



Grant County
PUBLIC UTILITY DISTRICT
Excellence in Service and Leadership

Fall Chinook Work Group

Tuesday, 2 April 2013

Wanapum Dam

Beverly, WA

Technical members

Paul Wagner, NMFS
Jeff Fryer, CRITFC
Holly Harwood, BPA
Keith Truscott, CPUD
Bill Tweit, WDFW
Marcie Mangold, WDOE
Russell Langshaw, GCPUD
Steve Hemstrom, CPUD

Joe Skalicky/Don Anglin, USFWS
Paul Ward/Bob Rose, YN
Brett Swift, American Rivers
Tom Kahler, DPUD
Paul Hoffarth, WDFW
John Clark, ADFG
Todd Pearsons, GCPUD

Attendees: (*Denotes Technical member)

Marcie Mangold, WDOE* (phone)
Tom Kahler, DPUD*
Jeff Fryer, CRITFC*
Tom Skiles, CRITFC
Debbie Williams, GCPUD
Stacy Remples, WDFW

Russell Langshaw, GCPUD*
Paul Hoffarth, WDFW*
John Clark, ADFG* (phone)
Steve Hays, CPUD (phone)
Bob Rose, YN*
Tracy Hillman, Facilitator

Action Items:

1. **Russell Langshaw will forward the outline for the predation report to the FCWG by Friday, 5 April 2013.**
2. **Russell Langshaw will conduct retrospective analysis on historical stranding and entrapment work and identify issues for discussion during the next FCWG meeting.**

Meeting Minutes

- I. **Welcome and Introductions** – Tracy Hillman welcomed attendees to the meeting. Attendees introduced themselves.

Tracy announced that Marcie Mangold has accepted a new job and will no longer be the Washington Department of Ecology representative on the FCWG. Ecology has not yet identified who will be representing them on the FCWG. The FCWG extended their gratitude to Marcie and wished her the best in her new job.

- II. **Agenda Review** – The agenda was reviewed and approved.

- III. **Approval of Meeting Minutes**

- 5 March Meeting Minutes were reviewed and approved.

- IV. **Review of Action Items** - Action items identified during the March meeting were discussed.

- Leah Sullivan will submit an outline of the predation report to the FCWG by 31 March 2013. **Complete; Russell Langshaw will forward the outline to the FCWG by Friday, 5 April.**
- Russell Langshaw and Jeff Fryer will work with presenters to coordinate presentations for the Fall Chinook Symposium at the Western Division AFS meeting in Boise. **Complete.**
- Russell Langshaw will conduct retrospective analysis on historical stranding and entrapment work and identify issues for discussion during the next FCWG meeting. **Ongoing.**
- Russell Langshaw will develop a protocol that will be followed when the USGS flow gage fails. **Complete. Flows measured at Priest Rapids Dam will be used if the USGS gage fails.**

- V. **Phase I Study Updates**

- A. **Productivity Assessment** – The final productivity report is complete and has been posted to Box.net.
- B. **Egg to Fry Survival** – The final egg-to-fry study report is complete and has been posted to Box.net.
- C. **Dam Passage Fallback** – The final dam passage fallback report is complete and has been posted to Box.net.
- D. **Hydrodynamic Model** – The final hydrodynamics model report (methods and a catalogue of what is available) is complete and has been posted to Box.net.

- E. **Production Simulation Model** – Russell Langshaw said that Cedar Morton, a doctoral student at Simon Fraser University, is reviewing the Production Simulation Model and may tweak it to evaluate flow effects on fish production in Canada. His work is associated with the Columbia River Treaty.

VI. Phase II Study Plan

Phase II Draft Study Plan – Blue Leaf Environmental has compiling and reviewed most of the available information on fish and bird predation in the Hanford Reach and Lake Wallula. Russell Langshaw indicated that Blue Leaf is still waiting for data from the USGS, ODFW, and Department of Energy. They were able to secure data from WDFW. Russell noted that the issues associated with funding constraints and contracting have been resolved. The draft report will likely be submitted to the FCWG by 31 July 2013 and the final after a 30-day comment period.

