



Grant County
PUBLIC UTILITY DISTRICT
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VIA ELECTRONIC FILING

February 1, 2013

Kimberly D. Bose, Secretary
Federal Energy Regulatory Commission
Mail Code: DHAC, PJ-12
888 First Street, N.E.
Washington, D.C. 20426

**RE: Priest Rapids Hydroelectric Project No.2114-164
License Compliance Filing – Article 401(a)(10) and (25) – 2011 Bull Trout
Monitoring and Evaluation Annual Report**

Dear Ms. Bose,

Please find enclosed the 2012 Bull Trout Monitoring and Evaluation Annual Report consistent with the Requirements of Article 401(a)(10) and Article 401(a)(25) of the Priest Rapids Hydroelectric Project License.

On June 4, 2009, the Federal Energy Regulatory Commission (FERC) issued an Order modifying and approving Public Utility District No.2 of Grant County, Washington's (Grant PUD's) Bull Trout Monitoring and Evaluation Plan. Under this Order, Grant PUD is required to file annually with FERC by February 1, beginning 2010 and concluding 2014, an Annual Bull Trout Monitoring and Evaluation Report. On September 19, 2009, Grant PUD filed its Bull Trout Hydrologic and Water Quality Study Plan requesting that due to the similarities of Bull Trout Hydrologic and Water Quality Study Plan and the Bull Trout Monitoring Evaluation Plan that FERC consider Grant PUD combining the objectives of the Bull Trout Hydrologic Water Quality Study Plan with the approved Bull Trout Monitoring Plan. On February 17, 2010, FERC issued an Order modifying and approving Grant PUD's Bull Trout Hydrologic and Water Quality Study Plan. Under this Order, Grant PUD is required to include the water quality monitoring results with the Bull Trout Monitoring and Evaluation Annual Report. This report includes monitoring results from the previous year including the number of bull trout observed or incidentally taken. Grant PUD distributed this annual report to the Priest Rapids Fish Forum on December 21, 2012 for review and comment. After a 30 day comment and review period,

comments were received from the Washington Department of Ecology and U.S. Fish and Wildlife Service; these comments addressed in this final report, are attached to the report as Appendix A, and a comment/comment response summary table (showing the agency comment and Grant PUD's response) is attached to the report as Appendix B.

FERC staff with any questions should contact Tom Dresser at 509-754-5088, ext. 2312.

Respectfully,



Julie E. Pyper
License Compliance Manager

Enclosures: 2012 Bull Trout Monitoring and Evaluation Report

**2012 Bull Trout Monitoring and Evaluation Report for the Priest
Rapids Project**

(License Articles 401(a)(10 & 25))

By

Behr Turner
Senior Biologist
Public Utility District No. 2 of Grant County, Washington
Priest Rapids Project
FERC Project Number 2114

January 2013

Executive Summary

Public Utility District No. 2 of Grant County, Washington (Grant PUD) owns and operates Wanapum and Priest Rapids dams on the Columbia River, known collectively as the Priest Rapids Hydroelectric Project (Project), operated under the terms and conditions of Federal Energy Regulatory Commission (FERC) Hydroelectric Project License No. 2114. The following is a report on Grant PUD's bull trout monitoring and evaluation program, in accordance with the Bull Trout Monitoring and Evaluation Plan (BTMEP) and Bull Trout Hydrologic and Water Quality Study Plan (BTWQP); note that the reporting requirements for these two plans have been combined into one report. The goal of the BTMEP and BTWQP is to, on a yearly basis, monitor and evaluate bull trout (*Salvelinus confluentus*) presence in the Project and collect hydrologic and water quality data related to Project operations and acclimation activities. This information and data are collected in order to evaluate the potential Project-related impacts on bull trout and to specify the basis for identifying measures Grant PUD will implement to address any Project-related impacts to bull trout.

The following presents a summary of the results from 2012; refer to the main document for additional detail and discussion.

Bull Trout Observations

In 2012, five bull trout were observed passing the fish ladder count stations at Priest Rapids Dam and three bull trout were observed passing the fish ladder count stations at Wanapum Dam between April 15 and November 15 for a total of eight observations. No bull trout were observed in juvenile bypass activities, gatewell dipping, turbine maintenance activities or fishway maintenance activities. During operation of screw-traps on the White River and Nason Creek (as part of Grant PUD's spring Chinook supplementation program), sixty-two bull trout were incidentally collected in the White River (nine of which were PIT-tagged), and nine bull trout were incidentally collected in Nason Creek (all nine were all PIT-tagged). Grant PUD also conducted spring Chinook acclimation activities at a site along the White River (near river mile 2) from March through May; no bull trout were observed during the temporary acclimation activities.

Hydrologic and Water Quality Monitoring

Grant PUD also statistically compared daily hydrologic and water quality data for the three year average, 2001-2003, with daily water quality data from 2012, which included the parameters of total dissolved gas (TDG), water temperature, water surface elevation and total discharge or outflow. In accordance with BTWQP, hydrologic and water quality data from 2001-2003 is used as the environmental "baseline" for which future years data would be compared.

Based on the results of the comparisons, hydrologic and water quality data from 2012 were significantly different than the 2001-2003 averages for all parameters except total dissolved gas at the Priest Rapids forebay. The primary reason for these differences can likely be attributed to higher than average flows throughout the mid-Columbia River in 2012, which lead to high water surface elevations, discharge, and TDG values within the Project area (when compared to the 2001-2003 average). For example, mean daily discharges during the 2012 fish-spill season were considerably higher than the 2001-2011 average (about sixty-eight percent higher on average) over the entire fish-spill season (April 1 through August 31). During the summer fish-spill season (June 15 through August 31), 2012 mean daily discharge values were seventy-eight

percent higher than the 2001–2011 average, and 101 percent higher from June 22 through July 28, which was the period when the highest TDG levels were observed throughout the mid-Columbia River (Keeler 2012).

In 2012, the forebay elevations at Wanapum Dam were significantly higher than the 2001-2003 elevation with a 2012 median elevation of 570.40 feet compared to the 2001-2003 median elevation of 569.66 feet; however, at Priest Rapids Dam, the 2012 forebay elevations (median = 486.10 feet) were significantly lower than the 2001-2003 forebay elevations (median = 486.66 feet).

Water temperature in 2012 was also significantly lower by approximately one degree Celsius in both forebays compared to the three year average.

In 2012, TDG was also significantly higher by approximately 5.7 percent saturation (median value) in the Wanapum forebay compared to the 2001-2003 data. There was no significant difference in the TDG between the 2012 data and the 2001-2003 data in the Priest Rapids forebay.

The 2012 discharge was also significantly higher at both dams when compared to the 2001-2003 data. At Priest Rapids Dam, the 2001-2003 discharge had a median of 102.9 kcfs (and average of 106.5 kcfs) and the 2012 discharge data had a median of 195.0 kcfs (and average of 182.0 kcfs). At Wanapum Dam, the 2001-2003 discharge had a median of 103.7 kcfs (and average of 107.6 kcfs) and the 2012 discharge data had a median of 195.1 kcfs (and average of 181.9 kcfs).

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1.0 Introduction

The Public Utility District No. 2 of Grant County, Washington (Grant PUD) owns and operates two hydroelectric dams on the Columbia River; Wanapum and Priest Rapids, known collectively as the Priest Rapids Hydroelectric Project (Project), operated under the terms and conditions of Federal Energy Regulatory Commission (FERC) Hydroelectric Project License No. P-2114.

Grant PUD operates the Project through the coordinated operation of the seven-dam system and other Columbia Basin entities with current operational agreements with the fishery agencies and other operators to provide protection and enhancement for a range of fisheries and other resources within and downstream of the project. These agreements include the Hanford Reach Fall Chinook Protection Program Agreement, the Hourly Coordination Agreement, and the Priest Rapids Project Salmon and Steelhead Settlement Agreement. The Project is also subject to the provisions of the FERC license and related laws and regulations, as well as to the requirements (incorporated by reference in the license) of the Biological Opinion for the Priest Rapids Project issued by the National Marine Fisheries Service (NMFS) for its effects on anadromous salmon, the Clean Water Act Section 401 Water Quality Certification issued by the Washington State Department of Ecology (WDOE), and the Biological Opinion for the Project issued by the United States Fish and Wildlife Service (USFWS; 2007) regarding the effects of the Project on bull trout (*Salvelinus confluentus*).

A 401 Water Quality Certification was issued by the WDOE on April 3, 2007, and amended March 6, 2008, for the operation of the Project. A new license for the Project was issued by FERC on April 17, 2008 (FERC 2008). Under FERC License Article 401(a)(10) and the 401 Certification (6.2 (5)(b)), Grant PUD was required, in consultation with the Priest Rapids Fish Forum (PRFF), to develop and submit for approval a Bull Trout Monitoring and Evaluation Plan (BTMEP) within one year of issuance of the license. The BTMEP was implemented upon FERC approval, June 4, 2009. In accordance with the BTMEP, Grant PUD monitored for bull trout during all Project related activities where bull trout could potentially be seen or encountered in 2012. In addition, in accordance with FERC License Article 401(a)(25) and Reasonable and Prudent Measure 2 of the USFWS Bull Trout Biological Opinion for the Project (USFWS 2007), Grant PUD, in consultation with the PRFF, developed the Bull Trout Hydrologic and Water Quality Study Plan (BTWQP). The BTWQP was implemented upon FERC approval on February 17, 2010. The goal of the BTMEP and BTWQP is to, on a yearly basis, monitor and evaluate bull trout presence in the Project and collect hydrologic and water quality data related to Project operations and acclimation activities. This information and data are collected in order to evaluate the potential Project-related impacts on bull trout and to specify the basis for identifying measures Grant PUD will implement to address any Project-related impacts to bull trout. The following presents a summary of the results from Grant PUD's 2012 monitoring efforts under the BTMEP and BTWQP (note that FERC approved the combination of both reporting requirements into a single report on with approval of the BTWQP).

2.0 Bull Trout Observations

According to the Bull Trout Biological Opinion for the Project (USFWS 2007; Terms and Conditions 1 and 2), Grant PUD is to provide adequate year-round passage conditions for bull trout at Project facilities, and to count and report bull trout moving past Wanapum and Priest Rapids dams between April 15 and November 15 of each year. Grant PUD maintains video adult fish counting equipment at Priest Rapids and Wanapum dams and full duplex PIT-Tag detection

equipment at Priest Rapids Dam. The adult video fish-counting season runs from April 15 through November 15, annually, which is also in accordance with Terms and Condition 1.22 of the Salmon and Steelhead Biological Opinion (NMFS 2008). The adult fishway PIT-tag detectors are operated year-round.

In 2012, five bull trout sightings were observed at the Priest Rapids Dam fish ladder count stations and three bull trout were observed at Wanapum Dam between April 15 and November 15 for a total of eight observations. Figure 1 and Figure 2 captured bull trout passing Priest Rapids and Wanapum dams. Table 1 contains all the pertinent information related to the bull trout observations made at Priest Rapids and Wanapum dam count stations in 2012. The bull trout lengths in Table 1 were stoichiometric estimates based on bull trout total lengths and the distances between the length lines in the counting windows. The total lengths were categorized by total length inches. Bull trout 5-13 inches in total length were classified as sub-adult and bull trout greater than 13 inches in total length were classified as adults (USFWS 2007). The accuracy of these total length estimates are suspect due to the position of the bull trout in the camera's field of view. Table 2 shows bull trout use of the left bank and right bank fish ladders for both Priest Rapids and Wanapum dams from 2007 through 2012. The 2010-2012 estimated total lengths of bull trout were provided on all photograph data available (Table 3). No photographic data were available for years prior to 2010. One PIT-tagged bull trout (i.e., 3D9.1C2CCD42DD) was detected at the Priest Rapids detection array in on May 24, 2012. Because the PIT-tag detection arrays are located upstream of the counting station and near the upstream fishway exit, it is believed this PIT-tag detected bull trout was counted on May 23, 2012. The PIT-tagged bull trout was not detected at Wanapum Dam; because, Grant PUD only maintains full duplex PIT-Tag detection equipment at Priest Rapids Dam. Grant PUD operated its fishways in accordance with the Priest Rapids Salmon and Steelhead Agreement and Grant PUD's annual Fishway Operating Plan.

No bull trout were observed in juvenile bypass activities, gatewell dipping, turbine maintenance activities, fishway maintenance activities, Hanford Reach Fall Chinook Protection Program, hatchery activities, or any other activities in the Priest Rapids Project.

