



Grant County  
**PUBLIC UTILITY DISTRICT**  
*Excellence in Service and Leadership*

## Fall Chinook Work Group

Tuesday, 2 July 2013

Grant PUD Headquarters Building

Ephrata, WA

### Technical members

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Paul Wagner, NMFS	Joe Skalicky/Don Anglin, USFWS
Jeff Fryer, CRITFC	Paul Ward/Bob Rose, YN
Holly Harwood, BPA	Brett Swift, American Rivers
Keith Truscott, CPUD	Tom Kahler, DPUD
Bill Tweit, WDFW	Paul Hoffarth, WDFW
Jim Bellatty, WDOE	John Clark, ADFG
Russell Langshaw, GCPUD	Todd Pearsons, GCPUD
Steve Hemstrom, CPUD	

### Attendees: (\*Denotes Technical member)

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Russell Langshaw, GCPUD*	Tom Kahler, DCPUD* (phone)
Stacy Remples, WDFW (phone)	Paul Wagner, NMFS* (phone)
Tracy Hillman, Facilitator	

### Action Items:

1. Paul Hoffarth will contact Matt Mesa to see if the USGS predation study plan can be shared with the FCWG.
2. Russell Langshaw will provide Paul Hoffarth and Stacy Remples with hourly flow data for Rock Island and Priest Rapids dams.
3. Russell Langshaw will conduct retrospective analysis on historical stranding and entrapment work and identify issues for discussion during the next FCWG meeting.
4. Tracy Hillman will help arrange a stranding/entrapment meeting with WDFW, Grant PUD, and Battelle.

# Meeting Minutes

- I. **Welcome and Introductions** – Tracy Hillman welcomed attendees to the meeting. Attendees introduced themselves.
- II. **Agenda Review** – The agenda was reviewed and approved.
- III. **Approval of Meeting Minutes**
  - The June Meeting Minutes were reviewed and approved.
- IV. **Review of Action Items** - Action items identified during the June meeting were discussed.
  - Paul Hoffarth will contact Matt Mesa to see if the USGS predation study plan can be shared with the FCWG. **Ongoing; Leah Sullivan has been in communication with Matt Mesa.**
  - Tracy Hillman will send Tom Skiles the draft outline for the predation report. **Complete.**
  - Russell Langshaw will provide Paul Hoffarth with hourly flow data for Rock Island and Priest Rapids dams. **Ongoing. Russell will also send the data to Stacy Remples.**
  - Russell Langshaw will conduct retrospective analysis on historical stranding and entrapment work and identify issues for discussion during the next FCWG meeting. **Ongoing.**
- 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 seeking funding from B.C. Hydro to use on the Production Simulation Model. Cedar will model effects in Canada, while Battelle, with support from CRITFC, will model effects in the US. Depending on funding, Cedar plans to meet with Grant PUD and Battelle in the near future.

## VI. Phase II Study Plan

**Predation Report** – Russell Langshaw said that there are no new updates on the draft predation report. He indicated that Blue Leaf is on track to provide a draft report by 31 July 2013. The FCWG recommended receiving the report a bit earlier so they would have time to read it before the August meeting. The FCWG will have a 30-day comment period.

## VII. HRWG Activities

**Stranding and Entrapment Retrospective Analysis** – Russell Langshaw said that he has finished compiling and QA/QC the historic stranding and entrapment data set. He is now prepared to use the zero-inflated negative binomial and/or poisson distributions to analyze the data. 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 has the models ready to run in SYSTAT or STATA. Russell will provide 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 final, two-week results from the stranding and entrapment studies (see Attachment 1).

Entrapments: From 22 May through 9 June, field crews visited 65 transects to conduct entrapment sampling. A total of 120 entrapments were sampled. Chinook were present in 11 entrapments. A total of 104 Chinook were collected during the two-week sampling period, yielding an average of 0.9 Chinook per sampled entrapment. The highest concentration of entrapped Chinook was in Segment 2. Fates were recorded for 48 of the 120 sampled entrapments.

In sum, as of 2 March, a total of 658 entrapments have been sampled within 322 transects. A total of 2,072 Chinook fry have been sampled. Fates have been recorded for 287 of the 658 observed entrapments.

Stranding: For stranding, 20 of the 27 transects visited by the field crews during the two-week survey period had insufficient flow fluctuations to assess stranding. Crews sampled 111 plots totaling 5,946 m<sup>2</sup> of shoreline. Three stranded Chinook were collected during this sampling period.

In sum, as of 2 March, a total of 169 stranding transects have been visited. Sampling did not occur at 34 of the 169 transects because of insufficient flow fluctuations. Within the remaining 135 transects, crews

sampled 678 plots equating to 34,571 m<sup>2</sup> of shoreline area. A total of 58 stranded Chinook have been collected.

