



Whooshh Innovations, Inc.
201 W Garfield Street, C-126
Seattle, WA 98119

Sept 13, 2019

Columbia River Inter-Tribal Fish Commission
700 NE Multnomah St., Suite 1200
Portland, OR 97232

USACE Bonneville AFF Project Coord.
Bonneville Lock & Dam
Cascade Lock, OR 97014

RE: In-Season Steelhead Report Task 3 Update 4 (Aug 2-Aug 31, 2019)

Dear Jon Hess, Jeff Fryer, John Whiteaker, Stuart Ellis and Andrew Derugin,

Task 3: Steelhead Update Reporting.

Methods: *Biological characteristics of each Steelhead identified*

a). 18 images in a single scan were captured for each fish described below via the FishL™ Recognition system. Forklength measurements were automatically calculated to 1/10 mm. Due to warm temperatures between Aug 2 and Aug 31, 2019, the Bonneville AFF only sampled on nine days. During that time 167 Steelhead were identified in the 848 scans collected. In this set of steelhead scans, there were no scans with multiple fish present. Thus, forklength measurements were captured for all steelhead.

Table 1 below lists the Steelhead identified in the scans taken between Aug 2 and Aug 31, 2019. The information has been added to a continuous table listing all Steelhead identified in the scanned images from April-Aug 31, 2019 (attached Excel file: BV Steelhead Table Update Report 4_final).

b). The adipose presence or absence (clipped) is recorded in Table 1 for each Steelhead.

c). Dorsal fin status is recorded in the table. If there is no table entry the dorsal fin is full and healthy. The term “not visible” or question mark (?) indicates that the dorsal fin viewing was not ideal and thus status is inconclusive. Observations of split dorsal fins are noted. Those that appear to be intact but with the edge having several small splits it listed as “ragged”. Those dorsal fins that are substantially eroded or all but absent have been given a “stubby” descriptor.

d). The date and time a given Steelhead passed through the scanner with images captured is also recorded in Table 1. All time stamps during the April – Aug 31, 2019 are Pacific Daylight Time (PDT).

Results: To date, April – Aug 31, 2019, **270 Steelhead** have been identified in the scans produced by the Whooshh FishL™ Recognition system.

Aug 2 – Aug 31, 2019 = 167

July 18-Aug 1, 2019 = 32

July 1-July 17, 2019

= 32

Apr – June 30, 2019

= 39* (*one as discussed in update report 1 is likely a Steelhead)

Of the 167 Steelhead identified Aug2-Aug 31, 2019 two were larger than 780 mm.

W131 was a 821.7 mm Steelhead, adipose – present

W174 was a 782.0 mm Steelhead, adipose – clipped

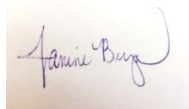
Within this group of 167 Steelhead, the average forklength was 590.8 mm. The adipose fin was not visible, due to water occlusion of viewing or the fish being inverted as it slid through the scanner, on three fish (1.8%). On sixty-seven Steelhead the adipose fin was present (40% wild) and for ninety-seven Steelhead the adipose fin was clipped (58% hatchery).

119 (71%) appeared to have normal, healthy, full dorsal fins. 27 (16%) had stubby, eroded dorsal fins. The dorsal fin was not visible for 8 Steelhead (5%). Eight steelhead had a split dorsal fin (5%) and five had multiple small dorsal fin splits giving a “ragged” appearance (3%). There were a considerable number of noted minor injuries (fins splits, scrapes, descale, sores) to major injuries (open wounds, torn tails, scratches) which are described per fish in Table 1.

Conclusion: Between April and Aug 31, 2019 there were a series of dates in which the Bonneville AFF was operational and fish that passed over the right-side false weir, and were not selected for sampling, slid through the right-side bypass and were imaged via the Whooshh FishL™ Recognition system before exiting into a calm channel connected to the fish ladder. Within this timeframe and under these conditions, 7841 scans were recorded, and date and time of scan logged. Two hundred and seventy scans contained fish that were identified as Steelhead. As determined by adipose presence or clipped adipose, 47% of the 270 Steelhead identified were of native, wild, origin, 51% were of hatchery origin and 1.9% were undetermined as the adipose region was not visible in the scans.

There have been some spiders that have entered the scanner and have occasionally triggered images to be taken when no fish are present but otherwise the is functioning well. The above data and additional Sockeye and Chinook data from the Bonneville AFF FishL™ Recognition system will be passed on to Jeff Fryer at CRITFC for an AFF presentation. Inquires as to the data or report please feel free to contact me.