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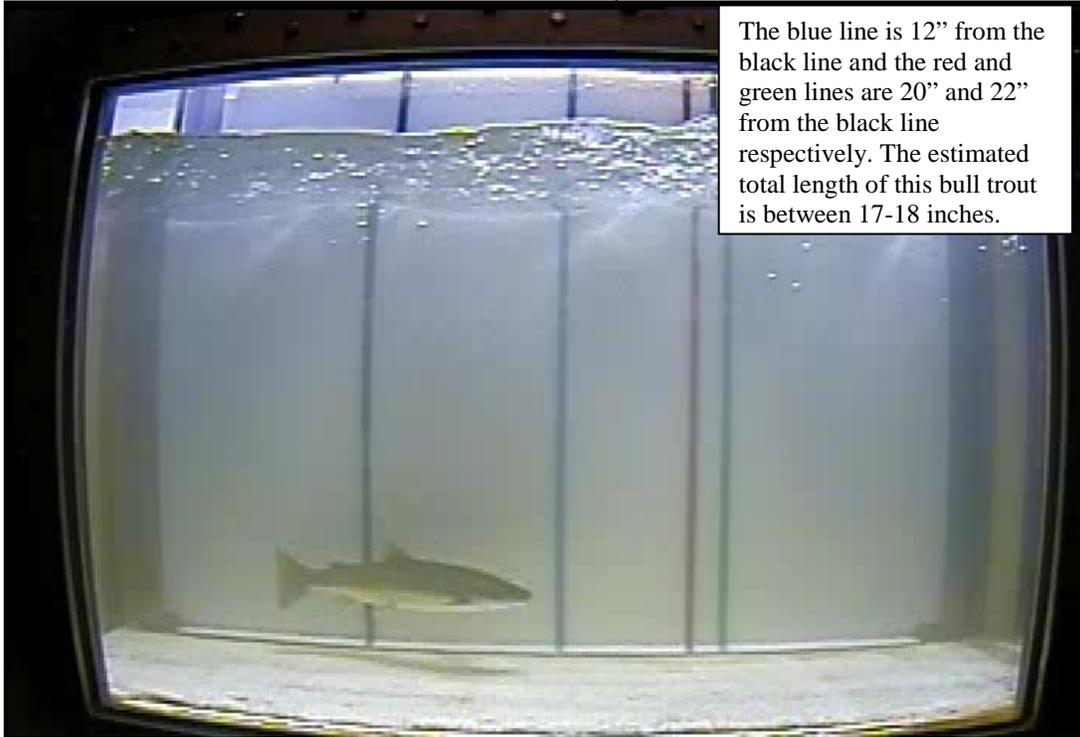


Figure 1 An example of a bull trout passing Priest Rapids left bank count station on June 28, 2012.

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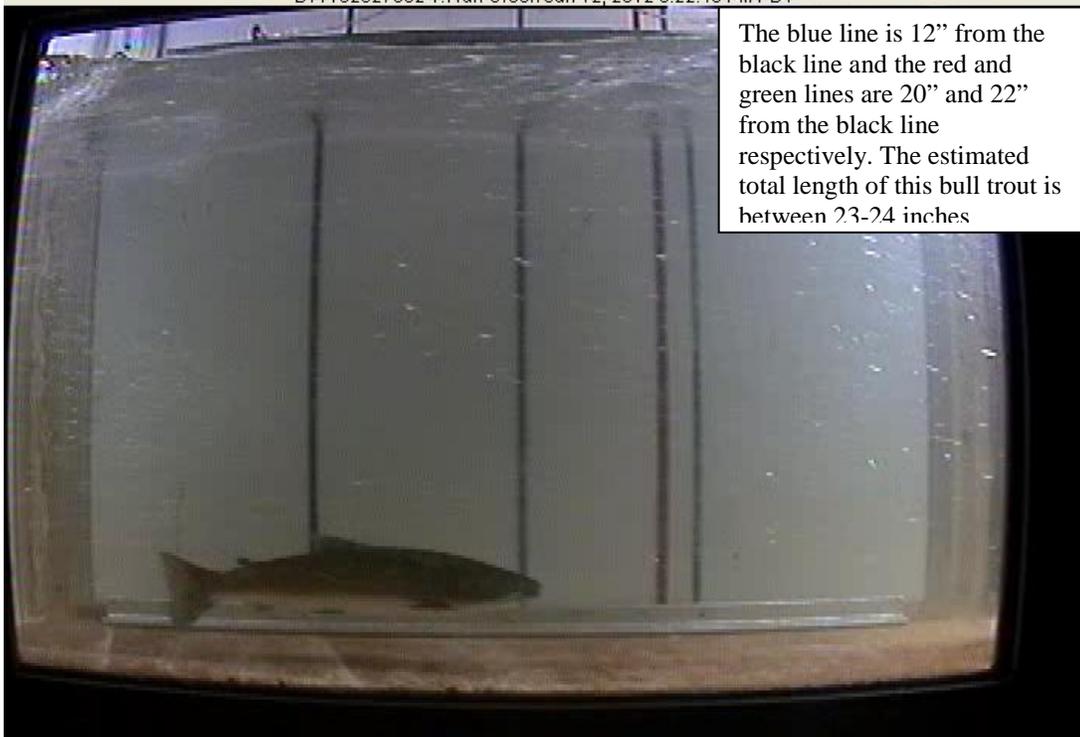


Figure 2 An example of a bull trout passing Wanapum left bank count station on June 12, 2012.

Table 1 Bull Trout Observation at the Priest Rapids Project Count Stations in 2012.

Priest Rapids Dam	Date	Ladder	Number	Estimated Total Length
	5/23/2012	Left	1	N/A
	6/2/2012	Right	1	N/A
	6/28/2012	Left	1	17-18 inches
	7/9/2012	Left	1	22-23 inches
	7/14/2012	Left	1	19-20 inches
Wanapum Dam	Date	Ladder	Number	Estimated Total Length
	6/12/2012	Left	1	23-24 inches
	6/12/2012	Right	1	23-24 inches
	9/16/2012	Left	1	20-21 inches

Table 2 Number of Bull Trout Passing Priest Rapids and Wanapum dams form 2007 to 2012.

Year	Priest Rapids Dam		Wanapum Dam	
	Left Bank	Right Bank	Left Bank	Right Bank
2007	0	1	1	0
2008	2	3	0	0
2009	5	1	3	0
2010	5	2	5	2
2011	5	3	9	3
2012	4	1	2	1

Table 3 Estimated bull trout total lengths (inches) from available fish passage photos collected during the 2010-2012 fish counting periods.

Bull Trout Total Length Estimate Categories in Inches for Photographed Bull Trout																	
Year	Row Labels	16-17	17-18	18-19	19-20	20-21	21-22	22-23	23-24	24-25	25-26	26-27	27-28	30-31	31-32	38-39	Grand Total
2010	PRD				2		1							1			4
	UNK									1							1
	Annual Total				2		1			1				1			5
2011	PRD			1	1							1	1		2		6
	WAN	1					1		1		3	1			1	1	9
	Annual Total	1		1	1		1		1		3	2	1		3	1	15
2012	PRD		1		1			1									3
	WAN					1			2								3
	Annual Total		1		1	1		1	2								6
Grand Total		1	1	1	4	1	2	1	3	1	3	2	1	1	3	1	26

Note: The counts of bull trout length estimates do not correspond to the total annual bull trout fish counts at the dams

PRD = Priest Rapids Dam

WAN = Wanapum Dam

UNK = Dam Unknown

3.0 Bull Trout Observations and Handlings on Nason Creek and White River

Grant PUD monitors screw traps on the White River and Nason Creek through the Yakama Nation as part of Grant PUD’s spring Chinook hatchery supplementation program. A map showing the location of the screw traps is provided in Figure 3. The Yakama Nation operates screw traps for spring Chinook salmon and additionally records bull trout observations on the White River and Nason Creek. During screw trap operations in 2012, 62 bull trout were incidentally collected in the White River and 9 bull trout were incidentally collected in Nason Creek. Of the 62 bull trout collected in the White River, ten measured greater than 60 mm in length, and nine bull trout were PIT-tagged. Nine bull trout were collected in Nason Creek, and all nine bull trout were greater than 60 mm in fork length, thus they were all PIT-tagged. The associated PIT-tags have been uploaded to the PTAGIS website for future tracking. Data for the individual fish tagged were provided in Table 4.

Grant PUD also conducted short-term spring Chinook acclimation activities at one location in the White River Basin between March and May, 2012. Fish were acclimated in tanks on the bank at Grant PUD’s Bridge Site (river mile (RM) 2); water was pumped from the White River to the acclimation tanks via a “pump-basket” set-up with water being returned via outflow pipes (Figure 4). No bull trout were observed during the setup, operation, or demobilization of the acclimation site (see Section 4.2 for description of water quality monitoring activities during the White River acclimation activities).

Table 4 PIT-tag codes and data for bull trout incidentally collected in the Nason Creek and White River screw traps.

Location	Date Tagged	Fork Length (mm)	Weight (g)	PIT-tag Code
Nason Creek	4/28/2012	172	46.6	3D9.1C2D6D7682
Nason Creek	5/12/2012	123	18.2	3D9.1C2D6B01A6
Nason Creek	5/22/2012	138	16.9	3D9.1C2D6AD6B1
Nason Creek	5/27/2012	148	30.0	3D9.1C2D6A00C1
Nason Creek	5/28/2012	125	17.8	3D9.1C2D69F408
Nason Creek	6/8/2012	142	28.2	3D9.1C2D69F7C6
Nason Creek	6/24/2012	152	32.1	3D9.1C2D6A94E0
Nason Creek	7/17/2012	156	35.5	3D9.1C2D6A7E90
Nason Creek	7/22/2012	95	8.8	3D9.1C2D6D41B5
White River	6/9/2012	150	71.7	3D9.1C2D7ED43F
White River	6/27/2012	99	8.6	3D9.1C2D7635BC
White River	8/22/2012	121	15.3	3D9.1C2D7ECC7A
White River	9/4/2012	175	27.5	3D9.1C2D7E9C5C
White River	10/4/2012	197	78.9	3D9.1C2D7645F5
White River	10/5/2012	161	38.9	3D9.1C2D763FC4
White River	10/6/2012	146	30.2	3D9.1C2D76464E
White River	10/11/2012	151	33.1	3D9.1C2DB57ABF
White River	10/13/2012	179	57.4	3D9.1C2DB5D4B3

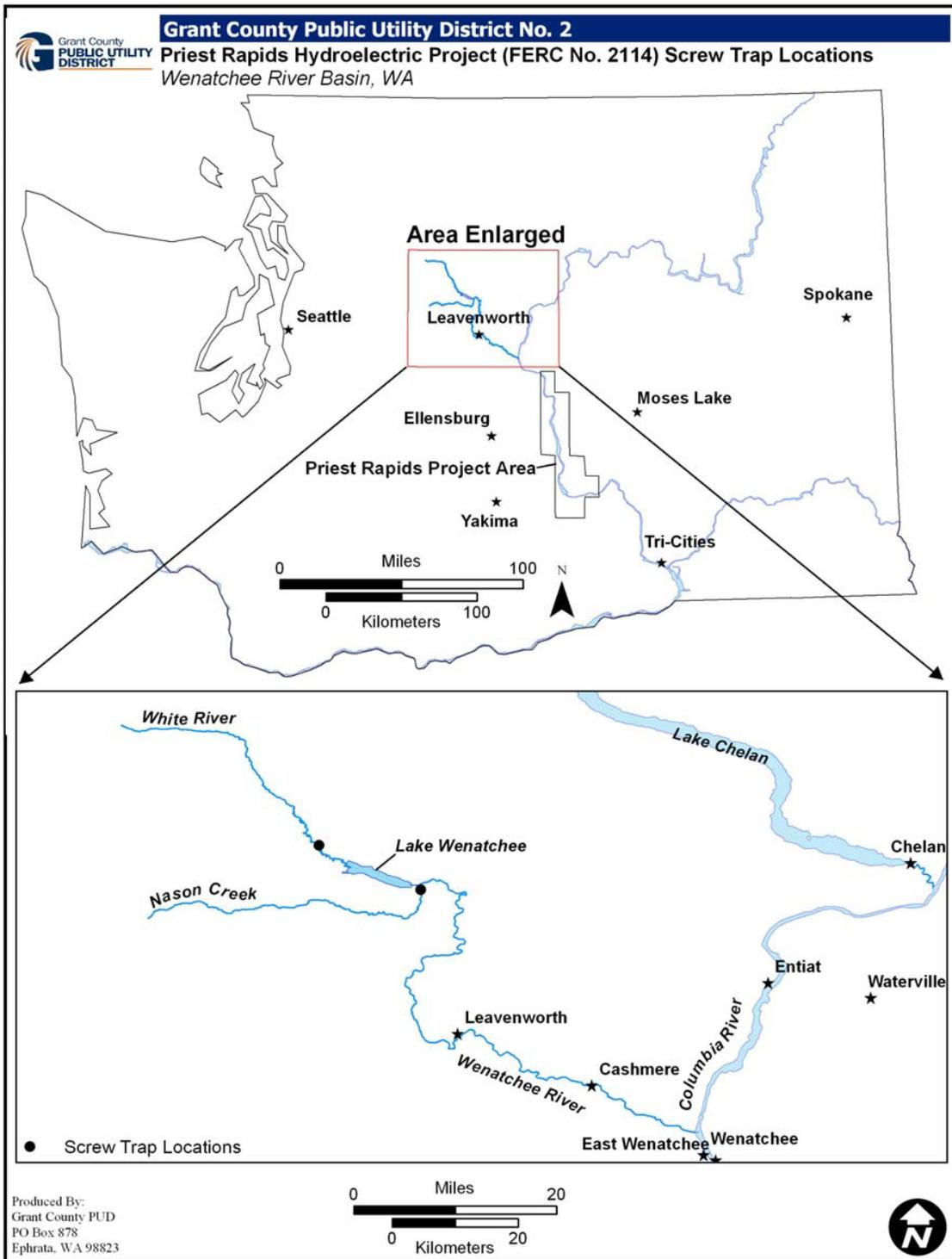


Figure 3 Screw Trap Locations on White River and Nason Creek.

