Juvenile Fish Passage Accomplishments

Prepared by: James Bartlett, June 2017

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ABSTRACT:

As part of the Pelton Round Butte Project's Federal Energy Regulatory Commission (FERC) license, PGE and the Confederated Tribes of the Warm Springs Reservation of Oregon (CTWSRO) have committed to reestablishing anadromous fish runs above Round Butte Dam. PGE and CTWSRO reestablished downstream passage for anadromous smolts and resident fish species in December of 2009 when the Selective Water Withdrawal structure and associated downstream fish passage, capture, sampling, and transfer facilities became operational. The surface intake system screens the entire normal flow of the Deschutes River. The fish facilities are designed to capture downstream-migrant juvenile salmonids from Lake Billy Chinook for transport to the lower Deschutes River. Since operation was initiated, thousands of downstream migrating spring Chinook, summer steelhead, and juvenile *Onerka* (sockeye) have been captured and transported below the project to continue their downstream migration.

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BIOGRAPHY:

Jim's career started with PGE at the Faraday hydroelectric project in 1999. Jim was originally hired as a fisheries technician responsible for hydro project relicensing and juvenile and adult fish passage. With the new license issued to the Pelton Round Butte project in June of 2005, Jim began working as a fish passage biologist for PGEs Pelton Round Butte project. Jim has spent most of his time working with state and federal agencies, consultants, contractors, and engineers designing, implementing, and maintaining the juvenile and adult fish passage facilities located at the Round Butte project. Jim also assists with the reintroduction of Spring Chinook, summer steelhead, and sockeye salmon into the Deschutes, Crooked, and Metolius rivers.

Streamflow Restoration on Whychus and McKay Creeks

Prepared by: Natasha Bellis, Deschutes River Conservancy
June 2017

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ABSTRACT:

For over two decades, the Deschutes River Conservancy (DRC) has partnered with local entities and irrigators to restore streamflow to rivers and streams in the Deschutes Basin while meeting agricultural and municipal needs. This presentation will provide an update on DRC's streamflow restoration efforts in two watersheds: Whychus Creek, a tributary to the Deschutes River and McKay Creek, a tributary to the Crooked River.

Since 2005, DRC and the Three Sisters Irrigation District (TSID) have partnered to restore streamflow to Whychus Creek by piping TSID's main canal to reduce seepage and evaporation loss. TSID dedicates all the water conserved from this piping to instream use through Oregon's conserved water statute. The resulting instream water right helps meet DRC's flow target from April-October. This presentation will present the cumulative water quality results of TSID's main canal piping.

As a major tributary to the Crooked River, McKay Creek is critical to the successful reintroduction of salmon and steelhead in the lower Crooked River, providing the freshwater habitat steelhead require at the beginning and end of their life cycle. Primary factors limiting steelhead reintroduction efforts on McKay Creek are concentrated in the middle reach where private landowners divert water directly from the creek, contributing to 1) critically low and intermittent streamflow conditions earlier in the summer than would naturally occur, 2) fish passage barriers, and 3) to high water temperatures. The McKay Creek Water Rights Switch will restore natural flow to the middle reach of the creek by allowing private irrigators to trade their McKay Creek water rights for Ochoco Irrigation District water rights sourced from Prineville Reservoir.

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BIOGRAPHY:

Natasha joined the Deschutes River Conservancy team in 2016. She provides strategic oversight of the organization's stream flow restoration programs, including negotiating streamflow restoration agreements and convening and facilitating stakeholder processes in priority reaches. Natasha moved to Bend in 2015 from Portland, OR where she worked as the Flow Restoration Director for The Freshwater Trust. Prior to joining the Deschutes River Conservancy, Natasha developed conservation land acquisitions for the Deschutes Land Trust. Natasha holds a JD from Lewis and Clark Law School with a certificate in Environmental and Natural Resource Law.

