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Via Electronic Filing

March 28, 2012

Honorable Kimberly D. Bose
Secretary
Federal Energy Regulatory Commission
888 First Street, NE
Washington DC 20426

Subject: Wells Hydroelectric Project No. 2149
Wells Bull Trout Monitoring and Management Plan – Annual Report

Dear Secretary:

In accordance with Article 62 of the Federal Energy Regulatory Commission (Commission) license for the Wells Hydroelectric Project (Wells Project), the Public Utility District No. 1 of Douglas County (Douglas PUD) hereby submits the 2011 Annual Report associated with the implementation of the Wells Bull Trout Monitoring and Management Plan (Bull Trout Plan).

On June 21, 2004, the Commission issued orders amending the license for the Wells Project in order to implement the terms of the Anadromous Fish Agreement and Habitat Conservation Plan (Wells HCP). The United States Fish and Wildlife Service (USFWS) issued a biological opinion (BO) pursuant to Section 7 of the Endangered Species Act (ESA) to assess the effects of the HCP on ESA listed bull trout and other listed species under the jurisdiction of the USFWS. The BO included reasonable and prudent measures (RPMs) and associated terms and conditions for implementing the RPMs for bull trout. The Commission order approving the Wells HCP added Article 61, 62 and 63 to the Wells Project license.

Article 61 of the license required Douglas PUD to file with the Commission a Bull Trout Plan for monitoring take associated with the operations of the Wells Project. Article 61 further required that Douglas PUD prepare the Bull Trout Plan in consultation with the USFWS, National Marine Fisheries Service (NMFS), Washington Department of Fish and Wildlife (WDFW), and interested Indian Tribes (Colville Confederated Tribes and the Yakama Nation).

Following consultation with the USFWS, NMFS, WDFW, Colville Confederated Tribes, and the Yakama Nation, Douglas PUD filed the Bull Trout Plan with the Commission on February 28, 2005. The Bull Trout Plan was approved by the Commission on April 19, 2005.

Article 62 of the license requires Douglas PUD to prepare and file with the Commission an annual report describing the activities required by the Bull Trout Plan.

Article 63 of the license reserves the Commission's authority to require Douglas PUD to carry out specified measures for the purpose of participating in the development and implementation of a bull trout recovery plan.

Consistent with Article 62 of the license, please find enclosed Douglas PUD's Annual Bull Trout Report for activities that took place between January 01, 2011 and December 31, 2011. This report is simultaneously being provided to the USFWS and the parties to the Wells HCP and the Aquatic Settlement Agreement.

If you have any questions related to the 2011 Annual Bull Trout Report, please feel free to contact me at (509) 881-2208 or sbickford@dcpud.org.

Sincerely,

Shane Bickford
Supervisor of Natural Resources

Enclosure: (1) 2011 Bull Trout Annual Report. Wells Hydroelectric Project FERC Project No. 2149. March 2012.

Copy: Steve Lewis, USFWS
Walt Davis, FERC, Portland, with 1 copy
James Hastreiter, FERC, Portland, with 1 copy
Erich Gaedeke, FERC, Portland with 1 copy
Mike Schiewe, Coordinator – HCP Coordinating Committee
Wells HCP Coordinating Committee – Members List
Wells Aquatic Settlement Work Group – Members List
Brad Hawkins, Douglas PUD

BULL TROUT MONITORING AND MANAGEMENT PLAN
2011 ANNUAL REPORT

WELLS HYDROELECTRIC PROJECT

FERC PROJECT NO. 2149

March 28, 2012

Public Utility District No. 1 of Douglas County
East Wenatchee, Washington

For copies of this Annual Report, contact:

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Table of Contents

List of Tables

List of Figures

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EXECUTIVE SUMMARY

The goal of the Wells Hydroelectric Project (Wells Project) Bull Trout Monitoring and Management Plan (Bull Trout Plan) is to identify, develop, and implement measures to monitor and address potential project-related impacts on bull trout (*Salvelinus confluentus*) associated with the operations of the Wells Project and associated facilities (Douglas PUD 2004). The Bull Trout Plan was prepared and is implemented to meet monitoring requirements stipulated in a U.S. Fish and Wildlife Service (USFWS) Biological Opinion (USFWS 2004) regarding implementation of the Wells Project Anadromous Fish Agreement and Habitat Conservation Plan (Wells HCP). The USFWS Biological Opinion monitoring requirements were also incorporated by the Federal Energy Regulatory Commission (FERC) into the existing Wells Project license in 2004. The Bull Trout Plan was developed in collaboration with the USFWS, National Marine Fisheries Service (NMFS), Washington Department of Fish and Wildlife (WDFW), the Colville Confederated Tribes, and the Yakama Nation, and was approved by the FERC. The Bull Trout Plan has four objectives, addressed by carrying out various field study components from 2004 to 2008 at the Wells Project.

In accordance with Article 62 of the FERC license for the Wells Project, Public Utility District No. 1 of Douglas County (Douglas PUD) is required to prepare and file with the Commission an annual report describing the activities required by the Bull Trout Plan. In December 2008, Douglas PUD filed with the FERC, a final comprehensive report summarizing the results of all activities conducted under the Bull Trout Plan between January 2005 and July 2008.

In a letter to the FERC on December 29, 2008, Douglas PUD requested that the 2008 annual report filing (due March 31, 2009) be eliminated and instead include all remaining 2008 activities (August to December 2008) within the 2009 annual report that was filed with the FERC on March 31, 2010. In a letter dated February 3, 2009 the FERC approved Douglas PUD's request. The 2009 annual report was submitted in March of 2010, and included both the results of those additional activities conducted in 2008 that were not included in the Bull Trout Plan 2005-2008 Final Report (LGL and Douglas PUD, 2008) and the ongoing Bull Trout Plan activities that were conducted in 2009. In March 2011, the 2010 annual was submitted to FERC.

The enclosed annual report is a comprehensive summary of the bull trout research, monitoring and evaluation (M&E) efforts that took place during calendar year 2011.

Four adult bull trout were incidentally captured at Wells Dam during Chinook brood collection activities in the spring of 2011. All of these fish were PIT-tagged and subsequently released back into the fishways to continue their upstream migration. One of these fish was later detected at the Twisp River PIT tag interrogation location on October 12, 2011. Another fish PIT-tagged at Wells was released and detected at the Gold Creek interrogation station on September 28, 2011. The other two adult bull trout tagged at Wells Dam in 2011 have not been detected to date. This outcome is not surprising given the low detection probabilities for the riverine PIT-tag detection arrays, especially during the spring freshet.

One of the five fish PIT-tagged at Wells in 2010, during brood collection activities, was detected in the Twisp River on July 5th and again in the lower Methow River on October 4th of 2010. In

2011, this fish was detected at Rocky Reach and then at Wells Dam in early and mid-July, respectively. Together, this fish appeared to make a spawning migration to the Twisp River in 2010, exited the Methow in the fall of 2010, successfully passed downstream through Wells and Rocky Reach between October 2010 and July 2011, followed by successful accents at both of these projects in July 2011.

Thirty-six adult bull trout (>440 mm) were captured by the PUD's contractor at the Twisp Weir in 2011. Twenty-six of these fish did not have a PIT tag and were given one. Seven of these 36 fish were fish captured and tagged in 2010 and 3 were fish captured twice in 2011. DNA samples were taken from adults captured at the Twisp River Weir in 2010 and 2011. These DNA samples will be passed along to the USFWS for future micro satellite analysis.

Bull trout behavior within the Methow Basin during 2011 remained similar to previous years; however, fewer PIT-tag detections were recorded in the spring of 2011 due to a protracted spring freshet that damaged many of the PIT-tag detection arrays and significantly reduced the detection efficiencies the few remaining interrogation sites. Similarly, bull trout encounters at the Twisp Weir were also down in 2011 when compared to prior years. The historically high flows in 2011 prevented the weir from being operated for almost two months because river flows exceeded the operational tolerance of the weir. As in past years, adult bull trout were detected migrating upstream into the Twisp River in the spring (May and June). After spawning in August and September, a consistent downstream migration was exhibited by adults moving out of the Twisp River and into the lower Methow and Wells reservoir.

Counts of bull trout passing Wells Dam in 2011 remained similar to counts collected during 2008 through 2010, but showed a slight increase in observations. Adult bull trout counts at the Wells Project were 43, 43, 44 and 66 respectively for the years 2008 through 2011. Off-season fishway video monitoring continues to indicate that bull trout are not passing Wells Dam during January to April. In late December 2011 two bull trout were salvaged in the east fish ladder during maintenance activities. During 2011, 97% (64 of 66) of the bull trout passing through Wells Dam fish ladders did so during the months of May through July, with the last observation in early November 2011. This timing is consistent with past years, and indicates bull trout passage at the dam is largely a seasonal migration independent of Project operations.

