

Iron Canyon Fish Ladder Project

Project Description

The project will repair existing weirs, expand and modify existing weirs, and install 6 new weirs at the Iron Canyon Fish Ladder (Fish Ladder) on Big Chico Creek in Bidwell Park, Chico, California. The Fish Ladder was constructed in the mid 1950s to provide spring run salmon passage during low to moderate flows, so that the fish can reach holding and spawning habitat upstream. The ladder has suffered damage and now does not function as designed. The United States Fish and Wildlife Service (USFWS) developed final designs and specifications (pending permit and funding agency conditions) and has provided funding to the Foundation to complete environmental review, obtain permits and develop construction funding. The Foundation is working with the City of Chico, the Big Chico Creek Watershed Alliance, the CA Department of Fish and Game and the CA Department of Water Resources to complete these tasks.

The project will involve the following:

Construction Staging and Site Preparation

- Mowing of an existing access road from Parking Lot "P" to a staging area and installing construction fencing along the road and chain link fencing around the staging area, which will be 400 feet by 100 feet.
- Mowing of the staging area.
- Scraping and leveling within the staging area for the installation of some or all of the following:
 - Crane pads 2ea x 6 @ 3'x3' = 108 sf
 - Trailer pads 6 @ 2'x2' = 24 sf
 - Concrete washout (portable) 12x20 = 240 sf
 - Generator pad and fire safe area 10x20 = 200 sf
 - Water Tank pads 4 @ 2x2 = 16 sf
 - Construction box 15x40 = 600 sf
- Installation of wire extensometers and/or survey pins across selected joints along canyon wall and/or rim.
- Scaling of the western canyon wall (use of hand tools similar to pry bars) to remove loose blocks and debris from above the planned work zone.
- Removal of Lovejoy Basalt block identified as Block 2 (estimated volume of 30 cubic yards) by mechanical scaling (e.g., excavator with rock breaker).
- Provision for emergency access/egress by installing a construction elevator (hoist) or scaffolding tower anchored to the western canyon wall at several locations along its height (120-140 feet). A bridge will be necessary to span from the setback (30 feet) on the canyon rim to the distance the elevator or tower is set back from the canyon wall (approximately 40 to 50 feet). The canyon wall set back is necessary to ensure the emergency access/egress is sufficiently sited away from overhanging blocks and/or blocks with open joints on the western

canyon wall that are judged to have potential static and/or seismic instability.

- Install a single platform of approximately 1,200 square feet in area, to be constructed near Weir 8 from light steel beams with a wooden deck. A second platform could be constructed near Weirs 9 through 17 providing additional staging, although it would be more difficult to construct.

Flow Containment and Diversion

- Install aqua-dams, sandbags and plastic sheets, and piping to temporarily redirect the creek flow. Potentially use naturally occurring pool to create a temporary sump and pump some or all of the flow rather than damming the creek to a height great enough to redirect it. A combination of methods will likely be required to dewater. The dewatering and construction may also be done in sections.

Fish Ladder Construction

- Pool deepening, at minimum of 0.1 feet to 2.1 feet. Excavation of pool sidewalls will be necessary, with large boulder-sized blocks potentially requiring partial or complete removal. Jack-hammer and/or drilling may be necessary for the large block removal. Excavated material does not require removal from site and may be disposed of in adjacent, non-fishway pools.
- Drilling into existing rocks for reinforcing and dowel attachments (sampled compressive strengths for Lovejoy Basalt ranged from 7,000 psi to 64,000 psi).
- Placing of concrete buttresses, cut-off slabs/walls or concrete foundations may be necessary to stabilize individual blocks that will support concrete ladder structures.
- Partial demolition of 18 existing weirs (Weirs 1 through 6, 6B, and 7 through 17) with removal and legal disposal of concrete debris. These weirs will then be encased in new integrally colored (dark gray to mimic adjacent Lovejoy Basalt) reinforced concrete (either cast-in-place concrete or shotcrete).
- At the contractor's discretion, existing weirs may also be entirely demolished and replaced with new weir design, rather than encased.
- Installation of 6 new weirs (Weirs 1B, 5B, 7B, 8B, 8C, 11B) constructed with integrally colored (dark gray to mimic adjacent Lovejoy Basalt) reinforced concrete (either cast-in-place concrete or shotcrete).
- Installation of fabricated stainless steel fish passage slots and bypass slots cast into new and modified/expanded weirs.
- Encasement of existing reinforced concrete basalt block strut at Weir 12 with 36-inch diameter reinforced concrete column.
- Permeation grouting of loose materials (sand/gravel/cobble bottoms) immediately upstream and downstream of most new and modified weirs.
- Installation of fabricated aluminum flashboards into finished weir slots.