The Reconnection of Large Wood Transport between the Upper Deschutes and the Lower Deschutes River

Prepared by: Micah Bennett, Portland General Electric

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ABSTRACT:

Large wood transport from the upper Deschutes basin into the lower Deschutes River was halted due to construction of the three dams that comprise the Pelton Round Butte complex. In 2007, large wood transport upstream of Round Butte Dam to the lower Deschutes River was reconnected. To date, 298 pieces of large wood have been removed from Lake Billy Chinook to the lower Deschutes River. In the Metolius arm of Lake Billy Chinook large wood found above Rattle Snake Point is anchored to shore and snorkel surveys are conducted on them twice in the spring for fish and wildlife usage. All large wood found in Lake Billy Chinook in 2016, with the exception of wood found above rattle snake point, was captured and is currently being held for incorporation into Phase two of the Gravel Study. Snorkel surveys were conducted on the lower Deschutes River to determine fish and wildlife use of a subsample of previously placed large wood, once in the spring and once in the early summer. Wood that washed downstream from its original placement location was tracked from the Re-regulation Dam to Whitehorse; which is the furthest point downstream that wood has been observed.

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BIOGRAPHY:

Micah Bennett is currently a fisheries biologist for Portland General Electric at the Pelton Round Butte Project. Since 2009, he has participated in all fisheries activities conducted at PRB, including extensive time spent on the fish habitat studies. He previously worked for the USDA Forest Service doing habitat surveys, habitat restoration and the reintroduced bull trout population in the upper Willamette River; and Oregon Department of Fish and Wildlife conducting angler surveys and work on the Metolius basin bull trout population. Micah graduated from Oregon State University with a Bachelors in Fisheries Biology in 2009. In his free time he enjoys fishing, camping, and water sports with his family.

2016 Adult Migration, Survival and Migration

Prepared by: Rebekah Burchell, Portland General Electric
June 2017

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ABSTRACT:

Specific objectives of the Adult Migration Test and Verification Study are to determine: migration timing, spawning distribution, spawning abundance, interspecific and intraspecific competition, and survival to spawning for adult Oncorhynchus mykiss (steelhead), Oncorhynchus nerka (sockeye), and Oncorhynchus tshawytscha (Chinook) released upstream of the Project. We will present the results for the 2016 adult Chinook, sockeye, and steelhead returning to the Pelton Adult Fish Trap between September 2015 and November 2016.[1]

[1] Burchell, R.D., and M. Hill. 2017. 2016 Adult Migration, Survival, and Spawning Test and Verification Study. Portland General Electric Company. Portland, Oregon.

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BIOGRAPHY:

Rebekah Burchell is currently a fisheries biologist for Portland General Electric at the Pelton Round Butte Project. She has been with PGE for 8.5 years and is currently the lead biologist for the Adult Migration Study. Her main focus is to ensure safe upstream passage of salmon and steelhead adults captured at the Pelton Adult Trap. She is also the liaison to Round Butte Fish Hatchery facilitating communications, project support, and coordination between agencies. Rebekah earned a zoology degree from Portland State University in 1997. In her spare time she loves to ride her motorcycle, travel, and hike around beautiful Central Oregon.

Water Quality Monitoring and Management

Prepared by: Lori Campbell, Portland General Electric; June 2016

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ABSTRACT:

The Pelton Round Butte Project is a three dam complex owned and operated by Portland General Electric and the Confederated Tribes of the Warm Springs Reservation of Oregon on the Deschutes River in Central Oregon. Lake Billy Chinook is fed by three tributaries, the Crooked, Deschutes, and Metolius rivers, and each are characterized by ground water inputs of different temperatures. Cold dense Metolius River water fills the bottom of the reservoir while the warmer Crooked and Deschutes water fills the reservoir from the surface down. Prior to implementation of the Selective Water Withdrawal (SWW) facility (2009) the reservoir had exclusively deep (hypolimnetic) water withdrawal, altering discharge temperatures down the lower Deschutes River with cooler water discharged in the spring and warmer water discharged in the fall than would have occurred naturally. The SWW was designed to address two goals of the Project's (2005) FERC license; fish passage and water quality management. Throughout the late-spring and summer, surface water is mixed with deep water withdrawal to modify temperatures downstream of the project at rkm 161, patterning seasonal temperature cycling that would occur without the dams in place. Additionally, the SWW would help meet dissolved oxygen and pH targets in the lower Deschutes at rkm 161. Since SWW discharge temperature cycling has more closely followed predicted "without project temperatures". Discharged dissolved oxygen during summer and fall is influenced by oxygen poor hypolimnetic water in the blend and spilling to help boost oxygen levels typically is needed. Meeting license goals and targeting each water quality criteria at rkm 161 has proven more complex than was predicted.

