

FINAL Meeting Notes
Lewis River License Implementation
Aquatic Coordination Committee (ACC) Meeting
February 8, 2007
Ariel, WA

ACC Participants Present (23)

Jim Byrne, WDFW
 Clifford Casseseka, Yakama Nation (via teleconference 9:00am – 12:00pm)
 James Dixon, WDFW (via teleconference 9:00am – 11:30am)
 Jeremiah Doyle, PacifiCorp Energy
 Sean Flak, PacifiCorp Energy (9:00am – 10:00am)
 George Gilmour, Meridian Environmental (9:00am – 12:30pm)
 Bryce Glasser, WDFW (9:00am – 10:30am)
 Diana Gritten-MacDonald, Cowlitz PUD (via teleconference 9:00am – 12:00pm)
 LouEllyn Jones, USFWS (via teleconference 10:25am)
 Kaitlin Lovell, Trout Unlimited (9:00am – 12:00pm)
 Eric Kinne, WDFW
 George Lee, Yakama Nation
 Erik Lesko, PacifiCorp Energy
 Jim Malinowski, Fish First
 Kimberly McCune, PacifiCorp Energy
 Todd Olson, PacifiCorp Energy
 Jason Shappart, Meridian Environmental (9:00am – 12:30pm)
 Frank Shrier, PacifiCorp Energy
 Karen Thompson, USDA Forest Service
 Rich Turner, NMFS (via teleconference 10:30am – 11:30am)
 Steve Vigg, WDFW (9:00am – 12:00pm)
 John Weinheimer, WDFW
 Shannon Wills, Cowlitz Indian Tribe

Calendar:

Feb. 14, 2007	TCC Meeting	Merwin Hydro
Feb. 16, 2007	Habitat Prioritization Synthesis Workshop	Merwin Hydro
Feb 26, 2007	ACC - HGMP Subgroup Meeting	WDFW, Vancouver
March 7, 2007	TCC Meeting	Merwin Hydro
March 7, 2007	ACC Meeting	Merwin Hydro

Assignments from February 8th Meeting:	Status:
McCune: Email Lewis River Neighbors letter to ACC.	Complete – 2/9/07
McCune: Email document provide by Jim Malinowski titled, “ <i>Export of Lewis River Basin Marine Derived Nutrients that could otherwise support Salmon Recovery</i> ”.	Complete – 2/8/07
ACC: Provide comments and/or questions regarding the H&S	Complete – 2/16/07

timeline on or before Friday, February 16, 2007.	
Shrier: Suggest two dates in the month of April to conduct an acclimation pond site tour for the Tribal Council members and other interested ACC participants.	Complete – 2/9/07
McCune: Post the Hatchery Pond 15 30% design, PowerPoint presentation and photos on the Lewis River website for ACC review and comment.	Complete – 2/12/07

Assignments from January 11th Meeting:	Status:
Lesko: Create a schedule relating to the key milestone dates on the HGMP and H&S Plan and present back to the ACC.	Complete – 2/8/07
Burley: Investigate tribes ceremonial and subsistence needs and respond back to McCune.	Complete – 2/2/07
McCune: Email the Draft 1/5/07 Habitat Prioritization Synthesis Workshop meeting notes to the ACC for their information, when available.	Complete – 1/22/07
McCune: Email the <i>6.1.2 – Lewis River Upper Flow Release – Jan 2007</i> to the ACC for their further review and comment. All comments are due on or before Monday, February 12, 2007.	Complete – 1/12/07
Lesko: Speak to Will Shallenberger (PacifiCorp Energy) about any geomorphic concerns of water loss due to dissipation or subterranean loss (percolation) relating to the Upper Flow Release 60% designs and report back to the ACC.	Complete – 2/8/07

Assignments from December 14th Meeting:	Status:
Shrier: PacifiCorp to form technical committee consisting of the USFS, the Tribes and Utilities in order to nail down the acclimation sites.	On going

Opening, Review of Agenda and Meeting Notes

Frank Shrier (PacifiCorp Energy) called the meeting to order at 9:05 a.m. He conducted a review of the agenda for the day and requested a round-table introduction for those participating via teleconference. Shrier reviewed last months assignments with the attendees and Erik Lesko (PacifiCorp Energy) provided more detail regarding his discussions with Will Shallenberger (PacifiCorp Energy) relating to geomorphic concerns in the constructed upper release channel. Lesko communicated that there is no other place for the water to go other than the constructed channel. The base will be compacted and percolation is not likely. Accretion flows will likely supplement any water loss due to dissipation or subterranean loss.

Shrier requested comments and/or changes to the ACC Draft 1/11/07 meeting notes. No additional changes were requested.

The ACC attendees present accepted these meeting notes at 9:20am.

Relicensing Schedule Update

NMFS is diligently working on the BiOp and may make their goal of mid February 2007. Ken Hogan (FERC) communicated to Shrier that the BiOps will not be in effect until License issuance. In addition, Hogan said that it may take as long as 90 days to issue the licenses after receipt of the NMFS BiOp.

