

Operation of Public Service Company of New Mexico Fish Passage Structure

## **Fiscal Year 2021 Project Proposal**

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### **Background**

The Power Company of New Mexico (PNM) Diversion Dam was constructed in 1971. The 3.25-foot high diversion dam (weir) is located on the San Juan River about 12 miles downstream of Farmington, New Mexico near the town of Fruitland at River Mile 166.6. Facilities at the diversion include a concrete weir, a series of screened intake structures, an intake channel, a settling channel, and a pump house.

Water flows over the dam into a stilling basin created by a concrete apron. The stilling basin is the width of the river. The presence of the dam and the basin creates a barrier to fish potentially moving upstream. As flows increase, the difference in the upstream and downstream water levels is decreased, therefore the fish barrier is temporarily less of a challenge to cross over. Although water levels are reduced, water velocities increase and the weir provides an impediment to upstream fish movement. Recovery studies conducted as part of the SJRRIP have shown that some fish are able to move upstream past the weir but their specific method of movement is not known and the number of fish discouraged from upstream movement by the presence of the weir is an unknown. One possible method of upstream movement could occur during high river flows. When the flow in the San Juan River is above 7,000 cfs, some of the flow goes around the dam making it possible for fish to go around the dam at these higher flows.

A need has been identified by the San Juan River Basin Recovery Implementation Program (SJRRIP) to restore endangered fish passage upstream past the PNM Diversion Dam. The purpose of establishing fish passage was to protect and recover native Colorado pikeminnow (*Ptychocheilus lucius*) and Razorback sucker (*Xyrauchen texanus*) populations in the San Juan Basin while water development proceeds in compliance with all applicable Federal and State laws, including fulfillment of Federal trust responsibilities to the Southern Ute Indian Tribe, Ute Mountain Ute Tribe, Jicarilla Apache Nation and the Navajo Nation. In addition, other native fish species would benefit from restored passage. The facility has been operated and maintained by the Navajo Nation Department of Fish and Wildlife (NNDFW) since it was built in 2003. The U.S. Fish and Wildlife Service (Service), Bureau of Reclamation (BOR), Bureau of Indian Affairs (BIA), Navajo Indian Irrigation Project (NIIP), Navajo Agricultural Products Industry (NAPI), and PNM have provided the NNDFW with technical assistance, planning assistance, environmental clearance, maintenance assistance and improvements to the facility and its access points.

The fish passage has facilitated movement of Pikeminnow and Razorback suckers upstream into a 50 mile stretch of river, which is historical habitat of these species.

### **Study Area**

Public Service Company of New Mexico Diversion Dam is located at RM 166.6.

### **Methods/Approach**

The Fish Passage facility will be operated from March 1 to May 31, 2021 as a flow through system. This was decided by the biology committee during the February 2018 BC meeting. Pressure sensors at the south channel, entry point and last boulder before passage were installed to keep record of flow during this pass thru system utilizing the south channel. A new PIT tag antenna was installed at the river-side inlet attached to the debris beam to collect additional data for fish usage and passing thru the passage channels. Installation of a game camera was also installed to give a time-lapse of the passage in seasonal operation.

In preparation for the south screen flow-thru, firstly is to remove and secure the south channel automatic brush system and lift and remove both top and bottom screens to provide complete unrestricted water flow thru the south channel passage. The north channel river door will be closed, restricting water flow, leaving the south channel river door open for water flow down the channel and the ladder.

The Fish Passage facility will resume normal operation from June 1 to October 31, 2021. The fish passage traps fish attempting to move upstream thru the facility. All fish that are caught in the trap are transported to a sorting table. All fish are identified and enumerated. Non-endangered native fishes are released alive

upstream of the facility. Rare native fishes are scanned for a pit tag, weighed and measured, marked with a pit tag if they do not have one and released alive upstream of the facility. All non-native fishes are removed from the river system permanently.