To date, no sub-adult bull trout have been observed in Wells Dam fishways. After reviewing video of the 66 bull trout that were observed in the fish ladders in 2011, all of these fish were classified as adults. These fish had an average estimated total length of 21 inches and ranged from 15-28 inches (380-710 mm). In August 2011 a Methow Core Area (MCA), PIT tagged (2010) sub-adult bull trout was detected at the Rocky Reach bypass facility and was therefore moving downstream. This fish was 170 mm (7 inches) when tagged in August 2010, suggesting that it may have been a sub-adult at the time it passed Wells Dam (sometime before August 29th 2011). To date, over 100 sub-adult bull trout have been PIT tagged in the MCA by Douglas PUD contractors. The 2011 detection would be the first confirmed MCA sub-adult observed at a mid-Columbia project. This preliminary data suggests that sub-adults in the MCA stay close to their natal habitats relative to adult conspecifics.

Incidental captures of sub-adult bull trout by Douglas PUD's hatchery monitoring and evaluation screw traps were consistent with previous years. Twenty-one sub-adult bull trout were captured in the Twisp River (six year average = 20.1). Two sub-adult bull trout were captured in the Methow River screw trap (six year average = 1.8). DNA samples were taken from all of these fish. Alex Repp (WDFW, Biologist) is the current custodian of these samples. DNA samples from previous years are being held by the WDFW and the USFWS for future analyses. Additional incidental captures of sub-adult bull trout took place by Douglas PUD contractors conducting hook and line, backpack electroshocking and netting for residual steelhead in the Methow Basin. A total of 14 bull trout were incidentally captured with this gear in 2011. All of these fish were subsequently PIT-tagged and released unharmed (Charlie Snow, pers. comm.). Tag codes for all PIT-tagged fish were uploaded to the PTAGIS database.

Douglas PUD biologists conducted a bull trout stranding survey in the Wells project on June 10th 2011, following operations at the project that lowered the reservoir below 773 feet above mean sea level (MSL). No bull trout were observed during this sampling. Past stranding and entrapment surveys have indicated that infrequent Project operations that result in lowering of the reservoir have not impacted adult or sub-adult bull trout in the Wells Project.

In accordance with Article 63 of the Wells Dam operating license, Douglas PUD continued participation in the development of a bull trout recovery plan with regional USFWS authorities. This participation included attending June 29th 2011 and August 29th 2011 recovery planning meetings and data sharing at the request of the USFWS. Douglas PUD will participate in the review of the Bull Trout Recovery Plan following its release in the spring of 2012.

In early 2011 the USFWS initiated an ESA Section 7 consultation on the proposed relicensing of the Wells Project. This consultation was concluded on March 16th 2012 when the USFWS issued a final Biological Opinion and Incidental Take Statement for the relicensing of the Wells Project. Douglas PUD provided the USFWS with biological data and information related to this consultation

1.0 INTRODUCTION

In August 1993, Douglas, Chelan, and Grant Public Utility Districts (collectively, "mid-Columbia PUDs") initiated discussions to develop a long-term, comprehensive program for managing fish and wildlife that inhabit the mid-Columbia River basin (the portion of the Columbia River from the tailrace of Chief Joseph Dam to the confluence of the Yakima and Columbia rivers). After an extensive review, the negotiating parties determined that the best basin-wide approach would be to develop an agreement for anadromous salmonids, specifically: spring and summer/fall Chinook salmon (*Oncorhynchus tshawytscha*); sockeye salmon (*O. nerka*); coho salmon (*O. kisutch*); and steelhead (*O. mykiss*) (collectively, "Plan Species") which are under the jurisdiction of the National Marine Fisheries Service (NMFS).

On July 30, 1998, Public Utility District No. 1 of Douglas County (Douglas PUD) submitted an unexecuted form of an Application for Approval of the Wells Project Anadromous Fish Agreement and Habitat Conservation Plan (Wells HCP) to the Federal Energy Regulatory Commission (FERC) and NMFS. To expedite the FERC's completion of formal consultation, Douglas PUD prepared a biological evaluation of the effects of implementing the Wells HCP on listed species under the jurisdiction of the U.S. Fish and Wildlife Service (USFWS).

In a letter to the FERC, the USFWS requested consultation under Section 7 of the Endangered Species Act (ESA) regarding the effects of hydroelectric project operations on bull trout in the Columbia River (letter from M. Miller, USFWS, to M. Robinson, FERC, dated January 10, 2000). The request for consultation was based on observations of bull trout in the study area. In its reply to the USFWS, the FERC noted that there was virtually no information on bull trout in the mainstem Columbia River. To begin to address this information gap, an initial radio-telemetry study of bull trout in the mid-Columbia basin was requested by USFWS in 2000 and implemented from 2001 to 2004 by Douglas, Chelan, and Grant PUDs (BioAnalysts, Inc. 2004).

On November 24, 2003, Douglas PUD filed an application with the FERC for approval of the executed Wells HCP. The 2003 application for approval replaced the 1998 application with the executed form of the Wells HCP. On December 10, 2003, the USFWS received a request from the FERC for formal Section 7 ESA consultation to determine whether the proposed incorporation of the Wells HCP into the FERC license for Wells Hydroelectric Project (Wells Project) operations was likely to jeopardize the continued existence of the Columbia River ESA-listed bull trout, or destroy or adversely modify proposed bull trout critical habitat. In response to the FERC request, the USFWS issued a Biological Opinion (BO) pursuant to Section 7 of the ESA to assess the effects of implementing the HCP on bull trout and other listed species under the jurisdiction of the USFWS. The BO included an Incidental Take Statement outlining reasonable and prudent measures (RPMs) and associated terms and conditions to monitor and limit bull trout take at the Wells Project. On June 21, 2004, the FERC issued orders amending the license for the Wells Project to implement the terms of the Wells HCP. The FERC incorporated the USFWS bull trout RPMs and terms and conditions into the existing Wells Project license, which are detailed in license articles 61, 62, and 63.

Article 61 of the license requires Douglas PUD to file with the FERC a Bull Trout Plan for implementing the USFWS bull trout RPMs and terms and conditions, which were designed to

monitor and limit bull trout take associated with Wells Project operations. Article 61 further requires that Douglas PUD prepare the Bull Trout Plan in consultation with the USFWS, NMFS, Washington Department of Fish and Wildlife (WDFW), and interested Indian Tribes (Colville Confederated Tribes and the Yakama Nation). Following consultation with these stakeholders, on February 28, 2005, Douglas PUD filed with the FERC the "*Wells Hydroelectric Project Bull Trout Monitoring and Management Plan, 2004-2008"* (Douglas PUD 2004), which is referred to as the "Bull Trout Plan" in this document. The Bull Trout Plan was approved by the FERC on April 19, 2005.

Article 62 of the license requires Douglas PUD to prepare and file with the FERC an annual report of the status of activities required by the Bull Trout Plan. On March 26, 2008, Douglas PUD with approval from USFWS filed a request for an extension of time to submit the 2007 annual bull trout monitoring report and to consolidate the 2007 annual report with the final bull trout monitoring report, required to be filed with the FERC by December 31, 2008. On April 16, 2008, the FERC issued an order granting this request and per the order, Douglas PUD filed with the FERC a 2005-2008 final monitoring report that summarized all data collected to meet the Bull Trout Plan objectives outlined in the USFWS bull trout RPMs and terms and conditions, and the Wells Project license articles 61 and 62.

The next reporting deadline associated with the Bull Trout Plan was March 31, 2009 (2008 Annual Report). However, because the 2005-2008 final report contained bull trout monitoring activities for most of 2008, Douglas PUD requested and was granted permission, via the FERC's April 16, 2008 letter to Douglas PUD, to eliminate the March 2009 filing of the 2008 Annual Report and instead include all remaining 2008 activities within the 2009 annual report**.** The former document was submitted in March of 2010, which summarized the results of those additional activities conducted in 2008 that were not completed in time for inclusion into the Bull Trout Plan 2005-2008 Final Report (LGL and Douglas PUD 2008) and the ongoing Bull Trout Plan activities that were conducted in 2009. In March of 2011 the 2010 annual report was submitted to the FERC. The following document serves as the 2011 annual report (filed with the FERC in March 2012). As in previous years the 2011 report is a comprehensive summary of all the bull trout research over the last 11 years, but is focused largely on the monitoring and evaluation efforts conducted during 2011.

Article 63 was a reservation of authority by the FERC to require the licensee to carry out specified measures for the purpose of participating in the development and implementation of a bull trout recovery plan. The USFWS continued bull trout recovery planning in 2011. In response to compliance with article 63 of the Wells Project license, Douglas PUD has and will continue to participate in the development of future recovery planning documents for bull trout.