[1] Campbell, L. 2017. Pelton Round Butte Project (FERC 2030) 2016 Water Quality Monitoring Report. Portland General Electric Company. Portland, Oregon.

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BIOGRAPHY:

Lori Campbell comes from eastern Washington where she completed a Master's Degree in Biology with emphasis in freshwater studies. She has worked in New York for Fordham University and was involved in applied environmental research. After returning to the Northwest she was employed by the Coeur d'Alene Tribe of Indians and then the US Fish and Wildlife Service where she worked on fisheries habitat restoration projects. Her history in Oregon includes several years managing a lake on the Oregon coast. In 2005, she moved to central Oregon and has worked since as a water quality specialist for Portland General Electric.

Lower Deschutes River Fish Population Status Updates.

Prepared by: Rod French, Oregon Department of Fish and Wildlife, The Dalles, Oregon
June 2017

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ABSTRACT:

The Oregon Department of Fish and Wildlife has monitored the status of fish populations and angler success in the lower Deschutes River since the 1970's. While populations can be highly variable over time, the long term data provides a unique examination of population trend information and sport and tribal fisheries on the lower Deschutes River. Run strength of all anadromous stocks in the Deschutes were generally reduced in 2016 when compared with the previous year, while sport fisheries remained popular, but catch rates were decreased. Resident trout population numbers were not estimated, but other population parameters were examined to monitor the relative health of the population. Resident trout fishing was extremely popular and generally high catch rates were observed.

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BIOGRAPHY:

Rod French is the District Fish Biologist for the Oregon Department of Fish and Wildlife's Mid-Columbia Fisheries District. He has worked for the department for 29 years, in a variety of positions across the state in both a research and management role.

Warm Springs River Helicopter Large Wood Additions Project

Prepared by: Jason Grant, CTWS Fisheries. June, 2017

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ABSTRACT:

From July 25th to July 29th, 2016 the CTWS – Fish Habitat Program completed the Warm Springs River Helicopter Large Wood Additions Project along about 3.5 miles of the Warm Springs River, where 90 log jams were constructed and over 900 trees were placed.

Stream surveys conducted on the Reservation in 2013 within the Warm Springs River showed that this section of river was lacking large wood and pools, specifically it contained insufficient adult holding habitat for large salmonids. Additionally, fish passage data from the Warm Springs National Fish Hatchery (downstream of the project area) and Tribal redd surveys indicate that spring Chinook salmon and bull trout populations are declining in the watershed. Accordingly, an instream habitat restoration project aimed at increasing habitat quality and quantity for all life stages of salmonids was developed. The Warm Springs River has a stable hydrology, is clear and cold within the upper river reaches. Furthermore, its importance to Tribal history, culture and subsistence is invaluable. Therefore, Tribal staff decided that a low environmental impact type of restoration project (such as helicopter large wood placements) was warranted. Prior to implementation, Tribal staff investigated the natural formations of large wood within the channel. Based on those field investigations, coordination with a hydraulic engineer, and flood flow mapping, four types of log jams were designed and implemented. Two types were constructed along the stream margins (73 total log structures) in order to provide for low-velocity juvenile salmonid habitat. The other two larger structure types (some spanning the entire channel) were constructed in order to induce streambed scour, sort streambed sediments, create pools and activate side channels. The ultimate goal of this project is to increase native salmonid production and survival within the project area.

In addition to the presentation, an approximately 3-minutes long video highlighting the project will be shown. The video was created by Wahoo Films of Bend, OR.

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BIOGRAPHY:

Jason attended Oregon State University where he majored in Fisheries and Wildlife Science. He has worked in the Fisheries field for over 11 years, beginning as a Fisheries Technician with the Forest Service on the Siuslaw Ranger District, then moving to the Willamette National Forest for two more seasons. Upon the realization that seasonal work is not sustainable, he accepted a Fish Habitat Biologist position with the Confederated Tribes of the Umatilla – La Grande Field Office. In this position, Jason furthered his knowledge of aquatic restoration practices. In early 2011, he accepted a position with the Confederated Tribes of the Warm Springs. In both tribal biologist positions, he has managed many active and passive stream restoration projects.