VII. HRWG Activities

Update on Protection Flows – Russell Langshaw said that the protection program for the rearing period began on 2 March 2013. Since then, there has been one violation. An exceedence occurred on 8 March. This occurred because BPA changed their drafting plan during the weekend. Russell indicated that there will likely be minimal flow fluctuations because of the proposed BPA flow releases over the next couple weeks. Russell noted that all temperature and flow data are displayed in the Fixed Site Monitoring – Monthly Summary files on the Grant PUD Water Quality Website (<http://www.gcpud.org/naturalResources/fishWaterWildlife/waterqualityMonitoring.html>). The temperature unit tracking spreadsheet is found under “Fixed Site Monitoring – Monthly Summary.”

Paul Hoffarth noted that Chinook fry abundance is increasing in near-shore areas. So far, a total of 165 Chinook fry have been collected during shoreline seining at 15 sites.

Russell indicated that he is revisiting how accumulations of temperature units affect initiation of sampling and protection flows. The intent is to try to match protection flows with peak susceptibility. Paul noted that they have about 6-8 years of seining data that can be used to help model the relationship among spawn timing, temperature units, and peak susceptibility of Chinook fry. Tom Kahler suggested that Russell speak with Kim Hyatt, who developed a model for predicting emergence of sockeye fry in the Okanogan system. Perhaps elements of that model could be used in the Hanford Reach. Russell will continue to evaluate methods to accurately forecast the peak susceptibility of Chinook fry in the Hanford Reach.

Stranding and Entrapment Retrospective Analysis – Russell Langshaw said that he is continuing to evaluate past entrapment data. He said that he is currently examining the use of the zero-inflated negative binomial and poisson distributions. The zero-inflated negative binomial appears appropriate because of the large number of zeros in the data set (most entrapments have no fish), and the occurrence of large numbers of fish within a randomly selected entrapment is rare. Russell will continue to conduct retrospective analysis. He will provide more results during the next FCWG meeting. Recall that Russell is doing this work to more accurately estimate the number of fish that die in entrapments and to reduce the level of uncertainty in the estimate.

Stranding and Entrapment Field Work – Stacy Remples, WDFW, shared with the Working Group the recent results from the stranding and entrapment studies (see Attachment 1).

Entrapments: From 13 through 27 March, field crews visited 32 transects to conduct entrapment sampling. Flows were too low to develop entrapments in 11 transects and no entrapments were present in 14 of the 32 locations sampled. She noted that the model tended to select island sites during periods of low fluctuations. This is because island sites have several shorelines and the sum of those shoreline dewatered areas add up to the criterion of 10 m of dewatered shoreline. Paul Hoffarth stated that they have resolved this issue. In the remaining 19 sample locations, 106 entrapments were sampled. Chinook were present in seven entrapments. A total of 235 Chinook (all were alive) were collected during the two-week sampling period, yielding an average of 2.2 Chinook per sampled entrapment. The highest concentration of entrapped Chinook was in segment 3 at 7.7 Chinook per entrapment. Fates were recorded for 42 of the 106 sampled entrapments.

In sum, as of 2 March, a total of 159 entrapments have been sampled within 100 transects. A total of 274 Chinook fry have been sampled. Fates have been recorded for 65 of the 159 observed entrapments.

Stranding: For stranding, 11 of the 25 transects visited by the field crews during the two-week survey period had insufficient flow fluctuations to assess stranding. At the remaining 14 transects, crews sampled 54 plots totaling 1,303 m² of shoreline. Eight stranded Chinook were collected during this sampling period.

In sum, as of 2 March, a total of 48 stranding transects have been visited. Sampling did not occur at 16 of the 48 transects because of insufficient flow fluctuations. Within the remaining 32 transects, crews sampled 114 plots equating to 3,927 m² of shoreline area. A total of 14 stranded Chinook have been collected.

WDFW will continue to send stranding and entrapment updates every two weeks to the FCWG.