Lewis River Hatchery Pond 15 30% Design Review – Schedule 8.7

Sean Flak (PacifiCorp Energy) conducted an overview relating to the Hatchery Pond 15 over the past 12 months to include the following (a more detailed summary, designs and photos can be viewed at the following link):

<http://www.pacificorp.com/Article/Article71315.html>

Flak reviewed the Tasks Completed to Date, the 30% Plans, key design points, outline of the 60% plans and the construction schedule. All tasks completed to date were a combined effort provided by PacifiCorp Energy, WDFW, NMFS, the Tribes and the ACC Engineering Subgroup.

Flak reviewed an electronic copy of the 30% design plan to include the Pond 15 existing site plan location, existing path of fish, number of ponds, tank sizes, anesthetic basket, fish ladder and the automatic crowding device. In addition, Flak also reviewed the changes to include the pescalator hydraulic profile, and the 15 rpm (maximum speed) crowder to control density of fish. Flak also provided more detail regarding the elevation of the sorting tank, cross sections of ponds, three crowders for each channel and that additional room was left if any undo stress for the fish. The 60% design will illustrate a conventional basket system to alleviate concern of stress to fish.

The ACC attendees also viewed video clips of the Macaw Hatchery 18' long pescalator and the Bonneville Hatchery dual basket lift system.

Flak informed the ACC attendees that this presentation begins the 30-day review period. Comments are requested on or before **Monday, March 12, 2007**. Kimberly McCune (PacifiCorp Energy) will post the 30% design, PowerPoint presentation and photos on the Lewis River website for ACC review.

Flak communicated that design completion is expected mid summer 2007, permits have been submitted and construction is planned to begin January 2008.

Revised Hatchery Upgrade Schedule

Lesko provided a handout titled, "*Lewis River Revised Hatchery Upgrade Schedule*", (**Attachment A-1**), for ACC attendees review and informed them that the delay of License issuance has pushed out the Pond 15 schedule and related ponds 13, 14 & 16 out by one year since the latter ponds rely upon completion of pond 15 to provide alternative rearing space during construction.

Nutrient Enhancement Discussion – allocation of returning bio-mass

Jim Malinowski (Fish First) provided a document for ACC attendees review titled, “*Export of Lewis River Basin Marine Derived Nutrients that could otherwise support Salmon Recovery*”, (**Attachment B**) and informed the ACC that Fish First is prepared to proceed with a public battle in an effort to clarify the details and to obtain a detailed accounting of the biomass. The goal is to keep more of the biomass in the Lewis River basin. Malinowski also expressed that the ACC would not likely have a roll in this effort but will keep the ACC informed.

WDFW expressed that the original document as provided by WDFW, which was presented to the ACC attendees by Malinowski included a modification to a title on page one which originally read, GHFB (Gray’s Harbor Food Bank) but was modified by Fish First to read “Fish Buyer”.

McCune will email Attachment B to all ACC participants for their review.

Break <10:10am>

Reconvene <10:25am>

Status of Hatchery & Supplementation Plan

Steve Vigg (WDFW) provided a handout titled, “*Draft Issue Paper – Lewis River Late-winter Steelhead HGMP*”, dated February 8, 2007 (**Attachment C**) which outlined unresolved items such as:

- A. Is the natural spawning Lewis River Late-winter Steelhead population spawning below Merwin Dam the appropriate (best) donor stock for the broodstock program?*
- (1) Is it a locally adapted population that is genetically distinct from out of basin hatchery stocks, e.g., Chambers Creek stock? {Results from the NOAA Fisheries (G. Winan study) and WDFW study}*
 - (2) If the natural origin steelhead trapped at Merwin Dam are not genetically distinct from Chambers Creek stock, then what is the best alternative? {e.g., Cedar Creek, residual rainbow from upstream, natural origin stock from adjacent river, Kalama late winter, etc.}*
- B. Is the population size of the selected naturally spawning stock (lower Lewis River natural or alternative) adequate for the donor broodstock program?*
- (1) Can 25 pairs (50 fish) be trapped annually for the program on a sustained basis?*
 - (2) Since the AHA and genetic modeling (conducted by Kieth Keown) was based on EDT data of lower Lewis River and Cedar Creek combined (assuming > 350 adult population) – does a re-analysis need to be done based on separate EDT analysis of the lower Lewis River versus Cedar Creek?*
- C. What fish marking and genetic monitoring program is needed to implement the HGMP for the long term?*
- (1) Do all fish produced in this program need to be uniquely marked?*
 - (2) What level of genetic tracking is needed (family pedigree)?*

More detailed information regarding a brief background, status of HGMP and recovery plan goals can be viewed in Attachment C.

HGMP Update

James Dixon (WDFW) informed the ACC attendees that the current HGMP is a more streamlined version than the initial draft. None of the assumptions that were modeled have changed. Dixon further communicated that the new draft HGMP can be cleaned up and rolled out by Tuesday, February 13, 2007.

