2011 Fall Chinook Salmon Spawning Ground Survey

Salmon-Scott Rivers Ranger District
Klamath National Forest

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ABSTRACT

Cooperative spawning ground surveys between the U.S. Forest Service, California Department of Fish and Game, 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 2011 cooperative survey began October 10th and ended December 1st, although effort continued on the Scott River by California Department Fish and Game for several additional weeks. All scheduled surveys were completed on the Scott River. In the Salmon River, overall survey effort was very good, although high water from a storm event forced cancellation of the first survey of the year and elevated flows at the end of November limited access. Surveys in both drainages also included drainages and upper elevation reaches not regularly visited.

Approximately 5,493 fish returned to the Salmon River and 5,515 fish returned to the Scott River. Run estimates, made by California Department of Fish and Game, 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 2011 returns appear to be above average [2nd highest] for the Salmon River, and about average for the Scott River.

INTRODUCTION

Since 1978, the California Department of Fish and Game (CDFG) 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 CDFG, 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 CDFG 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 CDFG estimates by enabling surveys that are more extensive and frequent in nature.

In fall 2011, 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**). Occasionally, discharge conditions were unsafe on the Salmon River (mainstem/forks) for surveys, else snow prevented access by the KNF crew over Etna Pass. During those times, KNF crews were diverted to survey tributaries or performed additional reach surveys upon the Scott River. This report summarizes redd count surveys conducted from October 10th through December 1st 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 will be covered in the KNF-wide compilation of spawning survey activities (which will also include the mainstem Klamath River and its tributaries).

A separate report is prepared by CDFG biologists for the escapement estimates to be used by the fisheries management councils. The most recent draft of the 2011 MegaTable has been included in **Appendix A** (CDFG 2012).

Table 1. The 2011 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-10 (ns - holiday)	Oct-11 (Salmon tribs)		Oct-13	Oct-14
2	Oct-17	Oct-18		Oct-20	Oct-21
3	Oct-24	Oct-25		Oct-27	Oct-28
4	Oct-31	Nov-01		Nov-03	Nov-04
5	Nov-07	Nov-08		Nov-10	Nov-11 (ns - holiday)
6	Nov-14	Nov-15		Nov-17	Nov-18 (extra Scott R reaches)
7	Nov-21	Nov-22 (Scott tribs)		Nov-24 (ns - holiday)	Nov-25 (ns - holiday)
8	Nov-28	Nov-29		Dec-01	

*ns - no survey

METHODS

In 2011, redd surveys were conducted on the Salmon River and Scott River, as well as various tributaries. **Table 2** summarizes each reach for 2011, 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 twice weekly from mile marker 6 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 16 to mile marker 6.
    - Tributaries surveyed included Indian Creek, Knownothing Creek (including West Fork and East Fork), Little North Fork Salmon River, Methodist Creek, Nordheimer Creek, Plummer Creek, and St. Claire Creek.
- Scott River was surveyed from 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 upper South Fork Scott River and its Boulder Creek tributary.

The USFS and CDFG held two training sessions for agency employees, Tribal employees, and volunteers. On October 3rd, the redd survey/carcass mark-recapture training was held at Indian Scotty Group campground on the Scott River. Similar training was held at Oak Bottom River Access on the mainstem Salmon River on September 26th. Topics discussed at the trainings

comprised redd and fish identification; carcass marking, including the explanation of Petersen mark-recapture estimates; scale, tissue, and otolith sampling; data collection; salmonid life cycles; and survey safety procedures. An expanded swift-water training and safety session was held on October 7th at Indian Scotty campground.

Table 2. Fall Chinook spawning survey reach descriptions for Salmon River and Scott Rivers in 2011. Salmon River reaches surveyed by Six Rivers National Forest not included.

Stream Name	Reach Name	Reach Number	Miles	Number of Times Surveyed[1]	Total Number of Redds Surveyed…
Salmon River					
Mainstem	Otter Bar to Nordheimer Ck	4A	1.6	9	67
	Forks of Salmon to Otter Bar	4B	2.4	9	111
North Fork	Mile 2 to Forks of Salmon	9A	2.0	11	108
	Mile 4 to Mile 2	9B	2.0	11	82
	Mile 6 to Mile 4	10A	2.0	11	50
	Mile 8 to Mile 6	10B	2.0	4	65
	Mile 10 to Mile 8	11A	2.0	4	54
	Mile 12 to Mile 10	11B	2.0	2	32
	Mile 16 to Mile 12	12	4.0	1	3
South Fork	Henry Bell to Forks of Salmon	5A	3.0	8	118[2]
	O'Farrell Gulch to Henry Bell	5B	2.0	9	126
	Indian Ck to O'Farrell Gulch	6A	3.0	8	102
	Matthews Ck to Indian Ck	6B	2.2	7	69
Tributaries	Indian Creek		1.5	1	0
	Knownothing Creek		2.5	3	12
	EF Knownothing Creek		0.8	1	4
	WF Knownothing Creek		0.4	1	4
	Little NF Salmon River		3.0	1	11
	Methodist Creek		1.3	2	12
	Nordheimer Creek		2.5	1	22
	Plummer Creek		0.4	1	1
	St. Claire Creek		0.5	1	0
Scott River					
	Midpoint to Confluence	1	2.5	15	49
	Trabucco to Midpoint	2	2.5	15	31
	George Allen to Trabucco	3	1.9	15	20
	Tompkins Creek to George Allen	4	2.5	14	25

Stream Name	Reach Name	Reach Number	Miles	Number of Times Surveyed[1]	Total Number of Redds Surveyed…
	Bridge Flat to Tompkins Creek	5	4.0	14	24
	CDFG Weir to Bridge Flat	6	3.8	14	40
	USGS Gauge to CDFG Weir	7	3.5	10	41
	Meamber Bridge to USGS Gauge	8	3.5	16	246
	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	6	16[3]
	Horn Lane to Sweezy	13	3.0	7	50[3]
	Young's Dam to Horn Lane	14	2.0	13	107[3]
	Fay Lane to Young's Dam	15	3.5	12	104[3]
	Top of Barnes to Fay Lane	16	1.0	0	Not surveyed
Tributaries	Boulder Creek (SF Scott River)		1.0	1	0
	SF Scott River		1.3	1	0

[1]Flagging marking redds was removed prior to end of carcass surveys. "Times Surveyed" includes ALL surveys, even those performed end-of-season when redds were no longer counted.
[2]Reach 5A (Henry Bell to Forks of Salmon) is not flagged. Number reported is the maximum number of observed redds (11/1/11).
[3]Reaches 12 through 15 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 (CDFG 2011). A typical crew consisted of two people. Each crew walked two to five 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 were 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 – Reaches 12 through 15

RESULTS

Salmon River

Overall effort on the Salmon River was good, with the exception of an early season storm causing the cancellation of the first survey on October 11th (for mainstem/forks; Forest Service crews did complete tributary surveys). Elevated flows at the end of November affected effort, restricting which reaches could be safely entered as a function of availability of specialized equipment (e.g., dry suits) and personnel experienced with high water conditions, but no days were called off (**Appendix B**).