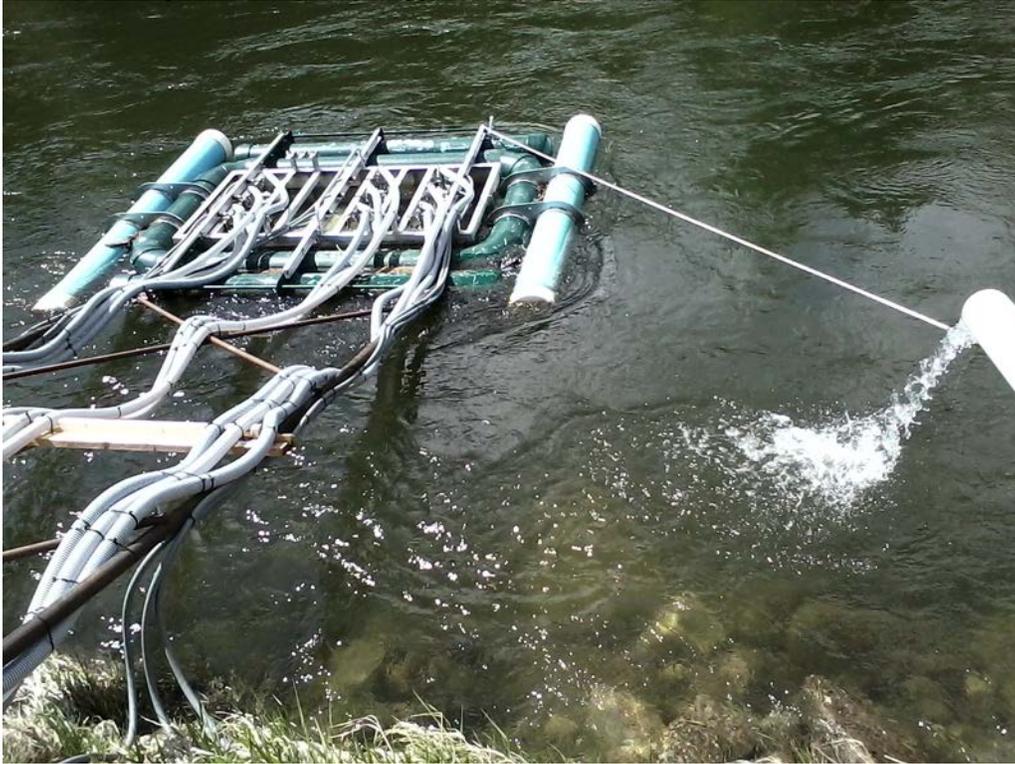


Figure 4 A photograph of the 2012 White River acclimation site water pump-basket with an outflow pipe.

4.0 Hydrologic and Water Quality Monitoring

The following sections present a summary of the 2012 bull trout water hydrologic and water quality evaluation.

4.1 Water Quality Evaluation

Grant PUD statistically compared daily hydrologic and water quality data for the three year average, 2001-2003, with daily hydrologic water quality data from 2012. In accordance with the BTWQP, the hydrologic and water quality data from 2001-2003 is used as the environmental “baseline” for which future years (e.g. 2012) data would be compared. This comparison is being made due to available bull trout data collected from 2001-2003 (BioAnalysts 2002, 2003 and 2004), which demonstrated through a bull trout telemetry study that the Project, although rarely frequented by bull trout, appeared to have no measurable impact on movement or on any life stage of bull trout. Although specific hydrologic and water quality data from the Project area were not collected or analyzed as part of the BioAnalysts studies, this data from 2001-2003 were selected as the environmental “baseline” based on the assumption that hydrologic and water quality data from 2001-2003 were suitable for bull trout, based on the results of the BioAnalysts studies (2002, 2003, and 2004). Thus, in accordance with the BTWQP, if hydrologic and/or water quality data collected in a given year (e.g. 2012) were significantly different from the 2001-2003 data, additional evaluations could be assessed (if feasible) as to potential Project-related impacts upon bull trout and subsequent mitigation measures. The hydrologic and water quality parameters under evaluation were total dissolved gas (TDG), temperature, water level elevation and total discharge or outflow. The water quality data of TDG and temperature were

taken from the Priest Rapids and Wanapum dam forebays, in accordance with Grant PUD’s fixed-site water quality monitoring program (Hendrick 2009). The hydrologic parameters of forebay elevation and total discharge were obtained from the Ovation Historical Data Retrieval Request Client. In accordance with the BTWQP, hydrologic and water quality data from May 1 through October 31 was evaluated.

In 2012, the three-year daily averages of the 2001-2003 hydrologic and water quality data were compared to 2012 daily average data. SigmaStat 3.5 was used to conduct the statistical analyses. Data normality tests were conducted to determine the appropriate statistic for comparison. Following the normality tests, which failed for all variables, a non-parametric Mann-Whitney Rank Sum Test, $\alpha = 0.05$, was used to determine if there were significant differences in the hydrologic and/or water quality parameters of the 2001-2003 three-year averaged data and the 2012 data. At Priest Rapids Dam, the results showed that there were significant differences in water quality parameters between the three-year average and the 2012 data for temperature, forebay elevation and discharge, but there was no significant difference in totally dissolved gas between the 2012 and the 2001-2003 data (Table 5). At Wanapum Dam, all water quality parameters were significantly different between the 2001-2003 average data and the 2012 data (Table 6). Water quality data values such as the median, average, minimum and maximum daily values for 2001 through 2003, the 3-year average and 2012 are presented in Table 7 and Table 8. Daily average water quality data from the Wanapum and Priest Rapids dam for TDG, temperature, elevation and discharge for the years 2001-2003, the 3 year average of those years, and 2012 are presented in Figure 5 through Figure 12. Additional details on each of these parameters were presented in the sections below.

Table 5 Results of Mann-Whitney Rank Sum Test between three year average water quality data (2001-2003) and the 2012 water quality data at Priest Rapids Forebay.

Priest Rapids Forebay				
Parameter	Total Dissolved Gas (% Saturation)	Temperature	Water Level Elevation	Discharge
Statistical Comparison	No Significant Difference	Significantly Different	Significantly Different	Significantly Different
2001-2003	111.08	17.18	486.66	102.90
2012	108.92	15.96	486.10	195.05
P-value	P=0.058	P<0.001	P<0.001	P<0.001

Table 6 Results of Mann-Whitney Rank Sum Test between three year average water quality data (2001-2003) and the 2012 water quality data at Wanapum Forebay.

Wanapum Forebay				
Parameter	Total Dissolved Gas (% Saturation)	Temperature	Water Level Elevation	Discharge
Statistical Comparison	Significantly Different	Significantly Different	Significantly Different	Significantly Different
2001-2003	109.21	17.28	569.62	103.74
2012	114.92	16.05	570.40	195.12
P-value	P<0.001	P=0.001	P<0.001	P<0.001

Table 7 Water Quality Data Values for Priest Rapids Forebay 2001-2003, 3 year average and 2012.

Water Quality Data Values (mean daily averages) at Priest Rapids Dam Forebay, 3yr-Ave (2001-2003) vs. 2012					
TDG (% Sat)	2001	2002	2003	3yr-Ave	2012
Median	106.7	112.7	110.2	111.1	108.9
Average	106.0	110.5	108.0	108.2	107.5
Minimum	96.2	96.3	97.4	97.2	95.7
Maximum	116.3	125.8	119.6	116.2	122.3
Temperature (C)	2001	2002	2003	3yr-Ave	2012
Median	17.0	16.0	18.1	17.2	16.0
Average	16.2	15.7	16.8	16.2	15.3
Minimum	9.6	8.0	8.6	8.7	8.5
Maximum	19.5	20.2	21.0	19.9	19.4
Forebay Elevation (ft.)	2001	2002	2003	3yr-Ave	2012
Median	486.6	486.8	486.5	486.7	486.1
Average	486.6	486.7	486.5	486.6	486.1
Minimum	484.4	483.9	484.2	484.6	483.3
Maximum	487.4	487.9	487.9	487.3	487.8
Discharge (kcfs)	2001	2002	2003	3yr-Ave	2012
Median	68.9	132.1	107.4	102.9	195.0
Average	70.8	140.4	108.4	106.5	182.0
Minimum	38.6	46.4	40.6	47.8	41.2
Maximum	127.3	274.3	193.1	181.1	352.7

Table 8 Water Quality Data Values (mean daily averages) for Wanapum Dam Forebay 2001-2003, 3 year average and 2012.

Water Quality Data Values at Wanapum Dam Forebay, 3yr-Ave (2001-2003) vs. 2012					
TDG (% Sat)	2001	2002	2003	3yr-Ave	2012
Median	106.5	112.0	107.3	109.2	114.9
Average	106.2	110.2	106.4	107.6	112.8
Minimum	96.8	95.7	96.5	97.3	96.3
Maximum	118.5	124.4	115.7	115.3	129.3
Temperature (C)					
2001	2002	2003	3yr-Ave	2012	
Median	16.9	16.4	17.8	17.3	16.1
Average	16.3	15.8	16.6	16.3	15.4
Minimum	9.2	8.1	8.7	8.8	8.6
Maximum	21.2	20.8	21.5	20.4	19.7
Forebay Elevation (ft.)					
2001	2002	2003	3yr-Ave	2012	
Median	569.6	570.1	569.5	569.6	570.4
Average	568.9	569.7	569.2	569.3	569.9
Minimum	562.7	563.6	564.2	564.2	566.1
Maximum	571.2	571.7	571.4	571.0	571.4
Discharge (kcfs)					
2001	2002	2003	3yr-Ave	2012	
Median	68.2	130.9	107.2	103.7	195.1
Average	73.5	140.0	109.4	107.6	181.9
Minimum	39.0	44.9	41.8	47.9	36.4
Maximum	139.0	273.9	185.7	185.7	341.2

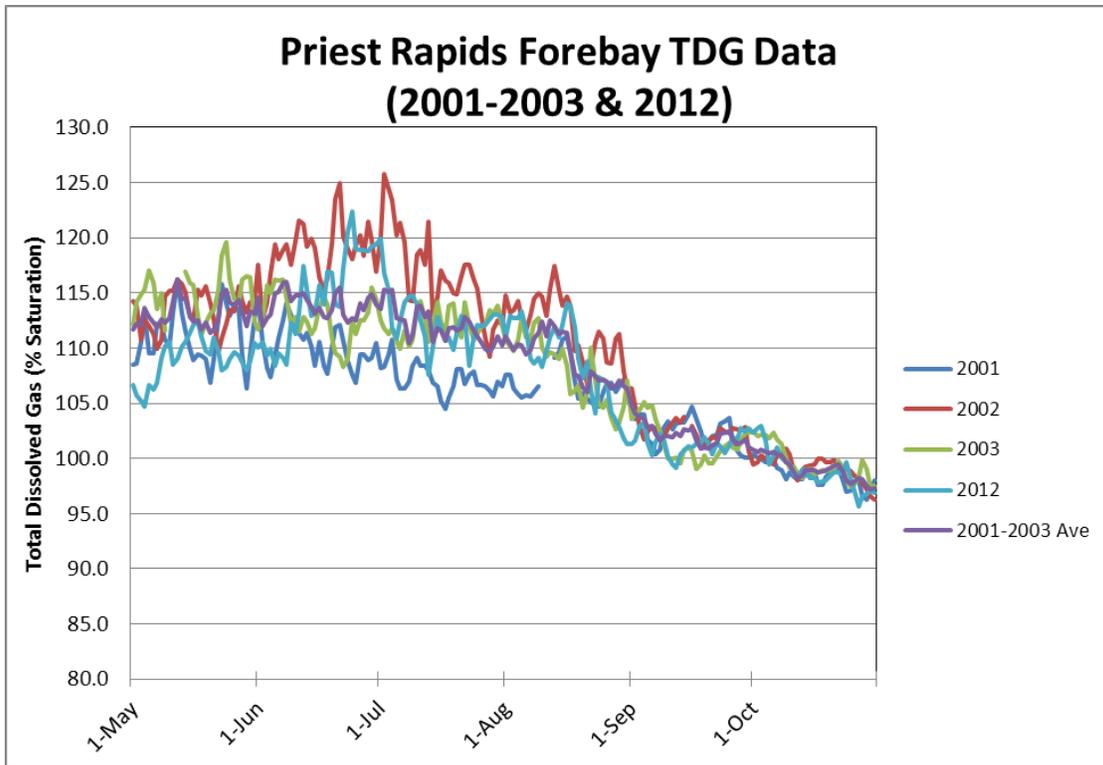


Figure 5 Daily Average TDG Values for Priest Rapids Dam Forebay for the years 2001-2003, the 3 year average and 2012.