Shrier provided a letter from Gary Winans, Research Population Geneticist at NMFS titled, "NMFS letter to Frank Shrier regarding joint investigation on an evaluation of the differentiation of *O. mykiss* in the Lewis River, dated February 7, 2007, ([Attachment D](#)) which outlines the following preliminary results:

*In summary, 1) the Merwin late-returning fish are distinctive from the winter-run hatchery stock and 2) the genetic variability in mSATs and the patterns of differentiation will provide us with the opportunity to monitor the reproductive success of individual steelhead relocated above the dam system, the participation of resident *O. mykiss* in the overall recolonization program, and the genetics/phenetics of who will be producing new adult steelhead recruits into the upper watershed.*

NMFS will have the MHC and morphological analyses finished for Shrier's and ACC review in the spring of 2007.

Gary Winans plans to make a presentation to the ACC in the near future.

Shrier communicated that the hatchery subgroup could be the mechanism to review any issues surrounding the HGMP.

HGMP Milestone Schedule

Lesko provide two handouts for ACC review: Components of the Draft H&S Plan, [Attachment A-2](#); and a Timeline for Implementation of H&S Plan, [Attachment A-3](#). He communicated that in order to proceed with the winter steelhead program this year we need HGMP approval by mid February 2007. Lesko indicated that this was not likely to happen, and that we ought to think about postponing the winter steelhead program until 2008

To implement the Spring Chinook implementation program we need HGMP approval by August 2007 (assuming an approved HGMP is not needed for taking additional spring chinook broodstock) and for Coho we need approval by late September 2007.

The ACC attendees were requested to provide comments and/or questions regarding the H&S timeline **on or before Friday, February 16, 2007**.

Richard Turner (NMFS) expressed that we could go forward with taking brood for the Spring Chinook program without approval because that is an ongoing program but NMFS could not complete the environmental assessment by April 2007 so we cannot proceed with the winter steelhead program this year. Turner would like to see the winter steelhead HGMP by the end of February 2007 so NMFS can be ready for the Fall program.

Shannon Wills (Cowlitz Indian Tribe) communicated that she is of the opinion that slower is better than quicker relating to completion of the HGMP and the implementation of the Spring Chinook collection program so we have time to deal with all the issues surrounding the collection of wild fish.

Draft Bull Trout Limiting Factors Analysis Discussion - Consultants Presentation & Update

Jason Shappart (Meridian Environmental) provided a handout titled, *“Lake Merwin and Swift Creek Reservoir Tributary Streams Bull Trout Limiting Factors Analysis – 70% Draft”*, dated February 7, 2007 and presented a PowerPoint presentation which outlined the following:

- Study Objectives – Answers to Questions
- Address Key Information Gaps Identified in the Draft Recovery Plan
- Study Approach
- Study Area
- Initial Rating and Rating Criteria
- Water Temperature Methods
- Water Temperature Results
- Cold Water Refugia Survey Data
- Continuous Logger Data
- Presence/Absence Survey
- Swift Creek Bull Trout
- Swift Creek below 5-ft falls (photo)
- Swift Creek upstream of 5-ft falls (photo)
- Low Flow mid-Sept (S10 Creek & Brooks Creek - photos)
- Habitat Surveys
- November Flood
- Brooks Creek early-December (photo)
- S10 Creek early – December (photo)
- S10 Creek
- New barrier formed by massive scour \approx 350 ft downstream of previous barrier (photo)
- Habitat Survey Re-Schedule
- Future Work
- List of Participants

For more detail the PowerPoint presentation can be viewed on the Lewis River website at the following link: <http://www.pacificcorp.com/Article/Article71311.html>

Lunch <12:10pm>

Reconvene 12:45pm>

Utilities Review of 2006/2007 Aquatic Fund Proposals

Shrier reviewed the Lewis River Aquatic Fund Final Proposals matrix for 2007, which outlined PacifiCorp’s comments and recommendations for funding. Hard copies of the memorandum, Final Proposals Matrix and nine (9) final proposals were mailed to all

ACC participants on February 7, 2007. **Comments are due on or before Tuesday, March 6, 2007.**

Study Updates

Shrier provided the following study updates:

Yale Entrainment Study – Consultants have experienced a hang-up with the hydroacoustic data. Document is still pending.

Merwin Tailrace Behavior Study – Expect final report within the week.

Merwin Sorting Facility Design – Still working on design issues.

Swift Surface Collector Design – Just completed the Computational Fluid Dynamics (CFD) Model. Will Shallenberger will provide an update at the March 8, 2007 ACC meeting.

Acclimation Pond Plan – Shrier working on the draft plan. At the request of George Lee (Yakama Nation), Shrier will suggest two dates in the month of April to conduct an acclimation pond site tour for the Tribal Council members and other interested ACC participants.

Habitat Synthesis Tool – Adam Haspiel (USDA FS) and Jim Byrne (WDFW) have copies of the matrix PacifiCorp created, which the Subgroup will be reviewing and commenting on at the next scheduled Subgroup meeting on February 16, 2007.

