Blackfoot River Restoration-Blackfoot River Wildlife Management Area

The Idaho Department of Fish and Game's Southeast Region was awarded $10,000 to assist with the design costs for fish habitat restoration work on the Blackfoot River Wildlife Management Area by the Idaho Fish and Wildlife Foundation in 2021. This property is owned by the Idaho Department of Fish and Game (hereafter The Department), and it encompasses a key river reach for an adfluvial Yellowstone Cutthroat Trout (YCT) population in the Blackfoot River. The Department documented YCT population declines over the last 20 years because of degraded habitat and excessive predation by White Pelicans. The Department is working to address both factors to conserve this important migratory population of YCT.

The Blackfoot River WMA Fisheries Habitat Restoration Project is a four-phase multi-partner effort that aims to increase habitat complexity in a seven-mile reach of the Blackfoot River. The existing condition consisted of denuded riparian vegetation, limited recruitment of large wood, eroded banks, an incised channel, increased sediment load, and limited spawning gravels. The goal of this project was to address these habitat issues by installing large woody debris, constructing riffles, narrowing the channel, reactivating the floodplain, and increasing the number of pools. These treatments also provide cover for YCT to evade predation.

The current phase of this project garnered funding support from seven different funding entities including the Upper Blackfoot Confluence, the Habitat Improvement Team, the Idaho Department of Lands, the Idaho Department of Environmental Quality, the Western Native Trout Initiative (National Fish Habitat Partnership program funding) and the Idaho Fish and Wildlife Foundation demonstrating the importance of habitat restoration work in this location. The funds awarded to the Department by the Idaho Fish and Wildlife Foundation (IFWF) in 2021 were used to design Phase-3 of this multi-phase habitat restoration effort. Quadrant Consulting Inc. of Boise, Idaho completed the design of the project, and the entire $10,000 from IFWF was paid to Quadrant to partially fund the design costs which were approximately $62,000 total.

Aqua Terra Inc. won the bid to construct this habitat restoration project at a total implementation cost of $782,410. Aqua Terra Inc. began Phase-3 construction on September 6, 2022, and completed construction on November 11, 2022. In total this phase of the project rehabilitated two miles of the Blackfoot River. The project contractor acquired 411 conifers that they used to construct 118 in stream wood treatments. Wood treatments included whole trees with rootwads, log jams, and bank roughening log piles. The contractor planted 65 willow clumps and 180 willow stakes and imported approximately 1,120 cubic yards of fill material for construction of two riffles and one point bar. These treatments increased the habitat complexity by altering hydraulic dynamics, creating cover for YCT to evade predation, and creating conditions for spawning gravel recruitment. We also expect the treatments will encourage sediment deposition in specific locations which decreases the width to depth ratio of the river. These treatments will benefit all life-stages of YCT in the Blackfoot River for many years to come.

