

**Nez Perce Tribe Nacó'x̂ (Chinook salmon) and Héeyey (Steelhead)
Adult Escapement and Spawning Ground Survey
2009 Summary Report**



© 1995 Nez Perce Tribe

Prepared by:

Adult Technical Team

Nez Perce Tribe
Department of Fisheries Resources Management
Fisheries Research Division
Lapwai, ID 83540

January 2010

**Nez Perce Tribe Nacó'x̂ (Chinook salmon) and Héeyey (steelhead)
Adult Escapement and Spawning Ground Survey
2009 Summary Report**

Prepared by:

Adult Technical Team

Nez Perce Tribe
Department of Fisheries Resources Management
Fisheries Research Division
Lapwai, ID 83540

This document should be cited as follows:

Adult Technical Team. 2010. Nez Perce Tribe Nacó'x̂ (Chinook salmon) and Héeyey (steelhead) adult escapement and spawning ground survey 2009 summary report. Nez Perce Tribe Department of Fisheries Resources Management, Fisheries Research Division. Lapwai, ID

INTRODUCTION

This document summarizes adult spring, summer, and fall Nacó'x̂ (Chinook salmon) and Héeyey (steelhead) population estimates and spawning ground survey information collected on streams surveyed by the Nez Perce Tribe Department of Fisheries Resources Management (DFRM) during 2009. The purpose of this document is to provide resource assessment information to co-managers on a timely basis. Data collection is conducted under multiple contracts with specific project objectives and study designs. Methods have been standardized to assure accurate characterization of basic performance measures (Beasley et al. 2008; <http://www.cbfwa.org/csmep/web/documents/general/Documents/FINAL%20REPORT%20AHSWG.pdf>; Appendix B). The reader is directed to project specific annual reports for a detailed description of methods used for calculation of performance measures.

Adult spring and summer Nacó'x̂ (Chinook salmon) escapement estimates are presented from six streams where adult monitoring sites are located. Adult Héeyey (steelhead) escapement information is presented from one stream located in the Imnaha River subbasin. Spring, summer, and fall Nacó'x̂ (Chinook salmon) redd count and carcass data is presented from multiple streams surveyed in the Clearwater River, Salmon River, Grande Ronde River, and Imnaha River subbasins. Index area (trend), extensive area, and supplemental area redd count information are presented.

DESCRIPTION OF STUDY AREA

Study streams surveyed in the Clearwater River, Salmon River, Grande Ronde River, and Imnaha River subbasins are presented in Appendix Figures 1-3. Individual streams surveyed and locations of surveyed areas are presented below.

Adult spring Nacó'x̂ (Chinook salmon) escapement is monitored at three sites in the Clearwater River subbasin located in north central Idaho; two picket weirs are operated in Lolo Creek (rkm 21 and rkm 51), a tributary to the Clearwater River (Appendix Figure 4) and one in Newsome Creek (rkm 0), a tributary to the South Fork Clearwater River (Appendix Figure 5). In addition to escapement monitoring, the three weirs are operated to collect broodstock for the Nez Perce Tribal Hatchery (NPTH) program. To supplement broodstock collection, the adult fish ladder at the NPTH site (Appendix Figure 1) is also operated to collect adult spring Nacó'x̂ (Chinook salmon) and fall Nacó'x̂ (Chinook salmon).

Multiple stream locations were sampled within the Clearwater River subbasin during spring Nacó'x̂ (Chinook salmon) spawning ground surveys by three different projects within the DFRM Research Division. The streams monitored for the NPTH spring Chinook Monitoring and Evaluation (M&E) project are Lolo Creek, Yoosa Creek, Musselshell Creek, and Eldorado Creek (Appendix Figure 4), Newsome Creek, (Appendix Figure 5) Mill Creek, and Meadow Creek, tributaries to the South Fork Clearwater River (Appendix Figure 1), Meadow Creek, a tributary to the Selway River (Appendix Figure 6), and the lower Selway River (Appendix Figure 1). The Salmon Supplementation Studies in Idaho Rivers (ISS) project studied two streams in the Clearwater River subbasin; Fishing Creek and Legendary Bear Creek (Appendix Figure 7). Both streams are tributaries to the Lochsa River. The NPTH M&E project conducted aerial fall Nacó'x̂ (Chinook salmon) redd count surveys in the Clearwater River subbasin in the mainstem Clearwater River, lower Potlatch River, North Fork

Clearwater River, Middle Fork Clearwater River, and lower sections of the South Fork Clearwater River and Selway River (Appendix Figure 8).

Adult spring and summer Nacó'x̂ (Chinook salmon) escapement is monitored at three sites within the South Fork Salmon River; Lake Creek, the Secesh River, and in Johnson Creek. All three streams are located in west central Idaho (Appendix Figures 9 and 10) and are tributaries to the South Fork Salmon River. The Chinook Salmon Adult Abundance Monitoring project uses a dual frequency identification sonar (DIDSON) monitoring site in the Secesh River at rkm 30, to quantify natural origin adult salmon escapement. An adult salmon underwater video monitoring site is also located in Lake Creek (Appendix Figure 9) approximately 100 m upstream from the mouth of Lake Creek as part of the ISS Project. The Johnson Creek Artificial Propagation and Enhancement project (JCAPE) employs a temporary picket style weir, located in Johnson Creek at rkm 8.2 (Appendix Figure 10), to assess adult salmon escapement and collect broodstock for the supplementation program.

Multiple stream locations were sampled within the Salmon River subbasin for Nacó'x̂ (Chinook salmon) spawning ground surveys. The ISS project studied three streams within the Salmon River drainage; the Secesh River which is a tributary of the South Fork Salmon River and Lake Creek which is a tributary of the Secesh River, and Slate Creek, a tributary of the mainstem Salmon River (Appendix Figures 9, 10, and 12). The JCAPE project conducted multiple pass ground index area and extensive area redd count surveys in Johnson Creek and one of its tributaries (Burntlog Creek) (Appendix Figure 10). The Lower Snake River Compensation Plan (LSRCP) Monitoring and Evaluation (M&E) project conducted multiple pass surveys in the upper mainstem South Fork Salmon River below the adult weir and in the Middle Fork Salmon River on Big Creek (Appendix Figures 13 and 14). The JCAPE and LSRCP project also conducted single and multiple pass ground surveys in the East Fork South Fork Salmon River and two of its tributaries (Sugar Creek and Meadow Creek) (Appendix Figure 11). The Fall Chinook Acclimation Project (FCAP) M&E staff conducted aerial fall Nacó'x̂ (Chinook salmon) redd count surveys in the mainstem Salmon River from the mouth up to French Creek (Appendix Figure 15).

Adult spring and summer Nacó'x̂ (Chinook salmon) escapement was monitored at one site in the Lostine River. The Grande Ronde Supplementation: Lostine River Operation and Maintenance Project employed a panel weir, located in the Lostine River at rkm 1.4 (Appendix Figure 16), to quantify adult salmon escapement to the tributary and for collection of broodstock for the supplementation program.

Multiple adult spring and summer Nacó'x̂ (Chinook salmon) redd count surveys were conducted within the Grande Ronde River subbasin in the Lostine River. The Grande Ronde Supplementation: Lostine River Monitoring and Evaluation project in a cooperative effort with co managers conducted index area and extensive area surveys in the Lostine River (Appendix Figure 16). The FCAP M&E staff collected aerial fall Nacó'x̂ (Chinook salmon) redd count survey information in the mainstem Grande Ronde River from the mouth up to the Wallowa River, the lower Wallowa River to the mouth of the Minam River, and the lower Wenaha River from the mouth to rkm 17.5 (Appendix Figure 17).

The FCAP M&E staff conducted aerial fall Nacó'x̂ (Chinook salmon) redd count surveys in the mainstem Imnaha River from the mouth up to rkm 19.5 at the town of Imnaha (Appendix Figure 17). The LSRCP project monitored adult Héeyey (steelhead) escapement in one tributary in the lower Imnaha River (Horse Creek) (Appendix Figure 3).

Table 1. Returning (to the target stream) spring/summer and fall Chinook, Nacó'x̂ (Chinook salmon), and Héeyey (steelhead) adults trapped, number of fish removed (broodstock collected, etc.), estimated escapement and percent hatchery fish above weirs, and total tributary escapement for streams monitored by the Nez Perce Tribe during 2009 (N/A = Not applicable, S/A = Still being analyzed). Total tributary escapement is escapement to the entire stream prior to broodstock take, harvest, and expanded for redds located below weirs.

Stream	Number Trapped	Number of Fish Removed (broodstock, euthanized, outplanted, distributed, reported harvest)	Estimated Escapement Above Weir (95% C.I.)	Percent Hatchery Above Weir	Total Tributary Escapement	Percent Hatchery for Total Tributary
<u>Spring/Summer Nacó'x̂ (Chinook salmon)</u>						
Clearwater River						
Lolo Creek	94	50	198 (198-198)	16.7	248	21.0
Newsome Cr.	91	65	130 (58-202)	80.0	215	91.4
NPTH Ladder	338	252	N/A	N/A	N/A	N/A
Salmon River						
Johnson Cr.	813 ¹	97	786 (753-818)	70.0	929	65.7
Secesh River	N/A	N/A	S/A	S/A	S/A	N/A
Lake Creek	N/A	N/A	391 (351-431)	S/A	S/A	N/A
Grande Ronde R.						
Lostine River	2,431	1,999 ²	974 (913-1,035)	51.5	3,288	80.9
<u>Fall Nacó'x̂ (Chinook salmon)</u>						
Clearwater River						
NPTH Ladder	5,618	5,294	N/A	N/A	N/A	N/A
<u>Héeyey (steelhead)</u>						
Imnaha River						
Horse Cr.	159	N/A	185 (145-224)	2.0	N/A	N/A

1 Excludes fish recaptured in the upstream or downstream trap boxes.

2 Includes estimated harvest that was not included in previous year's reports.

Table 2. Adult spring and summer Nacó'x̂ (Chinook salmon) escapement to Lolo Creek, Newsome Creek, Johnson Creek, Secesh River, Lake Creek, and the Lostine River from 2005 to 2009. Escapement information is total tributary escapement to the entire stream prior to broodstock take (S/A = Still being analyzed).

Year	Lolo Creek	Newsome Creek	Johnson Creek	Secesh River	Lake Creek	Lostine River
2005	322	67	221	344	137	916
2006	209	84	227	212	84	634
2007	138	53	438	307	90	593
2008	287	150	738	912	318 ¹	SA
2009	248	215	929	S/A	391	3,288

¹ Estimate generated from a fish per redd value of 2.01 and 158 redds.

Table 3. Adult spring and fall Nacó'x̂ (Chinook salmon) swim-in returns and volunteers to the Nez Perce Tribe Hatchery (NPTH) ladder from 2005 to 2009 (N/A = Not applicable).

Year	Spring Chinook ¹	Fall Chinook
2005	12	167
2006	51	138
2007	161	2,174
2008	196	1,279
2009	338	5,618

¹ Outplanted adults returned to the Clearwater River were not marked early in the run, thus total return numbers may be high.

Table 4. Adult Héeyey (steelhead) escapement to Lightning Creek, Cow Creek, and Horse Creek in the Imnaha River subbasin from 2005 to 2009. Escapement information is total escapement above the weir site.

Year	Lightning Creek	Cow Creek	Horse Creek
2005	70	88	N/A
2006	95	27	N/A
2007	93	39	N/A
2008	Discontinued	Discontinued	114
2009	Discontinued	Discontinued	185

Table 5. Spring/summer Nacó'x̂ (Chinook salmon) spawning ground index area and extensive area redd count surveys conducted by the Nez Perce Tribe Department of Fisheries Resources Management during 2009 (N/A = Not applicable). Redd counts are ground counts unless otherwise noted. Number of extensive passes included the range of passes because in many cases extensive area surveys encompass multiple sections and not all sections are surveyed equal number of times.

Subbasin	Stream	Index Area Redd Count	Number of Passes (Index)	Extensive Area Redd Count	Number of Passes (Extensive)	Total Number of Redds
Clearwater River	Lolo Creek (excluding trib.'s)	34	3	14	1	48
	Yoosa Creek	0	3	N/A	N/A	0
	Musselshell Creek	N/A	N/A	0	1	0
	Eldorado Creek	0	3	0	1	0
	Newsome Creek	15	3	0	1	15
	SF Clearwater River	4 ²	2	N/A	N/A	4 ²
	Meadow Creek	N/A	N/A	0	1	0
	Mill Creek	N/A	N/A	0	1	0
	Meadow Creek (Selway)	12	1 ¹	N/A	N/A	12
	Lower Selway River	N/A	N/A	8 ^{1,2}	1	8 ^{1,2}
	Fishing Creek (Squaw Cr) ³	7	3	N/A	N/A	7
Salmon River	Legendary Bear Creek (Papoose Cr)	29	3	3	3	32
	Slate Creek	6	2	2	1	8
	Secesh River (excluding trib.'s)	135	3	5	3	140
	Lake Creek	154	3	37	3	191
	Summit Creek	N/A	N/A	47	3	47
	Grouse Creek	N/A	N/A	47	3	47
	Lick Creek	N/A	N/A	0	1	0
	Upper Mainstem South Fork Salmon River	341 ³	4-5	N/A	N/A	341 ³
Johnson Creek (excluding trib.'s)	205	6	32	2-6	237	

Subbasin	Stream	Index Area Redd Count	Number of Passes (Index)	Extensive Area Redd Count	Number of Passes (Extensive)	Total Number of Redds
	Burnt Log Creek	N/A	N/A	16	6	16
	East Fork South Fork Salmon River	N/A	N/A	68 ⁴	1-3	68 ⁴
	Sugar Creek	N/A	N/A	40 ⁴	3	40 ⁴
	Meadow Creek	N/A	N/A	41 ⁴	1	41 ⁴
	Big Creek	69	3	15 ²	2	84
Grande Ronde River	Lostine River	131	4	127	3-4	258

¹ Aerial survey.

