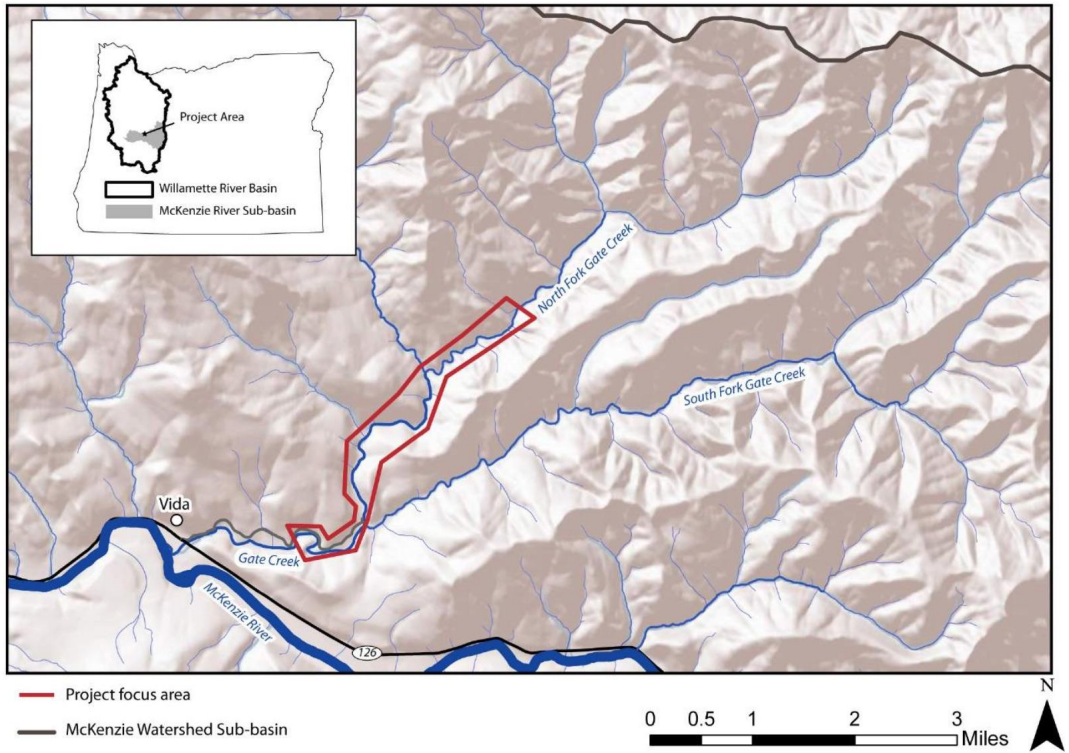
Boulder Weir Analysis At North Fork Gate Creek 2017

By Hunter Putzier and Jason White, Thurston HS

Background on North Fork Gate Creek



- The THS Aquatic Habitat Team conducted a survey in North Fork Gate Creek. The purpose of this was to identify pre-project conditions and the need for in-stream restoration to improve fish habitat.
- During the survey, we found three historic partially-intact boulder weirs and one intact boulder weir.

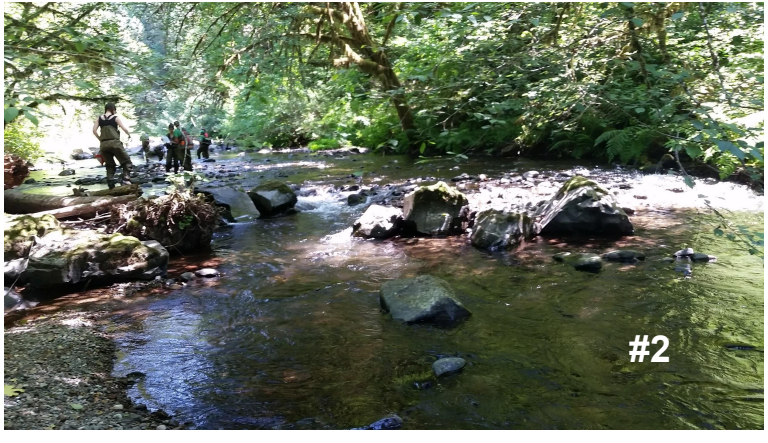
Boulder Weirs as a Historical Stream Enhancement Tool