Best regards,



Janine Bryan

Whooshh Innovations, Inc.

janine.bryan@whooshh.com

(206) 801-3565 ext 16

Table 1: Steelhead identified via the FishL™ Recognition system at Bonneville AFF between Aug 2- Aug 31, 2019. W# is the Steelhead number. The dark shaded ForkLength boxes highlight two Steelhead >780 mm.

W#	ScanNumber	Species	Adipose	ForkLength	ScanDate	ScanTime	Dorsal	Condition
104	6992	STEELHEAD	clipped	600.0	8/12/2019	8:41:59 AM	stubby	descale, lots of scratches and small wounds
105	6993	STEELHEAD	present	617.8	8/12/2019	8:44:53 AM		
106	7006	STEELHEAD	not visible	493.6	8/12/2019	9:15:29 AM	not visible	few sores
107	7011	STEELHEAD	present	547.9	8/12/2019	9:37:09 AM		scrapes
108	7012	STEELHEAD	present	569.3	8/12/2019	9:37:46 AM		descale, scrapes
109	7019	STEELHEAD	present	589.9	8/12/2019	10:07:33 AM		scrapes
110	7022	STEELHEAD	present	541.2	8/12/2019	10:22:52 AM		
111	7027	STEELHEAD	clipped	638.4	8/12/2019	10:38:31 AM		descale, scrapes
112	7031	STEELHEAD	clipped	515.5	8/12/2019	10:44:04 AM	ragged	scrapes, scratches
113	7039	STEELHEAD	clipped	510.7	8/12/2019	11:02:51 AM	stubby	
114	7040	STEELHEAD	present	478.8	8/12/2019	11:04:31 AM	ragged	small adipose, multiple sores, small wounds, tail clip
115	7042	STEELHEAD	present	699.8	8/12/2019	11:05:49 AM		net descale, multiple small tail splits
116	7044	STEELHEAD	clipped	722.1	8/19/2019	10:21:10 AM	not visible	
117	7045	STEELHEAD	present	512.6	8/19/2019	10:21:19 AM		descale, clipped/split tail
118	7047	STEELHEAD	clipped	623.4	8/19/2019	10:29:10 AM		descale, split tail
119	7048	STEELHEAD	clipped	685.4	8/19/2019	10:29:40 AM		scratches, scrapes
120	7059	STEELHEAD	present	654.5	8/19/2019	10:51:06 AM		net scrapes, descale
121	7060	STEELHEAD	clipped	561.9	8/19/2019	10:52:19 AM		dorsal notched, scrape
122	7063	STEELHEAD	present	519.7	8/19/2019	10:52:54 AM		scratches, descale
123	7066	STEELHEAD	clipped	567.4	8/19/2019	10:56:50 AM		descale
124	7067	STEELHEAD	present	666.5	8/19/2019	11:01:27 AM		
125	7069	STEELHEAD	clipped	565.0	8/19/2019	11:05:38 AM		dorsal notched, scrapes, net
126	7072	STEELHEAD	clipped	699.5	8/19/2019	11:14:32 AM	stubby	small multip open wounds
127	7079	STEELHEAD	clipped	511.8	8/20/2019	7:44:43 AM		split tail
128	7094	STEELHEAD	clipped	406.4	8/20/2019	9:24:15 AM	stubby	eroded tail
129	7099	STEELHEAD	present	517.7	8/20/2019	9:49:38 AM		open wound
130	7100	STEELHEAD	clipped	510.1	8/20/2019	9:50:46 AM		
131	7102	STEELHEAD	present	821.7	8/20/2019	9:50:57 AM		descale, split tail
132	7111	STEELHEAD	present	687.8	8/20/2019	9:59:15 AM	split fin	tail clip multi tail splits, descale, scrapes multi small wounds/sores
133	7113	STEELHEAD	clipped	567.7	8/20/2019	10:01:12 AM	stubby	open tail wound
134	7114	STEELHEAD	clipped	522.5	8/20/2019	10:01:58 AM	stubby	
135	7123	STEELHEAD	clipped	632.6	8/20/2019	10:31:51 AM		large scrape, descale
136	7133	STEELHEAD	clipped	593.7	8/20/2019	10:42:48 AM		descale, small sore
137	7136	STEELHEAD	clipped	567.3	8/20/2019	10:46:49 AM		large patch descale
138	7137	STEELHEAD	present	431.5	8/20/2019	10:48:37 AM	split fin	open wound, scratches, descale, sores
139	7139	STEELHEAD	clipped	644.1	8/20/2019	10:49:53 AM	stubby	anal fin wound