² Does not represent comprehensive coverage of entire spawning distribution.

³ Entire index not surveyed.

⁴ Excess fish from South Fork Salmon River (689) were outplanted into the East Fork South Fork Salmon River and may have had an effect on the increased number of redds compared to previous years.

Table 6. Fall Nacó'x̂ (Chinook salmon) spawning aerial redd count surveys conducted by the Nez Perce Tribe Department of Fisheries Resources Management during 2009.

Subbasin	Stream	Total Number of Redds	Number of Passes
Clearwater River	Clearwater River – mainstem below North Fork Clearwater River	1,142	9
	Clearwater River – mainstem above North Fork Clearwater River	42	4
	North Fork Clearwater River	1	9
	South Fork Clearwater River	12	3
	Selway River	1	3
	Potlatch River	0	2
	Middle Fork Clearwater River	0	3
	Salmon River	Salmon River – mainstem	34
Grande Ronde River	Grande Ronde River - mainstem	101	9
	Wallowa River	0	2
	Wenaha River	0	2
Imnaha River	Imnaha River – mainstem	36	8

Table 7. Spring/summer Nacó'x̂ (Chinook salmon) spawning ground survey carcass recovery information from all sections (includes all available within the stream collected by the Nez Perce Tribe Department of Fisheries Resources Management during 2009 (S/A = Still being analyzed).

Subbasin	Stream	Number of Known Origin Carcasses	Total Hatchery Composition of Known Origin Carcasses (%)	Out of Population Strays ¹ (%)
Clearwater River	Lolo Creek	24	16.7	8.3
	Yoosa Creek	0	0	0
	Musselshell Creek	0	0	0
	Eldorado Creek	0	0	0
	Newsome Creek	5	80.0	80.0
	SF Clearwater River	0	0	0
	Meadow Creek	0	0	0
	Mill Creek	0	0	0
	Meadow Creek (Selway)	0	0	0
	Lower Selway River	0	0	0
	Fishing Creek (Squaw Cr)	1	100.0	100.0
Salmon River	Legendary Bear Creek (Papoose Cr)	21	85.7	4.7
	Slate Creek	2	50.0	50.0
	Secesh River (excluding trib.'s)	137	2.2	2.2
	Lake Creek	139	2.2	2.2
	Summit Creek	30	0	0
	Grouse Creek	28	14.3	14.3
	Upper Mainstem South Fork Salmon	469	46.2	NA
	Johnson Creek (excluding trib.'s)	379	68.3	1.1
	Burnt Log Creek	3	33.3	0.0
	Big Creek	52	1.9	1.9
	East Fork South Fork Salmon River	53	N/A ²	N/A ²
Sugar Creek	78	N/A ²	N/A ²	
Meadow Creek	60	N/A ²	N/A ²	
Grande Ronde R.	Lostine River	326	59.5	S/A

¹ Defined as the percentage of all hatchery fish which strayed into the study stream from out of the population.

² Excess fish from South Fork Salmon River (689) were outplanted into the East Fork South Fork Salmon River and thus makes reporting these numbers not comparable with the intent of this table.

Table 8. Fall Nacó'x̂ (Chinook salmon) spawning ground survey carcass recovery information collected by the Nez Perce Tribe Department of Fisheries Resources Management during 2009.

Subbasin	Stream	Number of Carcasses	Total Hatchery Composition (%)	Out of Population Strays ¹ (%)
Clearwater River ²	Clearwater River – mainstem	257	47.3	1.2
	Clearwater River – above North Fork	0	0	0
	South Fork Clearwater	0	0	0
	North Fork Clearwater	0	0	0
	Lower Selway River	0	0	0
	Potlatch River	0	0	0
	Middle Fork Clearwater River	0	0	0
	Salmon River	Salmon River – mainstem	0	0
Grande Ronde R.	Grande Ronde River – mainstem	0	0	0
	Wallowa River	0	0	0
	Wenaha River	0	0	0
Imnaha River	Imnaha River – mainstem	0	0	0

¹ Defined as the percentage of all fish which strayed into the study stream from out of the Snake Basin ESU.

² From coded wire tags, ad-clips. Scales have not been analyzed at the time of this report.

Table 9. Total number of spring and summer Nacó'x̂ (Chinook salmon) redds, index area and extensive area, observed in Clearwater River tributary streams from 2005 to 2009 (includes tributary streams). N/S = not surveyed. The reader is directed to individual year annual reports for a description of stream kilometers surveyed.

Year	Lolo Creek	Newsome Creek	South Fork Clearwater ¹	Mill Creek	Meadow Creek (SF Clearwater)	O'Hara Creek	Meadow Creek (Selway)	Lower Selway River ¹	Fishing Creek (Squaw Cr.)	Legendary Bear Creek (Papoose Cr.)
2005	45	7	4	N/S	0	N/S	18	2	2	8
2006	9	4	19	0	0	N/S	52	14	7	8
2007	14	2	3	0	0	N/S	8	1	0	1
2008	102	22	7	N/S	39	10	29	14	38	40
2009	48	15	4	0	0	N/S	12	8	7	32

¹ Does not represent comprehensive coverage of entire spawning distribution.

Table 10. Total number of spring and summer Nacó'x̂ (Chinook salmon) redds, index area and extensive area, observed in Salmon River tributary streams and the Lostine River in the Grande Ronde River subbasin from 2005 to 2009 (includes tributary streams). The reader is directed to individual year annual reports for a description of stream kilometers surveyed.

Year	Slate Creek	Secesh River	Johnson Creek	East Fork South Fork Salmon River	Upper South Fork Salmon River ¹	Big Creek ²	Lostine River
2005	2	205	55	N/A	376	21	148
2006	3	75	38	N/A	274 ³	15	111
2007	0	83	74	N/A	259	25	104
2008	10	384	224	5	487 ³	44	293
2009	8	425	253	149 ⁴	341	84	258

¹ - Redd count numbers represent supplemental area counts, not inclusive of all potential spawning areas.

² - Redd count numbers represent index area and supplemental area counts, not inclusive of all potential spawning areas.

³ - Unknown tributary above Goat Creek to ³/₄ mile below Goat Creek section not surveyed.

⁴ - Excess fish from South Fork Salmon River (689) were outplanted into the East Fork South Fork Salmon River and may had an effect on the increased number of redds compared to previous years.

Table 11. Total number of fall Nacó'x̂ (Chinook salmon) redds observed in the Clearwater River and tributaries, Salmon River, Grande Ronde River, and Imnaha River from 2005 to 2009. The reader is directed to individual year annual reports for a description of stream kilometers surveyed.

Year	Clearwater River Mainstem below North Fork	Clearwater River Mainstem above North Fork	North Fork Clearwater River	South Fork Clearwater River	Middle Fork Clearwater River	Potlatch River	Lower Selway River	Salmon River Mainstem	Grande Ronde River Mainstem	Imnaha River Mainstem
2005	433	54	0	0	0	0	0	27	129	36
2006 ¹	251	6	0	0	0	0	0	9	42 ²	36
2007	711	7	0	0	0	0	0	18	81 ³	17 ¹
2008	919	22	0	3	0	16	5	14	186 ³	68
2009	1,142	42	1	12	0	0	1	34	101	36

¹ Clearwater, Salmon, Grande Ronde, and Imnaha redd surveys were not a total count due to high water events, turbid conditions, and inclement weather.

² Includes one redd observed in the Wenaha River, one redd observed in the upper Grande Ronde, and no redds in the Wallowa River (extensive areas surveyed in 2006 - 2008).

³ Includes one redd observed in the Wenaha River.

Appendix

Appendix Table 12. Description of **redd count index areas (trend areas)** surveyed for spring/summer Nacó'x̂ (Chinook salmon) and fall Nacó'x̂ (Chinook salmon) during 2009.