Daily operation and maintenance include cleaning of all screened-surfaces and submerged trash, debris, silt, and river-born algae from the trash racks and bar screens in the fore-bay of the fish passageway, and aluminum spindle screens in the channel fish trap. The quantity of algae, debris, trash, and sediment that accumulates daily at this site is seasonally variable, depending upon flow magnitude and water volume during the water year. Maintenance can also include rust-resistant spray painting as necessary to reduce corrosion on open metal surfaces, apply food grade lubrication on all machine equipment, and checking fluid levels in gearboxes and cooling radiators, as necessary. Representatives from the NNDFW, BOR, PNM and the Service will perform an inspection of the facility every 3 years. In the event of a significant flood event, representatives from the NNDFW will notify BOR, PNM and FWS and appropriate parties will inspect the facility for damage, as necessary.

The Fish Passage Program maintains a database of all fish processed through the facility. Staff that operate this facility also have initiated a public outreach and education program that will continue in FY' 2021. School groups visit the facility to learn about the purpose of the facility and the endangered fish program on the San Juan River.

Objectives of this project are as follows:

1. Determine the use of the fish passage by juvenile and adult native and nonnative fishes.
2. Identify any Colorado pikeminnow congregations that may be related to the spawning period in the San Juan River.
3. Operate and maintain the facility in a manner that assures long-term benefit.

This proposal does not include any maintenance or repair work that is major and requires mobilization of heavy equipment and is outside of the constraints of this budget.

### **Products/Schedule**

The Fish Passage facility will be operated from March 1 to October 31, 2021. During the operation season the passage is operating 24 hours a day, 7-days a week. Each channel is checked daily and are sorted for Native and Non-natives.

Data will include definitive numbers of species, numbers per species, and seasonal use and distribution by species. Our numbers on Razorback Suckers seem to be greater before the high flow regime and later in the season when flows taper out. The 2016 numbers were 42 before the high flow period (March to May) and 30 at the end of the season (Sept. and Oct.). As for the Colorado pikeminnow they seem to have peak after the monsoon season flow spikes. The 2016 data showed 129 species to move thru the facility during the months of July and August. Identification of Colorado pikeminnow congregations will be observed and noted based off flow regime and monsoon season trend. As 2016 showed our pikeminnow numbers occurred at the tail-end of the monsoon season for San Juan County. As of 2019 we seen an increase in untagged juvenile CPM coming thru the passage. We can only assume this will likely happen again in the 2020 as the water from run off tends to warm up and clear up, we can only record data from this CPM small spike in young of the year fish.

NNDFW has supported the ongoing tissue collections from various non-tribal partners. NMGF has collected whole body native fishes. This was conducted in the summer of 2016 after the Gold King Mine Spill to study the effects or changes to native fish tissues. Specific fish size, species, and number of fish were collected during the summer months. NNDFW staff also collected fin clips from CPM >300 mm

during the 2019 season for genetic analysis as well as UDWR needing muscle plugs summer 2019 from fish obtained thru the fish passage during the regular operating season. KSU as well as CSU have tagged Channel catfish with both PIT and Floy tags to determine fish movement seasonally.

NNDFW staff will prepare and submit monthly reports and one draft and final annual report. USFW Service staff will assist NNDFW with data analysis and draft and final report preparation, if needed.

Data from the PNM Fish Passage will be inserted into the shared template and sent to the Service by December 31, of the end year.

NNDFW staff will attend SJRRIP Biology Committee meetings and provide reports as needed throughout the year.

