

# 2013 Fall Chinook Salmon Spawning Ground Survey

Salmon-Scott Rivers Ranger District  
Klamath National Forest



Prepared by  
Maija Meneks  
Salmon-Scott Rivers District Fish Biologist

June 30, 2014

Salmon-Scott Rivers Ranger District  
Klamath National Forest  
11263 N. State Hwy 3  
Fort Jones, CA 96032

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## ABSTRACT

Cooperative spawning ground surveys between the U.S. Forest Service, California Department of Fish and Wildlife, Yurok Tribe, Karuk Tribe, Quartz Valley Indian Reservation, Salmon River Restoration Council, and local schools and volunteers have occurred on the Klamath National Forest since 1992. In addition to providing information to land managers in regard to where these fish spawn, these surveys are used to estimate the total in-river spawner escapement of fall Chinook salmon (*Oncorhynchus tshawytscha*) by the Klamath River Technical Team and the Pacific Fisheries Management Council for determination of harvest allocations for the subsequent year.

The Salmon River and Scott River are surveyed on an annual basis using both carcass mark-recapture and redd count techniques. Mark-recapture of carcasses (and in some cases, redd counts) are used for population estimations. Redd counts are utilized on the rivers' smaller tributaries, which may not be regularly visited during the spawning season. The 2013 cooperative survey began October 17<sup>th</sup> and ended December 6<sup>th</sup>. Limited effort continued on the Scott River by California Department of Fish and Wildlife after this date to track the transition into Coho spawning. All scheduled surveys were completed on both the Salmon River and Scott River, although Forest personnel were not fully committed until third week of October due to furlough by the Federal government. Surveys in both drainages also included drainages and upper elevation reaches not regularly visited.

Approximately 2,480 fish returned to the Salmon River and 4,624 fish returned to the Scott River. Run estimates, made by California Department of Fish and Wildlife, are compiled through a combination of redd count and mark-recapture carcass surveys. The Scott River also employs weir videography. Using data collected since initiation of organized surveys in 1978, year 2013 returns appear to be slightly below average for both Salmon River [20<sup>th</sup> highest] and Scott River [18<sup>th</sup> highest].

## INTRODUCTION

Since 1978, the California Department of Fish and Wildlife (CDFW) has determined fall Chinook salmon spawner escapement in the Klamath River watershed using a combination of weirs, mark-recapture surveys, redd surveys, and hatchery return information. This data is used in the determination of stock size projections for the management of Klamath River fall Chinook salmon stocks by the Klamath River Technical Team and the Pacific Fisheries Management Council.

The CDFW, Six Rivers National Forest (SRNF), and Klamath National Forest (KNF) (the Forests are hereafter collectively referred to as USFS) have conducted Chinook spawner surveys for many years. Since missions differ among agencies, the objectives for these surveys were always slightly different. The USFS traditionally counted redds and live fish in order to estimate number and distribution of spawning Chinook salmon. Beginning in 1992, the CDFW and USFS joined together to accomplish spawner escapement surveys, partially due to shrinking budgets in both State and Federal programs, but also the desire to increase cooperative operations between agencies. These surveys now include collaboration with the Karuk Tribal Government, Yurok Tribal Government, Quartz Valley Tribal Government, Salmon River Restoration Council, Scott Valley Resource Conservation District, Mid-Klamath Watershed Council, Northern California Resource Center, and local volunteers and public schools. The cooperative effort has improved the accuracy of CDFW estimates by enabling surveys that are more extensive and frequent in nature.

In fall 2013, a combination of redd and mark-recapture counts were completed in the Salmon River and Scott River drainages, including mainstems and tributaries, in order to determine fall Chinook spawner escapement and distribution (**Table 1**). Due to declining budgets, surveys on the Salmon River were delayed one week later than the normal start date in the second week of October. Additionally, KNF participation on the Scott River surveys did not occur on the first survey date of this system due to the Federal government furlough. This report summarizes redd count surveys conducted from October 17<sup>th</sup> through December 5<sup>th</sup> on the KNF portion of the Salmon and Scott Rivers (i.e., within the Salmon-Scott Rivers Ranger District). The exception of this is Wooley Creek and the Salmon River below Nordheimer Creek, which were surveyed by SRNF personnel. Data from these locations is covered in the annual KNF-wide report of spawning survey activities (which will also include the mainstem Klamath River and its tributaries).

A separate report is prepared by CDFW biologists for the escapement estimates to be used by the fisheries management councils. The most recent draft of the 2013 MegaTable has been included in **Appendix A** (CDFW 2014).

**Table 1.** The 2013 survey schedule for KNF crews for the Salmon River and Scott River.

Survey Week	Scott River (Monday)	Salmon River (Tuesday)	No surveys on Wednesday	Scott River (Thursday)	Salmon River (Friday)
1	Oct-14 (ns - holiday)	Oct-15 (ns - not started)		Oct-17 <sup>1</sup> (ns - Fed furlough )	Oct-18 (ns - not started)
2	Oct-21	Oct-22 <sup>2</sup>		Oct-24	Oct-25
3	Oct-28	Oct-29		Oct-31	Nov-01
4	Nov-04	Nov-05		Nov-07	Nov-08
5	Nov-11 (ns - holiday)	Nov-12		Nov-14	Nov-15
6	Nov-18	Nov-19		Nov-21	Nov-24
7	Nov-25	Nov-26		Nov-28 (ns - holiday)	Nov-29 (ns - holiday)
8	Dec-02	Dec-03 (last day FS)		Dec-05 (last day FS)	Dec-06

\*ns - no survey

<sup>1</sup>First day of Scott River surveys; no participation by Forest Service because agency just returning from furlough.

<sup>2</sup>First day of Salmon River surveys for all participants.

## METHODS

In 2013, redd surveys were conducted on the Salmon River and Scott River, as well as various tributaries. **Table 2** summarizes each reach for 2013, including reach number and length, number of times surveyed, and total number of redds counted over the course of the survey season.

- Salmon River was surveyed once to twice weekly from mile marker 8 on the North Fork (NF) to the confluence with the South Fork (SF); Matthews Creek campground on the SF to the confluence with the NF; and the mainstem Salmon River from the confluences to Nordheimer Creek. The mainstem below Nordheimer Creek and Wooley Creek were surveyed on a differing schedule by SRNF personnel, and is detailed in a separate report.
  - The NF also included occasional surveys from mile marker 12 to mile marker 8.
  - Tributaries surveyed included Blackbear Creek, Indian Creek, Knownothing Creek, Little North Fork Salmon River, Methodist Creek, and Nordheimer Creek.
- Scott River was surveyed from above Fay Lane in the upper Scott Valley to the confluence of the Klamath River. Lack of access across or through private property excluded some segments or portions within reaches from survey.
  - Surveys also included Canyon Creek, Kelsey Creek, and Tompkins Creek.

The CDFW held training sessions for agency employees, Tribal employees, and volunteers. The KNF was unable to participate due to the furlough. On October 15<sup>th</sup>, the redd survey/carcass mark-recapture training was held on the Quartz Valley Indian Reservation at the tribal Environmental Protection Agency office. Similar training was held at Oak Bottom River Access

on the mainstem Salmon River on October 16<sup>th</sup>. Topics discussed at the trainings comprised redd and fish identification; carcass marking, including the explanation of mark-recapture estimates; scale and otolith sampling; data collection; salmonid life cycles; and survey safety procedures.

**Table 2.** Fall Chinook spawning survey reach descriptions for Salmon River and Scott Rivers in 2013. Salmon River reaches surveyed by Six Rivers National Forest not included.

Stream Name	Reach Name	Reach Number	Miles	Number of Times Surveyed <sup>1</sup>	Total Number of Redds Surveyed...
<b>Salmon River</b>					
Mainstem	Otter Bar to Nordheimer Ck	4A	1.6	10	59
	Forks of Salmon to Otter Bar	4B	2.4	12	109
North Fork	Mile 2 to Forks of Salmon	9A	2.0	10	116
	Mile 4 to Mile 2	9B	2.0	9	59
	Mile 6 to Mile 4	10A	2.0	7	41
	Mile 8 to Mile 6	10B	2.0	6	75
	Mile 10 to Mile 8	11A	2.0	3	37
	Mile 12 to Mile 10	11B	2.0	1	14
South Fork	Henry Bell to Forks of Salmon	5A	3.0	9	86 <sup>2</sup>
	O'Farrell Gulch to Henry Bell	5B	2.0	11	112
	Indian Ck to O'Farrell Gulch	6A	3.0	10	161
	Matthews Ck to Indian Ck	6B	2.2	8	81
Tributaries	Blackbear Creek		2.0	1	0
	Indian Creek		1.0	1	0
	Knownothing Creek		2.0	2	6
	Little NF Salmon River		2.3	1	1
	Methodist Creek <sup>3</sup>		1.0	2	0
	Nordheimer Creek <sup>4</sup>		2.5	2	9
<b>Scott River</b>					
	Midpoint to Confluence	1	2.5	14	146
	"Cabin Hole" to Midpoint <sup>5</sup>	2	2.5	12	71 (17)
	George Allen to "Cabin Hole" <sup>5</sup>	3	3.0	10	86 (30)
	Tompkins Creek to George Allen	4	2.5	9	95
	Bridge Flat to Tompkins Creek	5	4.0	10	61
	CDFW Weir to Bridge Flat	6	3.8	8	78
	USGS Gauge to CDFW Weir	7	3.5	8	36

Stream Name	Reach Name	Reach Number	Miles	Number of Times Surveyed <sup>1</sup>	Total Number of Redds Surveyed...
	Shackleford Creek to USGS Gauge	8	2.9	13	276
	Dunlap to Meamber Bridge	9	3.0	0	Not surveyed
	Hwy 3 to Dunlap	10	3.0	0	Not surveyed
	Eller Lane to Hwy 3	11	7.0	0	Not surveyed
	Sweezy to Eller Lane	12	2.5	4	21 <sup>6</sup>
	Horn Lane to Sweezy	13	3.0	4	34 <sup>6</sup>
	Young's Dam to Horn Lane	14	2.0	12	67 <sup>6</sup>
	Fay Lane to Young's Dam	15	3.5	12	26 <sup>6</sup>
	Top of Barnes to Fay Lane	16	1.0	0	Not surveyed
Tributaries	Canyon Creek		1.3	2	0
	Kelsey Creek (including spawning channel)		0.6	2	0
	Tompkins Creek		2.5	1	0

<sup>1</sup>Flagging marking redds may have been removed prior to end of carcass surveys. "Times Surveyed" includes ALL surveys, even those performed end-of-season when redds may have been no longer counted.

<sup>2</sup>Reach 5A (Henry Bell to Forks of Salmon) is not flagged. Number reported is the maximum number of observed redds (10/29/13).

<sup>3</sup>Second Methodist Creek survey was unable to determine if redds observed were Chinook or Coho. Therefore these redds are not included in the summary table.

<sup>4</sup>Flagging found on Nordheimer Creek suggests Six Rivers surveyed on 11/13, with a total of 5 redds recorded. Neither date nor redds are included in this summary table.

<sup>5</sup>Portions of private property in Reach 2 and Reach 3 of Scott River not flagged due to lack of permission, although property was still traversed. Numbers in parenthesis is the maximum number of unflagged redds encountered during a single survey.

<sup>6</sup>Reaches 12 through 16 of the Scott River are not flagged. Number reported is the maximum number of observed redds. See the text and associated Table 3 for additional information, including date of maximum observance.

On the Salmon and Scott Rivers, crews conducted two concurrent surveys on survey reaches, using redd counts and carcass counts (CDFW 2013). A typical crew consisted of two people. Each crew walked two to four miles of river each survey day unless health or safety concerns limited ability to survey. The number of times a reach was surveyed was directly related to the number of people available on the survey dates. When a lack of available surveyors was a concern, the reaches to be surveyed were determined by the level of activity observed on the prior survey date and personnel knowledge of the system. Access to private land was also a concern on the Scott River. An attempt was made to have people survey different reaches throughout the season so as to reduce estimator bias.

On both rivers, all redds were counted, flagged, and location marked on a topographic map, with total number of redds tallied at the end of each reach. Reaches where redds were not marked due to landowner preference regarding flagging on their property are listed below. Additionally, redds (where flagged) were characterized as to size (width/length) and habitat type in which it

was observed. At mid-point and end-of-season, redds were GPSed. Original field maps of redd locations are available at the Salmon-Scott Rivers District Office in Fort Jones, CA.

- Salmon River, not flagged – Reach 5A
- Scott River, not flagged – portions of Reaches 2 and 3; and all of Reaches 12 through 16

## **RESULTS**

### Salmon River

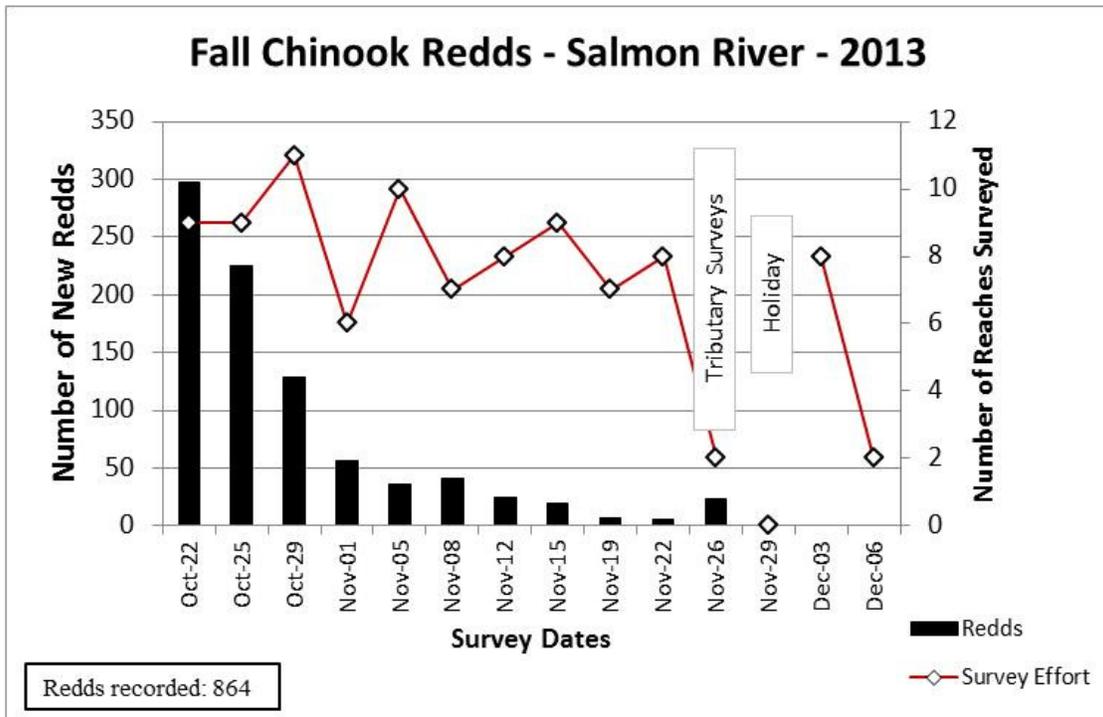
Overall effort on the Salmon River was good. While there were elevated flows for several days following a storm in mid-November, the event had sufficiently subsided by the next scheduled survey date to allow crews to safely traverse reaches. For 2013, no days were cancelled due to high water; and for much of the survey period, flows are considered to have been unseasonally low (**Appendix B**).

The Salmon River probably reached peak spawning in mid-October, although specific dates cannot be determined because by October 22<sup>st</sup> spawning activity was already well underway (**Figure 1**). Overall survey effort was affected by number of surveyors available, weather, and flows. See **Appendix C** for a table of redd numbers organized by reach and date.

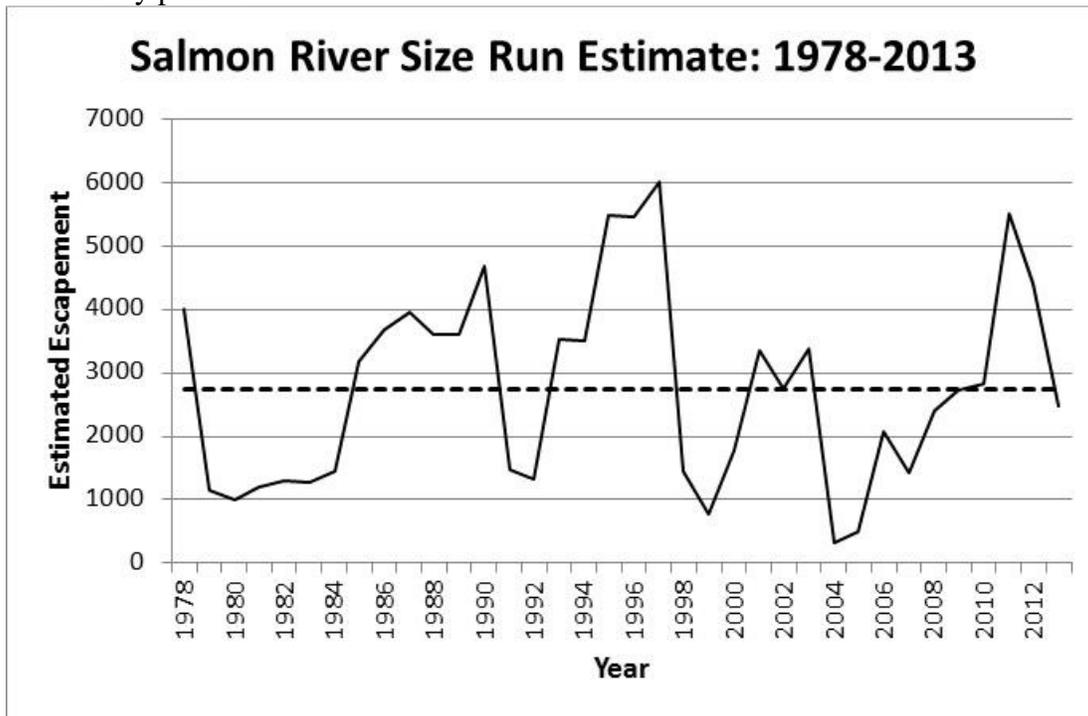
Specific areas of the Salmon River display a greater preference for use by spawning fall Chinook. Specifically, GPS and map data indicate the reaches nearest Forks of Salmon tend to show the highest redd density. Of note, there are several locations – Forks of Salmon bridge, Red Bank Campground engine access (NF Salmon); Methodist Creek confluence (SF Salmon) – which have displayed spawning preference each year since redd GPSing began in 2011. Additional years of data are required to fully identify which specific sites attract spawning fish most years. Amongst all reaches for 2013, those with over 100 redds include 4B (mainstem); 5B and 6A (SF Salmon); and 9A (NF Salmon). The site adjacent to the Red Bank Campground engine access had 31 redds recorded within a 100 meter length of river. See **Appendix D** for redd spatial distribution and density information.

Using survey data, the Salmon River is estimated to have had about 2,480 fall run Chinook salmon return in the fall of 2013 (**Figure 2; Appendix A**). Based on long-term tracking data from the CDFW MegaTable, 2013 was slightly below average, ranking 20<sup>th</sup> for run size (CDFW 2014).

**Figure 1.** Fall Chinook redds observed and survey effort on the Salmon River in 2013. Surveys occurred (maximum 12 reaches available) on NF Salmon River from Mile 12 to Forks of Salmon; on SF Salmon River from Matthews Creek to Forks of Salmon; and on the mainstem Salmon River from Forks of Salmon to Nordheimer Creek.

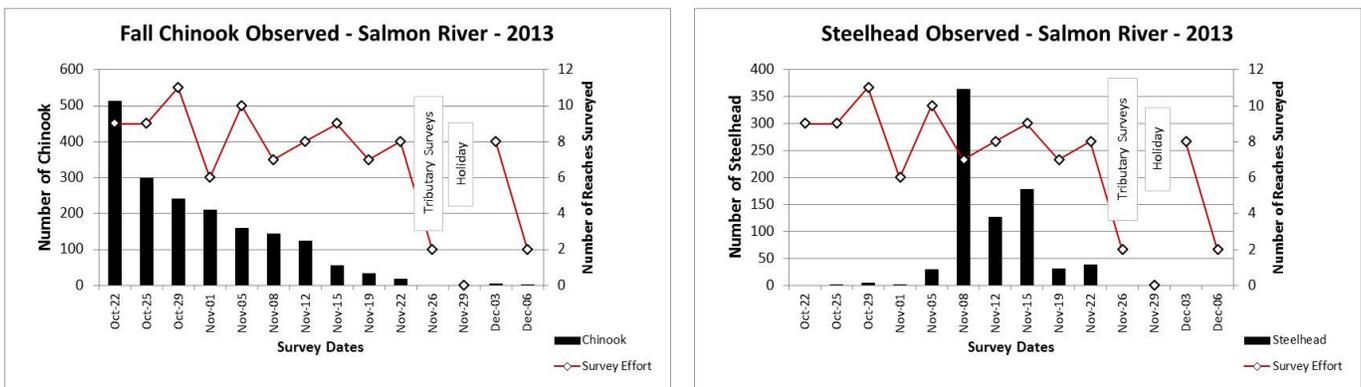


**Figure 2.** Salmon River fall run size estimates for 1978 to 2013. Dashed line is average over long-term survey period.



Live Chinook and steelhead were tallied during surveys (**Figure 3**). As with redds, survey effort is impacted by high flow; and fish observation is affected by number of surveyors, weather, discharge conditions, and surveyor experience. Peak live Chinook were observed on October 22<sup>nd</sup>, with subsequent numbers declining within the survey area. Similar to redd results, true peak cannot be definitely determined because fish were already very active upon the spawning grounds at the commencement of surveys. Steelhead were variable, with the most observed on November 8<sup>th</sup>. Although changing flow conditions is often considered to be one of the triggers for steelhead movement, it is unclear if such was true in 2013. There was a storm event in early October, but discharge had subsided to low-flow fall conditions well before steelhead were observed; and the next peak did not occur until the latter half of November. See **Appendix C** for a table of fish numbers organized by species, reach, and date.

**Figure 3.** Observation of fall Chinook and steelhead during the 2013 Salmon River surveys.



Coho were also incidentally observed during the fall Chinook surveys:

- November 15<sup>th</sup>
  - Two Coho reported in Reach 4B (Otter Bar to Forks of Salmon)
- November 26<sup>th</sup>
  - Ten Coho reported in Reach 11B (Mile 12 to Mile 10)

Salmon River tributary surveys occurred during November and early December (**Appendix A**). Chinook salmon redds were found on Knownothing Creek, Little North Fork Salmon River, and Nordheimer Creek; and redds of uncertain origin (Chinook or Coho) were reported on Methodist Creek. No live Chinook or steelhead were seen.

### Scott River

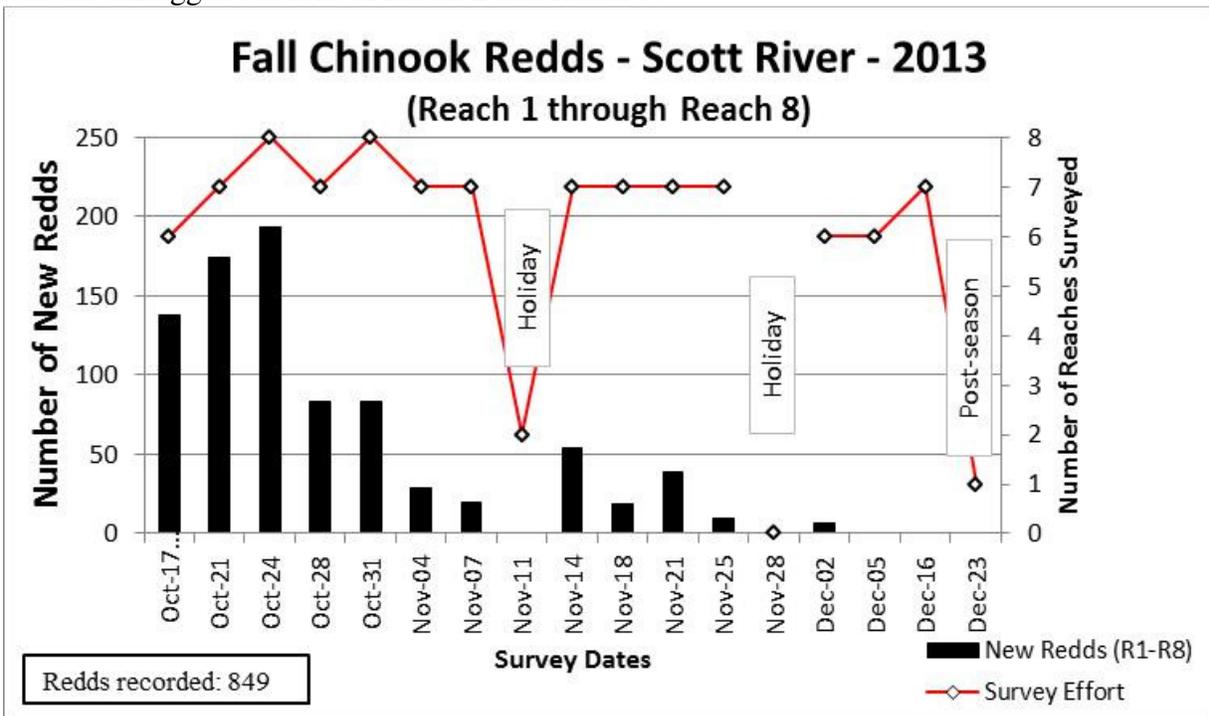
Based on the available data, the Scott River reached the peak of spawning on October 24<sup>th</sup> for Reach 1 through Reach 8 (**Figure 4**). This date is similar to that observed last year, and may be slightly advanced compared to prior years. An examination of the data split by reach and date suggests spawning to have peaked below the USGS gauge approximately a week prior to that upstream the gauge. This expected observation is the result of fish moving to the middle and upper portions of the Scott River as the spawning period progressed through October and November. There was also a slightly uptick in new redds, which could be the result of new fish entering the system (although not at the amount suggested by the live Chinook count – see discussion later in this subsection), as well as buildup of redds for those reaches not surveyed on

the Veteran’s Day holiday. Overall survey effort was affected by number of surveyors available, weather, and flows. See **Appendix C** for a table of redd numbers organized by reach and date.