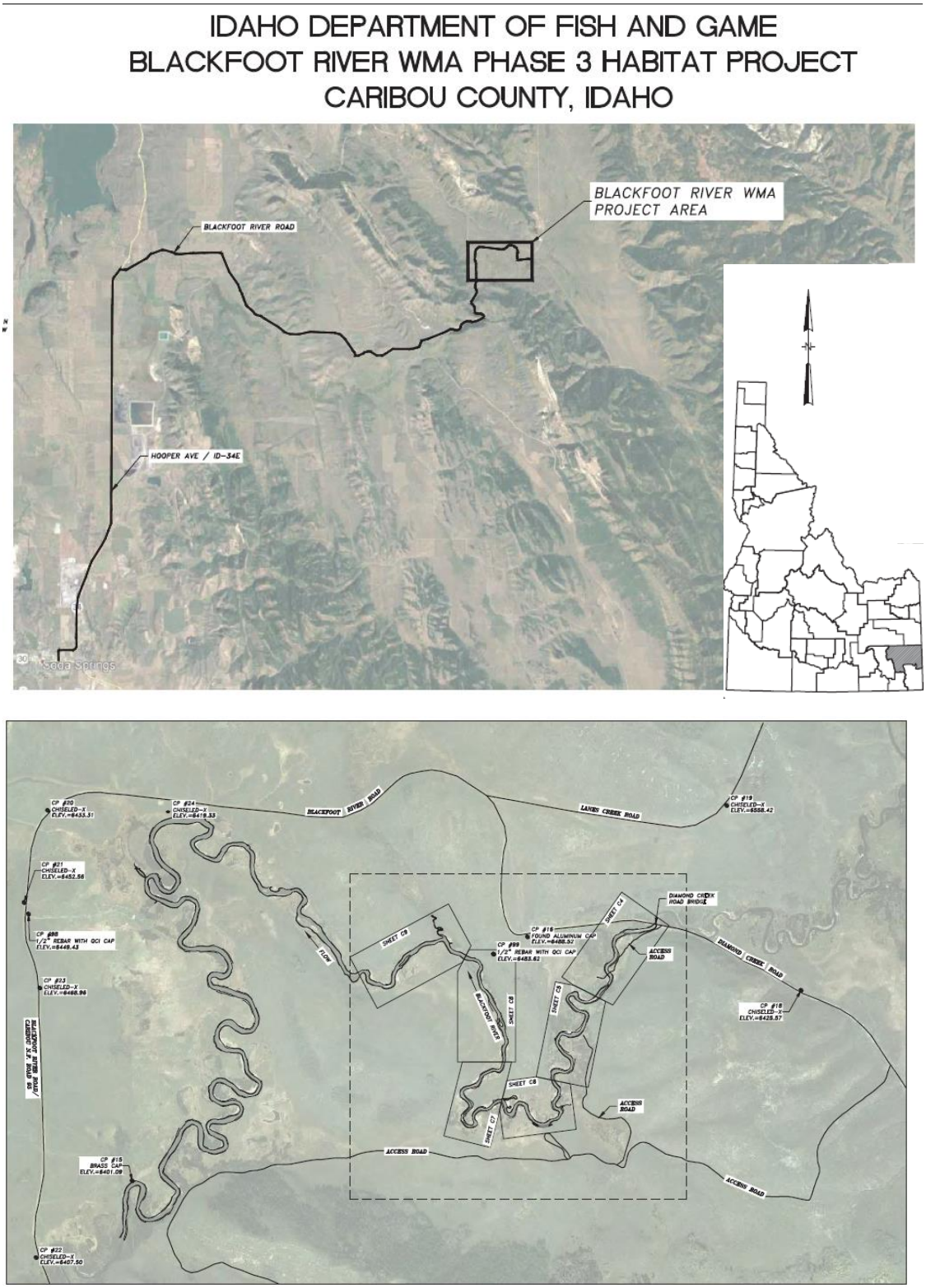
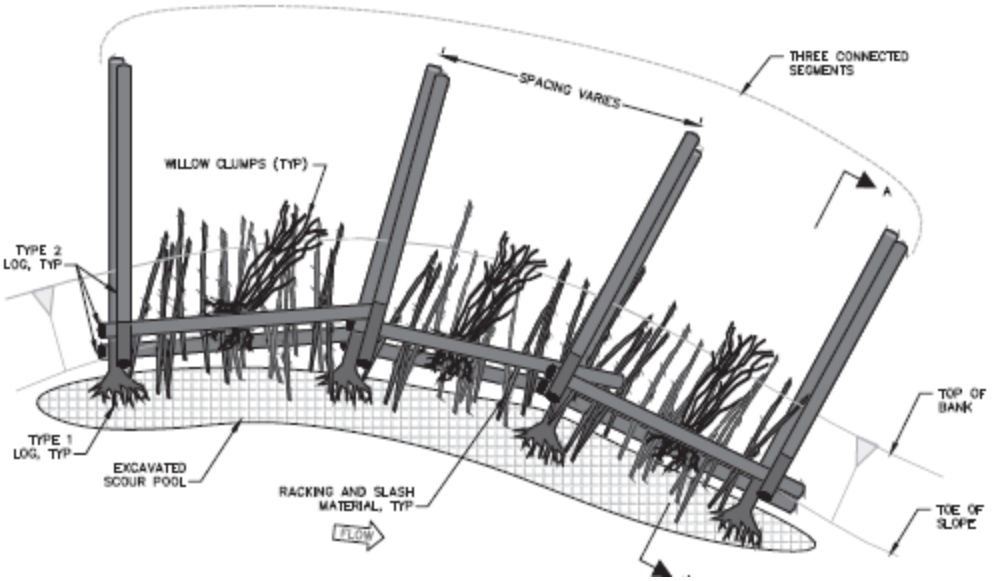