Tracy Hillman asked Stacy if the field crews identified any problems during field work. Stacy indicated that there were some issues with the Random Transect Generator Model. There were problems with time lags and the random sampling component of the model occasionally sent crews to steep-bank areas with no entrapments. In addition, there may have been issues with predators removing fish from entrapments before the crews arrived at the entrapments. Thus, the number of estimated entrapped fish may be biased low. The trail-camera did not provide much help in identifying predation pressure, but crews did identify lots of bird tracks around entrapments. Russell Langshaw noted that his retrospective analyses may help assess the effects of predation pressure. Tracy indicated that a meeting with field crews may be helpful. This should be scheduled soon since sampling experiences are fresh in the memories of the crews. Tracy will arrange a stranding/entrapment meeting with WDFW, Battelle, and Grant PUD.

Russell Langshaw stated that the stranding and entrapment report is due on 15 January 2014. They will use the same analyses as last year. WDFW and Grant PUD will write most of the report. Battelle will estimate the number of fish stranded and calculate the number of entrapments formed. The US Fish and Wildlife Service will calculate the number of fish entrapped and estimate mortalities. Stacy indicated that WDFW will have the data available for analysis by the end of the week. They need to complete QA/QC and GIS layers. Russell will contact Paul Hoffarth about authorship.

**Hanford Reach PIT-Tagging Project** – Tracy Hillman reported that Jeff Fryer tagged about 178,426 wild juvenile fall Chinook with CWTs. He also tagged about 4,000 juvenile fall Chinook with PIT tags. Jeff told Tracy in an email that he will spend some time with the PIT data to figure out the effective tag output after mortality, which was unfortunately high, and shed tags. An exact number of fish tagged will be provided during the August meeting. Russell Langshaw noted that mortality was high this year because of several factors, but most likely related to collection location. This year, crews had to collect fish lower in the Reach and then transport the fish upstream to the tagging location. Russell said that the PUD supported the tagging program this year by providing additional tags (as part of Phase II studies) and people to tag fish. The PUD will continue to support the project in the future. This may include providing holding tanks for fish.

**VIII. Next Meeting:** Tuesday, 6 August 2013 at Grant PUD in Ephrata, WA.

# Attachment 1

## Summary of Hanford Reach Juvenile Fall Chinook Stranding and Entrapment Surveys

WDFW

**22 May – 9 June 2013**

From May 22, through June 9, field crews visited 65 transects to conduct entrapment sampling (Table 1). Entrapments were present in 28 of the 65 transect visited for a total of 120 entrapments sampled. Flows ranged from 119,400 cfs on June 7, to 247,500 cfs on May 23, with an average daily flow of 191,400 cfs for this sampling period.

Table 1. Entrapments Sampled: May 22, – June 9, 2013

Segment	Total Transects Visited	Entrapments Present		Entrapments Sampled
		Yes	No	
<b>1</b>	15	7	8	27
<b>2</b>	18	6	12	22
<b>3</b>	5	4	1	28
<b>4</b>	2	2	0	9
<b>5</b>	4	1	3	1
<b>6</b>	4	1	3	1
<b>7</b>	7	5	2	30
<b>8</b>	10	2	8	2
<b>Totals</b>	<b>65</b>	<b>28</b>	<b>37</b>	<b>120</b>

Chinook were present in 11 of the entrapments sampled (Table 2). A total of 104 Chinook were collected from these entrapments. For this sampling period, the average number of Chinook per entrapment was 0.9, with the highest concentration occurring in Segment 2.

Table 2. Entrapments with Chinook: May 22, – June 9, 2013

<b>Segment</b>	<b>Entrapments w Chinook</b>	<b>Chinook Present Total</b>	<b>Chinook per Entrapment</b>
<b>1</b>	0	0	0.0
<b>2</b>	7	60	2.7
<b>3</b>	0	0	0.0
<b>4</b>	0	0	0.0
<b>5</b>	0	0	0.0
<b>6</b>	0	0	0.0
<b>7</b>	4	44	1.5
<b>8</b>	0	0	0.0
<b>Totals</b>	<b>11</b>	<b>104</b>	<b>0.9</b>

Of the entrapments evaluated during this bi-weekly period, known fates have been recorded for 48 of the 120 observed (Table 3); 13 reflooded, 22 drained and 13 were considered lethal with a water temperature exceeding 27°C at the time of re-visitation. Of the 11 entrapments that contained Chinook, three reflooded, five drained, one was thermal, and one entrapment fate remained unknown.

Table 3. Entrapment Fates: May 22, - June 9, 2013

<b>Segment</b>	<b>Entrapment Fates</b>			
	<b>Unknown</b>	<b>Reflood</b>	<b>Drain</b>	<b>Temp &gt;27C</b>
<b>1</b>	13	3	8	3
<b>2</b>	13	3	6	0
<b>3</b>	21	1	3	3
<b>4</b>	5	4	0	0
<b>5</b>	1	0	0	0
<b>6</b>	1	0	0	0
<b>7</b>	16	2	5	7
<b>8</b>	2	0	0	0
<b>Totals</b>	<b>72</b>	<b>13</b>	<b>22</b>	<b>13</b>

For this final sampling period unidentified sculpin species and three-spine stickleback were the only non-salmonid species collected from entrapments (Table 4).

