TACOMA POWER
TACOMA PUBLIC UTILITIES

3628 South 35th Street
Tacoma, Washington 98409-3192

TACOMA PUBLIC UTILITIES

ELECTRONIC FILING

July 16, 2009

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

Re: City of Tacoma, Cowlitz River Hydroelectric Project No. 2016
2009 Annual Upstream Fish Passage Study Report,
Settlement Agreement License Article 3 and License Article 415

Dear Ms. Bose:

Attached is the 2009 Annual Upstream Fish Passage Study Report prepared and filed as a response to the August 18, 2005 Federal Energy Regulatory Commission (the Commission), Order Modifying and Approving Upstream Fish Passage Study Report, Settlement Agreement Article 3 for the Cowlitz River Project, FERC No. 2016. In addition, this report partially fulfils the requirements of License Article 401 and fulfils the requirements for 2009 of Article 415 Final Fish Passage Plan as it applies to upstream passage.

The final draft report was distributed to the Cowlitz Fisheries Technical Committee (FTC) for their comments on June 5, 2009. In addition, the draft report was briefly discussed along with the schedule for comments at the June and July FTC meetings. No comments were received.

Please do not hesitate to contact Debbie Young, Natural Resources Manager, at (253) 502-8340, or Tom Martin, License Implementation Coordinator, at (253) 502-8298 if you have any questions regarding this submittal.

Sincerely,

for Patrick D. McCarty
Generation Manager

Attachment

Cc: Federal Energy Regulatory Commission, Portland Regional Office (w/attachment)
Erich Gaedeke, Federal Energy Regulatory Commission, Portland Regional Office (w/attachment)
Fisheries Technical Committee (w/attachment)
Debbie Young (w/attachment)
Tom Martin (w/attachment)

City of Tacoma,
Department of Public Utilities, Light Division
Cowlitz Hydroelectric Project
FERC No. 2016

Settlement Agreement Article 3, License Article 415 and License Article 401

Upstream Fish Passage Study Report

2009 Annual Report

INTRODUCTION

This report is prepared as a response to the August 18, 2005 Federal Energy Regulatory Commission (the Commission) Order Modifying and Approving Upstream Fish Passage Study Report, Article 3 for the Cowlitz River Project, FERC No. 2016. The license article requires the City of Tacoma, Department of Public Utilities, Light Division (Tacoma) to file an annual report on adult anadromous fish traveling through the Cowlitz River Project within 60 days from the date of the Order, and annually thereafter beginning July 19, 2006, until a decision is made on constructing volitional upstream passage facilities. This fifth Annual Report presents information that will be used in making that decision.

In addition, this report partially fulfils the requirements of License Article 401 and fulfils the requirements for 2009 of Article 415 Final Fish Passage Plan as it applies to upstream passage. There have been no changes in operation and maintenance, emergency procedures or inspection procedures of the Cowlitz River Project fish passage facilities that were detailed in the Article 415 Final Fish Passage Plan submitted February 8, 2006, and approved by FERC Order dated May 10, 2006. That plan detailed the current operation and maintenance, emergency and inspection procedures for each of the facilities. The approved plan stated that should any changes to the operation and maintenance, emergency or inspection procedures for the existing facilities occur, these changes will be documented and reported in a subsequent Article 415 Fish Passage Plan report. Updated or new operation and maintenance plans, emergency procedures, and inspection procedures will be developed for any future fish passage facilities, but until there is agreement on the type and design of any new facilities, such plans and procedures cannot be developed. Tacoma Power is reporting that no changes have occurred and no new facilities have been constructed so a new revised Article 415 report is not required.

PROJECT DESCRIPTION

The Cowlitz Project (FERC No. 2016) is located on the Cowlitz River, Lewis County, Washington between river mile (RM) 49.5 and RM 88.0. The project consists of Mossyrock Dam (RM 65.5), Mayfield Dam (RM 52.0), Riffe Lake reservoir, Mayfield Lake reservoir, two hydroelectric powerhouses, the transmission facilities associated with the dams, the Cowlitz Salmon Hatchery (RM 50.0), the Barrier Dam (RM 49.5), the Cowlitz Trout Hatchery (RM 42.0), recreational facilities at the reservoirs and lands within the Project boundary. Construction of the Project began with Mayfield Dam in 1956 and was completed with the construction of Mossyrock Dam ending in 1968. The Project has been operated and maintained continuously since original construction.

Tacoma Power built the Cowlitz Project between 1958 and 1968 and generation capacity was expanded in 1983. The original license for the project was issued November 28, 1951, and expired on December 31, 2001. A new thirty-five year license for the project was made effective on July 18, 2003.

Cowlitz Falls Project (FERC No. 2833) is located on the Cowlitz River, Lewis County, Washington between RM 88.0 and RM 101. The Project is owned and operated by the Lewis County Public Utility District and consists of Cowlitz Falls Dam (RM 88.0) and powerhouse and the transmission facilities associated with the Project. The BPA owned Cowlitz Falls Fish Collection Facility is attached to the LCPUD owned Cowlitz Falls Project and is located just below Cowlitz Falls Dam. Construction of the Project began in 1991 and was completed with initial operations in 1994. The Project has been operated and maintained continuously since original construction.

The original license for Cowlitz Falls Project was issued in 1986 and will expire on June 30, 2036.