New for 2013, Reach 3 was floated through the private section, with all redds (new and old) counted each time, although not flagged. Depending on crew, redds were sometimes mapped or GPSed and/or had dimensions measured. The private section of Reach 2 through the town of Scotts Bar was also visited at least once during the survey season; and any redds visible from the bridge over the river were counted. The maximum number of unflagged redds observed in Reach 3 was 30; and for Reach 2 was 17. These redds are not included in final map outputs nor added to the final number due to difficulty in determining “new” versus “old” redds.

Of particular note, Reach 8 on 11/7 had 95 redds which were excluded from the final data analysis. Several irregularities accompanied this survey. First, the number of “new” redds was out-of-character, considering that redd numbers were declining, with few counted in surveys prior and none immediately after. Second, the crew noted on the datasheet that the redds seemed to be older, and expressed confusion that they had not been flagged by prior surveys. After discussion with CDFW, it was decided to exclude these redds. Flagging may have been removed by vandals, else torn off by wildlife (unlikely – animals have been responsible for lost flagging, although it is typically only a few flags per season). However it had been lost, the redds written to the datasheet had likely been captured in prior surveys, and the number of actual new redds therefore not included in the final dataset was probably minimal.

**Figure 4.** Fall Chinook redds observed and survey effort on the Scott River in 2013. Due to differences in redd tracking between lower and middle reaches, data displayed is for Reach 1 through Reach 8 only. Final redd number includes neither the Reach 8 discrepancy nor redds from the unflagged sections of Reach 2 and Reach 3.



The Scott Valley Resource Conservation District performed redd and carcass surveys upon private property from Reach 12 through Reach 16. Landowner preference was to leave redds unflagged. Therefore, because “new” and “old” redds cannot be reliably differentiated, all are counted during each survey date. Theoretically, total redd number for each reach should increase until a maximum is achieved, and then remain thereabouts until the end of the survey period. In reality, weather and water conditions, scour by high flows, superimposition of redds, surveyor experience, and other factors create conditions whereupon this does not necessarily occur. If maximum number of redds in these survey reaches are tallied, regardless of date, a total of 153 redds is calculated (**Table 3**). Overall peak spawning for Scott Valley Reach 12 through Reach 15 appears to have occurred a week or two later compared to canyon reaches, with progressively later spawning peaks upstream compared to downstream.

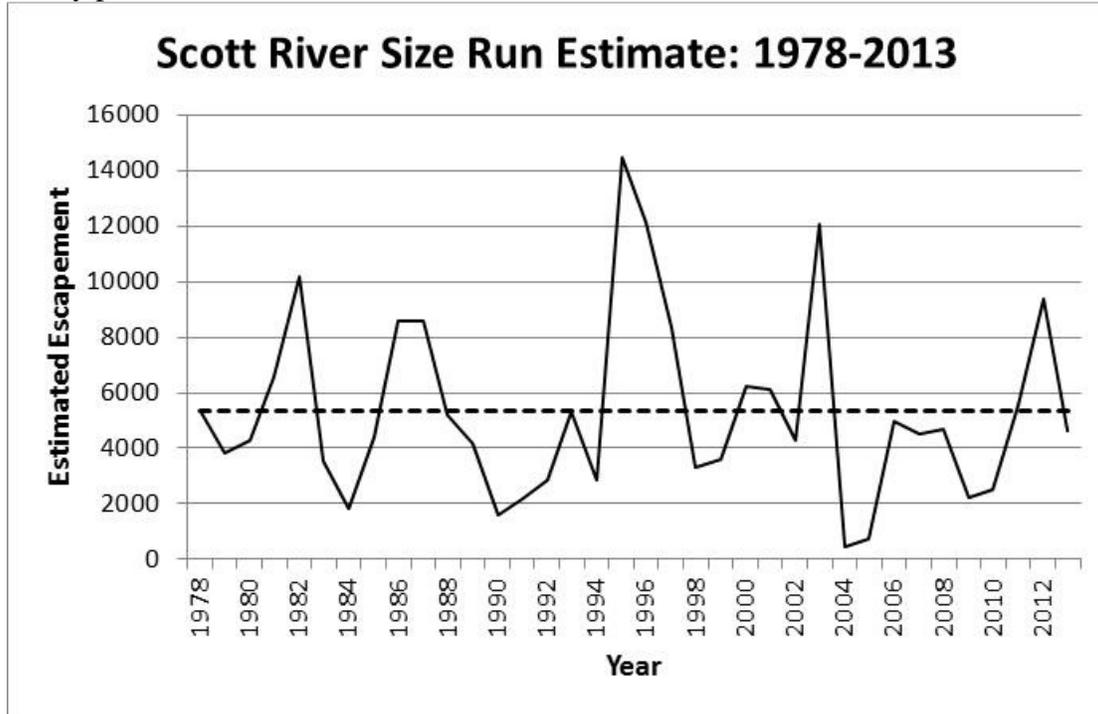
**Table 3.** Maximum number of redds and date observed by for Reach 12 through Reach 16 for Scott River in 2013.

	Reach 12	Reach 13	Reach 14	Reach 15	Reach 16	Total
Maximum Redds	26	34	67	26	-	153
	Oct-31	Oct-31	Nov-07	Dec-02		

Specific areas of Scott River display a greater preference for use by spawning fall Chinook. Within the GPSed segment of Reach 1 through Reach 8, the highest concentration of fish was Reach 8 (above the canyon, and at the lower end of the Scott Valley). Next in prominence was Reach 1, with three distinct locales of concentrated redd placement. While there were areas of elevated use within the other reaches (e.g., confluence of Middle Creek [Reach 5] and downstream of Jones Beach [Reach 7]), spawning in most instances can largely be described as dispersed. Of note, redds have been GPSed for three years now, and the primary concentrated use areas appear to be conserved year to year. Although neither GPS data nor maps had been provided to the Forest Service by the Scott Valley Resource Conservation District for inclusion in this report, examination of Scott Valley redd tallies show Reach 14 to have an elevated amount of spawning activity relatively to the other surveyed locales in this area. See **Appendix D** for redd spatial distribution and density information.

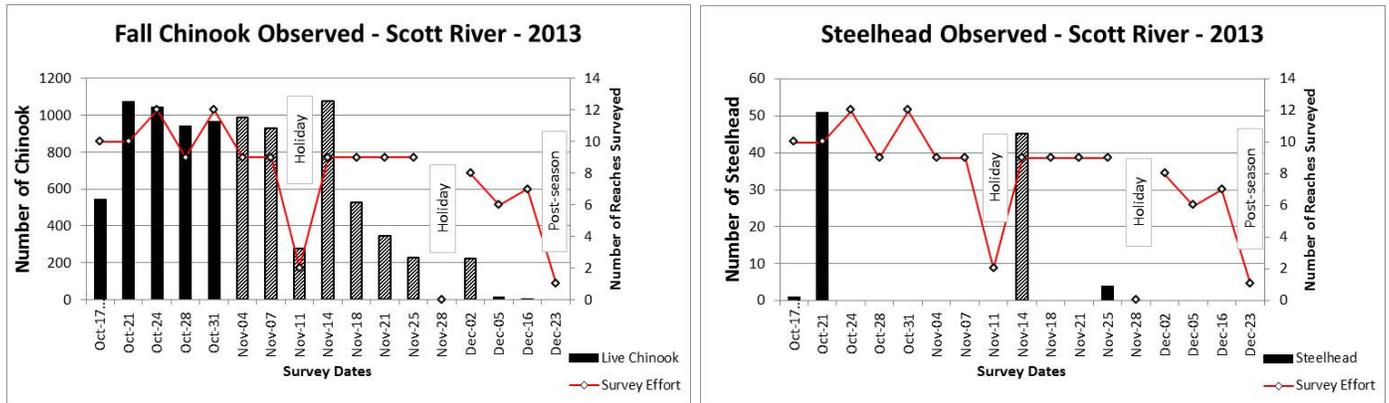
Using survey data and video weir observation, the Scott River is estimated to have had about 4,624 fall Chinook salmon return in 2013 (**Figure 5; Appendix A**). Based on long-term tracking data from the CDWF MegaTable, 2013 was slightly below average, ranking 18<sup>th</sup> for run size (CDFW 2014).

**Figure 5.** Scott River fall run size estimates for 1978 to 2013. Dashed line is average over long-term survey period.

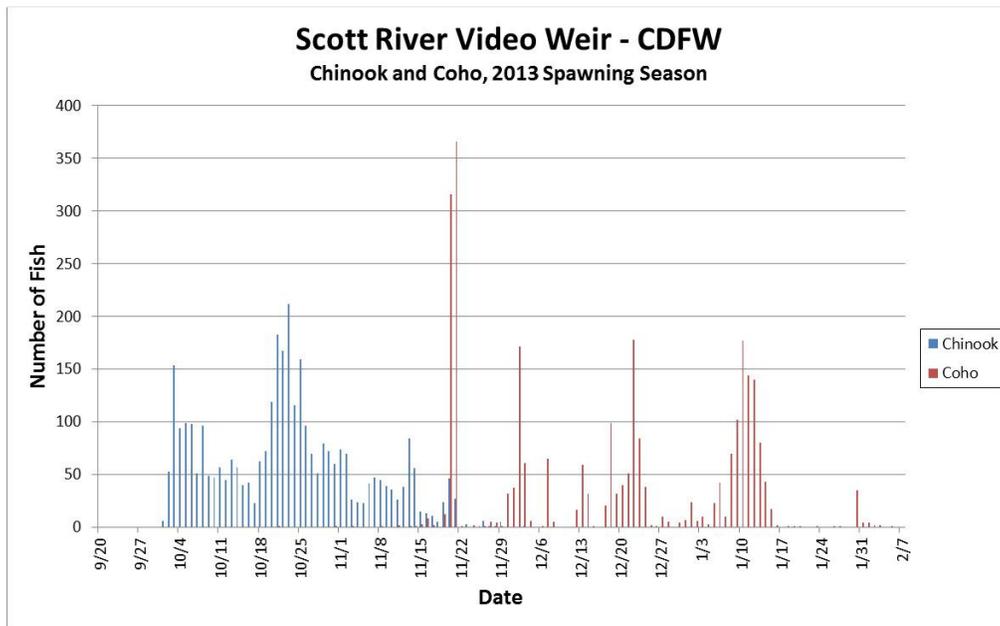


Live Chinook and steelhead were tallied during surveys (**Figure 6**). As with redds, fish observation is affected by number of surveyors, weather, discharge conditions, and surveyor experience. Peak live Chinook was probably mid- to late-October, but the entry of Coho to the system appears to have confounded counts. In early November, a large pulse of fish was observed in Reach 1. Some of these fish could have been Chinook as there was a small uptick in new redds in subsequent surveys in several reaches, but not nearly enough to account for the number of fish. However, the CDFW video weir, located at the Reach 6/7 break, did observe a large pulse of Coho arriving mid-November (**Figure 7**); and experienced crew members also began to report schools of Coho in the system about the same time. During the same time period at the weir, Chinook numbers were clearly on the decline, with very few passing through by November 15<sup>th</sup>. Therefore, the conclusion is that “Chinook” counts for Scott River must be used with extreme caution starting early-November. The fish seen from this point forward were likely mixed schools of Chinook and Coho, with Coho increasingly dominant later in the season as spawned-out Chinook died. Steelhead numbers were highly variable; and the mid-November spike may also represent confusion with Coho. See **Appendix C** for a table of fish numbers organized by species, reach, and date.

**Figure 6.** Observation of fall Chinook and steelhead during the 2013 Scott River surveys (all reaches). Cross-hatched survey dates are questionable as to count accuracy due to likelihood of mixed Chinook/Coho schools.



**Figure 7.** Scott River video weir summary for Chinook and Coho for the 2013 spawning season.



Coho were incidentally observed during the fall Chinook surveys:

- November 14<sup>th</sup>
  - Reach 3 - 90 live Coho reported
- November 18<sup>th</sup>
  - Reach 1 - Coho included in live Chinook count because fish are in mixed schools
- November 21<sup>st</sup>
  - Reach 5 - 5 live Coho reported
  - Reach 6 - 82 live Coho reported
  - Reach 8 - 3 live Coho and 1 redd observed; 3 additional redds may also be Coho

- December 2<sup>nd</sup>
  - Reach 6 - 5 live Coho, 1 redd, and 1 carcass reported; and likely Coho amid the Chinook count due to mixed schools
- December 16<sup>th</sup>
  - Reach 5 - 2 carcasses recorded
  - Reach 6 - 160 live Coho reported
  - Reach 8 - 1 carcass recorded
- December 23<sup>rd</sup>
  - Reach 8 - 26 live Coho and 2 carcasses reported

Scott River tributary surveys occurred during November and December (**Appendix C**). No Chinook redds or fish were found. One Coho redd was reported in Canyon Creek; and five Coho redds, plus at least one live Coho, were recorded for Kelsey Creek. Additionally, one potential lamprey redd was seen at Kelsey Creek.

## **DISCUSSION**

Discharges were lower than normal during the survey period, an observation particularly evident in the Scott River drainage. The effect upon Chinook spawning within the survey areas was not readily apparent, but likely prevented fish from ascending to locations higher in the respective basins which are usually accessible. Some tributary mouths, such as Methodist Creek (SF Salmon River) and Kelsey Creek (Scott River), did present access conditions much more difficult than usual. While there were storm event peaks in the Salmon River drainage before the survey period in October, and again in the latter half of November, which may have assisted early and late season distribution of fish, no such occurrence happened in the Scott River basin. General low flow conditions extended well into winter, which did hamper distribution of Coho spawners in the Scott River.

Potential vandalism of flagging was noted on the Scott River. It is likely that some redds were subsequently double-counted due to being recorded as “new” more than once, it is not believed that the final redd count for the 2013 survey was substantially affected. Specifically, some flagging may have been removed during the first several weeks of surveys in Reaches 4 and 5. It is unclear if flagging thought to have been lost from Reach 8 in early November was due to vandalism and/or animals (see earlier text for additional details).

### *Recommendation Review – 2012 Survey Report*

Follow-up review of recommendations from the 2012 Forest Service Salmon-Scott River Survey report:

1. Ensure protocol consistency for Salmon River surveys in regards to redd characterization, mapping, and flagging, so as to reduce crew confusion and decrease data error.
  - Forest Service and CDFW survey administrators made sure that the same protocol was followed each survey day. Consequently, a more consistent data product appears to have been achieved.
2. Salmon River administrators give packets (carcass and redd sheets, maps, etc) to each crew individually so all datasheets are acquired prior to the daily survey effort.

- For the most part, this action did occur. Datasheets/maps were still lost, not fully filled in, or not returned, but overall there was a higher quality and consistency of data.
  - Scott River crews exhibited some data consistency issues, which will be discussed further within the recommendations.
3. Continued emphasis of datasheets and physical maps – Scott River and Salmon River
    - The necessity to turn in maps and datasheets, regardless if redds/fish were encountered, was continued to be emphasized at training, as well as the staging area prior to daily surveys. As combined with #2 above for the Salmon River, there appeared to be improvement in return rate of maps/datasheets. However, both Scott River and Salmon River continued to have instances of maps/datasheets turned in, but either not filled out completely, correctly, or at all. For 2013, inconsistencies occurred at a higher rate for the Scott River compared to the Salmon River.
  4. Following of GPS protocol
    - Basic understanding on how to use a GPS is increasing. When GPSes are used, each crew usually has at least one member whom can operate the device.
    - Continuation of some individuals/crews incorrectly entering points into the GPS units, even when directly conversed with by a survey administrator. While there were several small occurrences on both rivers, the most egregious one occurred on the Scott River when an entire reach had to be reGPSed due to improper titling of redd inputs.
  5. GPS units and Forest Service download computer
    - Both Forest Service and CDFW were able to bring sufficient GPS units for own crews and to loan to other crews; and several individuals brought their own GPS units. Forest Service brought a computer for on-site download of GPS units at the Salmon River and Scott River on the scheduled GPS days.
      - While most reaches could be covered on the designated GPS day, it still required a second day to completely GPS redds.
    - There were several crews whom regularly brought a GPS to the surveys and were consequentially able to GPS redds outside the scheduled GPS days. To better accommodate those crews, the Forest Service began to bring a computer at least once a week to download units.
  6. Redd GPSing at least twice during the season
    - The bulk of GPSing occurred late-October/early-November, which captured redds built during the most active portion of the spawning season. Additionally, some agencies/entities GPSed new redds during their respective survey dates.
    - The attempt to GPS remaining redds at the time of flag removal was somewhat haphazard. Many late-season redds had to be digitized from hardcopy maps. This likely occurred due to a combination of reasons: (1) end-of-season survey fatigue; (2) flagging removed over multiple days due to loss of seasonal crewmembers; (3) on Scott River, extension of surveys to track Coho spawning delaying flag recovery for some reaches; and (4) Forest Service administrator not present on final survey dates.

7. Pre-identification of tributary surveys on the Scott River in event of high water
  - Pre-identification of tributary reaches did not occur. A more comprehensive set of tributary maps needs to be provided to CDFW for inclusion in the data packets.
8. Property trespass – Scott River
  - A solution to property trespass on the lower Scott River on Reach 2 and 3 was created by CDFW. The river was surveyed for fish and redds via floating through in wetsuits or drysuits. All redds were counted on each survey date, with no flagging hung.
  - Better flagging and verbal directions were provided for the exit point above Scott Bar in Reach 2. Unfortunately, the return point was not well marked, and may have included trespass. Some crews did not survey Forest Service land on Reach 2 downstream of Scott Bar due to the private property uncertainty.
9. Recommendation to CDFW from Forest Service in previous spawning survey reports to modify the daily summary sheets to provide separate entries for split reaches.
  - This change was adopted. Crews no longer need to draw lines to separate “A” and “B” data under the reach entry.

#### *Survey Observations and Recommendations*

In general, the rush in the morning by surveyors to leave for assigned reaches means not all datasheets/maps may not be acquired, even with repeated verbal reminders. Survey fatigue also begins to set in during November. This results in not all datasheets/maps being turned in, leading to missing data; and data quality starts to slip by the end of the season compared to the beginning. Actions were taken on the Salmon River in 2013 to address this issue, and the return rate and quality of data improved. While the Scott River has not previously exhibited problems concerning data management, increased incidence of missing data compared to previous years did occur.

- Recommendation is to continue to provide data packets (carcass and redd sheets, maps, etc.) to each crew individually on the Salmon River, and this procedure be adopted by the Scott River. This may be completed personally by the survey administrators, else via an individual delegated to do so. During the free-for-all morning gathering of datasheets/maps, there are inevitably crews who forget something. This point of interaction would also be a good time to provide reminders as to protocol to individuals and/or crew, and also emphasize the complete filling out of all datasheets to return at the end of the survey day.

Similar to the recommendation of previous reports, the importance of both datasheets and maps needs continued emphasis at both training and the staging area prior to daily surveys. Because there may not be sufficient resources to consistently GPS redds, the use of paper maps in regards to redd distribution, both spatially and temporally, is critical. In regards to datasheets, all information – headers, redd data, live fish count – needs to be filled out *every time* in the manner outlined during training and in the survey manual. For a complete record, all datasheets and maps should be turned in, regardless if redds/fish are observed or not. A negative result still represents an important addition to the final record. Each survey year since 2011 has exhibited

improvement in consistency with turning in datasheets/maps, including those with negative results.

Other items to emphasize include:

- For redds, always use the header sheet. Only use the continuation sheet as the primary data sheet for redds when no header sheet is available.
  - Forest Service survey administrator needs to better ensure that redd datasheet (and maps) are always available, thereby eliminating the need for crews to improvise.
- Correctly fill out all datasheets.
  - Complete header information as appropriate – start/end time, weather, streamflow, temperature (when available), crew names, etc. Header information allows survey administrators to gage effort. For instance, it is expected that better data will have been gathered in conditions of clear water and sunny skies, compared to rain/wind with high flows.
  - Count all live fish. Record total live Chinook seen during a survey on both the carcass and redd datasheets. The redd sheet also asks for Coho and steelhead.
  - “Unflagged Segments” on the redd sheet should only be filled in when and where not flagging. The Forest Service administrator will see if a modification can be made to render this element more clear on the datasheets.
  - As possible given equipment limitations, redd dimensions should be measured to the nearest 0.1 meter.
- For Salmon River, survey administrators need to ensure crews are aware of which reach number and which subreach (“A” or “B”) is being surveyed. For 2013, there were multiple examples of incorrect reach/subreach recorded in datasheets and on GPS points.
- Redd flagging should always include survey date and redd number to avoid double-counting.

There are continued cases of crew members not following GPS protocol, even when it is explained to them directly and survey administrators receive direct acknowledgement of understanding. The most common issues include (1) improper redd enumeration and (2) ignoring flagged dates/redd numbers, instead sequentially numbering all redds on the GPS date regardless of original day of discovery. Correct GPS entry input is very important for post-survey processing into GIS databases, minimizing the need to utilize hardcopy map backups and other means of reconciling discrepancies.

- When GPSes are to be used, the recommendation is to have the crewmember responsible for taking points explain the protocol to the survey administrator. The primary emphasis is for proper redd enumeration, with the crew member verbally describing, writing down, or demonstrating on a GPS unit how a point should be titled. Additionally, it is suggested “How to Title Redd GPS Points” be incorporated into annual pre-season survey training.

Similar to previous years, it is highly recommended all agencies/entities involved in the survey effort try to commit to bringing at least one GPS-per-crew to the designated GPS day. Some entities – Forest Service, CDFW – may be able to loan additional units. However, entities not Federal or State should also try to commit a unit. The desired goal is to have sufficient equipment to allow all reaches to be GPSed in a single day. Forest Service will continue to provide a computer on GPS days for immediate download from compatible devices.

Additionally, the Forest Service will try to bring a computer at least once a week to accommodate those agencies/entities whom regularly bring GPSes to the survey. If devices are not compatible, or the computer is inoperable, an agency/entity needs to send the GPS file to the Forest Service survey manager in a timely manner.

For 2014, the recommendation is to continue twice-a-season GPSing, once late-October/early-November and a second time when flagging is removed. The first date would capture the bulk of the spawning and should occur before storm events potentially make river access difficult; and the latter date would capture the remaining redds. Coordination must occur to ensure GPSing during flag removal, even if the Forest Service administrator is not present. Ideally, sufficient GPSes would be available to log new redds for all reaches on all survey dates, which would alleviate the need to designate GPS days. While this scenario is not expected to occur in the foreseeable future, the initiative of some crews to regularly bring GPSes to capture new redds does decrease the workload on formal GPS days. Something to consider is the possibility of an agency/entity securing a grant to purchase a number of reasonably priced GPSes that can be committed to the fall Chinook survey.

For the Scott River, it is recommended that tributary surveys be pre-identified in the event of discharge flows above safe levels, else an opportunity otherwise presents itself for additional surveys. Maps for these systems already exist, but the Forest Service needs to provide copies to the map packets maintained by CDFW so they will be easily available for all cooperators. For some areas, private landowners may need to be approached prior to the survey season in order to ensure access.