The Salmon River probably reached peak spawning in early- to mid-October, although specific dates can not be determined because by October 14th, spawning activity was already well begun (**Figure 1**). Surveyors participating in the spring Chinook spawning survey (September to early-October) observed a large number of new fish moving into the middle reaches of both North Fork and South Fork – locales correspond with the downstream-most sample area for spring Chinook – at the end of September; and shortly thereafter, an increase in redds began to be reported on datasheets. It is highly likely these fresh fish were fall Chinook, and the uptick in redds represents a spatial and temporal overlap of the two runs. Potential fall Chinook fish/redds were not separated from the spring Chinook dataset. Overall survey effort was affected by amount of surveyors available, weather, and flows. See **Appendix C** for a table of redd numbers organized by reach and date.

The sustained higher-than-average Salmon River system discharge appears to have affected timing of fall Chinook, as well as where they were found. An early-October storm which resulted in a pulse of high water may have also stimulated movement and spawning. Compared to previous years, peak fall Chinook spawning was advanced several weeks and fish were observed higher in the watershed. There is normally a more distinct separation in timing and location between the spring and fall runs. Additionally, redds and/or fish were observed at greater numbers in tributaries than is considered typical, as well as were traveling further upstream into these smaller systems.

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 to show the highest redd density. Reaches with more than 100 redds include 4A (mainstem); 5A, 5B, and 6A (SF Salmon); and 9A (NF Salmon). In general, spawning activity decreases the further the North Fork and South Fork are progressed upstream. Tributary use was more dispersed than that found in the mainstem or forks, with only one or two redds found at any single locale. See **Appendix D** for redd spatial distribution and density information.

Using survey data, the Salmon River is estimated to have had about 5,493 fall run Chinook salmon return in the fall of 2011 (**Figure 2**; **Appendix A**). Draft MegaTable results indicate 2011 was above average, ranking 2nd for run size.

Figure 1. Fall Chinook redds observed and survey effort on the Salmon River in 2011. Surveys occurred (maximum 13 reaches available) on NF Salmon River from Mile 16 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.

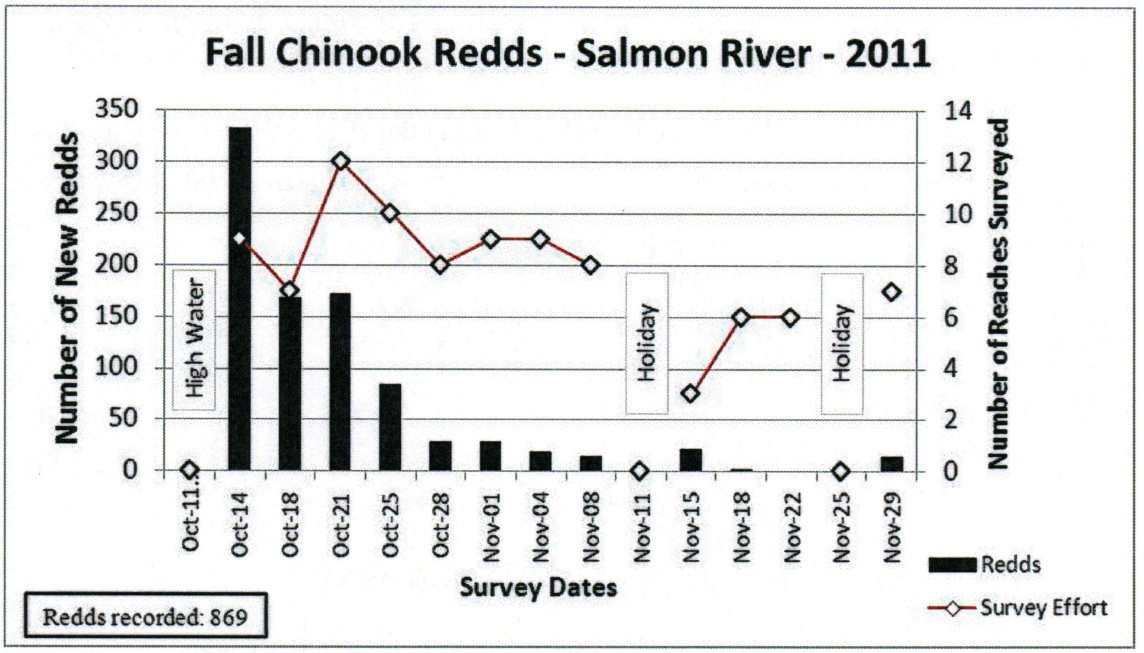
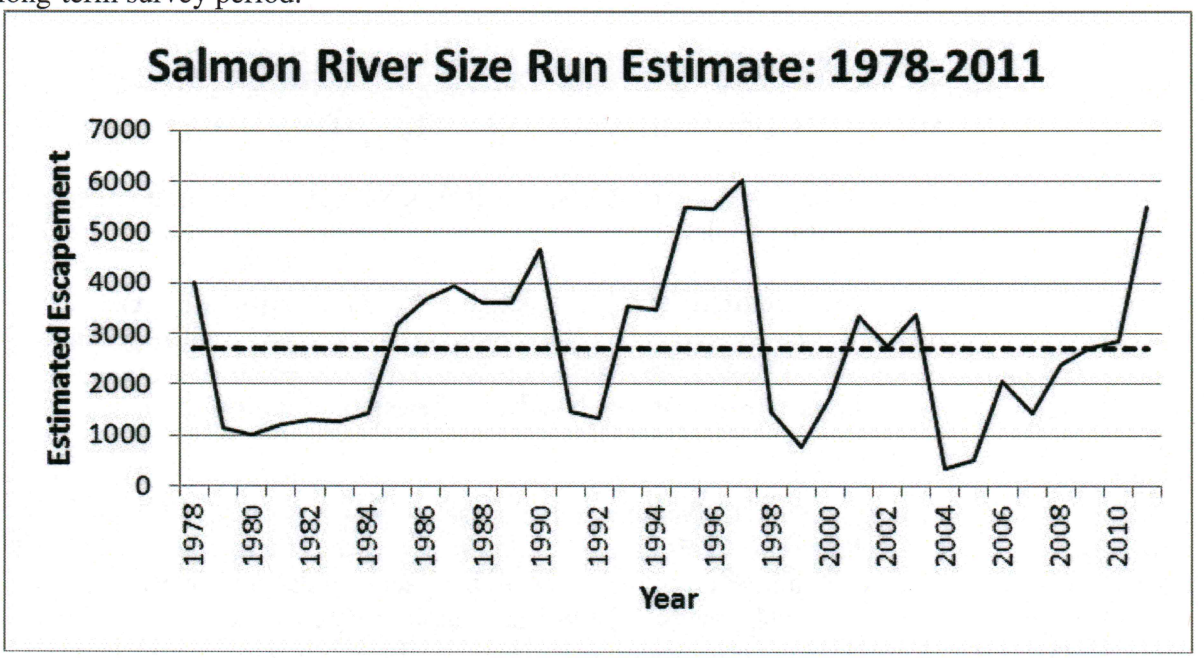