FERC License Articles

Settlement Article License Article 3 ***Upstream Fish Passage: Barrier, Mayfield and Mossyrock.*** *b) Within six months of license issuance, or as soon as practicable thereafter depending on the availability of marked fish, and updated on an annual basis thereafter, the Licensee shall file with the Commission a report on adult anadromous fish traveling through the Cowlitz River Project[1], prepared in collaboration with the Fisheries Technical Committee provided for in the August 2000 Settlement Agreement, or if the Settlement Agreement has become void, with the U.S. Fish and Wildlife Service, National Marine Fisheries Service, Washington Department of Fish and Wildlife and Washington Department of Ecology (referred to as "the FTC or agencies"). The report shall include: 1) the most recent version of Tables 3, 4, and 5 from the report entitled Contribution Rate Benchmarks for Future Runs of Spring Chinook, Fall Chinook, and Coho Produced at the Cowlitz Salmon Hatchery that provide estimated age 3 recruits and survival equivalency that enables comparison of future broods to the benchmark run year and survival rate for each of these species, dated June 28, 2000 and filed with the Commission concurrently with the August 2000 Cowlitz River Hydroelectric Project Settlement Agreement[2]; 2) tables estimating the annual number of adult recruits originating from the Cowlitz River basin upstream of the Toutle River, and including steelhead, cutthroat trout, and all other indigenous stocks that are produced at the hatcheries, along with an index of each stock to its benchmark values, or if not otherwise agreed, a default index of "1"; 3) a plan and schedule for studies, to be conducted at regular intervals, to evaluate whether the following criteria for implementing effective upstream passage through volitional facilities have been met: A) adult fish in Mayfield Lake are able to choose their tributary of origin and survive Mayfield Lake transit at rates determined by NMFS and USFWS, in consultation with the FTC or agencies, to be sufficient to achieve effective upstream passage through volitional facilities; and B) as determined based on the above-described tables with respect to: (i) the number of pre-spawners arriving at the Barrier Dam, in at least 3 of 5 consecutive brood years measured, and based on the 5-year rolling average, exceeds an abundance level which indicates natural recruitment above Mayfield Dam has achieved self-sustaining levels, as determined by the National Marine Fisheries Service in consultation with the FTC or agencies; (ii) the productivity level in 3 of 5 years and the 5-year rolling average, as measured at the Barrier Dam or other Cowlitz River fish counting*

[1] See Tables 1 & 2, this report.
[2] See Appendix B, this report.

facilities by the recruit/pre-spawner ratio, exceeds 1.0[3]; and (iii) the disease management plan required by Article 8 has been implemented. c) For any annual report filed within 12 years of license issuance in which the results of the studies indicate that, within the next three years or less, the above criteria for volitional upstream passage will be met with respect to any salmonid species originating in the Tilton basin and with respect to either spring Chinook salmon or late winter steelhead originating above Mossyrock Dam, the Licensee shall also include proposed preliminary designs and schedules for the construction of upstream passage systems for the Project. In the case of Barrier Dam, the proposed modifications shall provide for breaching the Barrier Dam. In lieu of breaching, a fish ladder may be constructed only if NMFS and USFWS determine, in consultation with the FTC or agencies, that a ladder is more appropriate than breaching for effective upstream passage. The proposed modifications for the Barrier Dam shall also include steps to disable the electrical field in the event of fish ladder construction or breaching the dam. In the case of Mayfield Dam, the upstream passage system proposed shall be a ladder with sorting facilities, unless prior to filing the report the NMFS and USFWS determine that a tram is more appropriate than a ladder for effective upstream passage, in which case the system proposed shall be a tram with sorting facilities. In the case of Mossyrock Dam, the passage system proposed shall be an adult trap and haul facility to facilitate adult transit above Cowlitz Falls Dam to be built before or concurrently with the upstream passage system at Mayfield Dam, unless prior to filing the report the USFWS and NMFS determine that a comparably-priced tram is more appropriate than a trap and haul facility based on studies that show fish are able to migrate through Riffe Lake, and it has also been determined that an adult upstream passage facility will be developed at Cowlitz Falls Dam. A draft report shall be provided to the FTC or agencies for review and comment. The Licensee shall include with the report documentation of consultation and copies of comments and recommendations on the report, and specific descriptions of how the FTC's and agencies' comments are accommodated by the report. The Licensee shall submit the final report to the NMFS and USFWS for approval prior to filing with the Commission. Upon approval by NMFS and USFWS and filing with the Commission, the Licensee shall implement the proposals in the report. d) Upon meeting the criteria above for the construction of volitional upstream passage systems, the Licensee shall proceed expeditiously to complete the final design, permitting and construction of upstream passage systems. The final design shall be subject to the same review and approval process described in paragraph c) above. Once the report containing the final design and implementation schedule for the construction of upstream fish passage systems is approved by NMFS and USFWS and filed with the Commission, volitional upstream passage facilities shall be completed and made operational within one (1) year of meeting the criteria or approval of the final design, whichever is later, unless there is good cause for extending the period beyond one year. e) Within five years of license issuance, the Licensee shall establish an interest-bearing escrow account in the amount of $15 million to contribute to the total cost of constructing volitional upstream fish passage facilities. To minimize administrative cost and allow conservative growth, said escrow account may be held by the Licensee as a separate account (with Licensee being obligated to treat said account substantially similar to an escrow account), and said account may be invested, consistent with investment limitations on public agencies within the State of Washington. f) If at any time the Licensee files a report indicating that the above criteria are not likely to be met within 15 years following license issuance with respect to listed Chinook salmon or steelhead originating above Mayfield Dam, the Licensee shall consult with the FTC or agencies, using the best available data at the time, regarding factors that may be contributing to the failure to meet such criteria, and the likelihood or not that such criteria will be met for the listed stocks in the foreseeable future. g) If preliminary or final upstream volitional fish passage design plans and implementation schedules have not been