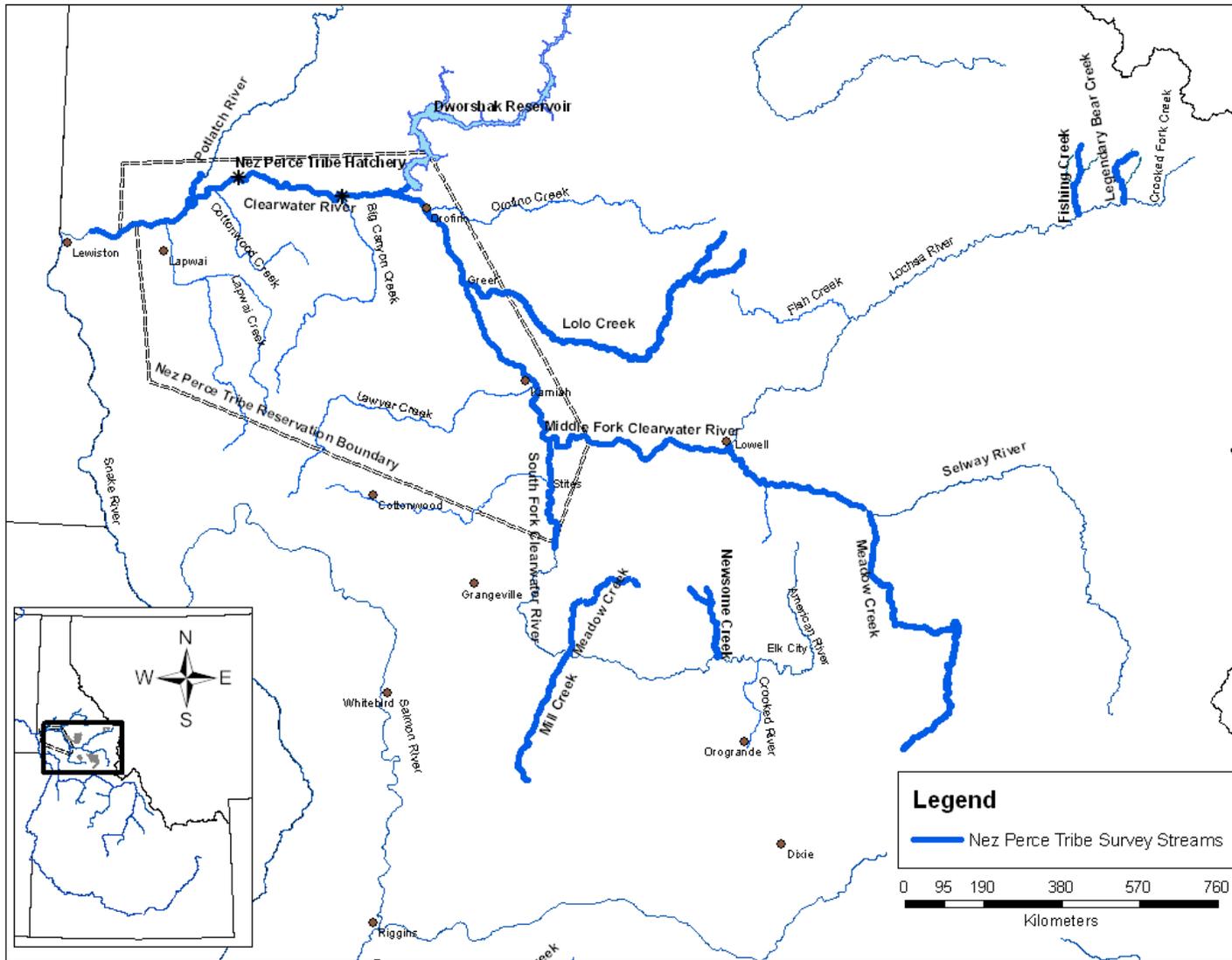
Stream	Type of Count	GPS Location & Description
Lolo Creek	Ground	Pheasant Camp sign to mouth of Yoosa Creek
		GPS Coordinates N 46.28882 W 115.75987 to N 46.39251 W 115.68398
Yoosa Creek	Ground	Mouth of Yoosa to mouth of Camp Creek
		GPS Coordinates N 46.39251 W 115.68398 to N 46.39702 W 115.64738
Eldorado Creek	Ground	Mouth of Eldorado Creek to old weir site
		GPS Coordinates N 46.29473 W 115.75077 to N 46.28572 W 115.72031
Newsome Creek	Ground	Mouth of Newsome Creek to Glory Hole
		GPS Coordinates N 45.82865 W 115.61534 to N 45.92752 W 115.64008
S.F. Clearwater River	Ground	Mouth of Leggett Creek to mouth of Newsome Creek
		GPS Coordinates N 45.82664 W 115.62705 to N 45.82865 W 115.61534
Meadow Creek (Selway)	Aerial	Mouth of Meadow Creek to Fourmile Creek
		GPS Coordinates N 46.04537 W 115.29637 to N 45.72618 W 115.16726
Fishing Creek	Ground	Mouth of Fishing Creek to 1 st culvert above the confluence of West Fork
		GPS coordinates N 46.49227 W 114.85765 to N 46.54126 W 114.86246
Legendary Bear Creek	Ground	Mouth of Legendary Bear Creek to confluence of East and West Fork
		GPS Coordinates N 46.51148 W 114.76134 to N 46.53504 W 114.76608
Slate Creek	Ground	Mouth of Willow Creek to USFS 329 footbridge across Little Slate
		GPS coordinates N 45.637852 W 116.110359 to N 45.600529 W 116.067946
Secesh River	Ground	Alex Creek to Grouse Jct. Bridge
		GPS coordinates N 45.202162 W 115.815679 to N 45.267267 W 115.845103
Lake Creek	Ground	Mouth of Lake Creek to confluence of Willow Creek
		GPS Coordinates N 45.256376 W 115.897122 to N 45.330665 W 115.949875
Upper Mainstem South Fork Salmon River ¹	Ground	South Fork Salmon River weir to Dime Creek
		GPS Coordinates N 44.66674 W 115.70307 to N 44.70261 W 115.70035
Upper Mainstem South Fork Salmon River ¹	Ground	Dime Creek to Unknown tributary above Goat Creek
		GPS Coordinates N 44.70261 W 115.70035 to N 44.74028 W 115.68915
Upper Mainstem South Fork Salmon River ¹	Ground	Blackmare Creek to lower end of Poverty Flat
		GPS Coordinates N 44.82299 W 115.70444 to N 44.83201 W 115.70416
Upper Mainstem South Fork Salmon River ¹	Ground	Lodgepole Campground to Phoebe Creek Bridge
		GPS Coordinates N44.86579 W115.69653 to N44.89900 W115.71597
Johnson Creek	Ground	Top of Deadhorse Rapids to Mouth of Moose Creek
		GPS Coordinates N 44.891977 W 115.49791 to N 44.852551 W 115.509123
Big Creek	Ground	Logan Creek to Jacobs Ladder Creek
		GPS Coordinates N 45.11824 W 115.32011 to N 45.08166 W 115.33877
Clearwater River (lower)	Aerial (fall Chinook)	Potlatch Mill to North Fork Clearwater River Confluence
		GPS Coordinates N 46.432608 W 116.971406 to N 46.502350 W 116.329547
Clearwater River (upper)	Aerial (fall Chinook)	North Fork Clearwater confluence to South Fork Clearwater confluence
		GPS Coordinates N 46.502350 W 116.329547 to N 46.144906 W 115.992267
North Fork Clearwater R.	Aerial (fall Chinook)	Mouth of North Fork to just below Dworshak Dam
		GPS Coordinates N 46.502350 W 116.329547 to N 46.511231 W 116.301886
South Fork Clearwater R.	Aerial (fall Chinook)	Mouth of South Fork Clearwater to town of Harpster
		GPS Coordinates N 46.144906 W 115.982267 to N 45.985208 W 115.965931
Middle Fork Clearwater R.	Aerial (fall Chinook)	South Fork Clearwater River confluence to Selway River confluence
		GPS Coordinates N 46.145689 W 115.981936 to N 46.141122 W 115.597686
Selway River	Aerial (fall Chinook)	Mouth of Selway River to Selway Falls
		GPS Coordinates N 46.141122 W 115.597686 to N 46.053361 W 115.308931
Grande Ronde River	Aerial (fall Chinook)	Mouth of Grande Ronde River to Wildcat Bridge above town of Troy
		GPS Coordinates N 46.079917 W 116.980372 to N 45.898842 W 117.483081
Lostine River	Ground	Six Mile Bridge to Lostine River Ranch Bridge
		GPS Coordinates N 45.43897 W 117.42633 to N 45.40825 W 117.42809
Imnaha River	Aerial (fall Chinook)	Mouth of Imnaha River to town of Imnaha
		GPS Coordinates N 45.816897 W 116.764564 to N 45.559842 W 116.833906
Salmon River	Aerial (fall Chinook)	Mouth of Salmon River to French Creek above town of Riggins
		GPS Coordinates N 45.856253 W 116.793825 to N 45.403617 W 116.098461

1-Not entire index area surveyed.

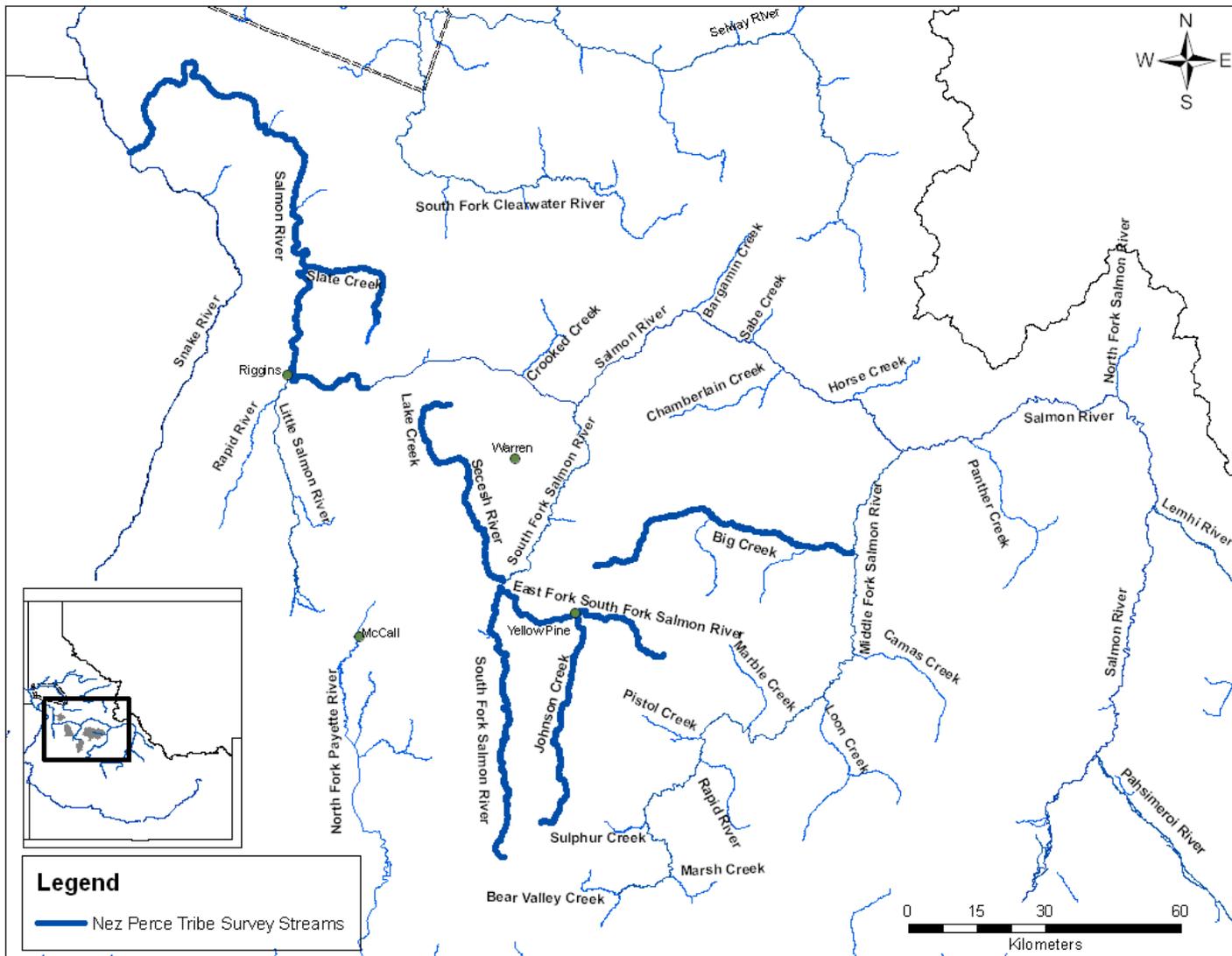
Appendix Table 13. Description of redd count **extensive areas** surveyed for spring/summer Nacó'x̄ (Chinook salmon) and fall Nacó'x̄ (Chinook salmon) during 2009.

Stream	Type of Count	GPS Location & Description
Lolo / Upper	Ground	Mouth of Yoosa Creek to Slide
		GPS Coordinates N 46.39251 W 115.68398 to N 46.39899 W 115.67646
Lolo / Rock Creek	Ground	Mouth of Rock Creek to Pheasant Camp sign
		GPS Coordinates N 46.27243 W 115.80407 to N 46.28882 W 115.75987
Lolo / Lower Weir Site	Aerial	1.6 km downstream of lower Lolo weir to Pheasant Camp
		GPS Coordinates N 46.30293 W 115.98960 to N 46.28882 W 115.75987
Musselshell Creek	Ground	Mouth of Musselshell Creek to mouth of Gold Creek
		GPS Coordinates N 46.30966 W 115.75410 to N 46.36984 W 115.74089
Eldorado Creek	Ground	Old weir site to Dollar Creek bridge
		GPS Coordinates N 46.28572 W 115.72031 to N 46.29930 W 115.64601
Newsome / Radcliff Creek	Ground	Glory Hole to mouth of Radcliff Creek
		GPS Coordinates N 45.92752 W 115.64008 to N 45.95367 W 115.64610
Newsome / Pilot Creek	Ground	Lower 500 meters
		GPS Coordinates N 45.90722 W 115.63001 to N 45.90790 W 115.63541
Newsome / Baldy Creek	Ground	Lower 400 meters
		GPS Coordinates N 45.90779 W 115.63149 to N 45.90943 W 115.63403
Mill Creek	Ground	Mouth of Mill Creek to mouth of Markham Creek
		GPS Coordinates N 45.82892 W 115.93556 to N 45.79521 W 115.95947
Meadow Cr. (S.F. Clwtr R.)	Ground	McComas Meadows
		GPS Coordinates N 45.88533 W 115.92017 to N 45.90763 W 115.89977
Lower Selway River	Aerial	Mouth of Selway River to mouth of Otter Creek
		GPS Coordinates N 46.14078 W 115.59725 to N 46.05077 W 115.22524
Legendary Bear Creek	Ground	Confluence of East and West Fork to 1.0 km up West Fork
		GPS coordinates N 46.53504 W 114.76608 to N 46.545285 W 114.77.3681
Slate Creek	Ground	Forest Boundary to Mouth of Willow Creek
		GPS coordinates N 45.630544 W 116.203253 to N 45.637852 W 116.110359
Secesh River	Ground	Grimmet Creek to confluence of Lake Creek and Summit Creek
		GPS coordinates N 45.155493 W 115.799853 to N 45.256376 W 115.897122
Lake Creek	Ground	Mouth of Willow Creek to confluence of Corduroy Creek
		GPS coordinates N 45.330665 W 115.949875 to N 45.366537 W 115.93857
Grouse Creek	Ground	Mouth upstream 3.0 km
		GPS coordinates N 45.265319 W 115.830516 to N 45.289131 W 115.835765
Summit Creek	Ground	Mouth to Pucker Point
		GPS coordinates N 45.256376 W 115.897122 to N 45.200303 W 115.954676
Johnson Creek	Ground	Confluence of Johnson Creek and East Fork South Fork to NPT Screw Trap
		GPS Coordinates N 44.962469 W 115.502462 to N 44.91763 W 115.483355
Johnson Creek	Ground	NPT Screw Trap to NPT Adult Weir
		GPS Coordinates N 44.91763 W 115.483355 to N 44.901166 W 115.488842
Johnson Creek	Ground	NPT Adult Weir to top of Deadhorse Rapids
		GPS Coordinates N 44.901166 W 115.488842 to N 44.891977 W 115.49791
Johnson Creek	Ground	Mouth of Moose Creek to Mouth of Burnt Log
		GPS Coordinates N 44.852551 W 115.509123 to N 44.802991 W 115.518556
Johnson Creek	Ground	Old Burnt Log Trail Crossing to Landmark Bridge
		GPS Coordinates N 44.69737 W 115.545397 to N 44.652499 W 115.54237
Johnson Creek	Ground	Landmark Bridge to Swamp Creek
		GPS Coordinates N 44.652499 W 115.54237 to N 44.597181 W 115.524275
Burnt Log Creek	Ground	Mouth of Burnt Log Creek to E.F. Burnt Log confluence
		GPS Coordinates N 44.802991 W 115.518556 to N 44.73684 W 115.50140
East Fork South Fork Salmon River	Ground	River kilometer 3 to 4
		GPS Coordinates N45.00489 W115.69906 to N44.99908 W115.69378
East Fork South Fork Salmon River	Ground	River kilometer 4 to 5
		GPS Coordinates N44.99908 W115.69378 to N44.99515 W115.68315
East Fork South Fork Salmon River	Ground	River kilometer 7 to 8
		GPS Coordinates N44.98451 W115.67419 to N44.97592 W115.67244
East Fork South Fork Salmon River	Ground	River kilometer 8 to 9
		GPS Coordinates N44.97592 W115.67244 to N44.96842 W115.66681

