



Memorandum

Oregon Department of Fish and Wildlife

DATE: July 18, 2022

TO: Greg Apke, Fish Passage Program Coordinator

FROM: Alex Farrand, South Willamette Assistant District Fish Biologist

SUBJECT: Net Benefit Analysis for proposed barrier on headwaters of Mill Creek (South Santiam Basin) Fish Passage Exemption Request

Background and Context:

The South Willamette Watershed District has reviewed the request by Mr. Jered Cate to obtain a fish passage exemption, as permissible in OAR 635-412-0025, for a proposed barrier on a tributary slough to Mill Creek, a floodplain tributary to the South Santiam River in Linn County.

The proposed action includes building an earthen dam with an associated culvert and flashboard riser. A previous landowner filled in the channel at this location many years ago, resulting in a pond approximately 400 long, 25 feet wide, with an average depth approximately 1-2 feet. This proposed new dam would raise the water depth of the pond approximately 2-3 feet and extend the pond's footprint approximately 200 feet upstream. The landowner is required to obtain the rights to the water before he could proceed with proposed action.

The landowner applied for a water right through the Oregon Water Resources Department (OWRD) Alternate Reservoir process in February of 2022, which triggered a review by ODFW for any impacts to fishery resources. ODFW District fish biologists reviewed the information provided in the application, consulted maps, visited the site in March 2022, and determined that the project may have been historic habitat for native migratory fish (NMF).

This NMF determination triggered, as per ORS 509.585, the requirement for either an approved fish passage plan, a fish passage waiver or an exemption. The applicant cannot proceed forward with OWRD and the water right process without addressing the state's fish passage rules and regulations. As such, the landowner chose to pursue approval a fish passage exemption through ODFW. The OWRD Alternate Reservoir Process is therefore currently on hold until an ODFW fish passage exemption is approved.

This memorandum serves as the ODFW Benefit Analysis, required to evaluate fish passage exemption requests, as required in Oregon Administrative Rule 635-412-0025. The ODFW may grant fish passage exemptions if there is no appreciable benefit to NMF is passage is provided.

Site Information:

The entire Mill Creek basin consists of a network of interconnected or semi-connected sloughs

that lies within the historic floodplain of the South Santiam River. NMF historic distribution determinations in this basin are difficult to determine due to significant human development that has altered the landscape. Sections of the slough network have been plowed under, channelized, and excavated into large oxbow ponds that make it difficult to determine the start and endpoints of contributory ditches and under which flow conditions certain barriers become passable. ODFW South Willamette District staff (District staff) estimate that the proposed action would exclude approximately 1,200 feet of seasonal fish habitat, or between 0.5% to 3.0 % of the total stream length.

The impacted slough/creek, an unnamed tributary of Mill Creek was determined to have had potential historical fish use based on the following basin/channel characteristics: low gradient, a sinuous channel with some remnant riparian floodplain forests where the slough is still relatively unaltered, and proximity to the South Santiam. Habitat characteristics and conclusions are based on site visits conducted by District staff on 3/2/22, 6/10/22, and 6/15/22. Fish sampling was conducted on 6/15/22 at select downstream locations, and site visits to various road-stream crossings were complete on 6/10/22. A lengthy search of ODFW records yielded no data or anecdotal information of historic fish use of the project area.

Basin/Channel Characteristics:

The unnamed tributary stream in question (hereafter “slough/creek”) drains flat agricultural land north of Lebanon and east of Albany, including rural residential areas, small agricultural fields, and mixed woodlands. In its unaltered natural state, Mill Creek and this tributary slough likely offered valuable off-channel juvenile refuge habitat during the wet season. NMF species in this basin include ESA-listed spring chinook and winter steelhead, coastal cutthroat trout, mountain whitefish, northern pikeminnow, and largescale sucker.

This slough may originally have been a side-channel to the South Santiam, but it has been heavily altered and now functions as a seasonal drainage ditch. Flows in the slough are generally from November through May or early June and are augmented by road run-off from ditches that feed into it from Hwy 20.

There are several road and stream crossings (culverts) downstream of this site that were identified in the exemption application as partial fish passage barriers, with the potential for one or more unknown barriers on private property situated downstream of the proposed action. The riparian vegetation in this area is dominated by grasses, willows and blackberry, while in many places the ditch is filled by dense grass year-round. Depending on the amount of spring rainfall, the slough/creek stops flowing sometime between mid-May and late June and continues to be dry until the onset of fall precipitation. Based on measurements using aerial photographs, the proposed dam would be located about 7.5 miles upstream of the confluence with the South Santiam River, and about 0.25 miles from a hypothetical end to fish use.

Downstream Barriers:

We investigated all barriers that had public access points downstream of the proposed dam to the confluence with the South Santiam. The most significant barriers to fish passage are identified on the map provided by the applicant as Culvert 1, Culvert 2, and Culvert 3.

Culvert 1 is a 2-foot diameter corrugated pipe about 20 feet long to pass water underneath a driveway. This culvert is a seasonal barrier to all fish when the water level in the impoundment

drops below the culvert invert (bottom) and is likely a partial barrier to some juvenile NMF when it is flowing. The installed debris screen on the upstream end of the pipe would not necessarily prevent passage of fish strong enough to swim through it, unless it became clogged with debris.