- **Fall Chinook Presentations at the American Fisheries Society (AFS) Meeting** – Russell Langshaw and Jeff Fryer have organized the presentations for the Fall Chinook Symposium at the Western Division AFS meeting in Boise. The symposium will cover both Snake River and Hanford Reach fall Chinook. Russell noted that because Marcie has taken a new job, she will not give the first presentation, which describes the 401 Certification process and places the Hanford Reach studies in context. Instead, Russell will include this in his talk. He will also describe the results from the various studies. Ryan Harnish will talk about the productivity study and Paul Hoffarth will discuss the stranding and entrapment studies. Jeff Fryer will describe results from his tagging studies. The AFS meeting is on 16-18 April 2013. The Fall Chinook Symposium will be on Tuesday, 16 April.

VIII. Next Meeting: Tuesday, 7 May 2013 at Grant PUD in Ephrata, WA.

IX. Hanford Reach Tour: Following the meeting, the FCWG visited some of the stranding and entrapment sites on the Hanford Reach.

Attachment 1

Summary of Hanford Reach Juvenile Fall Chinook Stranding and Entrapment Surveys

WDFW

March 13 - March 27, 2013

Data collection for stranding and entrapment of juvenile fall Chinook began on March 2, 2013. Washington Department of Fish and Wildlife (WDFW) staff consists of three boats, 2-3 person crews, working seven days a week. Two of the three crews are sampling for entrapments. The first entrapment crew begins at dawn with the second entrapment crew starting mid-day and ending at dusk. The third crew is sampling to assess losses due to stranding.

Sampling methods and data collection for the 2013 Evaluation follows protocols developed in 2012. The Hanford Reach will be divided into three primary sections, Upper, Middle, and Lower, similar to previous years. The three sections will be further divided into eight river segments (Figure 1 & Table 1). River stage variation associated with the unsteady flow hydrograph is relatively consistent within each of the eight segments. Each river segment will then be further sub-divided into sample sites delineated by transect lines located at ~250 meter intervals (Figure 2). The entrapment sample locations are bounded by adjacent transect lines.