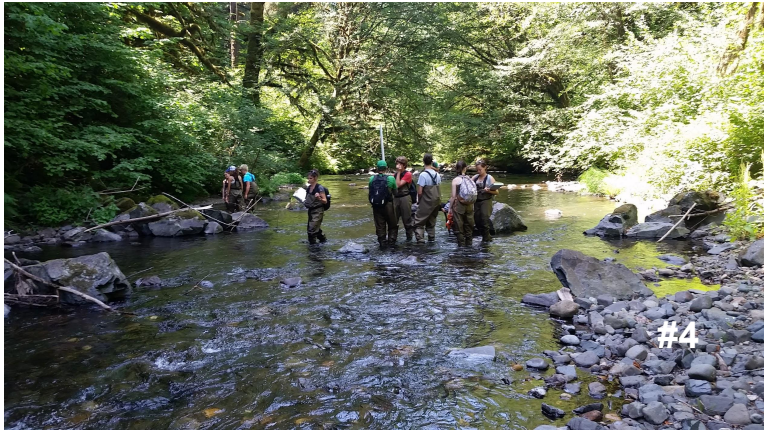
- Boulder weirs were used to catch gravel in the stream; to provide an area where salmon can lay their eggs.
- Boulder weirs were used when the gravel gets flushed out and has nothing to get caught on.
- Boulder weirs have been used in NF Gate Creek before but it is unknown to what extent they were used.They were also commonly used as a foundation for logs so that they would stick to the surrounding area better instead of floating away.
- Boulder weirs were also mainly used in places where the creek did not have any logs or gravel prior to the boulder weirs. These are places with lots of bedrock that would not stop gravel from going straight past.

Our Question:

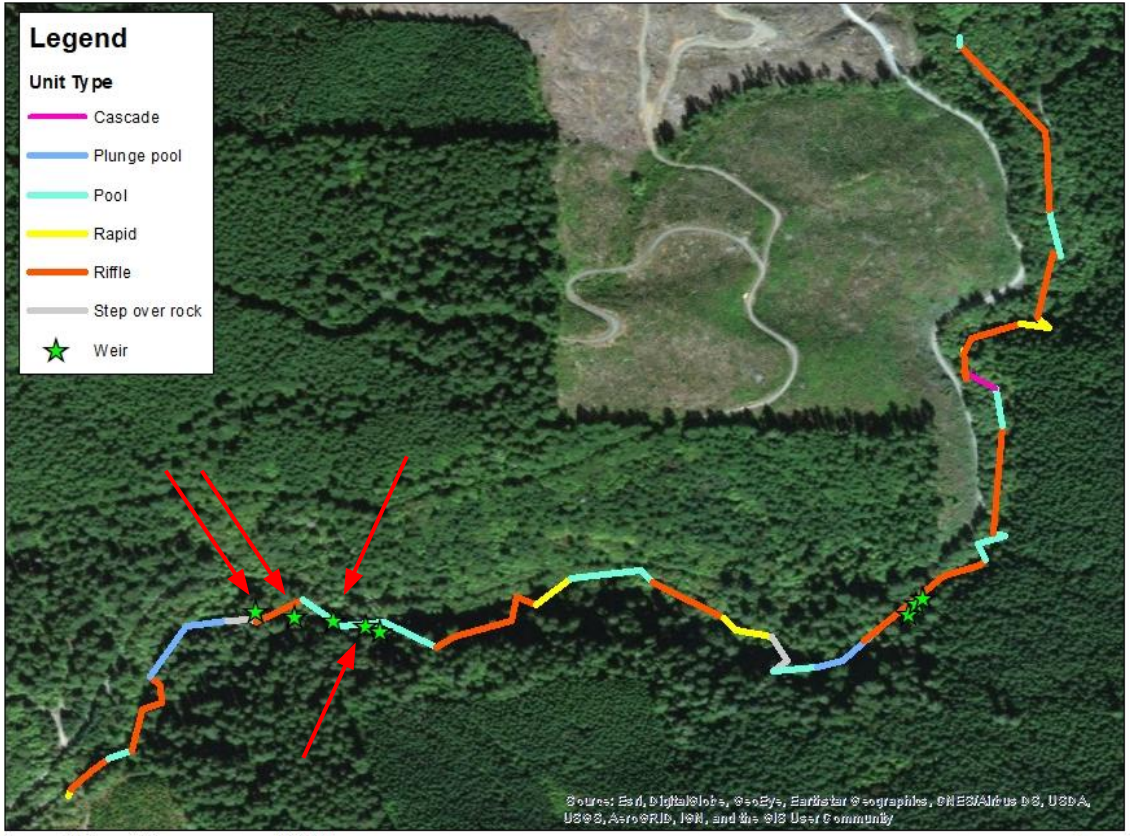
Were the boulder weirs in North Fork Gate Creek successful at creating suitable habitat for fish species?