In 2013, the incidence of trespassing upon private property along the Scott River decreased compared to 2012 due to better use of flagging and verbal descriptions concerning entry/exit points. Some trespass did continue to occur, although the Forest Service survey administrator is unaware if complaints were made to CDFW.

- It is recommended that survey administrators continue to ensure that crew are aware of where to enter and exit the river so as to avoid trespass. As necessary, flagging should be placed on the river and the road to demark entry/exit points.

Some recommendations from the previous Forest Service Salmon-Scott River Survey reports have been adopted. Coordination with CDFW should continue to investigate the possibility of additional minor modifications to summary sheets filled in by crews following the completion by each team of their assigned reach.

- Expand the “Live Fish” field to specify “Live Fish – Chinook”, “Live Fish – Steelhead”, and “Live Fish – Coho”.
- Include a checkbox with each reach for the survey manager to mark when a reach is not surveyed. The manager should also comment why the reach was omitted (e.g., high water, insufficient crew, safety concerns).

As discussed in previous spawning survey reports, redd data analysis and display requires additional consideration. The redd protocol was updated in 2010, and extensive information has been collected in the subsequent years – i.e., size, habitat use, location on the landscape. Initial

interpretation needs to occur, and results presented in an accessible manner for it to be of use. Some questions to be addressed may include:

- Is there a better way to visually display the spatial distribution of redds than a density-by-distance map?
- How does timing of spawning differ between reaches and shift on an annual basis, and what triggers, if any, are driving that variability?
- Does the same location see concentrated spawning use each year?
- Does redd size and/or degree of superimposition change on an annual basis? And if so, how does it do so? Does data suggest any reaches to have spawning habitat limitations?

The desired end result is for spawning (redd) surveys conducted in the Salmon and Scott Rivers watersheds have local applicability in guiding informed management decisions (Forest Service and private individuals) in regards to projects, ongoing/proposed upland and riparian land use activities, and response to climate change.

### **LITERATURE CITED**

California Department of Fish and Wildlife (CDFW). 2014. Draft Klamath River Basin fall Chinook salmon spawner escapement, in-river harvest and run-size estimates – 1979-2013.

California Department of Fish and Wildlife (CDFW). 2013. Klamath Basin cooperative spawning ground survey – 2012 training manual. 59 pp.

# Appendix A – California Department Fish and Wildlife “MegaTable”

SPAWNER ESCAPEMENT										
<b>Hatchery Spawners</b>	1978			1979			1980			
	Grilse	Adults	Totals	Grilse	Adults	Totals	Grilse	Adults	Totals	
	Iron Gate Hatchery (IGH)	925	6,945	7,870	257	2,301	2,558	451	2,412	2,863
	Trinity River Hatchery (TRH)	1,325	6,034	7,359	964	1,335	2,299	2,256	4,099	6,355
Subtotals	2,250	12,979	15,229	1,221	3,636	4,857	2,707	6,511	9,218	
<b>Natural Spawners</b>										
Trinity River basin	4,712			3,936			16,837			
(above Willow Creek, excluding TRH)	31,052	4,000	11,964	8,028	1,150	7,700	24,537	1,000	4,277	
Salmon River basin	1,400	2,600	4,000	150	1,000	1,150	200	800	1,000	
Scott River basin	1,909	3,423	5,332	428	3,396	3,824	2,245	2,032	4,277	
Shasta River basin	6,707	12,024	18,731	1,040	7,111	8,151	4,334	3,762	8,096	
Bogus Creek basin	651	4,928	5,579	494	5,444	5,938	1,749	3,321	5,070	
Main Stem Klamath River	300			466			867			
(excluding IGH)	1,700	2,000	4,656	4,190	4,656	2,468	3,335	1,500	1,500	
Misc. Klamath tributaries	735			147			500			
(above Hoopa and Yurok Reservations)	2,765	3,500	1,215	1,068	1,215	1,000	1,500	1,500	1,500	
Hoopa and Yurok Reservation tribs.	--	b/	--	b/	--	b/	100	c/	400	
Subtotals	16,414	58,492	74,906	6,761	30,637	37,398	26,982	21,483	48,465	
<b>Total Spawner Escapement</b>										
	18,664	71,471	90,135	7,982	34,273	42,255	29,689	27,994	57,683	
IN-RIVER HARVEST										
<b>Angler Harvest</b>	1978			1979			1980			
	Grilse	Adults	Totals	Grilse	Adults	Totals	Grilse	Adults	Totals	
	Klamath River (below Hwy 101 bridge)	122	854	976	216	484	700	835	727	1,562
	Trinity River basin (above Willow Creek)	--	d/	--	d/	--	d/	765	1,157	1,922
Balance of Klamath system	1,960	840	2,800	1,200	500	1,700	2,600	2,771	5,371	
Subtotals	2,082	1,694	3,776	2,181	2,141	4,322	5,891	4,496	10,387	
<b>Indian Net Harvest e/</b>	--			--			495			
	Klamath River (below Hwy 101 bridge)	--	--	--	--	--	9,605	10,100	10,100	
	Klamath River (Hwy 101 to Trinity mouth)	--	--	--	--	--	272	1,528	1,800	
	Trinity River (Hoopa Reservation)	--	--	--	--	--	220	880	1,100	
Subtotals	1,800	18,200	20,000	1,350	13,650	15,000	987	12,013	13,000	
<b>Total In-river Harvest</b>										
	3,882	19,894	23,776	3,531	15,791	19,322	6,878	16,509	23,387	
IN-RIVER RUN										
<b>Totals</b>	1978			1979			1980			
	Grilse	Adults	Totals	Grilse	Adults	Totals	Grilse	Adults	Totals	
	In-river Harvest and Escapement	22,546	91,365	113,911	11,513	50,064	61,577	36,567	44,503	81,070
	Angling Mortality (2.04% of harvest) f/	42	35	77	45	44	88	120	92	212
Net Mortality (8.70% of harvest) f/	157	1,583	1,739	117	1,187	1,304	86	1,045	1,130	
<b>Total In-river Run</b>										
	22,745	92,983	115,728	11,675	51,295	62,970	36,773	45,640	82,413	

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**SPAWNER ESCAPEMENT**

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	1981			1982			1983		
	Grilse	Adults	Totals	Grilse	Adults	Totals	Grilse	Adults	Totals
<b>Hatchery Spawners</b>									
Iron Gate Hatchery (IGH)	540	2,055	2,595	1,833	8,353	10,186	514	8,371	8,885
Trinity River Hatchery (TRH)	1,004	2,370	3,374	4,235	2,058	6,293	271	5,494	5,765
Subtotals	1,544	4,425	5,969	6,068	10,411	16,479	785	13,865	14,650
<b>Natural Spawners</b>									
Trinity River basin									
(above Willow Creek, excluding TRH)	5,906	15,340	21,246	8,149	9,274	17,423	853	17,284	18,137
Salmon River basin	450	750	1,200	300	1,000	1,300	75	1,200	1,275
Scott River basin	3,409	3,147	6,556	4,350	5,826	10,176	170	3,398	3,568
Shasta River basin	4,330	7,890	12,220	1,922	6,533	8,455	753	3,119	3,872
Bogus Creek basin	912	2,730	3,642	2,325	4,818	7,143	335	2,713	3,048
Main Stem Klamath River									
(excluding IGH)	1,000	3,000	4,000	1,000	3,000	4,000	200	1,800	2,000
Misc. Klamath tributaries									
(above Hoopa and Yurok Reservations)	500	1,000	1,500	600	1,500	2,100	140	1,270	1,410
Hoopa and Yurok Reservation tribs.	-- b/								
Subtotals	16,507	33,857	50,364	18,646	31,951	50,597	2,526	30,784	33,310
<b>Total Spawner Escapement</b>	18,051	38,282	56,333	24,714	42,362	67,076	3,311	44,649	47,960

**IN-RIVER HARVEST**

	1981			1982			1983		
	Grilse	Adults	Totals	Grilse	Adults	Totals	Grilse	Adults	Totals
<b>Angler Harvest</b>									
Klamath River (below Hwy 101 bridge)	536	1,714	2,250	1,252	3,539	4,791	60	750	810
Trinity River basin (above Willow Creek)	1,456	3,174	4,630	2,554	2,321	4,875	116	2,360	2,476
Balance of Klamath system	5,260	1,095	6,355	8,678	2,479	11,157	175	1,125	1,300
Subtotals	7,252	5,983	13,235	12,484	8,339	20,823	351	4,235	4,586
<b>Indian Net Harvest e/</b>									
Klamath River (below Hwy 101 bridge)	912	23,097	24,009	290	4,547	4,837	12	800	812
Klamath River (Hwy 101 to Trinity mouth)	1,104	8,405	9,509	1,195	8,424	9,619	121	5,700	5,821
Trinity River (Hoopa Reservation)	449	1,531	1,980	314	1,511	1,825	30	1,390	1,420
Subtotals	2,465	33,033	35,498	1,799	14,482	16,281	163	7,890	8,053
<b>Total In-river Harvest</b>	9,717	39,016	48,733	14,283	22,821	37,104	514	12,125	12,639

**IN-RIVER RUN**

	1981			1982			1983		
	Grilse	Adults	Totals	Grilse	Adults	Totals	Grilse	Adults	Totals
<b>Totals</b>									
In-river Harvest and Escapement	27,768	77,298	105,066	38,997	65,183	104,180	3,825	56,774	60,599
Angling Mortality (2.04% of harvest) f/	148	122	270	255	170	425	7	86	94
Net Mortality (8.70% of harvest) f/	214	2,872	3,087	156	1,259	1,416	14	686	700
<b>Total In-river Run</b>	28,130	80,292	108,422	39,408	66,612	106,020	3,846	57,546	61,392

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	1984			1985			1986		
	Grilse	Adults	Totals	Grilse	Adults	Totals	Grilse	Adults	Totals
<b>Hatchery Spawners</b>									
Iron Gate Hatchery (IGH)	764	5,330	6,094	2,159	19,951	22,110	1,461	17,096	18,557
Trinity River Hatchery (TRH)	766	2,166	2,932	18,166	2,583	20,749	3,609	15,795	19,404
Subtotals	1,530	7,496	9,026	20,325	22,534	42,859	5,070	32,891	37,961
<b>Natural Spawners</b>									
Trinity River basin (above Willow Creek, excluding TRH)	3,416	5,654	9,070	29,454	9,217	38,671	20,459	92,548	113,007
Salmon River basin	216 g/	1,226 g/	1,442 g/	905	2,259	3,164	949	2,716	3,665
Scott River basin	358	1,443	1,801	1,357	3,051	4,408	4,865	3,176	8,041
Shasta River basin	480	2,362	2,842	2,227	2,897	5,124	683	3,274	3,957
Bogus Creek basin	465	3,039	3,504	1,156	3,491	4,647	1,184	6,124	7,308
Main Stem Klamath River (excluding IGH)	200	1,350	1,550	156	468	624	196	603	799
Misc. Klamath tributaries (above Hoopa and Yurok Reservations)	150	990	1,140	646	4,214	4,860	606	4,919	5,525
<u>Hoopa and Yurok Reservation tribs.</u>	-- b/	-- b/	-- b/	50 h/	80 h/	130 h/	-- b/	-- b/	-- b/
Subtotals	5,285	16,064	21,349	35,951	25,677	61,628	28,942	113,360	142,302
<b>Total Spawner Escapement</b>	6,815	23,560	30,375	56,276	48,211	104,487	34,012	146,251	180,263

**IN-RIVER HARVEST**

	1984			1985			1986		
	Grilse	Adults	Totals	Grilse	Adults	Totals	Grilse	Adults	Totals
<b>Angler Harvest</b>									
Klamath River (below Hwy 101 bridge)	175	548	723	1,479	2,427 v/	3,906	704	2,456	3,160
Trinity River basin (above Willow Creek)	393	736	1,129	5,442	154 v/	5,596	3,438	12,039	15,477
Balance of Klamath system	384	2,056	2,440	4,274	1,001 v/	5,275	5,266	6,532	11,798
Subtotals	952	3,340	4,292	11,195	3,582 v/	14,777	9,408	21,027	30,435
<b>Indian Net Harvest e/</b>									
Klamath River (below Hwy 101 bridge)	132	11,878	12,010	132	5,700	5,832	191	15,286	15,477
Klamath River (Hwy 101 to Trinity mouth)	183	5,622	5,805	476	3,925	4,401	377	5,033	5,410
Trinity River (Hoopa Reservation)	140	1,170	1,310	947 j/	1,941 j/	2,888 j/	286	4,808	5,094
Subtotals	455	18,670	19,125	1,555	11,566	13,121	854	25,127	25,981
<b>Total In-river Harvest</b>	1,407	22,010	23,417	12,750	15,148	27,898	10,262	46,154	56,416

**IN-RIVER RUN**

	1984			1985			1986		
	Grilse	Adults	Totals	Grilse	Adults	Totals	Grilse	Adults	Totals
<b>Totals</b>									
In-river Harvest and Escapement	8,222	45,570	53,792	69,026	63,359	132,385	44,274	192,405	236,679
Angling Mortality (2.04% of harvest) f/	19	68	88	228	73	302	192	429	621
Net Mortality (8.70% of harvest) f/	40	1,623	1,663	135	1,006	1,141	74	2,185	2,259
<b>Total In-river Run</b>	8,281	47,261	55,542	69,389	64,438	133,827	44,540	195,019	239,559

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	1987			1988			1989		
	Grilse	Adults	Totals	Grilse	Adults	Totals	Grilse	Adults	Totals
<b>Hatchery Spawners</b>									
Iron Gate Hatchery (IGH)	1,825	15,189	17,014	609	16,106	16,715	831	10,859	11,690
Trinity River Hatchery (TRH)	2,453	13,934	16,387	4,752	17,352	22,104	239	11,132	11,371
Subtotals	4,278	29,123	33,401	5,361	33,458	38,819	1,070	21,991	23,061
<b>Natural Spawners</b>									
Trinity River basin (above Willow Creek, excluding TRH)	5,949	71,920	77,869	10,626	44,616	55,242	2,543	29,445	31,988
Salmon River basin	118	3,832	3,950	327	3,273	3,600	695	2,915	3,610
Scott River basin	797	7,769	8,566	473	4,727	5,200	1,188	3,000	4,188
Shasta River basin	398	4,299	4,697	256	2,586	2,842	137	1,440	1,577
Bogus Creek basin	1,208	9,748	10,956	225	16,215	16,440	444	2,218	2,662
Main Stem Klamath River (excluding IGH)	65	863	928	164	2,982	3,146	214	1,011	1,225
Misc. Klamath tributaries (above Hoopa and Yurok Reservations)	237	3,286	3,523	418	4,167	4,585	248	3,239	3,487
Hoopa and Yurok Reservation tribs.	-- b/	-- b/	-- b/	55 k/	820 k/	875 k/	40 k/	600 k/	640 k/
Subtotals	8,772	101,717	110,489	12,544	79,386	91,930	5,509	43,868	49,377
<b>Total Spawner Escapement</b>	13,050	130,840	143,890	17,905	112,844	130,749	6,579	65,859	72,438

**IN-RIVER HARVEST**

	1987			1988			1989		
	Grilse	Adults	Totals	Grilse	Adults	Totals	Grilse	Adults	Totals
<b>Angler Harvest</b>									
Klamath River (below Hwy 101 bridge)	146	2,455	2,601	124	3,367	3,491	137	1,328	1,465
Trinity River basin (above Willow Creek)	923	9,433	10,356	2,735	9,341	12,076	209	3,054	3,263
Balance of Klamath system	4,367	8,281	12,648	2,552	9,495	12,047	1,921	4,393	6,314
Subtotals	5,436	20,169	25,605	5,411	22,203	27,614	2,267	8,775	11,042
<b>Indian Net Harvest e/</b>									
Klamath River (below Hwy 101 bridge)	36	39,978	40,014	138	36,914	37,052	0	37,130	37,130
Klamath River (Hwy 101 to Trinity mouth)	117	8,136	8,253	173	9,667	9,840	120	4,961	5,081
Trinity River (Hoopa Reservation)	262	4,982	5,244	267	5,070	5,337	71	3,474	3,545
Subtotals	415	53,096	53,511	578	51,651	52,229	191	45,565	45,756
<b>Total In-river Harvest</b>	5,851	73,265	79,116	5,989	73,854	79,843	2,458	54,340	56,798

**IN-RIVER RUN**

	1987			1988			1989		
	Grilse	Adults	Totals	Grilse	Adults	Totals	Grilse	Adults	Totals
<b>Totals</b>									
In-river Harvest and Escapement	18,901	204,105	223,006	23,894	186,698	210,592	9,037	120,199	129,236
Angling Mortality (2.04% of harvest) f/	111	412	523	110	453	564	46	179	225
Net Mortality (8.70% of harvest) f/	36	4,617	4,653	50	4,491	4,542	17	3,962	3,979
<b>Total In-river Run</b>	19,048	209,134	228,182	24,054	191,642	215,696	9,100	124,340	133,440

**Klamath River Basin Fall Chinook Salmon Spawner Escapement, In-river Harvest and Run-size Estimates  
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**SPAWNER ESCAPEMENT**

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	1990			1991			1992		
	Grilse	Adults	Totals	Grilse	Adults	Totals	Grilse	Adults	Totals
<b>Hatchery Spawners</b>									
Iron Gate Hatchery (IGH)	321	6,719	7,040	65	4,002	4,067	3,737	3,581	7,318
Trinity River Hatchery (TRH)	371	1,348	1,719	205	2,482	2,687	211	3,779	3,990
Subtotals	692	8,067	8,759	270	6,484	6,754	3,948	7,360	11,308
<b>Natural Spawners</b>									
Trinity River basin									
(above Willow Creek, excluding TRH)	241	7,682	7,923	382	4,867	5,249	2,563	7,139	9,702
Salmon River basin	596 <i>l</i>	4,071 <i>l</i>	4,667 <i>l</i>	143	1,337	1,480	547	778	1,325
Scott River basin	236	1,379	1,615	146	2,019	2,165	965	1,873	2,838
Shasta River basin	118	415	533	10	716	726	66	520	586
Bogus Creek basin	53	732	785	20	1,261	1,281	556	598	1,154
Main Stem Klamath River									
(excluding IGH)	59	505	564	8	572	580	234	366	600
Misc. Klamath tributaries									
(above Hoopa and Yurok Reservations)	30	694	724	9	495	504	153	280	433
Hoopa and Yurok Reservation tribs.	17 <i>k</i>	118 <i>k</i>	135 <i>k</i>	0 <i>k</i>	382 <i>k</i>	382 <i>k</i>	59 <i>k</i>	474 <i>k</i>	533 <i>k</i>
Subtotals	1,350	15,596	16,946	718	11,649	12,367	5,143	12,028	17,171
<b>Total Spawner Escapement</b>	2,042	23,663	25,705	988	18,133	19,121	9,091	19,388	28,479

**IN-RIVER HARVEST**

	1990			1991			1992		
	Grilse	Adults	Totals	Grilse	Adults	Totals	Grilse	Adults	Totals
<b>Angler Harvest</b>									
Klamath River (below Hwy 101 bridge)	58	291	349	19	314	333	13	20	33
Trinity River basin (above Willow Creek)	22	328	350	94	1,177	1,271	158	314	472
Balance of Klamath system	2,020	2,934	4,954	573	1,892	2,465	3,949	668	4,617
Subtotals	2,100	3,553	5,653	686	3,383	4,069	4,120	1,002	5,122
<b>Indian Net Harvest <i>e/</i></b>									
Klamath River (below Hwy 101 bridge)	13	3,648	3,661	7	3,902	3,909	124	1,152	1,276
Klamath River (Hwy 101 to Trinity mouth)	141	3,447	3,588	25	5,016	5,041	200	3,687	3,887
Trinity River (Hoopa Reservation)	36	811	847	30	1,280	1,310	42	946	988
Subtotals	190	7,906	8,096	62	10,198	10,260	366	5,785	6,151
<b>Total In-river Harvest</b>	2,290	11,459	13,749	748	13,581	14,329	4,486	6,787	11,273

**IN-RIVER RUN**

	1990			1991			1992		
	Grilse	Adults	Totals	Grilse	Adults	Totals	Grilse	Adults	Totals
<b>Totals</b>									
In-river Harvest and Escapement	4,332	35,122	39,454	1,736	31,714	33,450	13,577	26,175	39,752
Angling Mortality (2.04% of harvest) <i>f/</i>	43	73	115	14	69	83	84	20	105
Net Mortality (8.70% of harvest) <i>f/</i>	17	687	704	5	887	892	32	503	535
<b>Total In-river Run</b>	4,392	35,882	40,274	1,755	32,670	34,425	13,693	26,698	40,391

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**SPAWNER ESCAPEMENT**

	1993			1994			1995		
	Grilse	Adults	Totals	Grilse	Adults	Totals	Grilse	Adults	Totals
<b>Hatchery Spawners</b>									
Iron Gate Hatchery (IGH)	883	20,828	21,711	758	13,808 <sup>m/</sup>	14,566	259	22,681 <sup>m/</sup>	22,940
Trinity River Hatchery (TRH)	736	815	1,551	4,442	3,264	7,706	76	15,178	15,254
Subtotals	1,619	21,643	23,262	5,200	17,072	22,272	335	37,859	38,194
<b>Natural Spawners</b>									
Trinity River basin									
(above Willow Creek, excluding TRH)	2,465	5,905	8,370	2,505	10,906	13,411	9,262	77,876	87,138
Salmon River basin	456	3,077	3,533	277	3,216	3,493	1,335	4,140	5,475
Scott River basin	265	5,035	5,300	505	2,358	2,863	3,279	11,198	14,477
Shasta River basin	85	1,341	1,426	1,840	3,363	5,203	695	12,816	13,511
Bogus Creek basin	431	3,285	3,716	443	7,817	8,260	1,207	45,225	46,432
Main Stem Klamath River									
(excluding IGH)	31 <sup>n/</sup>	647 <sup>n/</sup>	678 <sup>n/</sup>	625 <sup>n/</sup>	3,249 <sup>n/</sup>	3,874 <sup>n/</sup>	768 <sup>n/</sup>	6,472 <sup>n/</sup>	7,240 <sup>n/</sup>
Misc. Klamath tributaries									
(above Hoopa and Yurok Reservations)	92	2,470	2,562	50	1,202	1,252	744 <sup>o/</sup>	3,654 <sup>o/</sup>	4,398 <sup>o/</sup>
Hoopa and Yurok Reservation tribs.	0 <sup>h/</sup>	98 <sup>h/</sup>	98 <sup>h/</sup>	0 <sup>h/</sup>	222 <sup>h/</sup>	222 <sup>h/</sup>	34 <sup>p/</sup>	413 <sup>p/</sup>	447 <sup>p/</sup>
Subtotals	3,825	21,858	25,683	6,245	32,333	38,578	17,324	161,794	179,118
<b>Total Spawner Escapement</b>	5,444	43,501	48,945	11,445	49,405	60,850	17,659	199,653	217,312

**IN-RIVER HARVEST**

	1993			1994			1995		
	Grilse	Adults	Totals	Grilse	Adults	Totals	Grilse	Adults	Totals
<b>Angler Harvest</b>									
Klamath River (below Hwy 101 bridge)	23	669	692	246	662	908	323	956	1,279
Trinity River basin (above Willow Creek)	172	391	563	547	260	807	554	2,779	3,333
Balance of Klamath system	1,730	2,112	3,842	1,763	910	2,673	3,543	2,346 <sup>q/</sup>	5,889
Subtotals	1,925	3,172	5,097	2,556	1,832	4,388	4,420	6,081	10,501
<b>Indian Net Harvest e/</b>									
Klamath River (below Hwy 101 bridge)	62	3,017	3,079	81	4,362	4,443	137	5,119	5,256
Klamath River (Hwy 101 to Trinity mouth)	80	5,127	5,207	118	5,064	5,182	152	7,055	7,207
Trinity River (Hoopa Reservation)	33	1,492	1,525	94	2,266	2,360	268	3,383	3,651
Subtotals	175	9,636	9,811	293	11,692	11,985	557	15,557	16,114
<b>Total In-river Harvest</b>	2,100	12,808	14,908	2,849	13,524	16,373	4,977	21,638	26,615