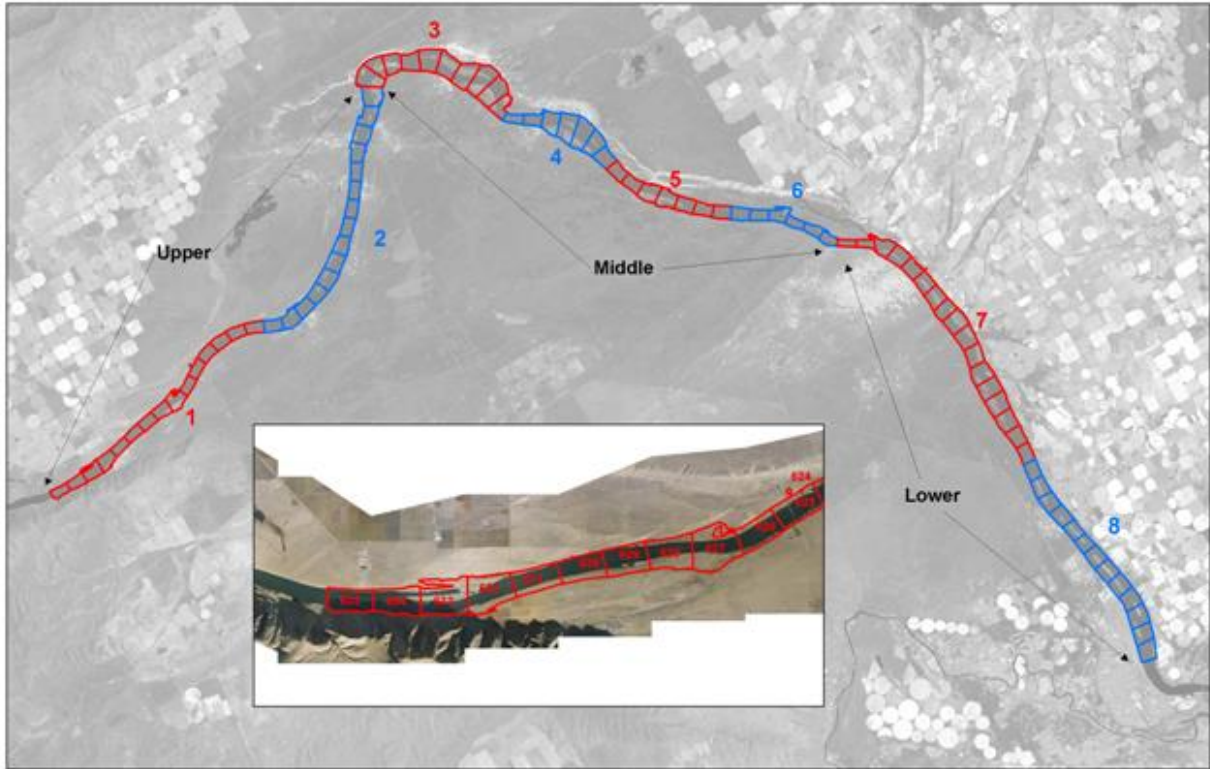


Figure 1. Spatial strata for the 2011-13 evaluation of stranding and entrapment of juvenile fall Chinook in the Hanford Reach.

Table 1. Delineations for the eight spatial strata for the 2011-13 evaluation of stranding and entrapment of juvenile fall Chinook in the Hanford Reach.

Section	Segment	Lower Boundary (rkm)	Upper Boundary (rkm)	Transects per Segment	Transects (#)
Upper	1	620	635	1-60	120
	2	605	620	61-120	
Middle	3	595	605	121-160	120
	4	588	595	161-188	
	5	581	588	189-216	
	6	575	581	217-240	
Lower	7	558	575	241-308	120
	8	545	558	309-360	