When he's not sitting in front of his computer writing grants, reports, or Biological Assessments for work, you might find him swinging files for steelhead, or hiking with his family.

Mill Creek at Potter's Pond Restoration Project after 2 years

Prepared by: Keith Karoglanian, CTWS Fisheries. June, 2017

Organization: Confederated Tribes of Warm Springs
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ABSTRACT:

The Mill Creek at Potter's Ponds Restoration Project was a floodplain and instream restoration project completed by the Confederated Tribes of Warm Springs (CTWS), in the fall of 2015. The Pelton-Round Butte Fund contributed approximately $500k toward project completion.

As one would assume, completing and maintaining a project of this magnitude has its speed bumps: design drawing oversights, water and sediment management, electronic surface file complications, wildfires and problems that Oregon's State Mammal can create. Regardless, the project was a success and continues to be a dynamic, evolving environment. This project has been presented at this event in the past so the focus of this presentation will be lessons learned from project construction, project reflection and the post project conditions.

In addition to the presentation, a nine and a half minutes long video highlighting the project will be shown. The video was created by Wahoo Films of Bend, OR. The goal of the video is to provide a means of showcasing the project to the tribal public, and to inform them of the work that the Fisheries Habitat Program does.

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BIOGRAPHY:

Keith has spent close to 13 years working as a natural resource professional. With stints in Montana chasing Grizzly Bears, months in Arizona babysitting eagles and a summer being the "Vegetation Maintenance" Manager at a coastal Oregon State Park; he finally realized that water is where he wanted to work. He started out his biologist career in Roseburg, Oregon working as a "Habitat" Hydrologist for the BLM. Upon hearing that George W. Bush was going slash BLM budgets, and not seeing his name on the projected organizational charts, he left the BLM for a Habitat Biologist position with the Confederate Tribes of the Umatilla. Eventually he followed his wife to Warm Springs where they both work today.

With over 7 years working as Habitat Biologist, he has worked on large scale floodplain restoration projects, culvert removals, road decommissioning projects, helicopter placement projects, beaver analog structure installation and fencing projects. In addition to project work, Keith is responsible for conducting a large portion of the physical monitoring for on-reservation restoration projects. This work includes, but is not limited to, collecting and analyzing bed composition samples, temperature profiles, collection of detailed topographic data (using a dreaded RTK), and conducting over 85 miles of stream habitat surveys on the reservation.

In his free time, you can find him playing outside with his two little kids (Caddis and Clover), on his roof tending to his bees, in his garage brewing beer, working in his garden, or camping in one of Oregon's many great landscapes.

2016 Juvenile Migration Test and Verification Study

Prepared by: Gonzalo Mendez, Portland General Electric

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ABSTRACT:

We captured and PIT tagged 383 steelhead naturally-reared smolts in upper tributary screw traps in 2016. No Chinook fry were released into the upper basin tributaries in 2015; therefore, insufficient numbers of Chinook were encountered to allow for analysis in this report. Therefore all Chinook data reported are for hatchery-reared Chinook. We PIT-tagged 1,200 hatchery Chinook smolts and 800 hatchery steelhead smolts released at the head of the arms in Lake Billy Chinook. ODFW also PIT-tagged and released 1,194 hatchery Chinook and 795 hatchery steelhead smolts into the upper tributaries. Chinook migration in the tributaries peaked in late-March. Steelhead migration peaked in mid-May. Migration peaks at the SWW occurred several weeks after the migration peak in the tributaries.

Hatchery-reared steelhead spent 21 days (median) in Lake Billy Chinook (LBC), and median Chinook travel time through LBC differed by arm, ranging from 31-35 days. Travel times through the reservoir for naturally-reared smolts are confounded by their travel from their release points in the tributaries to LBC. Of the hatchery-reared Chinook and steelhead smolts PIT-tagged in the tributaries, 47.7% and 11.5% respectively, were captured at the SWW. Eight percent of the naturally-reared steelhead smolts PIT tagged in the tributaries were captured at the SWW. Based upon the number of hatchery-reared Chinook and steelhead smolts captured at screw traps, the majority of hatchery smolts appear to have left Whychus and the Metolius and entered LBC. We estimate between 3,828 and 11,462 naturally-reared steelhead were produced by Whychus Creek in 2016.