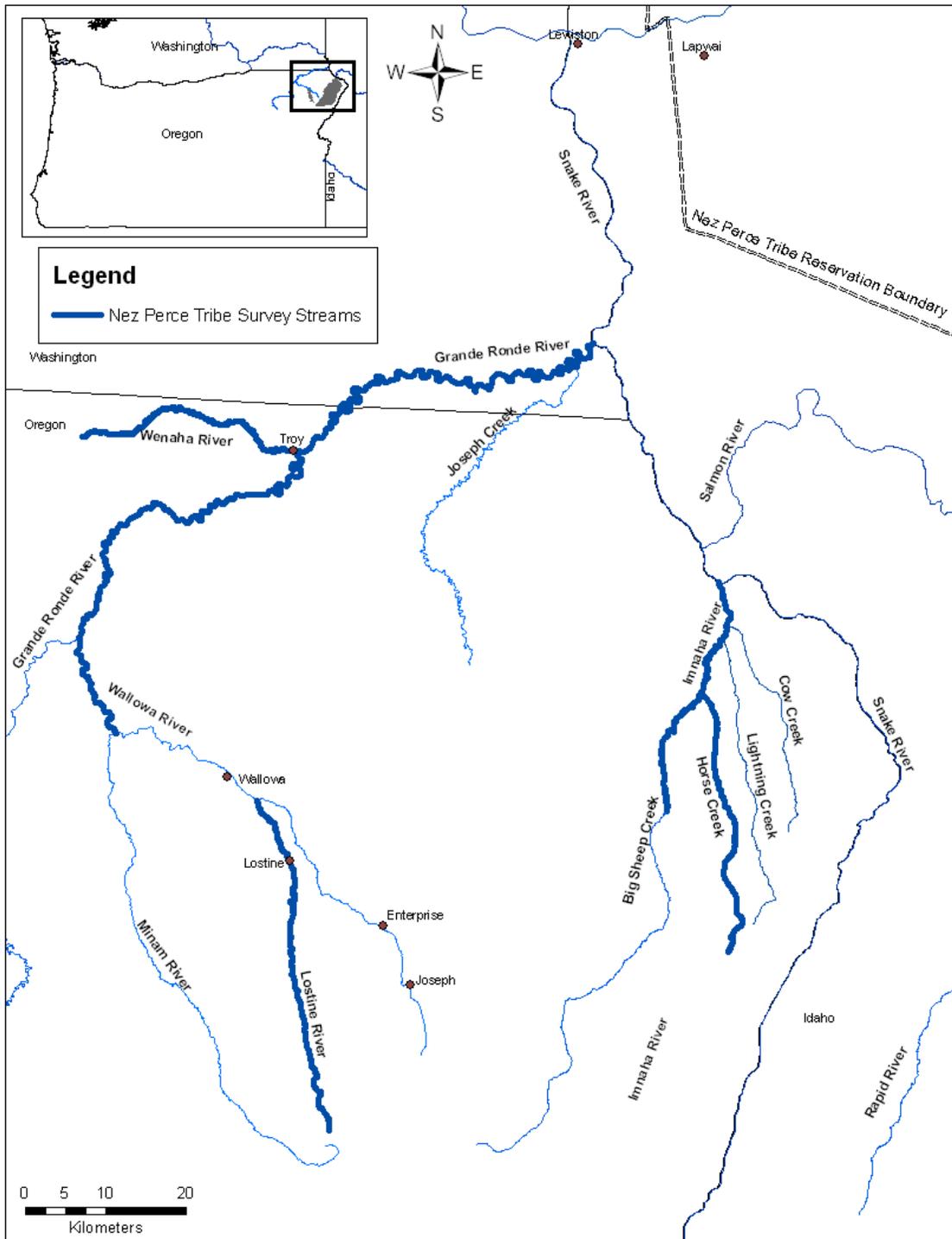
Stream	Type of Count	GPS Location & Description
East Fork South Fork Salmon River	Ground	River kilometer 9 to10
GPS Coordinates N44.96842 W115.66681 to N44.96176 W115.65978		
East Fork South Fork Salmon River	Ground	River kilometer 10 to 11
GPS Coordinates N44.96176 W115.65978 to N44.96113 W115.64906		
East Fork South Fork Salmon River	Ground	River kilometer 14 to 15
GPS Coordinates N44.94923 W115.61826 to N44.94499 W115.60753		
East Fork South Fork Salmon River	Ground	River kilometer 15 to 16
GPS Coordinates N44.94499 W115.60753 to N44.94551 W115.59536		
East Fork South Fork Salmon River	Ground	River kilometer 18 to 19
GPS Coordinates N44.95025 W115.57207 to N44.95321 W115.56092		
East Fork South Fork Salmon River	Ground	River kilometer 21 to 22
GPS Coordinates N44.95540 W115.53830 to N44.95781 W115.52676		
East Fork South Fork Salmon River	Ground	River kilometer 22 to 23
GPS Coordinates N44.95781 W115.52676 to N44.96023 W115.51491		
East Fork South Fork Salmon River	Ground	Quartz Creek to Tamarack Creek
GPS Coordinates N 44.9703 W 115.47824 to N 44.959581 W 115.390092		
East Fork South Fork Salmon River	Ground	Tamarack Creek to Sugar Creek
GPS Coordinates N 44.959581 W 115.390092 to N 44.936142 W 115.337942		
East Fork South Fork Salmon River	Ground	Fiddle Creek to 100 yards above Meadow Creek
GPS Coordinates N 44.92153 W 115.331314 to N 44.90215W 115.326816		
Sugar Creek	Ground	Confluence to Cinnibar Creek
GPS Coordinates N 44.936142 W 115.337942 to N 44.952353 W 115.293528		
Meadow Creek	Ground	Mouth to Tailings
GPS Coordinates N 44.902247W 115.327923 to N44.89445 W115.34129		
Big Creek	Ground	Smith Creek to Logan Creek
GPS Coordinates N 45.15231 W 115.29751 to N 45.11824 W 115.32011		
Potlatch River	Aerial (fall Chinook)	Mouth of Potlatch River to Rkm 4.5
GPS Coordinates N 46.474786 W 116.767264 to N 46.519608 W 116.740211		
Grande Ronde River (upper)	Aerial (fall Chinook)	Wildcat Bridge above Troy to mouth of Wallowa
GPS Coordinates N 45.898842 W 117.483081 to N 45.7254 W 117.7853556		
Lostine River	Ground	Confluence to Hwy 82
N 45.55216 W 117.49007 to N 45.49648 W 117.44029		
Lostine River	Ground	Trout Farm Bridge to Lostine River Ranch Bridge
N 45.46925 W 117.42517 to N 45.43897 W 117.42633		
Lostine River	Ground	Six Mile Bridge to Pole Bridge
N 45.40825 W 117.42809 to N 45.38668 W 117.42517		
Lostine River	Ground	Williamson to Walla Walla Campground
N 45.34184 W 117.41120 to N 45.30055 W 117.39697		
Lostine River	Ground	Bowman Trailhead to Turkey Flat
N 45.29335 W 117.39547 to N 45.27642 W 117.38981		
Wallowa River	Aerial (fall Chinook)	Mouth of Wallowa River to mouth of Minam River
GPS Coordinates N 45.7254 W 117.7853556 to N 45.898842 W 117.483081		
Wenaha River	Aerial (fall Chinook)	Mouth of Wenaha River to River km 17.5
GPS Coordinates N 45.94529167 W 117.45111944 to N 45.985774 W 117.611025		



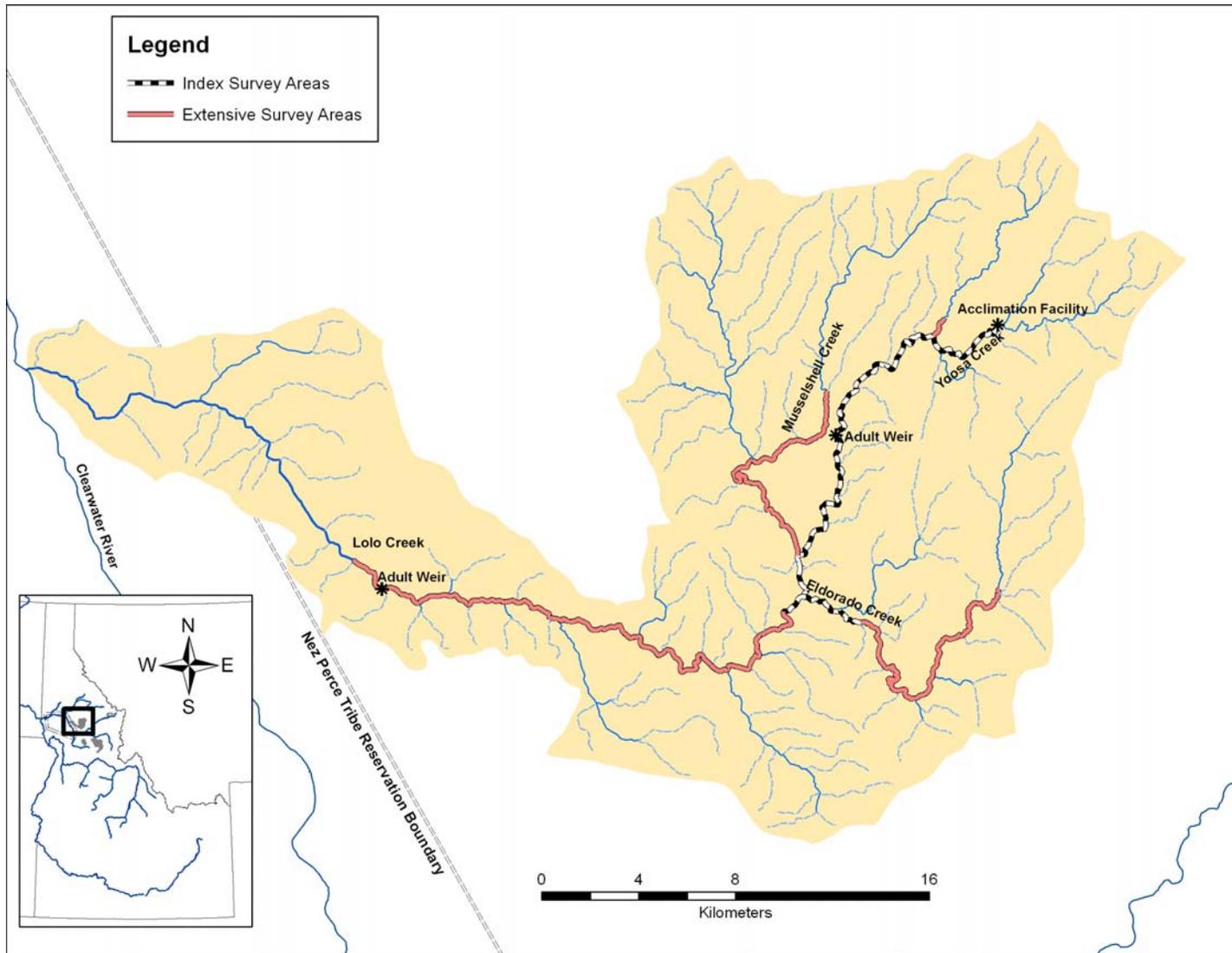
Appendix Figure 1. Overview map of research study streams indicating location within the Clearwater River subbasin. Spring and summer Nacó'x̂ (Chinook salmon) surveys occur in tributary streams, and fall Nacó'x̂ (Chinook salmon) surveys occur in mainstem river reaches.