Agenda items for March 8, 2007

- Lower Constructed Channel Update – Consultants Presentation
- Swift Downstream Collection Update – Will Shallenberger
- Aquatic Fund – review of comments
- Habitat Synthesis Tool Update
- Study/Work Product Updates
- Relicensing/BiOp Update
- HGMP Update

March 8, 2007	April 12, 2007
Merwin Hydro Facility	Merwin Hydro Facility
Ariel, WA	Ariel, WA
9:00am – 3:00pm	9:00am – 3:00pm

Meeting Adjourned at 1:30pm

Handouts

- Final Agenda
- Draft ACC Meeting Notes 1/11/07
- Lewis River Revised Hatchery Upgrade Schedule, (**Attachment A-1**)

- Components of the Draft H&S Plan, (Attachment A-2)
- Timeline for Implementation of H&S Plan, (Attachment A-3)
- Export of Lewis River Basin Marine Derived Nutrients that could otherwise support Salmon Recovery, as provided by Jim Malinowski (Attachment B)
- WDFW Draft Issue Paper – Lewis River Late-winter Steelhead HGMP (Attachment C)
- NMFS letter to Frank Shrier re joint investigation on an evaluation of the differentiation of *O. mykiss* in the Lewis River, dated February 7, 2007, (Attachment D)

REVISED HATCHERY UPGRADE SCHEDULE

Updated: February 1, 2007

Activity	Construction Dates	Construction Period (Days)	Year					Status	Permitting	NOTES
			2006	2007	2008	2009	2010			
Lewis River Hatchery										
Pond 13 (conversion to raceways)	May 1 - July 31	90						On Schedule	Not Started	Coho held at LR in raceways longer
Pond 14 (conversion to raceways)	March 15 - July 31	135						On Schedule	Not Started	SCH held at Speelyai, Pond 16 & LR Pond 15
Pond 15 (conversion to raceway/sorting facility)	Jan 1 - August 30	240						30 % Design Complete	JARPA Submitted (Jan 11, 2007)	Movement of P15 causes other projects to move
Pond 16 (conversion to raceways)	April 1 - July 31	120						On Schedule	Not Started	Moved out to allow for rebuild of P15, P13, P14
Downstream water intake repair (screening modification)	April 1 - July 31	120						On Schedule	Not Started	Needs to be done at same time of P16
Upstream intake and conveyance pipe testing & repair	May 1 - May31	30						On Schedule	n/a	

Merwin Hatchery

Upgrade ozone Treatment facility	July 1 - September 30	90						upgrades ongoing	Complete	Upgrades completed in 2005
Improve flow and exchange rates in rearing ponds	June 1 - July 30	60						On Schedule	Not Started	
Modify release ponds to accommodate adults	June 1 - July 30	60						On Schedule	Not Started	

Speelyai Hatchery

Pond 14 (conversion to raceways)	February 1 - May 30	120						On Schedule	Not Started	
Burrows Pond Bank No. 1 (conversion to raceways)	July 1 - October 31	120						40 % Design Complete	JARPA to be submitted: Feb 16	SCH to Pond 14, kokanee to stay in one bank
Burrows Pond Bank No. 2 (conversion to raceways)	July 1 - October 31	120						On Schedule	Not Started	SCH to Pond 14, kokanee to stay in one bank
Repair water intake structure	June 1 - September 30	120						On Schedule	Not Started	
Expand adult fertilization area	January 1 - March 30	90						On Schedule	Not Started	
Construct kokanee trap weir/trap	May 1 - August 30	120						On Schedule	Not Started	
Expand incubation building	July 1 - August 30	60						Complete	Complete	

Revised Schedule
 Original Schedule

Components of the Draft H & S Plan

Updated: February 6, 2007

	Winter Steelhead	Spring Chinook	Coho
Broodstock Source	Native (wild)	Hatchery	Hatchery
Juvenile Supplementation	50,000 reared at Merwin and released in lower river	100,000 to upper river acclimation sites	None
Current Juvenile Production	275,000	1,050,000	1,800,000 (early and late)
Additional Juvenile Production Targets	50,000	300,000 [^]	0*
Upper River Escapement (passage) Goal	500 (NOR)	2,000	9,000 (early, Type S)
Size at Release (fpp)	5-8	10-12	14-16
Natural Production Threshold	3,070	2,977	13,953
Supplementation Years (adults and juveniles)	15	15	15
Broodstock Origin	Late NOR	initially HOR, but with increased NOR through generations	initially HOR, but with increased NOR through generations
Broodstock collection	50 after March 1 (est.)	65 over full range of run	None, transported fish to represent entire run time
Mating	2X2 factorial of NOR (all live spawned)	2X2 factorial of NOR (includes jacks)	none
Rearing	Merwin Hatchery	Speelyai Hatchery; Transfer to acclimation sites in Feb. at 12 fpp	none
Release Location	Adults: Swift reservoir Juveniles: Downstream of Merwin Dam in April (volitional) with unique mark	Adults: Swift reservoir; Juveniles: volitionally between Feb 22 - Mar 31.	Swift reservoir
EDT habitat capacity		1,942	8,800
Time before hatchery integration is considered		15	9
HGMP/H&S Approval Needed	February 15	August 1**	October 1

* Juvenile production increases by 100,000 in years 4-5 of the H & S Plan; and by another 100,000 in years 6-50.