Over the last five years Douglas PUD has worked closely with stakeholders to relicense Well Dam. As part of this process the FERC requested ESA consultation from the USFWS on the Wells Project relicensing application, which included a series of new aquatic, wildlife, avian, botanical, historic property and recreation management plans, in addition to the plans already contained within the Wells HCP. In 2011 the USFWS initiated an ESA Section 7 consultation, requested by the FERC, as part of the relicensing of the Wells Project

2.0 GOALS AND OBJECTIVES

The goal of the Bull Trout Plan is to identify, develop, and implement measures to monitor and address potential project-related impacts on bull trout from Wells Project operations and facilities. The Bull Trout Plan was intended to be an adaptive approach, where strategies for meeting the goals and objectives may be negotiated under a collaborative effort with stakeholders based on new information and ongoing monitoring results. The plan was designed specifically to: (1) address ongoing project-related impacts through the life of the existing operating license; (2) provide consistency with recovery actions as outlined in the USFWS Draft Bull Trout Recovery Plan; and (3) monitor and minimize the extent of any incidental take of bull trout consistent with Section 7 of the ESA.

The Bull Trout Plan has four main objectives: (1) identify potential project-related impacts on upstream and downstream passage of *adult* bull trout through the Wells Dam and reservoir and implement appropriate measures to monitor any incidental take of bull trout; (2) assess project-related impacts on upstream and downstream passage of *sub-adult* bull trout; (3) investigate the potential for bull trout entrapment or stranding in off-channel or backwater areas of Wells Reservoir; and (4) identify the core areas and local populations, as defined in the USFWS Draft Bull Trout Recovery Plan, for the bull trout that utilize the Wells Project Area.

Activities designed to support some objectives in the Bull Trout Plan were only intended to be conducted in the early phases of plan implementation (i.e., radio-tagging of bull trout at Wells Dam between 2005-2008 and comprehensive incidental take calculation for monitoring years 2001-2004 and 2005-2008). The results of these activities can be found in the Bull Trout Plan 2005-2008 Final Monitoring Report (LGL and Douglas PUD 2008) and are considered completed tasks with the filing of that final report. For the purposes of continued annual reporting per Article 62, only ongoing Bull Trout Plan activities are reported herein.

Below is a brief summary of the Bull Trout Plan objectives. A more detailed strategic framework to implement each objective is summarized in the Bull Trout Plan 2005-2008 Final Monitoring Report (LGL and Douglas PUD 2008).

2.1 Objective 1 - Adult Bull Trout Passage Monitoring

Strategy 1-1: Implement an adult bull trout telemetry program to monitor adult upstream and downstream passage in the Wells Project Area and implement appropriate measures to monitor any incidental take of bull trout.

Strategy 1-2: Analyze passage results and operational data to determine if correlations exist between passage times and passage events and project operations.

Strategy 1-3: Determine off-season adult bull trout passage through the adult fishway (numbers and times of year) at Wells for an experimental period 2004-2005. Per request by the USFWS, off-season fishway monitoring for adult bull trout passage has continued to date.

Strategy 1-4: Should upstream or downstream passage problems be identified, pursue the feasibility of options to modify upstream passage facilities or operations that reduce the impact to bull trout passage.

2.2 Objective 2 - Sub-adult Bull Trout Passage Monitoring

Strategy 2-1: The stakeholders agree at this time[1] that because of the inability to collect a sufficient sample size of sub-adult bull trout, it is not feasible to assess sub-adult passage at Wells. However, when encountered at the Wells Project, or in tributary traps, sub-adult bull trout will be PIT-tagged.

Strategy 2-2: Determine off-season sub-adult bull trout passage through the adult fishway (numbers and times of year) at Wells for an experimental period from 2004 to 2005. Per request by the USFWS, off-season fishway monitoring for sub-adult bull trout passage has continued to date.

2.3 Objective 3 - Bull Trout Entrapment and Stranding Evaluation

Strategy 3-1: Evaluate Wells inflow patterns, reservoir elevations, and backwater curves to determine if stranding or entrapment of bull trout may occur.

2.4 Objective 4 - Identification of Core Area and Local Populations of Bull Trout that Utilize the Wells Project Area

Strategy 4-1: Gather genetic samples from radio-tagged and PIT-tagged bull trout for comparison to baseline genetic samples from local populations and core areas.

Strategy 4-2: Work cooperatively with other agencies to obtain locations of radio-tagged fish outside the Project area.

3.0 STUDY AREA

3.1 Wells Bull Trout Plan Study Area

The study area for this report included all waters within the Wells Project, including the lower Okanogan and Methow rivers, the Wells Reservoir, Wells Dam, and Wells Tailrace, downstream to the "Gateway" location set at approximately 3 miles downstream from Wells Dam. Additional monitoring also took place at downstream hydroelectric projects and other accessible reaches of the mid-Columbia Basin including the Methow, Wenatchee, Entiat, and Okanogan rivers. PIT tagging activities also occurred in the Methow and Twisp rivers.

[1] At the time that the Bull Trout Plan was prepared in 2004.

3.2 General Description of the Wells Hydroelectric Project Area

The Wells Project is located at river mile (RM) 515.6 on the Columbia River in the State of Washington. Wells Dam is located approximately 30 river miles downstream from the Chief Joseph Hydroelectric Project, owned and operated by the United States Army Corps of Engineers (COE), and 42 miles upstream from the Rocky Reach Hydroelectric Project owned and operated by Public Utility District No. 1 of Chelan County (Chelan PUD). The nearest town is Pateros, Washington, located approximately 8 miles upstream from the Wells Project at the mouth of the Methow River.

The Wells Project is the chief generating resource for Douglas PUD. It includes 10 generating units with a nameplate rating of 774,300 kW and a peaking capacity of approximately 840,000 kW. The design of the Wells Project is unique in that the generating units, spillways, switchyard, and fish passage facilities were combined into a single structure referred to as the hydrocombine. Fish passage facilities reside on both sides of the hydrocombine, which is 1,130 feet long, 168 feet wide, with a crest elevation of 795 feet mean sea level (msl) in height.

The Wells Reservoir is approximately 30 miles long. The Methow and Okanogan rivers are tributaries of the Columbia River within the Wells Reservoir. The Wells Project boundary extends approximately 1.5 miles up the Methow River and approximately 15.5 miles up the Okanogan River. The normal maximum surface area of the reservoir is 9,740 acres with a gross storage capacity of 331,200 acre-feet and usable storage of 97,985 acre-feet at elevation of 781 feet msl. The normal maximum water surface elevation of the reservoir is 781 feet msl (Figure 3.2-1).

