surface during some parts of the year (Natural Resources Conservation Service, 2015). This soil is moderately permeable (0.6 to 2.0 inches per hour). Susceptibility of Bluhol loam surface soils to water erosion is moderate. Bluhol loam is a hydric soil (Natural Resources Conservation Service, 2015).

Land subject to ground disturbance in the project area consists of relatively undisturbed areas and developed or previously graded and filled areas. Undisturbed areas include sites that have a hydric-to-mesic² soil moisture regime and sites that have a mesic-to-xeric soil moisture regime. Hydric-to-mesic sites are typically saturated at the surface from winter through spring and are sub-irrigated during summer and autumn. These sites have alkaline soils with vegetation dominated by alkali sacaton (*Sporobolus airoides*), alkali muhly (*Muhlenbergia asperifolia*), saltgrass (*Distichlis spicata*), southwestern sea lavender (*Limonium limbatum*), fiddleleaf hawksbeard (*Crepis runcinata*) and scattered patches of common reed (*Phragmites australis*; Figure 7).

Mesic-to-xeric sites are typically moist to saturated at varying soil depths from winter through spring. Normally, soil moisture then declines in summer and autumn. These sites are dominated by alkali sacaton and may also have patches of Indiangrass (*Sorghastrum nutans*) and tall dropseed (*Sporobolus compositus*). Russian olive is common throughout the site in undisturbed areas. Vegetation on the travertine slopes below the settling ponds and along the western part of the Bohrisch-Ortega Ditch (Figure 7) is dominated by one-seed juniper (*Juniperus monosperma*) and Russian olive (*Elaeagnus angustifolia*), with scattered, dense thickets of maple-leaf grape (*Vitis acerifolia*).

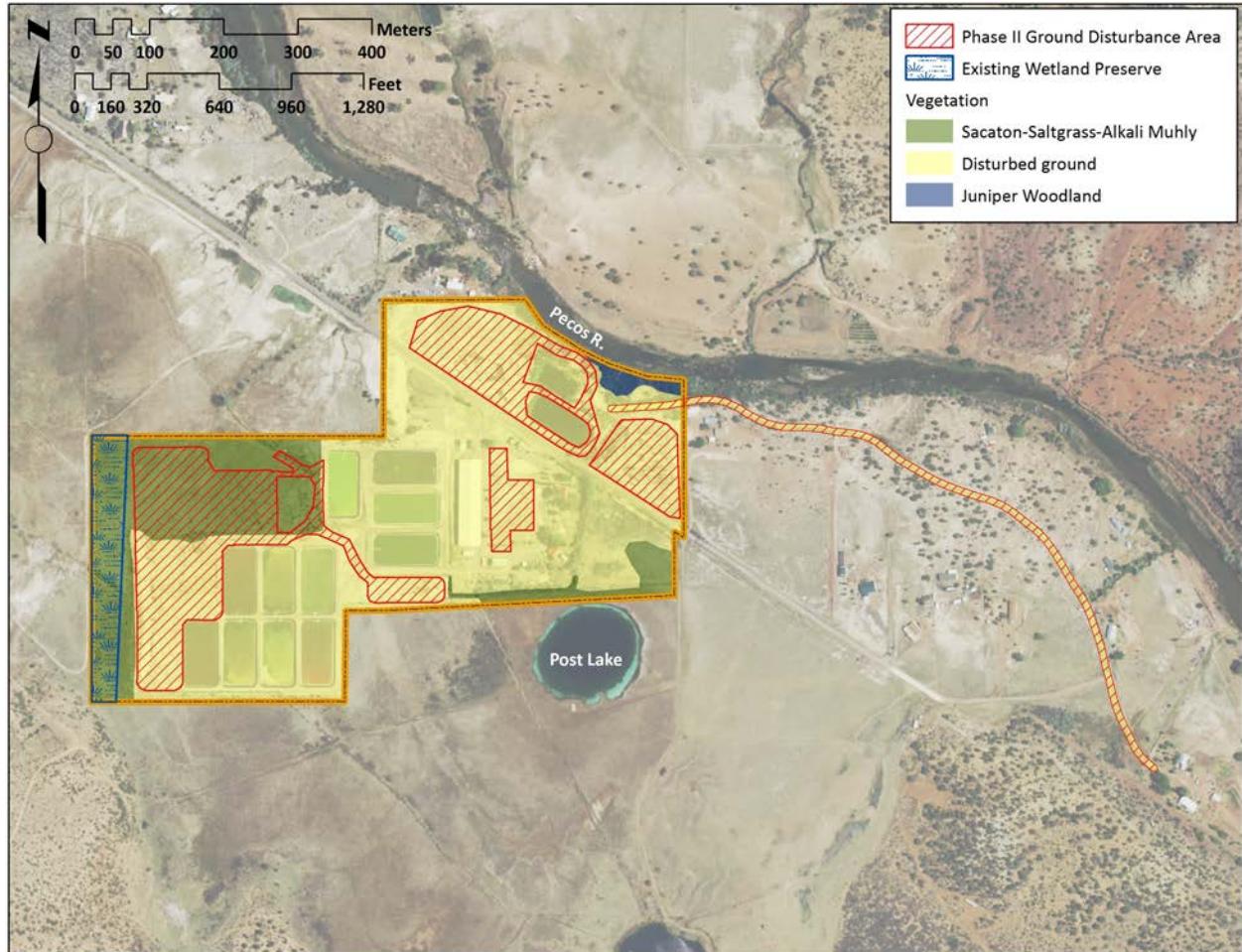
Previously disturbed sites in the project area are typically dominated by alkali sacaton, salt cedar (*Tamarix chinensis*), and saltgrass (Figure 7). The dry upland in the northeast corner north of River Road (*i.e.* the site of the proposed Pecos Watershed Environmental Education Center) is sandy gypsum soil with vegetation dominated by gyp dropseed (*Sporobolus nealleyi*), alkali sacaton and gypsum sundrops (*Oenothera hartwegii filifolia*). Some of this dry upland area has been buried by fill material. The settling ponds are ringed by woody vegetation dominated by Russian olive, salt cedar, cottonwood (*Populus deltoides*), and coyote willow (*Salix exigua*). Noxious weed species present in the project area include Russian olive and salt cedar. Special status plant species are discussed in section 3.5.