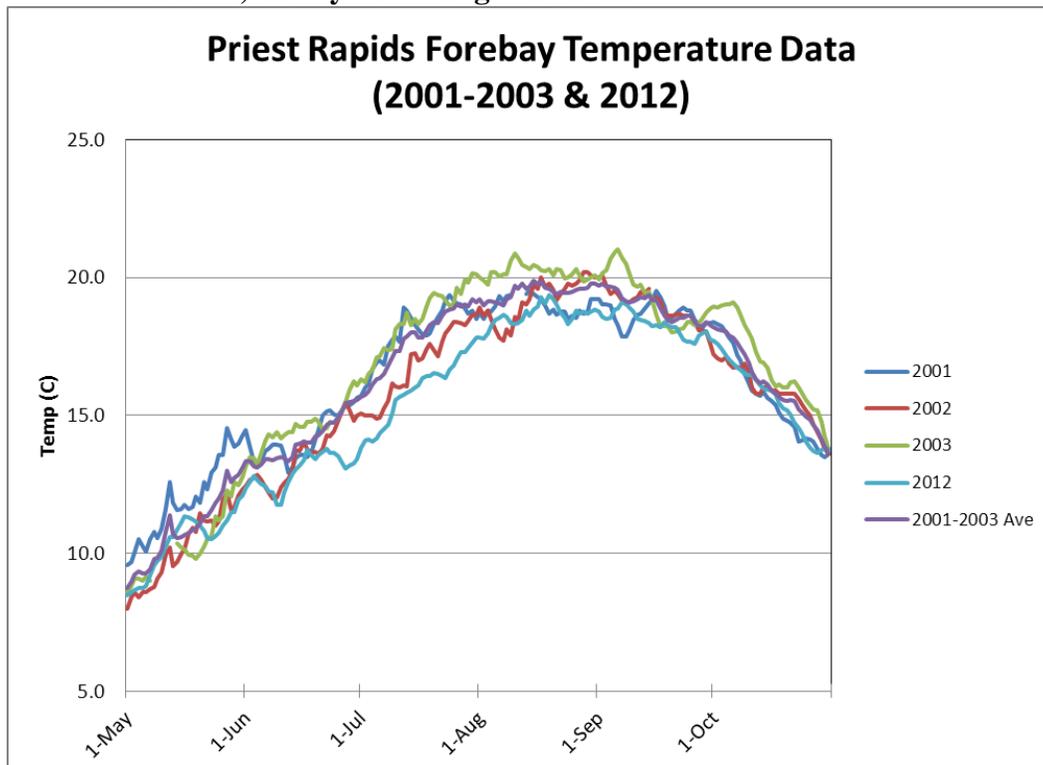


Figure 6 Daily Average Temperature Values for Priest Rapids Dam Forebay for the years 2001-2003, the 3 year average and 2012.

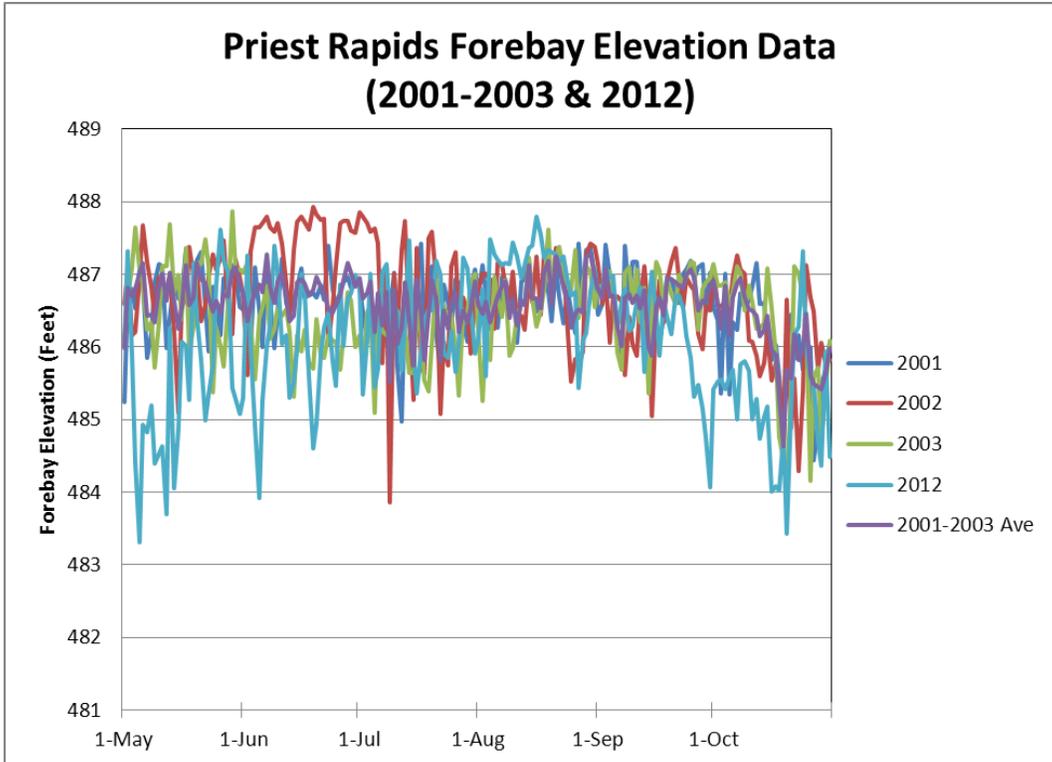


Figure 7 Daily Average Water Level Elevation Values for Priest Rapids Dam Forebay for the years 2001-2003, the 3 year average and 2012.

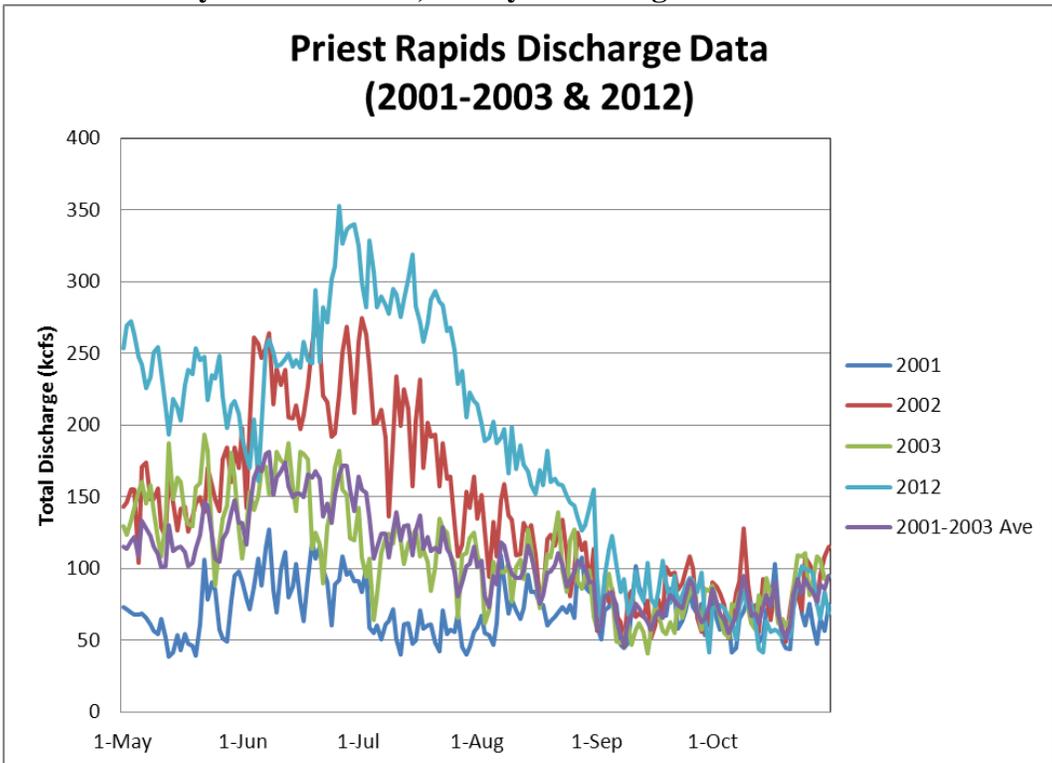


Figure 8 Daily Average Total Discharge Values for Priest Rapids Dam Forebay for the years 2001-2003, the 3 year average and 2012.

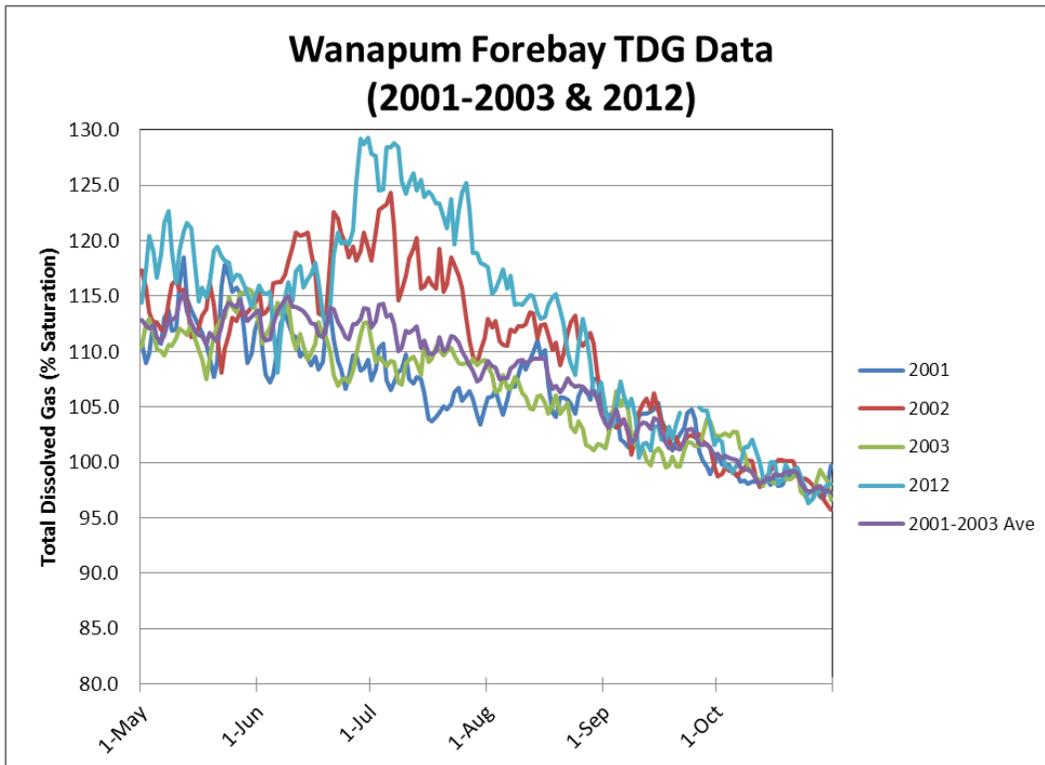


Figure 9 Daily Average TDG Values for Wanapum Dam Forebay for the years 2001-2003, the 3 year average and 2012.

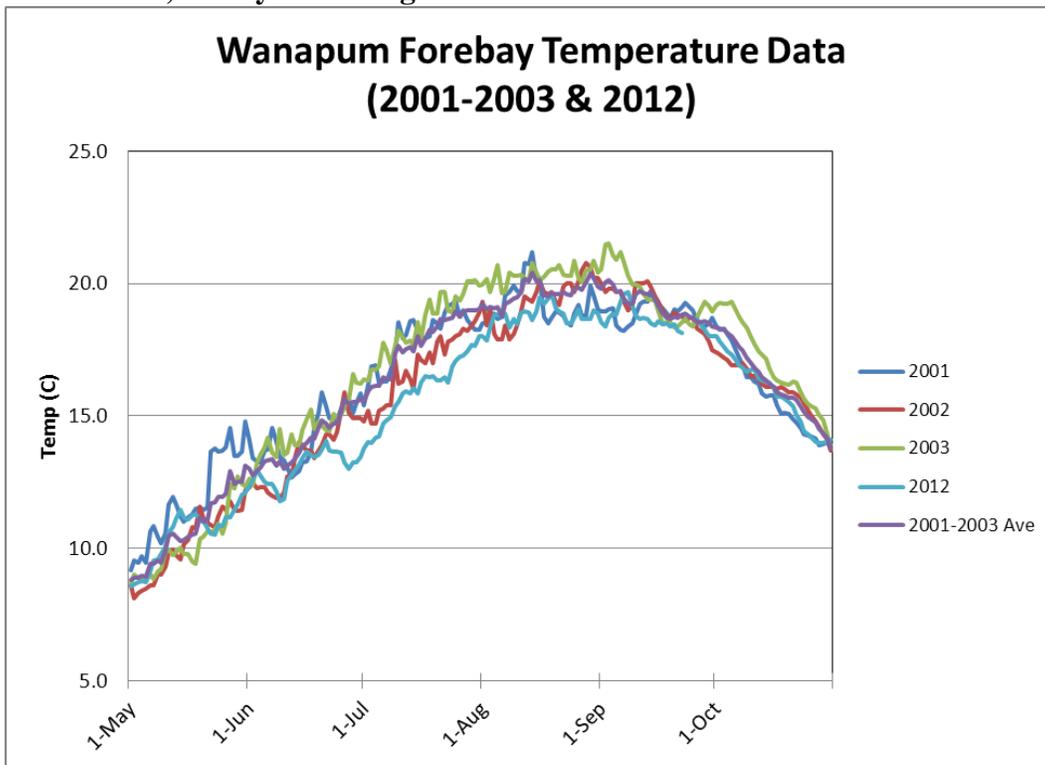


Figure 10 Daily Average Temperature Values for Wanapum Dam Forebay for the years 2001-2003, the 3 year average and 2012.