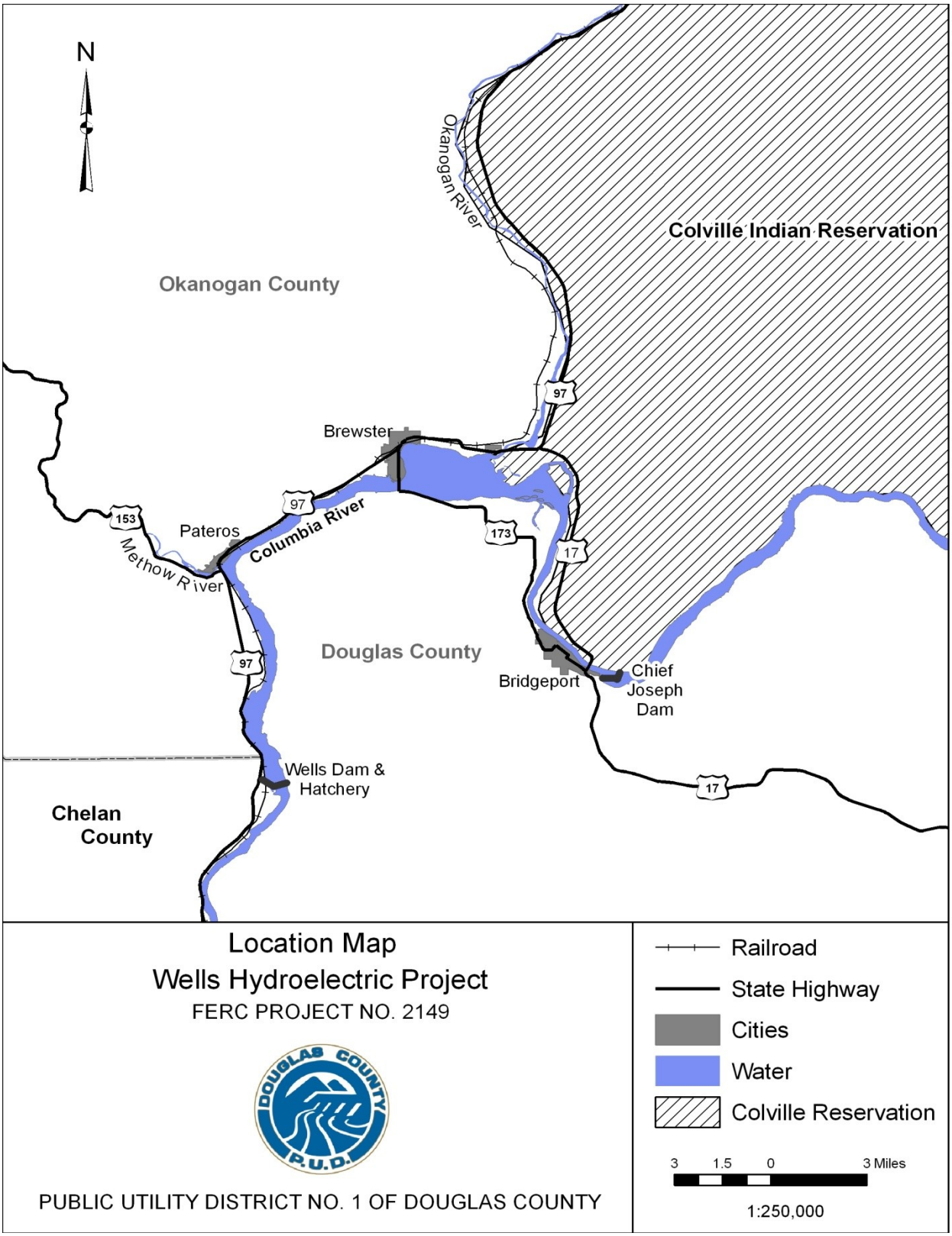

Figure 3.2-1 Location map of the Wells Project.

4.0 BACKGROUND AND EXISTING INFORMATION

4.1 Bull Trout Biology

Bull trout are native to northwestern North America, historically occupying a large geographic range extending from California north into the Yukon and Northwest Territories of Canada, and East to Western Montana and Alberta (Cavender 1978). They are generally found in interior drainages, but also occur on the Pacific Coast in Puget Sound and in the large drainages of British Columbia.

Bull trout currently occur in lakes, rivers and tributaries in Washington, Montana, Idaho, Oregon (including the Klamath River basin), Nevada, two Canadian Provinces (British Columbia and Alberta), and several cross-boundary drainages in extreme southeast Alaska. East of the Continental Divide, bull trout are found in the headwaters of the Saskatchewan River in Alberta, and the Mackenzie River system in Alberta and British Columbia (Cavender 1978; McPhail and Baxter 1996; Brewin and Brewin 1997). The remaining distribution of bull trout is highly fragmented.

Bull trout are a member of the char group within the family Salmonidae. Bull trout closely resemble Dolly Varden (*Salvelinus malma*), a related species. Genetic analyses indicate, however, that bull trout are more closely related to an Asian char (*Salvelinus leucomaenis*) than to Dolly Varden (Pleyte et al. 1992). Over part of their range, bull trout are sympatric with Dolly Varden; most notably in British Columbia and a small portion of the Coastal-Puget Sound region of Washington State.

Bull trout are believed to have more specific habitat requirements than other salmonids (Rieman and McIntyre 1993). Growth, survival, and long-term persistence are dependent upon habitat characteristics such as clean, cold, connected, and complex instream habitat (USFWS et al. 2000), and stream/population connectivity. Stream temperature and substrate type, in particular, are critical factors for the sustained long-term persistence of bull trout. Spawning is often associated with the coldest, cleanest, and most complex stream reaches within basins. However, bull trout may exhibit a patchy distribution, even in pristine habitats (Rieman and McIntyre 1995), and should not be expected to occupy all available habitats at the same time (Rieman et al. 1997).

Bull trout exhibit four distinct life history types: resident, fluvial, adfluvial, and anadromous. The fluvial, adfluvial, and resident forms exist throughout the range of the bull trout (Rieman and McIntyre 1993), although each form is not present everywhere. The anadromous life history form is currently known only to occur in the Coastal-Puget Sound region within the coterminous United States (Mongillo 1993; Kraemer 1994; McPhail and Baxter 1996; Volk 2000). Multiple life history types may be expressed in the same population, and this diversity of life history types is considered important to the stability and viability of bull trout populations (Rieman and McIntyre 1993).

The majority of growth and maturation for anadromous bull trout occurs in estuarine and marine waters, adfluvial bull trout in lakes or reservoirs, and fluvial bull trout in large river systems.

Resident bull trout populations are generally found in small headwater streams where fish remain their entire lives. Sexually mature resident bull trout are often much smaller at maturation than sexually mature adults of other life histories (McPhail and Baxter 1996).

For migratory life history types, juveniles tend to rear in tributary streams for 1 to 4 years before migrating downstream into a larger river, lake, or estuary and/or nearshore marine area to mature (Rieman and McIntyre 1993). In some lake systems, age 0+ fish (less than 1 year old) may migrate directly to lakes, but it is unknown if this emigration is a result of density dependent effects from limited stream rearing habitat, or if these young-of-the-year actually survive in the lake environment (Riehle et al. 1997). Juvenile bull trout in streams frequently inhabit side channels, stream margins and pools with suitable cover (Sexauer and James 1993) with maximum summer water temperatures generally less than 16ºC (Dunham et al. 2003) and areas with cold hyporheic zones or groundwater upwellings (Baxter and Hauer 2000).

4.2 Status

On June 10, 1998, the USFWS listed bull trout within the Columbia River basin as threatened under the ESA (FR 63(111)). Later (November 1, 1999), the USFWS listed bull trout within the coterminous United States as threatened under the ESA (FR 64(210)). The USFWS identified habitat degradation, fragmentation, and alterations associated with dewatering, road construction and maintenance, mining, and grazing; blockage of migratory corridors by dams or other diversion structures; poor water quality; incidental angler harvest; entrainment into diversion channels; and introduced non-native species as major factors affecting the distribution and abundance of bull trout. They noted that dams (and natural barriers) have isolated population segments resulting in a loss of genetic exchange among these segments (FR 63(111)). The USFWS believes many populations are now isolated and disjunct. In October 2002, the USFWS completed the first draft of a bull trout recovery plan intended to provide information and guidance that will lead to recovery of the species, including its habitat (USFWS 2002). The USFWS anticipates releasing a recovery planning document in the spring of 2012 (Judy Neibauer, Personal Communication, February 8, 2012). Threatened bull trout population segments are widely distributed over a large area and because population segments were subject to listing at different times, the USFWS adopted a two-tiered approach to develop the draft recovery plan for bull trout (USFWS 2002). In November 2002, the USFWS published in the federal register a proposed rule for the designation of critical habitat for the Klamath River and Columbia River distinct population segments of bull trout (67 FR 71235). In October 2004, the USFWS published a final rule in the Federal Register designating critical habitat for the Klamath River and Columbia River populations of bull trout (69 FR 59995). After legal challenge, the designation was expanded and new critical habitat was proposed throughout the range of bull trout in January 14, 2010 (75 FR 2270), including all of the Wells Project waters except the Okanogan River.

In April 2008, the USFWS completed the 5-year status review for Columbia River bull trout with two recommendations: maintain “threatened” status for the species, and determine if multiple distinct population segments exist within the Columbia River that merit protection under the ESA. The recommendations intend to facilitate analysis of project effects over more specific and biologically appropriate areas, ultimately allowing a greater focus of regulatory protection and

recovery resources (USFWS 2008a). The review also identified specific issues that limit the overall ability to accurately and quantitatively evaluate the current status of bull trout. Seven recommendations were made to improve future evaluation and management decisions, all of which are largely based on improvement and standardization of monitoring and evaluation techniques, better delineation and agreement of core areas and Recovery Units, and multi-agency cooperation and management (USFWS 2008b).

The Wells Project is situated within the Upper Columbia River Recovery Unit[2] and the USFWS has identified the Wenatchee, Entiat, and Methow rivers as its core areas. A core area represents the closest approximation of a biologically functioning unit for bull trout. A core area may function as a metapopulation for bull trout. Not all core areas are equal and each has specific functions that are unique. For example, the Entiat Core Area depends heavily on the mainstem Columbia River to provide overwintering, migration, and foraging habitats. The Wenatchee Core Area has populations using lake and riverine habitat (both the Wenatchee and Columbia rivers) for overwintering, migration, and foraging. Within a core area, many local populations may exist. A local population is assumed to be the smallest group of fish that is known to represent a regularly interacting reproductive unit. Sixteen local populations have been identified in the Wenatchee (6), Entiat (2), and Methow (8) core areas (USFWS 2002). However, little genetic information currently existed at the end of 2011, which identifies local populations by genetic means. As part of Douglas PUD's Bull Trout Monitoring and Management Plan, Douglas PUD has provided the USFWS with genetic samples to facilitate this process.

