U.S. Fish and Wildlife Service

Translocation of Lower Columbia River Fall Chinook Salmon (*Oncorhynchus tshawytscha*) In the Year of Condit Dam Removal and Year One Post-Removal Assessments

2011 and 2012 Report

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On the cover: Breaching of Condit Dam on October 26, 2011. Photograph by Andy Maser - National Geographic.

Below: Joe Skalicky, USFWS, transporting captured Lower Columbia River fall Chinook salmon for eventual translocation to the upper White Salmon River in September 2011.
Photo Credit – Rod Engle USFWS.

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Yakama Nation
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U.S. Geological Survey – Biological Resources Division
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FINAL REPORT

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Abstract – In September 1999, a Settlement Agreement was signed by PacifiCorp and State, Federal, Tribal and non-governmental organizations to remove Condit Dam and reopen the upper White Salmon River to fish passage. The breaching of Condit Dam in 2011 and draining of Northwestern Lake was expected to temporarily eliminate anadromous spawning in the lower river by inundating the spawning area with reservoir sediments. In 2008, a decision was made by the White Salmon Working Group consisting of the U.S. Fish and Wildlife Service, Yakama Nation, Washington Department of Fish and Wildlife, NOAA-Fisheries, U.S. Forest Service, PacifiCorp and U.S. Geological Survey-Biological Resources Division to translocate returning adult lower Columbia River (LCR) fall Chinook salmon (*Oncorhynchus tshawytscha*) from downstream of Condit Dam into upstream areas not impacted by Condit Dam deconstruction. In September and October 2011, 679 LCR fall Chinook salmon were translocated upstream of Condit Dam and allowed to spawn in an area not impacted by the large sediment release from dam breaching on October 26th, 2011. A total of 191 redds were observed from the 310 female fall Chinook salmon translocated in the upstream area of the White Salmon River but 24% occurred in an area where bed downcutting in the upper end of the former reservoir likely affected their survival. Overall, the 2011 translocation effort was a success based on pre-removal planning and the criteria outlined. In 2012, one year post-breaching of Condit Dam, high counts of 194 LCR fall Chinook salmon redds and 257 bright fall Chinook salmon redds were recorded during individual spawning ground surveys for both stocks. Redds of both Chinook salmon stocks were documented both upstream and downstream of the former Condit Dam site. Natural origin composition of carcasses based on presence of an adipose fin was 93% for 118 total LCR fall Chinook salmon and 71% for 97 for bright fall Chinook salmon observed carcasses. Total escapement of LCR fall Chinook salmon in 2012 was 755 adults and 1,061 for bright fall Chinook salmon.

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Introduction

The White Salmon Working Group (WSWG), consisting of the U.S. Fish and Wildlife Service - USFWS, Yakama Indian Nation-YN, Washington Department of Fish and Wildlife-WDFW, National Marine Fisheries Service-NMFS, U.S. Forest Service-USFS, PacifiCorp and U.S. Geological Survey-USGS, has been meeting since late 2006 to determine the actions needed to restore fish populations in the White Salmon River after Condit Dam removal. Based on the results of these meetings and in addition to on-the-ground research (Allen and Connolly 2005 and 2011, Smith and Engle 2011), a consensus decision was made to translocate adult fall Chinook salmon upstream of Condit Dam during the year of dam removal. This option was chosen in lieu of adult collection and subsequent propagation previously required in the National Marine Fisheries Service 2006 Biological Opinion (NMFS 2006). In fall 2008 and 2009, two focused field studies were conducted in the White Salmon River to inform the translocation decision in the year of actual removal. These studies identified and evaluated the efficacy of the preferred methods that were implemented in the year of dam removal (Engle and Skalicky 2009, Engle et al. 2010).

The goal of the chosen conservation measure for Endangered Species Act-Listed (ESA-Listed) Lower Columbia River (LCR) fall Chinook salmon was to mitigate for the impacts from the release of impounded sediment released downstream on the spawning habitat by enabling a portion of the population to spawn naturally upstream of the dam in historically occupied habitat. To accomplish this conservation measure, a minimum of 500 LCR fall Chinook salmon were estimated to be needed for capture and translocation upstream of Condit Dam prior to removal. The WSWG saw this as a reasonable goal for seeding the available spawning habitat in the White Salmon River based on ecosystem diagnosis and treatment methodology or EDT by Allen and Connolly (2005). Additional measures were planned for implementation in case this goal was not achieved through translocation. These additional measures relied on hatchery origin transfers or artificial production actions (Engle et al. 2011, Appendix A).

The 2011 translocation effort and the follow up monitoring in 2011 and 2012 was a cooperative effort between the Agencies and members of the White Salmon Working Group. The monitoring and actions were based on standard hatchery and fish research and monitoring protocols. The actions completed during the translocation effort of LCR fall Chinook salmon addressed the Reasonable and Prudent Measures, Terms and Conditions #2 in the NMFS (2006) Biological Opinion,

"Minimize direct take of listed species during adult salvage operation by following standard hatchery protocols for collecting, holding, and spawning brood stock".

The actions also addressed the Reasonable and Prudent Measures, Terms and Conditions #5 in the USFWS (2002) Biological Opinion and terms and conditions of USFWS (2005) Biological Opinion,

"Develop and implement a bull trout protection plan, in consultation with the Service that addresses handling and relocation protocols in the event bull trout are trapped and collected during the fish salvage efforts."

Methods

Operation of a resistance board weir and modified fast-pursuit seining was conducted in the lower White Salmon River to achieve the minimum goal of 500 ESA-Listed fall Chinook salmon spawners captured and transported upstream of Condit Dam. Use of these two methods for capture were nearly identical to previous research activities conducted to prepare for Condit Dam removal in 2008 (Engle and Skalicky 2009) and 2009 (Engle et al. 2010) in the White Salmon River. Differences in techniques or actions from previous actions, or from the proposed actions to be taken in 2011 (Engle et al. 2011, Appendix A) are identified and described.

Resistance Board Weir and White Salmon Ponds Collection Facility

A Resistance Board Weir (RBW) was installed at river mile 1.1 during August 11th and 12th, 2011 and combined with a dormant brood stock collection facility owned by the U.S. Fish and Wildlife Service, to capture migrating LCR fall Chinook salmon for translocation (Figure 1). The U.S. Fish and Wildlife Service along with assistance from the Yakama Nation, WDFW and other White Salmon Working Group members installed the weir using identical methods outlined in Engle et al. (2010) with assistance from experienced staff of the Washington Department of Fish and Wildlife. Removal of the weir occurred on October 20th 2011 prior to the breaching of Condit Dam on October 26th, 2011. The weir was considered a temporary weir for the operation and collection of LCR fall Chinook salmon during the year of dam removal. A temporary operational request by the USFWS – Spring Creek National Fish Hatchery to PacifiCorp for reduced flows from Condit Dam in the lower White Salmon River facilitated safe and efficient installation and removal conditions (Figure 2).

Operation of the temporary collection facility on the White Salmon River occurred daily from August 29th through October 5th, 2011. Migrating salmon or steelhead entered the facility through a fish ladder located adjacent to the RBW after encountering the weir and being attracted by flow at the ponds entrance. Adult salmon and steelhead jumped through a number of fish ladder steps and entered a final holding area with a modified finger weir to reduce fish escaping the area and to provide security. Unlike the 2009 operation (Engle and Skalicky 2009), the RBW did not have a passage chute for upstream passage of salmon or steelhead and operated as a complete upstream barrier. By not allowing upstream passage, installation of the weir and likely reduced potential mortality from sediment released during dam removal activities. Downstream passage of adults that may have been trapped upstream prior to the installation of the weir occurred from fish moving over the top of the weir from the upstream side with the aid of sandbags placed to "sink" portions of the weir where flows were greater. This has been effective with other resistance board weir operations where downstream steelhead passage was a concern (Kenneth Gates, USFWS, personal communication, June 29, 2009) and was also effective for previous operations at the site in 2009 (Engle et al. 2010).

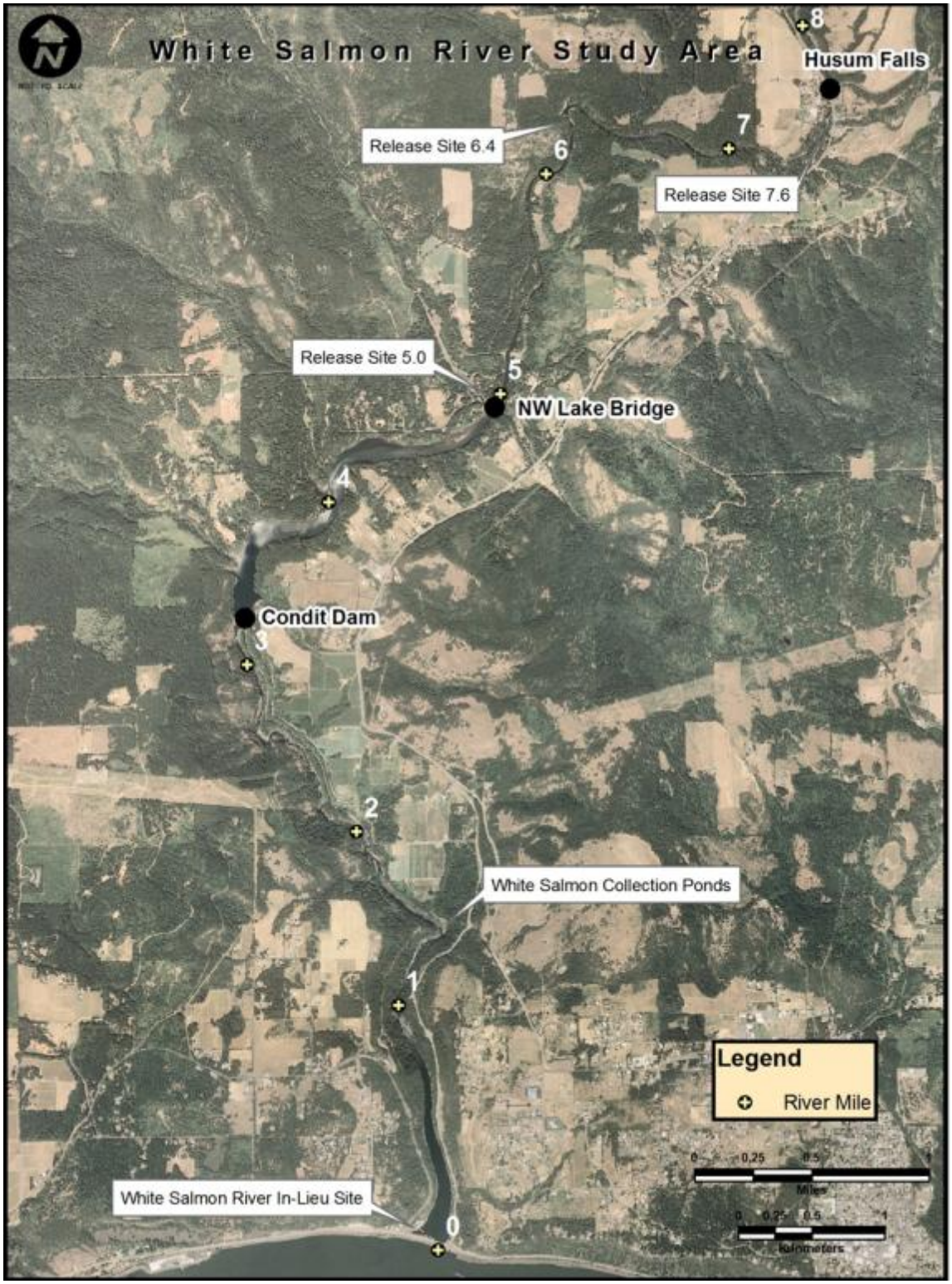

Figure 1. Map of the lower White Salmon River, Washington from RM 8.0 to the confluence with the Columbia River. Release sites of LCR fall Chinook salmon as well as the White Salmon Collection Ponds, the site of Condit Dam (2011) and other landmarks are noted.