**IN-RIVER RUN**

	1993			1994			1995		
	Grilse	Adults	Totals	Grilse	Adults	Totals	Grilse	Adults	Totals
<b>Totals</b>									
In-river Harvest and Escapement	7,544	56,309	63,853	14,294	62,929	77,223	22,636	221,291	243,927
Angling Mortality (2.04% of harvest) <sup>f/</sup>	39	65	104	52	37	90	90	124	214
Net Mortality (8.70% of harvest) <sup>f/</sup>	15	838	853	25	1,017	1,042	48	1,353	1,401
<b>Total In-river Run</b>	7,598	57,212	64,810	14,371	63,983	78,354	22,774	222,768	245,542

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**SPAWNER ESCAPEMENT**

	1996			1997			1998		
	Grilse	Adults	Totals	Grilse	Adults	Totals	Grilse	Adults	Totals
<b>Hatchery Spawners</b>									
Iron Gate Hatchery (IGH)	543	13,622	14,165	452	13,275	13,727	403	14,923	15,326
Trinity River Hatchery (TRH)	249	6,411	6,660	820	5,387	6,207	192	14,296	14,488
Subtotals	792	20,033	20,825	1,272	18,662	19,934	595	29,219	29,814
<b>Natural Spawners</b>									
Trinity River basin	4,478	42,646	47,124	2,845	11,507	14,352	1,974	24,460	26,434
(above Willow Creek, excluding TRH)	274	5,189	5,463	217	5,783	6,000	116	1,337	1,453
Salmon River basin	145	11,952	12,097	277	8,284	8,561	266	3,061	3,327
Scott River basin	46	1,404	1,450	334	1,667	2,001	76	2,466	2,542
Shasta River basin	377	10,420	10,797	221	9,809	10,030	205	6,630	6,835
Bogus Creek basin									
Main Stem Klamath River	218 n/	2,790 n/	3,008 n/	104 n/	3,472 n/	3,576 n/	109 n/	2,913 n/	3,022 n/
(excluding IGH)									
Misc. Klamath-Trinity tributaries	581 o/	5,804 o/	6,385 o/	174 o/	5,174 o/	5,348 o/	83 o/	1,232 o/	1,315 o/
(above Hoopa and Yurok Reservations)	55 p/	1,121 p/	1,176 p/	53 p/	448 p/	501 p/	26 p/	389 p/	415 p/
<b>Hoopa and Yurok Reservation tribs.</b>									
Subtotals	6,174	81,326	87,500	4,225	46,144	50,369	2,855	42,488	45,343
<b>Total Spawner Escapement</b>	6,966	101,359	108,325	5,497	64,806	70,303	3,450	71,707	75,157

**IN-RIVER HARVEST**

	1996			1997			1998		
	Grilse	Adults	Totals	Grilse	Adults	Totals	Grilse	Adults	Totals
<b>Angler Harvest</b>									
Klamath River (below Hwy 101 bridge)	100	3,110	3,210	49	2,182	2,231	124	1,603	1,727
Klamath River (Hwy 101 to Coon Cr Falls)	1,128	4,052	5,180	1,226	512	1,738	406	1,270	1,676
Trinity River basin (above Willow Creek)	331	1,214	1,545 r/	353	1,331	1,684 s/	275	3,262	3,537 w/
Balance of Klamath system	753	4,390	5,143	781	1,651	2,432 t/	303	1,575	1,878 v/
Subtotals	2,312	12,766	15,078	2,409	5,676	8,085	1,108	7,710 x/	8,818
<b>Indian Net Harvest e/</b>									
Klamath River (below Hwy 101 bridge)	163	49,113	49,276	21	5,574	5,595	16	3,454	3,470
Klamath River (Hwy 101 to Trinity mouth)	19	4,593	4,612	8	5,275	5,283	32	5,198	5,230
Trinity River (Hoopa Reservation)	8	2,770	2,778	6	1,238	1,244	5	1,535	1,540
Subtotals	190	56,476	56,666	35	12,087	12,122	53	10,187	10,240
<b>Total In-river Harvest</b>	2,502	69,242	71,744	2,444	17,763	20,207	1,161	17,897	19,058

**IN-RIVER RUN**

	1996			1997			1998		
	Grilse	Adults	Totals	Grilse	Adults	Totals	Grilse	Adults	Totals
<b>Totals</b>									
In-river Harvest and Escapement	9,468	170,601	180,069	7,941	82,569	90,510	4,611	89,604	94,215
Angling Mortality (2.04% of harvest) f/	47	261	308	49	116	165	23	157	180
Net Mortality (8.70% of harvest) f/	17	4,911	4,927	3	1,051	1,054	5	886	890
<b>Total In-river Run</b>	9,532	175,773	185,305	7,993	83,736	91,729	4,639	90,647	95,286

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**SPAWNER ESCAPEMENT**

	1999			2000			2001		
	Grilse	Adults	Totals	Grilse	Adults	Totals	Grilse	Adults	Totals
<b>Hatchery Spawners</b>									
Iron Gate Hatchery (IGH)	4,830	9,290	14,120	839	71,635	72,474	1,364	37,204	38,568
Trinity River Hatchery (TRH)	2,027	5,037	7,064	1,070	25,976	27,046	267	17,908	18,175
<b>Hatchery Spawner Subtotals:</b>	<b>6,857</b>	<b>14,327</b>	<b>21,184</b>	<b>1,909</b>	<b>97,611</b>	<b>99,520</b>	<b>1,631</b>	<b>55,112</b>	<b>56,743</b>
<b>Natural Spawners</b>									
Main Stem Klamath River n/ (excluding IGH)	630	1,978	2,608	184	3,271	3,455	1,016	9,832	10,848
Salmon River basin	110	670	780	228	1,544	1,772	743	2,607	3,350
Scott River basin	563	3,021	3,584	524	5,729	6,253	744	5,398	6,142
Shasta River basin	1,901	1,296	3,197	1,271	11,025	12,296	2,641	8,452	11,093
Bogus Creek basin	2,628	3,537	6,165	373	34,678	35,051	648	11,927	12,575
Misc. Klamath tributaries o/ (above Yurok Reservation)	251	777	1,028	158	1,345	1,503	538	2,240	2,778
Yurok Reservation tribs. (Klamath River) p/	210	381	591	153	796	949	48	488	536
<b>Klamath Natural Spawner Subtotals:</b>	<b>6,293</b>	<b>11,660</b>	<b>17,953</b>	<b>2,891</b>	<b>58,388</b>	<b>61,279</b>	<b>6,378</b>	<b>40,944</b>	<b>47,322</b>
Main Stem Trinity River dd/ (excluding TRH)	4,154	6,753	10,907	3,376	23,468	26,844	1,336	35,991	37,327 cc/
Misc. Trinity tributaries o/ (above Hoopa Reservation)				103	706	809	27	729	756
Hoopa Reservation tribs. (Trinity River) p/	0	44	44	24	166	190	6	170	176
<b>Trinity Natural Spawner Subtotals:</b>	<b>4,154</b>	<b>6,797</b>	<b>10,951</b>	<b>3,503</b>	<b>24,340</b>	<b>27,843</b>	<b>1,369</b>	<b>36,890</b>	<b>38,259</b>
<b>Natural Spawner Subtotals:</b>	<b>10,447</b>	<b>18,457</b>	<b>28,904</b>	<b>6,394</b>	<b>82,728</b>	<b>89,122</b>	<b>7,747</b>	<b>77,834</b>	<b>85,581</b>
<b>Total Spawner Escapement</b>	<b>17,304</b>	<b>32,784</b>	<b>50,088</b>	<b>8,303</b>	<b>180,339</b>	<b>188,642</b>	<b>9,378</b>	<b>132,946</b>	<b>142,324</b>

**IN-RIVER HARVEST**

	1999			2000			2001		
	Grilse	Adults	Totals	Grilse	Adults	Totals	Grilse	Adults	Totals
<b>Angler Harvest</b>									
Klamath River (below Hwy 101 bridge)	37	177	214	108	1,190	1,298	298	4,620	4,918
Klamath River (Hwy 101 to Coon Cr Falls)	869 y/	1,112 y/	1,981 y/	972	1,006	1,978	825	1,960	2,785
Klamath River (Coon Cr Falls to IGH)	138 z/	571 z/	709 z/	117	1,549	1,666 bb/	242	3,041	3,283
Trinity River basin above Weitchpec aa/	572	422	994	385	1,905	2,290	135	2,513	2,648
<b>Angler Harvest Subtotals:</b>	<b>1616</b>	<b>2282</b>	<b>3898</b>	<b>1582</b>	<b>5650</b>	<b>7232</b>	<b>1,500</b>	<b>12,134</b>	<b>13,634</b>
<b>Indian Net Harvest e/</b>									
Klamath River (below Hwy 101 bridge)	126	4,387	4,513	35	17,278	17,313	261	28,967	29,228
Klamath River (Hwy 101 to Trinity mouth)	49	7,295	7,344	140	6,175	6,315	78	4,724	4,802
Trinity River (Hoopa Reservation)	96	2,978	3,074	128	5,962	6,090	60	4,954	5,014
<b>Indian Net Harvest Subtotals:</b>	<b>271</b>	<b>14,660</b>	<b>14,931</b>	<b>303</b>	<b>29,415</b>	<b>29,718</b>	<b>399</b>	<b>38,645</b>	<b>39,044</b>
<b>Total In-river Harvest</b>	<b>1,887</b>	<b>16,942</b>	<b>18,829</b>	<b>1,885</b>	<b>35,065</b>	<b>36,950</b>	<b>1,899</b>	<b>50,779</b>	<b>52,678</b>

**IN-RIVER RUN**

	1999			2000			2001		
	Grilse	Adults	Totals	Grilse	Adults	Totals	Grilse	Adults	Totals
<b>Totals</b>									
In-river Harvest and Escapement	19,191	49,726	68,917	10,188	215,404	225,592	11,277	183,725	195,002
Angling Mortality (2.04% of harvest) f/	33	47	80	32	115	148	31	248	278
Net Mortality (8.70% of harvest) f/	24	1,275	1,298	26	2,558	2,584	35	3,360	3,395
<b>Total In-river Run</b>	<b>19,248</b>	<b>51,048</b>	<b>70,296</b>	<b>10,246</b>	<b>218,077</b>	<b>228,323</b>	<b>11,343</b>	<b>187,333</b>	<b>198,676</b>

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	2002			2003			2004		
	Grilse	Adults	Totals	Grilse	Adults	Totals	Grilse	Adults	Totals
<b>Hatchery Spawners</b>									
Iron Gate Hatchery (IGH)	1,294	23,667	24,961	290	31,970	32,260	937	10,582	11,519
Trinity River Hatchery (TRH)	1,037	3,516	4,553	574	29,812	30,386	1,044	12,399	13,443
<b>Hatchery Spawner Subtotals:</b>	<b>2,331</b>	<b>27,183</b>	<b>29,514</b>	<b>864</b>	<b>61,782</b>	<b>62,646</b>	<b>1,981</b>	<b>22,981</b>	<b>24,962</b>
<b>Natural Spawners</b>									
Main Stem Klamath River n/ (excluding IGH)	658	21,650	22,308	298	17,722	18,020	205	5,037	5,242
Salmon River basin	78	2,669	2,747	73	3,302	3,375	51	282	333
Scott River basin	47	4,261	4,308	65	11,988	12,053	22	445	467
Shasta River basin	386	6,432	6,818	155	4,134	4,289	129	833	962
Bogus Creek basin	304	17,530	17,834	188	15,422	15,610	295	3,493	3,788
Misc. Klamath tributaries o/ (above Yurok Reservation)	44	1,344	1,388	38	1,761	1,799	80	477	557
Yurok Reservation tribs. (Klamath River) p/	12	339	351	31	1,094	1,125	64	144	208
<b>Klamath Natural Spawner Subtotals:</b>	<b>1,529</b>	<b>54,225</b>	<b>55,754</b>	<b>848</b>	<b>55,423</b>	<b>56,271</b>	<b>846</b>	<b>10,711</b>	<b>11,557</b>
Main Stem Trinity River dd/ (excluding TRH)	2,230	10,880	13,110	1,065	31,173	32,238	3,722	12,718	16,440
Misc. Trinity tributaries o/ (above Hoopa Reservation)	66	324	390	109	602	711	75	258	333
Hoopa Reservation tribs. (Trinity River) p/	42	206	248	80	444	524	42	144	186
<b>Trinity Natural Spawner Subtotals:</b>	<b>2,338</b>	<b>11,410</b>	<b>13,748</b>	<b>1,254</b>	<b>32,219</b>	<b>33,473</b>	<b>3,839</b>	<b>13,120</b>	<b>16,959</b>
<b>Natural Spawner Subtotals:</b>	<b>3,867</b>	<b>65,635</b>	<b>69,502</b>	<b>2,102</b>	<b>87,642</b>	<b>89,744</b>	<b>4,685</b>	<b>23,831</b>	<b>28,516</b>
<b>Total Spawner Escapement</b>	<b>6,198</b>	<b>92,818</b>	<b>99,016</b>	<b>2,966</b>	<b>149,424</b>	<b>152,390</b>	<b>6,666</b>	<b>46,812</b>	<b>53,478</b>

**IN-RIVER HARVEST**

	2002			2003			2004		
	Grilse	Adults	Totals	Grilse	Adults	Totals	Grilse	Adults	Totals
<b>Angler Harvest</b>									
Klamath River (below Hwy 101 bridge)	274	3,285	3,559	180	1,589	1,769	748	725	1,473
Klamath River (Hwy 101 to Coon Cr Falls)	284	3,268	3,552	369	3,336	3,705	1,493	1,472	2,965
Klamath River (Coon Cr Falls to IGH)	93	3,216	3,309	40	2,397	2,437	52	1,266	1,318
Trinity River basin above Weitchpec aa/	219	726	945	225	2,358	2,583	448	540	988
<b>Angler Harvest Subtotals:</b>	<b>870</b>	<b>10,495</b>	<b>11,365</b>	<b>814</b>	<b>9,680</b>	<b>10,494</b>	<b>2,741</b>	<b>4,003</b>	<b>6,744</b>
<b>Indian Net Harvest e/</b>									
Klamath River (below Hwy 101 bridge)	17	20,149	20,166	15	22,688	22,703	75	21,037	21,112
Klamath River (Hwy 101 to Trinity mouth)	41	3,257	3,298	17	4,575	4,592	73	3,077	3,150
Trinity River (Hoopa Reservation)	68	1,168	1,236	12	2,771	2,783	20	1,689	1,709
<b>Indian Net Harvest Subtotals:</b>	<b>126</b>	<b>24,574</b>	<b>24,700</b>	<b>44</b>	<b>30,034</b>	<b>30,078</b>	<b>168</b>	<b>25,803</b>	<b>25,971</b>
<b>Total In-river Harvest</b>	<b>996</b>	<b>35,069</b>	<b>36,065</b>	<b>858</b>	<b>39,714</b>	<b>40,572</b>	<b>2,909</b>	<b>29,806</b>	<b>32,715</b>

**IN-RIVER RUN**

	2002			2003			2004		
	Grilse	Adults	Totals	Grilse	Adults	Totals	Grilse	Adults	Totals
<b>Totals</b>									
In-river Harvest and Escapement	7,194	127,887	135,081	3,824	189,138	192,962	9,575	76,618	86,193
Angling Mortality (2.04% of harvest) f/	18	214	232	17	198	214	56	82	138
Net Mortality (8.70% of harvest) f/	11	2,137	2,148	4	2,612	2,615	15	2,243	2,258
Fish Die Off ee/	2,003	30,550	32,553						
<b>Total In-river Run</b>	<b>9,226</b>	<b>160,788</b>	<b>170,014</b>	<b>3,845</b>	<b>191,948</b>	<b>195,791</b>	<b>9,646</b>	<b>78,943</b>	<b>88,589</b>

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**SPAWNER ESCAPEMENT**

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	2005			2006			2007		
	Grilse	Adults	Totals	Grilse	Adults	Totals	Grilse	Adults	Totals
<b>Hatchery Spawners</b>									
Iron Gate Hatchery (IGH)	42	13,955	13,997	2,386	11,604	13,990	180	16,969	17,149
Trinity River Hatchery (TRH)	59	13,744	13,803	4,076	7,918	11,994	33	18,081	18,114
<b>Hatchery Spawner Subtotals:</b>	<b>101</b>	<b>27,699</b>	<b>27,800</b>	<b>6,462</b>	<b>19,522</b>	<b>25,984</b>	<b>213</b>	<b>35,050</b>	<b>35,263</b>
<b>Natural Spawners</b>									
Main Stem Klamath River n/ (excluding IGH)	32	4,622	4,654	853	4,538	5,391	41	6,914	6,955
Salmon River basin	105	401	506	791	1,278	2,069	55	1,377	1,432
Scott River basin	58	698	756	1,953	3,007	4,960	11	4,494	4,505
Shasta River basin	37	2,018	2,055	1,395	789	2,184	27	2,009	2,036
Bogus Creek basin	58	5,341	5,399	765	3,368	4,133	64	4,677	4,741
Misc. Klamath tributaries o/ (above Yurok Reservation)	40	361	401	739	1,165	1,904	26	1,414	1,440
Yurok Reservation tribs. (Klamath River) p/	68	113	181	20	119	139	8	407	415
<b>Klamath Natural Spawner Subtotals:</b>	<b>398</b>	<b>13,554</b>	<b>13,952</b>	<b>6,516</b>	<b>14,264</b>	<b>20,780</b>	<b>232</b>	<b>21,292</b>	<b>21,524</b>
Main Stem Trinity River dd/ (excluding TRH)	760	12,885	13,645	7,607	15,375	22,982	832	39,038	39,870
Misc. Trinity tributaries o/ (above Hoopa Reservation)	8	164	172	71	142	213	5	246	251
Hoopa Reservation tribs. (Trinity River) p/	4	84	88	189	382	571	2	94	96
<b>Trinity Natural Spawner Subtotals:</b>	<b>772</b>	<b>13,133</b>	<b>13,905</b>	<b>7,867</b>	<b>15,899</b>	<b>23,766</b>	<b>839</b>	<b>39,378</b>	<b>40,217</b>
<b>Natural Spawner Subtotals:</b>	<b>1,170</b>	<b>26,687</b>	<b>27,857</b>	<b>14,383</b>	<b>30,163</b>	<b>44,546</b>	<b>1,071</b>	<b>60,670</b>	<b>61,741</b>
<b>Total Spawner Escapement</b>	<b>1,271</b>	<b>54,386</b>	<b>55,657</b>	<b>20,845</b>	<b>49,685</b>	<b>70,530</b>	<b>1,284</b>	<b>95,720</b>	<b>97,004</b>

**IN-RIVER HARVEST**

	2005			2006			2007		
	Grilse	Adults	Totals	Grilse	Adults	Totals	Grilse	Adults	Totals
<b>Angler Harvest</b>									
Klamath River (below Hwy 101 bridge)	311	243	554	60	1	61	20	1,097	1,117
Klamath River (Hwy 101 to Weitchpec)	595	468	1,063	4,421	38	4,459	218	2,211	2,429
Klamath River (Weitchpec to IGH)	6	318	324	721	18	739	19	1,667	1,686
Trinity River basin above Weitchpec aa/	118	956	1,074	325	5	330	112	1,337	1,449
<b>Angler Harvest Subtotals:</b>	<b>1,030</b>	<b>1,985</b>	<b>3,015</b>	<b>5,527</b>	<b>62 ff/</b>	<b>5,589</b>	<b>369</b>	<b>6,312</b>	<b>6,681</b>
<b>Indian Net Harvest e/</b>									
Klamath River (below Hwy 101 bridge)	21	2,293	2,314	30	2,726	2,756	16	23,475	23,491
Klamath River (Hwy 101 to Trinity mouth)	38	3,314	3,352	240	3,396	3,636	5	1,800	1,805
Trinity River (Hoopa Reservation)	11	2,409	2,420	145	4,161	4,306	0	2,298	2,298
<b>Indian Net Harvest Subtotals:</b>	<b>70</b>	<b>8,016</b>	<b>8,086</b>	<b>415</b>	<b>10,283</b>	<b>10,698</b>	<b>21</b>	<b>27,573</b>	<b>27,594</b>
<b>Total In-river Harvest</b>	<b>1,100</b>	<b>10,001</b>	<b>11,101</b>	<b>5,942</b>	<b>10,345</b>	<b>16,287</b>	<b>390</b>	<b>33,885</b>	<b>34,275</b>

**IN-RIVER RUN**

	2005			2006			2007		
	Grilse	Adults	Totals	Grilse	Adults	Totals	Grilse	Adults	Totals
<b>Totals</b>									
In-river Harvest and Escapement	2,371	64,387	66,758	26,787	60,030	86,817	1,674	129,605	131,279
Angling Mortality (2.04% of harvest) f/	21	41	62	113	76	114	8	129	137
Net Mortality (8.70% of harvest) g/	6	697	703	36	894	930	2	2,397	2,399
Catch and Release Mortality gg				0	373	373			
<b>Total In-river Run</b>	<b>2,398</b>	<b>65,125</b>	<b>67,523</b>	<b>26,936</b>	<b>61,373</b>	<b>88,309</b>	<b>1,684</b>	<b>132,131</b>	<b>133,815</b>

**Klamath River Basin Fall Chinook Salmon Spawner Escapement, In-river Harvest and Run-size Estimates  
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**SPAWNER ESCAPEMENT**

	2008			2009			2010		
	Grilse	Adults	Totals	Grilse	Adults	Totals	Grilse	Adults	Totals
<b>Hatchery Spawners</b>									
Iron Gate Hatchery (IGH)	2,130	9,101	11,231	1,229	12,263	13,492	1,069	10,278	11,347
Trinity River Hatchery (TRH)	801	4,451	5,252	143	7,351	7,494	1,432	7,774	9,206
<b>Hatchery Spawner Subtotals:</b>	<b>2,931</b>	<b>13,552</b>	<b>16,483</b>	<b>1,372</b>	<b>19,614</b>	<b>20,986</b>	<b>2,501</b>	<b>18,052</b>	<b>20,553</b>

**Natural Spawners**

Main Stem Klamath River n/ (excluding IGH)	1,199	5,830	7,029	295	7,945	8,240	275	3,684	3,959
Salmon River basin	650	1,749	2,399	516	2,204 <sup>hh/</sup>	2,720	356	2,478 <sup>hh/</sup>	2,834
Scott River basin	1,228	3,445	4,673	44	2,167	2,211	394	2,114	2,508
Shasta River basin	3,621	2,741	6,362	151	6,145	6,296	87	1,261	1,348
Bogus Creek basin	1,565	3,001	4,566	471	5,455	5,926	291	3,180	3,471
Misc. Klamath tributaries o/ (above Yurok Reservation)	1,073	1,845	2,918	175	3,094	3,269	274	1,663	1,937
Yurok Reservation tribs. (Klamath River) p/	89	409	498	296	733	1,029	134	790	924
<b>Klamath Natural Spawner Subtotals:</b>	<b>9,425</b>	<b>19,020</b>	<b>28,445</b>	<b>1,948</b>	<b>27,743</b>	<b>29,691</b>	<b>1,811</b>	<b>15,170</b>	<b>16,981</b>

Main Stem Trinity River dd/ (excluding TRH)	7,255	11,006	18,261	5,958	16,168	22,126	9,779	21,579	31,358
Misc. Trinity tributaries o/ (above Hoopa Reservation)	158	240	398	70	190	260	69	152	221
Hoopa Reservation tribs. (Trinity River) p/	385	584	969	114	308	422	147	324	471
<b>Trinity Natural Spawner Subtotals:</b>	<b>7,798</b>	<b>11,830</b>	<b>19,628</b>	<b>6,142</b>	<b>16,666</b>	<b>22,808</b>	<b>9,995</b>	<b>22,055</b>	<b>32,050</b>

<b>Natural Spawner Subtotals:</b>	<b>17,223</b>	<b>30,850</b>	<b>48,073</b>	<b>8,090</b>	<b>44,409</b>	<b>52,499</b>	<b>11,806</b>	<b>37,225</b>	<b>49,031</b>
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<b>Total Spawner Escapement</b>	<b>20,154</b>	<b>44,402</b>	<b>64,556</b>	<b>9,462</b>	<b>64,023</b>	<b>73,485</b>	<b>14,307</b>	<b>55,277</b>	<b>69,584</b>
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**IN-RIVER HARVEST**

	2008			2009			2010		
	Grilse	Adults	Totals	Grilse	Adults	Totals	Grilse	Adults	Totals
<b>Angler Harvest</b>									
Klamath River (below Hwy 101 bridge)	521	141	662	319	1,191	1,510	162	510	672
Klamath River (Hwy 101 to Weitchpec)	3,358	896	4,254	1,559	2,015	3,574	1,320	1,225	2,545
Klamath River (Weitchpec to IGH)	160	523	683	155	1,614	1,769	88	875	963
Trinity River basin	269	359	628	181	831	1,012	261	425	686
<b>Angler Harvest Subtotals:</b>	<b>4,308</b>	<b>1,919</b>	<b>6,227</b>	<b>2,214</b>	<b>5,651</b>	<b>7,865</b>	<b>1,831</b>	<b>3,035</b>	<b>4,866</b>