4.3 2001-2004 Mid-Columbia Bull Trout Radio-telemetry Study

Bull trout have been counted at Wells Dam since 1998. In 2000, due to the potential for operations at mid-Columbia dams to affect the movement and survival of bull trout, the USFWS requested that the three mid-Columbia PUDs evaluate the movement and status of bull trout in their respective project areas. At that time, little was known about the behavior, migratory characteristics and habitat use of bull trout in the mid-Columbia River. Therefore, to assess the operational effects of hydroelectric projects on bull trout within the mid-Columbia, a three PUD coordinated radio-telemetry study was implemented beginning in 2001. The goal of the study was to monitor the movements and migration patterns of adult bull trout in the mid-Columbia River using radio-telemetry (Figure 4.3-1) to address the information deficit. The number of bull trout to be collected and tagged at each dam (Rock Island, Rocky Reach, and Wells) was based on the proportion of fish that migrated past those dams in 2000.

From 2001 to 2003, bull trout were collected from the Wells, Rocky Reach, and Rock Island dams, radio-tagged, and monitored through 2004. Multiple-telemetry techniques were used to assess the movement and behavior of tagged bull trout within the study area. At Wells Dam, a combination of aerial and underwater antennas was deployed. The primary purpose for this system was to document the presence of bull trout at the project, identify passage times and

[2] Note that while the USFWS refers to the area encompassing the Wells Project as the Upper Columbia Recovery Unit for bull trout, the section of the Columbia River from Chief Joseph Dam to the confluence of the Yakima and Columbia rivers is often termed the "mid-Columbia" for other purposes, and is the term used in this document when referring to the reach.

determine their direction of travel (i.e., upstream/downstream). In addition to these systems, a number of additional telemetry systems were deployed to address specific questions posed by the USFWS and Douglas PUD. At Wells Dam, several additional systems were installed to identify whether tagged bull trout could enter, ascend, and exit specific gates and fish ladders. All possible access points to the adult fish ladders and the exits were monitored individually during the study period from 2001-2004, allowing the route of passage to be determined as well as the ability to establish the exact time of entrance and exit from the ladder system.

To assess bull trout movements into and out of the Wells Reservoir, fixed-telemetry monitoring sites were established at the mouth of the Methow and Okanogan rivers and periodic aerial telemetry surveys were conducted on the reservoir and throughout both watersheds (English et al. 1998, 2001). English et al. (1998, 2001) provide a detailed description of the telemetry systems at each of the dams and within the tributaries.

Successful bull trout upstream and downstream passage was observed at the Wells Project. In addition, no bull trout injury or mortality was observed associated with the Wells Project. Radio-tagged bull trout that migrated upstream past Wells Dam used the Methow River subbasin during the bull trout spawning period. Key findings of the 2001 to 2004 study are used in this document to assess the 6-year average take analysis as stipulated in the Bull Trout Plan (Objective 1, Strategy 1-1) and are summarized in the results section of this document.

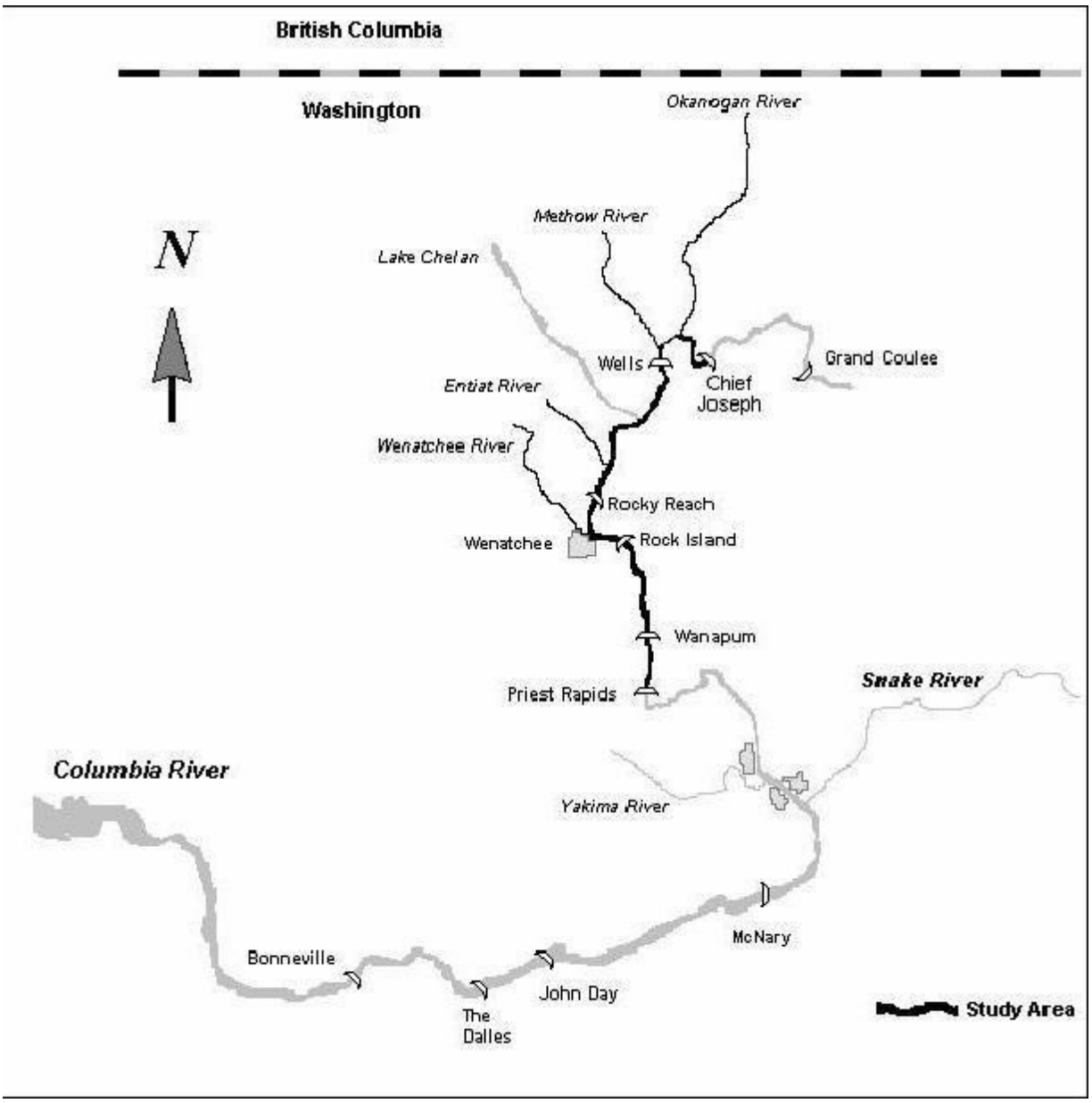

Figure 4.3-1 Study area for assessing migration patterns of bull trout in the mid-Columbia River (2001-2004).

4.4 2005-2008 Bull Trout Monitoring and Management Plan Activities

The goal of the Wells Project Bull Trout Plan is to identify, develop, and implement measures to monitor and address potential project-related impacts on bull trout associated with the operations of the Wells Project and associated facilities (Douglas PUD 2004). The Bull Trout Plan has four objectives, addressed by implementing various field study components from 2004 to 2008 at the Wells Project.

The first objective was to identify potential project-related impacts on upstream and downstream passage of adult bull trout (fish ≥ 400 mm in length) through Wells Dam and reservoir, and implement appropriate measures to monitor any incidental take of adult bull trout. To meet the first objective, radio-telemetry was used to monitor upstream and downstream passage, and off-season video counting was done in the Wells Project fishways during the winter. Between 2005 and 2008, 26 adult bull trout were trapped at Wells Dam and radio-tagged. Concurrent with the implementation of the Bull Trout Plan, the USFWS and Chelan PUD radio-tagged and released 136 adult bull trout at other mid-Columbia River basin locations including the Methow River, and Rock Island and Rocky Reach dams (50 USFWS tags 2006-2008, 86 Chelan PUD tags 2005-2007).

From 2005 to 2008, 25 downstream passage events and 52 upstream passage events by 40 individual bull trout were recorded at Wells Dam. Of these, 17 downstream and 41 upstream passage events occurred within one year of tagging and release. Of all tags released from 2001 to 2004, there were 2 downstream passage events and 41 upstream passage events. Of these, 2 downstream and 38 upstream passage events occurred within one year of release date. The take estimates for the Wells Project were based upon the number of unique upstream and downstream passage events that took place within one year of each bull trout being tagged and released. During the six-year study and eight years of monitoring, 19 downstream and 79 upstream passage events took place at Wells Dam by radio-tagged bull trout within one year of release date. Taking into account all observed passage events a total of 27 downstream and 93 upstream passage events took place at Wells Dam. Radio-tagged bull trout passed downstream through the turbines or spillways as no downstream passage events were recorded via the fishways. Out of the 19 downstream passage events that occurred within one year of tagging, zero bull trout injury or mortality was observed at the Wells Project. Out of the 79 upstream passage events that occurred within one year of tagging, zero bull trout injury or mortality was observed at the Wells Project.