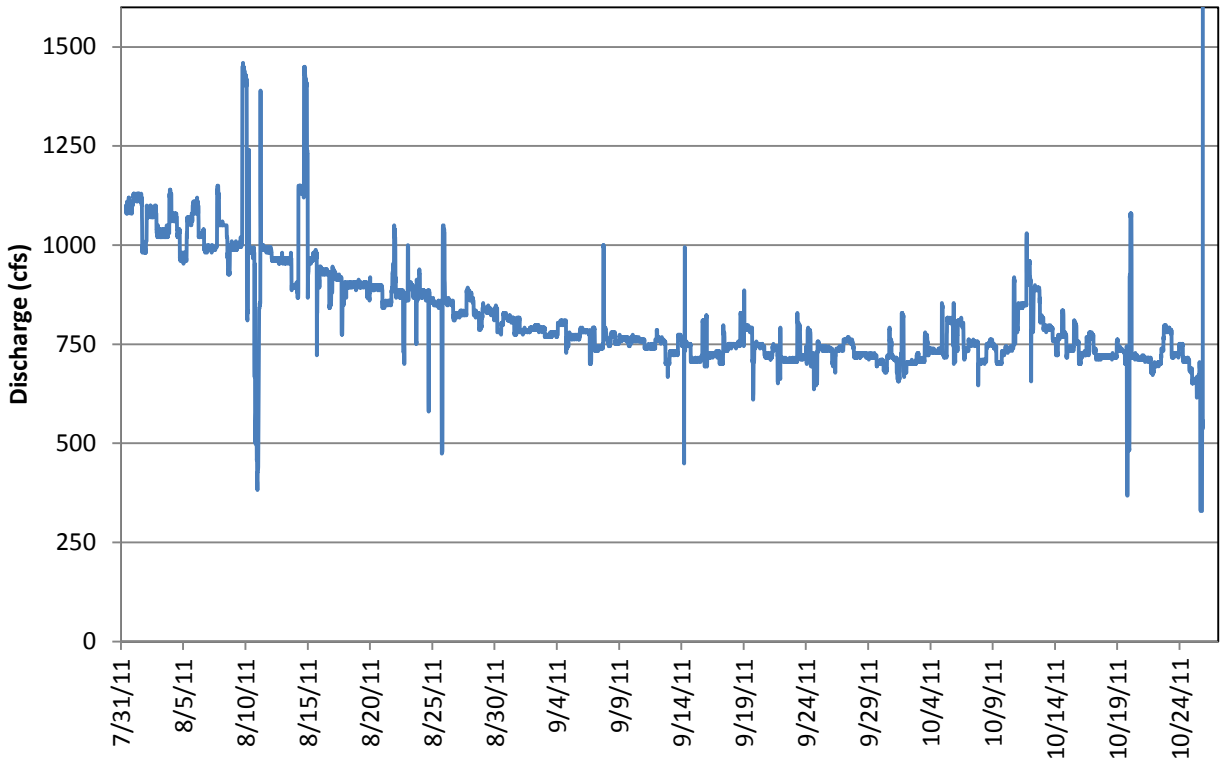

Figure 2. River flows (cubic feet per second) in the White Salmon River from August 1, 2011 to dam breach on October 26, 2011. The discharge spike on the right depicts the increase in flows immediately following dam breach before the gage failed at 13,600 cfs. Days of USFWS requested reduced flows for weir installation and removal were on August 11th and October 20th, 2011.

All captured adult salmon and steelhead were crowded within the upper containment area of the collection facility and biological sampling was conducted. Individual fish were placed in a 150 gallon holding container with a consistently pumped fresh water supply and positioned either in a PVC coated fabric cradle or in a large, 2-inch mesh dip net for biological sampling. Fish were anesthetized using a low voltage DC current (Hudson et al. 2011) while being physically held by staff. A fin clip was removed for genetic archival and hatchery or natural origin was determined (adipose fin absence or presence, respectively). For all LCR fall Chinook salmon, coho salmon, pink salmon or steelhead, a uniquely numbered floy tag was inserted adjacent to the dorsal fin, in the white muscle tissue. These tags facilitated subsequent identification of individual adults during both spawning ground surveys conducted for LCR fall Chinook salmon upstream of the dam, for recaptures of previously released coho salmon and steelhead during continued operation of the ponds, or during seining. Recovery from electronarcosis occurred within seconds and LCR fall Chinook salmon were immediately transferred to a waiting transport truck. All other captures were released on-site immediately downstream of the weir through a return tube to the White Salmon River. A plan to translocate recaptured wild steelhead that were genetically related to *Oncorhynchus mykiss* populations upstream of Condit Dam was also put in place (Engle et al. 2011 Appendix A), but the opportunity to execute it did not occur. Additionally, plans for incidentally captured bull trout and numerous repeated captures of previously sampled or captured coho salmon and hatchery steelhead did not require implementation as planned in Engle et al. (2011, Appendix A). An unanticipated fish salvage effort that involved relocating both adult and juvenile fish species from a pool immediately below Condit Dam downstream approximately 40 meters is presented in Appendix B.

Seining in Lower White Salmon River

Beach seines were deployed by boat in simple arc and fast-pursuit sets for the capture of LCR fall Chinook salmon in the lower White Salmon River from river mile (RM) 0.6 to 0.9 similar to methods described by Engle and Skalicky (2009). Seining occurred 3 days per week starting on September 6th, 2011 and ending on September 30th, 2011. Several smaller panels of 15.2, 22.9, 30.5, 45.7 or 53.3 meter seines were combined by the crew on days of seining to allow variable lengths (61.0 to 83.8 meters) to effectively fish targeted areas of the lower White Salmon River. Panel depths varied but were specifically combined to transition from 1.8-m deep in shallower areas where net deployment originated, to a 3.7-m depth panel tied up to 2.4-m to create an encompassing feature around trapped adults when it was pulled by the boat or crew. This design limited adult escapement either over the top or below the seine. Net mesh size varied between 63.5 to 88.9-mm knotless, diamond panels on the combined seines. Seines were deployed upstream of or through aggregations of adults staging below and within spawning gravels in the lower White Salmon River.

Once seines were collapsed by crew members, captured fish were removed by hand, dip net, or fish sleeve and then transferred immediately to a 150-gallon tote with fresh river water in a boat for downriver transport. All captured LCR fall Chinook salmon were retained for translocation upstream of Condit Dam unless they appeared post-spawn or were degraded from spawning activities in which case they were immediately released and not counted as part of the overall catch of the day. All steelhead and coho salmon were also collected for downstream transport unless they were identified as recaptures based on the presence of a floy tag. All captures were

then transported by boat to a mobile biological sampling station located at RM 0.7. The sampling station consisted of a modified screw trap frame with three perforated 150-gallon totes securely submerged within the river for water exchange and one extra tote above the water line for electronarcosis and biosampling. Steelhead, coho or pink salmon were biologically sampled and then released on-site. Retained LCR fall Chinook salmon were processed using identical methods described for pond captures. Adult LCR fall Chinook were held in totes within the barge from 15 minutes to 2 hours depending on daily catch, transport vehicle activities, or until a suitable number of fish were available for tagging and transport to the waiting transport truck (≥ 4 salmon). Following sampling, retained fish were transferred from in-river totes and placed back into 150-gallon totes within boats for transport to a transport truck at the Underwood In-Lieu Site located at RM 0.1 downstream. Translocation to upriver release sites usually took 10 to 20 minutes depending on the site and size of the load. The 400-gallon insulated holding tank was fitted with a supplemental oxygen supply and water temperature was maintained within the temperatures recorded at seining and biological sampling sites (45-48°). Fish were transferred at a capacity well below the one fish per 4.5 ft^3 of water recommended by WDFW and USFWS adult transportation guidelines. None of the transfer trucks loads ever had more than 30 adults.

Release Sites

In 2011, three sites were used to release LCR fall Chinook salmon back into the White Salmon River upstream of Condit Dam. One was located on PacifiCorp property at RM 5.0 at the site of a gas line easement, a second site was on private property near RM 6.4, and the third site a private property near RM 7.6 in the town of Husum, WA immediately downstream of Husum Falls on the White Salmon River (Figure 1). Adults were released into the White Salmon River by releasing a lift gate in the rear of the holding tank and funneling adults and the tank water through a 0.91 by 3.65-m flexible, plastic pipe into the river. At the RM 6.4 release site, fish were removed from the tank and placed either in a knotless dipnet or into a transport sleeve and released by hand into the river. During releases, fish were observed for approximately 1 to 2 minutes to ensure all fish were alive and holding in current before dispersing.

Redd Surveys – 2011 and 2012

In 2011, the objective of the redd surveys was to identify and enumerate the total number of LCR fall Chinook salmon redds present in the upstream release areas. The primary survey area was from Husum Falls at RM 7.8 down to Northwestern Reservoir at RM 4.9. This area was surveyed on three separate occasions each a week apart. A secondary survey area was located between RM 12.4 down to Husum Falls at RM 7.8 and was only surveyed on one occasion. This section is thought to be inaccessible to LCR fall Chinook salmon due to the height of Husum Falls and low flows at that time of the year. Redd surveys were conducted from inflatable, whitewater rafts and guided by a rafting guide contracted through Wet Planet Whitewater of Husum, WA who was trained in Swiftwater Rescue Techniques (SRT certified). The 2.9 mile reach downstream of Husum Falls to the upstream terminus of Northwestern Reservoir was subdivided into 4 reaches based on landmarks. Reach 1 was from Husum Falls to a bend in the river at RM 7.1. Reach 2 was from RM 7.1 to the entrance of Spring Creek at RM 6.6. Reach 3 was from RM 6.6 to the crossing point for water pipeline at RM 5.6. Reach 4 was from RM 5.6 to the Northwestern Park at RM 4.9. Individual redds were visually identified from the surface

by one or more survey crew members. Redd observations were enumerated in each section accordingly. Observations were recorded on data sheets and all redds were marked on detailed field maps for later digitizing and enumeration in a GIS.

In 2012, the objectives of the redd surveys were two-fold. First, to collect data for WDFW and Pacific States Marine Fisheries Commissions staff for their annual White Salmon River LCR fall Chinook salmon escapement estimate as well as the composition adult origin (hatchery or natural), and secondly to identify and estimate the total number of LCR and bright fall Chinook salmon redds present in the White Salmon River. These two different stocks of fall Chinook are present in the White Salmon River and have been previously documented in juvenile collections and genetic studies (Allen and Connolly 2011, Smith and Engle 2011). As adults, ESA-listed LCR fall Chinook salmon exhibit advanced maturation and darkened skin at freshwater entry while bright fall Chinook salmon lack these secondary characteristics, having brighter skin at freshwater entry and maturing 1–3 months after freshwater entry. With the exception of late fall–run Chinook salmon in the Lewis and Sandy rivers, there is no information to suggest that this bright life history form was historically present in the LCR Chinook salmon ESU (Myers et al. 2006) in which the White Salmon River is a part. Introduced bright fall Chinook salmon that are naturally spawning in the Columbia River Gorge are not considered part of the LCR Chinook salmon ESU (NMFS 2007). While migrations of returning tule and bright fall Chinook salmon adults coincide at Bonneville Dam between mid-August and September, spawning is separated in the White Salmon River with LCR fall Chinook spawning in September and early October while bright fall Chinook spawn in late October and November.

Three main reaches were established for the 2012 LCR and bright fall Chinook salmon surveys. Reach 1 was The 2.9 mile reach downstream of Husum Falls at RM 7.6 to the former upstream end of Northwestern Reservoir at RM 4.9, Reach 2 was the 2.4 mile reach that included the area of the former Northwestern Reservoir at RM 4.9 downstream to the Condit Dam Powerhouse at RM 2.3, and Reach 3 was the 2.3 mile downstream reach from Condit Dam Powerhouse to the Underwood In-lieu site at RM 0.0. Redd surveys were conducted from inflatable, whitewater rafts and guided by rafting guides contracted through Wet Planet Whitewater of Husum, WA (SRT certified). When salmon carcasses were encountered, species or run was determined, scales were collected, fork length (mm) was measured, and coded wire tag and adipose fin presence or absence was recorded to determine origin (hatchery or natural). The tail of the carcass was removed to identify it as sampled during subsequent surveys and to provide a mark for a continued long-term data set of estimates completed by WDFW and Pacific States Marine Fisheries Commission. Carcasses which were in an advanced state of decay or simply unreachable by crew were not sampled but their numbers were recorded. Redd observations were recorded on data sheets and all redds were marked on detailed field maps for later digitizing and enumeration in a GIS. An escapement estimate was derived using methods outlined in Hilborn et al. (1999) using the trapezoidal approximation of area-under-the-curve (AUC) with an average residence time of 5.1 and 6.0 days for live LCR and bright fall Chinook salmon, respectively. An additional, less conservative escapement estimate incorporating trapezoidal approximation of AUC that accounts for carcasses and adults recorded but not sampled was also used (Hilborn et al. 1999).