3.2.2 Effects on Soils and Vegetation

No Action The no action alternative would not result in any impacts to soils or vegetation in the project area. Salt cedar and Russian olive would persist in the project area.

² These are relative terms that describe the seasonal variation in soil moisture. In the context of this discussion, hydric means the soil is wet, or saturated. Mesic means the soil has a moderate amount of moisture, but is not saturated. Xeric means the soil contains little moisture.

Figure 7. Vegetation in the project area.



Proposed Action Implementation of the proposed action would result in earth disturbance, excavation, and placement of fills in an approximately 22.82-acre area (“Phase II Ground Disturbance Area” in Figure 6), including approximately 2.22 acres along the existing concrete-lined Bohrisch-Ortega Ditch that would be disturbed during installation of the pipeline.

Soils that would be affected in the 22.82-acre ground disturbance area would include 13.28 acres of Bluhol loam and 9.54 acres of Hollomex-Reeves Complex (Figure 6). Approximately 70 percent of the impacted soil area would be covered by Phase II elements including the new ponds, the education center and associated parking lot and trails, and the new hatchery building. The remaining 30 percent of the soil impact area would be subject to temporary disturbance. Both of the affected soils are widespread in the vicinity of the project area.

Approximately 5.6 acres of relatively undisturbed vegetation would be affected by the proposed action (Figure 7). This impact area is located in the northwest quarter of the site, where vegetation is dominated by alkali sacaton, saltgrass, Indiangrass, alkali muhly, and Russian olive. Vegetation would be removed in this impact area. The remaining approximately 17.22 acres of vegetation impacts are located in areas that were previously disturbed and are typically only sparsely vegetated, such as the two-track road adjacent to the Bohrisch-Ortega Ditch where the pipeline would be buried. An exception is the site of the proposed hatchery building, which is located on a mowed field dominated by saltgrass.

3.3 Wetlands

3.3.1 Existing Conditions

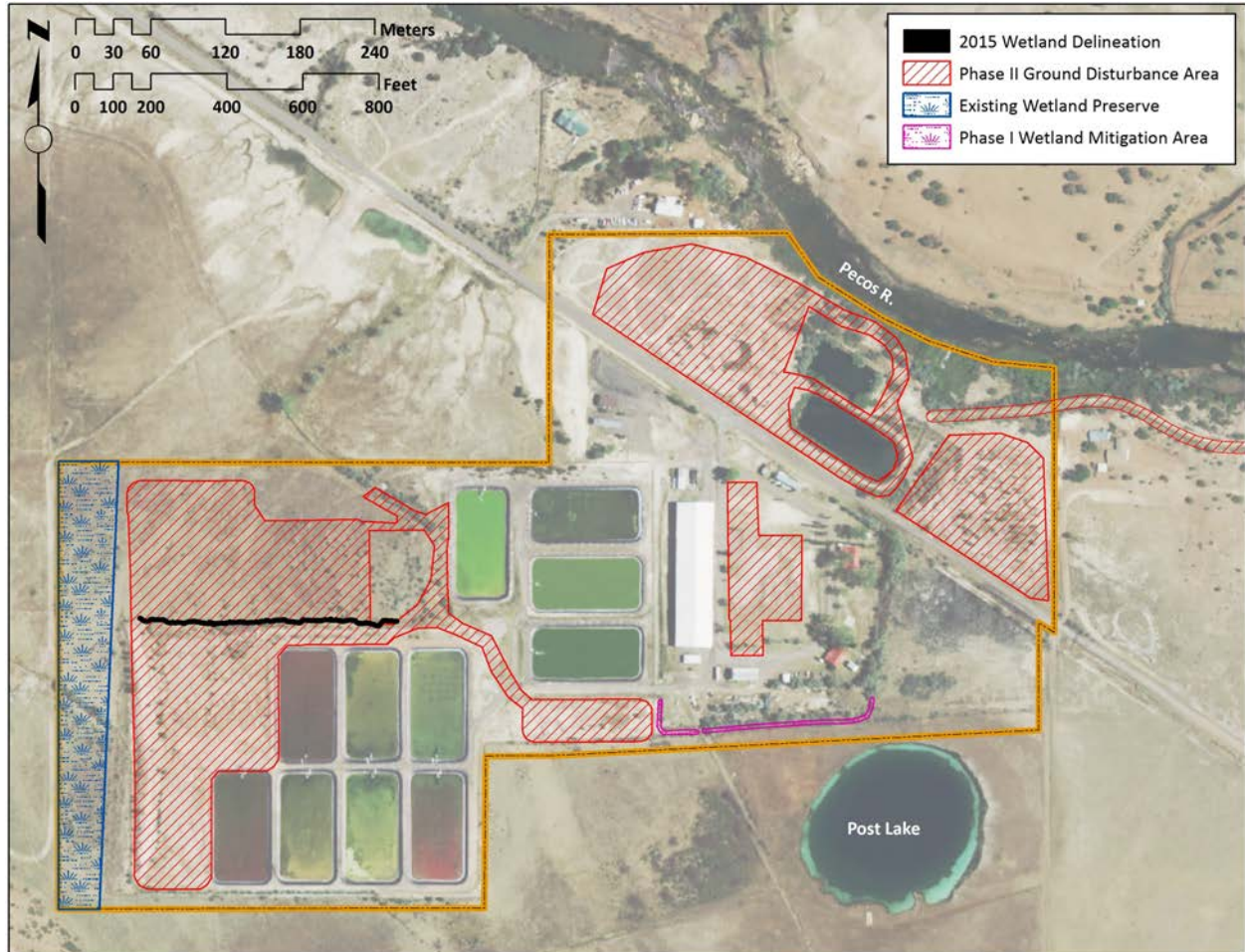
The U.S. Army Corps of Engineers made a jurisdictional determination at the hatchery on 15 July 2005 that included an approximately 3.58-acre wetland area along the western boundary of the hatchery site (Figure 8). In Phase I, this area was fenced by Game and Fish and was designated as a wetland preserve at the hatchery site (Figure 8). Construction plans for hatchery renovation were altered to protect this wetland preserve. The original plans specified 20 1.0-acre warm-water fish rearing ponds. The total number of ponds was reduced and revised to 14 1.0-acre ponds, four 0.9-acre ponds, and four small bass ponds.