Upstream passage of adult bull trout through the fish ladders at Wells Dam has historically occurred between early May and late October, with peak passage typically occurring in May and June. During the 2005 and 2008 study, 214 adult bull trout were counted passing upstream through Wells Dam. The proportion of the bull trout population at Wells Dam that was radio-tagged was 24% (52/214 = 0.24).

Project operations did not appear to influence the movements of adult bull trout. Instead, adult bull trout passage events appeared to be more closely associated with water temperature, photoperiod and time of year with rather predictable patterns of upstream and downstream

movement (LGL and Douglas PUD 2007; 2008). Because no take (injury or mortality) was observed during the study, there was no need to investigate how Project operations affected take at Wells Dam.

During the 2005-2008 monitoring period, no adult bull trout were counted during the 24-hour off-season fishway counting period (November 16 to April 30).

No upstream or downstream passage problems were identified during this study. Passage times upstream through the fishway appeared reasonable relative to the species migration and spawn timing. Because no passage problems were identified during the study, there was no need to develop recommendations to change or modify the fishway operations at Wells Dam.

The second objective was to assess project-related impacts on upstream and downstream passage of sub-adult bull trout (fish <400 mm in length). During the development of the Bull Trout Plan, stakeholders agreed that because of the inability to collect a sufficient sample size of sub-adult bull trout at Wells Dam, it was not feasible to assess sub-adult passage. However, when encountered at Wells Dam fishways, or in tributary traps, sub-adult bull trout would be PIT-tagged. Douglas PUD provided funding, equipment, training, and coordination for the sub-adult bull trout PIT tag program. From 2004 to 2008, 67 sub-adult bull trout were PIT-tagged in the Methow River sub-basin during standard tributary smolt trapping operations. Douglas PUD operated PIT tag detection systems year-round within the Wells Dam fishways during the study period (2005 to 2008) and no PIT-tagged sub-adult bull trout were detected. Additionally, sub-adult bull trout were to be PIT-tagged opportunistically when encountered at the Wells Project; however, no sub-adult bull trout have been encountered at Wells Dam during this period.

The third objective was to investigate the potential for sub-adult entrapment or stranding in off-channel or backwater areas of Wells Reservoir. Field surveys were conducted at potential bull trout stranding sites during periods of low reservoir elevation. High resolution bathymetric information, reservoir elevations, backwater curves, and inflow patterns were used to identify potential stranding sites for the survey. No stranded or entrapped bull trout of any size were found during the field surveys conducted in 2006 and 2008. No surveys were conducted during 2005 or 2007 because river operations were not low enough to warrant a survey.

The fourth objective was to identify the core areas and local populations of bull trout that utilize the Wells Project. Data from radio-tagged bull trout tracked during the 2005 to 2008 study period were analyzed with data from the 2001 to 2004 study. Bull trout that pass Wells Dam (either upstream or downstream) migrated into the Methow, Entiat, and Wenatchee rivers during the spawning period. Observed tributary entrances of bull trout detected at Wells Dam from 2005 to 2008 were 86% Methow River, 10% Entiat River, and 2% Wenatchee River. Genetic samples of all fish tagged at Wells Dam were submitted to the USFWS for analysis. The USFWS is responsible for analyzing the genetic samples and providing those results. To further support this objective (Strategy 4-2: Work cooperatively with other agencies to obtain locations of radio-tagged fish outside the project area), Douglas PUD regularly coordinated bull trout data and monitoring activities with other agencies including the USFWS, WDFW and Chelan PUD.

In summary, no mortality or injury was observed for bull trout (adult and sub-adult) passing through or interacting with the operations of the Wells Project during the take monitoring studies conducted between 2001 and 2008. No incidental take of bull trout was observed at the Wells Project, and the Wells Project is presumed to be within the incidental take levels authorized by the USFWS Biological Opinion Incidental Take Statement (USFWS 2004).

5.0 2011 BULL TROUT MONITORING AND MANAGEMENT PLAN ACTIONS

A more detailed description of the methodologies used to implement each Bull Trout Plan objective-strategy in 2011 can be found in the Bull Trout Plan 2005-2008 Final Monitoring Report (LGL and Douglas PUD 2008). These methodologies were developed from the objectives first outlined in the *Wells Hydroelectric Project Bull Trout Monitoring and Management Plan 2004-2008* (Douglas PUD 2004).

6.0 RESULTS

6.1 Strategy 1-1: Adult bull trout telemetry program

6.1.1 Bull trout tagged by Douglas PUD

As previously reported, an evaluation of station receiver data for the period of August 2008 to December 2009 at Wells Dam, Wells Dam Tailrace, the "Gateway" location (approximately 3 miles downstream from Wells Dam), and at stations located at the Methow and Okanogan river mouths yielded no additional detection data. During the latter half of 2008, bull trout would have already entered the Methow River to access spawning and overwintering habitat located outside of the Wells Project Area. By 2009, most of the tags activated in earlier years expired and were unavailable in providing additional data. A complete description of bull trout radio-telemetry findings can be found in (LGL and Douglas PUD 2008).

No additional radio-telemetry was conducted in 2011. Douglas PUD will implement a radio-telemetry study using adult bull trout captured in the Twisp River Weir in year one of the new FERC license. In 2016 additional radio-telemetry efforts will be carried out at Wells Dam in consultations with the Aquatic Settlement Work Group and the USFWS. These and other bull trout measures are part of the Aquatic Settlement Agreement prepared during the Integrated License Process for Wells Dam.

6.1.2 PIT tagging efforts and interrogations

Thirty-six adult bull trout (>440 mm) were incidentally captured at the Twisp River Weir in 2011. These captures are approximately 60% fewer bull trout that were captured at the weir in 2010 and is a result of high flows in June that made the weir inoperable. Migrating bull trout would have been able to pass the weir without capture during these flows. Twenty-six of the 2011 captures had not been previously PIT tagged. Untagged adults were anesthetized, measured, and given a PIT tag prior to release. Seven of these 36 fish were captured and tagged in 2010 and 3 were captured twice in 2011.

Out of the 26 adult bull trout PIT-tagged at the Twisp Weir in 2011, 14 were subsequently detected on instream PIT-tag arrays within the Methow Basin in 2011. Ninety-three percent of these detections occurred at the TWR (lower Twisp River) location during a time when bull trout have been observed exiting the Twisp River following spawning in the upper reaches of this river (Table 6.1.2-1). These results are consistent with previous years of monitoring.

Ninety one adult bull trout were incidentally captured at the Twisp River Weir in 2010. Eighty seven of these fish were given new PIT tags, while 4 of them were recaptures. These adult bull trout contribute to a novel dataset tagged within the Twisp River or MCA. Sixty nine percent of these adults have since been detected at various locations following release in 2010. Because of the complexity of these in-stream behaviors, movements associated with spawning have been summarized in Table 6.1.2-1. In this summary two assumptions were made: 1) drop back was assumed when a fish was detected at any site downstream of the weir after August of the tagging year and 2) spawning was assumed when a fish was detected post tagging at TWR during the months of September and October, which is associated with downstream movement following spawning. Together, important limitations exist with passive tags, however behaviors appear to be tied to pre- and post-spawning behaviors and bull trout seeking overwintering habitats.

Table 6.1.2-1 Summary of adult bull trout incidentally captures at the Twisp Weir in 2010 and 2011 and their PIT tag detections as of December 31 2011.

Description	2010	2011
Number tagged	87	26
Number detected post release	60	14
Percent detected post release	69%	54%
Spawned in 2010	18	NA
Spawned in 2011	1	13
Spawned in both 2010 and 2011	24	NA
Dropped back after tagging and spawned in 2010 only	0	NA
Dropped back after tagging and spawned in 2011 only	4	0
Dropped back after tagging and spawned in 2010 and 2011	3	NA
Dropped back after tagging (not observed spawning)	8	0
Overwinter detection or upstream movement only	2	1
Percent of bull trout assumed spawned in same tag year*	**75%** (45/60)	**93%** (13/14)

* assumes that an equal number of spawning fish and drop back fish went undetected.
Note. drop back was assumed when a fish was detected at a downstream location after tagging between June and August of tag year.
Note. spawning was assumed when a fish was detected post tagging at TWR during the months of September and October, which is associated with downstream movement following spawning.