Results

White Salmon Ponds Collection and Seining

Installation of the resistance board weir and operation of the White Salmon River collection ponds were successful in capturing 239 adult LCR fall Chinook salmon over the 2011 collection period. Seining activities in the lower river successfully captured 416 adult LCR fall Chinook over the same period (Table 1). Origin of captures was 85% natural origin (557/655). During September 20th, 2011 hatchery females (29) from Spring Creek NFH were translocated to the upper White Salmon River due to the low number of overall females translocated up to that point from seining and from the collection ponds. Translocated adults from Spring Creek NFH were handled, measured and tagged identically as adults translocated from the White Salmon River. This was the only instance of translocating LCR adults from the hatchery and represented the step to the secondary option of adult translocation outlined in Engle et al. (2011, Appendix A). Additional salmon species including coho and pink salmon as well as steelhead were captured in the lower White Salmon River during operation of the collection ponds and seining (Table 2). A total of 4 pink salmon were known mortalities from the weir and were discovered impinged within the weir during daily maintenance checks and daily recovery of carcasses from the weir (Appendix C).

Release Sites

In 2011, a total of 679 LCR fall Chinook salmon were translocated upstream of Condit Dam across three different release locations in the middle of the White Salmon River basin (Table 3). Distribution of total adults was slightly lower between the lower release site at RM 5.0 and the two upstream release sites when combined (370 vs. 309, respectively) and for total females (165 vs. 145). Males were distributed similarly between the three release sites with 205 translocated to RM 5.0 compared to a combined total of 164 for the two upstream release sites. Average size of translocated adult by origin was 77 cm for hatchery origin and 89 cm for natural origin. See Figure 3 for sizes of translocated adults in 2011.

Table 1. Capture location of LCR fall Chinook salmon by origin and sex (F=female and M=male) during translocation activities in the White Salmon River in 2011. Spring Creek NFH is located less than one mile from the mouth of the White Salmon River on the Columbia River. The acronym DIT stands for Double Index Tag identifying that the fall Chinook salmon was coded wire tagged but not adipose fin clipped, the standard identification of hatchery origin.

	Spring Creek NFH			Collection Ponds (RM 1.1)					Seining (RM 0.6 to 0.9)					
	Hatchery	DIT		Hatchery		Natural			Hatchery		Natural			
Date	F	F	TOTAL	F	M	F	M	TOTAL	F	M	F	M	TOTAL	Summary by Date
9/6/2011							1	1		1		1	2	3
9/7/2011							1	1				6	6	7
9/8/2011						1		1						1
9/9/2011									1	2	2	9	14	14
9/12/2011				1		3	5	9		14	13	38	65	74
9/13/2011									1		1	3	5	5
9/14/2011					1	6	6	13		6	6	12	24	37
9/15/2011						5	4	9						9
9/16/2011				1		5	5	11	2	12	9	44	67	78
9/17/2011					1	11	7	19						19
9/19/2011				1		4	12	17	3	4	12	10	29	46
9/20/2011	27	2	29			5	5	10						39
9/21/2011									2	7	12	18	39	39
9/22/2011						10	11	21						21
9/23/2011						19	7	26	5	10	22	11	48	74
9/26/2011						33	13	46	1	6	13	17	37	83
9/27/2011				2	1	8	3	14						14
9/28/2011										3	17	21	41	41
9/29/2011						7	1	8						8
9/30/2011						4	1	5	4	3	15	17	39	44
10/3/2011					1	7	9	17						17
10/5/2011				2		7	2	11						11
Totals	**27**	**2**	**29**	**7**	**4**	**135**	**93**	**239**	**19**	**68**	**122**	**207**	**416**	**684**

Table 2. Capture location of salmon and steelhead, determined by origin during translocation activities in the White Salmon River during 2011. Origin (Natural = N and Hatchery = H) was determined by the presence or absence of an adipose fin. Salmon species that could not be identified (Unknown) and species where no identified origin was recorded (No Or.) are noted.

	Collection Ponds (RM 1.1)								Seining (RM 0.6 to 0.9)						
	Salmon								Salmon						
	Coho	Pink	Bright Fall Chinook		Unknown		Steelhead		Coho	Pink	Bright Fall Chinook		Steelhead		
Date	N	N	H	N	N	No Or.	H	N	N	N	H	N	H	N	Summary by Date
8/31/11				1											1
9/6/11	1						1								2
9/7/11							3						1	1	5
9/9/11				1											1
9/12/11												1		1	2
9/14/11			1						1	5				1	8
9/15/11		1						1							2
9/16/11					1					3					4
9/17/11							1								1
9/19/11							3		1						4
9/20/11	1	2					2	1							6
9/21/11										1					1
9/22/11		1	1												2
9/23/11		2	2	1					1	1					7
9/26/11			2			1	3	1	2	1		1			11
9/27/11			1	1											2
9/28/11											1	1		1	3
9/29/11	1			3			4								8
9/30/11		2		3			1		1		2	2			11
10/3/11	2	1	3	12			1								19
10/5/11			9	9			2	1							21
Totals	**5**	**9**	**19**	**31**	**1**	**1**	**21**	**4**	**6**	**11**	**3**	**5**	**1**	**4**	**121**

Table 3. Summary by release site of LCR fall Chinook salmon that were translocated upstream of Condit Dam prior to breaching of Condit Dam in 2011. Origin and Sex (M=Male, F=Female) as well as river mile of release site (RM) is provided**.**

	RM 5.0					RM 6.4					RM 7.6					
	Hatchery		Natural			Hatchery		Natural			Hatchery		Natural			
Date	F	M	F	M	Total	F	M	F	M	Total	F	M	F	M	Total	Summary by Date
9/6/11		1		1	2											2
9/7/11				6	6									1	1	7
9/8/11													1		1	1
9/9/11	1	2	2	9	14											14
9/12/11	1	14	16	42	73											73
9/13/11	1		1	3	5											5
9/14/11		5	6	12	23							2	6	6	14	37
9/15/11			5	4	9											9
9/16/11											3	12	14	49	78	78
9/17/11		1	11	7	19											19
9/19/11	1		4	12	17						3	4	12	10	29	46
9/20/11								5	5	10	27		2		29	39
9/21/11											2	7	12	18	39	39
9/22/11			10	10	20									1	1	21
9/23/11	5	10	41	18	74											74
9/26/11		5	31	19	55	1	1	15	11	28						83
9/27/11	2	1	8	3	14											14
9/28/11								6	7	13		3	10	14	27	40
9/29/11													7	1	8	8
9/30/11	4	3	15	17	39								4	1	5	44
10/3/11												1	7	8	16	16
10/5/11											2		6	2	10	10
Total	**15**	**42**	**150**	**163**	**370**	**1**	**1**	**26**	**23**	**51**	**37**	**29**	**81**	**111**	**258**	**679**

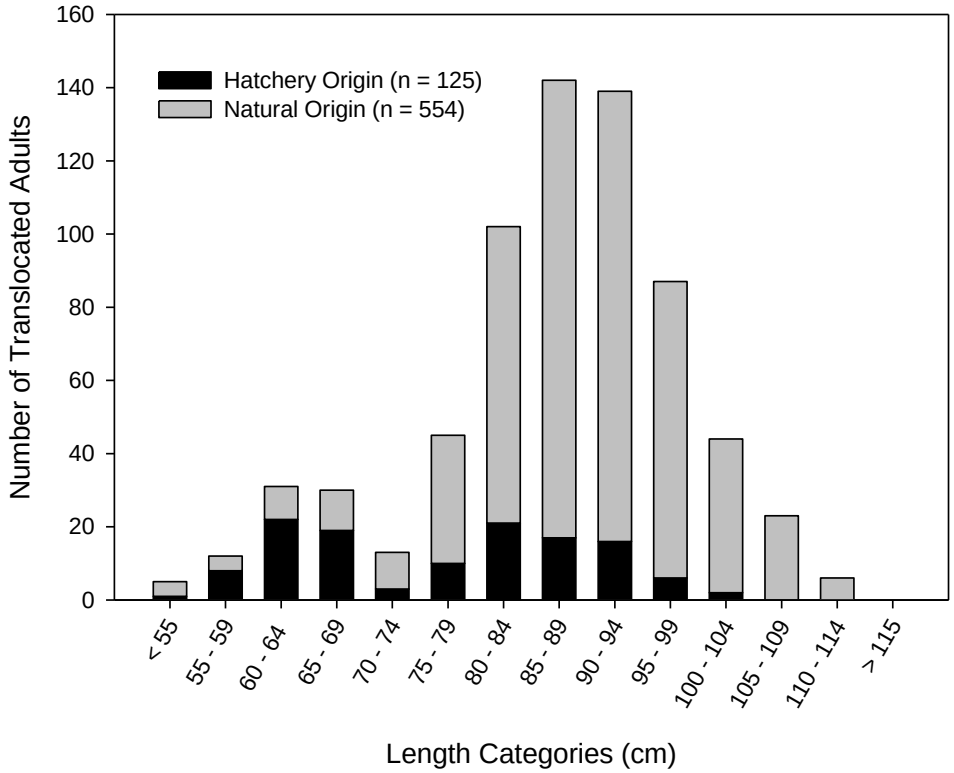

Figure 3. Length, in centimeters, of translocated adult LCR fall Chinook salmon by origin (hatchery or natural) into the White Salmon River upstream of Condit Dam in 2011.

A total of 10 pink salmon, four males and six females, were also translocated upstream of Condit Dam and distributed across three release sites (Table 4). Pink salmon had been seen previously in the White Salmon River (Engle et al. 2010), but their numbers or spawning regularity was entirely unknown in the White Salmon River. The decision to translocate pink salmon was based on repeated captures of the salmon during seining and operation of the White Salmon Ponds. These captures led to conversations among the WSWG parties about their origin, spawning in the lower White Salmon River, and numbers that were being encountered. Based on visual observation, the pink salmon were in clear spawning colors and several of the females observed had the start of degraded tails, indicative of redd excavation within the river. Translocation of pink salmon began in mid-September but was not consistent due to its implementation during the middle of capture and translocation activities in 2011.

Table 4. Summary by release site of pink salmon that were translocated upstream of Condit Dam prior to breaching of Condit Dam in 2011. Sex (M=Male, F=Female) as well as river mile of release site (RM) is provided.

	RM 5.0		RM 6.4	RM 7.6	
Date	F	M	F	F	M
9/14/11		1			
9/16/11					1
9/20/11			1		
9/22/11		1			
9/23/11	2	1			
9/30/11				2	
10/3/11				1	
Total	**2**	**3**	**1**	**3**	**1**

Redd Surveys 2011

A total of three separate redd surveys were conducted within the upper White Salmon River on October 4th, 11th and 17th. A single survey was performed from RM 12.0 to Husum Falls at RM 7.6 on October 4th to determine if any spawning had occurred upstream of Husum Falls. No redds or salmon were observed. As a result, this area was not surveyed on subsequent days. Redd surveys were performed from Husum Falls at RM 7.6 to Northwestern Park Boat Ramp at RM 4.9. Four reaches were surveyed within this 2.9 mile reach. The maximum redd counts for surveys reaches 1 to 4 for all three survey dates were: Reach 1=27, Reach 2=5, Reach 3=75 and Reach 4=84 (Table 5). The highest count from a survey date was 181 redds observed on October 4, 2011. Maps of redd locations by reach for October 4, 2011 (highest redd count) are provided in Appendix D. A total redd population estimate of 191 was derived by summing the maximum reach counts for each of the three survey dates. We estimated an adult to redd ratio of 3.55 adults/redd and 1.62 females/redd.

Table 5. Distribution and counts of translocated LCR fall Chinook salmon redds by date and survey reach in the White Salmon River upstream of Condit Dam in 2011.

Survey Date	Survey Reach	Redd Count	Total Count/Week
10/4/2011	1	20	181
	2	2	
	3	75	
	4	84	
10/11/2011	1	26	129
	2	3	
	3	39	
	4	61	
10/18/2011	1	27	158
	2	5	
	3	48	
	4	78	
Redd Population Estimate		191	

Redd locations in the upper White Salmon River study site were distributed throughout the 2.9 mile study site, but more redds were located in the downstream reaches of 3 and 4 (Figure 4). Redd superimposition was not observed in any of the reaches, but was not directly monitored. A total 45 redds were estimated to have been lost due to post-dam breach river bed down-cutting at the former upstream end of Northwestern Reservoir. We estimated that down-cutting occurred a distance of 477 m upstream of Northwestern Bridge by mid-March 2012, a time when fry usually emerge from gravels in the White Salmon River (Allen and Connolly 2011, Smith and Engle 2011). The vertical extent of down-cutting was the most significant near the bridge and gradually diminished upstream. The 45 redds lost represents 24% of the total redd population estimate for translocated LCR fall Chinook salmon in 2011. Since more than 70 redds were located outside of this area and were unaffected, additional artificial production mitigation steps were not implemented as described in Engle et al. (2011, Appendix A).