<b>Fiscal Year 2021 NNDFW Fish Passage Budget</b>	
<b>Personnel</b>	
Fish Biologist	\$47,673.60
Fish Culturist, Seasonal 1040 hrs.	\$4,986.80
Fringe Benefits Fish Biologist	\$22,826.12
Fringe Benefits Fsih Culturist	\$482.72
Sub-Total Personnel Expenses	<b>\$75,969.24</b>
<b>Travel</b>	
GSA	\$12,546.00
Per Diem Lodginbg and Meals	\$3,725.00
Travel Sub-Total	<b>\$16,271.00</b>
<b>Operating Supplies</b>	
Limiting Switch (2)@ 125 ea	\$250.00
C2080SS Chain 320ft @ \$45/ft	\$14,400.00
Nylon Bristle Brush 28ft @ \$70/ft	\$1,960.00
Chain Track 280 ft @ \$22/ft	\$6,160.00
2080 Half Moon Idler 4 @\$225 ea	\$900.00
4025 -Tube H1 Quinplex Food Machine Lube 3 @ \$20.17 ea	\$60.51
Electricity Cost	\$1,000
Uniforms	\$500
Printing/Binding/Photocopying	\$100
Repairs and Maintenance	\$1,000
Operating Supplies Sub-Total	<b>\$26,330.51</b>
Subtotal	<b>\$118,570.75</b>
Indirect Cost 18.7% See Worksheet	<b>\$18,679.64</b>
<b>Total PNM Fish Passage</b>	<b>\$137,250.39</b>

## Response to questions:

**Bill Miller, Southern Ute Indian Tribe, BC member**

### *How can the technical aspects of this SOW be improved?*

- The products should also include a digital copy of all data for the passage delivered to the Program Office by December 31, 2021. The dates for delivery of the draft and final report should be added to the document

**Response:** A digital copy of the data from the passage will be submitted to the program office by December 31<sup>st</sup> of the fiscal year. A draft annual report will be submitted in February and a finalized copy be sent in May with comments for the final draft inputted.

## Program Office

### *How can the technical aspects of this SOW be improved?*

- Objectives should be clarified. For example, “2. Identify any Colorado pikeminnow congregations that may be related to the spawning period in the San Juan River.” What is that and how is it being addressed? If this is not occurring then it should be deleted.

**Response:** As of 2019 we seen an increase in untagged juvenile CPM coming thru the passage. We can only assume this will likely happen again in the 2020 as the water from run off tends to warm up and clear up, we can only record data from this CPM small spike in young of the year fish.

- The PNM fish passage provides support for a lot of projects so these other objectives that are occurring should be highlighted. For example, tissue collection for genetic analyses and support of the facilitated fish passage SOW.

**Response:** NNDFW has supported the ongoing tissue collections from various non-tribal partners. NMGF has collected whole body native fishes. This was conducted in the summer of 2016 after the Gold King Mine Spill to study the effects or changes to native fish tissues. Specific fish size, species, and number of fish were collected during the summer months. NNDFW staff also collected fin clips from CPM >300 mm during the 2019 season for genetic analysis as well as UDWR needing muscle plugs summer 2019 from fish obtained thru the fish passage during the regular operating season. KSU as well as CSU have tagged Channel catfish with both PIT and Floy tags to determine fish movement seasonally.

### *What is this SOW's contribution to recovery?*

PNM is a complete barrier to fish moving upstream and providing connection to upstream reaches during spawning season could increase reproductive success by providing access to more suitable habitat and providing more river for larvae to drift and recruit.

**Budget Increase Justification**

Operating supply cost from \$13,402.52 to \$26,330.51 is due to the operating of the Inline Screen Cleaner that was installed in 2015 by Aqua systems 2000. There are four 320 ft. steel chains that run the brush off a motor as well as a chain track that keeps the chain from binding or coming off gears and running straight. Two limiting switches were also included on the budget to help run the system to count the intervals on which it runs. The Half Moon Idler was also included for the continued running of the chain as it drops at the bottom to keep the motion of the moving chain running the nylon brush cleaning the screens. Over time the chains have stretched and are meeting the limit of the adjustment on the upper sprocket.

The change if the Indirect Cost Rate was changed by the Nation from previously at 15.65% to now 18.7%.