# Visual representation of policies and barriers affecting salmonid passage *(Oncorhynchus clarkii), (Oncorhynchus mykiss), (Oncorhynchus kisutch)* in the Rogue Valley

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## Introduction

Cutthroat trout (*Oncorhynchus clarkii*), steelhead, and rainbow trout (*Oncorhynchus mykiss*) are species of trout that are native to cold freshwater rivers and streams in Southern Oregon and along the west coast of North America. Steelhead trout are anadromous fish, meaning they spend half of their lives in freshwater and half in salt water. Juvenile steelhead will spend two to three years in freshwater streams and will then migrate to the ocean to mature and grow (Oregon Fish and Wildlife, 2018). Coastal cutthroat trout are semi-anadromous and do not over winter in the ocean, their range into small tributaries in the Rogue Valley is scattered.

Unlike salmon, steelhead and cutthroat trout do not die after spawning, and will return to their native streams to spawn year after year. Rainbow trout and steelhead trout are the same species, but rainbow trout reside entirely in freshwater and do not travel to the ocean (Oregon Fish and Wildlife, 2018). Due to the more abundant food in the ocean, cutthroat and steelhead trout grow to a larger size than rainbow trout. The National Oceanic and Atmospheric Administration (NOAA) Marine Fisheries has identified 12 distinct population segments of steelhead trout on the West Coast, with ten populations listed as threatened and one population listed as endangered under the Endangered Species Act. In the Rogue Valley of Southern Oregon, there are both summer and winter runs of spawning steelhead trout. The Rogue River is the artery that allows anadromous fish to access the ocean and runs dam free for 157 miles from the Pacific Ocean to the William L. Jess Dam at Lost Creek Reservoir. The streams that we mapped are all tributaries to the Rogue River, and flow in below the dam.

Human activity such as water diversions, dams and culverts, pollution, invasive species, and habitat loss has adversely affected the number of native trout present in the Rogue Valley.

Healthy riparian areas surrounding streams are crucial for aquatic health, as the groundcover provides shade to reduce water temperature, and helps prevent soil erosion and infiltration from pollutants. Invasive species such as Himalayan Blackberry (*Rubus armeniacus*), Scotch Broom (*Cytisus scoparius*), and English Laurel (*Prunus laurocerasus*) can upset the balance of the riparian ecosystem by outcompeting native species. Private landowners often have riparian habitat on their property and can be unaware or uncaring, and will therefore remove riparian vegetation, allow grazing animals like cattle direct access to creeks, and create diversions for irrigation, which have detrimental effects on the ecosystem. All of these aforementioned actions both directly and indirectly affect the ability of salmonids to feed, reproduce and migrate.

However, there are policies and regulations in place in order to try and protect trout. Chapter 18.63 of The City of Ashland's Land Use Ordinance establishes three types of Stream Bank Protection Zones regulated by the City of Ashland: Riparian Corridors, Local Streams and Intermittent and Ephemeral Streams (City of Ashland Stream and Wetland Enhancement Guide). Riparian corridors are all fish bearing streams, such as Ashland Creek and Bear Creek, which have an average annual stream flow of 1000 cubic feet per second (CFS), the Stream Bank Protection Zone extends 50 feet upland from the top bank. The Stream Bank Protection Zone classified as Local Streams is a riparian buffer consisting of all lands 40 feet from the centerline of the stream. Intermittent and Ephemeral Streams should have a riparian buffer consisting of all lands within 30 feet from the centerline of the stream (City of Ashland Stream and Wetland Enhancement Guide).

The Department of Land Conservation and Natural Resource planning goal #5 which has been effective since 1996 (Punton, n.d.) works to protect over a dozen different natural resources including Wild and Scenic Rivers, state scenic waterways, groundwater, Oregon Recreational trails, sage grouse habitat, and wilderness areas. In order to account for these resources different areas were assessed and reviewed for natural resource occupancy. If the surrounding areas possess potential risks to any of those resources, action would be taken to protect those neighboring sites to ensure those habitats and surrounding areas were protected. Every year this list is reviewed and updated.