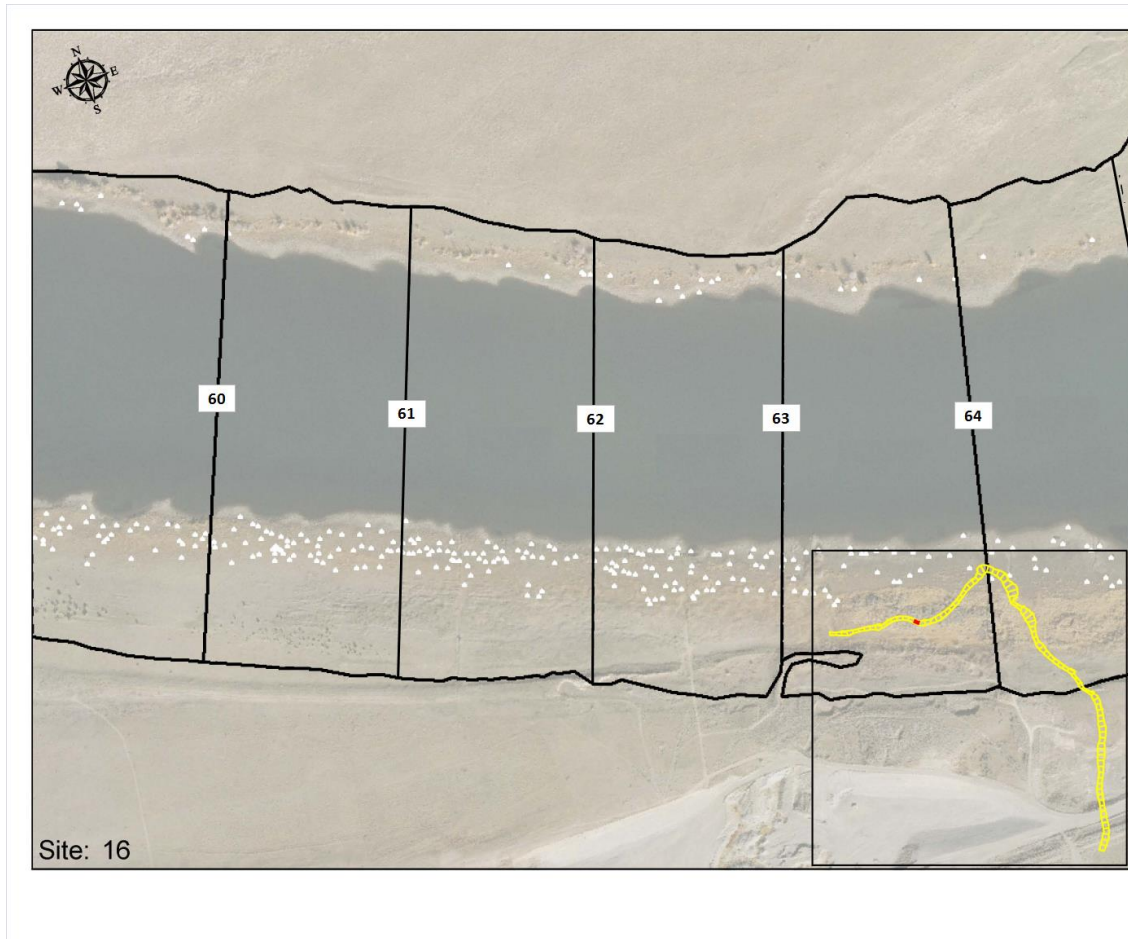


Figure 2. Example of an individual sample site (Site 16), quadrants (16.1-16.4), and entrapments (white dots).

The process for selecting sampling sites will be random selection, without replacement within the two week sampling periods. To be available for selection sample locations must exhibit a minimum 10 meter reduction in surface top width based on the SESSM using MASS1.

Entrapment: March 13 – March 27, 2013

From March 13, through March 27, field crews visited 32 transects to conduct entrapment sampling (Table 1). Entrapments were absent from 11 of the 32 transects visited. At 14 locations current flow regimes were too low to allow for entrapment formation. A total of 106 entrapments were sampled from the remaining 19 sites.

Table 1. Entrapments: March 13 – March 27, 2013

Segment	Total Transects Visited	Entrapments		Entrapments Sampled
		Yes	Present No	
1	10	7	1	52
2	8	6	2	22
3	3	1	2	21
4	5	2	3	2
5	1	0	1	0
6	0	0	0	0
7	4	3	1	9
8	1	0	1	0
Totals	32	19	11	106

Chinook were present in 7 of the entrapments (Table 2). A total of 235 Chinook, all collected alive, were sampled from entrapments during this bi-weekly period. For this two week sampling period, the average number of Chinook per entrapment was 2.2, with the highest concentration occurring in Segment 3.

Table 2. Entrapments with Chinook: March 13 – March 27, 2013

Segment	Entrapments w Chinook	Chinook Present Total	Chinook per Entrapment
1	2	7	0.1
2	2	56	2.5
3	2	162	7.7
4	0	0	0.0
5	0	0	0.0
6	0	0	0.0
7	1	10	1.1
8	0	0	0.0
Totals	7	235	2.2

Of the entrapments evaluated thus far, known fates have been recorded for 42 of the 106 observed (Table 3); only seven had re-flooded at time of re-visitation. Of the seven entrapments that contained Chinook three had reflooded and four were unknown.

Table 3. Entrapment Fates: March 13- March 27, 2013

Segment	Entrapment Fates			
	Unknown	Reflood	Drain	Temp >27C
1	29	0	23	0
2	17	2	2	0
3	12	2	6	1
4	0	1	1	0
5	0	0	0	0
6	0	0	0	0
7	6	0	3	0
8	0	2	0	0
Totals	64	7	35	0

For this bi-weekly sampling period stickleback were the most abundant non-salmonid species collected. Other fish species found in entrapments included Northern pikeminnow (NPM) and sucker species (Table 4).

Table 4. Other fish species collected: March 13- March 27, 2013

Segment	Other Species				
	NPM*	Sucker	Stickleback	Dace	Total
1	3	0	1	0	4
2	208	3	495	0	706
3	70	5	2	0	77
4	0	0	0	0	0
5	0	0	0	0	0
6	0	0	0	0	0
7	0	0	0	0	0
8	0	0	0	0	0
Totals	281	8	498	0	787

*denotes: Northern pikeminnow

Entrapment Summary: March 2 – March 27, 2013

As of March 27, 100 transects were visited with 159 entrapments sampled. The total number of Chinook collected was 274. Fates of entrapments have been recorded for 65 of the 159 observed (Table 5.)