[^] Includes 100,000 from the juvenile supplementation program

** Assumes that additional broodstock collection can be done without HGMP or H & S Plan approval

Attachment B

Export of Lewis River Basin Marine Derived Nutrients That Could Otherwise Support Salmon Recovery

Numerous scientific studies have identified the critical role of marine derived nutrients in salmon and steelhead stream productivity. Many of these studies contend that current nutrient levels are in the order of 5% of historic levels due primarily due to over harvest of salmon and steelhead stocks. Placement of hatchery origin salmon and steelhead carcasses provide a way to partially compensate for the starving of our streams of nutrients due to over harvesting practices.

The table below summarizes disposition of Lewis River Hatchery carcasses during 2006. An estimated 31% of the 2006 available biomass was placed in area streams. 3% went to the North Clark County Food Bank with the non-food portion of those fish (approximately 1/3) available to be placed in area streams. 13% of the biomass was given to treaty and non-treaty tribes for ceremonial and subsistence purposes. 49% was given to a food buyer who processes that biomass for state food bank, eggs for sale to the Japanese market and the remainder sold for cat

Lewis River Fish & Carcass Distribution

Data Provided by WSFWD 1/3/07

Distribution	<u>Numbers</u>			<u>Numbers %</u>			<u>Biomass lbs</u>			<u>Biomass %</u>		
	All	Adults	Jacks	All	Adults	Jacks	All	Adults	Jacks	All	Adults	Jacks
American Canadian	17	16	1	0	0	0	159	158	1	0	0	0
Dumped	1,277	1,232	45	3	3	1	16,904	16,855	49	4	4	1
Fish Buyer	27,401	21,805	5,596	55	50	89	217,776	212,180	5,596	49	48	89
Nutrient Program	10,663	10,605	58	21	24	1	106,108	106,050	58	24	24	1
Treaty Tribes												
Yakama	675	461	214	1	1	3	6,671	6,457	214	1	1	3
Warm Springs	<u>803</u>	<u>803</u>	<u>0</u>	<u>2</u>	<u>2</u>	<u>0</u>	<u>12,031</u>	<u>12,031</u>	<u>0</u>	<u>3</u>	<u>3</u>	<u>0</u>
Subtotal	1,478	1,264	214	3	3	3	18,702	18,488	214	4	4	3
Non-Treaty Tribes												
Cowlitz	1,949	1,632	317	4	4	5	15,517	15,198	319	3	3	5
Chinook	1,336	1,326	10	3	3	0	13,556	13,546	10	3	3	0
NW Indian VA	<u>1,137</u>	<u>1,136</u>	<u>1</u>	<u>2</u>	<u>3</u>	<u>0</u>	<u>11,133</u>	<u>11,131</u>	<u>2</u>	<u>3</u>	<u>3</u>	<u>0</u>
Subtotal	4,422	4,094	328	9	9	5	40,206	39,875	331	9	9	5
N. Co Food Bank	1,314	1,295	19	3	3	0	13,220	13,201	19	3	3	0
Forest Service	<u>3,202</u>	<u>3,201</u>	<u>1</u>	<u>6</u>	<u>7</u>	<u>0</u>	<u>32,011</u>	<u>32,010</u>	<u>1</u>	<u>7</u>	<u>7</u>	<u>0</u>
Totals	49,774	43,512	6,262	100	100	100	445,086	438,817	6,269	100	100	100

food or dumped. The appropriateness of this allocation of basin biomass should be examined.

The source data for the table above is contained in the four attached tables.

Given the role of marine derived nutrients in the health of Northwest streams, we believe that emphasis should be given to use of Lewis River hatchery carcasses for Lewis River Basin stream nutrient enhancement. We also believe that food bank allocation should be to food banks located in the basin. Export of basin marine derived nutrients should be minimized.

It is our belief that more than lip service should be given to scientific evidence related to salmon and steelhead life cycles if we are serious about salmon and steelhead recovery to healthy (near historic) populations. Addressing the issues related to marine derived nutrient's role in those life cycles is one of the ways we can show appropriate response to available scientific data.