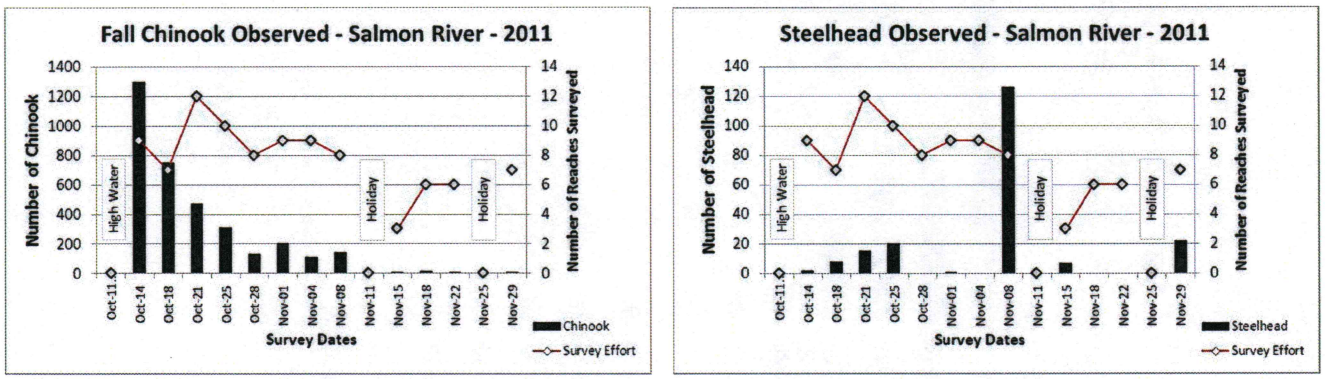
Figure 2. Salmon River fall run size estimates for 1978 to 2011. Dashed line is average over long-term survey period.



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 14th, 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 numbers were variable, with the peak on November 8th due to a large number of fish observed in Reach 4A (Otter Bar to Nordheimer Creek). 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 2011 Salmon River surveys.



Coho were also incidentally observed during the fall Chinook surveys:

- October 14th
  - One coho reported in Reach 4B (Forks of Salmon to Otter Bar)
- October 21st
  - One coho reported in Reach 4B (Forks of Salmon to Otter Bar)
- October 28th
  - One coho carcass retrieved from Reach 5B (O'Farrell to Henry Bell)
- November 8th
  - One coho carcass retrieved from Reach 9A (Mile 2 to Forks of Salmon)
- November 15th
  - Possible coho redds reported in Little North Fork Salmon River, but no fish present to confirm identity.

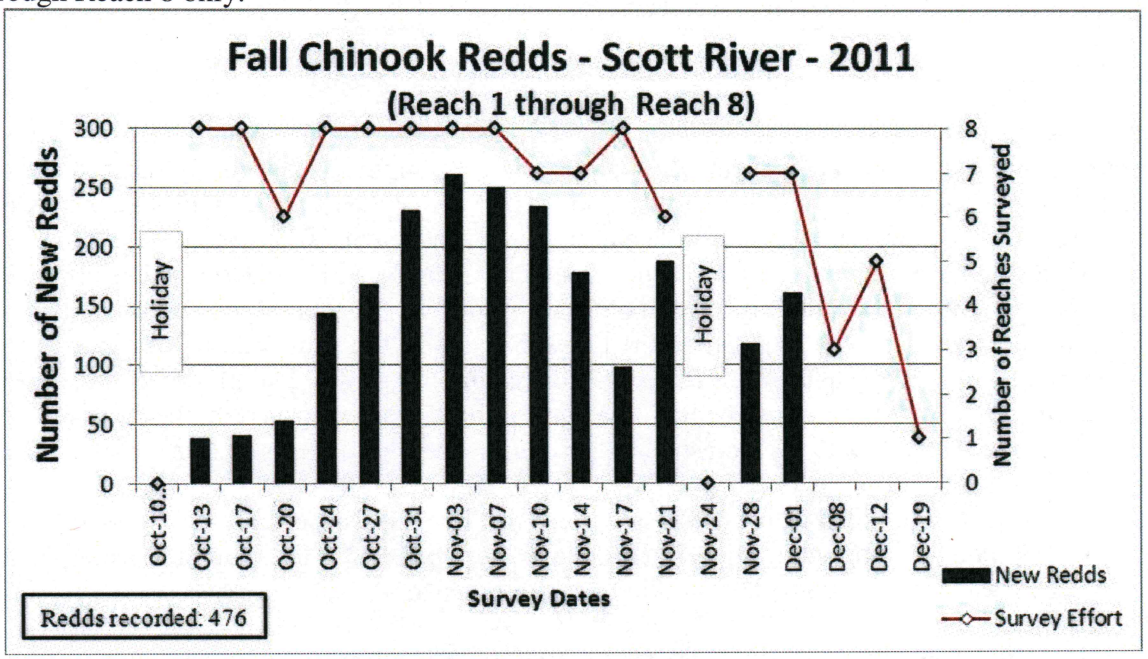
Salmon River tributary surveys occurred during October and November (**Appendix A**). Chinook salmon redds and/or fish were found on Knownothing Creek, East Fork Knownothing Creek, West Fork Knownothing Creek, Little North Fork Salmon River, Methodist Creek, Nordheimer Creek, and Plummer Creek. Steelhead were observed on Methodist Creek.