[3] See Tables 6 & 7, this report

approved and filed with the Commission at the end of year 12, the Licensee must prepare and submit preliminary design plans and schedules in accordance with paragraphs c) and d) if the volitional upstream passage criteria set forth in paragraphs b) and c) have been met or are likely to be met for any salmonid species in the Tilton by year 15. The Licensee shall proceed expeditiously with final design and construction of volitional upstream passage facilities, unless otherwise directed under paragraph h) below. h) If within 14 years of license issuance the criteria for volitional upstream passage facilities, described in b), c) and g) above, have not been met and it is determined by the FTC or agencies, and affected Tribes, with the concurrence of NMFS and USFWS, that measures in addition to those provided for in the August 2000 Settlement Agreement are necessary to restore self-sustaining, natural production of ESA-listed stocks in the Cowlitz River basin, and that expenditure of the escrow fund on such additional measures in lieu of volitional upstream facilities is necessary and appropriate to achieve natural stock restoration, consistent with the express purpose of the license and the Settlement Agreement, and with applicable recovery plans for the listed Cowlitz River stocks, the Licensee shall submit to the Commission a plan to abandon volitional upstream passage and expend the funds in the escrow account for the purposes of protecting and promoting restoration and recovery of listed Cowlitz River stocks. If the above criteria have not been met for any salmonid species in the Tilton by year 15, the Licensee shall continue monitoring fishery conditions for future construction of upstream volitional fish passage, until either the criteria are met or a decision is made to abandon upstream volitional passage and fund other necessary and appropriate measures in accordance with this paragraph. i) Following construction of volitional upstream passage facilities, the Licensee, in consultation with the FTC or the agencies, shall monitor the effectiveness of the facilities. As deemed necessary by NMFS and USFWS, after consultation with the FTC, the Licensee shall implement such reasonable modifications as may be necessary to improve passage effectiveness. j) Any plan required to be filed pursuant to this article shall be prepared in consultation with the FTC or agencies. The Licensee shall include with the plan documentation of consultation and copies of comments and recommendations on the plan, and specific descriptions of how the FTC's or agencies' comments are accommodated by the plan. The Licensee shall submit the plan to the National Marine Fisheries Service and U.S. Fish and Wildlife Service for approval prior to filing with the Commission. Upon approval by NMFS and USFWS and filing with the Commission, the Licensee shall implement the plan.

License Article 401 ***Requirement to File Plans for Commission Approval:*** *Settlement agreement articles 1, 2 and 3 (Appendix A) require the licensee to prepare plans regarding fish passage in consultation with the Fisheries Technical Committee or the U.S. Fish and Wildlife Service, National Marine Fisheries Service, Washington Department of Fish and Wildlife and Washington Department of Ecology (FTC or agencies) if the agreement has become void.*

2008 ANNUAL REPORT

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A. Definitions:

Natural-origin fish (NOR) are adult returns from juveniles produced from adult spawners in the Cowlitz River basin.

Hatchery-origin fish (HOR) are adults that return from smolts released from the Cowlitz Salmon or Trout hatcheries, or adult returns from hatchery fingerling or smolt releases in the upper Cowlitz River basin tributaries.

Marked fish are adults with a visible external fin clip, elastomer tag or alpha-numeric tag. The external mark is visible upon examination of the fish.

Unmarked fish do not have a visible external mark of any sort. All fins are intact.

Upper Cowlitz River basin is the area above Mayfield Dam.

Lower Cowlitz River basin is the area below Mayfield Dam.

Recruit (R) is an adult fish produced by a pre-spawner. Collected at the Cowlitz Salmon Hatchery separator.

Pre-spawner (S) is an adult that is the progeny of a hatchery or natural fish spawning in the natural environment. Collected at the Cowlitz Salmon Hatchery separator.

B. A Report on Adult Anadromous Fish Traveling Through the Cowlitz River Project

Adult salmonid returns to the Cowlitz River basin:

Adult salmonids traveling through the Cowlitz River Project return first to the separator facility at the Cowlitz Salmon Hatchery at RM 50.0 – the upstream limit of volitional anadromous passage. These fish are a mix of hatchery and natural-origin fish and are used for hatchery brood stock, or are transported upstream into the upper Cowlitz River sub-basins by Tacoma Power and the Washington Department of Fish and Wildlife (WDFW). Table 1 and Table 2 show the numbers of adult salmonids, by species, returning to the Cowlitz Salmon and Trout hatcheries and moving through Tacoma Power's Cowlitz River Project.

Adult spring Chinook returning to the Cowlitz Salmon Hatchery (CSH) separator in 2007/2008 may originate from a hatchery release (and therefore be either marked or unmarked), or the adult fish may originate from the upper Cowlitz River basin (and therefore be either marked or unmarked). A mix of marked and unmarked hatchery steelhead fry and hatchery spring Chinook fingerlings have been released into the upper Cowlitz River basins under past fisheries management practices. The adult recruits from those fish may be either hatchery or natural origin.

Table 3 and Table 4 show the possible origins of returning adults and are based on the information in Table 6, which shows the WDFW juvenile salmonid marking program for each species and release location in the Cowlitz River basin above the mouth of the Toutle River. Table 5 shows the origin of natural spawning fall Chinook in the lower Cowlitz River.