Photos of Boulder Weirs #1-4



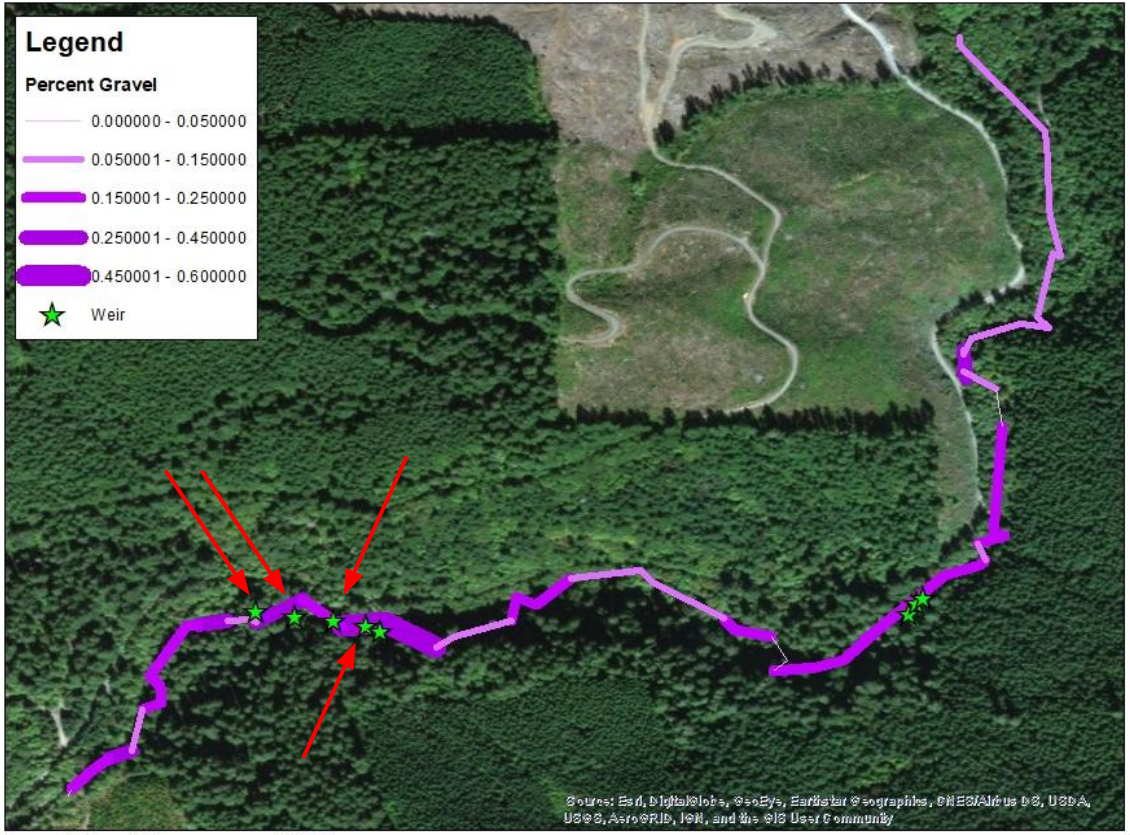


North Fort Gate Creek 2017
Boulder Weir and Unit Type
Hunter Putzier & Jason White



- This graph shows the places where the boulder weirs were found and what kind of unit they were in.
- Where the three partially intact weirs were and the fully intact one is, there is also a large amount of pools.
- The red arrows are the boulder weirs that were partially intact and the one that was intact. The others were completely blown out.

North Fort Gate Creek 2017
Boulder Weir and Percent Gravel Substrate
Hunter Putzier & Jason White



Do the boulder weirs create a suitable habitat for the salmon?

- The Boulder weirs up the stream have caught more gravel and have a better chance at redds spawning.
- On the other hand, more NE of the stream there is less gravel being caught by the boulder weirs, and have less chance at redds spawning.
- The boulder weirs upstream provided a better chance at creating a habitat suitable for salmon, but the one NE has a less chance of having a suitable habitat.

Results from Entire Stream Survey in 2017

Metric	Summer 2017	ODFW Desirable Standards
Percentage Substrate Gravel	17%	>35%
Percentage Total Pool Area	5%	>35%
Residual Depth of Pools (indicates the ability of a stream to provide critical habitat for fish)	.28	>0.5

Conclusions

Since some of the boulder weirs were completely blown out,the boulder weir project that happened did not create quality fish habitat. The results from our entire stream survey in 2017 were undesirable for good fish habitat.

- The gravel substrate was undesirable which means that we should add more material into the streams.
- The pool area and residual pool depth were much less than the desired benchmark standard, which means we need more structures in the water to increase pool area.

Acknowledgments

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