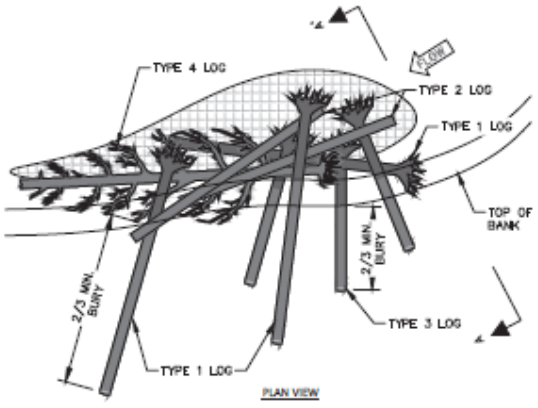
Figure 1. Map of Blackfoot River WMA Project Area (upper panel) and a map of the Phase-3 project area (lower panel; dashed outline)

HS–1 LOG QUANTITY SCHEDULE*				
TYPE 1	TYPE 2	RACKING/SLASH	LIVE WILLOW STAKES	WILLOW CLUMPS
16"–18" X 25' WITH ROOTWAD	12" X 25'	(CY)	1/2–2" X 3'	(EA)
1	3	5	6	1

* PER SEGMENT. ADD (1) TYPE 1 LOG AND (1) TYPE 2 LOG TO END OF STRUCTURE.



HS–2 LOG QUANTITY SCHEDULE					
TYPE 1	TYPE 2	TYPE 3	TYPE 4	RACKING/SLASH	WILLOWS CLUMPS
16"–18" X 25' WITH ROOTWAD	12" X 25'	8"–12" x 15' WITH ROOTWAD	16"–18" X 25' WHOLE TREE	(CY)	(EA)
3	2	3	1	5	3



NOTES:
1. RECOMMENDED LOG PLACEMENT SEQUENCE:
   a. (1) TYPE 3 LOG TRENCHED INTO BANK
   b. (1) TYPE 1 LOG PARALLEL TO FLOW
   c. (2) TYPE 3 LOGS TRENCHED INTO BANK ABOVE TYPE 1 LOG
   d. (1) TYPE 4 LOG PARALLEL TO FLOW
   e. (1) TYPE 1 LOG TRENCHED INTO BANK ABOVE TYPE 4 LOG
   f. (2) TYPE 2 LOGS ANGLED APPROX. 30° OFF BANK
   g. (1) TYPE 1 LOG TRENCHED INTO BANK
2. ADD MIN. 5 CY SLASH AND RACKING THROUGHOUT STRUCTURE TO INCREASE HABITAT.
3. ADD WILLOW CLUMPS TO BANK PRIOR TO BACKFILLING. ENSURE ROOTS CONTACT LOW WATER TABLE.
4. EMBEDMENT LENGTH OF LOGS WILL VARY TO MAXIMIZE HABITAT CONDITIONS. TRENCHED LOGS TO BE EMBEDDED MIN. 2/3 L.
5. BURY DEPTH OF TOP LOG SHALL BE MINIMUM 2.5 FEET.
6. EXPOSED LOG ENDS SHALL BE BROKEN NOT SAWN SO AS TO APPEAR NATURAL.
7. THE DESIGN ENGINEER SHALL BE ON SITE DURING PLACEMENT OF THE FIRST HABITAT STRUCTURES. PROVIDE MINIMUM 10 DAYS NOTICE TO ENGINEER PRIOR TO PLACEMENT.

Figure 2. Two examples of engineering designs for large woody debris habitat structures installed during Phase-3 of the Blackfoot River Restoration Project.

Figure 3. Looking upstream on a bend on Phase-3 of the Blackfoot River before treatments were installed.

Figure 4. Looking upstream on a bend on Phase-3 of the Blackfoot River after treatments were installed.

Figure 5. In stream wood treatment constructed with whole trees.

Figure 6. Excavator constructing bank roughening treatment that provides cover for all life stages of Yellowstone Cutthroat and increases bank stability.

Figure 7. Excavator harvesting whole tree with rootwad from the Blackfoot River Wildlife Management Area.

Figure 8. Constructed riffle in the upper right area of the image and whole tree wood treatments in the middle of the image.

Figure 9. Transplanted willow clumps to jump start willow recruitment increasing shading and providing natural bank stabilization.