During spring Chinook broodstock collection activities, five and four adult bull trout were incidentally captured and tagged at Wells Dam in 2010 and 2011, respectively. One of the 2011 fish was later detected at the Twisp River PIT tag interrogation location on October 12, 2011 and another was detected at the Gold Creek interrogation station on September 28, 2011. The other two adult bull trout tagged at Wells Dam in 2011 have not been detected to date. Of the five fish tagged at Wells in 2010, one was detected in 2011. Following release at Wells Dam in 2010, this fish was detected in the Twisp River on July 5th and, subsequently, in the lower Methow River near the Columbia on October 4th of 2010. In 2011, this fish was detected at Rocky Reach and Wells Dam in early and mid-July respectively, suggesting that this fish made successful downstream passages at Wells and Rocky Reach Dams, followed by successful accents at these projects during a typical upstream passage period. Previous radio-telemetry data is consistent with the behavior, timing, and successful dam passage displayed by this PIT-tagged adult.

Table 6.1.3-1summarizes the number of bull trout tagged in the MCA and at Wells Dam since 2005. These captures and tagging efforts are a result of incidental captures of bull trout during anadromous salmonid M&E and broodstock collection efforts. Together, Douglas PUD has funded the successful capture, tagging and release of 373 sub-adult and adult bull trout since 2005, 137 of which have since been detected passing at least one in-stream PIT tag array (Table 6.1.3-2).

6.1.3 Movement and Behavior within the Methow Basin

Detections within the Methow Basin occurred predominately during the late summer, fall and winter of 2011. Unusually high flows in the spring and early summer reduced detection efficiency and physically destroyed many detection arrays within the MCA. Ninety two unique fish were observed on at least one PIT tag interrogation station in the Methow Basin during 2010, 85 of which were PIT-tagged under Douglas PUD's M&E funding in the MCA. Twenty nine unique fish were observed on an MCA in-stream array in 2011. All but one of these fish were tagged by Douglas PUD's M&E staff (the other was tagged by the Yakama Nation Fisheries staff). Consistent with 2011 it appears that the majority of detections were a result of fish making downstream movements towards and, presumably, into the lower Methow River or Columbia River since approximately 70% of these detections occurred between September and December 2011. Information regarding station outages can be found on the PTAGIS website (http://www.ptagis.org/ptagis/index.jsp).

Table 6.1.3-1 Incidental captures of bull trout during M&E activities from 2005-2011. All fish were given PIT tags and data was uploaded to PTAGIS.

	Location								
Tag Year	Twisp River Weir	Twisp River Screw Trap	Methow River Screw Trap	Methow hook and line, dipnet, or shock	Twisp hook and line, dipnet, or shock	Chewuch hook and line, dipnet, or shock	Wells Dam	Total	Length (mean; range [mm])
2005	0	16	0	0	0	0	0	16	162; 106-196
2006	0	20	0	0	0	0	0	20	200; 121-287
2007	0	10	4	0	0	0	0	14	188; 146-244
2008	0	27	1	41	1	1	0	71	228; 82-330
2009	0	21	6	1	0	0	0	28	162; 118-227
2010	87	27	0	18	15	0	5	152	473; 118-790
2011	26	21	2	4	10	5	4	72	354; 141-720
Grand total								373	

Note: Presence of adults tagged at the Twisp Weir in 2010 and 2011 highlight the influence of capture method and location on mean fish size.

Table 6.1.3-2 Number of bull trout since detected in the Methow Core Area or Wells Action Area 2005-2011.

Tag year	Numbers tagged	Since detected	Percent detected	Number detected at Wells	Number detected at LMR
2005	16	0	0%	0	0
2006	20	0	0%	0	0
2007	14	2	14%	0	0
2008	71	10	14%	0	2
2009	28	12	43%	1	2
2010	152	84	55%	2	20
2011	72	29	40%	NA	3
Grand total	373	137	37%	3	27

Note. LMR is the lower Methow River interrogation location, approximately a mile upstream of the Methow and Columbia River Confluence. Detections at this location are often associated with upstream movements in the spring and early summer, downstream movements in the fall (September-October), or overwintering from November to May.

Together, three general trends exist for behavior of bull trout in the Methow River Basin:

1) Bull trout enter the Methow Basin in spring and early summer. They move quickly up river, presumably, to foraging and find spawning locations. The lack of upstream migration data, relative to downstream data in the fall is indicative of high flow river conditions, debris damaging PIT tag arrays and lower detection efficiencies during these

seasonal conditions. However, radio-telemetry data confirms that upstream movements do take place in the spring and summer.

2) The most obvious location for spawning occurs in the Twisp River above the Twisp River Weir detection location, since the majority of the fish were detected at the Twisp River Weir in the late summer and early fall.
3) Both adult and sub-adult bull trout appear to make directed downstream movements into the lower Methow and the Wells Project after spawning and prior to the onset of winter. However, adults and sub-adults have been detected in higher reaches of the Methow River during the winter periods, suggesting that over wintering locations are not exclusive to the Columbia and lower Methow Rivers.

6.2 Strategy 1-2: Correlations between passage events and Project operations

Results from the 2005-2008 radio-telemetry effort indicated bull trout movement was determined by seasonal conditions rather than project operations.

Observations of bull trout at Wells Dam in 2011 remained similar to observations from previous years. Adult bull trout fishway counts at the Wells Project were 43, 43, 44, and 66 respectively for the past four years. Over the last ten years, 2001 had the largest count at Wells Dam fishways at 107. The 2011 count is highly comparable to the eleven year average of just under 66 bull trout counted in Wells Dam fishways annually.

Adult bull trout begin seasonal usage of the Wells Dam fishways reliably in early to mid-May, with the >98% of fishway use occurring from May through the end of July. The seasonal end to Wells Dam fishway use by bull trout has been less predictable, occurring sometime between July and November over the last decade. 2011 was the first year that a bull trout was observed in the Wells Dam fish ladder in December. To date, no bull trout have been observed in Wells Dam fish ladders from January to April (Figure 6.2-1).

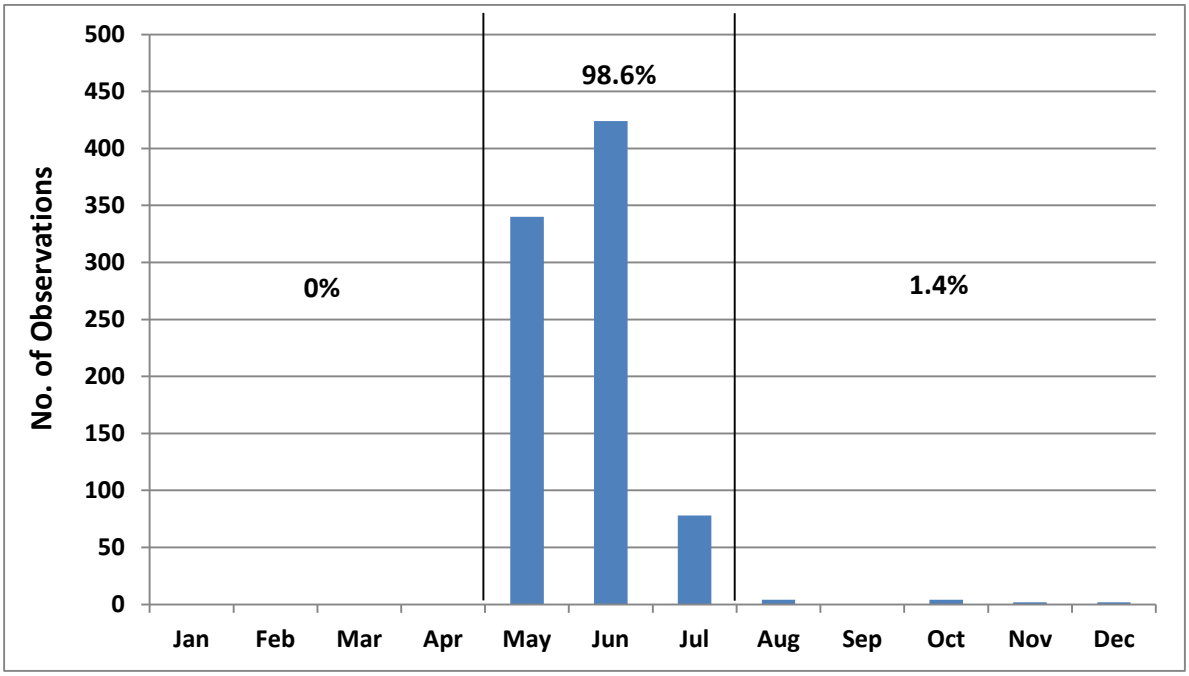

Figure 6.2-1 Seasonal distribution of bull trout observations at Wells Dam for the years 1998-2011.

6.3 Strategy 1-3: Off-season fishway passage of adult bull trout

Off-season video monitoring of both Wells Dam fishways continued for the 2010-2011 winter period (November 16 - April 30). Consistent with prior years of off-season video monitoring, no adult bull trout were observed using the fishways during the winter. However, during annual fish ladder dewatering activities, two bull trout were observed in the east fish ladder in 2011 (December). In 2011, 64 of 66 (97%) counted bull trout at Wells Dam fish ladders passed during the months of May through July. Consistent with observations from several years of year-round fishway counts, adult bull trout passage through Wells Dam primarily occurs in May through July each year (Figure 6.2-1).