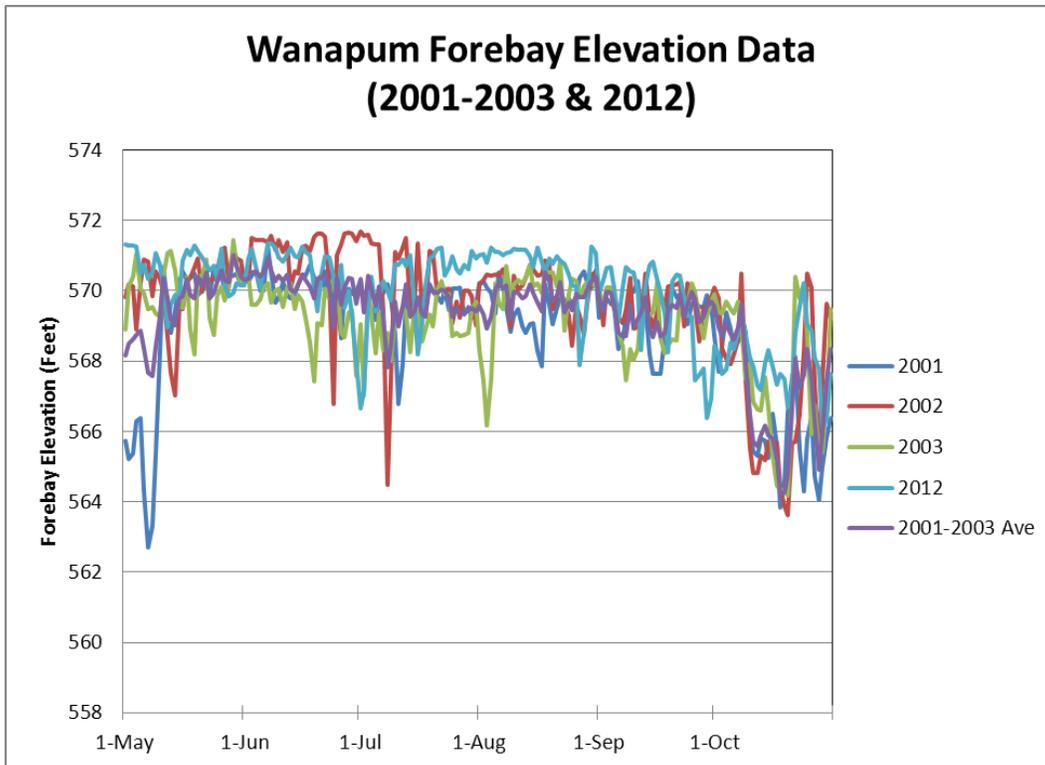


Figure 11 Daily Average Water Level Elevation Values for Wanapum Dam Forebay for the years 2001-2003, the 3 year average and 2012.

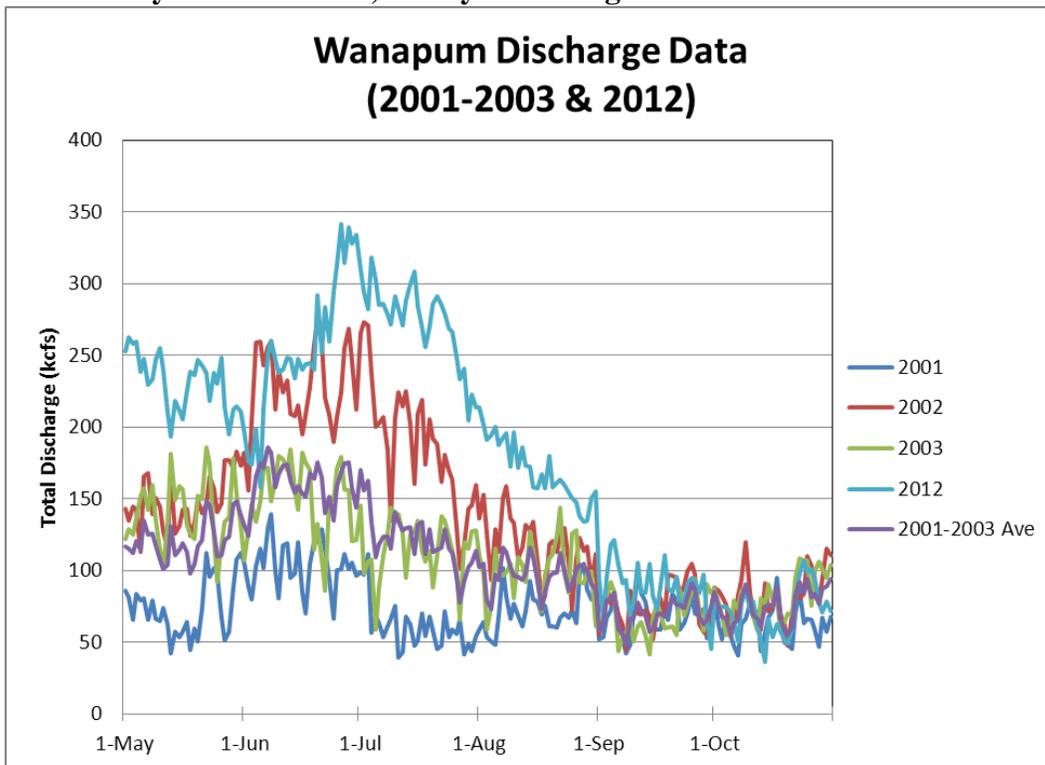


Figure 12 Daily Average Total Discharge Values for Wanapum Dam Forebay for the years 2001-2003, the 3 year average and 2012.

4.1.1 Water Surface Elevation

In 2012, the forebay elevations at Wanapum Dam were significantly higher than the 2001-2003 elevation with a 2012 median elevation of 570.40 feet compared to the 2001-2003 median elevation of 569.66 feet; however, at Priest Rapids Dam, the 2012 forebay elevations (median = 486.10 feet) were significantly lower than the 2001-2003 forebay elevations (median = 486.66 feet). Median values were reported due to non-parametric statistical analyses being applied to the non-normal data. Although a significantly higher forebay elevation was detected at Wanapum Dam in 2012 and a significantly lower forebay elevation was detected at Priest Rapids Dam in 2012, a negative impact to bull trout migrating through the project due to a nine inch increase (at Wanapum Dam) or six inch decrease (at Priest Rapids Dam) in forebay water level elevations appears to be unlikely at this time, due in part to site visits to potential bull trout stranding areas that did not observe any stranded bull trout in 2012 (see Section 4.3); although the number of stranding surveys in 2012 were limited in number, previous years stranding surveys also did not observe stranding bull trout.

4.1.2 Water Temperature

Water temperature in 2012 was also significantly lower by approximately one degree Celsius in both forebays compared to the three year average, but it is unlikely the slightly lower water temperature would have any negative impact to bull trout.

4.1.3 Total Dissolved Gas

In 2012, TDG was also significantly higher by approximately 5.7 percent saturation (median value) in the Wanapum forebay compared to the 2001-2003 data. There was no significant difference in the TDG between the 2012 data and the 2001-2003 data in the Priest Rapids forebay. As reported by Keeler (2012) elevated TDG values were observed throughout the mid-Columbia River for much of the 2012 fish-spill season due to a higher than normal run-off, which resulted in high incoming TDG levels, high levels of involuntary spill, and flows in excess of the established seven-day, ten-year frequency flood (7Q10) flow for Wanapum and Priest Rapids dams (at which time State water quality standards for TDG are waived for dams (WAC 173-201A-200(f)(i)). Mean daily discharge between April 1 and August 31, 2012 was compared to the ten-year average of mean daily flows from 2001 to 2011 (Figure 13) as measured at the U.S. Geological Survey (USGS) Streamflow gage #12472800 located 2.6 river miles downstream of Priest Rapids Dam (USGS 2012). Mean daily discharges during the 2012 fish-spill season were considerably higher than the 2001–2011 average (about sixty-eight percent higher on average) over the entire fish-spill season (April 1 through August 31). During the summer fish-spill season (June 15 through August 31), 2012 mean daily discharge values were seventy-eight percent higher than the 2001–2011 average, and 101 percent higher from June 22 through July 28, which was the period when the highest TDG levels were observed throughout the mid-Columbia River (Keeler 2012).

Keeler (2012) also reported that 3,469 smolts (n=3,279 Chinook; n=190 steelhead) were examined for gas bubble trauma (GBT) during the 2012 fish-spill season, with 27 total smolts showing signs of GBT. Cumulatively, 0.8 percent of the total smolts sampled were of Rank 1 (n=25 Chinook; n=1 steelhead) and Rank 2 (n=1 steelhead), thus 99.2% of the smolts sampled had no signs of GBT (i.e. Rank 0; Keeler 2012). According to the Fish Passage Center (FPC 2009), a rank is assigned based upon the percent area of the fin or eye covered with gas bubbles. A rank 0 is assigned if no gas bubbles occur; rank 1 is assigned if one to five percent of the fin or

eye is covered with gas bubbles; rank 2 is assigned for six to twenty-five percent area covered; rank 3 for twenty-six to fifty percent area covered; and rank 4 for greater than fifty percent area covered. Although bull trout were not surveyed for GBT because they were not observed within the sampling of fish collected for GBT monitoring (from the Priest Rapids Dam gatewells (see Keeler 2012), it appears to be unlikely this level of GBT would have a negative impact on bull trout in 2012 if it is assumed that any bull trout within the Project area had similar GBT signs.

In addition to the results of the GBT monitoring described above, in a review of available literature bull trout and other salmonids have been documented to avoid GBT and TDG supersaturation by migrating to tributaries where TDG supersaturation was not present or by depth compensation. According to Henry's Law, TDG is reduced by 10% for every one meter of depth fishes occupy due to the hydrostatic pressure, and resident and migratory fishes tend to occupy depths where TDG and GBT are compensated or avoided. In the Lower Clark Fork River, eight and three bull trout were collected for GBT analyses in 1999 and 2000, respectively, and no GBT signs were observed (Weitkamp et al. 2003). During the Weitkamp et al. (2003) studies, GBT signs appeared at TDG levels of 125-130%. In 1999, TDG levels were primarily between 120-130%, but spiked to levels of 135% saturation (Weitkamp et al. 2003). In 2000, GBT was essentially absent from 778 resident fish sampled when TDG levels had daily spikes to 120% or slightly higher from base TDG levels of 105% (Weitkamp et al. 2003). Gray and Haynes (1977) also reported that adult spring Chinook spent 89% of their time below the critical saturation zone (i.e., greater than 2 meters of depth) when migrating up the Snake River in the spring of 1976. The depths of the Columbia River greatly exceeds the 2 meters required to depth compensate for the TDG levels observed in 2012.

In summary, although TDG levels in the Wanapum forebay were significantly higher in 2012 as compared to 2001-2003, Project-related impacts to bull trout appears unlikely due to the results of GBT monitoring on Chinook salmonids and steelhead and the GBT compensatory fish behaviors documented in the literature. In addition, although Grant PUD attempted to reduce involuntary spill at Wanapum and Priest Rapids dams, high flows (above 7Q10 flows) and elevated TDG throughout the mid-Columbia River limited Grant PUD's ability to fully mitigate high TDG levels (see Keeler 2012).

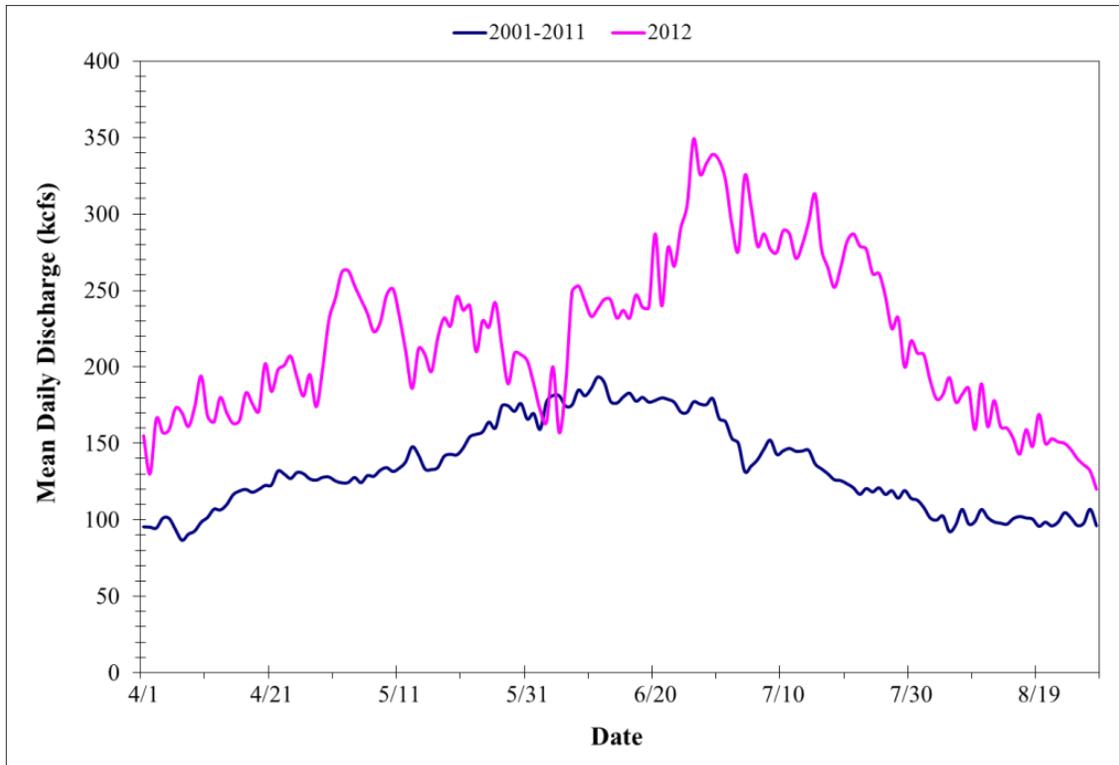


Figure 13 Comparison of 2012 vs. previous ten year average of mean daily discharge values as measured at the USGS streamflow #12472800 located below Priest Rapids Dam, mid-Columbia River, WA.