Scott River

Based on the available data, the Scott River reached the peak of spawning on November 3rd for Reach 1 through Reach 8 (**Figure 4**). This date is similar or slightly advanced compared to that observed in other years. An examination of the data split by reach and date [see **Appendix A**] 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. A higher than average mainstem discharge is also believed to have facilitated

upstream movement of fish. Overall survey effort was affected by the amount of surveyors available, weather, and flows. See **Appendix C** for a table of redd numbers organized by reach and date.

Figure 4. Fall Chinook redds observed and survey effort on the Scott River in 2011. Due to differences in redd tracking between lower and middle reaches, data displayed is for Reach 1 through Reach 8 only.



The Scott Valley Resource Conservation District performed redd and carcass surveys upon private property from Reach 12 through Reach 15. 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, scouring 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 277 redds is calculated (**Table 3**). Overall peak spawning for Reach 12 through Reach 15 appears to have occurred a week to ten days later compared to downstream reaches.

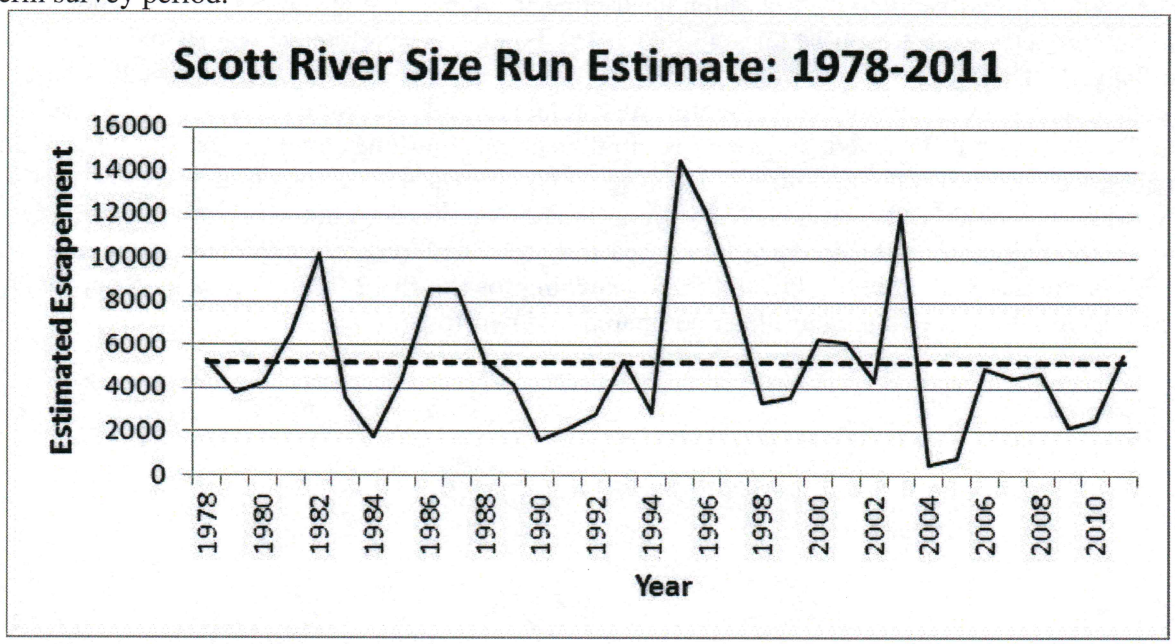
Table 3. Maximum number of redds and date observed by for Reach 12 through Reach 15 for Scott River in 2011.

	Reach 12	Reach 13	Reach 14	Reach 15	Total
Maximum Redds	16	50	107	104	277
	Oct-31	Nov-07	Nov-10	Nov-10	

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 a few areas of elevated use within the other reaches, spawning can primarily be described as dispersed, with less than five redds in vicinity to each other the norm. At the time of this report, neither GPS data nor maps had been provided to the Forest Service by the Scott Valley Resource Conservation District for inclusion. However, from examination of redd tallies, both Reach 14 and Reach 15 display the most use behind Reach 8 for those areas surveyed on the Scott River mainstem. See **Appendix D** for redd spatial distribution and density information.

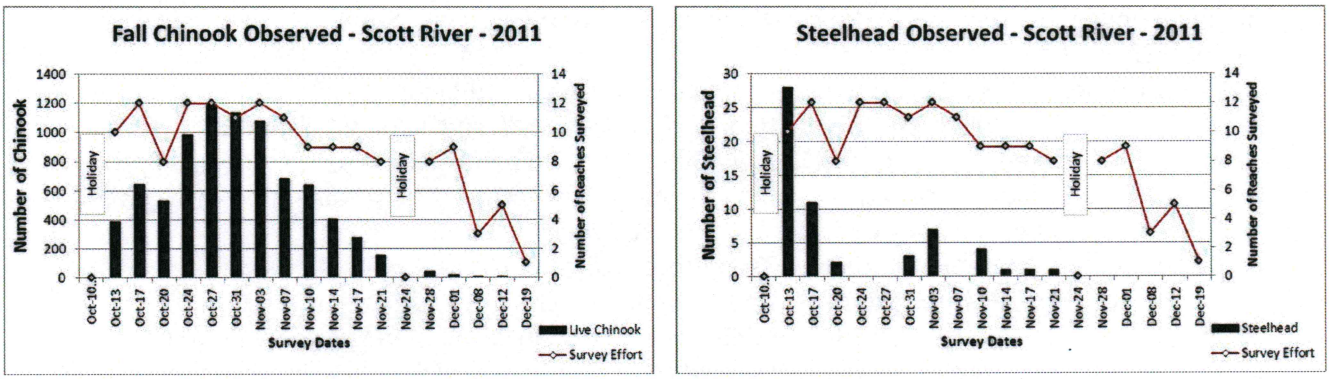
Using survey data and video weir observation, the Scott River is estimated to have had about 5,515 fall Chinook salmon return in 2011 (**Figure 5**; **Appendix A**). Based on draft MegaTable results, 2011 was just above average, ranking 11th for run size.

Figure 5. Scott River fall run size estimates for 1978 to 2011. 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 were observed on October 27th, with subsequent numbers declining within the survey area. Similar to the redd count, number of live Chinook appear to have increased at reaches higher in the Scott River after peaks lower in the system. This observation likely reflects upmigrating fish movement. Steelhead numbers were low and highly variable, with most observed during the first survey day. 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 2011 Scott River surveys (all reaches).