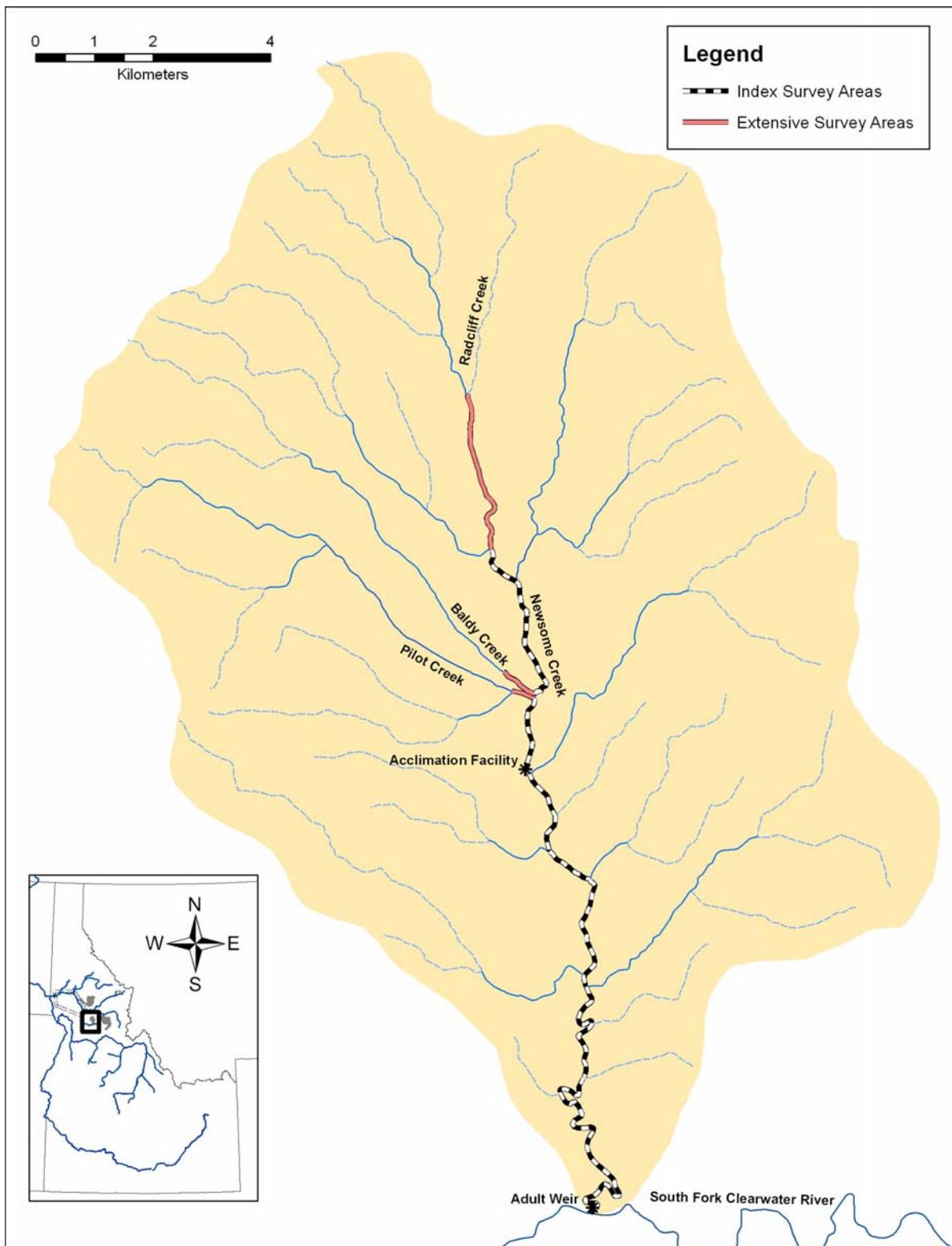
Appendix Figure 2. Overview map of research study streams indicating location within the Salmon River subbasin. Spring and summer Nacó'x̂ (Chinook salmon) surveys occur in tributary streams, and fall Nacó'x̂ (Chinook salmon) surveys occur in the lower Salmon River.



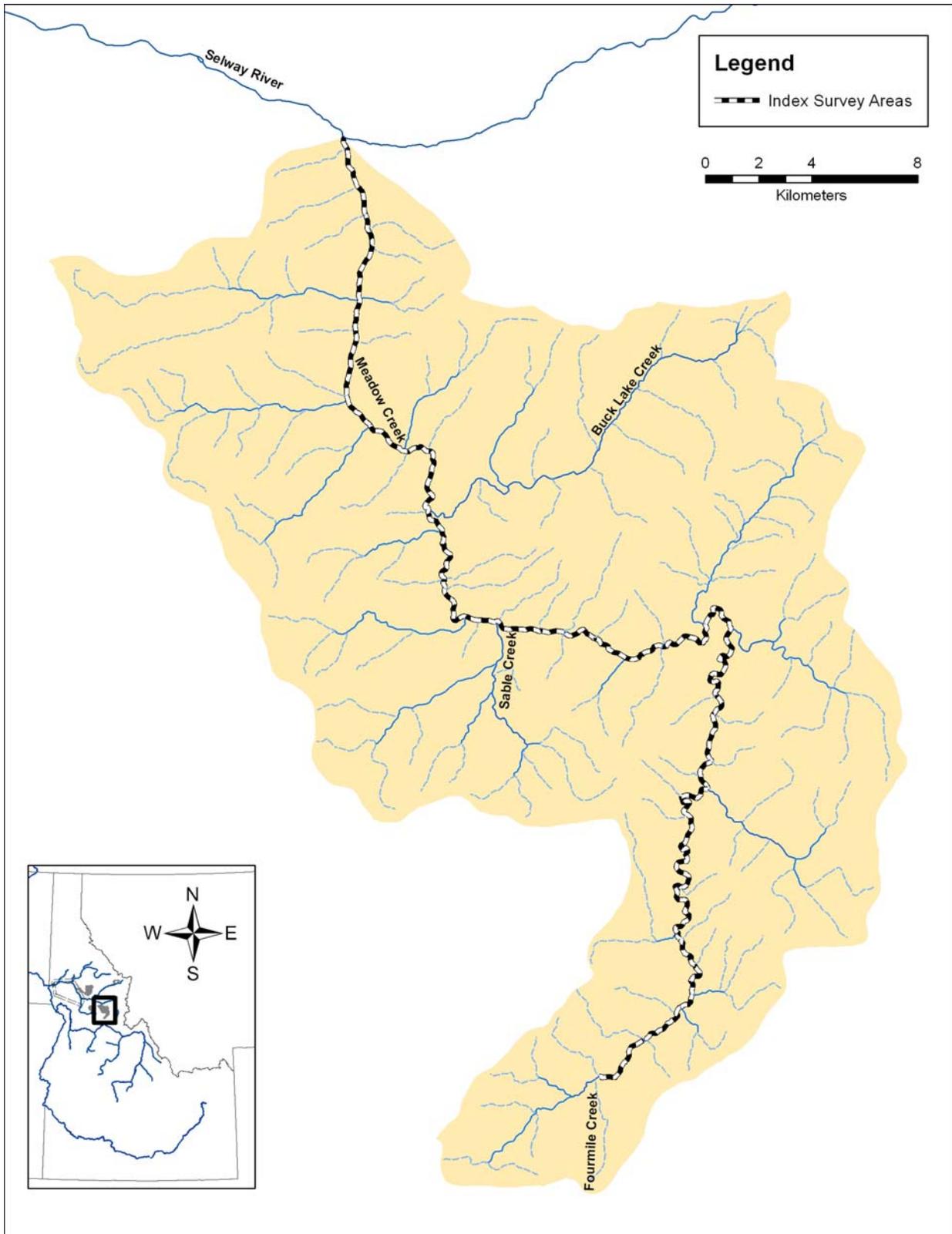
Appendix Figure 3. Overview map of research study streams indicating location within the Grande Ronde River and Imnaha River subbasin. Spring and summer Nacó'x̂ (Chinook salmon) surveys occur in tributary streams, fall Nacó'x̂ (Chinook salmon) surveys occur in lower mainstem river reaches, and Héeyey (steelhead) escapement monitoring occurs in Horse Creek in the Imnaha River.



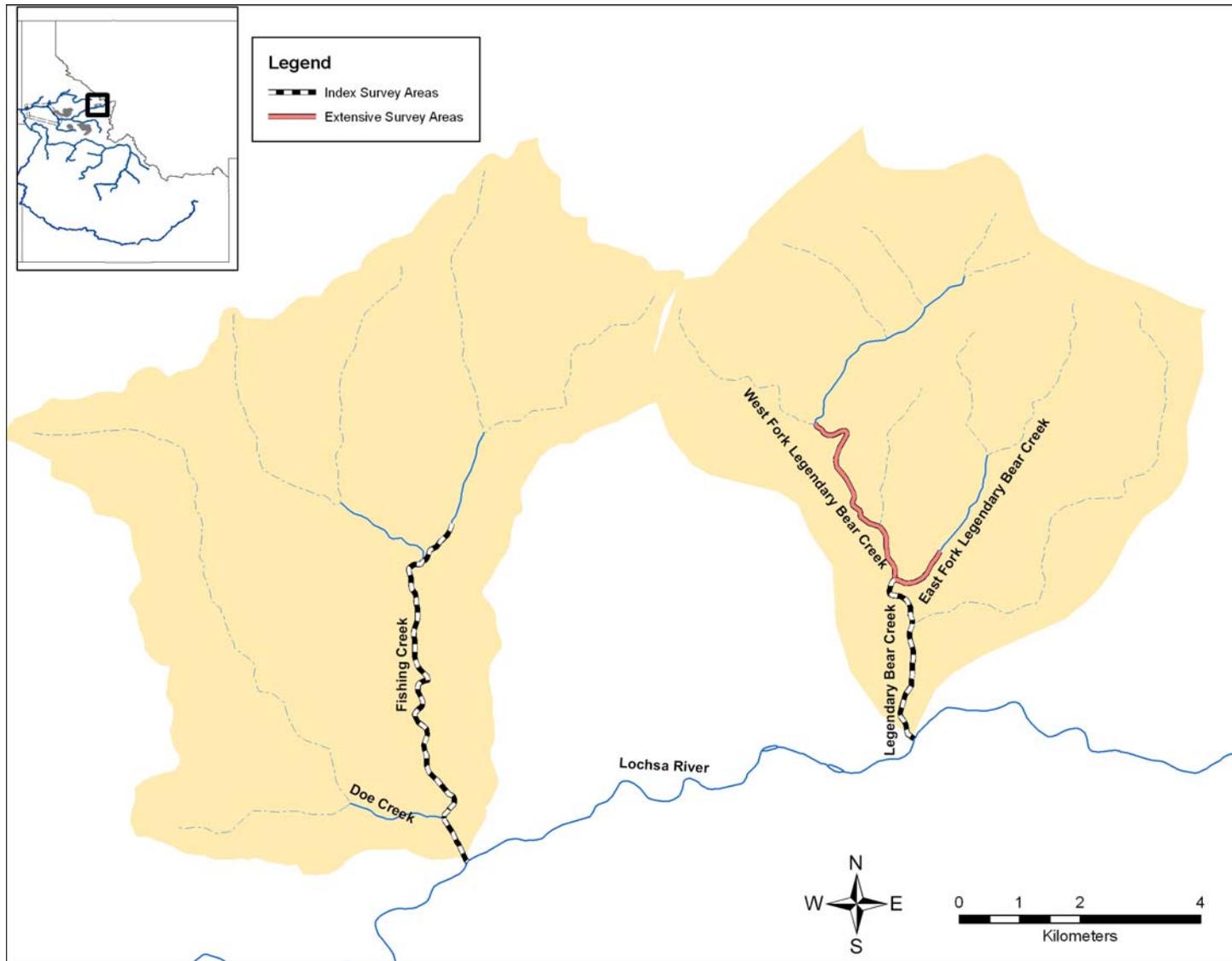
Appendix Figure 4. Tributary specific map indicating locations of index area and extensive area spring and summer Nacó'x̂ (Chinook salmon) redd count surveys, and locations of adult weirs in Lolo Creek, Yoosa Creek, Musselshell Creek, and Eldorado Creek.