**Indian Net Harvest e/**

Klamath River (below Hwy 101 bridge)	302	17,710	18,012	43	19,465	19,508	20	21,725	21,745
Klamath River (Hwy 101 to Trinity mouth)	187	2,636	2,823	39	4,769	4,808	156	4,461	4,617
Trinity River (Hoopa Reservation)	152	1,913	2,065	96	4,153	4,249	252	3,701	3,953
<b>Indian Net Harvest Subtotals:</b>	<b>641</b>	<b>22,259</b>	<b>22,900</b>	<b>178</b>	<b>28,387</b>	<b>28,565</b>	<b>428</b>	<b>29,887</b>	<b>30,315</b>

<b>Total In-river Harvest</b>	<b>4,949</b>	<b>24,178</b>	<b>29,127</b>	<b>2,392</b>	<b>34,038</b>	<b>36,430</b>	<b>2,259</b>	<b>32,922</b>	<b>35,181</b>
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**IN-RIVER RUN**

	2008			2009			2010		
	Grilse	Adults	Totals	Grilse	Adults	Totals	Grilse	Adults	Totals
<b>Totals</b>									
In-river Harvest and Escapement	25,103	68,580	93,683	11,854	98,061	109,915	16,566	88,199	104,765
Angling Mortality (2.04% of harvest) f/	88	39	127	45	115	161	37	62	99
Net Mortality (8.70% of harvest) f/	56	1,935	1,991	15	2,468	2,484	37	2,599	2,636
Catch and Release Mortality gg									
<b>Total In-river Run</b>	<b>25,247</b>	<b>70,554</b>	<b>95,801</b>	<b>11,914</b>	<b>100,644</b>	<b>112,558</b>	<b>16,640</b>	<b>90,860</b>	<b>107,500</b>

**Klamath River Basin Fall Chinook Salmon Spawner Escapement, In-river Harvest and Run-size Estimates,  
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**SPAWNER ESCAPEMENT**

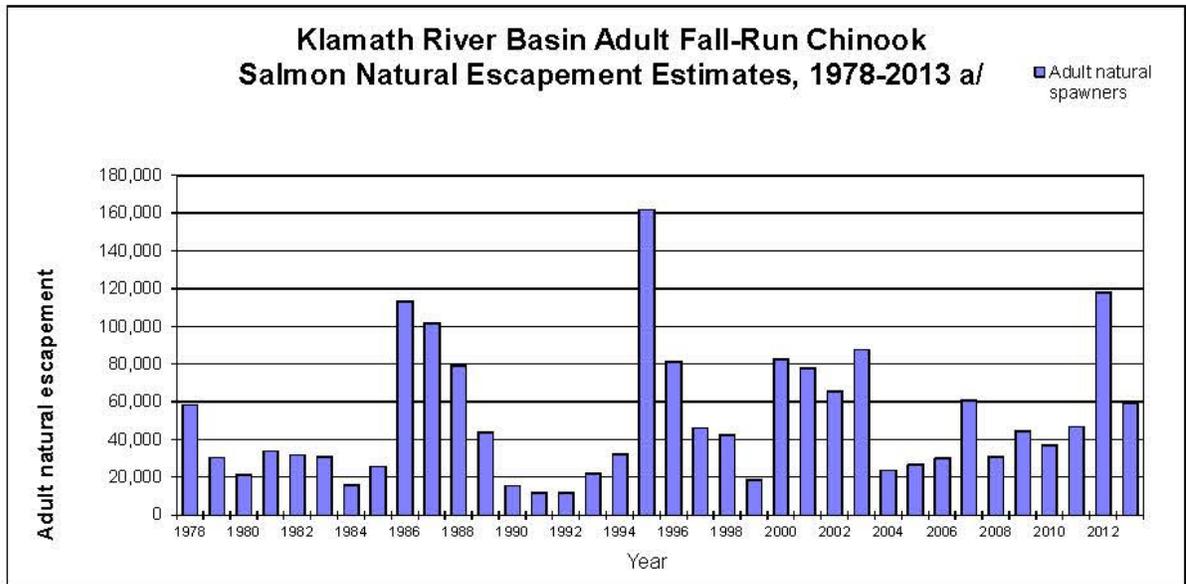
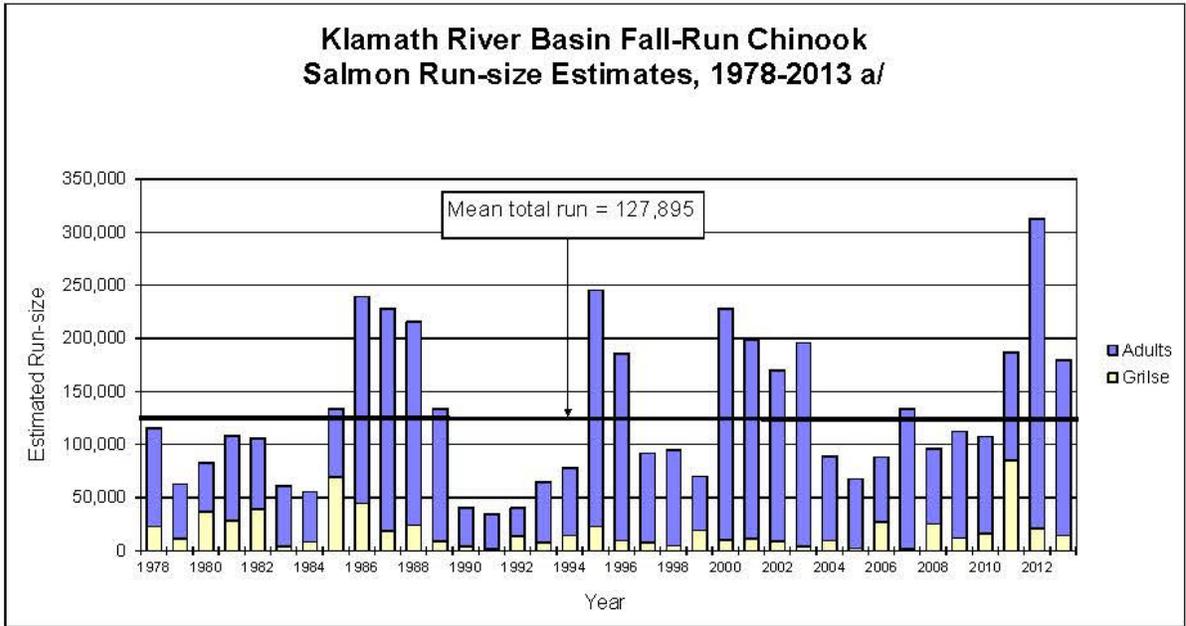
	2011			2012			2013		
	Grilse	Adults	Totals	Grilse	Adults	Totals	Grilse	Adults	Totals
<b>Hatchery Spawners</b>									
Iron Gate Hatchery (IGH)	9,549	8,490	18,039	1,537	38,478	40,015	1,232	13,431	14,754
Trinity River Hatchery (TRH)	1,875	13,847	15,722	92	17,461	17,553	135	3,717	3,852
<b>Hatchery Spawner Subtotals:</b>	<b>11,424</b>	<b>22,337</b>	<b>33,761</b>	<b>1,629</b>	<b>55,939</b>	<b>57,568</b>	<b>1,458</b>	<b>17,148</b>	<b>18,606</b>
<b>Natural Spawners</b>									
Main Stem Klamath River n/ (excluding IGH)	3,370	3,933	7,203	1,501	14,802	16,303	683	12,192	12,875
Salmon River basin	1,819	3,674	5,493	829	3,561	4,390	240	2,240	2,480
Scott River basin	2,502	3,019	5,521	1,783	7,570	9,352	588	4,036	4,624
Shasta River basin	11,175	213	11,388	1,944	27,600	29,544	1,096	6,925	8,021
Bogus Creek basin	2,303	2,919	5,222	839	11,792	12,631	362	3,925	4,287
Misc. Klamath tributaries o/ (above Yurok Reservation)	3,259	3,072	6,331	629	3,254	3,882	200	2,310	2,510
Yurok Reservation tribs. (Klamath River) p	418	1,143	1,561	406	761	1,167	129	326	455
<b>Klamath Natural Spawner Subtotals:</b>	<b>24,746</b>	<b>17,973</b>	<b>42,719</b>	<b>7,931</b>	<b>69,340</b>	<b>77,271</b>	<b>3,298</b>	<b>31,954</b>	<b>35,252</b>
Main Stem Trinity River dd/ (excluding TRH)	36,913	28,718	64,631	7,254	47,873	55,127	6,969	27,271	34,240
Misc. Trinity tributaries o/ (above Hoopa Reservation)	96	542	638	79	520	599	39	154	193
Hoopa Reservation tribs. (Trinity River) p/	94	530	624	48	316	364	61	240	301
<b>Trinity Natural Spawner Subtotals:</b>	<b>37,103</b>	<b>28,790</b>	<b>65,893</b>	<b>7,381</b>	<b>48,709</b>	<b>56,090</b>	<b>7,069</b>	<b>27,665</b>	<b>34,734</b>
<b>Natural Spawner Subtotals:</b>	<b>61,849</b>	<b>46,763</b>	<b>108,612</b>	<b>15,312</b>	<b>118,049</b>	<b>133,361</b>	<b>10,367</b>	<b>59,619</b>	<b>69,986</b>
<b>Total Spawner Escapement</b>	<b>73,273</b>	<b>69,100</b>	<b>142,373</b>	<b>16,941</b>	<b>173,988</b>	<b>190,929</b>	<b>11,825</b>	<b>76,767</b>	<b>88,592</b>

**IN-RIVER HARVEST**

	2011			2012			2013		
	Grilse	Adults	Totals	Grilse	Adults	Totals	Grilse	Adults	Totals
<b>Angler Harvest</b>									
Klamath River (below Hwy 101 bridge)	700	624	1,324	382	2,696	3,078	546	11,272	11,818
Klamath River (Hwy 101 to Weitchpec)	6,557	912	7,469	3,183	5,174	8,357	1,135	1,113	2,248
Klamath River (Weitchpec to IGH)	1,481	1,483	2,964	237	3,967	4,204	532	6,243	6,775
Trinity River basin	1,243	1,128	2,371	55	2,088	2,143	48	1,100	1,148
<b>Angler Harvest Subtotals:</b>	<b>9,981</b>	<b>4,147</b>	<b>14,128</b>	<b>3,857</b>	<b>13,925</b>	<b>17,782</b>	<b>2,261</b>	<b>19,728</b>	<b>21,989</b>
<b>Indian Net Harvest e/</b>									
Klamath River (below Hwy 101 bridge)	429	17,218	17,647	68	87,747	87,815	204	57,094	57,298
Klamath River (Hwy 101 to Trinity mouth)	467	4,272	4,739	54	3,494	3,548	41	2,656	2,697
Trinity River (Hoopa Reservation)	426	4,863	5,289	55	4,145	4,200	16	3,019	3,035
<b>Indian Net Harvest Subtotals:</b>	<b>1,322</b>	<b>26,353</b>	<b>27,675</b>	<b>177</b>	<b>95,386</b>	<b>95,563</b>	<b>261</b>	<b>62,769</b>	<b>63,030</b>
<b>Total In-river Harvest</b>	<b>11,303</b>	<b>30,500</b>	<b>41,803</b>	<b>4,034</b>	<b>109,311</b>	<b>113,345</b>	<b>2,522</b>	<b>82,497</b>	<b>85,019</b>

**IN-RIVER RUN**

	2011			2012			2013		
	Grilse	Adults	Totals	Grilse	Adults	Totals	Grilse	Adults	Totals
<b>Totals</b>									
In-river Harvest and Escapement	84,576	99,600	184,176	20,975	283,299	304,274	14,347	159,264	173,611
Angling Mortality (2.04% of harvest) f/	204	85	289	79	284	363	46	403	449
Net Mortality (8.70% of harvest) f/	115	2,292	2,407	15	8,294	8,310	23	5,458	5,481
Catch and Release Mortality gg/									
<b>Total In-river Run</b>	<b>84,895</b>	<b>101,977</b>	<b>186,872</b>	<b>21,069</b>	<b>291,877</b>	<b>312,946</b>	<b>14,416</b>	<b>165,125</b>	<b>179,541</b>



a/ 2011 data preliminary

**Footnotes for Klamath River Basin Fall Chinook Salmon Spawner Escapement,  
In-river Harvest and Run-size Estimates, 1978-2013<sup>a</sup>**

- a/ Prepared February 7, 2013. All counts/estimates are provided by California Department of Fish and Wildlife (CDFW) unless otherwise indicated. All estimates for Iron Gate and Trinity River hatcheries represent counts of fish entering those facilities. All spawner escapement estimates for the Shasta River basin for 1978-1987 and 1989-2013, plus those for Bogus Creek basin for 1980-1991 and 2003-2013 are based on counts made at counting/video stations located near the mouths of those streams. All remaining spawner escapements and all harvest estimates are developed from data obtained through ongoing field investigations in the Klamath-Trinity system. Estimate for years through 2012 are final; 2013 estimates are preliminary, subject to revision.
- b/ Data not available.
- c/ USFWS estimate.
- d/ In 1978, the Klamath River system sport salmon fishing season was closed August 25. There was essentially no sport harvest of fall Chinook in the Trinity River basin in 1978.
- e/ USFWS estimates for years through 1982; 1983 through 1993 estimates jointly made by USFWS and Hoopa Valley Business Council Fisheries Department (HVBCFD); 1994 through 2013 estimates made by HVBCFD for the Hoopa Reservation and Yurok Tribal Fisheries Department for the Yurok Reservation.
- f/ Factors for non-landed catch mortality calculated by the Klamath River Technical Advisory Team (KRTAT, 1986, "Recommended Spawning Escapement Policy for Klamath River Fall-run Chinook"). Modified non-landed catch mortality rates of 2.04% and 8.70% were applied to sport and net harvest respectively following the 2003 season. These rates were applied retrospectively to all years, replacing the historical rates of 2.0% (sport harvest) and 8.0% (net harvest).
- g/ U.S. Forest Service estimate.
- h/ HVBCFD estimate. Estimate for streams in Hoopa Reservation only.
- i/ In 1985, the Klamath River system sport salmon fishing season was closed to the taking of all salmon below the U.S. Highway 101 bridge from September 9 through December 31; the Klamath from the U.S. Highway 101 bridge to Iron Gate Dam and the Trinity River from its mouth to Lewiston Dam were closed to the taking of salmon 22 inches and longer from September 23 through December 31, 1985.
- j/ Estimates for Hoopa Reservation portion of catch (=947 grilse and 1,941 adults) are of catch occurring during open fishing periods only.
- k/ Estimates jointly made by USFWS and HVBCFD.
- l/ Final figures for Salmon River basin natural spawners shown in the December 11, 1991 table were incorrect. Corrected figures, plus necessary revisions to the 1990 totals, are presented here.
- m/ Figure does not include adults that, following entry into Iron Gate Hatchery, were returned to the river alive and un-spawned, and which are presumed to have spawned naturally. This includes 2,333 fish in 1994 and 8,932 fish in 1995.
- n/ CDFG estimate based on USFWS redd count data through 2000. Estimates for 2001-2013 are USFWS estimates based on a combination of redd count data (Shasta River downstream to Indian Cr.) and carcass mark-recapture estimates upstream of the Shasta River.
- o/ CDFG and USFS, estimates.
- p/ HVBCFD and YTFD estimates. YTFD fish count for Blue Creek is a based on several dive surveys conducted at peak of spawning and should not be construed as an escapement estimate. HVBCFD tributary estimates based on redd counts.
- q/ 750 of these adults were harvested between I-5 and IGH after the river reopened to sport angling on 13 OCT. 1995
- r/ Includes 51 grilse and 178 adults harvested in the main stem Trinity River between Willow Creek weir and the mouth of the Trinity River. HVBCFD estimate.
- s/ Includes 251 grilse and 645 adults harvested in the main stem Trinity River between Willow Creek weir and the mouth of the Trinity River. HVBCFD estimate.
- t/ Additional, but unknown harvest occurred upstream of Interstate 5 for jacks between Oct.2-18 and Oct.18-Nov. 30 for all Chinook after Iron Gate Hatchery reached its required 8,000 adult Chinook spawning escapement.
- u/ Includes 298 grilse and 799 adults harvested in the main stem Trinity River between Willow Creek weir and the mouth of the Trinity River. HVBCFD estimate.
- v/ Additional, but unknown harvest occurred upstream of Interstate 5 for jacks between Oct.4-17 after the 28 day window and Oct.17-Nov. 30 for all Chinook after Iron Gate Hatchery reached its required 8,000 adult Chinook spawning escapement.

- x/ Includes fish originally classified as grilse, based on the 24 inch TL specified in the 1998 sport angling regulations, which were re-classified as adult based on preliminary analysis of 1998 data.
- y/ Includes 21 Grilse and 42 adults harvested after the lower river reopened on Oct 15, 1999.
- z/ Harvest estimate based on creel census data and includes 54 grilse and 206 adults harvested during the secondary season allowed above the Interstate 5 bridge after IGH achieved 8,000 adult spawners.
- aa/ Harvest estimate based on HVBCFD creel census below the Willow Creek Weir and CDFG's estimate based on tag returns for the Trinity River above Willow Creek Weir.
- bb/ Harvest estimate based on creel census data and includes 113 grilse and 938 adults harvested during the secondary season allowed above the Interstate 5 bridge after IGH achieved 8,000 adult spawners.
- cc/ Includes 9 jacks and 252 adults estimated to have spawned in the mainstem Trinity River downstream of the Willow Creek Weir. Estimate based on HVBCFD expanded redd count data.
- dd/ Estimates upstream of Willow Creek weir provided by CDFG and are inclusive of the total basin upstream of weir; estimates downstream of Willow Creek weir provided by HVBCFD and only include the main stem Trinity to its confluence with the Klamath River.
- ee/ Prespawn mortality estimate for Chinook salmon that died in the lower Klamath River fish die off, 2002. Estimate provided by USFWS.
- ff/ Estimated 2006 river recreational fishery adult impacts (incidental mortality). Estimation methods documented in 2007 PFMC pre-season report I.
- gg/ The 2006 sport fishery was closed to the take of adult fall Chinook (greater than 22 inches).
- hh/ The 2009 and 2012 Salmon River adult escapement estimates were based on total redd counts (2009) and expanded redd counts from the first two weeks of survey expanded for the season based on historical cumulative average (2010).
- hi/ Salmon River adult escapement estimates for 2013 were based on carcass mark-recapture survey within the main- stem combined with red surveys of the lower main-stem and tributaries. Jacks were estimated from scale age data.

#### **List of acronyms**

CDFW – California Department of Fish and Wildlife  
 CDFG - California Department of Fish and Game  
 HVBCFD- Hoopa Valley Business Council Fisheries Department  
 IGH – Iron Gate Hatchery  
 KRTAT – Klamath River Technical Advisory Team  
 PFMC – Pacific Fishery Management Council  
 TRH – Trinity River Hatchery  
 USFS – United States Forest Service  
 USFWS – United States Fish and Wildlife Service  
 YTFD – Yurok Tribe Fisheries Department

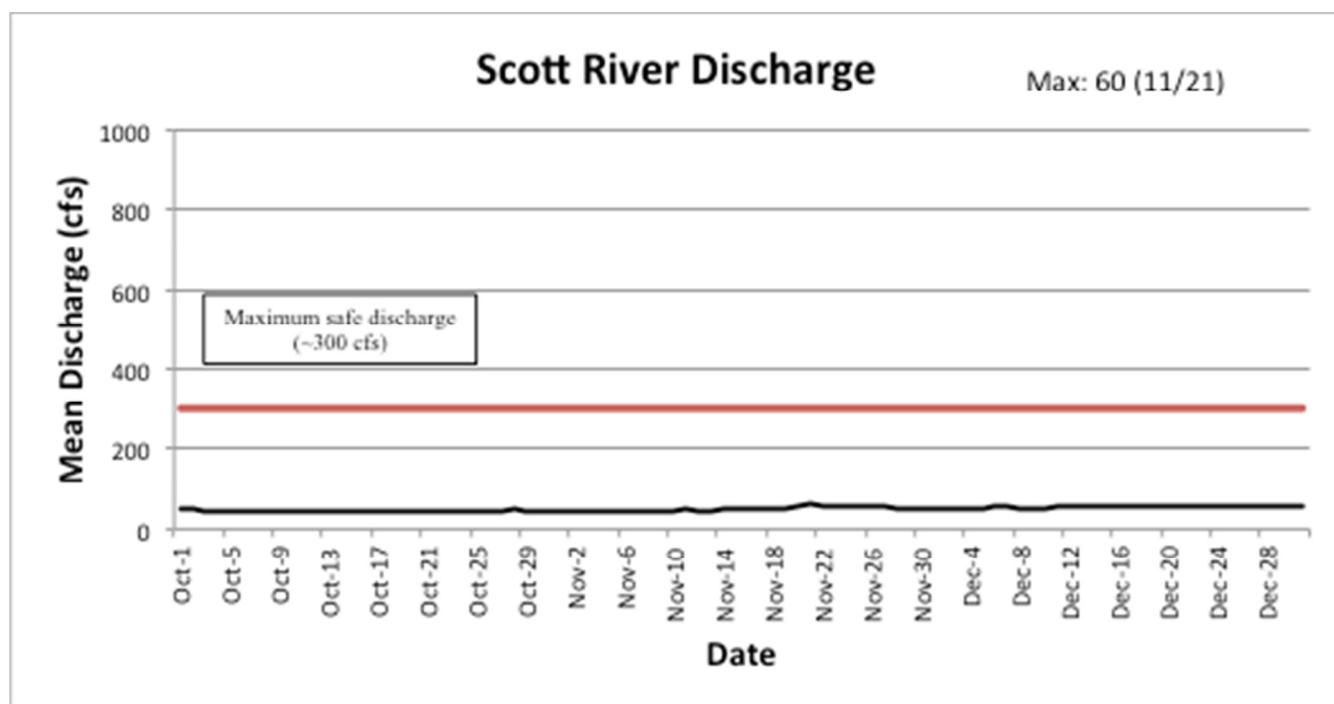
## Appendix B – USGS Discharge Charts

### Scott River

The Scott River gauge (11519500) is located 10.8 miles downstream from Fort Jones, CA.

- Legal location T.44N., R.10W., Sec. 29 (Mount Diablo Meridian); or
- Lat. 41°38'27" by Long. 123°00'50" (referenced NAD 1927)

The graph shown provides a daily mean of discharge at the gauge and includes October 1<sup>st</sup> through December 31<sup>st</sup>, 2013, which encompasses the redd/carcass survey dates and is inclusive effort by CDFW which continued after KNF and other cooperators had ended their survey season. Instantaneous discharges measured at the gauge can be higher or lower than that pictured. Variability in flow during an actual survey day may have provided a window of safe discharge not reflected in the figure.