Coho were also incidentally observed during the fall Chinook surveys:

- October 20th
  - Four possible coho observed in Reach 1 (Midpoint to Confluence
- November 21st
  - One coho carcass retrieved from Reach 3 (George Allen to Trabucco)
- November 28th
  - One coho reported in Reach 3 (George Allen to Trabucco)
  - One possible coho observed in Reach 8 (Meamber Bridge to USGS Gage)
  - Two coho reported in Reach 14 (Young's Dam to Horn Lane)
- December 1st
  - Three coho and one redd reported in Reach 14 (Young's Dam to Horn Lane)
  - Two coho reported in Reach 15 (Fay Lane to Young's Dam)
- December 19th
  - Two coho carcasses retrieved from Reach 8 (Meamber Bridge to USGS Gage)

Scott River tributary surveys occurred during November (**Appendix A**). No Chinook redds or fish were found.

DISCUSSION

Water discharge was consistently above average due to the exceptional and late-melting 2010/2011 snowpack. In turn, the fall Chinook run was affected, especially on the Salmon River. It was not until late-October or early-November that flows were on par with the long-term norm.

While factors such as ocean survival has a large effect on the number of fish which return to the Klamath Basin, spawning success of the upmigrants is ultimately determined by river conditions and habitat health. Undoubtedly, the higher flows contributed to survival and spawning of one of the Salmon River's largest fall Chinook runs since 1978. Another probably consequence of elevated discharge was the apparent advancement of the spawning peak for fall Chinook from its normal time for both Salmon and Scott Rivers. Finally, anecdotal evidence for the Salmon River is that fall Chinook were spatially and temporally overlapping the spring run to a greater extent than normal, and fish were able to ascend higher in the system, particular tributaries, than is usually observed.

Recommendation Review – 2010 Survey Report

Recommendations from the 2010 Forest Service Salmon-Scott River Survey Report which were adopted in 2011:

1. Flagging redds on Scott River – Forest Service managed land
    - All redds from Reach 1 through Reach 8 were flagged on the date first encountered. The CDFG was able to secure permission to flag redds upon private property where crews were granted survey access. The result was improved redd count accuracy compared to previous years.
2. Flagging redds on Salmon River – protocol adjustment
    - For 2011, the protocol on the Salmon River was to flag and map redds *every* survey day, instead of once a week. Normalization of the protocol eliminated confusion by surveyors as to when to flag/map, which in turn provided for cleaner data. Additionally, the new survey form, whereupon each flagged redd included an entry with data specific to the redd, also appeared to decrease error.
3. Taking GPS points of redds – Scott River and Salmon River
    - For 2011, GPSing was attempted upon both Scott River and Salmon River, with implementation upon the former more successful than the latter. Issues encountered and potential improvements for 2012 will be suggested in the "Recommendations" section. However, in both cases, comparison of GPS points and physical map data highlighted the greater accuracy for the GPSing. Depending on familiarity of surveyors with the reach and ability to use a topographic map, redd points vary anywhere from precisely placed to several hundred meters distant. Accurate redd location is important to identify important spawning sites so as to better focus management activities and monitoring.
4. Datasheet and physical map emphasis – Scott River and Salmon River
    - The necessity to turn in maps and datasheets, regardless if redds/fish were encountered, was emphasized at training, as well as the staging area prior to daily surveys. Nonetheless, there continued to be instances of maps/datasheets not returned, particularly later in the season. Occasionally, maps/datasheets were turned in, but either not filled out completely, correctly, or at all. Inconsistencies occurred at a higher rate for the Salmon River compared to the Scott River. Post-season lack-of-maps/datasheet made reconstruction of data difficult, or impossible, for some surveys.
5. Pre-identification of tributary surveys in event of high water
    - For the most part, weather and high water did not hinder surveys to the extent as occurred in 2010. For the Salmon River, multiple copies of maps for commonly

surveyed tributaries were made and are presently available in the data packets maintained by CDFG. While tributary maps were not made for the Scott River system, no days upon the mainstem were missed.

Recommendations

Similar to the recommendation in the 2010 report, 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.

On the Scott River, redd sheets were received from the private reaches surveyed by Scott Valley Resources Conservation District (RCD). Although unexpected, the data was welcome and thusly incorporated into this report. If RCD continues to have an interest in applying the Forest Service redd sheets to the valley reaches, it is highly recommended to invite RCD (as well as interested landowners) to the Scott River training session.

In 2012, Forest Service will substitute "Redd Overlap?" for "Enhanced?" upon the redd datasheets. The latter was a hold-over from the prior version of the redd form. After use through the 2011 survey season, it is the opinion of the District Fish Biologist "Enhanced?" provides little data benefit due to the difficulty for survey crews to recognize where the channel has been modified, particularly in regards to old stream enhancement projects that have been heavily impacted by flood events. The use of "Redd Overlap?" will allow the tracking of redd superposition. The degree of superposition, including where and when it occurs, is expected to provide information on spawning gravel limitations. If such exists, it may occur routinely in specific high-use areas, display an overall reach/river variability dependent upon number of returning fish, or other manifestation.

It is recommended to coordinate with CDFG to investigate the possibility of minor modifications to CDFG summary sheets filled in by crews when each team completes their assigned reach.

- Where reaches are split, reflecting this division on paper will make it clearer for crews as to where to input the daily summary. Split reaches are present on most of the Salmon River, as well as Scott River Reach 8. Currently, crews draw lines to separate "A" and "B" data under the reach entry; and when this occurs, sometimes not all required data is transferred from datasheets to the summary page. This change will also benefit State and Federal agencies when completing their post-season data compilation.
- Expand the "Live Fish" field to specify "Live Fish – Chinook" and "Live Fish – Steelhead".
- 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).

Redd data analysis and display requires additional consideration. A lot of redd information is being collected – i.e., size, habitat use, location on the landscape – but it needs to be interpreted and subsequently presented in an accessible manner for it to be of use. Some questions to be addressed in the future could 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 are the triggers driving that variability?
- Does the same location see concentrated spawning use each year?

How to display and analyze some data may only become apparent once multiple years of the same datum type has been collected, allowing construction of trends. 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.

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 do exist, but the Forest Service needs to provide copies to the map packets maintained by CDFG 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.

While redd GPSing was felt to have gone smoothly on the Scott River, there were issues on the Salmon River, particularly at the end of the season. It is understood that discharge conditions in November can create difficulties in safely accessing the Salmon River. However, the feeling for the Salmon River beginning mid-November was also one of survey fatigue and a desire to hurry and finish the season. This attitude affected the quality of the data. Between the rush to take down flagging (without GPSing) and the lackluster turning in of maps, redd location for the Salmon River in November was not good. Overall, there a greater than 200 redd discrepancy between datasheet and GPS/map points for the Salmon River. In comparison, the Scott River effort was able to GPS and/or reconcile via maps all but one redd recorded on the datasheets.