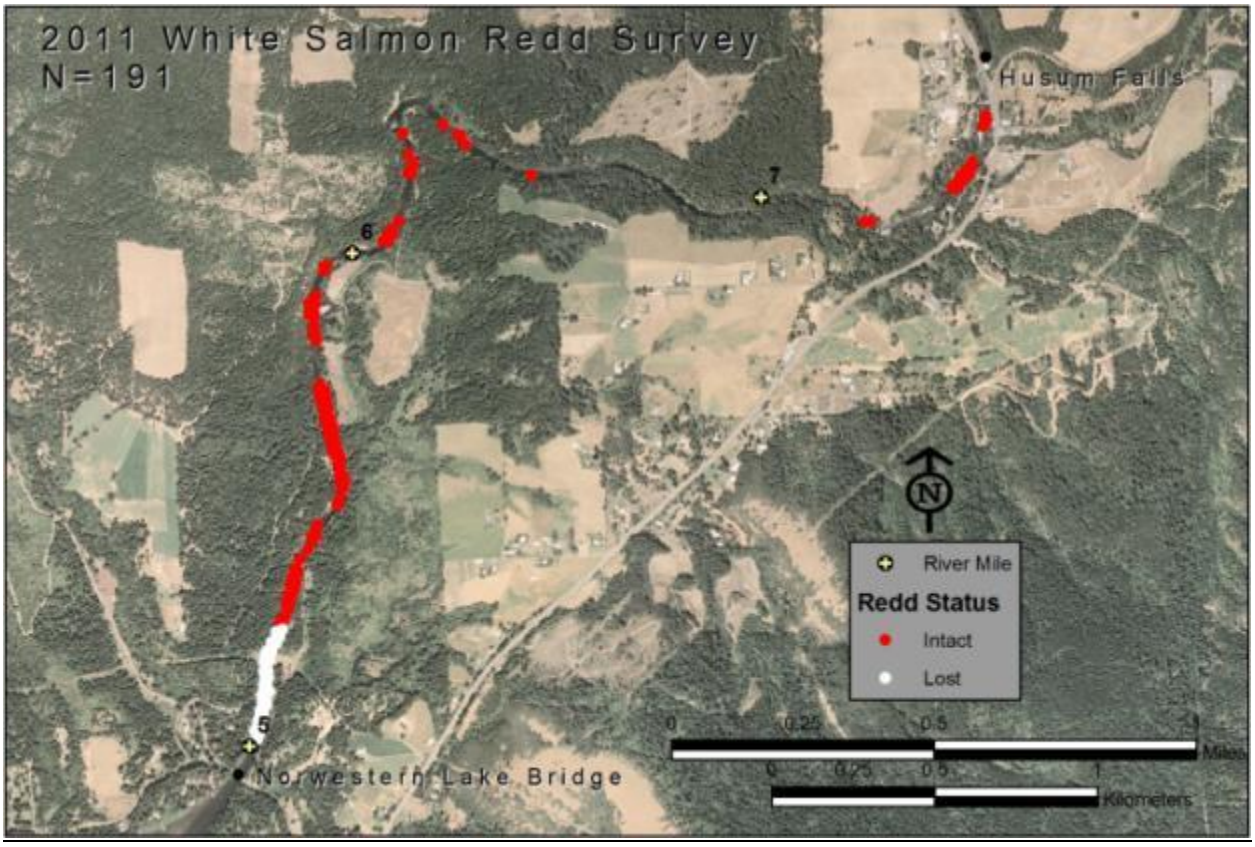

Figure 4. Map of translocated LCR fall Chinook salmon redds observed upstream of Condit Dam on the White Salmon River during 2011. Redd color denotes either loss from down-cutting of the river post-breaching of Condit Dam by March of 2012 (white) or if they were unaffected by down-cutting (red).

Redd Surveys 2012

Two different survey periods were conducted in 2012 for LCR and bright fall Chinook salmon (Table 6). The redd and carcass surveys for LCR fall Chinook salmon were conducted on September 20th, 27th, October 4th, 9th, 11th, and 19th. Bright fall Chinook salmon redd and carcass surveys occurred on October 26th, November 9th and November 15th. The distinction between the two runs coincided with several small elevated flow events and a natural transition between heavily degraded LCR fall Chinook carcasses and newly encountered bright fall Chinook salmon carcasses. Additional surveys were planned but did not occur for bright fall Chinook salmon due to adverse weather and high turbid flow conditions in November 2012. The entire river from RM 7.6 to RM 0.0 was surveyed only three times during fall 2012. This was due to ongoing Condit Dam deconstruction activities and concerns for crew safety with several in-water hazards and their removal. The area from RM 12.0 to RM 7.6 was surveyed for both LCR and bright fall Chinook salmon redds and carcasses on two occasions. Fall Chinook spawners or redds were never observed in the area so the stretch of river was subsequently dropped from surveys to focus effort on carcass recoveries in the lower White Salmon River.

A total of 118 LCR fall Chinook salmon carcasses and 97 bright carcasses were recovered during September, October and November 2012 (Table 7). A total of 8 LCR fall Chinook salmon and 28 bright fall Chinook salmon were identified as hatchery origin based on adipose fin clip presence or absence. Adults were scanned for presence of coded wire tags and 6 snouts were collected (4 LCR and 2 bright fall Chinook salmon) but lab analysis after cleaning and dissection did not yield coded wire tags in adults, suggesting false detections in the field most likely from particulates of sand on carcass heads.

Redd distribution of LCR fall Chinook salmon was concentrated in the lower White Salmon River downstream from river mile 2.3 (Former Condit Dam Powerhouse location) to the mouth, with some spawning also occurring in the former Northwestern Reservoir area just downstream of Northwestern Bridge (Figure 5). The uppermost observed LCR fall Chinook salmon redd was at approximately RM 5.7. Redd distribution of bright fall Chinook salmon was also concentrated in the lower White Salmon River downstream of river mile 2.3. Additional spawning of bright fall Chinook salmon occurred upstream of the former Condit Dam site and extended up to Husum Falls at river mile 7.8 with small concentrations around river mile 6.0 and 7.4. Maps of redd locations for each individual survey of LCR and bright fall Chinook salmon are in Appendix E. A single redd that was not newly constructed was observed on September 20th, 2012 at approximately RM 10.4 of the White Salmon River which, based on a number of factors discussed later, was likely a spring Chinook salmon redd.

Table 6. Distribution and counts of naturally spawning LCR and bright fall Chinook salmon adults, redds and carcasses in the White Salmon River in 2012. Stock of fall Chinook salmon is indicated as well as river mile (RM) of the start and end of each survey.

Date	Stock	Live Adults	Redds	New Carcasses (Tails Removed)	Previously Sampled Carcasses	Survey Start (RM)	Survey Finish (RM)
9/20/12	LCR	12	12	3		1.1	0
9/27/12	LCR	87	89	5		2.3	0
10/4/12	LCR	144	165	5	1	7.6	1.1
10/9/12	LCR	27	33	33	5	1.1	0
10/11/12	LCR	158	194	43	28	2.3	0
10/19/12	LCR	63	179	30	24	2.3	0
10/26/12	Bright	10	18	2	1	7.6	5.2
11/9/12	Bright	342	134	84	1	7.6	0
11/13/12	Bright		-	14			
11/15/12	Bright	193	257	63	31	7.6	0

Table 7. Composition of carcasses recovered in the White Salmon River in fall 2012. Determination of origin (hatchery or natural) was made by presence or absence of an adipose fin.

	LCR Fall Chinook Salmon		Bright Fall Chinook Salmon		Steelhead
	Natural	Hatchery	Natural	Hatchery	Hatchery
Male	28		20	6	
Female	82	8	48	22	1
Unknown			1		
Total	110	8	69	28	1

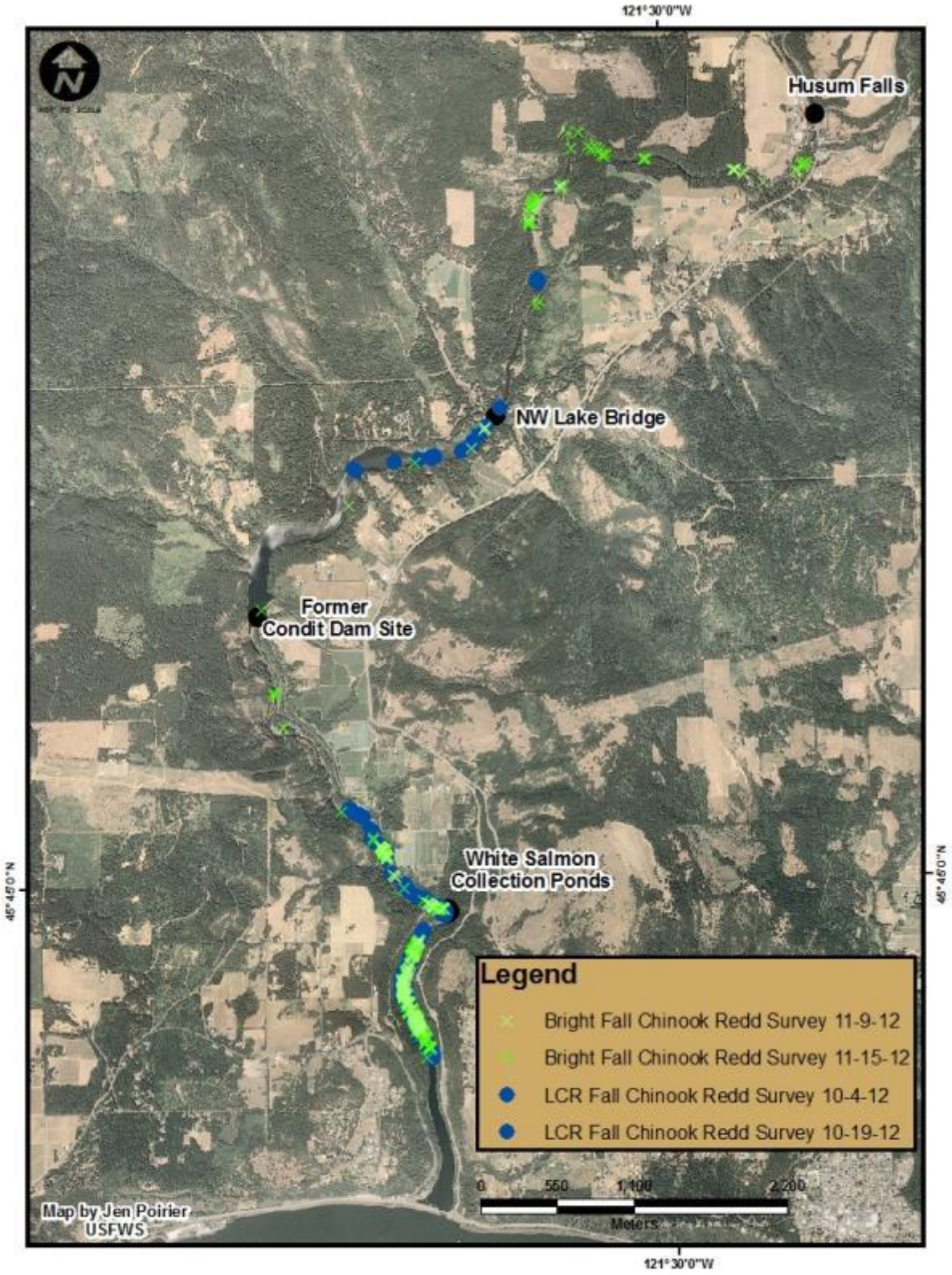

Figure 5. Map of selected LCR and bright fall Chinook salmon redds in the White Salmon River during 2012. Dates of surveys and points of interest are provided. Additional redd survey maps are provided in Appendix E.