Implementation of the revised design resulted in impacts to approximately 0.15 acres of jurisdictional wetlands. Construction of Phase I elements was authorized under Nationwide Permit No. 39 (Residential, Commercial, and Institutional Developments) by the Regulatory Branch of the U.S. Army Corps of Engineers, Albuquerque District, on 15 June 2006 (action no. 2004 00738). One special condition was specified in the authorization. The 404 authorization special condition stated that Game and Fish would:

“... construct and maintain two on-site wetland areas, 0.11 acres and 0.04 acres, respectively, and shall relocate native wetland vegetation from existing wetlands to the mitigated wetland areas. The permittee shall monitor the mitigation sites annually for 3 years and shall perform corrective actions as needed to ensure success. Successful mitigation shall be determined by a 75% vegetative survival rate after 3 years.”

This required wetland mitigation for Phase I was accomplished by creating two shallow drainage swales approximately 10 feet wide along the south boundary of the hatchery on each side of the intake pipeline (Figure 8).

Figure 8. Wetlands in the project area.



Determination and delineation of wetlands in the Phase II project area subject to jurisdiction under section 404 of the federal Clean Water Act was conducted in May 2015 (Pittenger, 2015a). Potential jurisdictional wetlands delineated in the Phase II project area were located in a shallow drainage swale that ran from the north end of a spoil berm east along the north side of the warm-water fish rearing ponds constructed in Phase I of the project (Figure 8). This wetland encompassed approximately 0.21 acres. The average width of the wetland was approximately 14 ft, average depth was approximately 0.3 ft, and the wetland swale was approximately 56 ft long.

Other wetlands within the hatchery boundary include the approximately 3.58-acre wetland preserve located on the western edge of the hatchery grounds and the 0.15-acre wetland mitigation area for Phase I, which is

located in a swale on each side of the hatchery intake (Figure 8). The approximately 3,227-ft segment of the concrete-lined Bohrisch-Ortega Ditch that would be placed in an enclosed pipeline would not be subject to the provisions of section 404 of the federal Clean Water Act. Section 404(f) of the federal Clean Water Act exempts construction and maintenance of irrigation ditches from permitting requirements. The definition of construction includes ditch conversion into pipe (U.S. Army Corps of Engineers, 2007). The ditch is not a water of the U.S., and any wetlands “established solely due to the presence of irrigation water ... do not qualify as wetlands” (U.S. Army Corps of Engineers, 2007).

3.3.2 Effects on Wetlands

No Action The no action alternative would not result in any impacts to wetlands in the project area.

Proposed Action Construction of the proposed hatchery expansion elements for Phase II of the project would result in placement of fill in approximately 0.21 acres of potential jurisdictional wetland (Figure 8). The wetland impacts would consist of excavation and placement of earth fill in the approximately 0.21-acre impact area associated with construction of four of the proposed warm-water fish rearing ponds.

Wetland fills totaling 0.21 acres would be compensated through two measures. First, construction of the proposed warm-water fish rearing ponds would entail grading a new stormwater drainage ditch that would run parallel to and south of the affected wetland swale. The ditch would be approximately 3.3 ft wide and 1 ft deep, with a length of approximately 1,908 ft. This ditch would be earthen and would support the development of wetland vegetation and hydric soils over an area of approximately 0.14 acres. A second means of compensation for the approximately 0.21 acres of wetland fills would be enhancement of the 3.58-acre wetland preserve by implementing control of Russian olive and salt cedar, with the goal of eliminating these species from the wetland preserve.