To ensure a high quality product for both Salmon and Scott Rivers, it is highly recommended that all agencies/entities involved in the respective survey effort should try to commit to bringing at least one GPS-per-crew to the designated GPS day. Some entities – Forest Service, CDFG – may be able to loan additional units. The desired goal is to have sufficient equipment to allow all reaches to be GPSed in a single day. In turn, the Forest Service will provide a computer on GPS days for immediate download from compatible devices. 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 2012, the recommendation is to continue a twice-a-season GPS, 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, particularly on the

Salmon River, to ensure the GPS protocol is followed. 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. Unfortunately, this scenario is not expected to occur in the foreseeable future. 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.

LITERATURE CITED

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Appendix A – California Department Fish and Game "MegaTable"

SPAWNER ESCAPEMENT

	1978			1979			1980		
Hatchery Spawners	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
Natural Spawners									
Trinity River basin (above Willow Creek, excluding TRH)	4,712	31,052	35,764	3,936	8,028	11,964	16,837	7,700	24,537
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 (excluding IGH)	300	1,700	2,000	466	4,190	4,656	867	2,468	3,335
Misc. Klamath tributaries (above Hoopa and Yurok Reservations)	735	2,765	3,500	147	1,068	1,215	500	1,000	1,500
Hoopa and Yurok Reservation tribs.	-- b/	-- b/	-- b/	100 c/	400 c/	500 c/	250 c/	400 c/	650 c/
Subtotals	16,414	58,492	74,906	6,761	30,637	37,398	26,982	21,483	48,465
Total Spawner Escapement	18,664	71,471	90,135	7,982	34,273	42,255	29,689	27,994	57,683

IN-RIVER HARVEST

	1978			1979			1980		
Angler Harvest	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	2,456	998	3,454
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
Indian Net Harvest e/									
Klamath River (below Hwy 101 bridge)	--	--	--	--	--	--	495	9,605	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
Total In-river Harvest	3,882	19,894	23,776	3,531	15,791	19,322	6,878	16,509	23,387

IN-RIVER RUN

	1978			1979			1980		
Totals	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
Total In-river Run	22,745	92,983	115,728	11,675	51,295	62,970	36,773	45,640	82,413

Klamath River Basin Fall Chinook Salmon Spawner Escapement, In-river Harvest and Run-size Estimates 1978-2011 a/

SPAWNER ESCAPEMENT

	1981			1982			1983		
Hatchery Spawners	Grilse	Adults	Totals	Grilse	Adults	Totals	Grilse	Adults	Totals
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
Natural Spawners									
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/	-- b/	-- b/	-- b/	-- b/	-- b/	-- b/	-- b/	-- b/
Subtotals	16,507	33,857	50,364	18,646	31,951	50,597	2,526	30,784	33,310
Total Spawner Escapement	18,051	38,282	56,333	24,714	42,362	67,076	3,311	44,649	47,960

IN-RIVER HARVEST

	1981			1982			1983		
Angler Harvest	Grilse	Adults	Totals	Grilse	Adults	Totals	Grilse	Adults	Totals
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
Indian Net Harvest e/									
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
Total In-river Harvest	9,717	39,016	48,733	14,283	22,821	37,104	514	12,125	12,639

IN-RIVER RUN

	1981			1982			1983		
Totals	Grilse	Adults	Totals	Grilse	Adults	Totals	Grilse	Adults	Totals
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
Total In-river Run	28,130	80,292	108,422	39,408	66,612	106,020	3,846	57,546	61,392

Klamath River Basin Fall Chinook Salmon Spawner Escapement, In-river Harvest and Run-size Estimates 1978-2011 a/

SPAWNER ESCAPEMENT

	1984			1985			1986		
Hatchery Spawners	Grilse	Adults	Totals	Grilse	Adults	Totals	Grilse	Adults	Totals
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
Natural Spawners									
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
Hoopa and Yurok Reservation tribs.	-- 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
Total Spawner Escapement	6,815	23,560	30,375	56,276	48,211	104,487	34,012	146,251	180,263

IN-RIVER HARVEST

	1984			1985			1986		
Angler Harvest	Grilse	Adults	Totals	Grilse	Adults	Totals	Grilse	Adults	Totals
Klamath River (below Hwy 101 bridge)	175	548	723	1,479	2,427 i/	3,906	704	2,456	3,160
Trinity River basin (above Willow Creek)	393	736	1,129	5,442	154 i/	5,596	3,438	12,039	15,477
Balance of Klamath system	384	2,056	2,440	4,274	1,001 i/	5,275	5,266	6,532	11,798
Subtotals	952	3,340	4,292	11,195	3,582 i/	14,777	9,408	21,027	30,435
Indian Net Harvest e/									
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
Total In-river Harvest	1,407	22,010	23,417	12,750	15,148	27,898	10,262	46,154	56,416

IN-RIVER RUN

	1984			1985			1986		
Totals	Grilse	Adults	Totals	Grilse	Adults	Totals	Grilse	Adults	Totals
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
Total In-river Run	8,281	47,261	55,542	69,389	64,438	133,827	44,540	195,019	239,559

Klamath River Basin Fall Chinook Salmon Spawner Escapement, In-river Harvest and Run-size Estimates 1978-2011 a/

SPAWNER ESCAPEMENT

	1987			1988			1989		
Hatchery Spawners	Grilse	Adults	Totals	Grilse	Adults	Totals	Grilse	Adults	Totals
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
Natural Spawners									
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
Total Spawner Escapement	13,050	130,840	143,890	17,905	112,844	130,749	6,579	65,859	72,438

IN-RIVER HARVEST

	1987			1988			1989		
Angler Harvest	Grilse	Adults	Totals	Grilse	Adults	Totals	Grilse	Adults	Totals
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
Indian Net Harvest e/									
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
Total In-river Harvest	5,851	73,265	79,116	5,989	73,854	79,843	2,458	54,340	56,798

IN-RIVER RUN

	1987			1988			1989		
Totals	Grilse	Adults	Totals	Grilse	Adults	Totals	Grilse	Adults	Totals
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
Total In-river Run	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 1978-2011 a/

SPAWNER ESCAPEMENT

	1990			1991			1992		
Hatchery Spawners	Grilse	Adults	Totals	Grilse	Adults	Totals	Grilse	Adults	Totals
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
Natural Spawners									
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 l/	4,071 l/	4,667 l/	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 k/	118 k/	135 k/	0 k/	382 k/	382 k/	59 k/	474 k/	533 k/
Subtotals	1,350	15,596	16,946	718	11,649	12,367	5,143	12,028	17,171
Total Spawner Escapement	2,042	23,663	25,705	988	18,133	19,121	9,091	19,388	28,479