Table 4. Other fish species collected: May 22, - June 9, 2013

Segment	Other Species				Total
	NPM*	RSS**	Stickleback	Sculpin	
<b>1</b>	0	0	0	0	<b>0</b>
<b>2</b>	0	0	0	21	<b>21</b>
<b>3</b>	0	0	0	0	<b>0</b>
<b>4</b>	0	0	0	0	<b>0</b>
<b>5</b>	0	0	0	0	<b>0</b>
<b>6</b>	0	0	0	0	<b>0</b>
<b>7</b>	0	0	21	2	<b>23</b>
<b>8</b>	0	0	0	0	<b>0</b>
<b>Totals</b>	<b>0</b>	<b>0</b>	<b>21</b>	<b>23</b>	<b>44</b>

\* Northern pikeminnow

\*\* Redside shiners

**Entrapment Summary: March 2, – June 9, 2013**

As of June 9, 322 transects were visited with 658 entrapments sampled. The total number of Chinook collected thus far is 2,072 fish. Fates of entrapments have been recorded for 287 of the 658 observed (Table 5.).

Table 5. Entrapment Summary: March 2, – June 9, 2013

Segment	Transects Visited	Entrapments Present		Entrapments Sampled	Entrapments w Chinook	Chinook Present Total	Chinook per Entrapment	Entrapment Fates			
		Yes	No					Unknown	Reflood	Drain	Temp >27C
<b>1</b>	70	43	25	185	13	198	1.1	79	11	49	4
<b>2</b>	66	40	26	152	35	484	3.2	76	31	38	7
<b>3</b>	50	24	28	114	19	460	4.0	83	14	24	4
<b>4</b>	27	14	13	67	14	221	3.3	39	18	21	2
<b>5</b>	18	8	12	47	14	472	10.0	29	13	3	0
<b>6</b>	8	3	5	3	0	0	0.0	1	1	1	0
<b>7</b>	42	28	18	82	19	232	2.8	50	7	21	13
<b>8</b>	41	5	36	8	2	5	0.6	3	2	3	0
<b>Totals</b>	<b>322</b>	<b>165</b>	<b>163</b>	<b>658</b>	<b>116</b>	<b>2,072</b>	<b>3.1</b>	<b>360</b>	<b>97</b>	<b>160</b>	<b>30</b>



**Stranding Survey: May 22, – June 9, 2013**

For the final sampling period of May 22, through June 9, the stranding crew visited 27 transects. A total of seven transect lines did not have sufficient river fluctuations to assess stranding (Table 6). The number of plots sampled was 111 for a total area of 5,946 m<sup>2</sup>. Chinook were collected from three of the 111 plots sampled, for a total of three fish.

Table 6. Stranding: May 22, – June 9, 2013

Segment	Transects Visited	Transects Sampled		Plots (#)	Area Sampled	Species			
		Yes	No			Chinook	NPM*	Stickleback	Sculpin
1	8	5	3	3	1676	1	0	0	0
2	6	3	3	23	1659	0	0	0	0
3	3	3	0	40	973	1	0	1	1
4	1	1	0	6	113	0	0	0	0
5	1	1	0	3	126	0	0	0	0
6	0	0	0	0	0	0	0	0	0
7	5	5	0	25	990	1	0	0	0
8	3	2	1	11	409	0	0	0	0
<b>Totals</b>	<b>27</b>	<b>20</b>	<b>7</b>	<b>111</b>	<b>5,946</b>	<b>3</b>	<b>0</b>	<b>1</b>	<b>1</b>

\*Northern Pikeminnow

### Stranding Summary: March 2, – June 9, 2013

As of June 9, 169 transects have been visited. River fluctuations were not sufficient at 34 of the 169 transects to allow sampling. From the remaining 135 transects, 678 plots were sampled for a final area assessment of 34,571 m<sup>2</sup>. A total of 58 Chinook, one northern pikeminnow, four three-spine sticklebacks, one unidentified sucker species, one redb side shiner, and three unidentified sculpin species have been collected.

Table 7. Stranding Summary: March 2, – June 9, 2013

Segment	Transects Visited	Transects Sampled		Plots (#)	Area Sampled	Species					
		Yes	No			Chinook	NPM*	Stickleback	Sucker	RSS**	Sculpin
1	42	34	8	138	7968	9	0	3	0	0	0
2	40	33	7	155	8949	4	1	0	0	0	0
3	15	11	4	81	2733	2	0	0	0	0	1
4	16	11	5	102	5656	23	0	0	0	1	1
5	6	6	0	28	1222	1	0	1	0	0	1
6	2	1	1	33	264	0	0	0	0	0	0
7	38	32	6	133	6841	19	0	0	1	0	0
8	10	7	3	8	938	0	0	0	0	0	0
<b>Totals</b>	<b>169</b>	<b>135</b>	<b>34</b>	<b>678</b>	<b>34,571</b>	<b>58</b>	<b>1</b>	<b>4</b>	<b>1</b>	<b>1</b>	<b>3</b>

\*Northern pikeminnow

\*\*Redside shiners