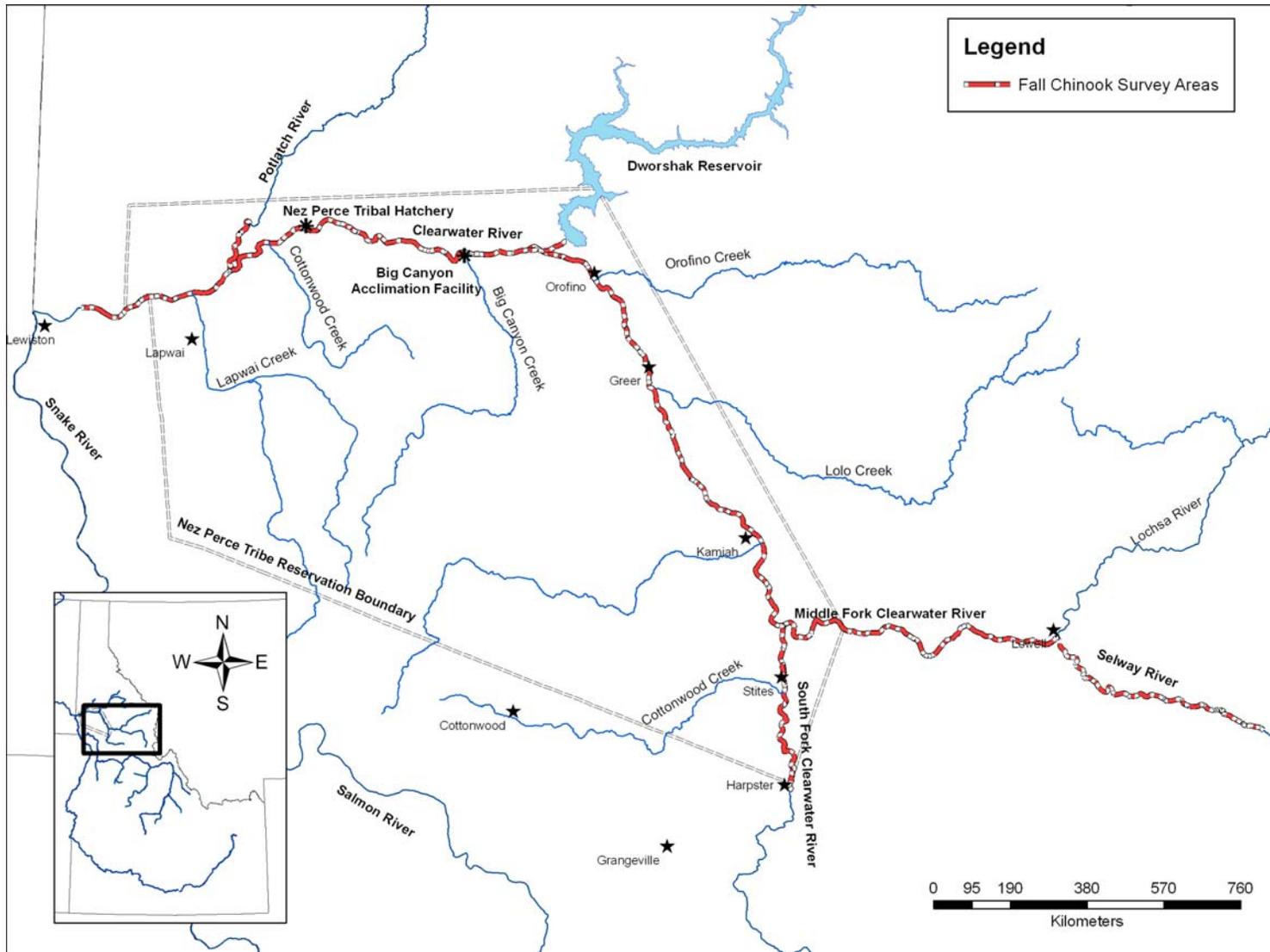
Appendix Figure 5. Tributary specific map indicating locations of index area and extensive area spring and summer Nacó'x̄ (Chinook salmon) redd count surveys, and location of the adult weir in Newsome Creek.



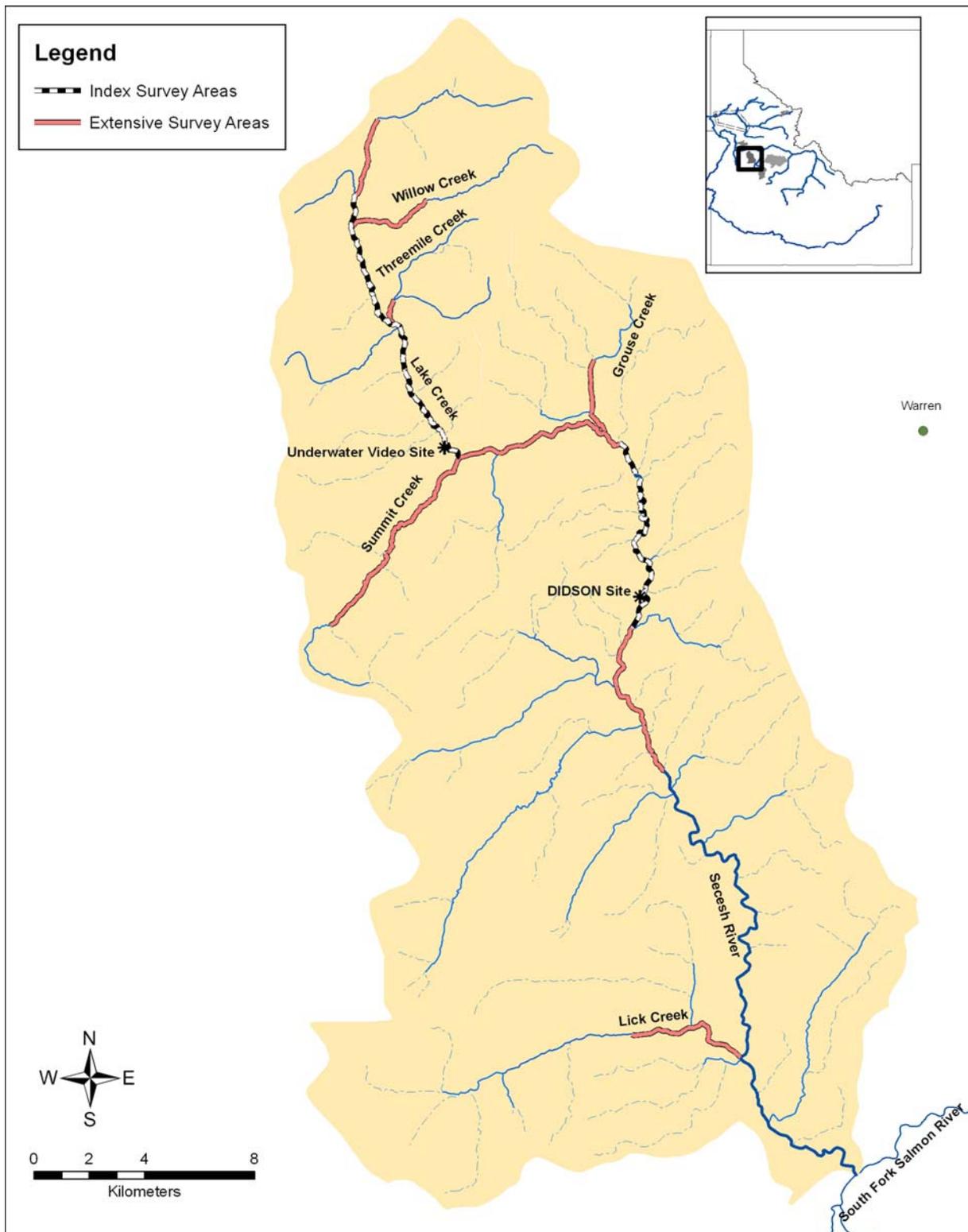
Appendix Figure 6. Tributary specific map indicating locations of index area spring and summer Nacó'x̄ (Chinook salmon) redd count surveys in Meadow Creek (Selway River).



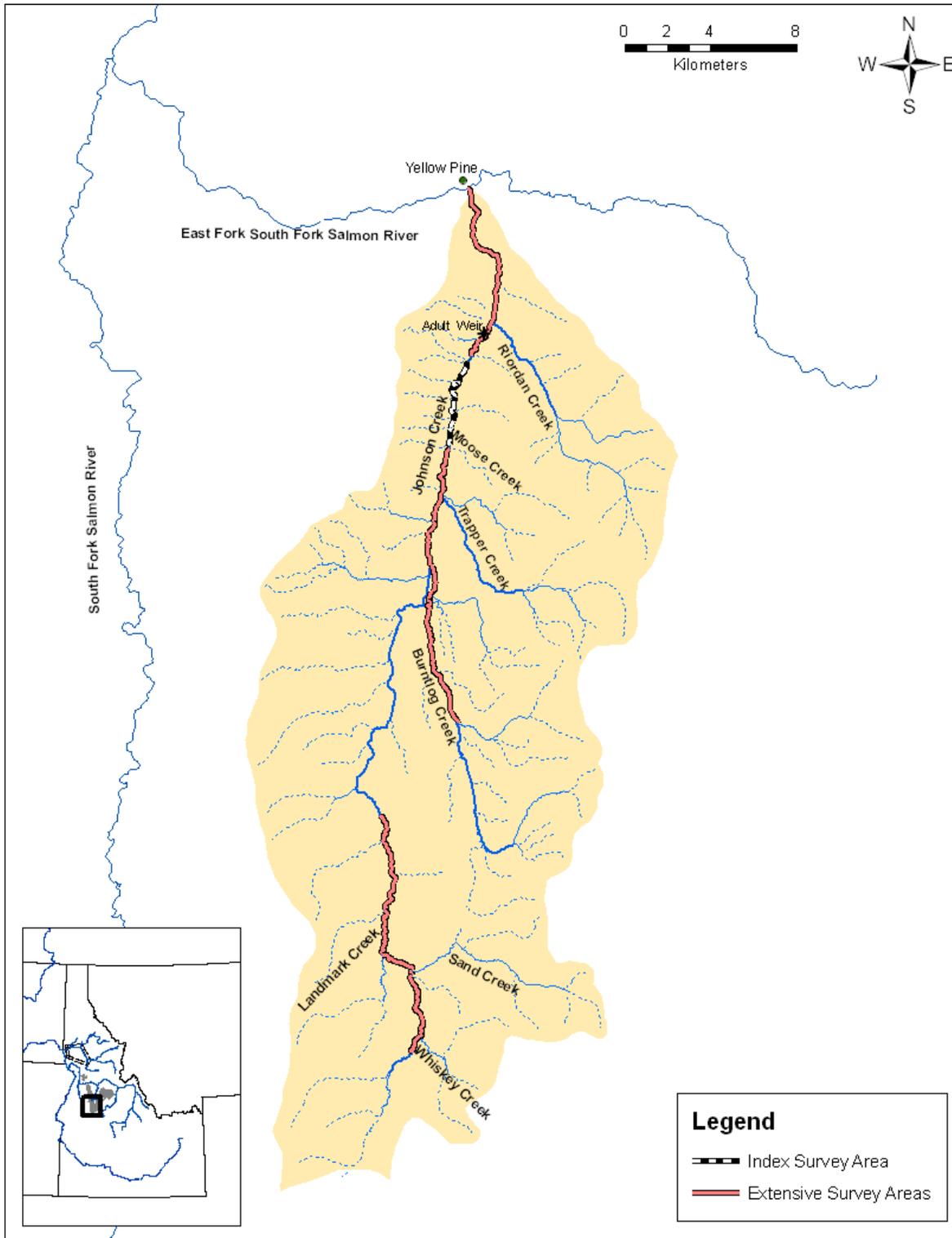
Appendix Figure 7. Tributary specific map indicating locations of index area and extensive area spring and summer Nacó'x̂ (Chinook salmon) redd count surveys in Fishing Creek and Legendary Bear Creek.



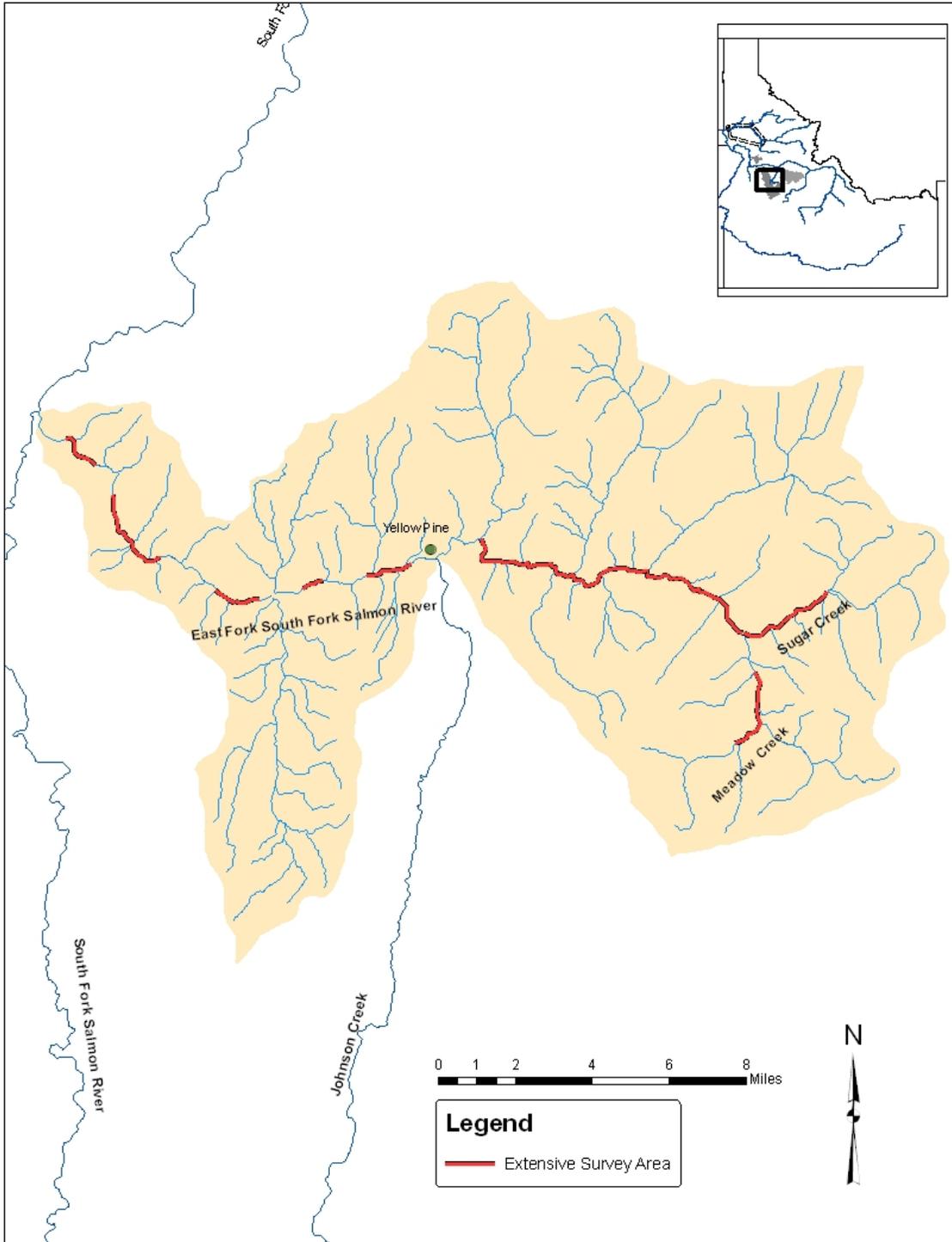
Appendix Figure 8. Tributary specific map indicating locations of fall Nacó'x̂ (Chinook salmon) redd count surveys in the mainstem Clearwater River, lower Potlatch River, North Fork Clearwater River, Middle Fork Clearwater River, and lower sections of the South Fork Clearwater River and Selway River.