IN-RIVER HARVEST

	1990			1991			1992		
Angler Harvest	Grilse	Adults	Totals	Grilse	Adults	Totals	Grilse	Adults	Totals
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
Indian Net Harvest e/									
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
Total In-river Harvest	2,290	11,459	13,749	748	13,581	14,329	4,486	6,787	11,273

IN-RIVER RUN

	1990			1991			1992		
Totals	Grilse	Adults	Totals	Grilse	Adults	Totals	Grilse	Adults	Totals
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) f/	43	73	115	14	69	83	84	20	105
Net Mortality (8.70% of harvest) f/	17	687	704	5	887	892	32	503	535
Total In-river Run	4,392	35,882	40,274	1,755	32,670	34,425	13,693	26,698	40,391

Klamath River Basin Fall Chinook Salmon Spawner Escapement, In-river Harvest and Run-size Estimates
1978-2011 a/

SPAWNER ESCAPEMENT

	1993			1994			1995		
Hatchery Spawners	Grilse	Adults	Totals	Grilse	Adults	Totals	Grilse	Adults	Totals
Iron Gate Hatchery (IGH)	883	20,828	21,711	758	13,808 m/	14,566	259	22,681 m/	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
Natural Spawners									
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 n/	647 n/	678 n/	625 n/	3,249 n/	3,874 n/	768 n/	6,472 n/	7,240 n/
Misc. Klamath tributaries (above Hoopa and Yurok Reservations)	92	2,470	2,562	50	1,202	1,252	744 o/	3,654 o/	4,398 o/
Hoopa and Yurok Reservation tribs.	0 h/	98 h/	98 h/	0 h/	222 h/	222 h/	34 p/	413 p/	447 p/
Subtotals	3,825	21,858	25,683	6,245	32,333	38,578	17,324	161,794	179,118
Total Spawner Escapement	5,444	43,501	48,945	11,445	49,405	60,850	17,659	199,653	217,312

IN-RIVER HARVEST

	1993			1994			1995		
Angler Harvest	Grilse	Adults	Totals	Grilse	Adults	Totals	Grilse	Adults	Totals
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 q/	5,889
Subtotals	1,925	3,172	5,097	2,556	1,832	4,388	4,420	6,081	10,501
Indian Net Harvest e/									
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
Total In-river Harvest	2,100	12,808	14,908	2,849	13,524	16,373	4,977	21,638	26,615

IN-RIVER RUN

	1993			1994			1995		
Totals	Grilse	Adults	Totals	Grilse	Adults	Totals	Grilse	Adults	Totals
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) f/	39	65	104	52	37	90	90	124	214
Net Mortality (8.70% of harvest) f/	15	838	853	25	1,017	1,042	48	1,353	1,401
Total In-river Run	7,598	57,212	64,810	14,371	63,983	78,354	22,774	222,768	245,542

Klamath River Basin Fall Chinook Salmon Spawner Escapement, In-river Harvest and Run-size Estimates 1978-2011 a/

SPAWNER ESCAPEMENT

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

IN-RIVER HARVEST

	1996			1997			1998		
Angler Harvest	Grilse	Adults	Totals	Grilse	Adults	Totals	Grilse	Adults	Totals
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 u/
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
Indian Net Harvest e/									
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
Total In-river Harvest	2,502	69,242	71,744	2,444	17,763	20,207	1,161	17,897	19,058

IN-RIVER RUN

	1996			1997			1998		
Totals	Grilse	Adults	Totals	Grilse	Adults	Totals	Grilse	Adults	Totals
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
Total In-river Run	9,532	175,773	185,305	7,993	83,736	91,729	4,639	90,647	95,286

(continued next page)

Klamath River Basin Fall Chinook Salmon Spawner Escapement, In-river Harvest and Run-size Estimates 1978-2011 a/

SPAWNER ESCAPEMENT

	1999			2000			2001		
Hatchery Spawners	Grilse	Adults	Totals	Grilse	Adults	Totals	Grilse	Adults	Totals
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
Hatchery Spawner Subtotals:	6,857	14,327	21,184	1,909	97,611	99,520	1,631	55,112	56,743
Natural Spawners									
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
Klamath Natural Spawner Subtotals:	**6,293**	**11,660**	**17,953**	**2,891**	**58,388**	**61,279**	**6,378**	**40,944**	**47,322**
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	0 756
Hoopa Reservation tribs. (Trinity River) p/	0	44	44	24	166	190	6	170	176
Trinity Natural Spawner Subtotals:	**4,154**	**6,797**	**10,951**	**3,503**	**24,340**	**27,843**	**1,369**	**36,890**	**38,259**
Natural Spawner Subtotals:	**10,447**	**18,457**	**28,904**	**6,394**	**82,728**	**89,122**	**7,747**	**77,834**	**85,581**
Total Spawner Escapement	**17,304**	**32,784**	**50,088**	**8,303**	**180,339**	**188,642**	**9,378**	**132,946**	**142,324**

IN-RIVER HARVEST

	1999			2000			2001		
Angler Harvest	Grilse	Adults	Totals	Grilse	Adults	Totals	Grilse	Adults	Totals
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
Angler Harvest Subtotals:	1616	2282	3898	1582	5650	7232	1,500	12,134	13,634
Indian Net Harvest e/									
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
Indian Net Harvest Subtotals:	271	14,660	14,931	303	29,415	29,718	399	38,645	39,044
Total In-river Harvest	1,887	16,942	18,829	1,885	35,065	36,950	1,899	50,779	52,678

IN-RIVER RUN

	1999			2000			2001		
Totals	Grilse	Adults	Totals	Grilse	Adults	Totals	Grilse	Adults	Totals
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
Total In-river Run	**19,248**	**51,048**	**70,296**	**10,246**	**218,077**	**228,323**	**11,343**	**187,333**	**198,676**

Klamath River Basin Fall Chinook Salmon Spawner Escapement, In-river Harvest and Run-size Estimates 1978-2011 a/