140	7143	STEELHEAD	clipped	523.7	8/20/2019	11:01:38 AM	stubby	
141	7147	STEELHEAD	clipped	571.5	8/20/2019	11:15:04 AM		multi small sores
142	7148	STEELHEAD	present	546.5	8/20/2019	11:18:39 AM	split fin	
143	7151	STEELHEAD	present	734.4	8/20/2019	11:25:39 AM		parallel scratches, sore
144	7158	STEELHEAD	clipped	667.7	8/21/2019	8:04:55 AM		
145	7161	STEELHEAD	present	707.9	8/21/2019	8:07:51 AM		open wound, scratches, torn tail
146	7167	STEELHEAD	clipped	660.5	8/21/2019	8:25:45 AM	split fin, small	
147	7169	STEELHEAD	present	539.0	8/21/2019	8:27:54 AM		
148	7184	STEELHEAD	clipped	546.4	8/21/2019	8:50:32 AM	not visible	
149	7188	STEELHEAD	clipped	718.7	8/21/2019	8:59:25 AM		descale, small tail wound, scratches
150	7194	STEELHEAD	present	704.9	8/21/2019	9:02:13 AM		dorsal notched
151	7204	STEELHEAD	present	585.8	8/21/2019	9:19:07 AM		open wounds, descale
152	7211	STEELHEAD	clipped	665.7	8/21/2019	9:36:01 AM		
153	7214	STEELHEAD	clipped	690.0	8/21/2019	9:36:38 AM	stubby	scratches scrapes, descale, sore
154	7217	STEELHEAD	present	583.8	8/21/2019	9:42:28 AM		
155	7219	STEELHEAD	present	563.3	8/21/2019	9:47:37 AM		caudal wound
156	7222	STEELHEAD	clipped	563.1	8/21/2019	9:55:22 AM	stubby	sores
157	7223	STEELHEAD	clipped	762.1	8/21/2019	9:59:04 AM	ragged	
158	7224	STEELHEAD	present	714.2	8/21/2019	10:00:50 AM		scratches
159	7226	STEELHEAD	present	532.8	8/21/2019	10:02:23 AM	not visible	open wounds, descale
160	7228	STEELHEAD	clipped	561.4	8/21/2019	10:03:42 AM	stubby	sores
161	7232	STEELHEAD	clipped	560.9	8/21/2019	10:07:29 AM		descale, net damage, tail splits
162	7233	STEELHEAD	present	530.9	8/21/2019	10:11:33 AM		
163	7234	STEELHEAD	clipped	523.4	8/21/2019	10:11:49 AM		net damage , descale, sores
164	7237	STEELHEAD	present	559.5	8/21/2019	10:21:34 AM		dorsal notched, sores
165	7243	STEELHEAD	clipped	646.2	8/21/2019	10:25:20 AM		dorsal ok
166	7244	STEELHEAD	clipped	498.9	8/21/2019	10:26:31 AM	not visible	open wounds, sores
167	7245	STEELHEAD	present	608.4	8/21/2019	10:28:30 AM	split fin	sore
168	7246	STEELHEAD	clipped	541.1	8/21/2019	10:30:32 AM		descale, scrapes, sore
169	7254	STEELHEAD	clipped	601.1	8/21/2019	10:36:20 AM	ragged	
170	7259	STEELHEAD	present	578.3	8/21/2019	10:51:54 AM	not visible	net damage, descale
171	7263	STEELHEAD	present	535.4	8/21/2019	11:05:54 AM		caudal wounds, descale
172	7264	STEELHEAD	clipped	533.8	8/21/2019	11:07:35 AM	ragged	descale, sores
173	7269	STEELHEAD	clipped	540.2	8/21/2019	11:16:53 AM		
174	7287	STEELHEAD	clipped	782.0	8/23/2019	8:19:20 AM		
175	7288	STEELHEAD	present	574.1	8/23/2019	8:22:23 AM		
176	7301	STEELHEAD	clipped	577.6	8/23/2019	8:42:41 AM	stubby	open wound, sores
177	7303	STEELHEAD	present	519.1	8/23/2019	8:45:32 AM		sores, tail tip torn
178	7306	STEELHEAD	clipped	583.6	8/23/2019	8:46:33 AM	stubby	scrapes, descale
179	7310	STEELHEAD	clipped	621.8	8/23/2019	8:50:25 AM		sores
180	7314	STEELHEAD	clipped	713.9	8/23/2019	8:51:55 AM		scrapes, descale
181	7326	STEELHEAD	present	766.0	8/23/2019	9:14:11 AM		
182	7344	STEELHEAD	clipped	605.0	8/23/2019	9:35:55 AM		sores
183	7347	STEELHEAD	clipped	601.0	8/23/2019	9:38:45 AM		scratches, sores
184	7350	STEELHEAD	clipped	391.1	8/23/2019	9:40:08 AM		

