

**Icicle Irrigation District Flow Control Structure Project (2014-02RI)**

**Final Report**



***Project Sponsor – Chelan County Natural Resource Department***

***Tributary Committee Grant Number – 2014-02 RI***

## **Project Summary -**

The goal of the project was to eliminate water from Icicle Creek from entering the Icicle diversion canal when the canal is not in use. This was accomplished by the installation of a flow control structure at the entrance of the canal. The structure is approximately eight feet high and twenty-five feet wide with steel-lined slots 4 inches wide for check boards that control flow into the canal. Prior to project implementation, once the canal was not in use, streamflow from Icicle Creek would enter the canal and essentially dewater approximately a 525ft section of the creek during low flow conditions. In addition to the flow control structure, habitat boulder clusters were installed just downstream of the Icicle diversion dam. The habitat boulders will provide holding and resting pools for aquatic species.

Beginning in August, Chelan County Natural Resource Department (CCNRD) staff and Icicle Irrigation District (IID) staff surveyed the project site and determined material quantities for the cofferdam, staging areas for materials and distance from staging areas to project area. CCNRD and IID staff coordinated on development of the Spill Prevention, Control and Countermeasure and Safety Plans (SPCC). See Appendix A. CCNRD staff coordinated delivery of construction materials. Staging of construction materials and equipment began on September 22. Construction of the access route began on September 24 and construction of the cofferdam began on September 26. Site visits were made by WDFW staff on September 29 and 30 to ensure proper screening of the de-watering pumps and to inspect the cofferdam installation. It was recommended by WDFW staff to install an additional sandbag wall within the irrigation channel to better isolate the work area. Icicle Irrigation District staff complied with all recommendations. Additional pumps were brought in to de-water the coffer dam area. CCNRD and WDFW staff de-fished the coffer dam area before any work began. A list of fish species and size are included in Appendix B. The irrigation canal was also de-fished where potential fish stranding could occur.

Once de-fishing was completed construction of the new flow control structure began. Concrete forms were built and a concrete pump truck was used to fill the forms. The concrete pump used a 200ft long hose to pump the concrete over Icicle Creek into the forms. Once the concrete had cured the forms were removed along with the cofferdam. Flash boards were inserted into the structure to eliminate any flow from entering the canal from Icicle Creek.

After completion of the flow control structure, three habitat boulder clusters were constructed just below the diversion dam. The boulder clusters will form scour pools just downstream to provide habitat for aquatic species. Once the boulder clusters were completed the area for ingress/egress was re-vegetated with native trees and shrubs.



**Before**



**After**

The above picture on the left shows how flow entered the irrigation canal unrestricted even when the canal was not in use. The picture on the right shows the new flow control structure with flashboards installed, prohibiting flow from enter the canal. The picture below shows the newly constructed boulder clusters just below the diversion dam.



### **Challenges –**

The main challenge for this project was the construction of the cofferdam and the de-watering of the isolated work area. Higher than expected stream flow in Icicle Creek, the porous nature of the streambed and the bedrock formation which forms the right side of the canal entrance made it difficult to isolate and de-water the work area. Additional time and resources were spent on construction of the cofferdam and an additional pump was needed to de-water the work area. The picture below shows the additional 4” pump (orange pump) that was needed to de-water the work area. It also shows the bedrock formation which made sealing the cofferdam difficult.



### **Suggestions to the Committee –**

The project sponsor felt the project solicitation and project management process was clear and easy to follow and does not have any suggestions for the Committee at this time.

### **Final Works Products –**

Appendix A: Spill Prevention, Control and Countermeasures Plan (SPCC Plan) – See attachment

Appendix B: De-fishing Species and Size Class Tables – See below

Appendix C: Construction As-built – See attachment

**Appendix B: De-fishing Species and Size Class Tables**

<b>SPECIES</b>	<b>SIZE</b>	<b>1st pass DITCH</b>	<b>2nd pass DITCH</b>	<b>BEHIND COFFER DAM</b>	<b>MORTS BY DRUM SCREEN (10/1/14)</b>
MYKISS	190- 2220	4	2	2	
MYKISS	160-190	2	2	2	2
MYKISS	100-160	2	6	2	
MYKISS	40-100	7	4		7
BULL TROUT	190-210			1	
BROOK	150-190		2		
BROOK	80				2
CHIN	100				1
DACE	30-60	1		5	

<b>SPECIES</b>	<b>TOTAL COUNT</b>	<b>NOTES</b>
MYKISS	44	
BULL TROUT	1	
CHIN	1	mortality
BROOK	4	
DACE	6	