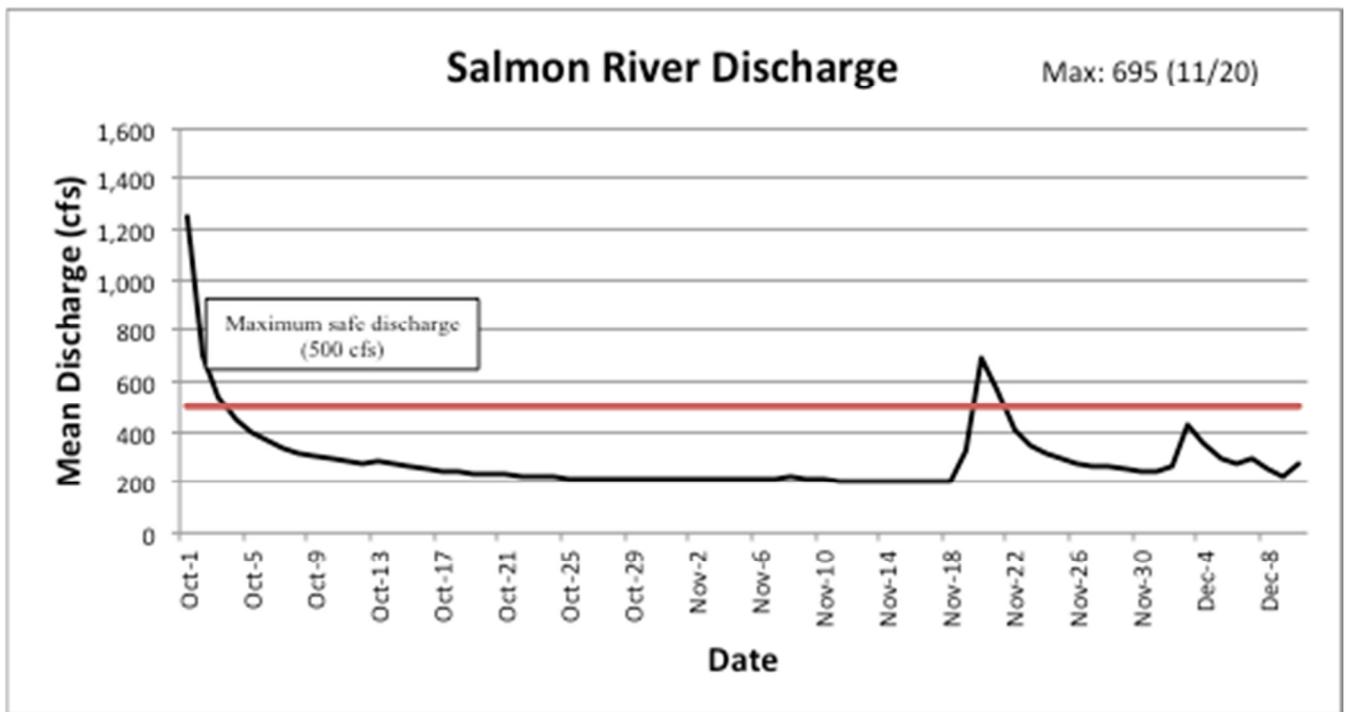


*Salmon River*

The Salmon River gauge (11522500) is located 1.0 miles upstream from Somes Bar, CA, at the confluence with the Klamath River.

- Legal location T.11N., R.6E., Sec. 3 (Humboldt Meridian); or
- Lat. 41°22'36" by Long. 123°28'33" (referenced NAD 1927)

The graph shown provides a daily mean of discharge at the gauge and includes October 1<sup>st</sup> through December 10<sup>th</sup>, 2013, which encompasses the redd/carcass survey dates. Instantaneous discharges measured at the gauge can be higher or lower than that pictured. Variability in flow during an actual survey day may have provided a window of safe discharge not reflected in the figure.



## Appendix C – Redd and Fish Survey Tables (2013)

### Salmon River Redds

Reach	Date														
	Oct-22	Oct-25	Oct-29	Nov-01	Nov-05	Nov-08	Nov-12	Nov-15	Nov-19	Nov-22	Nov-26	Nov-29	Dec-03	Dec-06	
<i>Mainstem</i>															
4A - Otter Bar to Nordheimer Ck	23		12	10	1	16	4	0	0	1	---	---	<u>0</u>		
4B - Forks to Otter Bar	23	39	2	24	6	3	1	3	0	0	---	---	<u>0</u>	<u>0</u>	
<i>North Fork</i>															
9A - Mile 2 to Forks	76	18	1	10	1		6	3	1	0	Trib Surveys	Holiday	<u>0</u>		
9B - Mile 4 to Mile 2	41	2	10		4		0	0	2	0			<u>0</u>		
10A - Mile 6 to Mile 4	17	21	2		1		0	0					<u>0</u>		
10B - Mile 8 to Mile 6	48	4	4		13			6					<u>0</u>		
11A - Mile 10 to Mile 8			25			3							<u>9</u>		
11B - Mile 12 to Mile 10													14		
<i>South Fork</i>															
5A - Henry Bell to Forks <sup>1</sup>	(56)	(75)	(86)	(2)	(70)	(82)	(82)	(62)		(72)	----	----			
5B - O'Farrell Gulch to Henry Bell	40	10	41	0	2	10	6	0	1	2			<u>0</u>		
6A - Indian Ck to O'Farrell Gulch	30	91	12	12	4	1	8		1	2				<u>0</u>	
6B - Matthews Ck to Indian Ck		40	20		4	8		7	2	0			<u>0</u>	-	

<sup>1</sup>Reach 5A is not flagged - total number of redds counted each survey

\*Underline = days which included pulling flagging

*Salmon River Tributary Surveys*

<b>Tributary</b>	<b>Date</b>	<b>Redds</b>	<b>Chinook</b>	<b>Steelhead</b>
Blackbear Creek	Nov-26	0	0	0
Indian Creek	Nov-26	0	0	0
Knownothing Creek	Nov-26	6	0	0
	Dec-06	3 <sup>2</sup>	0	0
Little NF Salmon River	Nov-26	1	0	0
Methodist Creek	Nov-26	0	0	0
	Dec-06	2 <sup>3</sup>	0	0
Nordheimer Creek <sup>1</sup>	Nov-26	9	0	0
	Dec-06	0	0	0

<sup>1</sup> Five redds found already flagged during 11/26 survey. Not included in total count for 11/26. Date on flags 11/13. Possibly done by Six Rivers.

<sup>2</sup> May be redds already counted on 11/26 (earlier redds not flagged).

<sup>3</sup> Uncertain species for redds. May be either Coho or late season Chinook.

Salmon River (Live) Chinook Observation

Reach	Date													
	Oct-22	Oct-25	Oct-29	Nov-01	Nov-05	Nov-08	Nov-12	Nov-15	Nov-19	Nov-22	Nov-26	Nov-29	Dec-03	Dec-06
<i>Mainstem</i>														
4A - Otter Bar to Nordheimer Ck	17		33	23	10	51	8	20	4	0	---	---	0	
4B - Forks to Otter Bar	81	40	16	96	50	32	28	12	9	5	---	---	4	0
<i>South Fork</i>														
9A - Mile 2 to Forks	58	50	21	19	15		24	7	6	1	Trib Surveys	Holiday	0	
9B - Mile 4 to Mile 2	38	nd	8		5		1	7	7	0			0	
10A - Mile 6 to Mile 4	25	12	3		0		0	0					0	
10B - Mile 8 to Mile 6	64	18	4		0			0					0	
11A - Mile 10 to Mile 8			7			2							0	
11B - Mile 12 to Mile 10													0	
<i>South Fork</i>														
5A - Henry Bell to Forks	57	38	22	19	14	23	35	5		0	-----	-----		
5B - O'Farrell Gulch to Henry Bell	47	52	70	17	12	3	9	2	1	9			0	
6A - Indian Ck to O'Farrell Gulch	126	51 <sup>1</sup>	38	35	39	25	18		6	2				1
6B - Matthews Ck to Indian Ck		38	18		15	8		1	1	0			0	-

<sup>1</sup>Total live Chinook not recorded. Minimum fish, as per count of individual fish on redds on redd datasheets.

Salmon River (Live) Steelhead Observation

Reach	Date													
	Oct-22	Oct-25	Oct-29	Nov-01	Nov-05	Nov-08	Nov-12	Nov-15	Nov-19	Nov-22	Nov-26	Nov-29	Dec-03	Dec-06
<i>Mainstem</i>														
4A - Otter Bar to Nordheimer Ck	0		1	nd	0	214	0	1	0	0	---	---	0	
4B - Forks to Otter Bar	0	0	0	0	0	126	62	176	0	0			0	nd
<i>North Fork</i>														
9A - Mile 2 to Forks	0	0	0	1	0		1	0	31	0	Trib Surveys	Holiday	0	
9B - Mile 4 to Mile 2	0	nd	0		0		0	0	0	0			0	
10A - Mile 6 to Mile 4	0	0	0		0		0	0					0	
10B - Mile 8 to Mile 6	0	0	0		0			0					0	
11A - Mile 10 to Mile 8			0			20							0	
11B - Mile 12 to Mile 10													0	
<i>South Fork</i>														
5A - Henry Bell to Forks	0	2	4	0	0	2	63	0		0	-----	-----		
5B - O'Farrell Gulch to Henry Bell	0	0	0	0	0	0	0	0	0	31			0	
6A - Indian Ck to O'Farrell Gulch	0	nd	0	1	29	2	0		0	0				0
6B - Matthews Ck to Indian Ck		0	0		0	0		1	0	7			0	-

\*nd = no data (surveys performed, but datasheets or data missing)

Scott River Redds

Reach	Date																		
	Oct-17	Oct-21	Oct-24	Oct-28	Oct-31	Nov-04	Nov-07	Nov-11	Nov-14	Nov-18	Nov-21	Nov-25	Nov-28	Dec-02	Dec-05	Dec-16	Dec-23		
R1 - Midpoint to Confluence	63	40	7	4	5	3	0	0	22	2	0	0	Holiday	0	0	0			
R2 - "Cabin Hole" to Midpoint	12	4	1	3	22	2	7	0	17	0	3	0			0				
R3 - George Allen to "Cabin Hole"	36	7	19	3	16	0	4	Holiday	0	0	0	1			0	0	0		
R4 - Townsend Gulch to George Allen	13	6	24	17	3	9	5			10	0	7		0		1	0	0	
R5 - Bridge Flat to Townsend Gulch	4	14	2	15	8	6	0			5	4	0		3			0	0	
R6 - CDFG Weir to Bridge Flat	10	8	20	8	8	5	4			0	13	0		0		2		0	
R7 - USGS Gauge to CDFG Weir			21		11											4		0	
R8 - Blw Meamber Bridge to USGS Gauge		95	99	33	10	4	94 <sup>1</sup>			0	0	29		6		0	0	0	0
R12 - Sweezy to Eller Lane	3	26	0		21														
R13 - Horn Lane to Sweezy	18		0		34														
R14 - Youngs Dam to Horn Lane	12	20	29	38	30	49	67		52	55	59	48		56					
R15 - Fay Lane to Youngs Dam	1	1	1	3	2	2	4		5	12	13	21		26					
R16 - Top of Barnes to Fay Lane																			

<sup>1</sup>Redd count from Reach 8 on 11/7 not included in final count. Several irregularities are associated with this survey, including unusually high number of "new" redds when counts for the reach were declining, as well as a note by the crew that the redds looked like they should have been old enough to have been captured in prior surveys. The conclusion is that flagging may have been vandalized and/or lost to wildlife, and most redds were likely captured earlier in the survey season. The number of actual new redds that were not captured was likely minimal.

\*Note: surveys included unflagged sections of Reach 2 and Reach 3; and redd counts from these locations are not included in the above table. The Reach 2 maximum number of unflagged redds was 17; and the maximum number for Reach 3 was 30. These redd counts are also not included in the final number of redds reported in this document.

*Scott River Tributary Surveys*

<b>Tributary</b>	<b>Date</b>	<b>Redds</b>	<b>Chinook</b>	<b>Steelhead</b>
Canyon Creek	Nov-14	0	0	0
	Nov-21	0	0	0
	Nov-27	0	0	0
	Dec-02	0	0	0
	Dec-19	0	0	0
	Dec-30	0	0	0
Kelsey Creek	Nov-14	0	0	0
	Nov-21	0	0	0
	Nov-27	0	0	0
	Dec-02	0	0	0
	Dec-19	0	0	0
	Dec-30	0	0	0
Tompkins Creek	Dec-03	0	0	0

\*Note: Coho (redds and/or live) were recorded in both Canyon Creek and Kelsey Creek. Additionally, a potential lamprey redd was observed in Kelsey Creek. Unusually low water conditions and lack of fall freshets October to December may have impeded Chinook in entering Canyon, Kelsey, and Tompkins Creeks, as one or more of these creeks normally experience some Chinook activity.

Scott River (Live) Chinook Observations

Reach	Date																
	Oct-17	Oct-21	Oct-24	Oct-28	Oct-31	Nov-04	Nov-07	Nov-11	Nov-14	Nov-18	Nov-21	Nov-25	Nov-28	Dec-02	Dec-05	Dec-16	Dec-23
R1 - Midpoint to Confluence	312	284	182	355	112	335	242	273	399	266	4	35	Holiday	23	1	0	
R2 - "Cabin Hole" to Midpoint	18	27	16	27	111	8	68	4	32	1	9	0			0		
R3 - George Allen to "Cabin Hole"	78	334	181	57	135	40	42	Holiday	274	11	8	13		0	3	0	
R4 - Townsend Gulch to George Allen	20	68	79	98	83	62	45		78	28	38	10		26	4	0	
R5 - Bridge Flat to Townsend Gulch	27	63	38	48	51	74	36		nd	59	63	82			0	0	
R6 - CDFG Weir to Bridge Flat	90	72	77	74	76	60	109		52	15	30	15		121		0	
R7 - USGS Gauge to CDFG Weir			57		84									5		0	
R8 - Blw Meamber Bridge to USGS Gauge		115	296	183	149	288	279		134	77	147	31		26	6	6	0
R12 - Sweezy to Eller Lane	28	47	0		32												
R13 - Horn Lane to Sweezy			36		44												
R14 - Youngs Dam to Horn Lane	27	59	72	89	78	109	95		65	43	22	24		16			
R15 - Fay Lane to Youngs Dam	3	3	9	12	12	10	13		43	26	26	20		4			
R16 - Top of Barnes to Fay Lane																	

\*nd = no data (surveys performed, but Chinook count not reported)

\*Highlighted dates very likely include mixed schools of Chinook and Coho, but reported as pure Chinook. Use counts with extreme caution. See text for further details.

Scott River (Live) Steelhead Observations

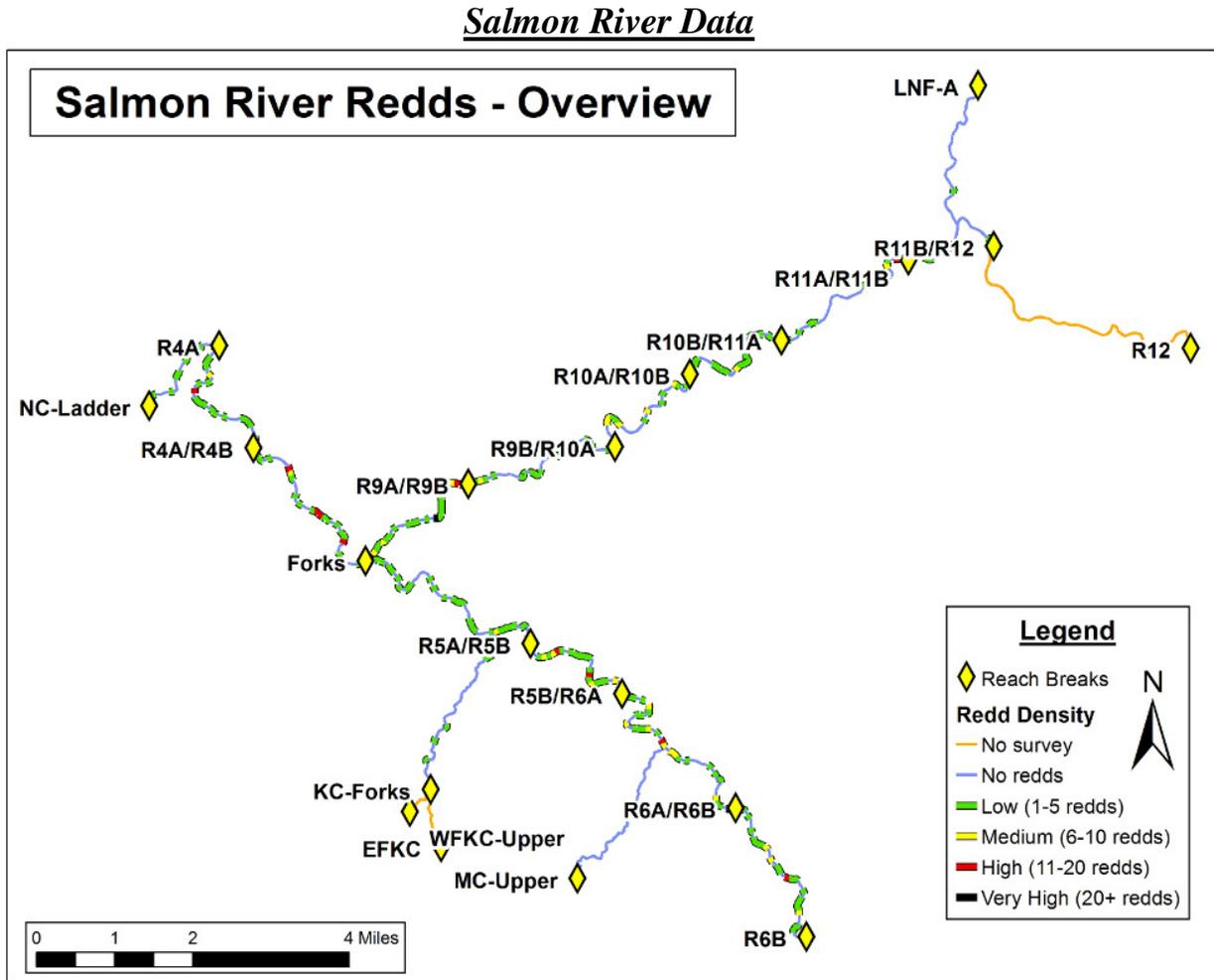
Reach	Date																		
	Oct-17	Oct-21	Oct-24	Oct-28	Oct-31	Nov-04	Nov-07	Nov-11	Nov-14	Nov-18	Nov-21	Nov-25	Nov-28	Dec-02	Dec-05	Dec-16	Dec-23		
R1 - Midpoint to Confluence	0	0	0	0	nd	0	0	nd	0	0	nd	0	Holiday	0	nd	nd			
R2 - "Cabin Hole" to Midpoint	0	0	0	0	0	nd	0	0	0	0	0	0			nd				
R3 - George Allen to "Cabin Hole"	0	50	0	0	0	nd	0	Holiday	45	0	0	0			0	nd	nd		
R4 - Townsend Gulch to George Allen	0	0	0	nd	0	0	0			0	0	0		0		0	nd	nd	
R5 - Bridge Flat to Townsend Gulch	0	0	0	0	0	0	0			nd	0	0		4			nd	0	
R6 - CDFG Weir to Bridge Flat	0	0	0	0	0	0	0			nd	0	nd		0		0		0	
R7 - USGS Gauge to CDFG Weir			0		0											0		nd	
R8 - Blw Meamber Bridge to USGS Gauge		0	nd	0	0	0	0			nd	nd	0		0		nd	nd	nd	nd
R12 - Sweezy to Eller Lane	1	1	0		0														
R13 - Horn Lane to Sweezy			0		0														
R14 - Youngs Dam to Horn Lane	0	0	0	0	0	0	0		0	0	0	0		0					
R15 - Fay Lane to Youngs Dam	0	0	0	0	0	0	0		0	0	0	0		0					
R16 - Top of Barnes to Fay Lane																			

\*nd = no data (surveys performed, but steelhead count not reported)

\*Highlighted date very likely include schools of mixed fish species due to presence of Coho, but reported as pure steelhead. Use counts with extreme caution. See text for further details.

## Appendix D – Redd Spatial Distribution and Density

Redd density on maps is displayed as number of redds observed per approximate 100 meter of survey. Where tributaries were surveyed, only those which recorded redds are included in this appendix.



**Figure D-SA1.** General overview of redd distribution and density for Salmon River surveys. Map is of survey area only and does not include roads, hillslopes, or other landmarks.

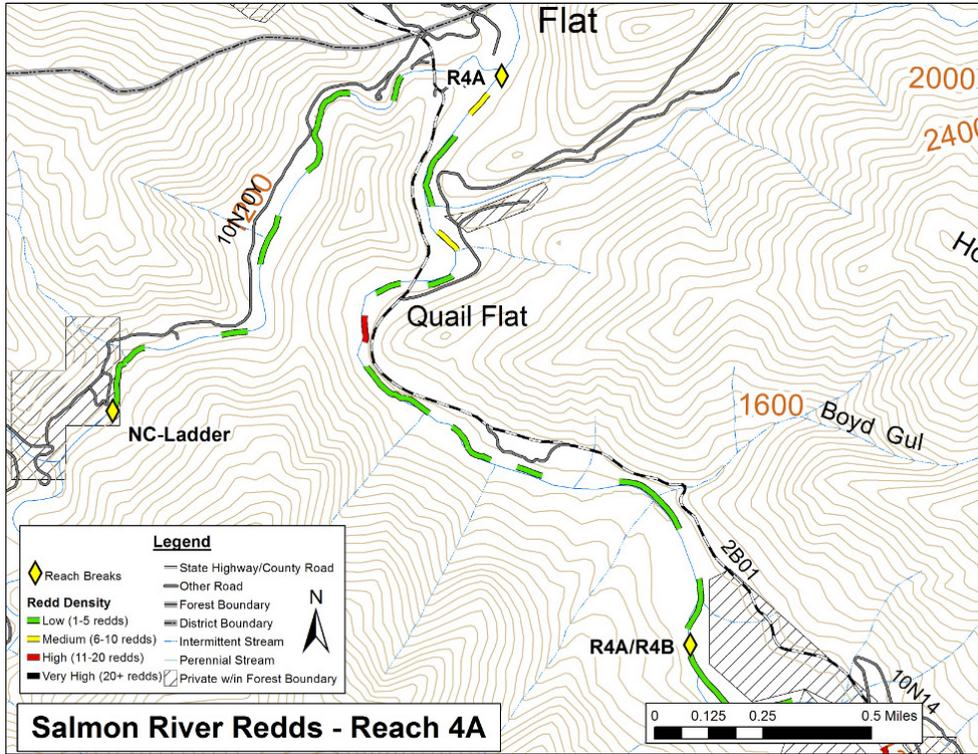


Figure D-SA2. Redd distribution and density for mainstem Salmon River, Reach 4A.

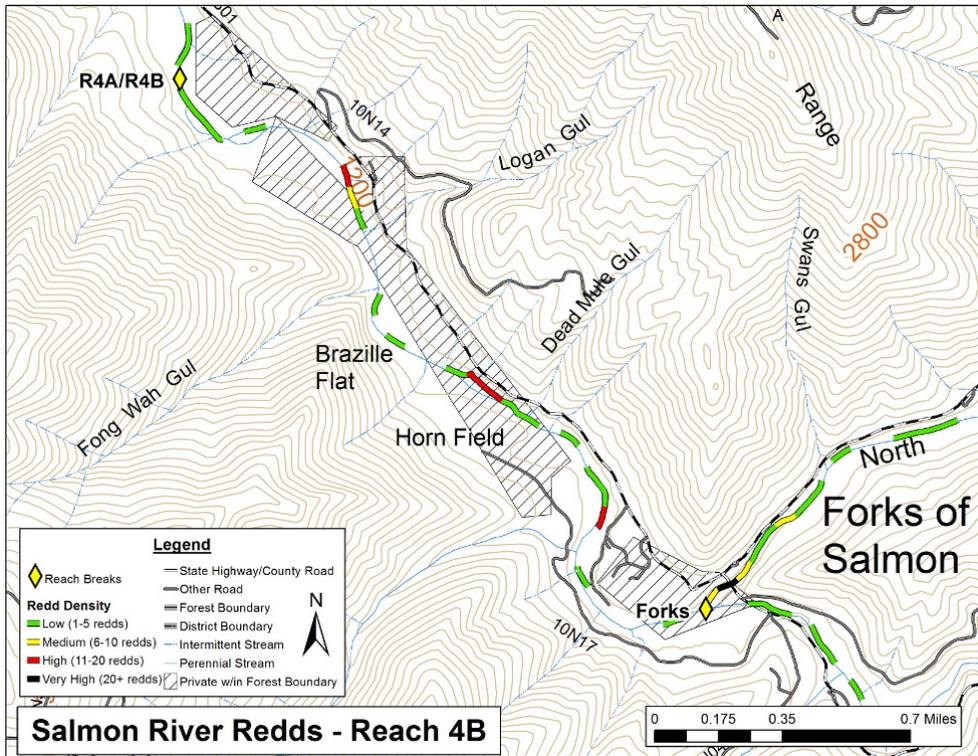


Figure D-SA3. Redd distribution and density for mainstem Salmon River, Reach 4B.