Fish First
February 7, 2007

Lewis River Fish & Carcass Distribution
Data Provided by WSFWD 1/3/07

Distribution	<u>Spring Chinook</u>			<u>Early Coho</u>			<u>Late Coho</u>			<u>Summer Steelhead</u>			<u>Winter Steelhead</u>			<u>Totals</u>		
	Male	Female	Jacks	Male	Female	Jacks	Male	Female	Jacks	Male	Female	Jacks	Male	Female	Jacks	All	Adults	Jacks
American Canadian	0	0	0	0	0	0	12	3	1	0	1	0	0	0	0	17	16	1
Dumped	451	460	4	151	160	41	0	0	0	4	5	0	1	0	0	1,277	1,232	45
Fish Buyer	119	237	0	5,241	6,259	3,394	3,335	2,789	2,202	1,545	1,688	0	306	286	0	27,401	21,805	5,596
Nutrient Program	0	0	0	1,480	1,176	11	3,759	4,190	47	0	0	0	0	0	0	10,663	10,605	58
Treaty Tribes																		
Yakama	167	204	0	0	0	0	25	61	214	3	1	0	0	0	0	675	461	214
Warm Springs	<u>350</u>	<u>451</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>2</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>803</u>	<u>803</u>	<u>0</u>
Subtotal	517	655	0	0	0	0	25	61	214	5	1	0	0	0	0	1,478	1,264	214
Non-Treaty Tribes																		
Cowlitz	113	145	2	38	45	79	13	72	236	605	601	0	0	0	0	1,949	1,632	317
Chinook	173	157	0	24	36	9	176	78	1	298	383	0	1	0	0	1,336	1,326	10
NW Indian VA	<u>66</u>	<u>135</u>	<u>1</u>	<u>177</u>	<u>141</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>266</u>	<u>351</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>1,137</u>	<u>1,136</u>	<u>1</u>
Subtotal	352	437	3	239	222	88	189	150	237	1,169	1,335	0	1	0	0	4,422	4,094	328
N. Co Food Bank	139	132	0	251	221	19	0	0	0	257	295	0	0	0	0	1,314	1,295	19
Forest Service	0	0	0	0	0	0	1,797	1,404	1	0	0	0	0	0	0	3,202	3,201	1
Totals	1,578	1,921	7	7,362	8,038	3,553	9,117	8,597	2,702	2,980	3,325	0	308	286	0	49,774	43,512	6,262

Lewis River Fish & Carcass Distribution

Data Provided by WSFWD 1/3/07

Percentages of Totals

Distribution	<u>Spring Chinook</u>			<u>Early Coho</u>			<u>Late Coho</u>			<u>Summer Steelhead</u>			<u>Winter Steelhead</u>			<u>Totals</u>		
	Male	Female	Jacks	Male	Female	Jacks	Male	Female	Jacks	Male	Female	Jacks	Male	Female	Jacks	All	Adults	Jacks
American Canadian							0.1	0.0	0.0		0.0					0.0	0.0	0.0
Dumped	28.6	23.9	57.1	2.1	2.0	1.2				0.1	0.2		0.3	0.0	0.0	2.6	2.8	0.7
Fish Buyer	7.5	12.3	0.0	71.2	77.9	95.5	36.6	32.4	81.5	51.8	50.8		99.4	100.0		55.1	50.1	89.4
Nutrient Program	0.0	0.0	0.0	20.1	14.6	0.3	41.2	48.7	1.7	0.0	0.0	0.0	0.0	0.0	0.0	21.4	24.4	0.9
Treaty Tribes	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Yakama	10.6	10.6					0.3	0.7	7.9	0.1	0.0					1.4	1.1	3.4
Warm Springs	<u>22.2</u>	<u>23.5</u>	<u> </u>	<u> </u>	<u> </u>	<u> </u>	<u> </u>	<u> </u>	<u> </u>	<u>0.1</u>	<u> </u>	<u> </u>	<u> </u>	<u> </u>	<u> </u>	<u>1.6</u>	<u>1.8</u>	<u>0.0</u>
Subtotal	32.8	34.1	0.0	0.0	0.0	0.0	0.3	0.7	7.9	0.2	0.0	0.0	0.0	0.0	0.0	3.0	2.9	3.4
Non-Treaty Tribes																		
Cowlitz	7.2	7.5	28.6	0.5	0.6	2.2	0.1	0.8	8.7	20.3	18.1					3.9	3.8	5.1
Chinook	11.0	8.2		0.3	0.4	0.3	1.9	0.9	0.0	10.0	11.5	0.0	0.3	0.0	0.0	2.7	3.0	0.2
NW Indian VA	<u>4.2</u>	<u>7.0</u>	<u>14.3</u>	<u>2.4</u>	<u>1.8</u>	<u>0.0</u>	<u>0.0</u>	<u>0.0</u>	<u>0.0</u>	<u>8.9</u>	<u>10.6</u>		<u>0.0</u>			<u>2.3</u>	<u>2.6</u>	<u>0.0</u>
Subtotal	22.3	22.7	42.9	3.2	2.8	2.5	2.1	1.7	8.8	39.2	40.2	0.0	0.3	0.0	0.0	8.9	9.4	5.2
N. Co Food Bank	8.8	6.9	<u> </u>	3.4	2.7	0.5	<u> </u>	<u> </u>	<u> </u>	8.6	8.9	<u> </u>	<u> </u>	<u> </u>	<u> </u>	2.6	3.0	0.3
Forest Service	<u> </u>	<u> </u>	<u> </u>	<u> </u>	<u> </u>	<u> </u>	<u>19.7</u>	<u>16.3</u>	<u>0.0</u>	0.0	0.0	<u> </u>	<u> </u>	<u> </u>	<u> </u>	6.4	7.4	0.0
Totals	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0		100.0	100.0		100.0	100.0	100.0