The escapement estimate for LCR fall Chinook salmon in fall 2012 was 619 adults using the AUC method outlined by Hilborn, et al. (1999) with a visibility estimate of 0.9 (or 90%) during the surveys and using only live fish counts. For bright fall Chinook salmon, escapement was estimated at 822 adults with a visibility estimate of 0.8 during the surveys. Using the AUC method with carcasses and unsampled adults also incorporated yielded escapement estimates of 755 LCR fall Chinook and 1061 bright fall Chinook salmon in the White Salmon River for 2012.

Conclusions

The effort and planning to complete the translocation of LCR fall Chinook salmon upstream of Condit Dam was a success based on the criteria outlined by the WSWG and proposed in the 2011 plan. (Engle et al. 2011, Appendix A). The methods employed to capture, effectively transport, and release adults were refined in previous studies conducted by the WSWG and funded by PacifiCorp. This helped considerably with logistics, preparation and determining areas of concern prior to the year of Condit Dam breaching and removal. Abundance estimates conducted by WDFW and PSMFC staff in 2011 downstream of Condit Dam, estimated that approximately 2,289 LCR fall Chinook escaped into the lower White Salmon River in 2011 (Quinten Daugherty, PSMFC, personal communication, December 2011 using AUC outlined in Hillborn, et al. 1999). Based on escapement estimates, our limited efforts of seining and use of the White Salmon River collection ponds were effective in collecting approximately 23% of the estimated adult LCR fall Chinook salmon in the lower river during fall 2011.

Near the upstream end of the former reservoir, both the extent and speed of downcutting of the riverbed following the breach of Condit Dam was unexpected. Within 17 days of breaching, the area of downcutting had reached RM 5.0 at the lower release site. This was with a pre-breach operation that had already dropped the reservoir level 10 feet during the summer for deconstruction activities. As of September of 2012, downcutting appeared to have reached river mile 5.4. The loss of newly constructed redds in the time period from breaching to mid-March 2012 in the stretch of river identified in Figure 4 was indeed unfortunate and unexpected, but the impact of dam deconstruction on the downstream spawning of LCR fall Chinook salmon was lessened by the translocation efforts and did not change the success of the translocation efforts. This section of river was used heavily by spawning adults in 2011, likely due to the abundance of high quality spawning sediment being deposited in the area from the transition of the river into the slower velocity water of Northwester Reservoir. In 2012, this area was changed considerably to a section of bedrock and turbulent water. Much of the spawning sediment used previously appears to have completely redistributed to areas downstream. Redd construction was generally limited to either upstream or downstream of the area in 2012 as evidenced by Figure 5. To this end and for future dam removals, efforts should be made by fisheries professionals to coordinate with fluvial geomorphologists to better understand downcutting, particularly if employing translocation to upstream areas that may be affected by dam deconstruction and downcutting. For our efforts in 2011, implementation of a second resistance board weir near river mile 5.4 and translocation of adults upstream of it may have negated redd losses from downcutting.

The distribution of spawning fall Chinook salmon adults in 2012 suggests a suitable lower White Salmon River for spawning in addition to a new, useable area of spawning habitat in the exposed river section of the former Northwestern Reservoir. Adult LCR fall Chinook salmon did not spawn in similar areas upstream of Northwestern Lake Bridge at RM 4.9 as occurred in 2011, but

their distribution suggests that a number of adults will use the upper White Salmon River upstream of the former Condit Dam site. As in 2008, LCR fall Chinook salmon were not observed spawning upstream of Husum Falls, likely due to low flows and jump height to clear the falls during their spawn timing. The number of redds in the lower White Salmon River below the former dam site suggests that its suitable for use by spawning LCR fall Chinook salmon. The majority of LCR fall Chinook redds were located in a section of newly deposited gravels from RM 1.1 down to river mile 0.6, with intermittent use upstream of RM 1.1 to the Condit Dam Powerhouse at RM 2.3. The amount and imposition of bright fall Chinook salmon redds in the lower White Salmon River suggests that this is a likely impact to redds placed by spawning ESA-listed LCR fall Chinook salmon. Future efforts of monitoring should focus on quantifying this impact in addition to assigning hatchery and natural origin escapement to the bright fall Chinook salmon population in the White Salmon River.

In both 2011 and 2012, the predominantly high composition of natural origin LCR fall Chinook salmon is of particular note. For captured adults in 2011, 85% were identified as natural origin and during 2012 carcass surveys 93% were identified as natural origin based on presence of an adipose fin. Spring Creek NFH located just 0.6 miles downstream of the mouth of the White Salmon River has one of the highest artificial production programs in the Columbia Basin with an annual release of 10.5 million subyearling LCR fall Chinook salmon. Since 2005, all releases at Spring Creek NFH have been marked to be identifiable as hatchery origin when they return as adults by either absence of an adipose fin (≤97% of production) or by presence of a coded wire tag (≥3% of production), with slight variations each production year. During 2011 and 2012 the Spring Creek NFH returned 20,809 and 27,135 adults, respectively. Considering those returns and the knowledge that the Spring Creek NFH stock originated from collections in the White Salmon River (Smith and Engle 2011) a higher catch or recovery rate of hatchery origin adults in the White Salmon River would not have been unexpected.

Additional species of interest beyond ESA-listed fall Chinook salmon appear to be present in the White Salmon River both before and shortly after removal of Condit Dam. In 2011, the numbers of pink salmon were a surprise and not predicted by members of the White Salmon Working Group. In 2012, as stated previously, we did observe one redd upstream of Husum Falls at RM 10.4 that we are deducing was a spring Chinook salmon redd. We believe this was a spring Chinook salmon redd due to the observation timing during our first survey date in September, the relative smaller size when compared to typical fall Chinook salmon redds, the lack of the LCR fall Chinook salmon run or indication of LCR spawning at the time or in the area upstream of Husum Falls and its location in the upper watershed. This upper watershed location would suggest that the adults that constructed the redd navigated Husum Falls at higher spring/summer flows when it can be likely easily navigated by anadromous salmonids. Lastly, sport anglers were capturing hatchery steelhead upstream of Condit Dam according toWDFW creel survey reports and a bull trout was angled in the upper White Salmon River and identified by a local fish biologist in August 2012. An account of the bull trout incident is in Appendix F. Future monitoring efforts in the White Salmon River by agencies of White Salmon Working Group are in planning stage for the next several years to document the recolonization of the upper basin by a number of both ESA-listed and non-listed fish species in the Pacific Northwest.

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Appendices

Appendix A. 2011 Capture and Transport Report

Engle, R., J. Skalicky, and W.R. Brignon. 2011. Capture and Transport of Lower Columbia River Fall Chinook Salmon Plan – Condit Hydroelectric project Decommissioning (FERC Project No. 2342). U.S. Fish and Wildlife Service, Columbia River Fisheries Program Office, Vancouver, WA. Prepared for PacifiCorp Energy. 20 pps.

Condit Hydroelectric Project Decommissioning
FERC Project No. 2342

CAPTURE and TRANSPORT of LOWER COLUMBIA RIVER FALL CHINOOK SALMON

Prepared by

Rod Engle, Joseph Skalicky and William R. Brignon
U.S. Fish and Wildlife Service – Columbia River Fisheries Program Office

In Cooperation With
The White Salmon Working Group

Prepared for

PACIFICORP ENERGY
A DIVISION OF PACIFICORP

February 4, 2011

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Appendix B. Summary of fish salvage immediately below Condit Dam in August, 2011 for dam deconstruction activities.

On August 15th and again on August 18th, an effort was undertaken by members of the White Salmon River Working Group and PacifiCorp to catalogue and relocate any fish that were in the White Salmon River immediately downstream of Condit Dam in a singular, large pool of the White Salmon River. This effort was very similar to another dewatering and salvage effort for Soda Springs Dam by PacifiCorp in 2010 (Frank Shrier, PacifiCorp, personal communication August, 2011).

The dimensions of the pool downstream of Condit Dam were roughly 45-m by 35-m with a maximum depth of 10-m prior to pumping actions to dewater the area. This dewatering and fish relocation effort was needed to adequately place a pad of aggregate in the area of the river immediately below the dam as an effective working platform for tunneling and breaching activities until October, 2011. This effort was permitted through the take of ESA listed species through dam deconstruction activities (NMFS 2006) and through a number of planning documents developed for removal of the dam. This salvage was viewed as additional, separate effort from the planned translocation efforts of the White Salmon Working Group of ESA-listed Lower Columbia River fall Chinook salmon upstream of the dam that this report has detailed.

On August 15th, efforts by contractors to dewater the pool through several diesel generated pumps fitted with juvenile fish screens was unsuccessful. A number of efforts were used to try and capture fish species that were present in the pool including 50-m gill nets, seines and backpack electrofishing with a Smith-Root Model 12A backpack electrofishing unit. On that day a total of 8 adult spring Chinook salmon and 2 adult steelhead (all hatchery origin) were captured and moved approximately 40-m downstream to a lower release area of a series of pools where water was flowing from a piped diversion from the Condit Dam penstock as well as returns from the diesel-generated pumps. One rainbow trout was collected by electrofishing and transported by bucket of water to the lower release area. Only tallying of species was recorded and expert opinion of staff present was used to determine adults from juveniles, run type and individual species was not determined for either sculpin (*Cottus* spp) or lamprey. All adult captures occurred through stretching the gill-net or seine through the targeted pool and pulling it to shore, through either manpower on the shoreline or assisted by swimmers, and pulling the net through the pool. Efforts were curtailed on August 15th to allow for more pumps to be provided to effectively lower the water levels and improve capture efficiencies.

On August 18th, additional pumps were operational and the water level of the targeted pool was reduced approximately 7 meters to approximately a level ranging from 1-2 meters depending on location and an area of 10-m by 15-m. Captures of adult and juvenile fish species using seines, gillnets and backpack electrofishing (in shallow water-filled areas) improved and a number of fish species were captured and relocated to the lower release area (Table A). Juveniles or smaller species were transported by buckets and adults were transported using cradles or adult-sized dip nets to the lower release area. Adult fish were out of water for approximately 1 minute during transports and hand released back into areas.

Table A. Relocated fish species from two efforts August 15th and 18th, 2011 from a pool area immediately downstream of Condit Dam to a release location approximately 40-m downstream.

	Hatchery	Natural	Mortalities
Spring Chinook salmon Adults	24	2	
Spring Chinook salmon (smolt)		1	
Steelhead (O. mykiss)	20		
Rainbow Trout (O. mykiss)		81	4
Sculpin (Cottus sp.)		87	
Lamprey spp. (ammoce tes)		53	

Figure A. Pictures of efforts to remove fish species and relocate them downstream from the pool area immediately downstream of Condit Dam on August 18th, 2011. Members of White Salmon Working Group electrofishing (top left), members of White Salmon Working Group, PacifiCorp and JR Merit staff capturing fish from a remaining pool (bottom left) and a picture of a White Salmon Working Group person at the base of Condit Dam after pumping activities on August 18th, 2011 (right). Credit – Jeanette Burkhardt of Yakama Nation Fisheries.