3.4 Fish and Wildlife

3.4.1 Existing Conditions

Habitat in the project area ranges from relatively undisturbed grassland vegetation dominated by alkali sacaton, saltgrass, and alkali muhly (Figure 9) to previously disturbed ground that is typically sparsely vegetated (Figure 10). Some habitat diversity is provided by the woody vegetation surrounding the two settling ponds on the eastern side of the hatchery grounds (Figure 11). Wildlife observed in the project area on 20 May 2015 included common raven (*Corvus corax*), American kestrel (*Falco sparverius*), western meadowlark (*Sturnella neglecta*), cliff swallow (*Petrochelidon pyrrhonota*), mallard (*Anas platyrhynchos*), turkey vulture (*Cathartes aura*), barn swallow (*Hirundo rustica*), brown-headed cowbird (*Molothrus ater*), killdeer (*Charadrius vociferus*), blue grosbeak (*Passerina caerulea*), great-tailed grackle (*Quiscalus mexicanus*), scaled quail (*Callipepla squamata*), Cassin’s kingbird (*Tyrannus vociferans*), American robin (*Turdus migratorius*), Say’s phoebe (*Sayornis saya*), house sparrow (*Passer domesticus*), lark sparrow (*Chondestes grammacus*), mourning dove (*Zenaida macroura*), double-crested cormorant (*Phalacrocorax auritus*), red-winged blackbird (*Agelaius phoeniceus*), and desert cottontail (*Sylvilagus audubonii*).

3.4.2 Effects on Fish and Wildlife

No Action Selection of the no action alternative would result in no changes to existing habitat conditions in the project area.

Proposed Action Implementation of the proposed action would result in impacts to approximately 5.6 acres of grassland habitat dominated by alkali sacaton, saltgrass, Indiangrass, alkali muhly, and Russian olive. Vegetation would be removed in this impact area. The loss of 5.6 acres of grassland habitat would not result in any measurable effects on wildlife in the area, as this type of habitat is widespread in the vicinity of the hatchery, and the impacted area is not rare or unique habitat. Another 17.22 acres of previously disturbed land, which is predominately marginal wildlife habitat characterized by sparse vegetation cover, would be impacted. Impacts to previously disturbed land includes the area along the Bohrisch-Ortega Ditch where the buried pipeline would be installed. Conversion of the open, concrete-lined ditch to a buried pipeline would remove a potential water source for wildlife. However, water is relatively abundant in the area at sites such as the Pecos River, Post Lake, and Rock Lake. Consequently, conversion of the open ditch to a pipeline would not be expected to have any measurable effect on the abundance or viability of wildlife in the project area.



Figure 9. Relatively undisturbed grassland habitat in the project area.



Figure 10. Previously disturbed land in the project area.



Figure 11. Woody vegetation around the cold-water settling pond.

3.5 Special Status Species

3.5.1 Existing Conditions

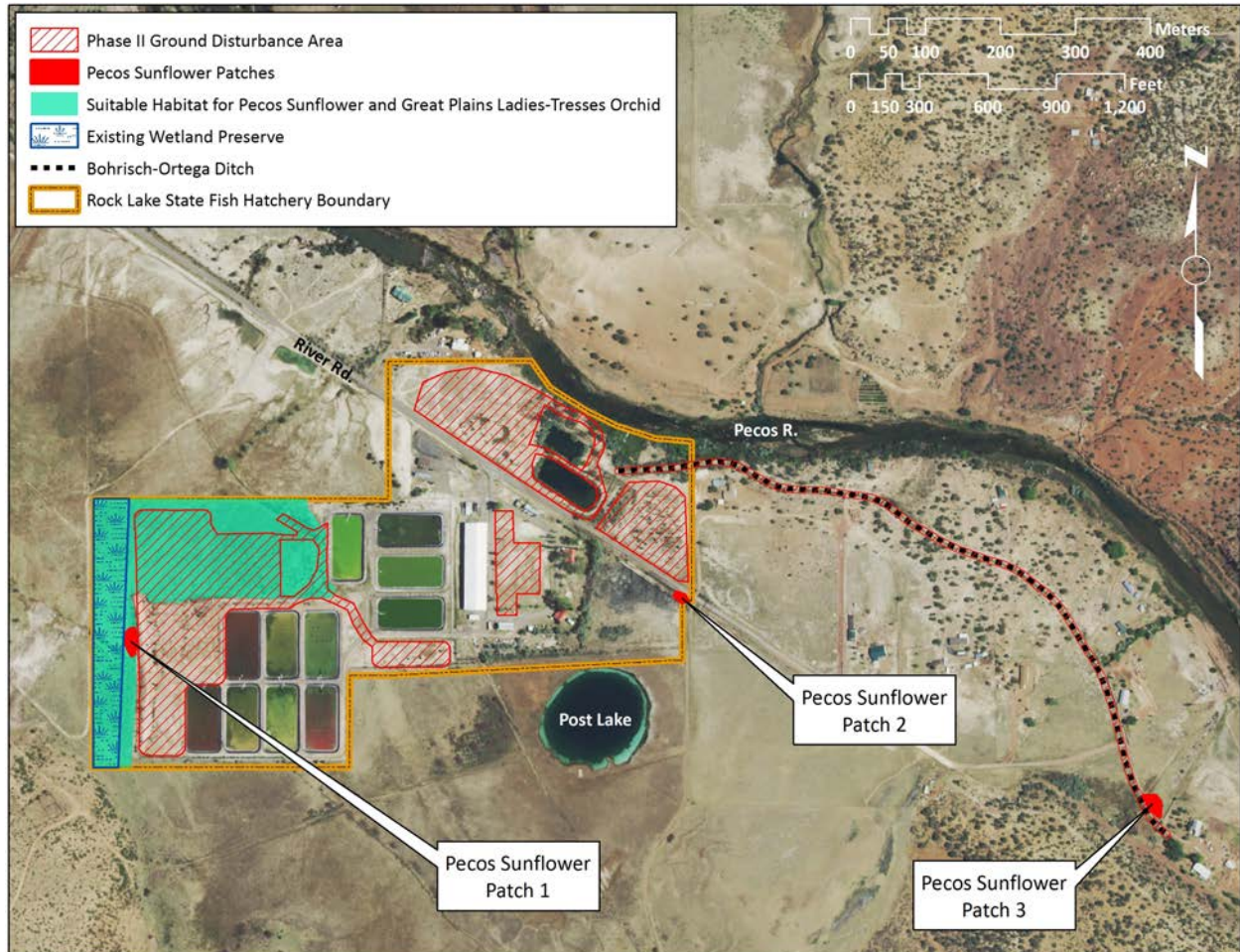
A biological assessment for the proposed action was prepared in 2015 (Pittenger, 2015b). Three special-status species were identified as potentially occurring in the project action area. These species were Wright's marsh thistle (*Cirsium wrightii*), Pecos sunflower (*Helianthus paradoxus*), and Great Plains ladies-tresses orchid (*Spiranthes magnicamporum*). One of the special-status species, Pecos sunflower, is listed as threatened under the federal Endangered Species Act and another, Wright's marsh thistle, is a candidate for listing. All three of the special-status species are listed as endangered by the State of New Mexico.