Data Provided by WSFWD 1/3/07
 Estimate of Biomass Distribution

Distribution Est. Weight lbs	Spring Chinook			Early Coho			Late Coho			Summer Steelhead			Winter Steelhead			Totals		
	Male	Female	Jacks	Male	Female	Jacks	Male	Female	Jacks	Male	Female	Jacks	Male	Female	Jacks	All	Adults	Jacks
	15	15	2	10	10	1	10	10	1	8	8	1	8	8	1			
American Canadian	0	0	0	0	0	0	120	30	1	0	8	0	0	0	0	159	158	1
Dumped	6,765	6,900	8	1,510	1,600	41	0	0	0	32	40	0	8	0	0	16,904	16,855	49
Fish Buyer	1,785	3,555	0	52,410	62,590	3,394	33,350	27,890	2,202	12,360	13,504	0	2,448	2,288	0	217,776	212,180	5,596
Nutrient Program	0	0	0	14,800	11,760	11	37,590	41,900	47	0	0	0	0	0	0	106,108	106,050	58
Treaty Tribes																		
Yakama	2,505	3,060	0	0	0	0	250	610	214	24	8	0	0	0	0	6,671	6,457	214
Warm Springs	5,250	6,765	0	0	0	0	0	0	0	16	0	0	0	0	0	<u>12,031</u>	<u>12,031</u>	<u>0</u>
Subtotal	7,755	9,825	0	0	0	0	250	610	214	40	8	0	0	0	0	18,702	18,488	214
Non-Treaty Tribes																		
Cowlitz	1,695	2,175	4	380	450	79	130	720	236	4,840	4,808	0	0	0	0	15,517	15,198	319
Chinook	2,595	2,355	0	240	360	9	1,760	780	1	2,384	3,064	0	8	0	0	13,556	13,546	10
NW Indian VA	990	2,025	2	1,770	1,410	0	0	0	0	2,128	2,808	0	0	0	0	<u>11,133</u>	<u>11,131</u>	<u>2</u>
Subtotal	5,280	6,555	6	2,390	2,220	88	1,890	1,500	237	9,352	10,680	0	8	0	0	40,206	39,875	331
N. Co Food Bank	2,085	1,980	0	2,510	2,210	19	0	0	0	2,056	2,360	0	0	0	0	13,220	13,201	19
Forest Service	0	0	0	0	0	0	17,970	14,040	1	0	0	0	0	0	0	32,011	32,010	1
Totals	23,670	28,815	14	73,620	80,380	3,553	91,170	85,970	2,702	23,840	26,600	0	2,464	2,288	0	445,086	438,817	6,269



UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
Northwest Fisheries Science Center
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SEATTLE, WASHINGTON 98112-2097

F/NWC1

Attachment D

February 7, 2007

Dr. Frank Shrier
PacifiCorp
825 NE Multnomah, Suite 1500
Portland, OR 97232

Dear Frank,

You requested an update on our joint investigation with you on an evaluation of the differentiation of *O. mykiss* in the Lewis River watershed particularly with respect to above and below the dams. We are looking at morphological differences (body shape and coloration patterns), mSAT differentiation (which is evolutionarily neutral variability that reflects breeding history/gene flow), and variation at two MHC loci which are presumed to be under natural selection with respect to disease resistance.

A. The major question: are the late returning fish to the Merwin Dam (that spawn in winter-spring) different from the steelhead that return to the hatchery (and spawn in the winter)?

With respect to mSAT variation: yes. We have two Merwin samples (from 2005 and 2006) of about 50 fish each that are similar to one another but statistically different at all 15 loci from 96 hatchery fish (sampled October 2005). The pattern of variability is summarized on the first three axes from a multivariate analysis (GENETIX) in Figure 1. There appears to be some temporal variability between the two Merwin samples, but this is small in comparison to the differentiation between the Merwin vs. the hatchery collection (nb: *Fst* [a common metric of differentiation] between the Merwin samples is 0.0046, and 0.028 and 0.032 between the hatchery and the Merwin collections).

With respect to the MHC variation: yes. A co-investigator has reported to me that a strong difference can be seen between 50 hatchery fish and the Merwin 2005 fish at one MHC locus.

We have no morphological data for the Merwin fish. Our ongoing study of morphological variability includes only juvenile hatchery fish vs. five or more upriver collections of juvenile/adult *O. mykiss*.

In sum, two sets of genetic markers agree with the large phenotypic differences (with respect to run-timing and time-of-spawning) seen between Merwin “wild” steelhead and the winter-run hatchery steelhead.

B. Are there differences in the *O. mykiss* populations above the dams vs. below the dam? We have some preliminary results for 15 loci for four collections. In Figure 2, collections from Siouxon Creek, Cussed Hollow Creek, and Muddy River are illustrated and are clearly differentiated from the three below-dam collections. It is also very interesting how different they are from each other. In Cussed Hollow and Muddy, 3-8 fish were excluded because they were or resembled *O. clarki* genotypes. A fourth collection from Quartz Creek is not included in this figure. It is so different (from the previously discussed fish) it cannot be conveniently compared on the same scale as these fish.