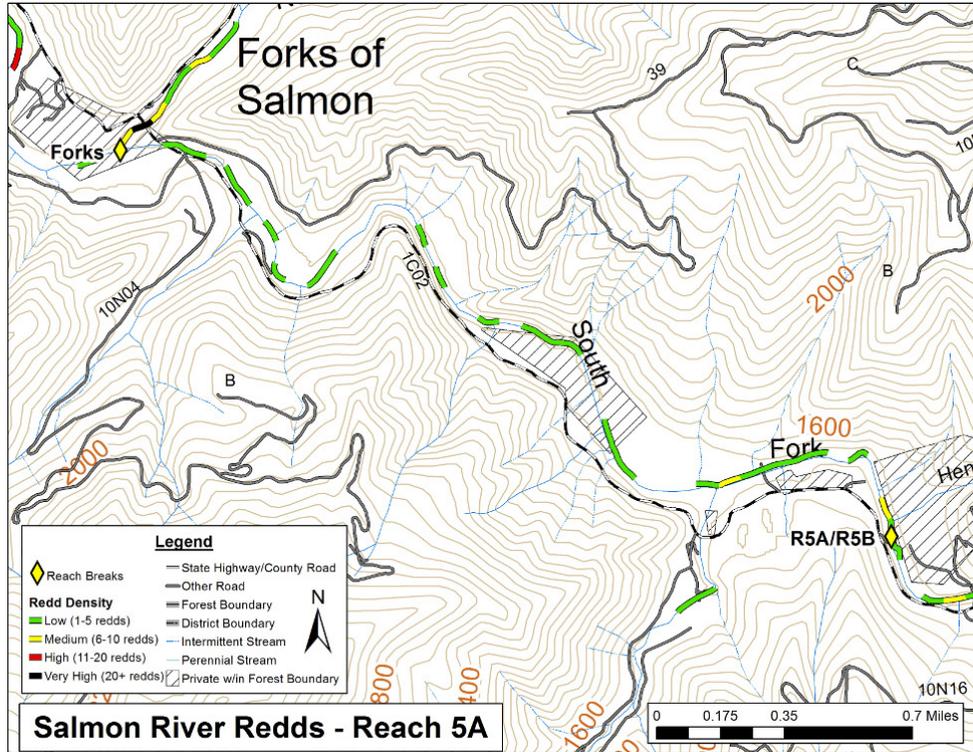


Figure D-SA4. Redd distribution and density for SF Salmon River, Reach 5A.

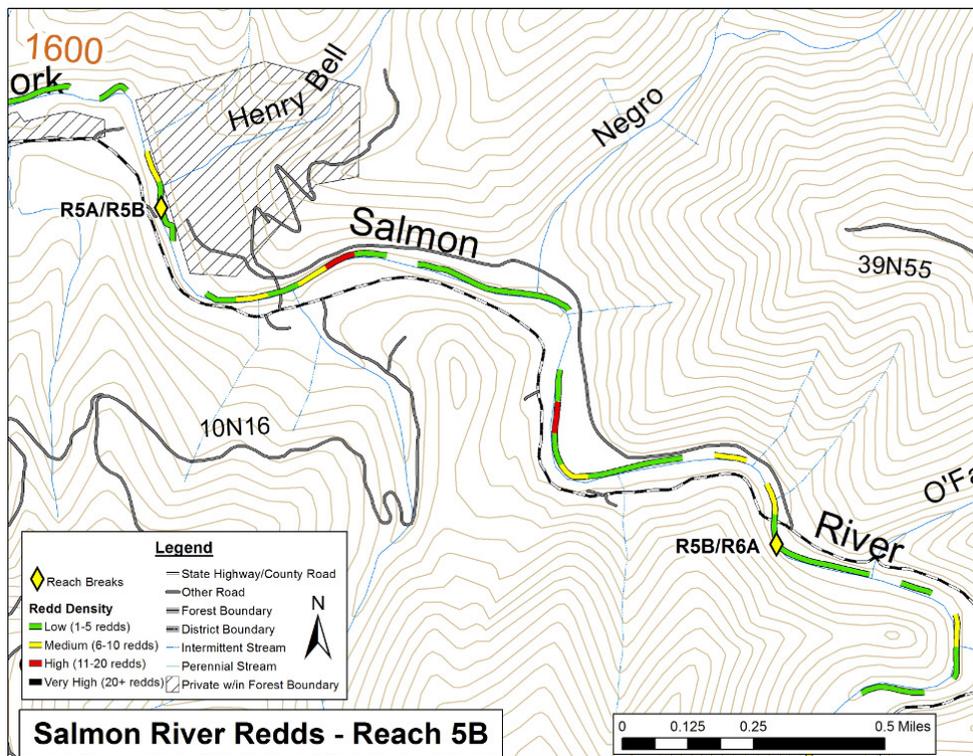


Figure D-SA5. Redd distribution and density for SF Salmon River, Reach 5B.

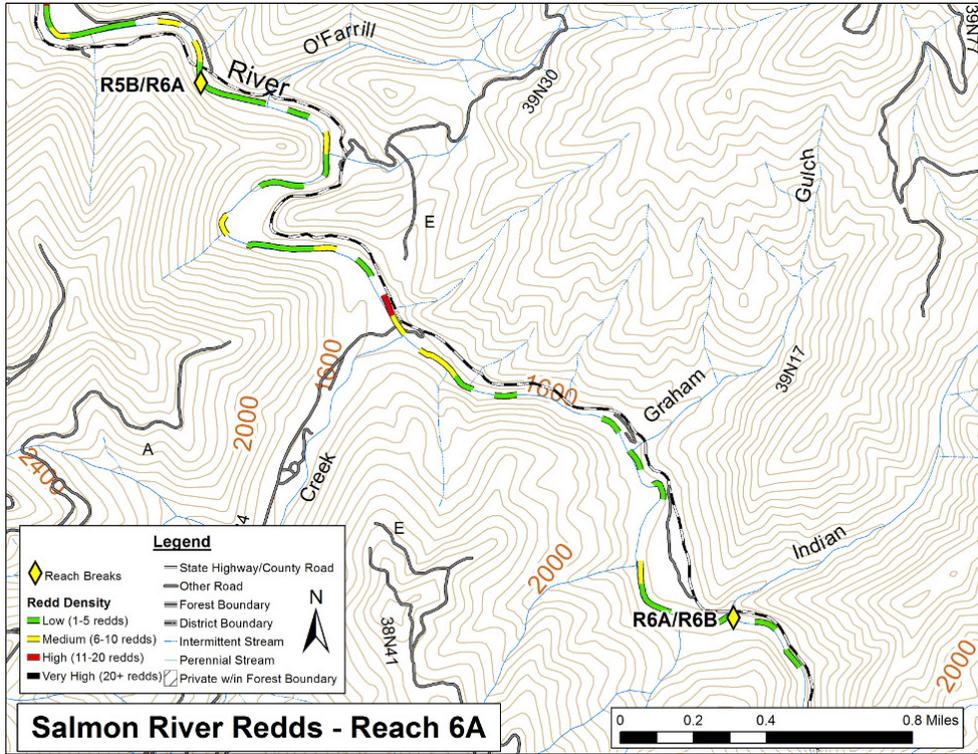


Figure D-SA6. Redd distribution and density for SF Salmon River, Reach 6A.

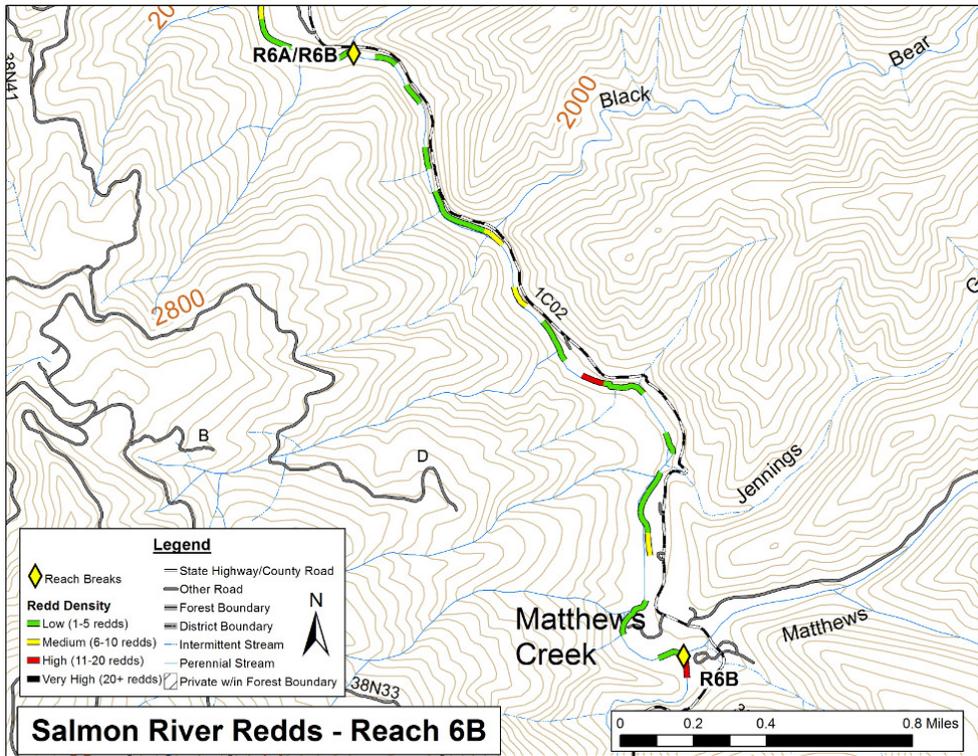


Figure D-SA7. Redd distribution and density for SF Salmon River, Reach 6B.

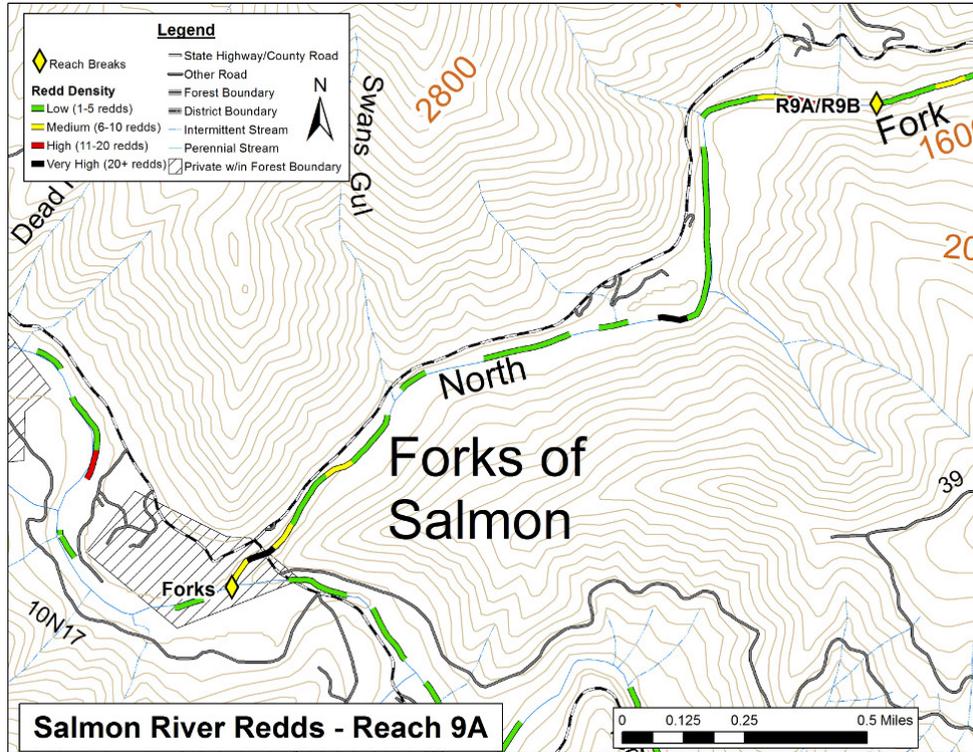


Figure D-SA8. Redd distribution and density for NF Salmon River, Reach 9A.

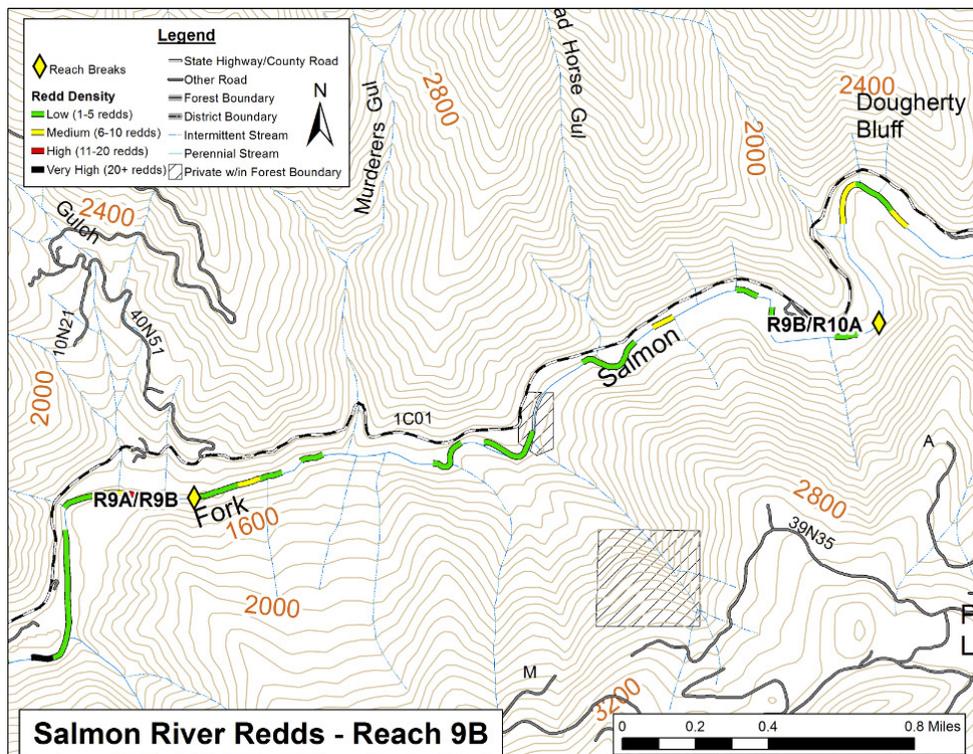


Figure D-SA9. Redd distribution and density for NF Salmon River, Reach 9B.

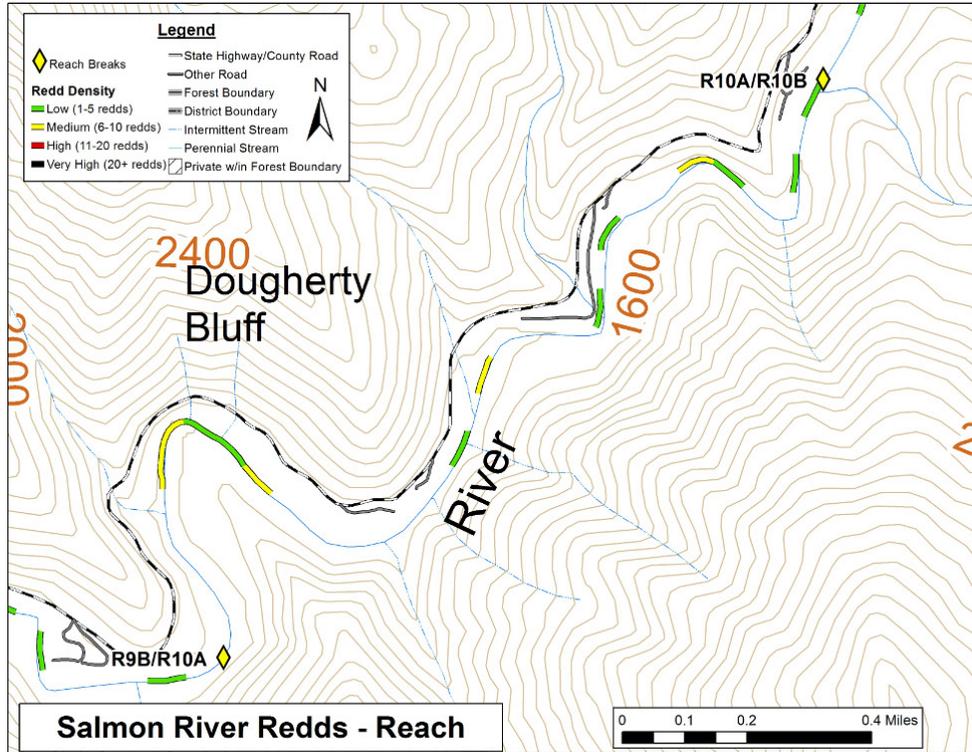


Figure D-SA10. Redd distribution and density for NF Salmon River, Reach 10A.

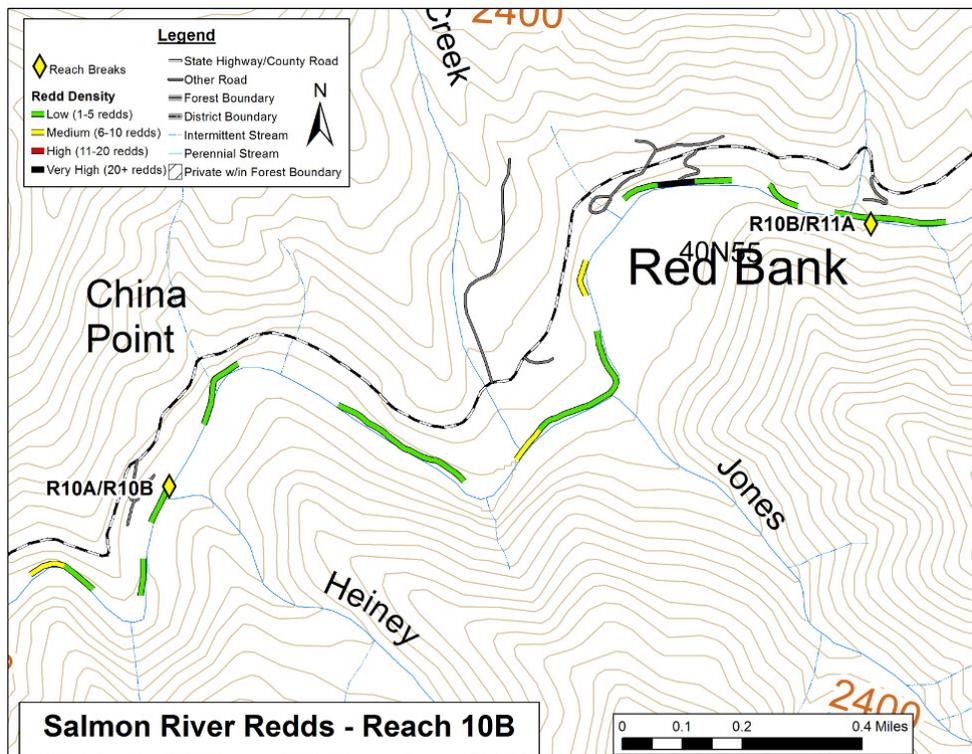


Figure D-SA11. Redd distribution and density for NF Salmon River, Reach 10B.

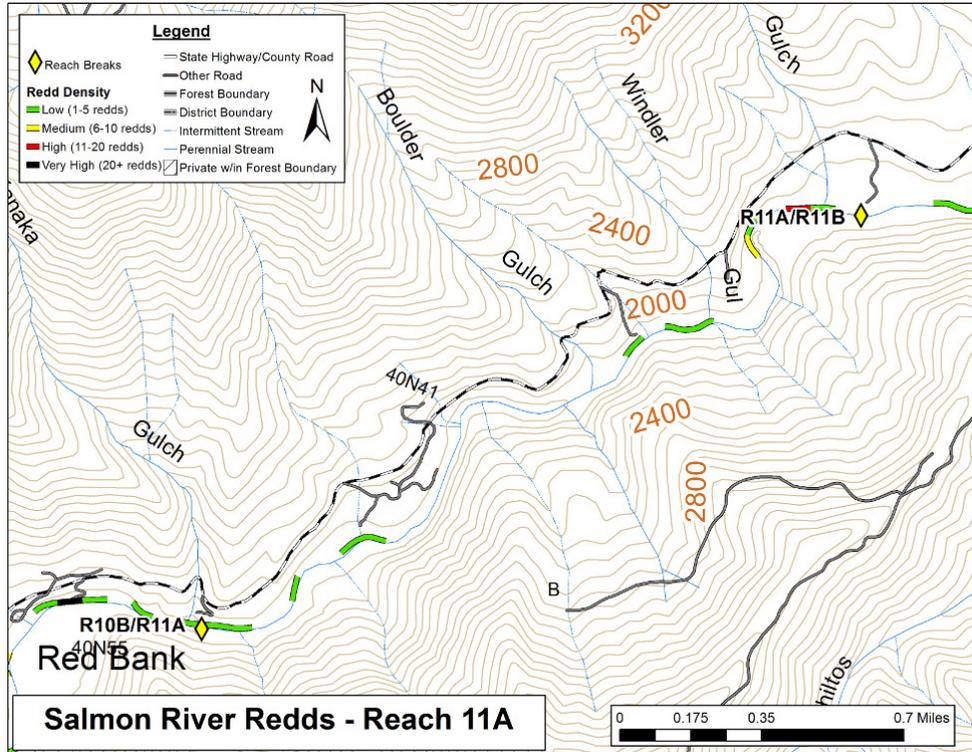


Figure D-SA12. Redd distribution and density for NF Salmon River, Reach 11A.

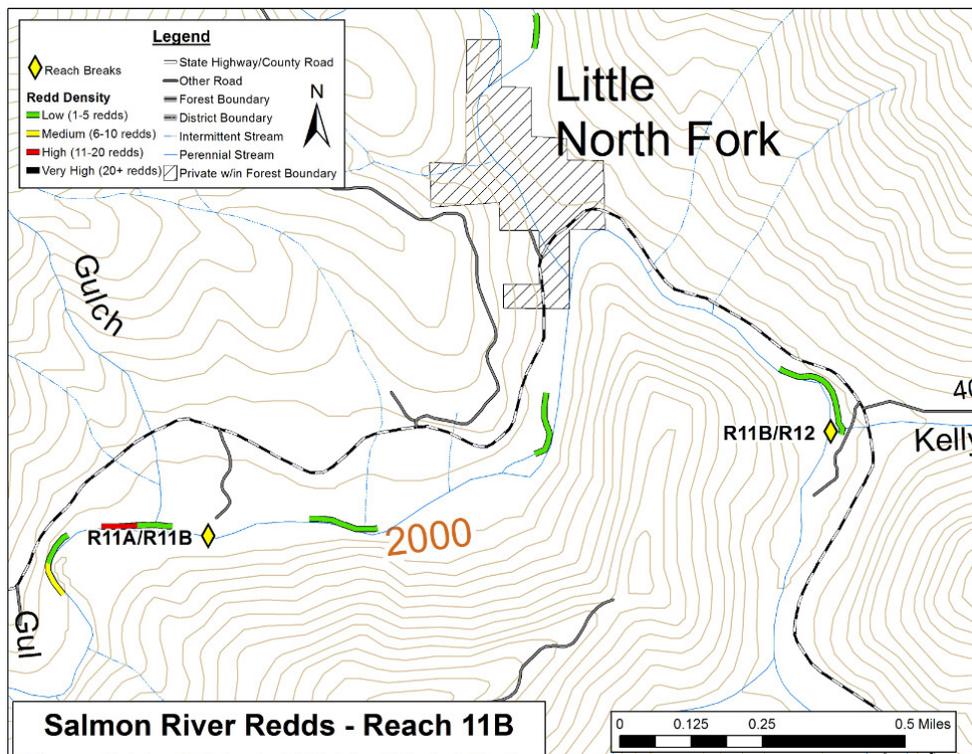


Figure D-SA13. Redd distribution and density for NF Salmon River, Reach 11B

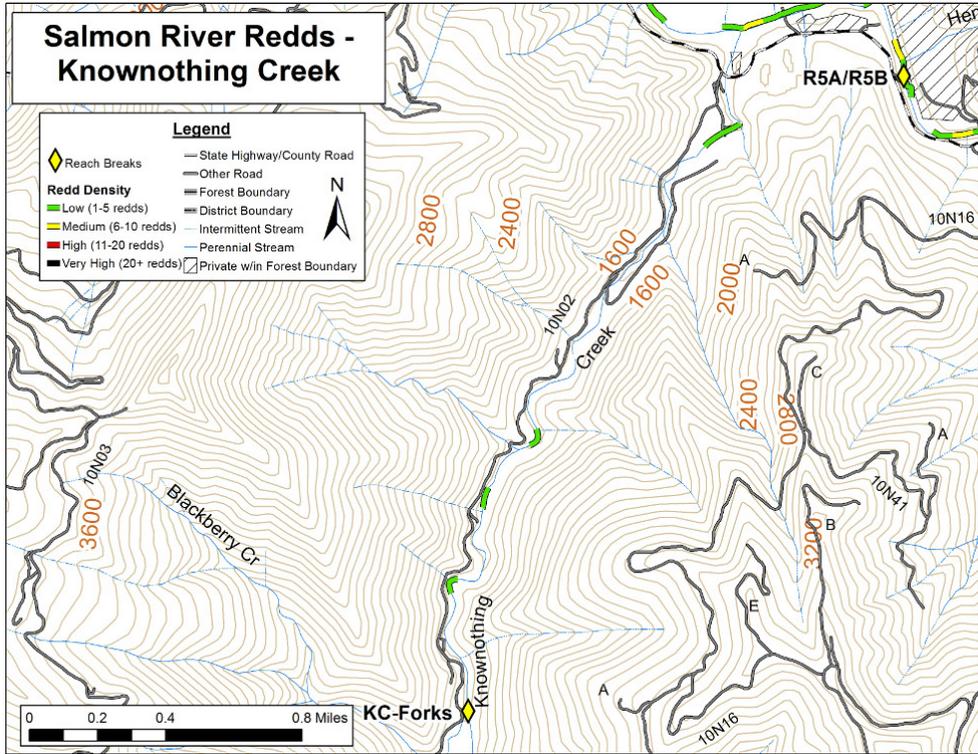


Figure D-SA14. Redd distribution and density for Knownothing Creek.