Three small patches of Pecos sunflower were delineated in or near the area that would be subject to ground disturbance (Sivinski, 2015; Figure 12). Additionally, approximately 5.6 acres of suitable but unoccupied habitat for Pecos sunflower is found in the northwest portion of the project area (Figure 12). All three patches of Pecos sunflower were located in alkali sacaton-alkali muhly habitat with alkaline soils that were wet at the surface in March 2015. Patch 1 consisted of about 250 sunflowers that occupied an area between the western toe of a long fill pile and the fence of the wetland mitigation preserve. Another smaller patch of about 100 Pecos sunflowers was found in the road-side ditch near a culvert on the south side of River Road. This sunflower patch is not within or near any sites where ground disturbance would occur. The third patch of Pecos sunflowers was found near the eastern terminus of the Bohrisch-Ortega Ditch. This patch consisted of approximately 50 plants located on the north side of the road that runs parallel to the concrete-lined ditch. The plants were found in wet soil below a large spring seep (Figure 12). The habitat at this patch is not hydrologically connected to the concrete-lined Bohrisch-Ortega Ditch.

Great Plains ladies-tresses orchid has been documented in Santa Rosa ciénegas dominated by Indiangrass and tall dropseed, so there is suitable habitat for this orchid in the large block of undisturbed ciénega habitat in the northwest corner of the hatchery property (Figure 12). Because it blooms in September, it was not detectable during the March 2015 survey (Sivinski, 2015: 8), and the species presence or absence at the hatchery is unconfirmed.

Perennially wet soils suitable for Wright's marsh thistle are not found in the area that would be subject to ground disturbance, and no Wright's marsh thistle was found within the property boundaries of the hatchery (Sivinski, 2015: 7).

Figure 12. Location of special-status species and suitable habitat in the project area.



3.5.2 Effects on Special Status Species

No Action Selection of the no action alternative would result in no impacts to special status species.

Proposed Action The proposed action would have no effect on Wright’s marsh thistle (Table 2). Pecos sunflower, listed as threatened under the federal Endangered Species Act and endangered by the State of New Mexico, may be affected by the proposed action. Existing patches of Pecos sunflower would not be affected by the proposed action, but approximately 5.6 acres of potentially suitable habitat for Pecos sunflower would be impacted by the proposed action (Pittenger, 2015b). This impacted area represents approximately 42 percent of the total amount of suitable habitat for the species in the western portion of the hatchery. Impacts

to potentially suitable habitat may be reduced by attempting to passively establish patches of Pecos sunflower in the wetland preserve through individual plant cut-stump treatments to control saltcedar and Russian olive in the wetland preserve. The three existing patches of Pecos sunflower would be encircled with high-visibility construction fencing prior to initiation of construction. This would prevent inadvertent impacts to the plant during construction. The fencing would be removed once construction is completed.

Table 2. Special-status species effects analysis summary. Status codes for U.S. Fish and Wildlife Service (USFWS) and the State of New Mexico (NM) are: **FT** = federal threatened; **FC** = candidate for listing under the federal Endangered Species Act; **CH** = critical habitat has been designated; and **SE** = state endangered.

COMMON NAME	SCIENTIFIC NAME	STATUS		EFFECT DETERMINATION
		USFWS	NM	
Wright's marsh thistle	<i>Cirsium wrightii</i>	FC	SE	NO EFFECT
Pecos sunflower	<i>Helianthus paradoxus</i>	FT/CH	SE	MAY AFFECT, NOT LIKELY TO ADVERSELY AFFECT
Great Plains ladies-tresses orchid	<i>Spiranthes magnicamporum</i>	---	SE	MAY AFFECT

Great Plains ladies-tresses orchid, which is listed as endangered by the State of New Mexico, may be affected by the proposed action. State law prohibits unauthorized collection of the plant. The occurrence of Great Plains ladies-tresses orchid in the 5.6-acre area of suitable habitat for the species in the action area is unknown. Consequently, construction of four of the proposed new warm-water fish rearing ponds, two bass ponds (Figure 12), and associated drainage structures may result in impacts to the species. Impacts to approximately 5.6 acres of habitat suitable for Great Plains ladies-tresses orchid would be reduced by improving habitat in the wetland preserve (as described above for Pecos sunflower) and through wetland mitigation measures (as described in section 3.3.2).