In 2016 we tested survival of day-released versus night-released fish throughout the lower Deschutes and to Bonneville. This revealed that night-released Chinook and steelhead have a

significant survival advantage over day-released fish that was present at the mouth of the Deschutes and persisted to Bonneville Dam. In 2015, Chinook survival estimates were 51%, similar to the day-released smolts in 2016, 59.5% (36.8-75.7). Night-released Chinook smolts survival estimate was 96.0% (79.3-100%). In 2015, steelhead survival estimates were 55% similar to 2016 day released smolts of 49.8% (29-69.4%). Night released steelhead smolt survival estimate was 77.4% (43.1-91.1%). We were not able to derive separate day versus night survival estimates for sockeye. In 2017, we will release smolts from the SWW at night to maximize lower river survival and improve adult return rates.

Migration Survival and Timing of Smolts Through the Lower Deschutes River 2015

Prepared by: Gonzalo Mendez, Portland General Electric; Megan Hill, Portland General Electric

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ABSTRACT:

Objectives of this study were to: 1) estimate travel timing and survival of Chinook, sockeye, and steelhead smolts released from the juvenile release pipe at river kilometer (rkm) 161 to near the mouth of the Deschutes River (rkm 5), 2) identify reaches in the lower Deschutes River where mortality might be occurring by using fixed radio telemetry stations. During the spring of 2016, 150 Chinook, 150 sockeye, and 150 steelhead smolts captured at the SWW were surgically-implanted with radio-tags and PIT-tags before release into the lower Deschutes River below the Reregulating Dam at the juvenile release pipe (rkm 161). Fish were divided into two treatment groups to test for differences in survival based on release timing, day vs night release. Fish were tagged throughout the spring migration March 8 – June 14. Radio-telemetry stations were continuously operated on the lower Deschutes River near Dizney Riffle (rkm 159), Trout Creek (rkm 140), Buck Hollow Creek (rkm 69), and the mouth of the Deschutes (rkm 5). Survival of radio-tagged smolts to the mouth of the Deschutes River was estimated at 64.4% for sockeye, 59.5% and 96.0% for day and night released Chinook, and 49.8% and 77.4% for day and night released steelhead. Survival estimates between telemetry stations were generally lowest at Trout Creek station but not consistently. For example, survival between the Dizney Riffle and Trout Creek ranged from 83.2-93.6% for sockeye and 75.0-73.5% between Dizney Riffle and Trout Creek for day released steelhead. Median travel times through the Deschutes River to the mouth varied by species and treatment group; three and six days in day and night released sockeye, four and four and a half days in day and night released Chinook, and five days in both day and night released steelhead. All three species travel rates (km/d) were slowest between release and Dizney Riffle telemetry station.

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BIOGRAPHY:

Gonzalo Mendez works for Portland General Electric as a fisheries biologist. He has been with the company for approximately two years. His main focus is to conduct Test and Verification studies associated with Juvenile Migration. On a yearly basis PGE monitors the movement and survival of released spring Chinook and summer steelhead from the major tributaries of the Deschutes basin to the Fish Transfer Facility (FTF) in Lake Billy Chinook. To accomplish this PGE deploys screw traps to capture and tag out-migrating smolts. Gonzalo earned a Bachelor's degree in Wildlife and Fisheries Conservation at University of Massachusetts, Amherst in 2002. He has been conducting fisheries related science for over 15 years and in that time he has worked in marine environments, participated in Atlantic salmon re-introduction, conducted fish passage work, and stream habitat assessments. In his spare time he pursues a variety of outdoor activities including fly fishing, hiking, snowboarding, and watching sports.