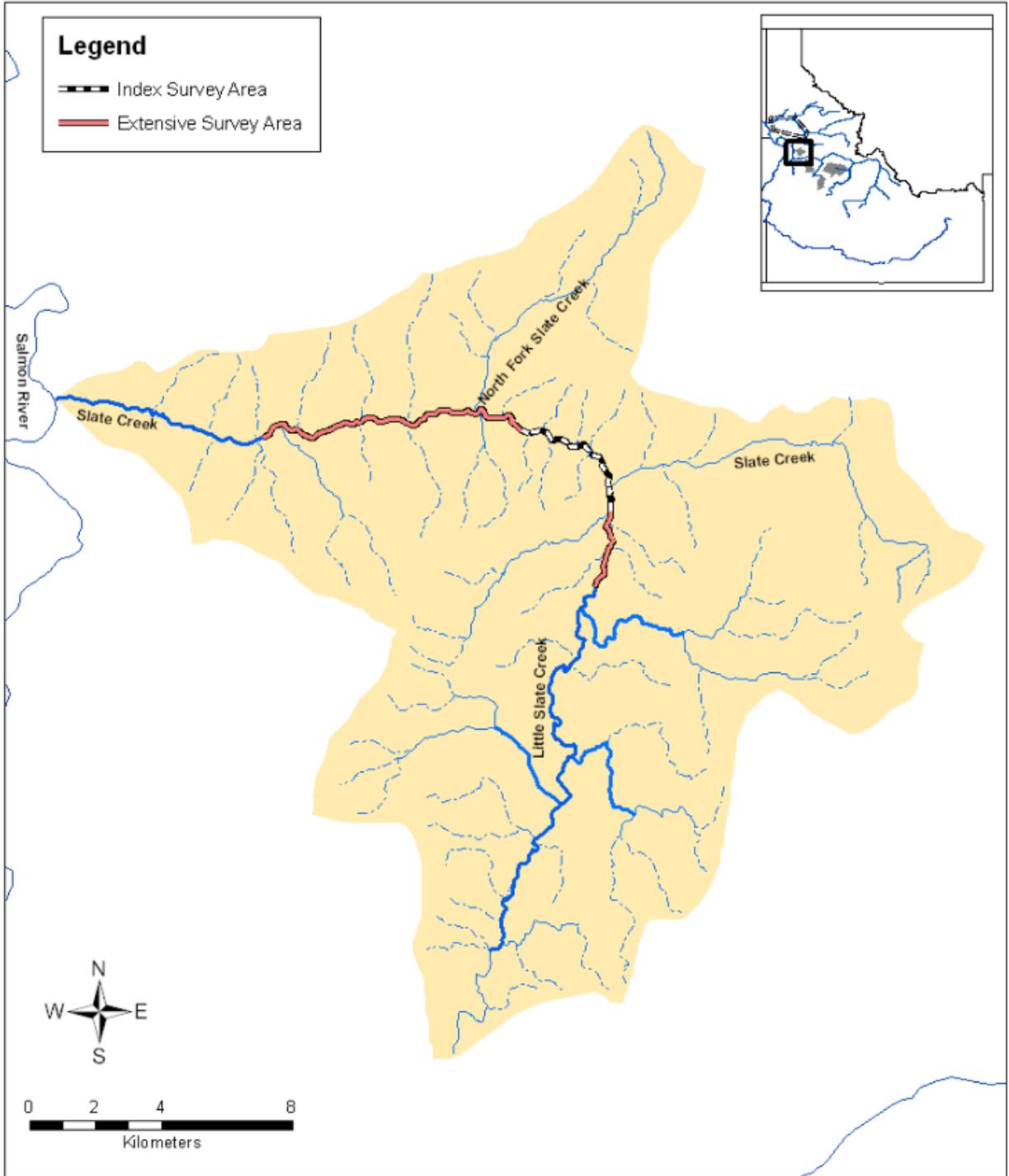
Appendix Figure 9. Tributary specific map indicating locations of index area and extensive area spring and summer Nacó'x̂ (Chinook salmon) redd count surveys, and locations of DIDSON and underwater video adult escapement monitoring sites in the Secesh River.



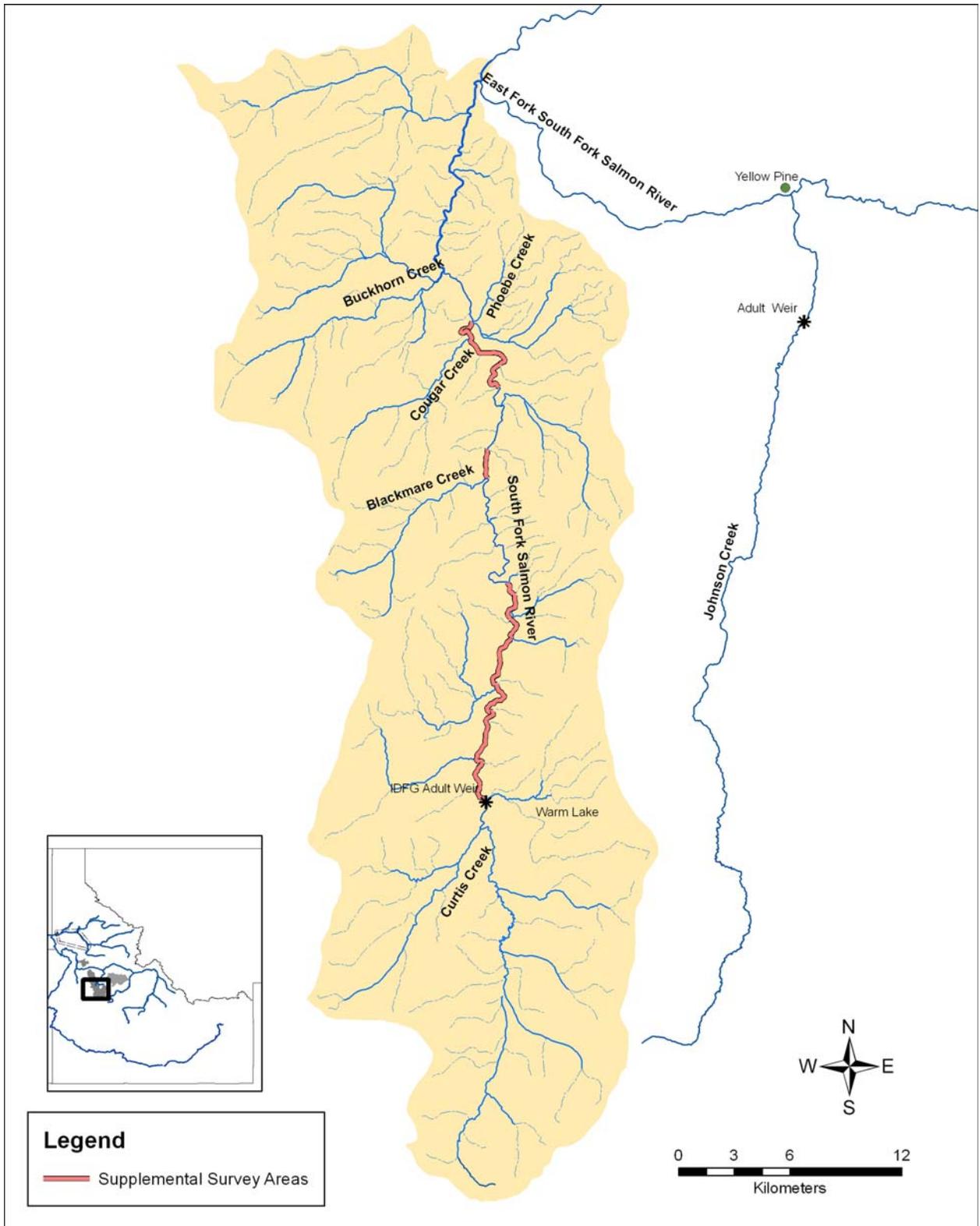
Appendix Figure 10. Tributary specific map indicating locations of index area and extensive area spring and summer Nacó'x̄ (Chinook salmon) redd count surveys, and location of the adult weir on Johnson Creek.



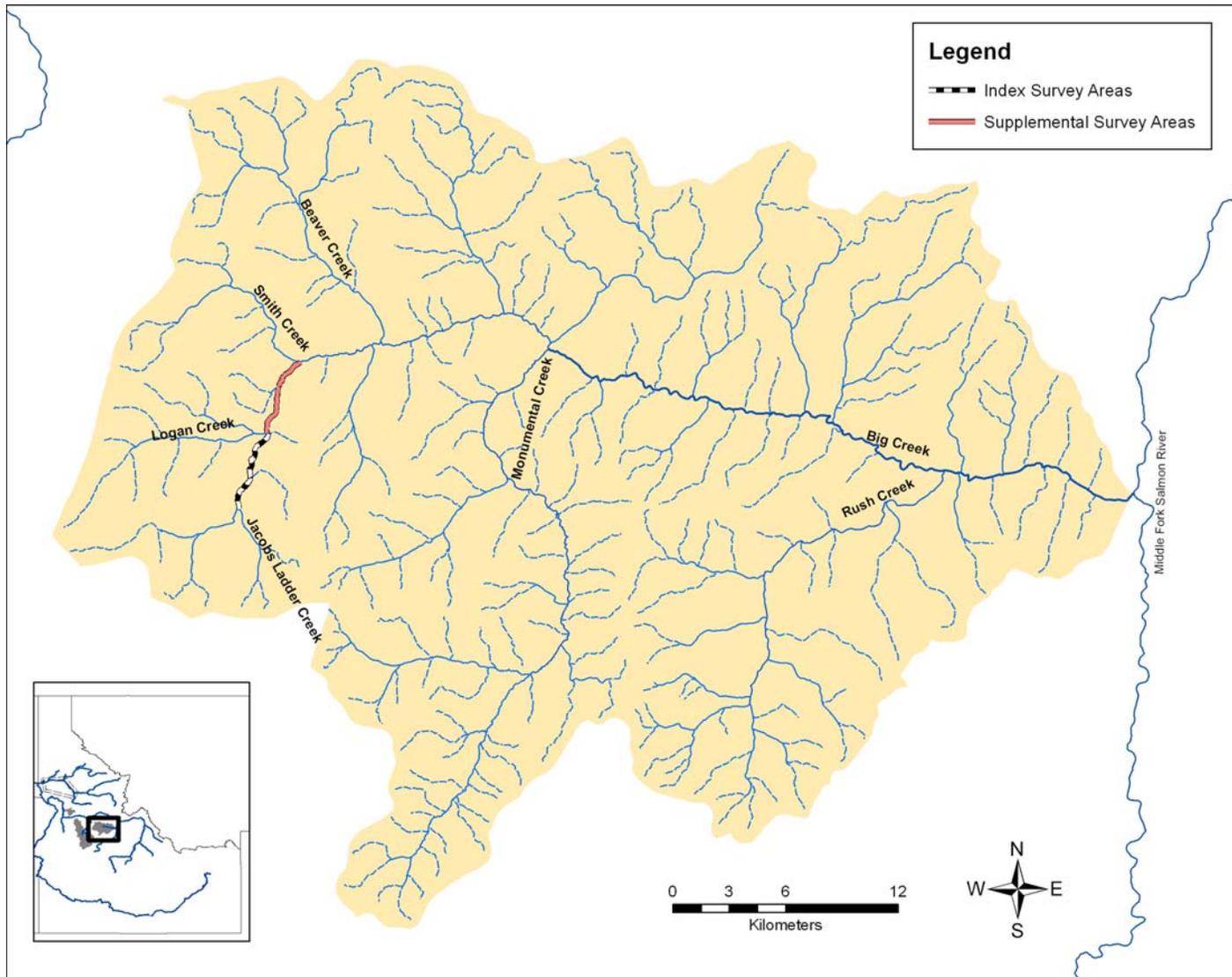
Appendix Figure 11. Tributary specific map indicating locations extensive area spring and summer Nacó'x̂ (Chinook salmon) redd count surveys in the East Fork South Fork Salmon River.