4.1.4 Discharge

The 2012 discharge was also significantly higher at both dams when compared to the 2001-2003 data. At Priest Rapids Dam, the 2001-2003 discharge had a median of 102.9 kcfs (and average of 106.5 kcfs) and the 2012 discharge data had a median of 195.0 kcfs (and average of 182.0 kcfs). At Wanapum Dam, the 2001-2003 discharge had a median of 103.7 kcfs (and average of 107.6 kcfs) and the 2012 discharge data had a median of 195.1 kcfs (and average of 181.9 kcfs). As explained in Section 4.1.3 above, high flows at both Wanapum and Priest Rapids dams led to high TDG levels throughout the mid-Columbia River. In addition, high discharge has the potential to affect the searching ability of fish to find upstream fishways; BioAnalysts (2003) also concluded that although hydrologic operations did not appear to affect survival of adult bull trout, the presence of dams may slow migration times. However, due to the high flows exhibited throughout the Columbia River system in 2012 (Section 4.1.3 above and Keeler (2012)) and based on the results of the 2012 fish passage counts at both Wanapum and Priest Rapids dams, the number of bull trout passing the Project area in 2012 was similar what was observed in previous years (e.g. compare passage at Wanapum left bank ladder in 2009 (a low flow year) vs. 2012 (high flow year; see Section 2.0, Table 2. Therefore, the higher discharges seen in 2012 (as compared to data from 2001-2003) did not appear to impact bull trout passage in the Project area. Furthermore, any impacts to bull trout due to high discharges was likely found throughout the mid-Columbia, as high flows were seen throughout the Columbia River (see Section 4.1.3

above), and were beyond the control of Grant PUD because, being run-of-river projects, Grant PUD has limited ability to reduce high flow volumes coming into the Project area.

4.2 Monitoring Acclimation Facility Discharge

In 2012, Grant PUD conducted short-term spring Chinook acclimation activities at one location in the White River Basin between March and May, 2012. Fish were acclimated in tanks on the bank at Grant PUD's Bridge Site (river mile (RM) 2), and fed low-phosphorus feed per established feeding methods. Because surface water was used to acclimate the fish, Grant PUD conducted water quality monitoring bi-monthly above and below the surface water intake and outfall locations. Parameters collected included dissolved oxygen, pH, and total phosphorus. Results of the data collection efforts indicated no negative impacts to water quality (all data collected was within water quality standards). Furthermore, the acclimation return flow water was discharged at the outfall locations to the top of the water surface, into pools with sufficient water depth to avoid erosion of the streambank and subsequent suspension of sediments.

4.3 Bull Trout Site Visits

In accordance with the BTWQP, Grant PUD conducted site evaluations in upper Wanapum and Priest Rapids reservoirs when reservoirs fluctuate a minimum of three feet in forebay elevation in a 24-hour period for upper Wanapum site evaluations, and a minimum of three feet in tailrace elevation in a 24-hour period for Priest Rapids reservoir site evaluations. The over-winter bull trout monitoring period was November 1, 2011-March 31, 2012, with a target of one survey per month (pending flow fluctuations of three feet in a rolling 24-hr period). In 2012 Grant PUD biologists monitored the gravel island area in upper Wanapum reservoir (Figure 14) on November 2, 2011 and the Beverly Island area in Upper Priest Rapids reservoir on November 1 and December 29, 2011 (Figure 15). With the exception of an unknown number of 3-spine stickleback, no bull trout or other fish species were observed in the stranding surveys.



Figure 14 Upper Wanapum Reservoir bull trout site evaluation area.



Figure 15 Upper Priest Rapids Reservoir bull trout site evaluation area.

5.0 Summary

In 2012, bull trout monitoring occurred throughout all Grant PUD programs in accordance with the BTMEP, BTWQP, and Bull Trout Biological Opinion for the Project (USFWS 2007). Based on the number of bull trout encountered, Grant PUD did not exceed the total annual “take” limits based on the Biological Opinion for the Project (USFWS 2007), and no lethal take was documented as a result of Grant PUD’s 2012 operations. Note that Grant PUD also provides a separate bull trout report specific to its annual “take” permit that is issued by the USFWS service (Turner 2013); however, Table 9 below provides a summary of bull trout “take” in 2012 as defined by the Biological Opinion (USFWS 2007).

Table 9 A summary table of the 2012 reporting period take of bull trout.

Project Element	Type of Take	Lethal Take		Non-lethal Take	
		Adult	Juvenile/Sub-Adult	Adult	Juvenile/Sub-Adult
Turbine Operations	Harm or Harass	0	0	0	0
Juvenile Fish Bypass	Harm or Harass	0	0	0	0
Spill Operations	Harm of Harass	0	0	0	0
Adult Fishways	Harass	0	0	8*	0
Hydrograph Variation	Harm or Harass	0	0	0	0
Predator Control	Harm or Harass	0	0	0	0
White River Supplementation Program	Harass	0	0	0	71
	TOTAL	0	0	8	71

*Note: Photos were not available for two fish passage events at Priest Rapids Dam. Based on 2012 observations, the assumption was these two bull trout were adults.

The hydrologic and water quality data from 2012 were significantly different than the 2001-2003 averages for all parameters except total dissolved gas at the Priest Rapids forebay. The primary reason for these differences can likely be attributed to higher than average flows throughout the mid-Columbia River in 2012, which lead to high water surface elevations, discharge, and TDG values within the Project area (when compared to the 2001-2003 average).

List of Literature

- BioAnalysts, Inc. 2002. Movements of bull trout within the mid-Columbia River and tributaries, 2002-2003. Final Report. Prepared for the Public Utility No. 1 of Chelan County. Wenatchee, Washington. November 2002.
- BioAnalysts, Inc. 2003. Movement of radio-tagged bull trout within Priest Rapids and Wanapum Reservoirs, 2001-2003. Prepared for the Public Utility No. 2 of Grant County. Ephrata, Washington. July 2003.
- BioAnalysts, Inc. 2004. Movements of bull trout within the mid-Columbia River and tributaries, 2001-2004. Final Report. Prepared for the Public Utility No. 1 of Chelan County, Wenatchee, Washington. May 2004.
- Federal Energy Regulatory Commission, Order Issuing New License for Public Utility District No. 2 of Grant County, Docket Number P-2114-116 (April 17, 2008).
- Fish Passage Center (FPC). 2009. Gas Bubble Trauma Monitoring Program Protocol for Juvenile Salmonids. April 2009. <http://www.fpc.org/smolt/gasbubbletrauma.html>. Accessed March 2010.
- Gray, R.H., and J.M. Haynes. 1977. Depth distribution of adult Chinook salmon (*Oncorhynchus tshawytscha*) in relation to season and gas-supersaturated water. Transactions of the American Fisheries Society 106:617-620.
- Hendrick, R. 2009. Quality Assurance Project Plan for Monitoring Selected Water Quality Parameters within the Priest Rapids Hydroelectric Project. Prepared for Public Utility District No. 2 of Grant County, Washington. January, 2009. <http://www.gcpud.org/resources/resLandWater/waterQuality.htm>
- Keeler, C. 2012. Summary of 2012 Annual Fish-Spill Season and Total Dissolved Gas Monitoring. Prepared for Public Utility District No. 2 of Grant County, Washington. October, 2012. <http://www.gcpud.org/naturalResources/fishWaterWildlife/waterQuality.html>
- National Marine Fisheries Service (NMFS). 2008. Endangered Species Act – Section 7 Consultation Biological Opinion and Magnuson-Stevens Fishery Conservation and Management Act Consultation for the New License for the Priest Rapids Hydroelectric Project, FERC Project No. 2114. Portland, Oregon.
- U.S. Geological Survey (USGS). 2011. Streamflow data collected at gage #12472800: Columbia River Below Priest Rapids Dam, WA. <http://waterdata.usgs.gov/wa/nwis/uv?station=12472800>. Accessed September 2011.
- Turner, B.G. 2013. Federal Fish and Wildlife Annual Bull Trout Report, 2012. Permit Number TE022743-4 Amended. The Public Utility District No. 2 of Grant County, WA annual report to USFWS, Ecological Services, Endangered Species Permits, Portland, OR.
- United States Department of Interior Fish and Wildlife Service (USFWS). 2007. USFWS Biological Opinion on the Effects of the Priest Rapids Hydroelectric Project Relicensing on Bull Trout (FERC No. 2114). Spokane, Washington. USFWS Reference: 13260- 2006 -P-0008, 13 260-2001-F-0062.

Weitkamp, D.E., R.D. Sullivan, T. Swant, and J. DosSantos. 2003. Gas bubble disease in resident fish of the Lower Clark Fork River. Transactions of the American Fisheries Society 132:865-876.

Appendix A
Agency Comments

Behr Turner

From: Mangold, Marcie (ECY) <DMAN461@ECY.WA.GOV>
Sent: Wednesday, January 02, 2013 12:06 PM
To: Behr Turner
Cc: Verhey, Patrick M (DFW); Stephen_Lewis@fws.gov; Tom Dresser
Subject: Bull Trout Monitoring and Evaluation Plan Annual Report

Behr,

I appreciate your time this morning to discuss my comments regarding the Bull Trout Monitoring and Evaluation Plan. I have summarized my comments below.

Executive Summary, page ii, second paragraph, second sentence

1. I have reviewed the BioAnalysts, Inc. reports that are referenced in the following statement, "The 2012 water quality data was compared to the 2001-2003 data due to the results of the bull trout studies conducted in 2001-2003 in the Priest Rapids Project that found water quality conditions in that time frame from 2001 to 2003 to have no negative impacts to bull trout (BioAnalysts, Inc. 2002, 2003, 2004)."

I am unable to find the statement, data, study or direct reference that water quality conditions during the 2001-2003 time frame have no negative impacts to bull trout in the cited reports. Can you please redirect or clarify the conclusions that were made in this sentence?

Executive Summary, page ii, third paragraph, sixth sentence

2. In the statement, "... negative impacts to bull trout migrating through the project due to increases in forebay water level elevations or discharges are unlikely", I am unable to find any discussion in the Plan that explains or supports this statement/assumption. Can you please direct me to this and/or clarify? I believe the BioAnalysts, January 2003 report (*Movement of Radio-Tagged Bull Trout Within Priest Rapids and Wanapum Reservoirs 2001-2002*, page 5, fourth paragraph, last sentence) does support that spill operations likely had no affect on bull trout in the May – October 2001 time frame.

Executive Summary, page ii, third paragraph, eighth sentence and Section 4.1.3 Total Dissolved Gas, page 19, second paragraph, last sentence

3. I understand that the idea is to compare GBT smolt monitoring of salmonids to bull trout, (which *are* salmonids) although they do behave quite differently than other salmonids. Can you please specify what 3,469 salmonid smolts were monitored for GBT studies?

Section 3.0 Bull Trout Observations and Handlings on Nason Creek and White River, page 4, first and second paragraphs

4. In the last sentence of the first paragraph it is stated that, "No bull trout observations or disturbances of bull trout habitat occurred during implementation of juvenile spring Chinook supplementation programs in 2012." In the second paragraph, you describe 62 bull trout collected in Nason Creek and White River during screw trap operations.

I am confused that the first paragraph states there were no bull trout observations, but the second paragraph describes 62 bull trout collected. Does the first statement of "no observations" refer to a different time frame when the 62 were collected? Possibly a time other than the juvenile spring Chinook supplementation program? Can you please clarify this or possibly provide an explanatory sentence?

4.1 Water Quality Evaluation, page 7, first paragraph, first sentence

5. It is stated that, “The 2012 water quality data was compared to the 2001-2003 data due to the results of the bull trout studies conducted in 2001-2003 in the Project that found water quality conditions in that time frame from 2001 to 2003 to have no negative impacts to bull trout (BioAnalysts, Inc. 2002, 2003, 2004)”. Please see comment #1.

4.1 Water Quality Evaluation, page 7, first paragraph, second sentence

6. I have reviewed the three BioAnalysts reports cited. The only water quality parameters evaluated in the BioAnalysts reports were discharge (Wells, Rocky Reach, Rock Island, Wanapum, and Priest Rapid dams) and temperature, which was not collected in the Priest Rapids and Wanapum Projects. Temperature was collected at; Wells Dam tailrace, Wenatchee River, Entiat River, Methow River, and the Columbia River downstream of Rocky Reach and Wells Dam. I understand that this bull trout Plan is looking at the stated “water quality parameters under evaluation” (I am assuming in the BioAnalysts reports) from 2001-2003 and comparing them to 2012 water quality data. The data and conclusions represented in the referenced BioAnalysts reports do not appear to support, conclude or state that water quality conditions in the time frame from 2001 to 2003 have no negative impacts to bull trout.

BioAnalyst Inc. does however state that:

- “...because no bull trout were detected at either dam, project operations likely had no affect on bull trout detected within the project area.”(**this statement is in reference to spill.**) (BioAnalyst, Inc., 2003);
- “operations of hydroelectric facilities on the mid-Columbia River did not negatively affect the survival of adult bull trout. That is, no adult bull trout were killed during upstream or downstream passage through the mid-Columbia dams.”(BioAnalyst Inc., 2003);
- “Although hydroelectric operations did not appear to affect the survival of adult bull trout, the presence of dams may have slowed migration times.” (BioAnalyst Inc., 2003); and
- “The successful migration of bull trout into the various spawning streams of the Wenatchee, Entiat and Methow suggests that temperatures at the time of migration in the mid-Columbia River did not appear to limit the migration of the radio-tagged bull trout.”(BioAnalyst Inc., 2004)

I believe that the idea is to statistically compare 2012 water quality data to the time frame 2001-2003 as you have done, but I fail to make the connection that water quality data collected in the 2001-2003 time frame in the BioAnalysts reports or the water quality at that time, did not negatively affect bull trout as presented in the Draft *Bull Trout Monitoring and Evaluation Plan Annual Report*. The water quality parameters measured in the BioAnalysts, Inc. reports were discharge (Wells, Rocky Reach, Rock Island, Wanapum, and Priest Rapid dams) and temperature (not in the Project).