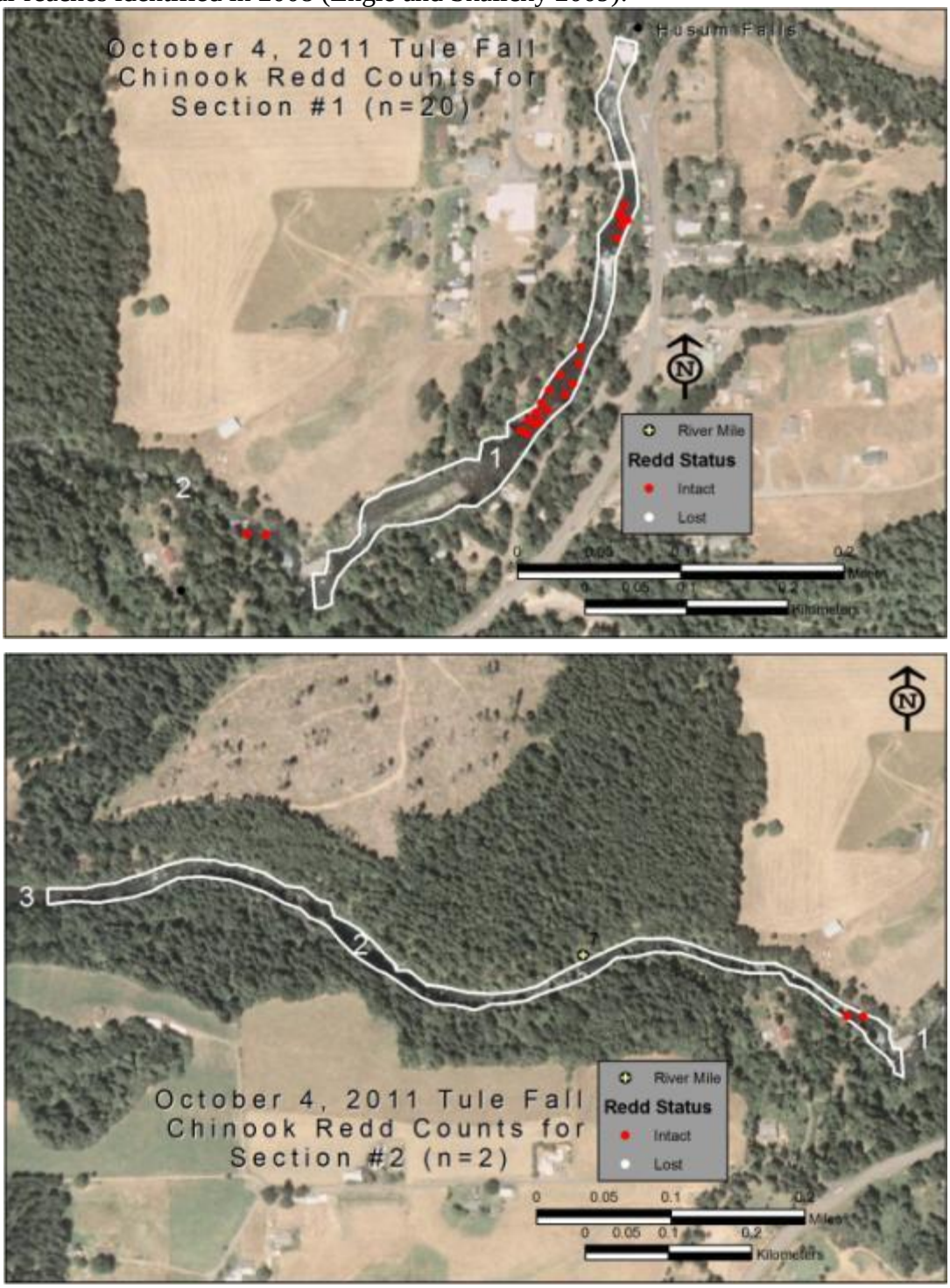
Appendix C. Collections of carcasses that collected upstream during the operation of the resistance board weir during 2011.

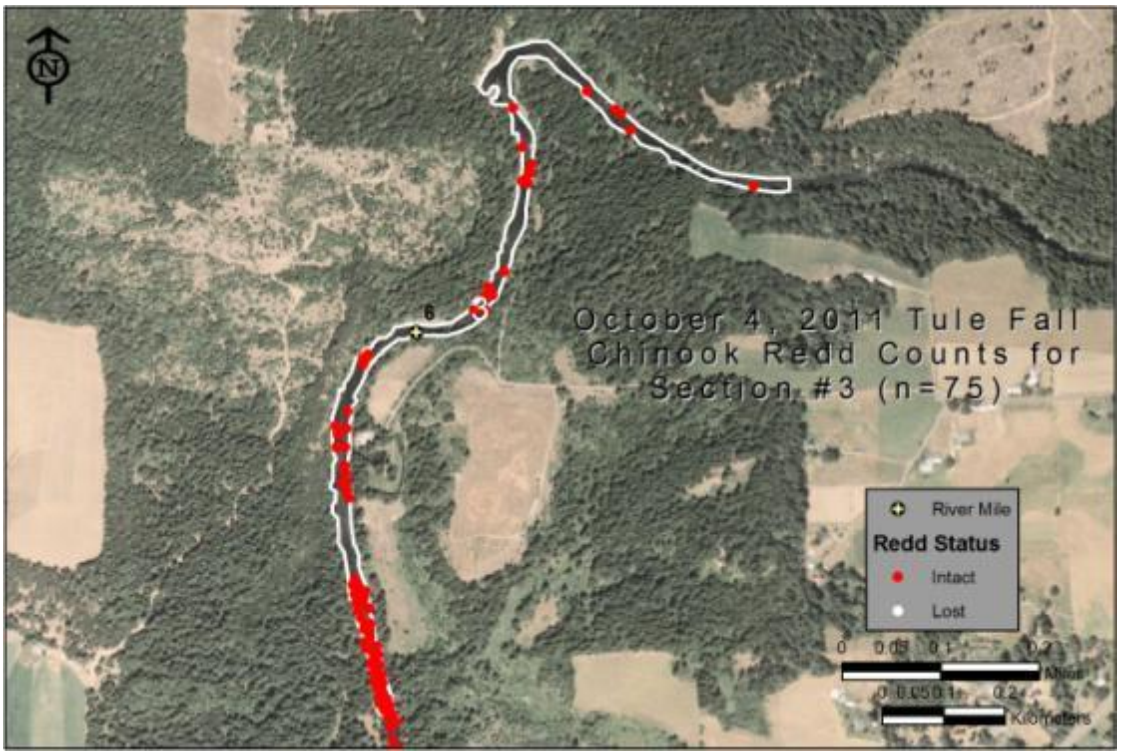
Recovery date, origin (H=Hatchery, N= Natural) and sample rate are provided. Direct weir mortality occurred for the Pink Salmon as they were recovered impinged on the weir. Total collection of carcasses by species based on expansions would be Spring Chinook salmon =27, LCR fall Chinook salmon=6, pink salmon=4, and Steelhead=5. One adult LCR fall Chinook salmon was included in carcass collections for the weir but had jumped from collection ponds and was found out of the White Salmon River.

Date	Species	Origin	Fork Length (cm)	Sex	Sample Rate	Spawn Success	Comment on mortality
8/29/2011	Spring Chinook	H	75	F	50%		
8/29/2011	Spring Chinook	H	86	F	50%		
8/29/2011	Spring Chinook	H	66	F	50%		
8/29/2011	Spring Chinook	H	70	F	50%		
8/29/2011	Spring Chinook	H	87	M	50%		
8/29/2011	Steelhead	N	54	M	100%		
8/30/2011	LCR Fall Chinook	N	101	F	100%		Jumped from collection ponds
8/30/2011	Spring Chinook	H	55	M	50%		
9/6/2011	Spring Chinook	H	76	F	50%		
9/6/2011	Spring Chinook	H	74	F	50%		
9/6/2011	Spring Chinook	H	71	F	50%		
9/8/2011	Spring Chinook	H	57	M	50%		
9/12/2011	Spring Chinook	H	70	F	50%		
9/12/2011	Spring Chinook	H	69	F	50%		
9/20/2011	LCR Fall Chinook	N	92	F	100%	Not Recorded	
9/20/2011	Spring Chinook	H	63	M	50%		
9/22/2011	LCR Fall Chinook	N	87	F	100%	100%	
9/22/2011	Pink Salmon	N	58	M	100%		Impinged on weir
9/22/2011	Spring Chinook	N	78	F	100%		
9/22/2011	Steelhead	H	77	M	50%		
9/26/2011	LCR Fall Chinook	N	103	M	100%		
9/26/2011	Pink Salmon	N	54	M	100%		Impinged on weir
9/26/2011	Pink Salmon	N	61	M	100%		Impinged on weir
9/29/2011	LCR Fall Chinook	N	77	M	100%		
9/29/2011	Pink Salmon	N	65	F	100%		Impinged on weir
9/29/2011	Steelhead	H	65	M	50%		
10/5/2011	LCR Fall Chinook	N	96	F	100%	100%	

Appendix D. Maps of the White Salmon River LCR fall Chinook salmon redd surveys conducted in the White Salmon River upstream of Condit Dam during October 4th, 2011.

Redds were constructed by LCR fall Chinook salmon translocated from downstream collection areas before breaching of Condit Dam on October 26, 2011. The maps presented are based on the four reaches identified in 2008 (Engle and Skalicky 2009).