3.6 Cultural Resources

3.6.1 Existing Conditions

A pedestrian survey for cultural resources was conducted by Townsend Archaeological Consultants for the entire hatchery property in 2004 (Townsend, 2004). The survey found no cultural concerns. This finding was concurred with by the New Mexico State Historic Preservation Office (SHPO) on 22 November 2004. A March 2015 review by the Game and Fish archaeologist of the 2004 survey report and SHPO concurrence with earlier findings of no effect to historic or cultural properties in the proposed project area reaffirmed the no effect finding. Therefore, no additional cultural resource inventory was conducted.

3.6.2 Effects on Cultural Resources

No Action As no changes would occur, no cultural resources would be affected with this alternative.

Proposed Action Construction of the remaining warm-water fish ponds and other features described for this alternative would not affect any cultural resources. If any previously unrecorded cultural resources are encountered during construction, work at that location would stop and the Game and Fish archaeologist would be contacted.

3.7 Socioeconomic Conditions

3.7.1 Existing Conditions

The project area, encompassing about 70.4 acres of Game and Fish property in Guadalupe County, is located adjacent to the Pecos River, approximately three miles south of downtown Santa Rosa on River Road (Figure 1). Approximately 40.4 acres of the project area has been used by Game and Fish for fish production facilities, employee housing, and related uses since 1964. Within the remaining approximately 30-acre tract of former pasture land purchased by Game and Fish in 2002, 11 one-acre, warm-water ponds were constructed in 2006 and 2007. The rest of this more recently-acquired tract is undeveloped. It is within this new tract that the hatchery expansion would continue under the proposed action.

Lands surrounding the Rock Lake State Fish Hatchery property are privately owned ranch and farm lands and rural residential properties. One certified organic farm and one transitional organic farm are located to the south of the hatchery; these landowners are members of the Borisch-Casaus Ditch Association.

River Road is a two-lane paved rural road. A new middle school, the Guadalupe County Hospital, and several residential subdivisions are accessed by side streets that intersect River Road north of the hatchery. Approximately 11 residences are located along River Road south of the hatchery. There are six residences located on hatchery property.

Santa Rosa, which is located along Interstate 40, has one high school, one middle school, and one elementary school. Other Santa Rosa community services include a public library and a senior citizen center. A municipal airport serves the area. Santa Rosa has community fire and emergency medical services, a regional hospital, and a city police department. Luna Community College, based in Las Vegas, New Mexico, has a satellite campus in Santa Rosa.

The City of Santa Rosa had a population of 2,848 as enumerated by the 2010 U.S. Census (U.S. Census Bureau, 2015). Just over 60 percent of the population of Guadalupe County resides in Santa Rosa, the county seat (Table 3). The population of Santa Rosa has been stable to slightly decreasing since 1970 (U.S. Census Bureau, 2015). As Santa Rosa composes a large portion of the population of Guadalupe County, population demographics of the City and County are very similar (*i.e.* largely white and of Hispanic origin; Table 3). The percentage of racial minorities in Santa Rosa and Guadalupe County are approximately the same as those

of the state of New Mexico, with the exception of American Indians whose populations are greater statewide than in the City or County.

Table 3. Selected social and economic demographic data for the state of New Mexico, Guadalupe County, and the City of Santa Rosa (U.S. Census Bureau, 2015). Totals may not add exactly to 100 percent due to rounding.

	New Mexico	Guadalupe County	Santa Rosa
Total population	2,059,179	4,687	2,848
Race (percent of total population)			
white	68.4%	70.4%	69.2%
black	2.1%	1.7%	2.4%
American Indian	9.4%	1.9%	2.0%
Asian	1.4%	1.3%	1.8%
Hawaiian or Pacific Islander	0.1%	0.0%	0.0%
some other race	15.0%	21.4%	21.1%
two or more races	3.7%	3.3%	3.4%
Hispanic origin (percent of total population)			
Hispanic or Latino (of any race)	46.3%	79.6%	79.4%
not of Hispanic origin	53.7%	20.4%	20.6%
Income			
per capita income (dollars - 2013 est.)	\$23,763	\$14,198	\$13,141
persons below poverty level	20.4%	17.5%	21.9%

Santa Rosa's current economy is influenced primarily by the presence of the Guadalupe County Correctional Facility, which opened in 1999, and the City's presence along Interstate 40 (Mitchell 2007). Direct employment and purchase of local services by the prison are an important economic driver in the community. Additionally, businesses that serve persons traveling I-40 (*e.g.* lodging, food, automotive repair) comprise another large economic sector of the City (Mitchell, 2007).

Per capita income of residents in the City and County are similar at \$13,141 and \$14,298, respectively, but this level is significantly below the state average of \$23,763. The percentage of residents living below poverty level is slightly higher for the City of Santa Rosa (21.9 percent) as compared to the State of New Mexico (20.4 percent) but the percentage is much lower (17.5 percent) for the entire County.