Can you please support the statement that “The 2012 water quality data was compared to the 2001-2003 data due to the results of the bull trout studies conducted in 2001-2003 in the Project that found water quality conditions in that time frame from 2001 to 2003 to have no negative impacts to bull trout (BioAnalysts, Inc. 2002, 2003, 2004)” and redirect to a supporting citation? It may be useful to establish a water quality connection by looking at the distribution of bull trout in the mid-Columbia River (BioAnalysts studies and past annual reports) and the past water quality evaluations.

Thank you for the opportunity to review and comment on the annual report. I hope that I have been clear in my comments. Please don't hesitate to contact me for further explanation or questions.

D. Marcie Mangold
Department of Ecology
Water Quality Program
phone (509) 329 3450

fax (509) 329 3570

Behr Turner

From: Lewis, Stephen <stephen_lewis@fws.gov>
Sent: Thursday, January 10, 2013 4:22 PM
To: Behr Turner
Cc: Mangold, Marcie (ECY); Patrick.Verhey@dfw.wa.gov; Tom Dresser
Subject: Re: Bull Trout Monitoring and Evaluation Plan Annual Report

Hi Behr-

Thanks for allowing us the opportunity to review the 2012 Bull Trout Monitoring and Evaluation Plan Annual Report. It's my understanding that comments pertaining to the plan are due to Grant PUD by January 25, 2013. As you will likely see, many of my comments coincide with Marcie Mangold's as seen in the message history for this document. My other comments attempt to create a more accurate depiction of bull trout use in the project area as it pertains to not only the Federal Power Act, but the Endangered Species Act as well. I want the PRFF review/editing process to be constructive and not simply be a "step" in the process. As such, please consider the following comments and let's discuss as needed during the next meeting of the PRFF in February:

- 1.) Page i and ii (top of page): We suggest changing the following sentence, "...to specify the basis for identifying measures Grant PUD will implement to address any adverse effects on bull trout determined to result from Project operations." to the following edited version, "...to specify the basis for identifying measures Grant PUD will implement to address any effects on bull trout determined to result from the Project."
- 2.) Page ii: This page contains a reference to BioAnalysts, Inc. 2002, 2003, and 2004 and water quality conclusions contained in this literature. These studies focused on the behavioral components of bull trout as they migrated both upstream and downstream of the mid-Columbia PUD hydroelectric projects. So we suggest removing references to these studies as they relate to water quality.
- 3.) Page iii: We suggest omitting the final conclusion statement on this page as there is not substantial evidence to support it. We are simply interested in what was seen at the Project as it relates to bull trout.
- 4.) Section 2.0 Bull Trout Observations (page 1): The first paragraph of this section discusses fish enumeration for salmon and steelhead at the Project. We suggest inserting verbage for bull trout enumeration per the FWS' Biological Opinion for Relicensing as well.
- 5.) Page 2, Table 2: We suggest inserting the size demographics for the bull trout listed in this table.
- 6.) Page 3, Figure 1: This figure does not specify the official length of the bull trout depicted in the video picture. We suggest inserting this measurement into the figure description.
- 7.) Page 4, Figure 2: Refer to comment #6 above.
- 8.) Section 3.0, Bull Trout Observations and Handlings on Nason Creek and White River (page 4): This section contains conflicting statements regarding observations of bull trout observed/handled during the implementation of the juvenile spring Chinook supplementation programs in 2012. Please ensure the consistency of bull trout observations when discussing these programs.
- 9.) Section 4.1 Water Quality Evaluation (page 7): Refer to comment #2 above.

10.) Section 4.1.1 Water Surface Elevation (page 18): The last conclusion statement in this paragraph is not so definitive in my mind so I suggest changing the final statement in this section to read as follow, "...a negative impact to bull trout migrating through the project due to a nine inch increase (at Wanapum Dam) or six inch decrease (at Priest Rapids Dam) in forebay water level elevation appears to be unlikely."

11.) Section 4.1.3 Total Dissolved Gas (page 19): The last conclusion statement in this paragraph is again not so definitive in my mind so I suggest changing the final statement in this section to read as follow, "In summary, it appears to be unlikely this level of GBT would have a negative impact on bull trout in 2012."

12.) Section 4.1.4 Discharge (page 20): I'm not sure I agree with the final conclusion of this section: "...it is unlikely that higher than average flows had significant negative impacts on bull trout." As we've seen with salmon and steelhead, high flows such as what we saw last year affect the searching ability of fish to find upstream fishways, so a discussion related to this aspect would provide better clarification in this section.

13.) Section 4.3 Bull Trout Site Visits (page 21): "No bull trout were observed in any of the site evaluation," however, were any fish observed during these site visits. Records of incidental observations would be useful in this section.

14.) Section 5.0 Summary (page 21): I'm not so sure I agree with the final statement in this section. For example, bull trout were "handled" during the White River and Nason Creek activities. That's a form of "incidental take" under the guidance of the ESA. Another example is bull trout upstream passage through Priest Rapids and Wanapum since these fish come into contact with the structures and devices of the respective fishways, hence a negative impact. So my suggestion is to delete the final statement and craft a brief table that breaks down each of the project components as defined in the FWS Biological Opinion where lethal and non-lethal take would be differentiated.

Please feel free to contact me if you have questions related to the comments contained herein, or we can discuss at the subsequent meeting of the PRFF.

S-

On Wed, Jan 2, 2013 at 12:05 PM, Mangold, Marcie (ECY) <DMAN461@ecy.wa.gov> wrote:

Behr,

I appreciate your time this morning to discuss my comments regarding the Bull Trout Monitoring and Evaluation Plan. I have summarized my comments below.

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1. I have reviewed the BioAnalysts, Inc. reports that are referenced in the following statement, "The 2012 water quality data was compared to the 2001-2003 data due to the results of the bull trout studies conducted in 2001-2003 in the Priest Rapids Project that found water quality conditions in that time frame from 2001 to 2003 to have no negative impacts to bull trout (BioAnalysts, Inc. 2002, 2003, 2004)."

I am unable to find the statement, data, study or direct reference that water quality conditions during the 2001-2003 time frame have no negative impacts to bull trout in the cited reports. Can you please redirect or clarify the conclusions that were made in this sentence?

Executive Summary, page ii, third paragraph, sixth sentence

2. In the statement, "... negative impacts to bull trout migrating through the project due to increases in forebay water level elevations or discharges are unlikely", I am unable to find any discussion in the Plan that explains or supports this statement/assumption. Can you please direct me to this and/or clarify? I believe the BioAnalysts, January 2003 report (*Movement of Radio-Tagged Bull Trout Within Priest Rapids and Wanapum Reservoirs 2001-2002*, page 5, fourth paragraph, last sentence) does support that spill operations likely had no affect on bull trout in the May – October 2001 time frame.

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Section 3.0 Bull Trout Observations and Handlings on Nason Creek and White River, page 4, first and second paragraphs

4. In the last sentence of the first paragraph it is stated that, "No bull trout observations or disturbances of bull trout habitat occurred during implementation of juvenile spring Chinook supplementation programs in 2012." In the second paragraph, you describe 62 bull trout collected in Nason Creek and White River during screw trap operations.

I am confused that the first paragraph states there were no bull trout observations, but the second paragraph describes 62 bull trout collected. Does the first statement of "no observations" refer to a different time frame when the 62 were collected? Possibly a time other than the juvenile spring Chinook supplementation program? Can you please clarify this or possibly provide an explanatory sentence?

4.1 Water Quality Evaluation, page 7, first paragraph, first sentence

5. It is stated that, "The 2012 water quality data was compared to the 2001-2003 data due to the results of the bull trout studies conducted in 2001-2003 in the Project that found water quality conditions in that time frame from 2001 to 2003 to have no negative impacts to bull trout (BioAnalysts, Inc. 2002, 2003, 2004)". Please see comment #1.

4.1 Water Quality Evaluation, page 7, first paragraph, second sentence

6. I have reviewed the three BioAnalysts reports cited. The only water quality parameters evaluated in the BioAnalysts reports were discharge (Wells, Rocky Reach, Rock Island, Wanapum, and Priest Rapid dams) and temperature, which was not collected in the Priest Rapids and Wanapum Projects. Temperature was collected at; Wells Dam tailrace, Wenatchee River, Entiat River, Methow River, and the Columbia River downstream of Rocky Reach and Wells Dam. I understand that this bull trout Plan is looking at the stated “water quality parameters under evaluation” (I am assuming in the BioAnalysts reports) from 2001-2003 and comparing them to 2012 water quality data. The data and conclusions represented in the referenced BioAnalysts reports do not appear to support, conclude or state that water quality conditions in the time frame from 2001 to 2003 have no negative impacts to bull trout.

BioAnalyst Inc. does however state that:

- “...because no bull trout were detected at either dam, project operations likely had no affect on bull trout detected within the project area.”(**this statement is in reference to spill.**) (BioAnalyst, Inc., 2003);
- “operations of hydroelectric facilities on the mid-Columbia River did not negatively affect the survival of adult bull trout. That is, no adult bull trout were killed during upstream or downstream passage through the mid-Columbia dams.”(BioAnalyst Inc., 2003);
- “Although hydroelectric operations did not appear to affect the survival of adult bull trout, the presence of dams may have slowed migration times.” (BioAnalyst Inc., 2003); and
- “The successful migration of bull trout into the various spawning streams of the Wenatchee, Entiat and Methow suggests that temperatures at the time of migration in the mid-Columbia River did not appear to limit the migration of the radio-tagged bull trout.”(BioAnalyst Inc., 2004)

I believe that the idea is to statistically compare 2012 water quality data to the time frame 2001-2003 as you have done, but I fail to make the connection that water quality data collected in the 2001-2003 time frame in the BioAnalysts reports or the water quality at that time, did not negatively affect bull trout as presented in the Draft *Bull Trout Monitoring and Evaluation Plan Annual Report*. The water quality parameters measured in the BioAnalysts, Inc. reports were discharge (Wells, Rocky Reach, Rock Island, Wanapum, and Priest Rapid dams) and temperature (not in the Project).

Can you please support the statement that “The 2012 water quality data was compared to the 2001-2003 data due to the results of the bull trout studies conducted in 2001-2003 in the Project that found water quality conditions in that time frame from 2001 to 2003 to have no negative impacts to bull trout (BioAnalysts, Inc. 2002, 2003, 2004)” and redirect to a supporting citation? It may be useful to establish a water quality

connection by looking at the distribution of bull trout in the mid-Columbia River (BioAnalysts studies and past annual reports) and the past water quality evaluations.

Thank you for the opportunity to review and comment on the annual report. I hope that I have been clear in my comments. Please don't hesitate to contact me for further explanation or questions.

D. Marcie Mangold

Department of Ecology

Water Quality Program

phone (509) 329 3450

fax (509) 329 3570

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Stephen T. Lewis
Hydropower and Energy Coordinator
US FISH AND WILDLIFE SERVICE
CENTRAL WASHINGTON FIELD OFFICE
215 MELODY LANE STE 103
WENATCHEE, WA 98801-8122
phone: (509) 665-3508 Ext. 2002
e-mail: Stephen.Lewis@fws.gov

"If a road has no obstacles, it probably doesn't lead to anywhere." S. Lewis

Appendix B
Agency Comment and Response Summary Table

Submitting Entity	Date Received	Paragraph #	Agency Comment	Grant PUD Response
WDOE	01/02/2013	1	<p>Executive Summary, page ii, second paragraph, second sentence 1.</p> <p>I have reviewed the BioAnalysts, Inc. reports that are referenced in the following statement, “The 2012 water quality data was compared to the 2001-2003 data due to the results of the bull trout studies conducted in 2001-2003 in the Priest Rapids Project that found water quality conditions in that time frame from 2001 to 2003 to have no negative impacts to bull trout (BioAnalysts, Inc. 2002, 2003, 2004).”</p> <p>I am unable to find the statement, data, study or direct reference that water quality conditions during the 2001- 2003 time frame have no negative impacts to bull trout in the cited reports. Can you please redirect or clarify the conclusions that were made in this sentence?</p>	This sentence was removed from the Executive Summary, and additional clarification regarding the use of water quality data from the 2001-2003 time periods was provided in Section 4.1 of the report.
WDOE	01/02/2013	2	<p>Executive Summary, page ii, third paragraph, sixth sentence</p> <p>2. In the statement, “... negative impacts to bull trout migrating through the project due to increases in forebay water level elevations or discharges are unlikely”, I am unable to find any discussion in the Plan that explains or supports this statement/assumption. Can you please direct me to this and/or clarify? I believe the BioAnalysts, January 2003 report (Movement of Radio-Tagged Bull Trout Within Priest Rapids and Wanapum Reservoirs 2001-2002, page 5, fourth paragraph, last sentence) does support that spill operations likely had no affect on bull trout in the May – October 2001 time frame.</p>	This sentence was removed from the Executive Summary, and additional clarification regarding increases in forebay elevations was provided in Section 4.1.1 of the report.
WDOE	01/02/2013	3	<p>Executive Summary, page ii, third paragraph, eighth sentence and Section 4.1.3 Total Dissolved Gas, page 19, second paragraph, last sentence</p> <p>3. I understand that the idea is to compare GBT smolt monitoring of salmonids to bull trout, (which are salmonids) although they do behave quite differently than other salmonids. Can you please specify what 3,469 salmonid smolts were monitored for GBT studies?</p>	This sentence was modified in the Executive Summary, and additional clarification and detail regarding total dissolved gas and gas bubble trauma (GBT) monitoring, including specificity as to the number of type of species monitoring for GBT, was provided in Section 4.1.3 of the report.
WDOE	01/02/2013	4	<p>Section 3.0 Bull Trout Observations and Handlings on Nason Creek and White River, page 4, first and second paragraphs</p> <p>4. In the last sentence of the first paragraph it is stated that, “No bull trout observations or disturbances of bull trout habitat occurred during implementation of juvenile spring Chinook supplementation programs in 2012.” In the second paragraph, you describe 62 bull trout collected in Nason Creek and White River during screw trap operations.</p>	Grant PUD has modified and clarified the wording associated with the operation of the White River acclimation facility and the White River and Nason Creek screw traps.