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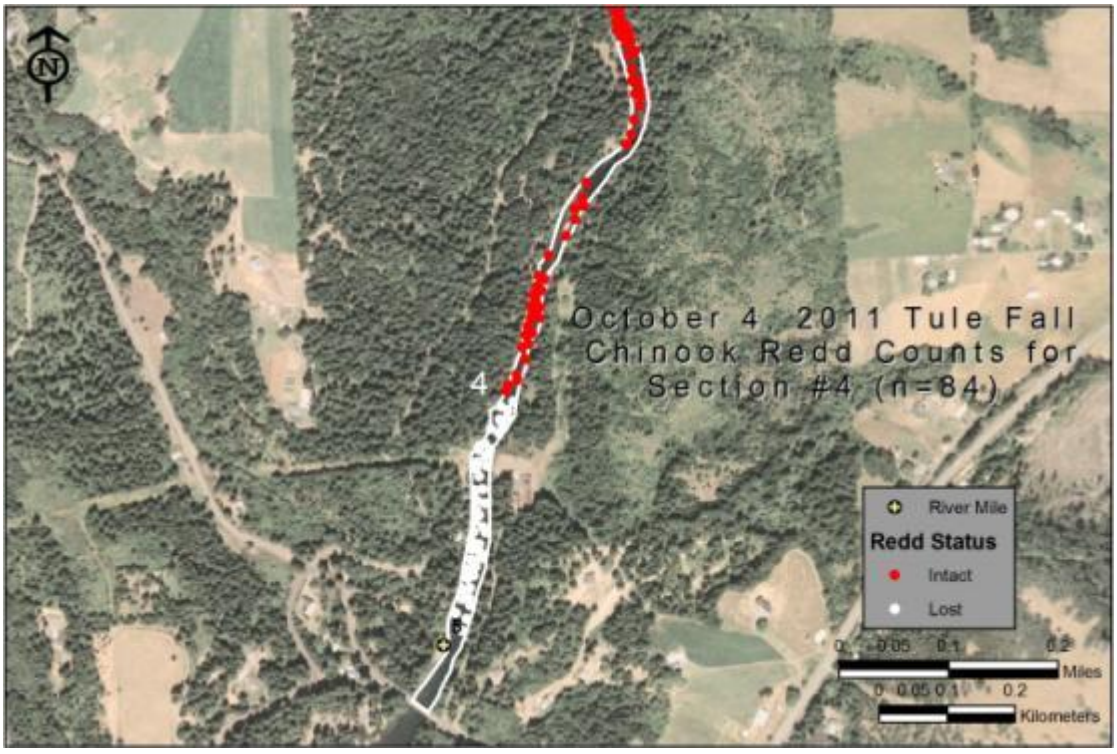
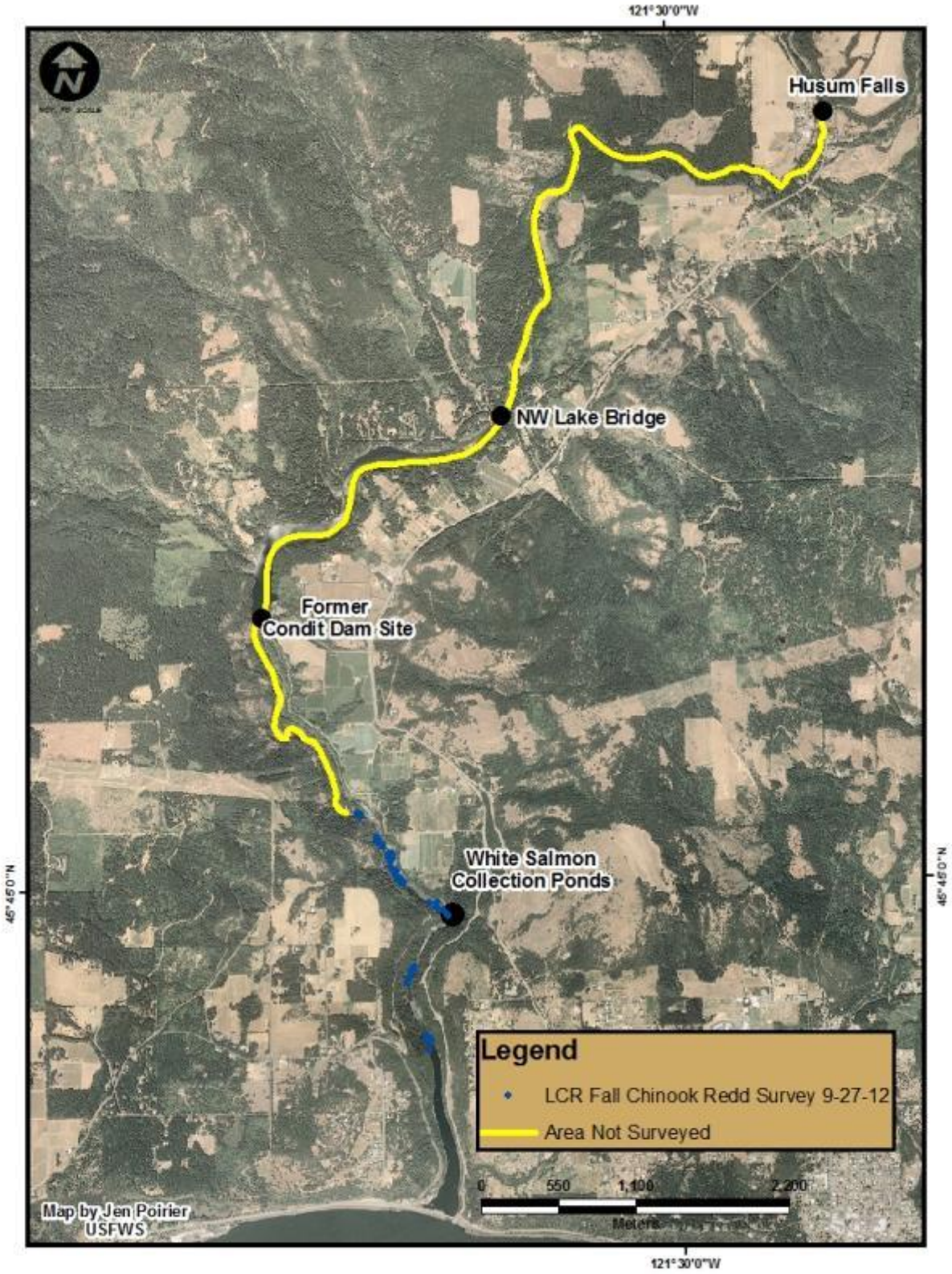
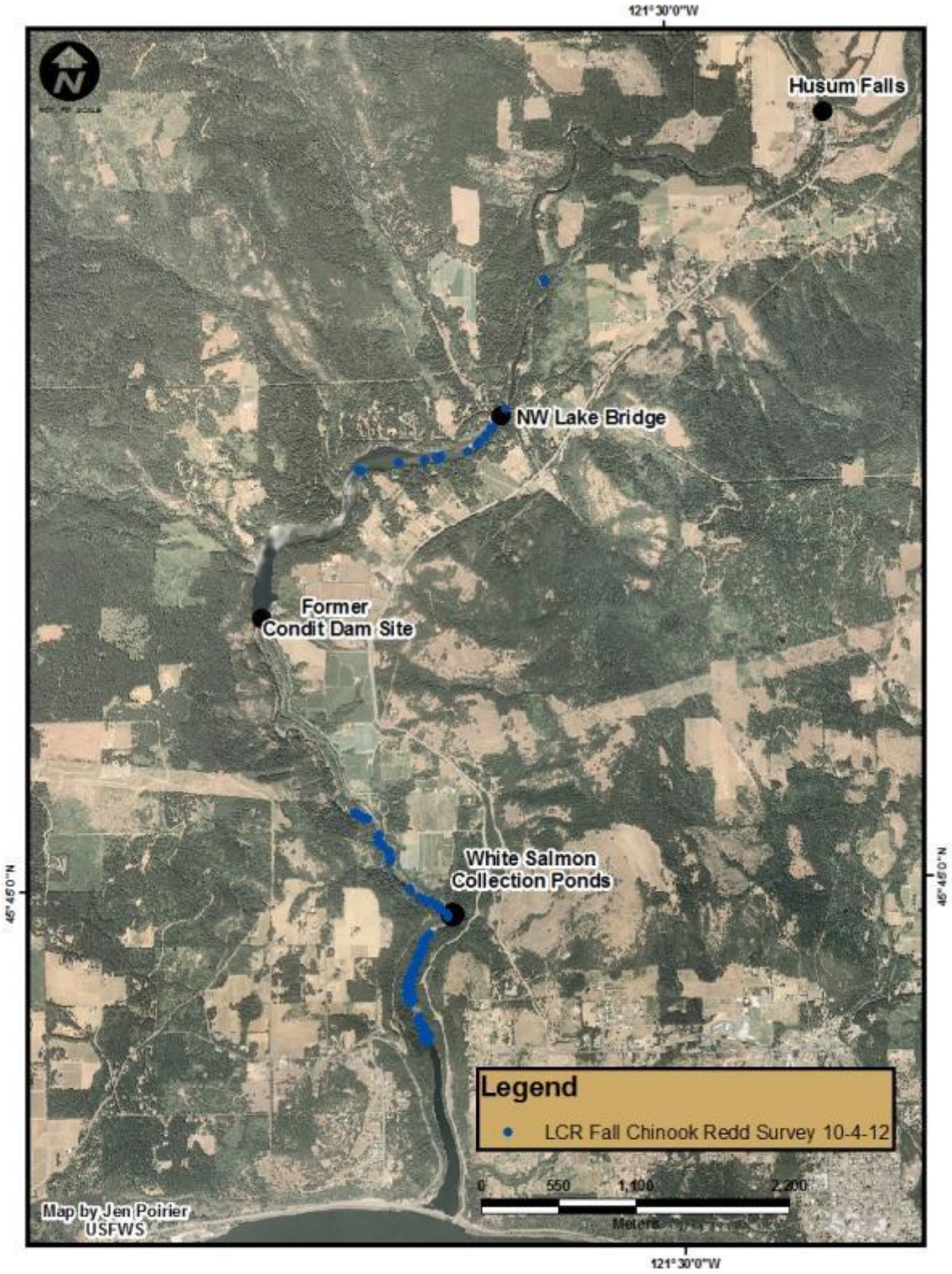
River Mile
Redd Status
Intact
Lost
0 0.05 0.1 0.2
Miles
0 0.05 0.1 0.2
Kilometers

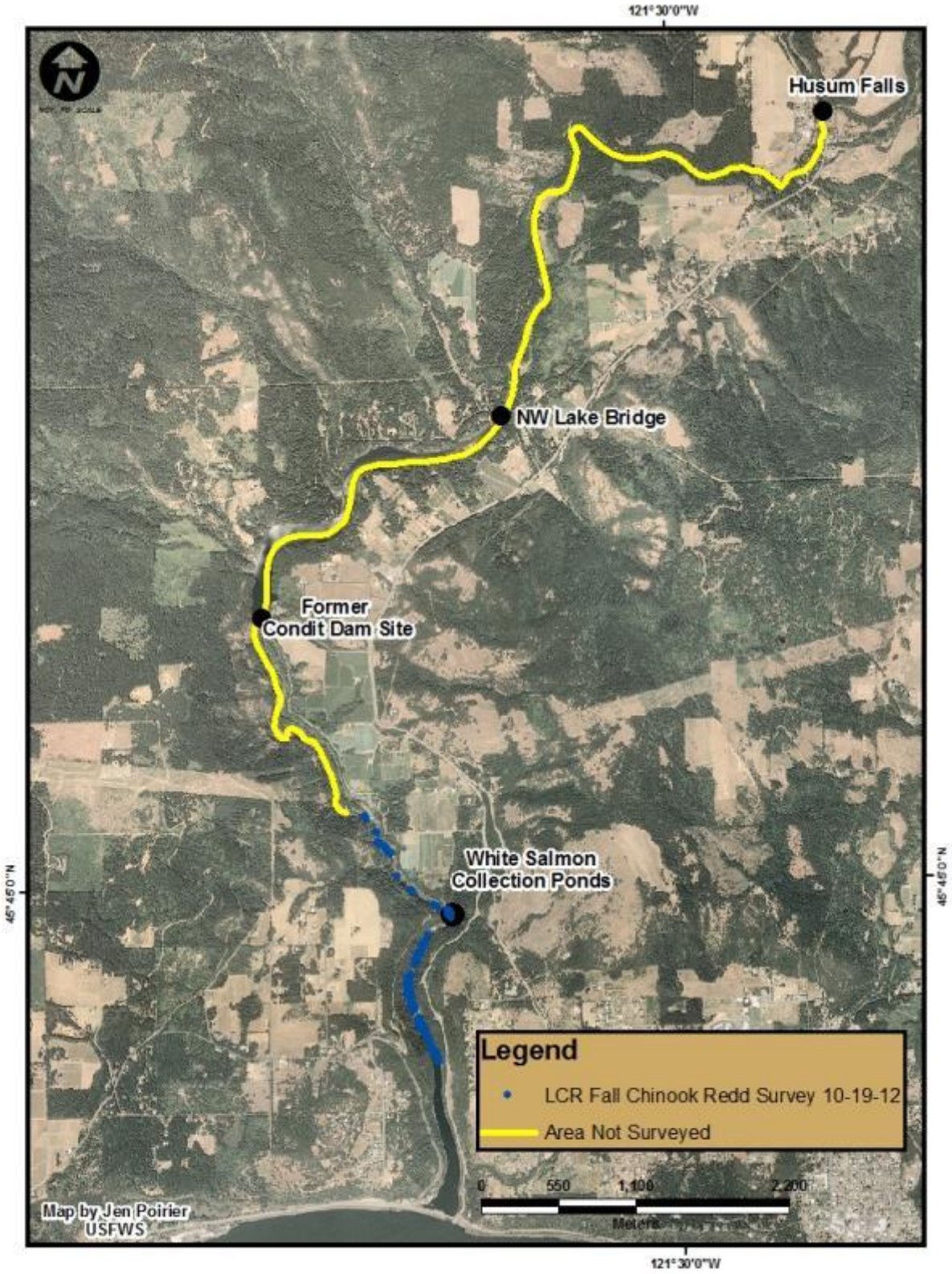

October 4, 2011 Tule Fall Chinook Redd Counts for Section #4 (n=84)
4
River Mile
Redd Status
Intact
Lost
0 0.05 0.1 0.2
Miles
0 0.05 0.1 0.2
Kilometers

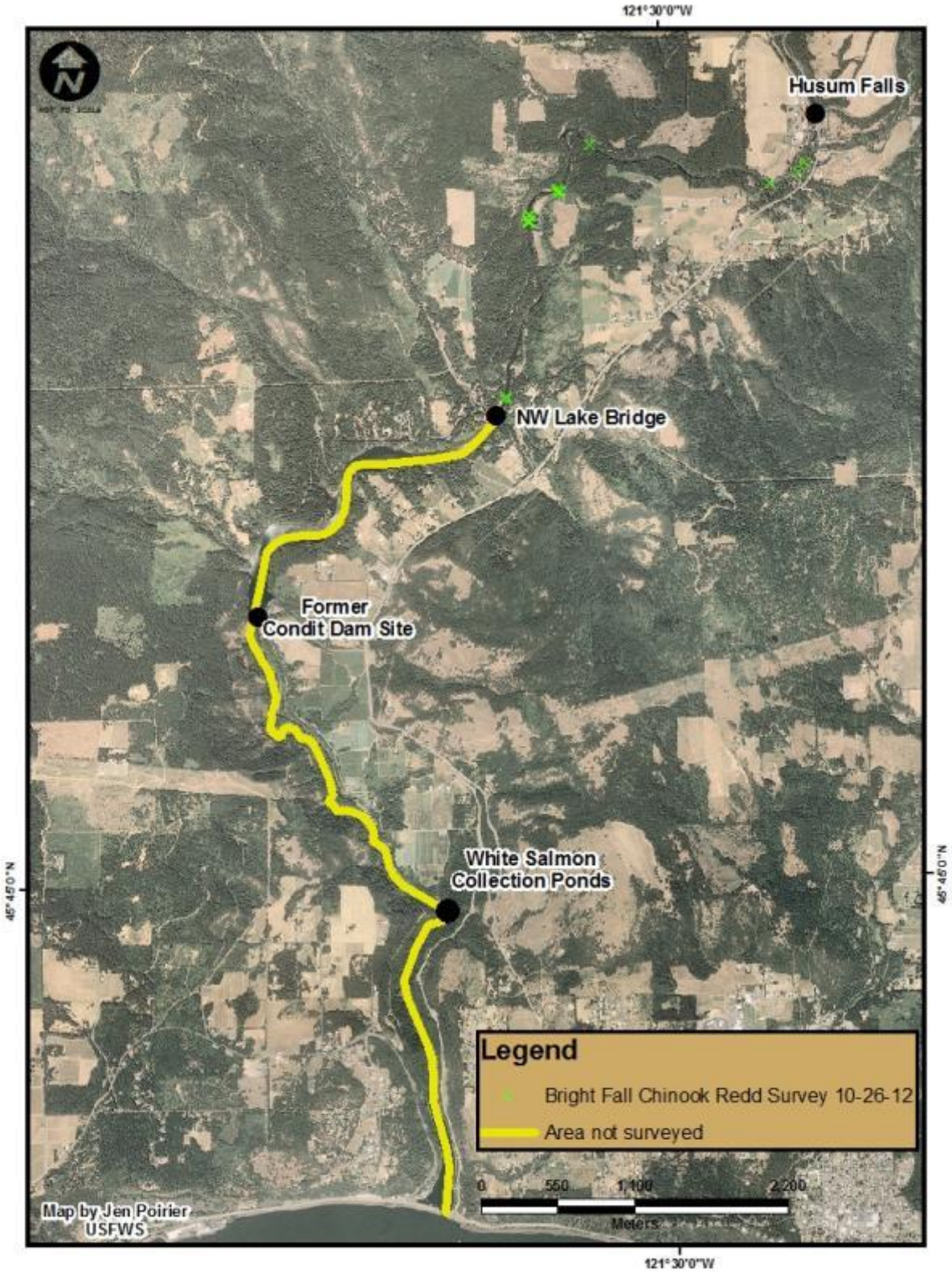
Appendix E. Maps of the White Salmon River LCR fall Chinook salmon redd surveys completed in the White Salmon River after removal of Condit Dam during the fall of 2012.