6.4 Strategy 1-4: Modifications to passage facilities or operations

There have been no passage issues identified that limit upstream or downstream passage of adult bull trout at Wells Dam. Therefore, there is no need for modifications to current passage facilities or operations.

6.5 Strategy 2-1: Sub-adult PIT tagging program

Douglas PUD passively collected information from all PIT-tagged fish, including bull trout, as they passed through the fishways at Wells Dam. Douglas PUD also scanned all bull trout incidentally captured at rotary screw traps and adult brood collection facilities. The information

collected at the dam and in the tributaries was posted on the PTAGIS website, which is operated and maintained by the Pacific States Marine Fisheries Commission.

Consistent with previous years, no sub-adult bull trout were observed or detected at Wells Dam. Douglas PUD continues to provide support to WDFW for PIT tagging bull trout incidentally collected at both on-site and off-site smolt collection facilities (Table 6.5-1). Tag information for all tagged fish was posted on the PTAGIS website (http://www.ptagis.org/ptagis/index.jsp). Despite tagging over 150 sub-adult bull trout in the Methow action area since 2005 only one Methow origin tagged sub-adult bull trout has been detected in the mainstem Columbia. In May of 2011, a sub-adult bull trout that was tagged in August of 2010 at the Twisp River screw trap, was detected at the Rocky Reach juvenile bypass facility. Therefore, this fish successfully passed downstream through Wells Dam. No sub-adults have been detected in Wells Dam fish ladders to date. Together, over 155 sub-adult bull trout have been PIT-tagged in the MCA as a result of Douglas PUD funding, including more than 20 in 2011.

Within the Methow Basin there are 15 separate PIT tag interrogations facilities, making it one of the most extensive PIT tag interrogation networks in the Columbia Basin. Of the bull trout that have been PIT-tagged by WDFW, using Douglas PUD tags, numerous within basin detections have occurred. Within the Methow, tagged sub-adult bull trout have been observed in the lower Methow, middle Methow, Chewuch, Beaver, Gold, Wolf and Eightmile Creek, Twisp River and the lower Methow detection locations. In summary, the majority of bull trout detections in the Methow River Basin occurred between July and November at the MRT and the TWR interrogation locations. Previous Radio-telemetry data suggests that the majority of bull trout tagged at Wells Dam are destined for spawning reaches in the Twisp River. Other spawning locations included the Lost River and Gold Creek (LGL and Douglas PUD 2008).

6.6 Strategy 2-2: Off-season fishway passage of sub-adult bull trout

Similar to off-season video monitoring of adult bull trout (Section 6.3), off-season video monitoring of the Wells Dam fishways for sub-adult bull trout continued for the winter periods (November 16 - April 30). During these monitoring periods, no sub-adult bull trout were observed utilizing the fishways. To date, no sub-adult bull trout have been observed using Wells Dam fishways at any time during the year.

6.7 Strategy 3-1: Inflow patterns, reservoir elevations, and backwater curves

On November 5, 2008, Douglas PUD conducted several stranding surveys intended to document whether or not bull trout are stranded in the Wells Reservoir during lower than normal reservoir surface elevation operations (surface elevation at or below 773 feet MSL). The survey locations were selected based upon an analysis of detailed bathymetric maps produced in 2005 combined with Wells Reservoir hydraulic information. This effort identified several locations where stranding of sub-adult bull trout could potentially occur. Six total potential stranding locations were identified. These locations were the Methow River mouth, the Okanogan River mouth, the Kirk Islands, the shallow water habitat in the Columbia River directly across from the mouth of the Okanogan River, Schluneger Flats and the off-channel areas of the Bridgeport Bar Islands.

Boat and foot surveys were conducted and included a combination of shoreline transects and inspection of isolated sanctuary pools. Similar to previous bull trout stranding surveys, no bull trout were observed during the 2008 survey which suggests that bull trout are able to avoid stranding and entrapment areas in the event of a Wells Reservoir drawdown. During 2009 and 2010, no stranding surveys were conducted as low water events did not take place. On June 10, 2011 Douglas PUD biologists conducted a stranding survey using similar methods as in 2008. This survey was initiated since Wells Project operations reduced reservoir depth to below 773 feet MSL. During this survey no bull trout were encountered and only a few sculpin (*Cottus* sp.) and three-spine stickleback (*Gasterosteus aculeatus*) were observed (less than 10 of each species). Imagines from this survey are included in Figure 6.7-1.

Figure 6.7-1 Low reservoir conditions on June 10, 2011 and Douglas PUD biologists conducting a stranding survey.

6.8 Strategy 4-1: Genetic sampling program

In 2011, 10 and 2 DNA samples were taken from juvenile bull trout in the Twisp River smolt trap and Methow River smolt trap respectively (operated by WDFW). Total DNA samples taken from sub-adults since 2008 are summarized in Table 6.8-1. All samples are currently in the care of WDFW or the USFWS. Genetic analysis results are not yet available, but are anticipated to be provided by USFWS in the future and when available will be included in future reports.

Table 6.8-1 Sub-adult bull trout PIT-tagged in the Methow Basin, 2008-2010 (data from C. Snow, WDFW).

Year	Collection/tag site	# PIT-tagged/ # captured	# DNA sampled
2008*	Methow River trap	0/0*	0*
2008*	Twisp River trap	13/14*	0*
2009	Methow River trap	6/6	5
2009	Twisp River trap	21/21	10
2010	Methow River trap	0/0	0
2010	Twisp River trap	29/29	10
2011	Methow River trap	2/2	2
2011	Twisp River trap	21/21	21

*August to December only: In early 2008 16 sub-adults were captured in the Twisp River trap and 10 DNA samples were taken from these fish. To see 2005-2008 data table similar to above, refer to LGL and Douglas PUD (2008).

6.9 Strategy 4-2: Participation in information exchanges and regional efforts

Douglas PUD continues to coordinate with regional tribal, state, and federal agencies, to promote the exchange of bull trout information and to ensure that local and regional bull trout monitoring efforts are coordinated in the Upper Columbia River. In 2011, Douglas PUD biologists attended June 29th and August 29th meetings to contribute to the recovery planning.

7.0 CONCLUSIONS

Six years of tagging results and eight years of monitoring results, as reported in the Bull Trout Plan 2005-2008 Final Report, demonstrate no project-related impacts to adult or sub-adult bull trout from passage through the Wells Project, nor by stranding/entrapment due to lowering of the reservoir elevation. Using the original eight years of data, Douglas PUD has also determined there are no apparent correlations between project operations and downstream passage events, and that there is no upstream movement of adult or sub-adult bull trout through the Wells Dam fishways during the November 16 through April 30 timeframe. Bull trout captured and tagged at Wells Dam were radio-tracked to the Methow and Entiat Core Areas during spawning periods, and have also demonstrated movement between these systems by successfully passing upstream and downstream through Wells Dam. PIT tag data concurs with radio-telemetry survival estimates (100%), since adult bull trout PIT-tagged in the MCA and at Wells have been detected at Wells in subsequent years following tagging.

Additional tagging and monitoring has taken place since 2008 including tagging and monitoring in 2009, 2010 and 2011. These studies support the conclusions reported for the first eight years of take monitoring at Wells Dam. In particular, the results of the 2011 implementation of the Bull Trout Plan remain consistent with the previous 10 years of monitoring and evaluation. Radio-telemetry and PIT tag data suggest that bull trout passage at Wells Dam is independent of project operations and instead associated with seasonal movement patterns such as spawning migrations during May through July. To date, no sub-adult bull trout have been observed in Wells Dam fishways. Data collected from the Methow River basin smolt collection operations indicate that sub-adult bull trout are present near the confluence of the Methow and Columbia River. However, only one of more than 155 sub-adults PIT-tagged in the MCA has since been detected in the mainstem Columbia below Wells Dam.

In 2011, thirty six adult bull trout were captured at the Twisp River Weir during salmonid broodstock operations. Twenty six of these fish did not have a PIT tag and were subsequently given one prior to release. Seven of the 36 adult bull trout were recaptures from 2010 PIT-tagging at the weir. Newly tagged fish in 2011 add to the unique dataset of already PIT-tagged bull trout in the MCA. Movements of these adult fish appear to be closely related to spawning migration movements (pre and post-spawning) and those related to overwintering.

In 2011, genetic samples were taken from 12 sub-adult bull trout during the implementation of off-site smolt collection activities and provided to the USFWS for future genetic analysis. To date, low-water project operations appear to have no stranding effect on adult or sub-adult bull trout. In addition to coordinating monitoring efforts and information exchanges of project specific bull trout data, Douglas PUD continues to participate in regional activities that support bull trout conservation and recovery.

8.0 REFERENCES

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