Table 1: Number of adult salmonids returning to the Cowlitz Salmon Hatchery separator in 2008/2009. ***(Data source: Tacoma Power separator count database)***

Week	SPCH	SPCH	SPCH	FCH	FCH	COHO	COHO	SRSH	SRSH	WRSH	SRCT	SRCT
Ending	Adult	Jack	Mini J	Adult	Jack	Adult	Jack	Adult	Jack	Adult	Jack	Adult
5-Apr										92		
12	3									103	3	
19	10							1		321	2	
26	8							4		364	1	1
3-May	12	3						11		245	3	3
10	43	5						17		169	3	
17	72	16						54		112	2	
24	300	45						107		63	1	1
31	49	16						130		16	1	
7-Jun	65	11						211		3		
14	322	49						254				
21	258	55	32					359	1			
28	125	24	44					400	1			
5-Jul	127	22	39					585	1			
12	41	14	66					767	5			1
19	266	20	176					527	3			
26	43	7	134					667	2			
2-Aug	21	7	102					541	3			3
9	49	9	74					463	2			9
16	25	2	28	1				333	1			3
23	27	11	28	9	4			181				1
30	27	4	15	36	14	2		156	4			4
6-Sep	41	2	15	322	73	26		97				12
13	17	2	2	631	156	492	16	101	3			36
20	19	1	2	839	263	1391	169	34				13
27	1		1	467	163	3711	707	37				45
4-Oct				573	121	5528	951	48				122
11				418	93	6396	1198	53				153
18				488	111	8084	2194	54		1		466
25				358	76	11689	2102	71				619
1-Nov				330	96	13266	2965	88		12		461
8				67	9	13206	1632	80		39		789
15				38	4	12785	1568	257		152	2	1500
22				30	2	3847	721	131		185	1	995
29				3		1146	207	24		132	2	137
6-Dec				1		1211	144	10		190	8	118
13					1	537	52	2		103	3	12
20				1		145	24			30	2	
27												
3-Jan						783	96			318	8	6
10												
17												
24												
31												
7-Feb						90	3			18		
14						53				6		
21						35						
28						13				2		
7-Mar						5				15		
14										34		
21						3				36		
28	1									155		
TOTALS	1,970	325	758	44,612	1,186	84,444	14,751	6,855	26	2,916	42	5,510

Table 2: Number of adult salmonids returning to the Cowlitz Trout Hatchery in 2008. ***(Data source: WDFW, 2008 Cowlitz Complex annual report)***[4]

	FCH	COHO-HOR	COHO-NOR	Early WRSH-HOR	SRSH-HOR	Late WRSH-HOR	Sea-run CUTT-HOR
Adult	0	0	0	89	1,623	569	2,971
Jack	0	0	0	1	3	2	0

Table 3: Possible origins of upper Cowlitz River basin adult returns in 2008. Does not include jack returns. ***(Data sources: Tacoma Power and WDFW)***

	Hatchery Unmarked	Hatchery Marked	Natural Unmarked	Natural Marked
Spring Chinook	**No**	**Yes**	**Yes**	**No**
Fall Chinook	**No releases**	**No releases**	**Yes**	**No**
Coho	**No releases**	**No releases**	**Yes**	**No**
Steelhead	**No**	**Yes**	**Yes**	**No**
Cutthroat trout	**No releases**	**No releases**	**Yes**	**Yes**

Table 4: Possible origins of lower Cowlitz River basin adult returns in 2008. Does not include jack returns. ***(Data sources: Tacoma Power and WDFW)***

	Hatchery Unmarked	Hatchery Marked	Natural Unmarked	Natural Marked
Spring Chinook	**Yes**	**Yes**	**Yes**	**No**
Fall Chinook	**Yes**	**Yes**	**Yes**	**No**
Coho	**No**	**Yes**	**Yes**	**No**
Chum	**No releases**	**No releases**	**Yes**	**No**
Sockeye	**No releases**	**No releases**	**Yes**	**No**
Steelhead	**No**	**Yes**	**Yes**	**No**
Cutthroat Trout	**No**	**Yes**	**Yes**	**No**

Table 5: Origin of natural spawning fall Chinook (FCH) by age in the Cowlitz River, 2008. ***(Data source: WDFW)***

Age Composition							Totals
Origin	*Stock*	2	3	4	5	6	
Unknown Origin	**LRH**	**181**	**697**	**328**	**111**	**0**	**1,317**
Kalama	**LRH**	**0**	**0**	**119**	**0**	**0**	**119**
Unknown Origin	**LRW**	**91**	**349**	**164**	**56**	**0**	**660**
Cowlitz/Tilton (W)	**LRW**	**0**	**4**	**0**	**0**	**0**	**4**
Totals		**272**	**1,050**	**611**	**167**	**0**	**2,100**

[4] FCH=fall Chinook, COHO=coho, WRSH=winter run steelhead, SRSH=summer run steelhead, SRCUTT=sea run cutthroat trout

Table 6: The 2008 marking program for juvenile salmonids released in the Cowlitz River basin. ***(Data sources: Tacoma Power and WDFW)***

Release Location	Spring Chinook	Fall Chinook	Coho	Steelhead	Cutthroat
Cowlitz Trout Hatchery	**None released**	**None released**	**None released**	**AD clip, AD&RV clip**	**AD clip**
Cowlitz Salmon Hatchery	**AD clip, AD&cwt**	**AD clip, AD&cwt**	**AD clip, AD&cwt**	**None released**	**None released**
Mayfield Dam Collector	**Snout CWT**	**Snout CWT**	**Snout CWT**	**Snout BWT**	**Snout BWT**
Cowlitz Falls Fish Facility	**Not marked**	**Not marked**	**Not marked**	**Not marked**	**Elastomer and alphanumeric tag**
Upper Cowlitz River basin	**RV or LV clip**	**None released**	**None released**	**AD&RV clip, RV clip**	**None released**

Tacoma Power Cowlitz River basin adult salmonid facilities – emergency events:

There were no emergency events to report in 2008 at Tacoma Power's adult salmonid handling and transportation facilities.