3.7.2 Effects on Socioeconomic Conditions

No Action This alternative is not expected to directly affect local community resources, infrastructure, or economics as no changes would occur. If the no action alternative is selected, the funds identified for this project would likely be spent on other projects in other communities that would benefit from these expenditures.

Proposed Action Implementation of the proposed action would result in a change in land use for a portion of the remaining undeveloped 30-acre parcel purchased by Game and Fish in 2002. A portion of the parcel was developed into 11 warm-water ponds in 2006-2007. With the implementation of this project, another portion of those 30 acres would be converted from undeveloped land to create an additional seven ponds for the purpose of producing and raising warm-water fish species. Construction of the new hatchery building would use undeveloped land situated within the original hatchery grounds, currently surrounded by raceways, other hatchery facilities, and employee housing. The Pecos Watershed Environmental Education Center would be constructed on undeveloped lands that are also part of the original hatchery grounds. This parcel is located across River Road from the hatchery entrance, next to the two settling ponds. No other land use changes are anticipated as a result of the proposed expansion.

Expansion of the hatchery would not disrupt community cohesion as all work would be conducted within the confines of Game and Fish property. No homes within or outside of the hatchery property would be affected by the expansion project. Development of the Pecos Watershed Environmental Education Center would benefit the community in two ways. First, it would provide a facility for school groups to learn about the Pecos River watershed as well as a short trail to observe wildlife. Second, it is hoped that the Center and Hatchery would develop into an educational resource for students from Luna Community College to learn technical skills in fish culture.

The proposed project is anticipated to beneficially affect the local community and economy. Therefore, the proposed action would not create disproportionate negative impacts on minorities or low income groups and is in compliance with Executive Order 12898.

No businesses would be relocated or suffer negative effects from the proposed project. With implementation of the proposed hatchery expansion, some short-term economic benefits to businesses in Santa Rosa may be realized from contractor possibly purchasing materials and supplies, gas, food, and lodging from local vendors. Lining the Bohrisch-Ortega Ditch would reduce maintenance for hatchery personnel, allowing additional time to be spent on fish culture and addressing other hatchery maintenance issues.

3.8 Recreation

3.8.1 Existing Conditions

Currently, warm-water anglers constitute approximately 20 percent of all anglers in New Mexico. In the vicinity of the project area, warm-water fishing for channel catfish, bass, crappie and walleye occurs at Santa Rosa Lake. Numerous lakes, rivers, streams, artesian springs, and state and city parks in southern Guadalupe County provide a variety of other outdoor recreational opportunities to residents and visitors of the Santa Rosa area. These sites include Blue Hole, Park Lake, Janes Wallace Memorial Park and Dam, Perch Lake, the Pecos River, El Rito Creek, and Santa Rosa Lake State Park and Dam. Recreation activities available at these recreation areas range widely but include camping, picnicking, hiking, birdwatching and wildlife viewing, fishing, hunting, water sports such as swimming, scuba diving, water skiing, wind surfing, and boating, and team sports (e.g. softball, basketball). There is a municipal golf course in Santa Rosa as well.

3.8.2 Effects on Recreation

No Action Selection of this alternative would not directly affect existing warm-water fishing opportunities in the project area, Guadalupe County, or the state of New Mexico. However, should the opportunity for Game and Fish to acquire warm-water fish from other states suddenly cease, warm-water recreational fishing opportunities in New Mexico would be severely curtailed if the no action alternative is selected. In addition, selection of this alternative would not allow Game and Fish to expand its current warm-water stocking program. This alternative would not meet the project objectives.

Proposed Action Implementation of the proposed action would allow Game and Fish to achieve their primary objective of reducing their dependence on other states in their ability to obtain and stock warm-water fish in New Mexico. By constructing and operating their own warm-water fish hatchery, Game and Fish would also have greater management flexibility in the use of warm-water fish to satisfy the demands of New Mexico anglers. No other recreation effects are anticipated from implementation of this action.

3.9 Noise Levels

3.9.1 Existing Conditions

In considering potential effects of increased noise levels, sensitive noise receptors are identified in a project area. Sensitive receptors include but are not limited to homes, lodging facilities, hospitals, parks, and undeveloped natural areas. Six residences are currently located within the hatchery property. Other private residences are located along River Road. The nearest hospital and school are about 1.5 (air) miles northwest of the hatchery.

3.9.2 Effects on Noise Levels

No Action The no action alternative would not result in any construction in the project area. Therefore, there would be no effect on noise levels.

Proposed Action If the proposed action is implemented, there would be temporary increases in noise levels from the operation of heavy equipment. Constructing the new hatchery building and ponds and replacing the existing ditch with a buried pipe would increase noise levels in the area intermittently during the period of construction, which is anticipated to be to six months. These noise increases may be quite loud and disturb residents in the vicinity. To reduce temporary construction noise, construction contracts would require that construction equipment and activities comply with state and local noise control ordinances.

Temporary increases in noise from construction also would be mitigated by the timing of construction activities. Construction is expected to being in the fall of 2015 and continue for six months. This schedule would reduce the potential for construction-related noise to carry inside homes as it is assumed that residential windows would be closed in winter and the cooler spring and fall months.

Construction of the proposed project is expected to more than double the truck traffic volume to and from the hatchery from about 100 trips annually to 200 trips. This, combined with expanded routine hatchery operation, would result in an elevation of noise levels from present conditions.