W#	ScanNumber	Species	Adipose	ForkLength	ScanDate	ScanTime	Dorsal	Condition
185	7351	STEELHEAD	present	585.7	8/23/2019	9:40:36 AM		sores
186	7356	STEELHEAD	clipped	512.7	8/23/2019	9:59:42 AM		
187	7366	STEELHEAD	present	584.9	8/23/2019	10:17:25 AM		descale, scrapes, sores, net
188	7372	STEELHEAD	clipped	533.6	8/23/2019	10:32:16 AM		large descale, scrapes
189	7373	STEELHEAD	clipped	608.2	8/23/2019	10:36:01 AM	stubby	sore
190	7375	STEELHEAD	clipped	572.1	8/23/2019	10:38:47 AM		large descale, scrapes
191	7377	STEELHEAD	present	547.0	8/23/2019	10:50:35 AM		descale
192	7409	STEELHEAD	clipped	525.8	8/26/2019	9:07:51 AM		sore
193	7416	STEELHEAD	clipped	596.9	8/26/2019	9:20:31 AM		sores
194	7420	STEELHEAD	clipped	447.2	8/26/2019	9:21:29 AM		sores, descale
195	7438	STEELHEAD	clipped	547.3	8/26/2019	9:43:24 AM	stubby	open sore wound
196	7440	STEELHEAD	clipped	527.5	8/26/2019	9:44:56 AM	stubby	descale
197	7448	STEELHEAD	clipped	605.9	8/26/2019	9:50:33 AM		
198	7449	STEELHEAD	present	566.0	8/26/2019	9:50:37 AM		descale, sores
199	7454	STEELHEAD	clipped	750.3	8/26/2019	9:56:13 AM	stubby	split tail
200	7461	STEELHEAD	clipped	659.5	8/26/2019	10:03:16 AM		scratch, wound
201	7466	STEELHEAD	clipped	577.7	8/26/2019	10:10:29 AM		descale scrape pattern
202	7469	STEELHEAD	present	513.6	8/26/2019	10:14:46 AM		
203	7480	STEELHEAD	clipped	648.5	8/26/2019	10:29:27 AM		small open wound, descale
204	7481	STEELHEAD	present	622.3	8/26/2019	10:29:31 AM	split fin	
205	7483	STEELHEAD	clipped	523.4	8/26/2019	10:31:31 AM	not visible	small wound, sore
206	7484	STEELHEAD	clipped	580.8	8/26/2019	10:32:28 AM	stubby	clipped tail
207	7485	STEELHEAD	present	487.7	8/26/2019	10:33:30 AM		sores
208	7486	STEELHEAD	clipped	717.2	8/26/2019	10:34:26 AM		multi tail splits, sores
209	7489	STEELHEAD	clipped	594.1	8/26/2019	10:35:39 AM		net scrape, descale
210	7495	STEELHEAD	present	560.5	8/26/2019	10:40:41 AM		net scrape
211	7498	STEELHEAD	present	708.6	8/26/2019	10:44:36 AM		split tail
212	7502	STEELHEAD	clipped	587.6	8/26/2019	10:49:58 AM	split fin	descale, scrapes
213	7510	STEELHEAD	present	529.7	8/26/2019	10:55:19 AM		
214	7511	STEELHEAD	present	622.5	8/26/2019	10:57:02 AM		open wounds, sores, descale
215	7518	STEELHEAD	present	620.4	8/26/2019	10:59:25 AM		small split, descale
216	7520	STEELHEAD	clipped	580.1	8/26/2019	11:00:09 AM		descale, sores
217	7545	STEELHEAD	present	526.3	8/26/2019	11:13:35 AM		
218	7568	STEELHEAD	present	578.7	8/26/2019	11:23:27 AM		
219	7571	STEELHEAD	clipped	618.6	8/26/2019	11:24:40 AM		
220	7572	STEELHEAD	present	534.8	8/26/2019	11:25:26 AM		sore
221	7575	STEELHEAD	clipped	538.0	8/26/2019	11:27:19 AM	split fin, small	descale
222	7591	STEELHEAD	clipped	647.8	8/27/2019	8:25:48 AM		
223	7602	STEELHEAD	clipped	619.8	8/27/2019	8:54:08 AM		scrapes and net descale
224	7603	STEELHEAD	present	484.1	8/27/2019	8:56:52 AM		sore, descale, scrapes
225	7611	STEELHEAD	present	547.8	8/27/2019	9:24:49 AM		sore
226	7612	STEELHEAD	clipped	698.0	8/27/2019	9:25:39 AM		descale