Submitting Entity	Date Received	Paragraph #	Agency Comment	Grant PUD Response
			<p>I am confused that the first paragraph states there were no bull trout observations, but the second paragraph describes 62 bull trout collected. Does the first statement of “no observations” refer to a different time frame when the 62 were collected? Possibly a time other than the juvenile spring Chinook supplementation program? Can you please clarify this or possibly provide an explanatory sentence?</p>	
WDOE	01/02/2013	5	<p>4.1 Water Quality Evaluation, page 7, first paragraph, first sentence</p> <p>5. It is stated that, “The 2012 water quality data was compared to the 2001-2003 data due to the results of the bull trout studies conducted in 2001-2003 in the Project that found water quality conditions in that time frame from 2001 to 2003 to have no negative impacts to bull trout (BioAnalysts, Inc. 2002, 2003, 2004)”. Please see comment #1.</p>	<p>Section 4.1 has been revised and clarification regarding the use of water quality data from the 2001-2003 time periods was added.</p>
WDOE	01/02/2013	6	<p>4.1 Water Quality Evaluation, page 7, first paragraph, second sentence</p> <p>6. I have reviewed the three BioAnalysts reports cited. The only water quality parameters evaluated in the BioAnalysts reports were discharge (Wells, Rocky Reach, Rock Island, Wanapum, and Priest Rapid dams) and temperature, which was not collected in the Priest Rapids and Wanapum Projects. Temperature was collected at; Wells Dam tailrace, Wenatchee River, Entiat River, Methow River, and the Columbia River downstream of Rocky Reach and Wells Dam. I understand that this bull trout Plan is looking at the stated “water quality parameters under evaluation” (I am assuming in the BioAnalysts reports) from 2001-2003 and comparing them to 2012 water quality data. The data and conclusions represented in the referenced BioAnalysts reports do not appear to support, conclude or state that water quality conditions in the time frame from 2001 to 2003 have no negative impacts to bull trout.</p>	<p>Section 4.1 has been revised and clarification regarding the use of water quality data from the 2001-2003 time periods, reference to the BioAnalysts reports, and their relation to data collected in 2012 and possible impacts to bull has been added.</p>
WDOE	01/02/2013	7	<p>BioAnalyst Inc. does however state that:</p> <p><input type="checkbox"/> “...because no bull trout were detected at either dam, project operations likely had no affect on bull trout detected within the project area.”(this statement is in reference to spill.) (BioAnalyst, Inc., 2003);</p> <p><input type="checkbox"/> “operations of hydroelectric facilities on the midColumbia River did not negatively affect the survival of adult bull trout. That is, no adult bull trout were killed during upstream or downstream passage through the mid-Columbia dams.”(BioAnalyst Inc., 2003);</p> <p><input type="checkbox"/> “Although hydroelectric operations did not appear to affect the survival of adult bull trout, the presence of dams may have slowed migration times.” (BioAnalyst Inc., 2003); and</p>	<p>Comment noted. Section 4.1 has been revised and clarification regarding the use of water quality data from the 2001-2003 time periods, reference to the BioAnalysts reports, and their relation to data collected in 2012 and possible impacts to bull has been added.</p>

Submitting Entity	Date Received	Paragraph #	Agency Comment	Grant PUD Response
			<input type="checkbox"/> "The successful migration of bull trout into the various spawning streams of the Wenatchee, Entiat and Methow suggests that temperatures at the time of migration in the mid-Columbia River did not appear to limit the migration of the radio-tagged bull trout."(BioAnalyst Inc., 2004)	
WDOE	01/02/2013	8	<p>I believe that the idea is to statistically compare 2012 water quality data to the time frame 2001-2003 as you have done, but I fail to make the connection that water quality data collected in the 2001-2003 time frame in the BioAnalysts reports or the water quality at that time, did not negatively affect bull trout as presented in the Draft Bull Trout Monitoring and Evaluation Plan Annual Report. The water quality parameters measured in the BioAnalysts, Inc. reports were discharge (Wells, Rocky Reach, Rock Island, Wanapum, and Priest Rapid dams) and temperature (not in the Project).</p>	<p>Comment noted. As stated in response to WDOE Paragraph comments 6 and 7, Section 4.1 has been revised and clarification regarding the use of water quality data from the 2001-2003 time periods, reference to the BioAnalysts reports, and their relation to data collected in 2012 and possible impacts to bull has been added. (see below for clarification)</p> <p>In accordance with the Bull Trout Hydrologic and Water Quality Study Plan (BTWQP), the hydrologic and water quality data from 2001-2003 is used as the environmental "baseline" for which future years (e.g. 2012) data would be compared. This comparison is being made due to available bull trout data collected from 2001-2003 (BioAnalysts 2002, 2003 and 2004), which demonstrated through a bull trout telemetry study that the Project, although rarely frequented by bull trout, appeared to have no measurable impact on movement or on any life stage of bull trout. Although specific hydrologic and water quality data from the Project area were not collected or analyzed as part of the BioAnalysts studies, this data from 2001-2003 were selected as the environmental "baseline" based on the assumption that hydrologic and water quality data from 2001-2003 were suitable for bull trout, based on the results of the BioAnalysts studies (2002, 2003, and 2004). Thus, in accordance with the BTWQP, if hydrologic and/or water quality data collected in a given year (e.g. 2012) were significantly different from the 2001-2003 data, additional evaluations could be assessed (if feasible) as to potential Project-related impacts upon bull trout and subsequent mitigation measures.</p>

Submitting Entity	Date Received	Paragraph #	Agency Comment	Grant PUD Response
WDOE	01/02/2013	9	Can you please support the statement that "The 2012 water quality data was compared to the 2001-2003 data due to the results of the bull trout studies conducted in 2001-2003 in the Project that found water quality conditions in that time frame from 2001 to 2003 to have no negative impacts to bull trout (BioAnalysts, Inc. 2002, 2003, 2004)" and redirect to a supporting citation? It may be useful to establish a water quality connection by looking at the distribution of bull trout in the mid-Columbia River (BioAnalysts studies and past annual reports) and the past water quality evaluations.	Comment Noted. This statement has been removed and Section 4.1 has been revised and clarification regarding the use of water quality data from the 2001-2003 time periods, reference to the BioAnalysts reports, and their relation to data collected in 2012 and possible impacts to bull trout has been added (See response to WDOE Paragraph 8).
WDOE	01/02/2013	10	Thank you for the opportunity to review and comment on the annual report. I hope that I have been clear in my comments. Please don't hesitate to contact me for further explanation or questions.	Grant PUD appreciates WDOE's participation and comments to improve this annual report.
USFWS	01/10/2013	1	1.) Page i and ii (top of page): We suggest changing the following sentence, "...to specify the basis for identifying measures Grant PUD will implement to address any adverse effects on bull trout determined to result from Project operations." to the following edited version, "...to specify the basis for identifying measures Grant PUD will implement to address any effects on bull trout determined to result from the Project."	Grant PUD has modified the executive summary to reflect the USFWS's recommendations.
USFWS	01/10/2013	2	2.) Page ii: This page contains a reference to BioAnalysts, Inc. 2002, 2003, and 2004 and water quality conclusions contained in this literature. These studies focused on the behavioral components of bull trout as they migrated both upstream and downstream of the mid-Columbia PUD hydroelectric projects. So we suggest removing references to these studies as they relate to water quality.	The executive summary has been revised and clarified regarding the use of water quality data from the 2001-2003 time periods, reference to the BioAnalysts reports, and their relation to data collected in 2012 and possible impacts to bull trout has been added to Section 4.1.
USFWS	01/10/2013	3	3.) Page iii: We suggest omitting the final conclusion statement on this page as there is not substantial evidence to support it. We are simply interested in what was seen at the Project as it relates to bull trout.	This statement has been removed.
USFWS	01/10/2013	4	4.) Section 2.0 Bull Trout Observations (page 1): The first paragraph of this section discusses fish enumeration for salmon and steelhead at the Project. We suggest inserting verbage for bull trout enumeration per the FWS' Biological Opinion for Relicensing as well.	Reference to the USFWS Biological Opinion and bull trout enumeration was added to Section 2.0.
USFWS	01/10/2013	5	5.) Page 2, Table 2: We suggest inserting the size demographics for the bull trout listed in this table.	Grant PUD added Table 3 and modified Table 1 to reflect the USFWS's recommendation with the data that were available.
USFWS	01/10/2013	6	6.) Page 3, Figure 1: This figure does not specify the official length of the bull trout depicted in the video picture. We suggest inserting this measurement into the figure description.	Grant PUD inserted text within the figure to reflect the USFWS's recommendations.
USFWS	01/10/2013	7	7.) Page 4, Figure 2: Refer to comment #6 above.	Grant PUD inserted text within the figure to reflect the USFWS's recommendations.
USFWS	01/10/2013	8	8.) Section 3.0, Bull Trout Observations and Handlings on Nason Creek and White River (page 4): This section contains conflicting statements regarding observations of bull trout observed/handled	Grant PUD has modified and clarified the wording associated with the operation of the White River acclimation facility and the White River and

Submitting Entity	Date Received	Paragraph #	Agency Comment	Grant PUD Response
			during the implementation of the juvenile spring Chinook supplementation programs in 2012. Please ensure the consistency of bull trout observations when discussing these programs.	Nason Creek screw traps.
USFWS	01/10/2013	9	9.) Section 4.1 Water Quality Evaluation (page 7): Refer to comment #2 above.	Section 4.1 has been revised and clarification regarding the use of water quality data from the 2001-2003 time periods, reference to the BioAnalysts reports, and their relation to data collected in 2012 and possible impacts to bull trout has been added.
USFWS	01/10/2013	10	10.) Section 4.1.1 Water Surface Elevation (page 18): The last conclusion statement in this paragraph is not so definitive in my mind so I suggest changing the final statement in this section to read as follow, "...a negative impact to bull trout migrating through the project due to a nine inch increase (at Wanapum Dam) or six inch decrease (at Priest Rapids Dam) in forebay water level elevation appears to be unlikely."	This sentence was revised based on USFWS's recommendation, as well as comments from WDOE (see WDOE Comment #2 above).
USFWS	01/10/2013	11	11.) Section 4.1.3 Total Dissolved Gas (page 19): The last conclusion statement in this paragraph is again not so definitive in my mind so I suggest changing the final statement in this section to read as follow, "In summary, it appears to be unlikely this level of GBT would have a negative impact on bull trout in 2012."	Section 4.1.3 was modified for better clarification to reflect the USFWS's recommendations, as well as comments from WDOE (see WDOE Comment #3 above).
USFWS	01/10/2013	12	12.) Section 4.1.4 Discharge (page 20): I'm not sure I agree with the final conclusion of this section: "...it is unlikely that higher than average flows had significant negative impacts on bull trout." As we've seen with salmon and steelhead, high flows such as what we saw last year affect the searching ability of fish to find upstream fishways, so a discussion related to this aspect would provide better clarification in this section.	Section 4.1.4 was revised to provide better clarification and basis for Grant PUD's conclusions related to discharge.
USFWS	01/10/2013	13	13.) Section 4.3 Bull Trout Site Visits (page 21): "No bull trout were observed in any of the site evaluation," however, were any fish observed during these site visits. Records of incidental observations would be useful in this section.	With the exception of an unknown number of 3-spine stickleback, no other fish were observed in the stranding surveys. Section 4.3 was modified to include this statement.
USFWS	01/10/2013	14	14.) Section 5.0 Summary (page 21): I'm not so sure I agree with the final statement in this section. For example, bull trout were "handled" during the White River and Nason Creek activities. That's a form of "incidental take" under the guidance of the ESA. Another example is bull trout upstream passage through Priest Rapids and Wanapum since these fish come into contact with the structures and devices of the respective fishways, hence a negative impact. So my suggestion is to delete the final statement and craft a brief table that breaks down each of the project components as defined in the FWS Biological Opinion where lethal and nonlethal take would be differentiated.	Comment noted. Grant PUD created Table 9 in Section 5 that reflects USFWS's suggestion.

Submitting Entity	Date Received	Paragraph #	Agency Comment	Grant PUD Response
USFWS	01/10/2013	15	Please feel free to contact me if you have questions related to the comments contained herein, or we can discuss at the subsequent meeting of the PRFF.	Grant PUD appreciates the USFWS's time to provide comments.