3.10 Air Quality

3.10.1 Existing Conditions

The Clean Air Act of 1970, as amended, established National Ambient Air Quality Standards (NAAQS) for six criteria air pollutants: ozone, airborne particulates (dust), carbon monoxide, nitrogen dioxide, sulfur dioxide, and lead. If measured concentrations of the six pollutants exceed their respective standards, the U.S. Environmental Protection Agency can designate the area as nonattainment area for that pollutant. The New Mexico Environment Department web site does not indicate exceedence of the any of the NAAQS in Guadalupe County in their air quality monitoring network (New Mexico Environment Department, 2015). Therefore, the area is currently in attainment of all federal air quality standards.

3.10.2 Effects on Air Quality

No Action The no action alternative would not affect existing air quality as no construction would occur.

Proposed Action The proposed project would result in minor, short-term effects to local air quality from heavy equipment emissions at the construction site and construction traffic along River Road to the hatchery. An increase in particulates would be expected as a result of topsoil disturbance, as would localized concentrations of carbon monoxide from equipment operation during construction.

Construction-related effects to air quality would be minimized by: 1) requiring the contractor to have emission control devices on all equipment; and 2) employing the use of Best Management Practices to control wind erosion, including wetting of soils within the construction zone and compliance with local soil sedimentation and erosion-control regulations. Construction and operation would conform with air quality control regulations as established by the Clean Air Act and the New Mexico Air Quality Control Act. No long-term or cumulative effects to air quality are anticipated as a result of the hatchery renovation.

3.11 Traffic

3.10.1 Existing Conditions

Game and Fish employees currently make about 100 trips per year to and from the hatchery to pick up or deliver fish to various locations in eastern New Mexico. The hatchery also has visitors arriving in personal vehicles and school groups arriving in buses.

3.11.2 Effects on Traffic

No Action The no action alternative would not affect existing traffic levels as hatchery operations would not change with no new construction.

Proposed Action River Road would temporarily experience increased traffic volumes as a result of contractors driving to and from the site during construction. Annual fish-distribution truck trips is expected to increase approximately from 100 to 200. Additional school bus trips to and from the hatchery due to the presence of the new environmental education center are anticipated.

3.12 Cumulative Effects

Cumulative effects are the effects from other land uses that are not part of this proposed project but which may have an additive effect when combined with the effects expected from the proposed actions. The geographic extent for which cumulative effects are considered vary for each resource. For the purpose of this cumulative effects analysis, existing conditions were considered to represent the cumulative aggregate impact of all past and ongoing actions in the project area (Council on Environmental Quality, 2005). Following is a description of non-federal past, ongoing, and reasonably foreseeable future actions that may overlap spatially and/or temporally with effects of the proposed action.

Past and ongoing actions that have taken place in the vicinity of the project area and that have affected habitat conditions include:

- construction and operation of the hatchery;
- road construction and maintenance; and
- ditch construction and maintenance.

Rock Lake State Fish Hatchery was constructed in 1964 as the Rock Lake Trout-Rearing Facility. The addition of 11 warm-water fish rearing ponds and associated facilities was completed in 2007. River Road bisects the hatchery property. The road is paved with asphalt and consists of two lanes. The road ends approximately 0.45 miles south of the turnoff to the hatchery.

The Bohrisch-Ortega Ditch was developed in 1963 to convey water from the hatchery settling pond to the Borisch-Casaus Ditch Association for application to agricultural fields or discharge to the Pecos River at one or more points along the ditch. The ditch owners signed an agreement with Game and Fish in 1963 in which the owners agreed to a proposal by the State Game Commission to combine the Casaus and Ortega ditch headings into one ditch that would flow through the new trout-rearing station (New Mexico Game Commission, 1963). This agreement also stated that Game and Fish would maintain the ditch. Game and Fish agreed with the Borisch-Casaus Ditch Association that 6.65 cfs of water would be delivered to the ditch year-round.

Fragmentation and loss of terrestrial wildlife habitat has resulted from construction of private and local roads, construction of buildings, farming and ranching operations, and clearing vegetation around structures. Similar future actions will contribute to habitat loss and fragmentation. These actions, combined with the proposed action, cumulatively result in the loss of wildlife habitat. However, the cumulative impact of the proposed action on wildlife habitat would be insignificant due to the small incremental effect (*i.e.* loss of approximately 5.7 acres of relatively undisturbed grassland habitat).

Soil loss in the vicinity of the project area has occurred through direct removal, wind and water erosion, and mixing and covering during construction of residential and commercial buildings, roads, and other facilities. Compaction and covering of soils for construction of the proposed project would contribute to effects on soils in the area. Soil loss would be minimized through implementation of erosion control measures. Due to the small area of effect and erosion control measures, the incremental effect of the proposed action on soils would be insignificant.

The proposed action would cumulatively affect Pecos sunflower through loss of approximately 5.6 acres of potentially suitable habitat. However, conservation measures implemented as part of the proposed action would offset this loss, resulting in an insignificant cumulative effect on the species.

3.12 Irreversible and Irretrievable Commitments of Resources

Irreversible commitments of resources are those that cannot be reversed. For example, the extinction of a species is an irreversible commitment. Irretrievable commitments of resources are those that are lost for a period of time, but may be reversed, such as building a shopping center on farmland. The land cannot be used for farming again until the pavement is removed and soils are restored. Construction of the proposed project would result in irretrievable effects on soils and vegetation that are covered by buildings, ponds, roads, and other facilities.

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