Tacoma Power Cowlitz River basin adult transportation individual fish truck haul records:

See Appendix 3 for the individual fish truck haul records from April 2008 to March 2009.

C. The status of Fisheries and Hatchery Management Plan and actions for determining the recruit per pre-spawner (R/S) ratio for selected upper Cowlitz River basin stocks.

The Order Modifying and Approving the Cowlitz River Hydroelectric Project Fisheries and Hatchery Management Plan (FHMP) was issued by the Commission on April 6, 2006. The modified FHMP directs Tacoma to continue the release of hatchery juveniles in the upper Cowlitz River basin. This action will necessitate the marking of all hatchery juvenile fish releases in order to allow an accurate identification of the origin of adult salmonid returns in the Cowlitz River basin in the future. Currently, due to the mix of unmarked hatchery and natural spring Chinook and steelhead adults returning to the upper Cowlitz River basin in 2007/2008 (see Table 3), the number of recruits and the recruit/pre-spawner (R/S) ratio cannot be calculated for spring Chinook and steelhead for the Cowlitz River above Cowlitz Falls Dam. Due to a unique mark applied at the Mayfield Dam downstream migrant collector, natural-origin Tilton River coho adults returning to the CSH separator were returned to the Tilton River beginning in 2003. The adult returns from those pre-spawners can be identified after 2007, and the R/S ratio can be calculated (see Table 7).

Table 7: Tilton River coho salmon Recruit per Pre-spawner (R/S) ratio calculations.

YEAR	No. of adult coho released into Tilton River	No. of adult coho released into Mayfield Lake	TOTALS	No. unmarked & BWT adult coho released into Tilton River	No. unmarked & BWT adult coho released into Mayfield Lake	TOTALS	R/S ratio (Goal > 1.0)
2001	16,657	10,513	27,170	NA	NA	NA	
2002	10,476	7,901	18,377	NA	NA	NA	
2003	7,467	3,009	10,476	483	173	656	
2004	12,488	477	12,965	388	316	704	0.039
2005	8,438	153	8,591	1,261	71	1,332	0.110
2006	783	1,583	2,366	412	326	738	0.105
2007	2,176	235	2,411	709	112	821	0.095
2008	2,601	114	2,715	808	107	915	0.159

Calculations:

2008: **Recruits** = 915

Coho smolt collection efficiency at Mayfield Dam = .67

$\mathbf{R_{expanded}}$ = 915/.67 = 1,366

Pre-spawners = 8,591

R/S ratio = $\mathbf{R_{expanded}}$/S = 1,366/8,591 = 0.16

Table 8: Upper Cowlitz River steelhead Recruit per Pre-spawner (R/S) ratio calculations.

YEAR	Total no. of steelhead released into upper Cowlitz River	No. unmarked steelhead released into upper Cowlitz River	R/S ratio (Goal > 1.0)
2005	691	280	
2006	999	544	
2007	1,253	622	
2008	1,089	553	0.800

Calculations:

2008: **Recruits** = 553

$\mathbf{R_{expanded}}$ = 553/NA = 553

Pre-spawners = 691

R/S ratio = $\mathbf{R_{expanded}}$/S = 553/691 = 0.80

D. A schedule for future actions and returns of adults needed to determine the status of naturally produced adult anadromous fish traveling through the Cowlitz River Project.

Table 9 lists the timetable for the calculation of the R/S ratio for the targeted Cowlitz River basin stocks. The goal of the R/S ratio as called for in Settlement Agreement License Article 3 (b) ii is for an R/S ratio > 1.0

Table 9: Timetable of actions for unmarked natural-origin salmonid returns to the Cowlitz River basin. **(Data source: Tacoma Power)**

	Spring Chinook	Steelhead	Coho – Tilton River
Start of FHMP implementation	**May 2006**	**May 2006**	**May 2006**
Last year of unmarked hatchery juvenile releases in the upper basin	**2003**	**2001**	**1999**
Last year of unmarked hatchery juvenile outmigrants from the upper basin	**2004**	**2004**	**2001**
Last year of adult returns from unmarked hatchery juvenile upper basin releases	**2009**	**2007**	**2004**
Start of pre-spawner adult returns to upper basin	**2010**	**2008**	**2005**
Calculation of R/S ratio	**2010**	**2008**	**2008**

The Tilton River coho R/S calculations were begun in 2004 (Tacoma Power 2005, and see Table 7). These R/S calculations are done by identifying the Tilton River natural-origin adult recruits by their unique mark. A combination of hatchery-origin adult coho and natural-origin adult coho are released into the Tilton River annually and those adults are used to calculate the number of pre-spawners (S).

The upper Cowlitz River steelhead R/S calculations were begun in 2008 (see Table 8). These R/S calculations are done by identifying the upper Cowlitz River natural-origin steelhead adult recruits by their lack of any unique mark. A combination of hatchery-origin adult steelhead and natural-origin adult steelhead are released into the upper Cowlitz River annually and those adults are used to calculate the number of pre-spawners (S).