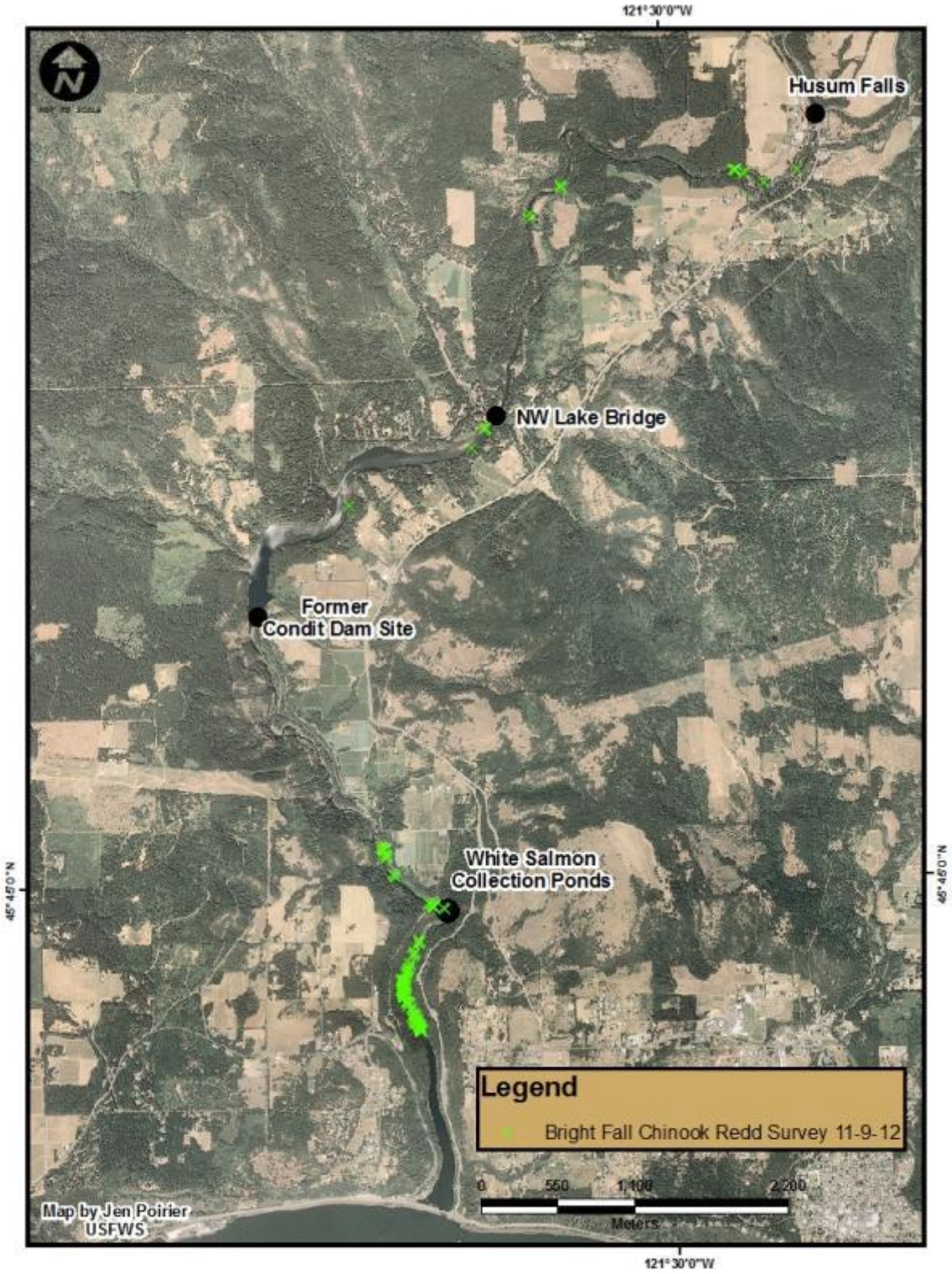
Redds were constructed by LCR and bright fall Chinook salmon that naturally migrated into the White Salmon River. The maps presented are based on a series of surveys conducted in September, October and November of 2012. Survey length is indicated on each map as well as date and stock of fall Chinook salmon.

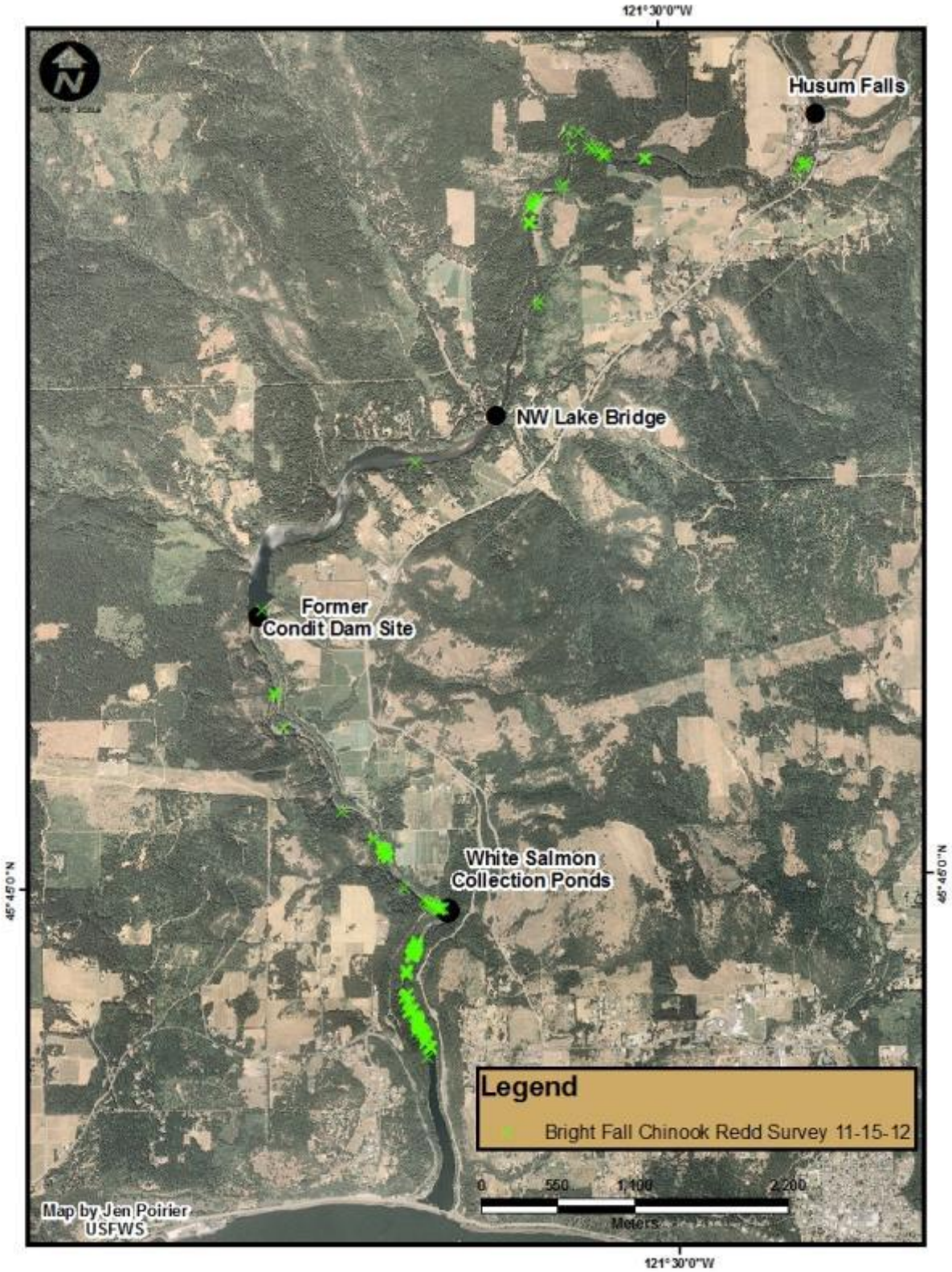

121°30'0"W
Husum Falls
NW Lake Bridge
Former
Condit Dam Site
White Salmon
Collection Ponds
45°45'0"N
Legend
LCR Fall Chinook Redd Survey 9-27-12
Area Not Surveyed
0
550
1,100
2,200
Meters
Map by Jen Poirier
USFWS


121°30'0"W
Husum Falls
NW Lake Bridge
Former
Condit Dam Site
White Salmon
Collection Ponds
45°45'0"N
Legend
LCR Fall Chinook Redd Survey 10-4-12
0
550
1,100
2,200
Meters
Map by Jen Poirier
USFWS


121°30'0"W
Husum Falls
NW Lake Bridge
Former
Condit Dam Site
White Salmon
Collection Ponds
45°45'0"N
Legend
LCR Fall Chinook Redd Survey 10-19-12
Area Not Surveyed
0
550
1,100
2,200
Meters
Map by Jen Poirier
USFWS


121°30'0"W
Husum Falls
NW Lake Bridge
Former
Condit Dam Site
White Salmon
Collection Ponds
45°45'0"N
45°46'0"N
Legend
Bright Fall Chinook Redd Survey 10-26-12
Area not surveyed
0
550
1,100
2,200
Meters
Map by Jen Poirier
USFWS
121°30'0"W


121°30'0"W
Husum Falls
NW Lake Bridge
Former
Condit Dam Site
White Salmon
Collection Ponds
45°45'0"N
45°45'0"N
Legend
Bright Fall Chinook Redd Survey 11-9-12
0
550
1,100
2,200
Meters
Map by Jen Poirier
USFWS
121°30'0"W


121°30'0"W
Husum Falls
NW Lake Bridge
Former
Condit Dam Site
White Salmon
Collection Ponds
45°45'0"N
45°46'0"N
Legend
Bright Fall Chinook Redd Survey 11-15-12
0
550
1,100
2,200
Meters
Map by Jen Poirier
USFWS
121°30'0"W

Appendix F. Details of incidental capture of a bull trout post Condit Dam breaching on August 20th, 2012 (Ian Jezorek, U.S. Geological Survey, personal communication to Rod Engle U.S. Fish and Wildlife Service).

On August 20th, 2011 Ian Jezorek a fish biologist was fishing on the upper White Salmon River at a property owned by the U.S. Forest Service with a friend and the two landed a bull trout (*Salvelinus confluentus*). The capture location was at river mile 7.3 at a location known as Dead Man's Corner in the town of Husum, WA and is a short distance below Husum Falls (RM 7.6). Ian Jezorek is a research fish biologist at the U.S. Geological Survey Laboratory at Cook, WA and has worked on several research projects involving bull trout as well as brook trout. He estimated the fish was approximately 12-13 inches and thought the coloration indicated it was preparing for spawning. Neither fisherman had a camera and recognizing it was an ESA-listed species in the White Salmon River they immediately released it.

U.S. Fish and Wildlife Service
Columbia River Fisheries Program Office
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