Lower Deschutes River Macroinvertebrate Study: Update on Additional Analyses

Prepared by: Tim Nightengale and Alice Shelly, R2 Resource Consultants, Inc.
June 2017

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ABSTRACT:

On April 1, 2016, Portland General Electric (PGE) filed the "Lower Deschutes River Macroinvertebrate and Periphyton Study" final report (R2 Resource Consultants, Inc. 2016) with the Federal Energy Regulatory Commission (FERC), meeting the requirements of the 401 certification in association with the FERC License. This final report summarized results of two years of post-selective water withdrawal (SWW) sampling (2013-2015) with comparisons with pre-SWW baseline sampling (1999-2001). In response to the final report, the Oregon Department of Environmental Quality (DEQ) sent a letter to PGE on May 23, 2016 outlining their concerns regarding the analysis and interpretation of the macroinvertebrate data collected for the study, and listed several recommendations for additional analyses. In response, PGE and R2 conducted continued analyses, which included re-examination of the datasets for taxonomic consistency, defining Optimal Taxonomic Units (OTUs) to use in the analyses, conducting simulated subsampling to make datasets comparable, recalculating metrics with newer published tolerance values, and running multivariate comparisons of pre- and post-SWW macroinvertebrate data using NMDS ordinations. The preliminary results of these additional analyses will be presented [1].

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[1] Nightengale, T. and A. Shelly. 2017. Lower Deschutes River Macroinvertebrate & Periphyton Study: Update on Additional Analyses. R2 Resource Consultants, Inc. Redmond, Washington. Pelton Round Butte 2017 Fisheries Workshop. Portland General Electric Company. Portland, Oregon.

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BIOGRAPHY:

Tim Nightengale is an Aquatic ecologist from R2 Resource Consultants. He has over 20 years of experience in field collection, identification, and analysis of freshwater benthic macroinvertebrate communities across the United States, specializing in aquatic insect taxa. Tim hails from Nebraska, where he earned his Bachelor's in Wildlife Biology. He traveled west to get his Master's from the University of Idaho, where he studied the macroinvertebrates in the Lower Snake River reservoirs. Tim spent a couple of years out of graduate school to sample and study the benthic communities in the Yakima and Okanogan rivers in Washington, before taking a position with the Academy of Natural Resources in Philadelphia. There, he ran the Patrick Center's Invertebrate Zoology section, and had the opportunity to sample rivers throughout the Eastern and Southern US. Tim has been with R2 for 13 years, recently completing a large River Productivity study on the Susitna River in Alaska, as well as the Lower Deschutes River Macroinvertebrate and Periphyton Study.

Hydrogeologic Review of the Pelton Round Butte Hydroelectric Project Waterbodies and Potential Thermal Impacts of Groundwater Discharge

Prepared by: Catherine Yonkofski, Wenwei Xu, Tarang Khangaonkar
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July 2017

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ABSTRACT:

To independently validate conclusions recently reported[1] that groundwater discharge is acting as a source of heat to the Pelton Round Butte (PRB) waterbodies, estimates of key heat flow parameters were made through a thorough literature review of the groundwater flows in the region. The objective of this review was to consolidate existing literature and recorded groundwater data to complete a preliminary quantification of groundwater heat flows into PRB waterbodies. To support this work, we reviewed the hydrologic setting, geologic and hydrogeologic properties, and local and regional subsurface thermal behavior about the study area. Following the hydrologic review, a simple conceptual model was built to perform a heat balance over the system. Overall, groundwater accounted for an approximately 30% increase in heat flow within the PRB waterbodies. Findings from this study independently validate the conclusion that groundwater discharge is acting as a source of heat to the PRB waterbodies[1] and also provide an approximate estimate of how much additional heat to anticipate across the system.

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1. Xu, W and T Khangaonkar. 2015. Temperature Model of the Pelton Round Butte Hydroelectric Project Reservoirs. PNNL-25094, Pacific Northwest National Laboratory, Richland, Washington. Available at http://www.pnnl.gov/main/publications/external/technical_reports/PNNL-25094.pdf.

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BIOGRAPHY:

Dr. Yonkofski is an environmental engineer in the Hydrology Group at PNNL. She has a background in applied math and hydrogeology, with a PhD in Environmental Engineering from Clemson University. Her specialty is in numerical modeling of flow in porous media with focuses on both subsurface energy resource engineering and groundwater flow problems. In the Spring of 2016, she became involved with efforts to improve temperature control of discharge through the surface water withdrawal operation at Lake Billy Chinook by PNNL under contract with Portland General Electric Company.