The impounded water from this culvert has been further excavated into a large 0.25 mile-long oxbow pond that holds water year-round but gets disconnected for several months during the summer. It is unlikely that this waterbody would be suitable for cold-water species such as native salmonids to survive the summer months. Based on an interview with the landowner of this impoundment, it appears to be at most six feet deep. Another smaller impoundment is immediately below this culvert but appears to be much shallower and even less hospitable to NMF species. Both of these man-made impoundments and any others not identified but that are capable of retaining their water through the summer likely hold both non-native gambusia and three-spined stickleback year-round, and potentially other non-native game fish (largemouth bass, bluegill, bullhead, etc.). They also pose significant entrapment risks for any native fish that may possibly find their way into them in the rainy season but are then unable to pick up the environmental cues that tells them when it is time to leave before the flow stops.

Culvert 2 consists of two 18-inch corrugated pipes of about 40 feet in length that allows the slough/creek to pass underneath Highway 226. Based on scour pool that has formed below the downstream end of the culvert, they are likely partial barriers to juvenile fish, especially at very high flows when velocities may exceed their swimming abilities.

Culvert 3 is a single 18-inch concrete pipe about 20 feet in length. It is located about 60 meters downstream from Culvert 2 in a channelized section of ditch alongside Highway 226, and is the most significant barrier of the three. Flow velocity in this section of the channel is highest and the culvert appears undersized. When this culvert was visited during a high flow event on 3/2/22 I estimate water velocity to have been greater than 1meter/sec.

In addition to these culverts, the channel itself has a thick, dense growth of rooted aquatic vegetation year-round, that would make it difficult for larger bodied NMF to navigate upstream at lower to moderate stream flows.

Upstream Fish Habitat:

The slough/creek continues above the proposed barrier site for approximately another 1,200 feet before it abruptly ends at a farm vehicle crossing site. The slough is no longer recognizable above that point and has no beds and banks or distinguishing channel features. The slough was likely filled in and drainage tiled many decades ago to increase farm acreage. Flow into the slough/creek above the proposed barrier site is augmented by a run-off from Highway 20. Based on observations from two separate visits estimated flow from road run-off is between 10-25% during the rainy season.

Most of the habitat is of poor quality for juvenile NMF, likely due to historic previous channelization efforts: open, grass-filled ditch with very little cover; no sinuosity, mostly uniform depth, width, and slope. It is a section that mimics other downstream sections that were altered historically to provide rapid drainage and transport of water during the rainy season.

Fish Presence:

ODFW sampling with a back-pack electro-shocker occurred at three sites above and below Culvert

2 and 3 (approximately one mile below the proposed barrier site, as well as at the proposed barrier site itself. The only fish species encountered or observed were *Gambusia affinis* (Western Mosquitofish) and Three-spine Stickleback. These two species are not NMF as per OAR 635-412-0005(32) and the state's fish passage rules and regulations to not apply. Many amphibians were also collected or observed, including bullfrog (tadpoles and adults) and Northwestern Salamander. Below is a description of the sampling habitat and what was found at each location with relevant observations, starting with the lowest most section and moving upstream.

A short, accessible 20-meter long section of the slough/creek below all three barriers was sampled on 6/15/22. Flows through this section were in the order of 1-2 cfs, but no fish or amphibians were observed. We speculate that the absence of fish at this location was due there not being a nearby permanent pool of water to support non-migratory fish such as *Gambusia* and three-spined sticklebacks.

We sampled above and below the Highway 226 culvert (Culvert 2) and found both fish species mentioned above as well as several amphibians. The downstream scour pool was approximately 20ft x 20ft in size, about 18 inches deep and heavily vegetated with rooted aquatic plants. While the culvert is sunk low enough, we found no streambed material in the pipe, and it likely poses a significant velocity barrier at high flows to fish less than 3 inches in length. The upstream pool is larger and a bit deeper. When the slough/creek stops flowing there is about 1 foot of impounded water left that likely does not persist through the summer. Fish and amphibian species were the same that were found below the culvert, but with higher densities of bullfrog tadpoles. This area is approximately ¼ mile downstream from Culvert 1 and the associated year-round impoundment.

A short section of the proposed dam site was sampled with dipnets and the electroshocker, which yielded only a few *Gambusia*. This location already functions as a partial passage barrier, as the slough/creek has been mechanically widened and deepened to form a year-round pond.

Net Benefit Analysis Conclusion:

The ODFW South Willamette Watershed District recommends granting the fish passage exemption as requested by the applicant for several reasons:

1. It is unlikely that NMF are currently able to access this slough/creek at the proposed dam location, because of multiple partial, seasonal barriers, impoundments, densely vegetated transport reaches, and the overall distance they would have to navigate to get to the project site.
2. The relatively small amount of available habitat that would become lost to any potential NMF is of poor quality and does not offer any measurable benefits to NMF.
3. Because of the addition of direct road run-off just upstream of the proposed barrier site, water quality is likely impaired. Water quality may be better further downstream and below some of the impoundments described above where harmful chemicals and pollutants can settle out, break down, or become diluted further.

We therefore support the approval of this exemption request, contingent of the premise that if conditions change proximal to this site from which this determination was made, the exemption be reviewed and revoked if fish passage at that time would provide appreciable benefits to NMF.


Sampling locations