The August 18, 2005 Order Modifying and Approving the Upstream Fish Passage Study Report, Article 3 for the Cowlitz River Project from the Commission calls for a plan and schedule of studies to evaluate if adult fish transiting Mayfield Lake are able to chose their tributary of origin and survive Mayfield Lake transit at rates acceptable to the federal fishery agencies. Some of the adult steelhead and adult spring Chinook returning to the Cowlitz River in 2008 are unmarked hatchery fish (see Table 3) and thus are indistinguishable from natural-origin adults. The adult transit study in Mayfield Lake requires natural-origin adults. Currently only natural-origin coho adults from the Tilton River are available to conduct this study (see Table 8). The earliest this study can be conducted utilizing only natural-origin “trigger” species of adult salmonids from the upper river is 2008.

As coho are not one of the “trigger” species for determining the development of self-sustaining runs of natural fish into the upper Cowlitz River basin, Tacoma Power will defer developing the schedule and study plan for the Mayfield Lake adult transit and survival study until such time as

there are sufficient natural adult salmonids of the trigger species from the upper Cowlitz River basin available for conducting the study (also see Table 8).

E. References

Cramer, S.P. 2000. Contribution rate benchmarks for future runs of spring Chinook, fall Chinook and coho produced at Cowlitz Salmon Hatchery. Technical Report, July 5, 2000. S.P. Cramer & Associates. Gresham, OR. 32 pp.

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F. Consultation and Comments

Date	Agencies/ Committees	Participants	Type of Communication	Topics
June 5, 2009	Cowlitz Fisheries Technical Committee	Tacoma Power, WDFW, Yakama Nation, AR/TU, WDOE, USFWS	Draft annual report posted and notification.	• Distribution of draft Annual Upstream Fish Passage Study Report and tables for review.
July 7, 2009	Cowlitz FTC Meeting	Tacoma Power, WDFW, Yakama Nation, AR/TU, WDOE, USFWS	Announcement of draft report	• Notification of draft Annual Upstream Fish Passage Study Report and tables for review

Appendix A

Adult salmonids transported and released into the upper Cowlitz River basin. ***(Data source: WDFW, Cowlitz Evaluation program)***

NOTE:
These appendix tables detail the transportation and release of adult salmonids into the upper Cowlitz River basins from the CSH separator in 2008.

Table A-1:
Fall Chinook transported and released in the Tilton basin in 2008.

Mayfield Lake Park and Ike Kinswa State Park --: August 2008 – January 2009.

	Female	Male	Jack	Total
Unmarked	160	795	66	1021
Unmarked + blank wire tagged	71	152	5	228
AD-clipped only	0	15	726	741
Ad-clipped CWT	5	8	1	14
Total	**236**	**970**	**798**	**2004**

Gust Backstrom Park (Tilton River) --: August 2008 – January 2009.

	Female	Male	Jack	Total
Unmarked	**71**	457	18	546
Unmarked + blank wire tagged	17	61	1	79
Ad-clipped only	0	30	160	190
Ad-clipped CWT	3	0	0	3
Total	**91**	**548**	**179**	**818**

Note: A total of 1,845 adults (327 females) and 977 jacks were planted in Tilton Basin in 2008.

Table A-2:
Coho salmon transported and released in the Tilton Basin in 2008.

Mayfield Lake Park and Ike Kinswa State Park -- Coho: August 2008 – March 2009.

	Female	Male	Jack	Total
Unmarked	0	0	0	0
Unmarked + blank wire tagged	44	63	19	126
AD-clipped only	0	7	0	7
Total	102	70	19	**133**

Gust Backstrom Park -- Coho: August 2008 – March 2009.

	Female	Male	Jack	Total
Unmarked	8	0	4	12
Unmarked + blank wire tagged	346	454	100	900
AD-clipped only	958	835	254	2047
Total	1312	1289	358	**2959**

Note: A total of 2,708 adult coho salmon were transported to the Tilton Basin.

Table A-3:

Winter steelhead trout transported to the Tilton Basin in 2008/2009.

	Unmarked+BWT			Unmarked			Ad only		
	Male	Female	Jack	Male	Female	Jack	Male	Female	Jack
November	0	0	2	**0**	0	0	0	0	0
December	2	0	0	**0**	0	0	0	**0**	0
January	1	2	0	0	0	0	0	0	**0**
February	0	0	0	0	0	0	0	0	0
March	0	1	0	0	0	0	3	7	10
April									
May									
TOTAL									

Table A-4:

Cutthroat trout transported and released in the Tilton Basin in 2008.

Mayfield Lake Park and Ike Kinswa State Park --Cutthroat trout: June – December 2008

	unknown sex
Unmarked	0
Unmarked + blank wire tagged	**0**
Total	**0**

Tilton River -- Cutthroat trout: June – December 2008

	unknown sex
Unmarked	85
Unmarked + blank wire tagged	72
Total	**157**

TableA-5: Adults transported and released into the Cowlitz River basin above Mossyrock Dam in 2007/2008. ***(Data source: WDFW, Cowlitz Falls Fish Facility program)***

Adult coho, steelhead, spring Chinook and cutthroat transported and released in the Upper Cowlitz Basin during the 2007 to 2008 season. (Unmarked=natural production, RVAD=hatchery smolt plant, RV=fry plant steelhead, RV= Cispus fry plant Chinook, LV= Cowlitz fry plant Chinook, AD= hatchery production)