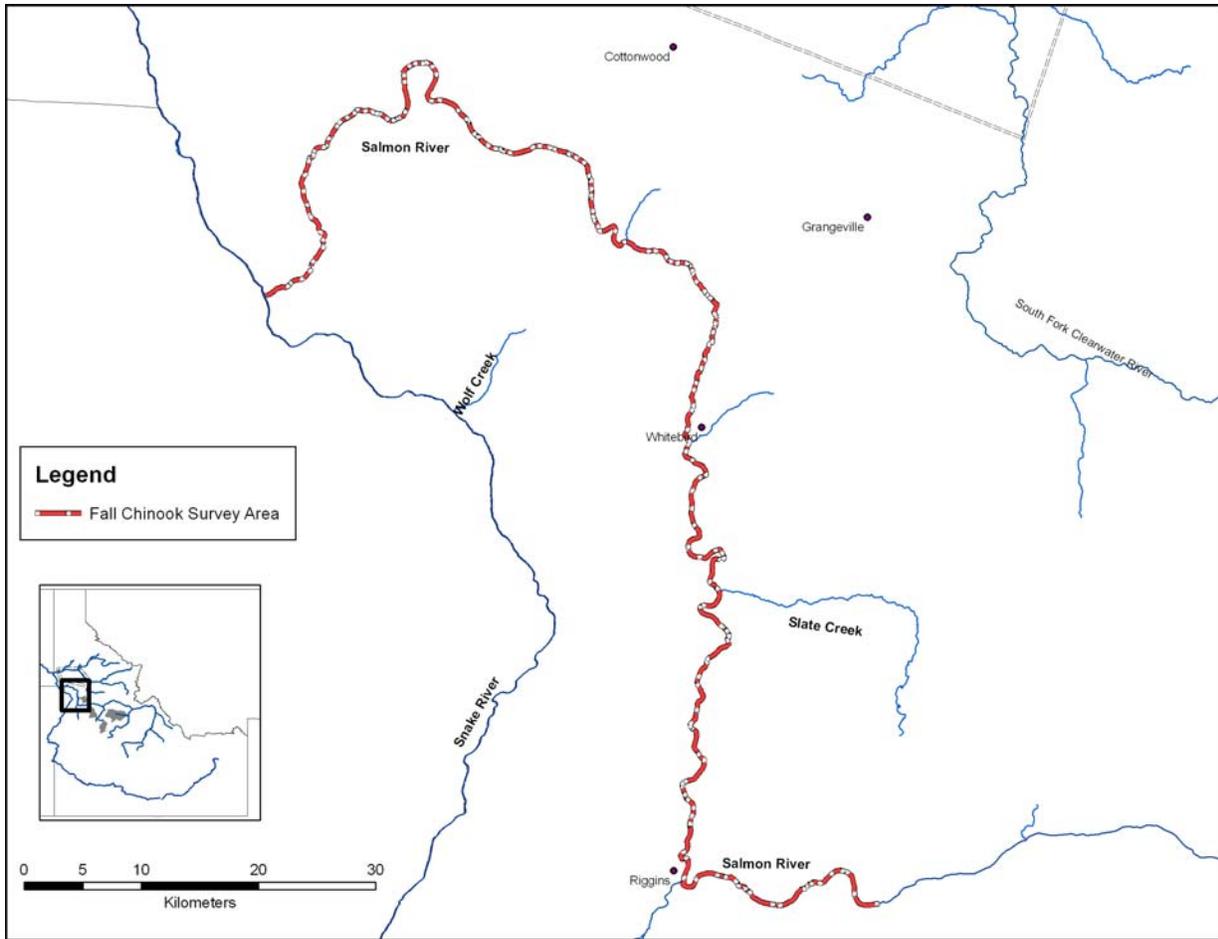
Appendix Figure 12. Tributary specific map indicating locations of index area and extensive area spring and summer Nacó'x̂ (Chinook salmon) redd count surveys in Slate Creek.



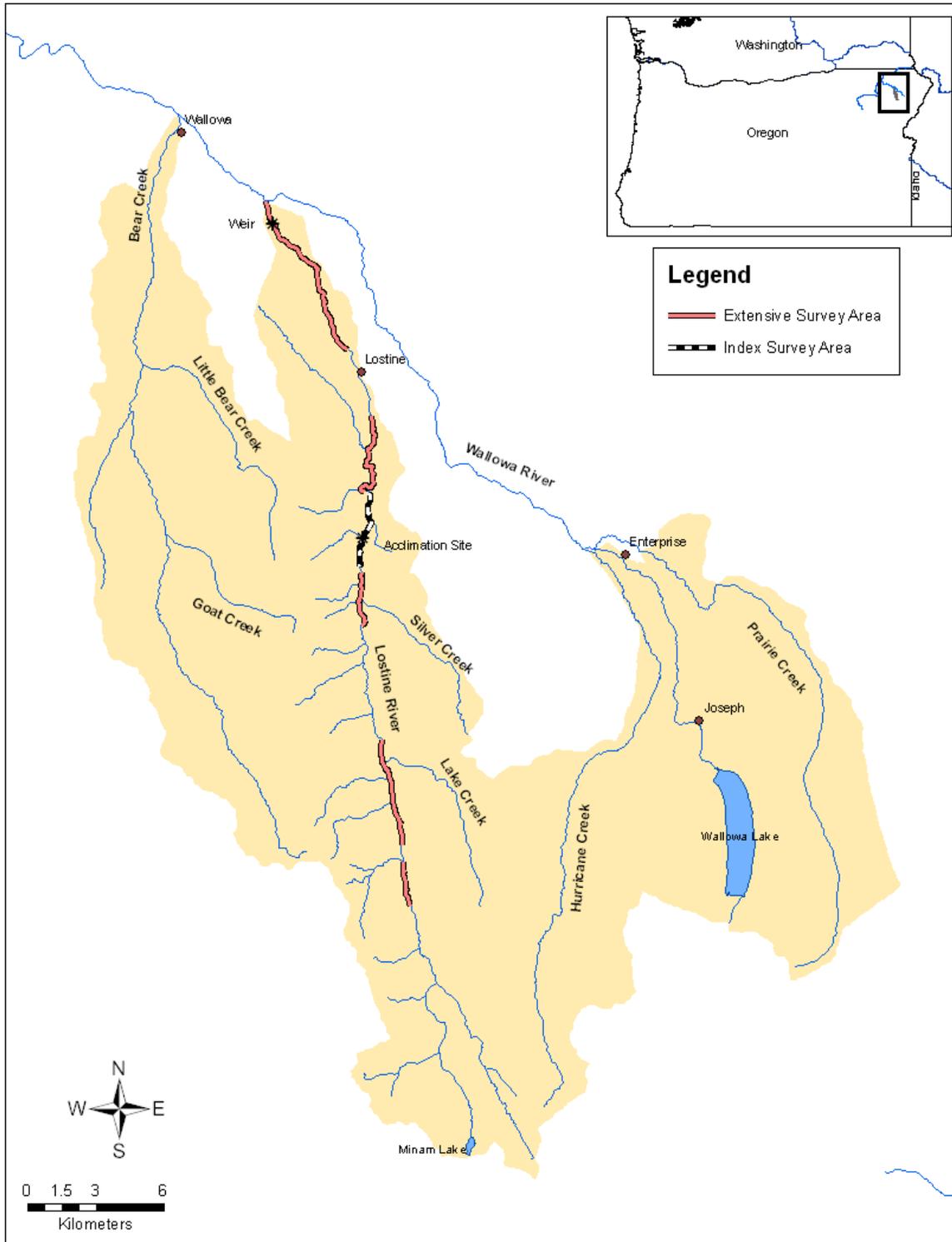
Appendix Figure 13. Tributary specific map indicating locations of supplemental area spring and summer Nacó'x̂ (Chinook salmon) redd count surveys in the upper mainstem South Fork Salmon River below the adult weir.



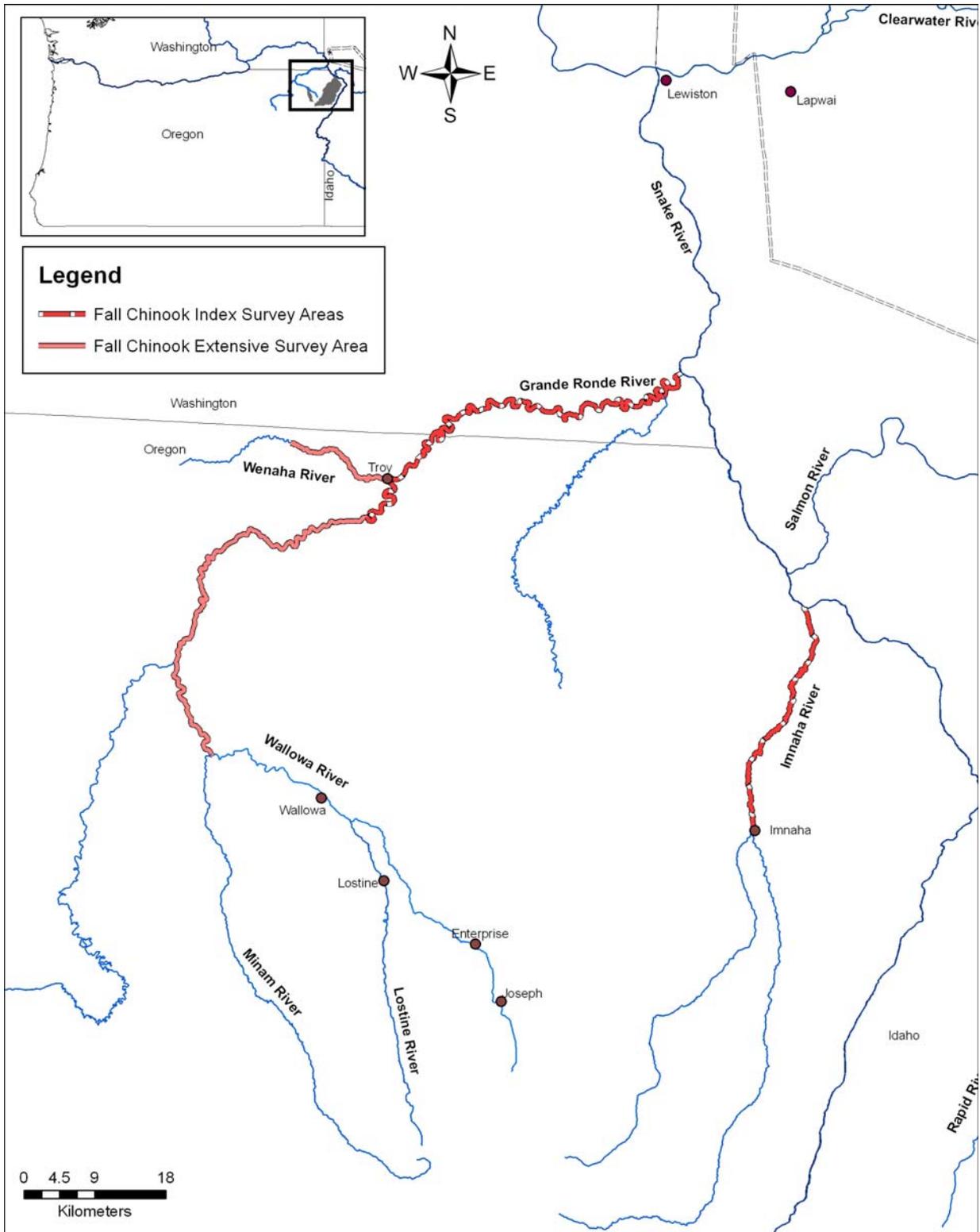
Appendix Figure 14. Tributary specific map indicating locations of index area and supplemental area spring and summer Nacó'x̂ (Chinook salmon) redd count surveys in upper Big Creek.



Appendix Figure 15. Tributary specific map indicating locations of fall Nacó'x̂ (Chinook salmon) redd count surveys in the lower mainstem Salmon River.



Appendix Figure 16. Tributary specific map indicating locations of index area and extensive area spring and summer Nacó'x̂ (Chinook salmon) redd count surveys, and the location of the adult weir in the Lostine River.



Appendix Figure 17. Tributary specific map indicating locations of fall Nacó'x̂ (Chinook salmon) redd count surveys in the lower mainstem Grande Ronde River and lower Imnaha River.

Appendix B. Ad Hoc Supplementation Monitoring and Evaluation Workgroup (AHSWG) Report.

Beasley, C.A., B.A. Berejikian, R. W. Carmichael, D.E. Fast, P.F. Galbreath, M.J. Ford, J.A. Hesse, L.L. McDonald, A.R. Murdoch, C.M. Peven, and D.A. Venditti. 2008. Recommendations for broad scale monitoring to evaluate the effects of hatchery supplementation on the fitness of natural salmon and steelhead populations. Final report of the Ad Hoc Supplementation Monitoring and Evaluation Workgroup (AHSWG).