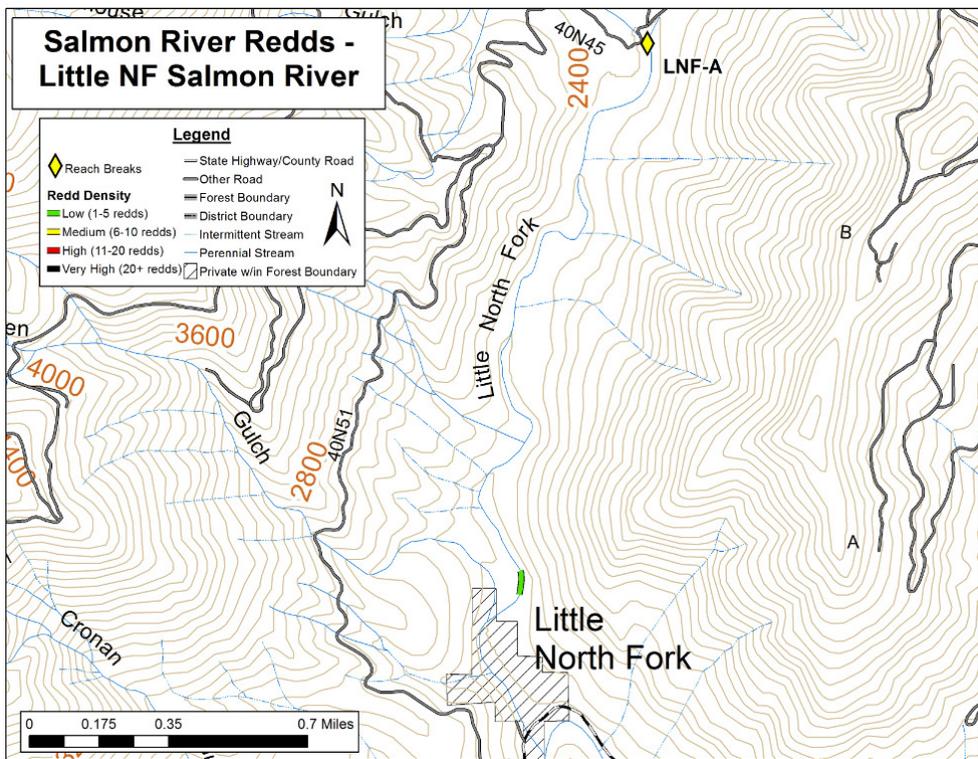


Figure D-SA15. Redd distribution and density for Little North Fork Salmon River.

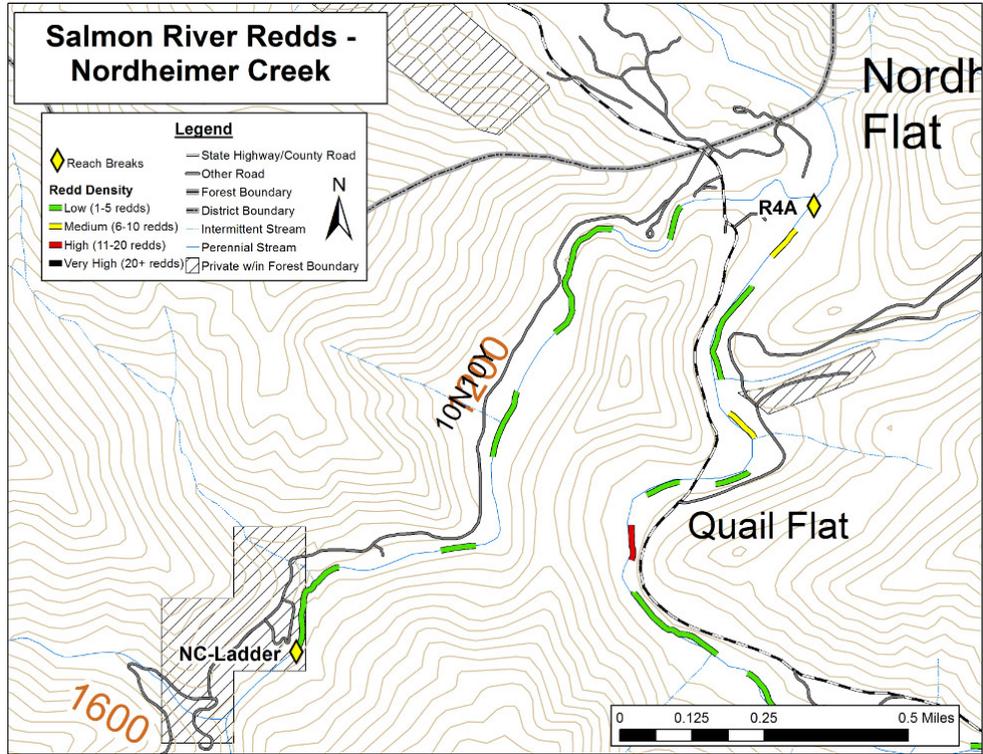
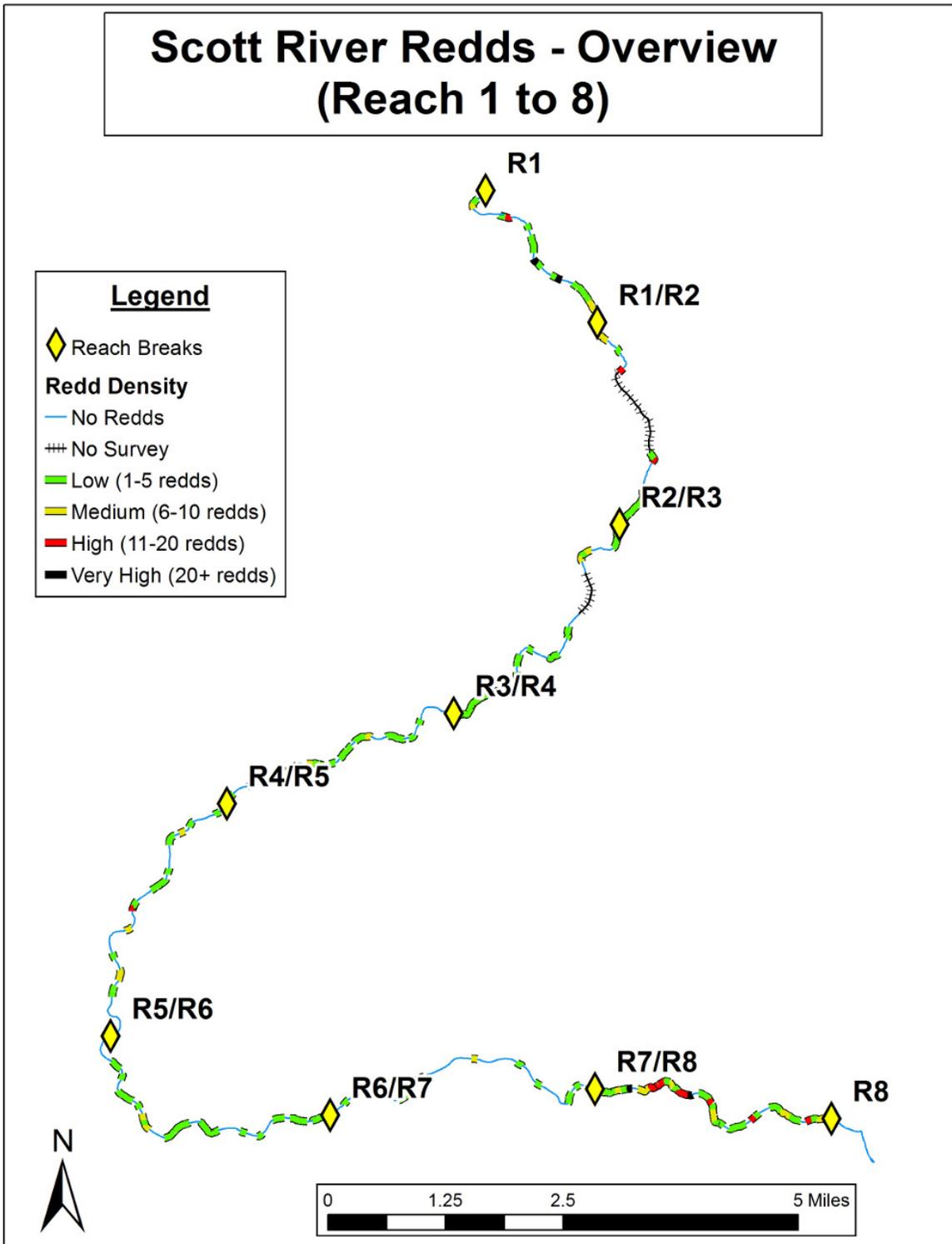


Figure D-SA16. Redd distribution and density for Nordheimer Creek.

Scott River Data



**Figure D-SC1.** General overview of redd distribution and density for Scott River surveys, Reach 1 through Reach 8. Map is of survey area only and does not include roads, hillslopes, or other landmarks.

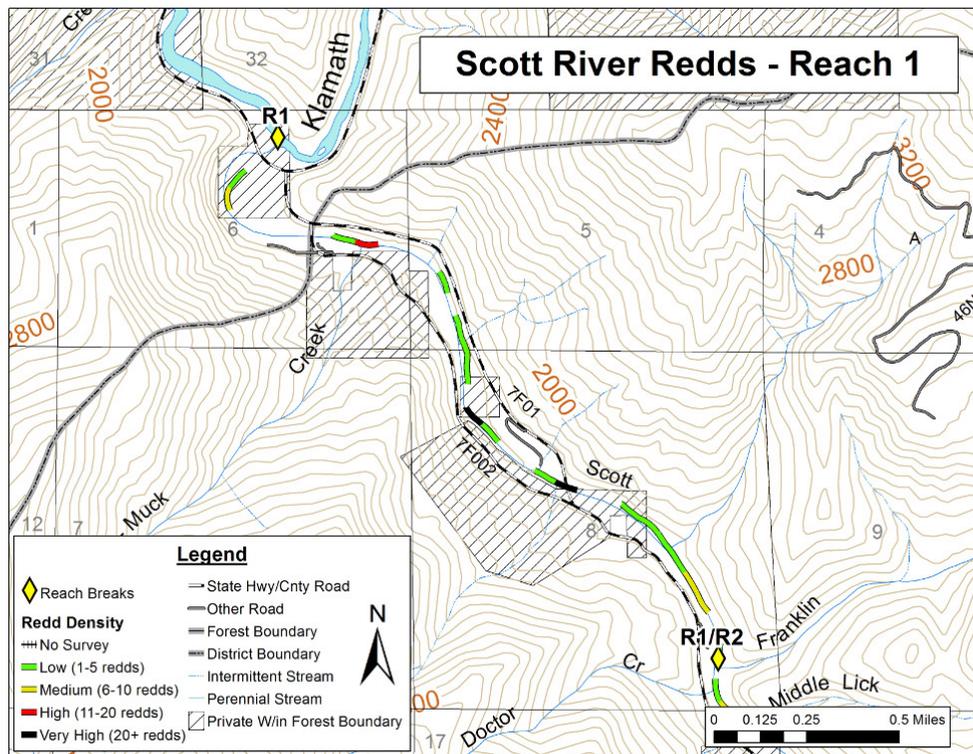


Figure D-SC2. Redd distribution and density for Scott River, Reach 1.

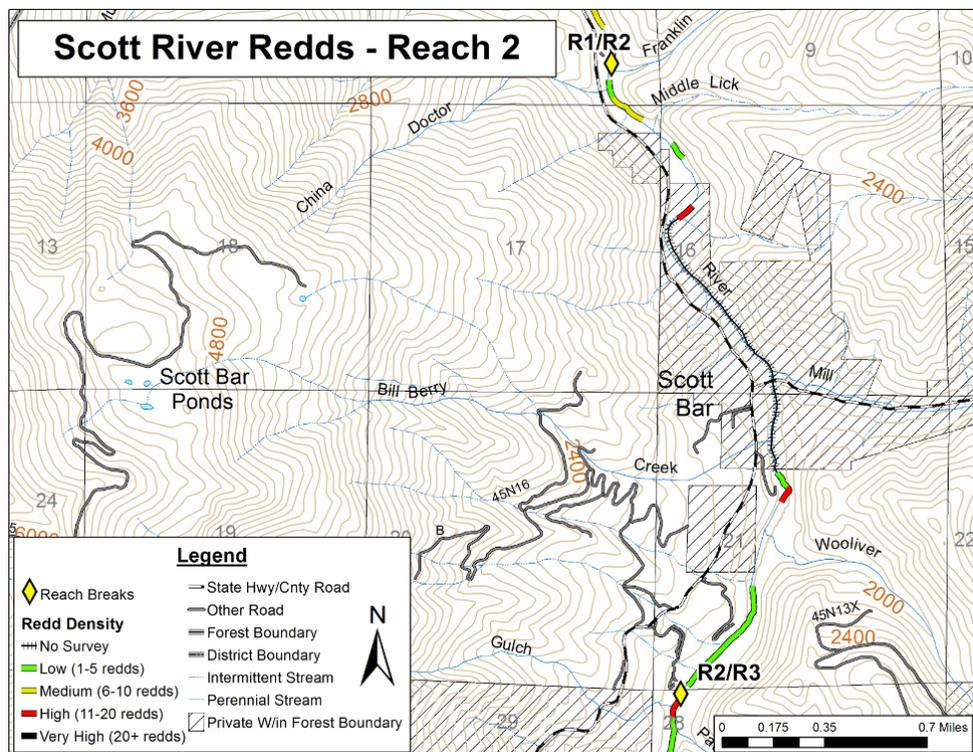


Figure D-SC3. Redd distribution and density for Scott River, Reach 2.

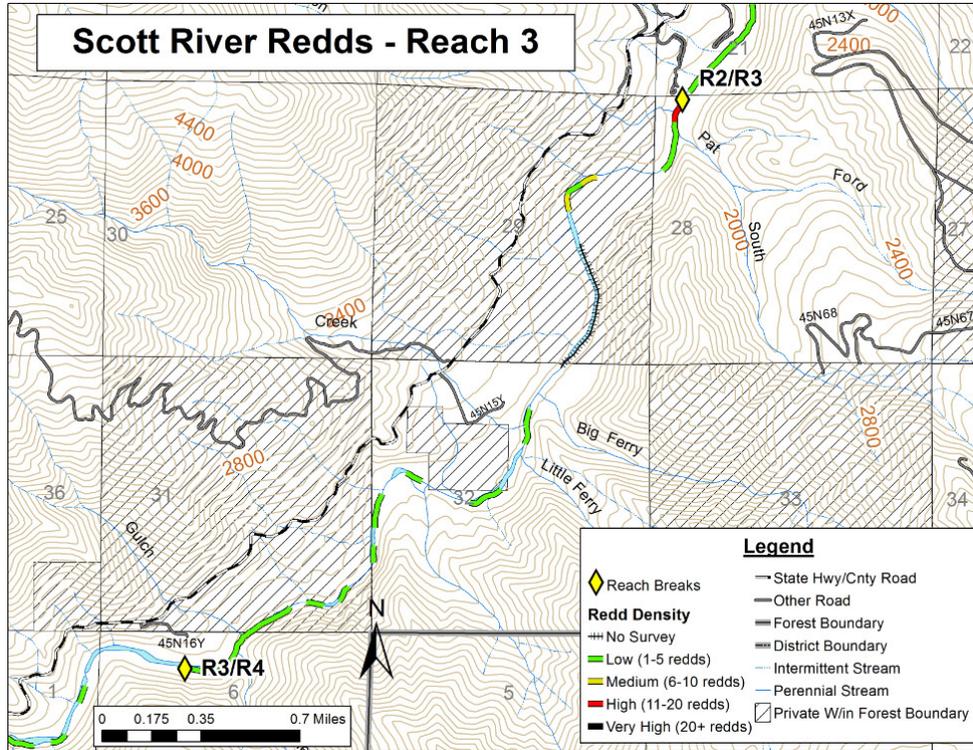


Figure D-SC4. Redd distribution and density for Scott River, Reach 3.

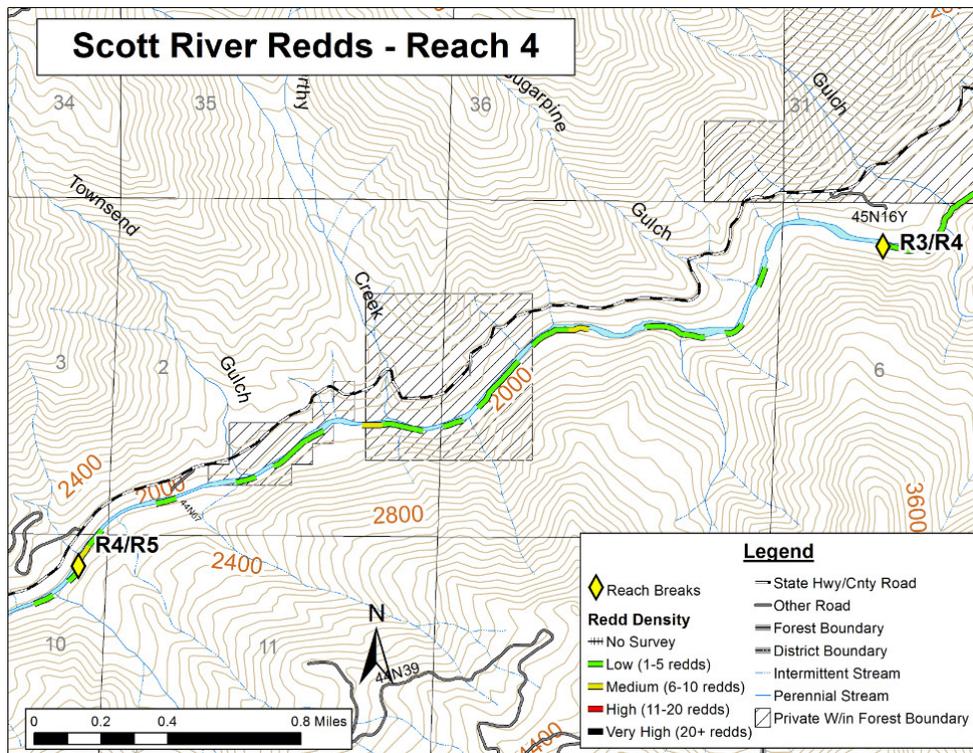


Figure D-SC5. Redd distribution and density for Scott River, Reach 4.



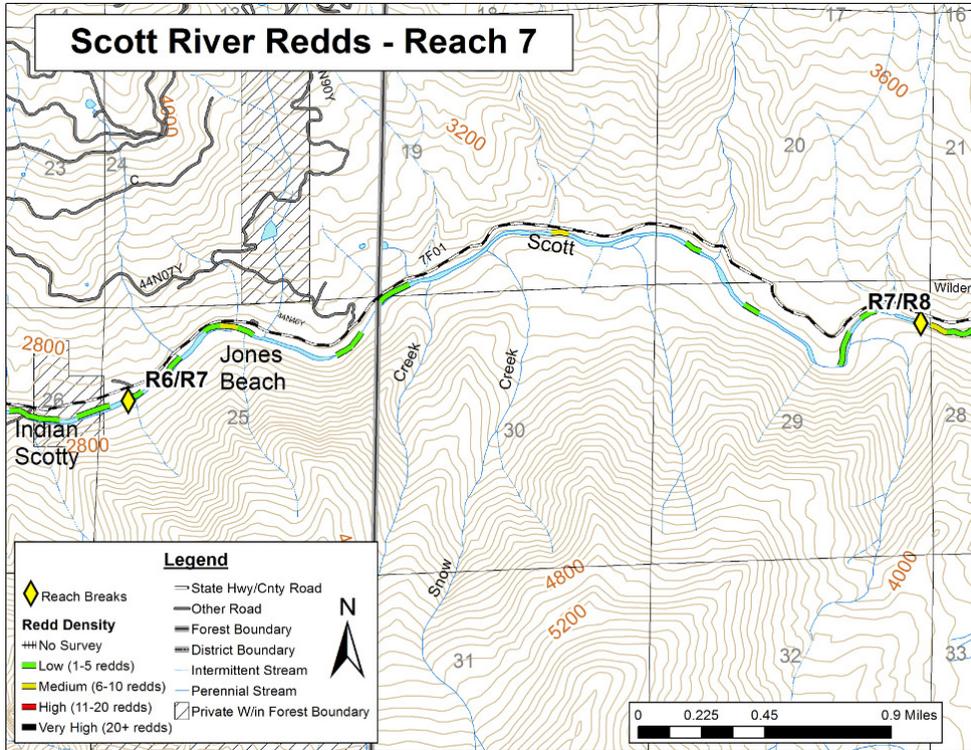


Figure D-SC8. Redd distribution and density for Scott River, Reach 7.

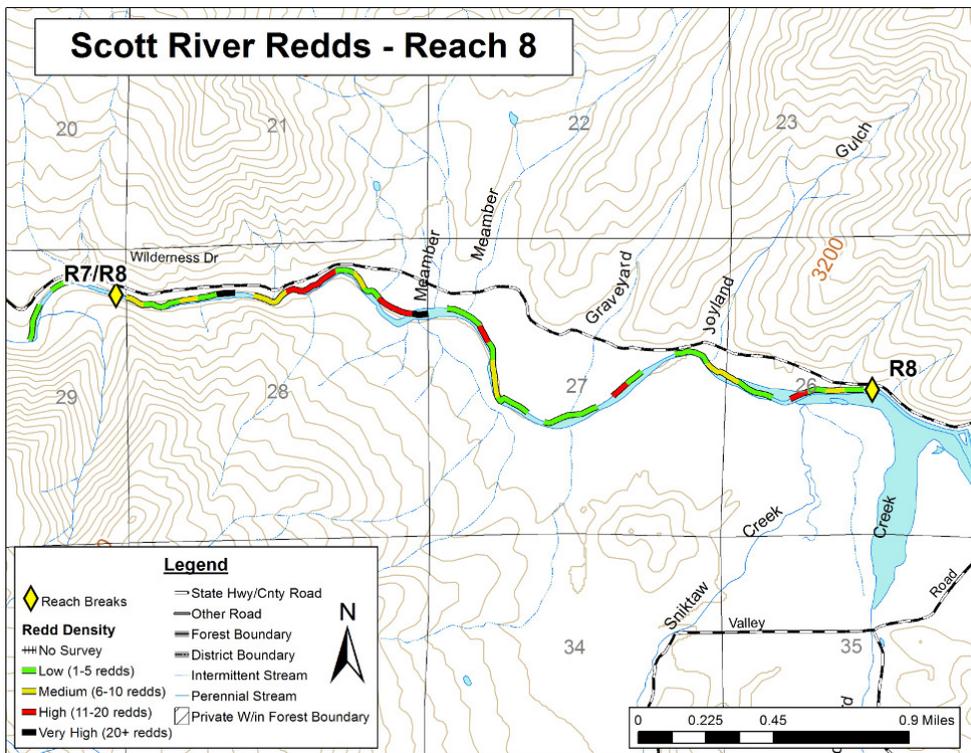


Figure D-SC9. Redd distribution and density for Scott River, Reach 8.

## **Appendix E – List of Cooperators and Contributions**

### *Federal*

Bureau of Reclamation

U.S. Forest Service

- Klamath National Forest
- Six Rivers National Forest

### *State*

California Department of Fish and Wildlife

- Arcata Office
- Yreka Office

### *Tribal*

Karuk Tribe

Yurok Tribe

Quartz Valley Indian Reservation

### *Other*

Local volunteers

Junction School District

Mid-Klamath Watershed Council

Northern California Resource Center

Salmon River Restoration Council

Scott Valley Resource Conservation District