Coho: October 2007-March 2008	Female	Male	Jack	Total
Unmarked	1,682	2,082	160	3,924
AD- clipped	2,642	3,049	688	6,379
Total	4,324	5,131	848	10,303

Steelhead : January-June 2008				
Unmarked	273	240	4	517
RV	24	12	0	36
RVAD	51	142	3	196
AD	101	231	8	340
Total	449	625	15	1,089

Spring Chinook: April-September 2008				
Unmarked	22	51	8	81
LV-clipped	1	1	0	2
RV-clipped	1	4	0	5
AD- clipped	253	222	257	732
Total	277	278	265	820

Cutthroat: August-December 2008	
Smolted in 2008	10
Smolted in 2007	8
Smolted in 2006	1
Unknown	15
Total	34

Appendix B

Contribution Rate Benchmarks for spring Chinook, fall Chinook and coho salmon produced from the Cowlitz Salmon Hatchery. ***(Data source: Tacoma Power)***

NOTE:

These tables will not be updated for this report. The Cowlitz Fisheries Technical Team recognized that these are estimates only, and the data are not needed for the current Cowlitz Project license mitigation. The FTC recommended at their May 10, 2006 meeting that the tables be updated in a couple of years as there is currently no annual utility for the data and they are not related to any trigger for a fish mitigation action or decision.

Appendix tables 6, 7 and 8 of this report are intended to update the estimated age 3 recruits and survival equivalencies for spring Chinook, fall Chinook and coho salmon produced from the Cowlitz Salmon Hatchery. This work is based upon the formulations established in Cramer (2000) and Cramer (2002) and updates Tables 6, 7 & 8 from the 2005 Annual Upstream Fish Passage Study Report, License Article 3 with the latest information available. The calculations are based upon coded wire tag (cwt) recoveries from tagged lots of Cowlitz River salmonids. For this Annual Report the tables have not been updated per the recommendation of the Cowlitz Fisheries Technical Committee.

Table B-1: Estimated age 3 recruits and survival equivalency scaling for Cowlitz spring Chinook that enables comparison of future broods to the benchmark run year and survival rate. "Scaled Population" is the survival-equivalent recruitment to age 3.

Brood Year	Age 3-6 Catch	Age 3-6 Spawn	Age 3 Recruits	Observed Survival	Benchmark Scalar	Scaled Population
1960	42,598	14,538	79,416			
1961	59,505	19,035	106,134		1.00	106,134
1962	17,950	8,288	36,077			
1963	12,357	4,092	22,619			
1964	11,784	5,298	23,950			
1965	13,863	7,543	29,784			
1966	24,940	8,866	46,598			
1967	11,241	5,445	22,836			
1968	14,097	3,155	24,201			
1969	40,085	8,755	67,740			
1970	42,251	17,955	82,506			
1971	46,041	20,089	91,810	7.00%	2.13	195,852
1972	103,557	24,283	168,951	8.70%	1.73	292,456
1973	47,755	15,190	85,249			
1974	49,964	9,763	79,717			
1975	52,070	12,103	92,535	7.10%	2.11	194,854
1976	79,267	18,502	134,031	23.00%	0.65	87,165
1977	47,815	23,991	101,233	18.40%	0.81	82,468
1978	17,376	8,455	36,329			
1979	28,155	16,425	60,920			
1980	25,398	14,751	54,370	2.60%	5.75	312,771
1981	9,626	7,391	24,666	5.90%	2.53	62,444
1982	7,270	4,821	17,625	3.60%	4.21	74,254
1983	25,724	18,829	63,909	14.90%	1.00	64,179
1984	21,946	10,509	47,709	7.60%	1.96	93,591
1985	11,138	4,266	23,139	6.20%	2.40	55,484
1986	10,536	5,356	23,735			
1987	7,586	5,285	18,003	6.20%	2.44	43,881
1988	12,836	9,652	32,056			
1989	9,539	7,063	24,086	3.30%	4.56	109,849
1990	1,296	1,861	4,978	1.28%	11.72	58,338
1991	640	1,573	3,932	0.64%	23.43	92,123
1992	496	1,965	4,008	0.58%	25.86	103,643
1993	346	1,096	2,297	0.28%	53.57	123,065
1994	688	1,332	3,618	0.42%	35.71	129,185
1995	543	1,215	2,849	0.52%	28.85	82,206
1996	1,849	2,027	5,887	1.16%	12.93	76,126
1997	1,433	879	3,551	0.15%	100.00	355,111
1998	15,270	6,630	33,499	3.30%	4.55	152,269
1999	49,715	14,147	95,880	6.35%	2.36	226,489
2000	7,186	8,431	20,449	1.82%	8.24	168,533
2001						

Table B-2: Estimated age 3 recruits and survival equivalency scaling for Cowlitz fall Chinook that enables comparison of future broods to the benchmark run year and survival rate. "Scaled Population" is the survival-equivalent recruitment to age 3.