227	7619	STEELHEAD	present	570.9	8/27/2019	9:39:32 AM		
228	7620	STEELHEAD	clipped	562.7	8/27/2019	9:40:26 AM		sores, descale, scrapes
229	7628	STEELHEAD	present	714.1	8/27/2019	10:13:26 AM	stubby	
230	7638	STEELHEAD	present	520.7	8/27/2019	10:39:19 AM		large descale, scrape, sores
231	7652	STEELHEAD	clipped	581.7	8/28/2019	8:39:54 AM		scrapes
232	7653	STEELHEAD	clipped	578.6	8/28/2019	8:40:00 AM		descale, scrapes, sores
233	7656	STEELHEAD	present	716.6	8/28/2019	8:55:45 AM		parallel scratches
234	7662	STEELHEAD	clipped	687.0	8/28/2019	9:12:14 AM	stubby	many sores
235	7669	STEELHEAD	present	645.7	8/28/2019	9:21:31 AM		sores
236	7673	STEELHEAD	clipped	476.1	8/28/2019	9:28:12 AM		descale
237	7688	STEELHEAD	clipped	529.1	8/28/2019	9:55:30 AM	stubby	net scrape, descale
238	7693	STEELHEAD	clipped	756.5	8/28/2019	9:58:16 AM		
239	7694	STEELHEAD	clipped	603.5	8/28/2019	10:00:05 AM		open scratch wound
240	7695	STEELHEAD	present	581.3	8/28/2019	10:00:23 AM		scapes, descale
241	7700	STEELHEAD	clipped	690.5	8/28/2019	10:09:08 AM		red band
242	7733	STEELHEAD	clipped	522.2	8/29/2019	8:05:32 AM		
243	7734	STEELHEAD	present	590.8	8/29/2019	8:13:52 AM		scrape, descale
244	7743	STEELHEAD	not visible	572.0	8/29/2019	8:44:44 AM		
245	7749	STEELHEAD	clipped	520.3	8/29/2019	9:01:23 AM	stubby	
246	7751	STEELHEAD	present	532.3	8/29/2019	9:11:04 AM		descale, sores, tail damage
247	7758	STEELHEAD	present	638.9	8/29/2019	9:33:52 AM		
248	7768	STEELHEAD	present	726.5	8/29/2019	9:42:48 AM		
249	7769	STEELHEAD	present	690.5	8/29/2019	9:44:29 AM	stubby	net descale, scrapes
250	7774	STEELHEAD	present	589.6	8/29/2019	9:48:32 AM		
251	7778	STEELHEAD	clipped	575.9	8/29/2019	9:55:00 AM		descale
252	7781	STEELHEAD	present	586.5	8/29/2019	10:01:08 AM		
253	7785	STEELHEAD	clipped	659.7	8/29/2019	10:03:54 AM		open wound, sores, descale
254	7797	STEELHEAD	clipped	696.5	8/29/2019	10:19:50 AM		
255	7801	STEELHEAD	clipped	535.6	8/29/2019	10:26:26 AM		sore
256	7803	STEELHEAD	clipped	541.5	8/29/2019	10:29:56 AM	stubby	
257	7804	STEELHEAD	clipped	565.0	8/29/2019	10:34:00 AM		
258	7805	STEELHEAD	present	610.8	8/29/2019	10:34:17 AM		descale, sore
259	7806	STEELHEAD	clipped	704.5	8/29/2019	10:35:39 AM	stubby	split tail
260	7809	STEELHEAD	clipped	499.4	8/29/2019	10:51:22 AM	stubby	
261	7810	STEELHEAD	clipped	560.5	8/29/2019	10:54:17 AM		torn tail, open wound
262	7815	STEELHEAD	present	590.0	8/29/2019	10:58:05 AM		descale
263	7817	STEELHEAD	present	525.9	8/29/2019	11:00:04 AM		net descale
264	7819	STEELHEAD	clipped	549.4	8/29/2019	11:03:20 AM		
265	7820	STEELHEAD	present	510.7	8/29/2019	11:04:14 AM		descale, sore
266	7823	STEELHEAD	clipped	513.8	8/29/2019	11:16:08 AM		multi small wounds, sores
267	7824	STEELHEAD	clipped	555.0	8/29/2019	11:16:33 AM		
268	7826	STEELHEAD	clipped	577.1	8/29/2019	11:18:37 AM	stubby	descale, split tail, net damage
269	7830	STEELHEAD	not visible	590.0	8/29/2019	11:24:03 AM	not visible	
270	7831	STEELHEAD	clipped	548.3	8/29/2019	11:24:22 AM		sores