C. Are there signs of gene mixing between these upriver “wild” rainbow trout and Goldendale trout, the primary hatchery stock of rainbow trout outplanted into the upper reservoir? Similar to Quartz Creek variation, Goldendale trout are so different they fall off these multivariate axes. In other words, any interbreeding with this stock will be easy to detect—which, unofficially, hasn’t been seen in any of these fish. We are also finishing genetic work for Spokane, Mt. Whitney-Tokul, and South Tacoma stocks of rainbow trout.

We will have the MHC and morphological analyses finished for your review in the spring.

In summary, 1) the Merwin late-returning fish are distinctive from the winter-run hatchery stock and 2) the genetic variability in mSATs and the patterns of differentiation will provide us with the opportunity to monitor the reproductive success of individual steelhead relocated above the dam system, the participation of resident *O. mykiss* in the overall recolonization program, and the genetics/phenetics of who will be producing new adult steelhead recruits into the upper watershed.

These are preliminary results. When we firm up a bigger data set, I want to make a presentation to you and your working group. Thank you very much for allowing this work to continue; it has been a great opportunity to study these interesting fish.

Sincerely,

Gary A. Winans
Research Population Geneticist

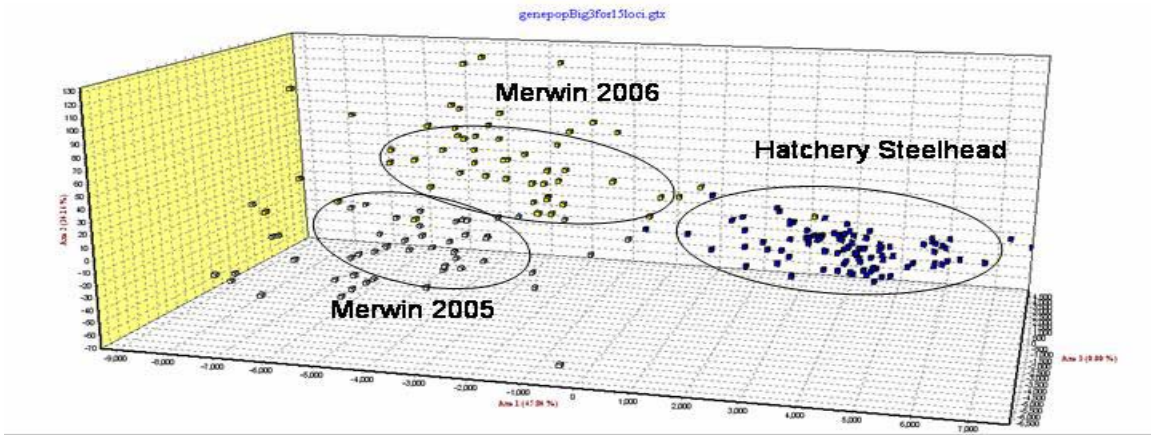


Figure 1: Results of a factorial correspondence analysis (in GENETIX) of 15 mSAT characters. Ellipses were added by eye to aid inspection of data.

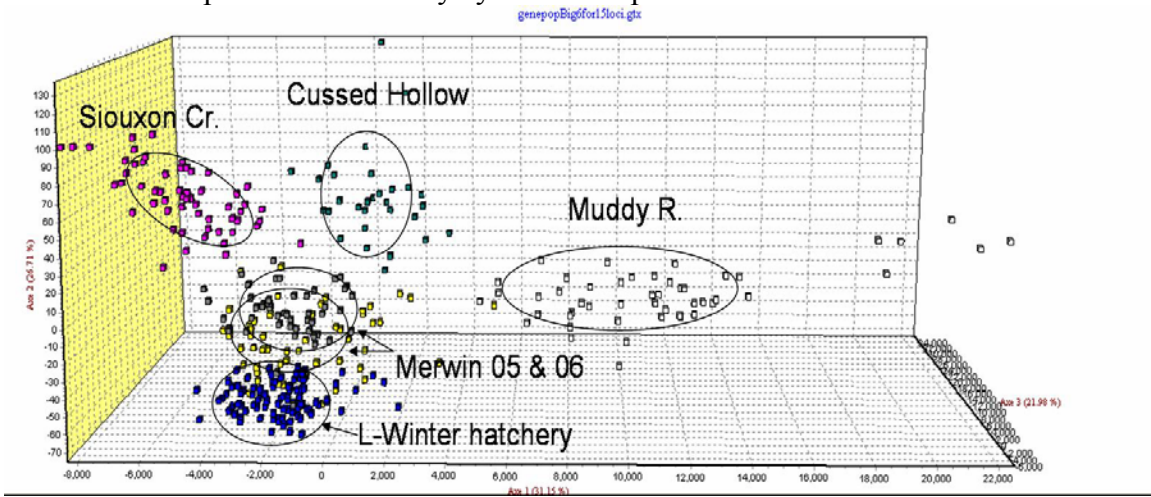


Figure 2: Results of a factorial correspondence analysis (in GENETIX) of 15 mSAT characters. Ellipses were added by eye to aid inspection of data.