Fall Chinook

Brood Year	Age 3-6 Catch	Age 3-6 Spawn	Age 3-6 Recruits	Observed Survival	Benchmark Scalar	Scaled Population
1959	35,963	3,336	53,673			
1960	49,582	6,359	73,940		1.00	73,940
1961	49,208	6,420	72,099	2.4	1.00	72,099
1962	82,220	5,970	113,084	1.0	1.00	113,084
1963	45,291	4,731	64,075	3.1	1.00	64,075
1964	91,407	3,486	123,225	3.2	1.00	123,225
1965	70,282	4,023	101,492			
1966	191,428	9,311	263,881			
1967	114,078	12,652	161,372			
1968	38,480	7,210	60,182			
1969	92,385	5,083	125,417			
1970	42,078	4,661	62,190			
1971	27,592	5,086	44,293			
1972	45,488	3,837	63,416			
1973	24,674	2,681	36,333			
1974	38,381	3,037	53,774			
1975	29,910	4,756	45,674			
1976	25,310	3,424	37,475			
1977	21,552	4,419	36,354	1.3	1.69	61,523
1978	12,281	4,184	21,999	0.5	4.40	96,795
1979	8,974	4,301	17,305			
1980	17,925	8,196	38,524	1.1	2.00	77,049
1981	13,558	5,921	27,477	0.7	3.14	86,355
1982	14,421	4,797	25,355	0.8	2.75	69,726
1983	59,942	15,478	96,638	2.6	0.85	81,770
1984	62,496	19,894	115,808	2.8	0.79	90,992
1985	32,908	8,974	56,944	0.6	3.67	208,793
1986	7,577	6,267	21,503	0.4	5.50	118,269
1987	3,544	4,006	10,876	0.1	22.00	239,270
1988	7,686	2,917	16,885	0.2	11.00	185,739
1989	12,623	2,115	21,291	0.19	11.58	246,529
1990	3,514	6,050	13,515	0.45	4.91	66,369
1991	830	4,034	8,065	0.18	11.96	96,426
1992	1,929	5,080	11,463	0.32	6.79	77,832
1993	4,137	5,725	15,135	0.32	6.98	105,706
1994	593	915	2,565	0.29	7.46	19,139
1995	1,645	3,607	8,658	0.20	10.84	93,834
1996	5,417	3,508	13,430	0.10	22.00	295,457
1997	1,913	3,091	7,959	0.17	12.94	103,001
1998	15,222	8,927	33,986	0.48	4.58	155,770
1999	13,464	8,397	32,829	1.16	1.90	62,272
2000	1,805	1,535	5,001	0.15	14.67	73,349
2001						

Table B-3: Estimated age 3 recruits and survival equivalency scaling for Cowlitz coho that enables comparison of future broods to the benchmark run year and survival rate. "Scaled Population" is the survival-equivalent recruitment to age 3.

Coho

Brood Year	Run Year	Adults at Fish Facility	Age 3 Catch	Age 3 Recruits	Observed Survival	Benchmark Scalar	Scaled Population
1958	1961	23,388	50,874	74,262			
1959	1962	22,701	56,701	79,402			
1960	1963	22,083	100,045	122,128			
1961	1964	25,546	98,731	124,277		1.00	124,277
1962	1965	22,774	100,408	123,182			
1963	1966	31,001	155,997	186,998			
1964	1967	18,801	98,401	117,202			
1965	1968	12,636	71,928	84,564			
1966	1969	4,913	16,292	21,205			
1967	1970	63,407	220,988	284,395	7.7%	1.04	296,689
1968	1971	33,239	203,860	237,099	12.2%	0.65	155,048
1969	1972	16,354	85,567	101,921	6.4%	1.26	128,280
1970	1973	19,954	209,591	229,545			
1971	1974	17,627	206,304	223,931			
1972	1975	23,000	423,936	446,936	7.0%	1.15	511,996
1973	1976	25,166	512,713	537,879			
1974	1977	10,299	286,933	297,232			
1975	1978	20,512	154,311	174,823			
1976	1979	13,912	148,918	162,830			
1977	1980	28,776	119,378	148,154			
1978	1981	27,003	132,617	159,620			
1979	1982	22,528	112,232	134,760			
1980	1983	24,493	69,690	94,183	3.8%	2.11	198,903
1981	1984	26,149	60,783	86,932	3.8%	2.12	183,898
1982	1985	18,610	60,781	79,391	2.6%	3.07	244,016
1983	1986	54,685	282,854	337,539	10.8%	0.74	250,091
1984	1987	18,716	69,192	87,908	3.2%	2.49	219,203
1985	1988	30,888	121,283	152,171	6.9%	1.16	177,199
1986	1989	35,886	165,941	201,827	7.9%	1.01	203,560
1987	1990	13,009	35,479	48,488	1.6%	5.10	247,495
1988	1991	46,303	162,033	208,336	8.8%	0.91	188,797
1989	1992	14,780	32,443	47,223	2.3%	3.51	165,820
1990	1993	5,641	10,837	16,478	0.8%	9.58	157,857
1991	1994	5,922	1,746	7,668	0.3%	24.13	185,052
1992	1995	7,637	9,118	16,755	0.4%	18.18	304,600
1993	1996	11,352	5,460	16,812	0.8%	9.88	166,099
1994	1997	15,694	8,494	24,188	1.0%	8.16	197,377
1995	1998	19,231	10,837	30,068	0.6%	13.33	400,806
1996	1999	40,321	47,957	88,278	4.5%	1.78	156,939
1997	2000	49,341	78,707	128,048	3.6%	2.29	292,681
1998	2001	79,395	135,202	214,597	7.8%	1.03	220,100
1999	2002	85,632	145,461	231,093	4.0%	2.00	462,186
2000	2003	39,636	55,606	95,242	4.1%	1.95	185,838
2001							

Appendix C

Tacoma Power Fish Truck Worksheets. April 2008 – March 2009. ***(Data source: Tacoma Power)***

Appendix D

Response to Comments on License Article 401 and Settlement Agreement Article 3. Upstream Fish Passage Study Report Draft 2009 Annual Report.