Table 5. Entrapment Summary: March 2 – March 27, 2013

Segment	Transects	Entrapments Present		Entrapments Sampled	Entrapments w Chinook	Chinook Present Total	Chinook per Entrapment	Entrapment Fates			
	Visited	Yes	No					Unknown	Reflood	Drain	Temp >27C
1	17	10	5	59	2	7	0.1	32	0	27	0
2	12	7	5	29	2	56	1.9	20	2	7	0
3	18	3	15	29	4	167	5.8	18	2	9	1
4	12	4	8	8	0	0	0.0	5	1	2	0
5	9	2	7	2	0	0	0.0	1	0	1	0
6	1	1	0	1	0	0	0.0	0	0	1	0
7	18	13	5	28	5	44	1.6	17	0	11	0
8	13	1	12	3	0	0	0.0	1	2	0	0
Totals	100	41	57	159	13	274	9.4	94	7	58	1

Stranding: March 13 – March 27, 2013

For the bi-weekly sampling period March 13, through March 27, the stranding crew visited 25 transects. Of these, 11 transect lines did not have sufficient river fluctuation to assess stranding (Table 6). From the remaining 14 transects, 54 plots were sampled for a total area of 1,303 m². A total of eight Chinook were collected within the sampled plots to date.

Table 6. Stranding: March 13 – March 27, 2013

Segment	Transects Visited	Transects Sampled		Plots (#)	Area Sampled	Species			
		Yes	No			Chinook	NPM*	Stickleback	Sucker
1	3	3	0	11	222.25	1	0	0	0
2	8	6	2	20	360.64	0	0	0	0
3	2	0	2	0	0	0	0	0	0
4	5	1	4	3	116.25	0	0	0	0
5	0	0	0	0	0	0	0	0	0
6	1	0	1	0	0	0	0	0	0
7	4	4	0	20	603.95	7	0	0	0
8	2	0	2	0	0	0	0	0	0
Totals	25	14	11	54	1,303	8	1	0	0

*NPM denotes Northern Pikeminnow

Stranding Summary: March 2 – March 27, 2013

As of March 27, 48 transects were visited. Fluctuations were not sufficient at 16 of the 48 transects to allow sampling. From the remaining 32 transects, 114 plots were sampled and 3,927 m² were assessed. A total of 14 Chinook, one Northern pikeminnow and one sucker species were collected.

Table 7. Stranding Summary: March 2 – March 27, 2013

Segment	Transects Visited	Transects Sampled		Plots (#)	Area Sampled	Species			
		Yes	No			Chinook	NPM*	Stickleback	Sucker
1	7	4	3	11	222.25	1	0	0	0
2	16	13	3	37	1120.44	1	1	0	0
3	5	2	3	5	145.79	0	0	0	0
4	6	2	4	31	1313.55	0	0	0	0
5	1	1	0	0	0	0	0	0	0
6	1	0	1	3	217.04	0	0	0	0
7	6	6	0	25	800.2	12	0	0	1
8	6	4	2	2	107.26	0	0	0	0
Totals	48	32	16	114	3,927	14	1	0	1

*denotes: Northern pikeminnow

Nearshore Sampling: March 13 – March 27

Nearshore seining has been conducted once per week over the past the bi-weekly period, March 13 – March 27, 2013, to assess abundance and size of juvenile fall Chinook in the Hanford Reach. A total of 164 Chinook were collected from 15 sites (Table 8.) during this sampling period.

Abundance is low as is typical during the early emergence period. No fall Chinook fry were collected from the four sites sampled on February 28 and only 22 fry have been collected during the past two surveys, March 8 and 13 (Table 6).

Table 8. Nearshore Sampling Summary: February 28 – March 27, 2013

Date	Sites Visited	Chinook (#)	Forklengths		
			Mean	Min	Max
28-Feb	4	0			
8-Mar	4	22	40.4	38	48
13-Mar	6	22	39.5	34	45
22-Mar	3	107	42.2	34	53
26-Mar	6	35	41.1	37	49