The ODFW Native Fish Conservation Policy was adopted in 2002 (Oregon Department of Fish and Wildlife, 2011). The intent of this policy is to preserve and ensure the conservation of native fish in Oregon. Three main goals were identified. The first goal is to prevent serious depletion of natural fish; the second is maintaining and restoring naturally producing fish to provide ecological and economic benefits to the environment and community, and the last goal is to sustain and foster opportunities for fisheries to conserve natural producing fish. These goals are maintained and worked on by the ODFW conservation plan commision. The commission works on recovery strategies that assesses current populations and target populations while monitoring and researching potential success strategies that could be implemented.

The Oregon Department of Fish and Wildlife has multiple fish passage requirements for private land owners that live on or nearby creeks and streams. If native migratory fish flow through a river on someone's property the owner or operator has to install a fish passage in any infrastructure or any artificial obstruction. Citizens can be exempt from this requirement if

ODFW performs a cost benefit analysis on the designated area and decides the structure isn't obstructing fish passage through the stream (Oregon Department of Fish and Wildlife, 2019).

**Methodology**

Our team has partnered with Oregon Fish and Wildlife (ODFW) to map barriers to various fish passages on 34 different tributaries in the Rogue Valley. In order to accomplish this task, we are using raw data compiled by the Oregon Department of Fish and Wildlife to assess cutthroat, steelhead and rainbow trout population trends between 2005 and 2014.

Hoop Traps were placed for different durations of time depending on the season and location of the creek. Our data did not have a consistent time frame or season that was used to trap and survey the different species of fish. Various data sets were from early to mid March while other data sets were collected between November and April. This made it difficult to accurately compare the success or decline of certain fish populations in different areas.

With this data we created a Story Map and a static map marking the different locations of each stream using GPS data from ODFW. The GPS coordinates were uploaded onto Esri Story Maps using ArcGIS. Each point has the different fish population data from 2005- 2014 along with the data we mentioned different fish barriers that have been observed at each stream over the years. These different points on our maps mentioned different organizations, businesses and schools that live next to these creeks or have partnered with ODFW in monitoring these fish habitats. These partners can help in maintaining healthy riparian coverage in the streams and their surrounding areas while looking out for fish passage barriers in order to notify ODFW to

get them removed. The maps mention different laws and ordinances that pertain to the protection of fish habitat and their surrounding environments.

ODFW will be putting our Story Map on their Facebook page with over 100,000 followers as on open access resource. The public will be able to view the map which will bring awareness to the cutthroat, steelhead and rainbow trout populations and how they are depleting in the Rogue Valley .We also hope this story map educates people on the different laws and policies that protect them.

With this project we hope to educate the local community on the existence and importance of the Ashland trout population and bring awareness to the community on issues and legislation surrounding the local fish and waterways in the Rogue Valley.

**Results and Discussion**

We used pictures provided by ODFW of the fish trap sites in the Rogue River watershed and geotagged the locations of the pictures using GPS points. We compiled our pictures and data supplied by Ryan Battleson into a Story Map which we will present at SOU and have featured on the Oregon Department of Fish and Wildlife's Facebook page.

The data has not been fully analysed, but the trend appears to be that fish are declining in Ashland due to artificial barriers such as culverts and dams. However, the installation of fish ladders and restoration of habitat can help bring back native salmonids populations to areas of the streams where they historically resided. We will share this information with residents of Ashland in order to help them make management decisions on their property as well as decisions in the polling booth.

## Conclusion

The combined data sets from ODFW told a story of a declining salmonid population in the Rogue River's tributaries. Our goal was to raise community awareness of the presence and plight of Ashland salmonids, such as steelhead, rainbow and cutthroat trout, and detail the policies and regulations in place that affect land owners and riparian habitat. We accomplished this goal with our Story Map and community presentation, by creating a public resource that is easy to navigate we hopefully informed landowners and the public how barriers affect salmonid fish passage and breeding. Our Story Map also contained policy and regulations to help landowners better understand their rights.

## Appendices

Partners

Oregon Department of Fish and Wildlife-Ryan Battleson (data, tools, and mentoring)

Ashland community (checking hoop traps)

Tools

GoPro (To take pictures of fish traps locations, barriers)

GPS (To mark locations of pictures)

Hoop traps (To catch fish)

ArcGIS Story Maps

# References

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