SPAWNER ESCAPEMENT

	2002			2003			2004		
Hatchery Spawners	Grilse	Adults	Totals	Grilse	Adults	Totals	Grilse	Adults	Totals
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
Hatchery Spawner Subtotals:	**2,331**	**27,183**	**29,514**	**864**	**61,782**	**62,646**	**1,981**	**22,981**	**24,962**
Natural Spawners									
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
Klamath Natural Spawner Subtotals:	**1,529**	**54,225**	**55,754**	**848**	**55,423**	**56,271**	**846**	**10,711**	**11,557**
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
Trinity Natural Spawner Subtotals:	**2,338**	**11,410**	**13,748**	**1,254**	**32,219**	**33,473**	**3,839**	**13,120**	**16,959**
Natural Spawner Subtotals:	**3,867**	**65,635**	**69,502**	**2,102**	**87,642**	**89,744**	**4,685**	**23,831**	**28,516**
Total Spawner Escapement	**6,198**	**92,818**	**99,016**	**2,966**	**149,424**	**152,390**	**6,666**	**46,812**	**53,478**

IN-RIVER HARVEST

	2002			2003			2004		
Angler Harvest	Grilse	Adults	Totals	Grilse	Adults	Totals	Grilse	Adults	Totals
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
Angler Harvest Subtotals:	**870**	**10,495**	**11,365**	**814**	**9,680**	**10,494**	**2,741**	**4,003**	**6,744**
Indian Net Harvest e/									
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
Indian Net Harvest Subtotals:	**126**	**24,574**	**24,700**	**44**	**30,034**	**30,078**	**168**	**25,803**	**25,971**
Total In-river Harvest	**996**	**35,069**	**36,065**	**858**	**39,714**	**40,572**	**2,909**	**29,806**	**32,715**

IN-RIVER RUN

	2002			2003			2004		
Totals	Grilse	Adults	Totals	Grilse	Adults	Totals	Grilse	Adults	Totals
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						
Total In-river Run	**9,226**	**160,788**	**170,014**	**3,845**	**191,948**	**195,791**	**9,646**	**78,943**	**88,589**

Klamath River Basin Fall Chinook Salmon Spawner Escapement, In-river Harvest and Run-size Estimates 1978-2011 a/

SPAWNER ESCAPEMENT

	2005			2006			2007		
Hatchery Spawners	Grilse	Adults	Totals	Grilse	Adults	Totals	Grilse	Adults	Totals
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
Hatchery Spawner Subtotals:	**101**	**27,699**	**27,800**	**6,462**	**19,522**	**25,984**	**213**	**35,050**	**35,263**
Natural Spawners									
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
Klamath Natural Spawner Subtotals:	**398**	**13,554**	**13,952**	**6,516**	**14,264**	**20,780**	**232**	**21,292**	**21,524**
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
Trinity Natural Spawner Subtotals:	**772**	**13,133**	**13,905**	**7,867**	**15,899**	**23,766**	**839**	**39,378**	**40,217**
Natural Spawner Subtotals:	**1,170**	**26,687**	**27,857**	**14,383**	**30,163**	**44,546**	**1,071**	**60,670**	**61,741**
Total Spawner Escapement	**1,271**	**54,386**	**55,657**	**20,845**	**49,685**	**70,530**	**1,284**	**95,720**	**97,004**

IN-RIVER HARVEST

	2005			2006			2007		
Angler Harvest	Grilse	Adults	Totals	Grilse	Adults	Totals	Grilse	Adults	Totals
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
Angler Harvest Subtotals:	**1,030**	**1,985**	**3,015**	**5,527**	**62** ff/	**5,589**	**369**	**6,312**	**6,681**
Indian Net Harvest e/									
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
Indian Net Harvest Subtotals:	**70**	**8,016**	**8,086**	**415**	**10,283**	**10,698**	**21**	**27,573**	**27,594**
Total In-river Harvest	**1,100**	**10,001**	**11,101**	**5,942**	**10,345**	**16,287**	**390**	**33,885**	**34,275**

IN-RIVER RUN

	2005			2006			2007		
Totals	Grilse	Adults	Totals	Grilse	Adults	Totals	Grilse	Adults	Totals
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) f/	6	697	703	36	894	930	2	2,397	2,399
Catch and Release Mortality gg				0	373	373			
Total In-river Run	**2,398**	**65,125**	**67,523**	**26,936**	**61,373**	**88,309**	**1,684**	**132,131**	**133,815**

Klamath River Basin Fall Chinook Salmon Spawner Escapement, In-river Harvest and Run-size Estimates 1978-2011 a/

SPAWNER ESCAPEMENT

	2008			2009			2010		
Hatchery Spawners	Grilse	Adults	Totals	Grilse	Adults	Totals	Grilse	Adults	Totals
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
Hatchery Spawner Subtotals:	**2,931**	**13,552**	**16,483**	**1,372**	**19,614**	**20,986**	**2,501**	**18,052**	**20,553**
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 hh/	2,720	356	2,478 hh/	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
Klamath Natural Spawner Subtotals:	**9,425**	**19,020**	**28,445**	**1,948**	**27,743**	**29,691**	**1,811**	**15,170**	**16,981**
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
Trinity Natural Spawner Subtotals:	**7,798**	**11,830**	**19,628**	**6,142**	**16,666**	**22,808**	**9,995**	**22,055**	**32,050**
Natural Spawner Subtotals:	**17,223**	**30,850**	**48,073**	**8,090**	**44,409**	**52,499**	**11,806**	**37,225**	**49,031**
Total Spawner Escapement	**20,154**	**44,402**	**64,556**	**9,462**	**64,023**	**73,485**	**14,307**	**55,277**	**69,584**

IN-RIVER HARVEST

	2008			2009			2010		
Angler Harvest	Grilse	Adults	Totals	Grilse	Adults	Totals	Grilse	Adults	Totals
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
Angler Harvest Subtotals:	**4,308**	**1,919**	**6,227**	**2,214**	**5,651**	**7,865**	**1,831**	**3,035**	**4,866**
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
Indian Net Harvest Subtotals:	**641**	**22,259**	**22,900**	**178**	**28,387**	**28,565**	**428**	**29,887**	**30,315**
Total In-river Harvest	**4,949**	**24,178**	**29,127**	**2,392**	**34,038**	**36,430**	**2,259**	**32,922**	**35,181**

IN-RIVER RUN

	2008			2009			2010		
Totals	Grilse	Adults	Totals	Grilse	Adults	Totals	Grilse	Adults	Totals
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									
Total In-river Run	**25,247**	**70,554**	**95,801**	**11,914**	**100,644**	**112,558**	**16,640**	**90,860**	**107,500**

Klamath River Basin Fall Chinook Salmon Spawner Escapement, In-river Harvest and Run-size Estimates, 1978-2011 a/

SPAWNER ESCAPEMENT

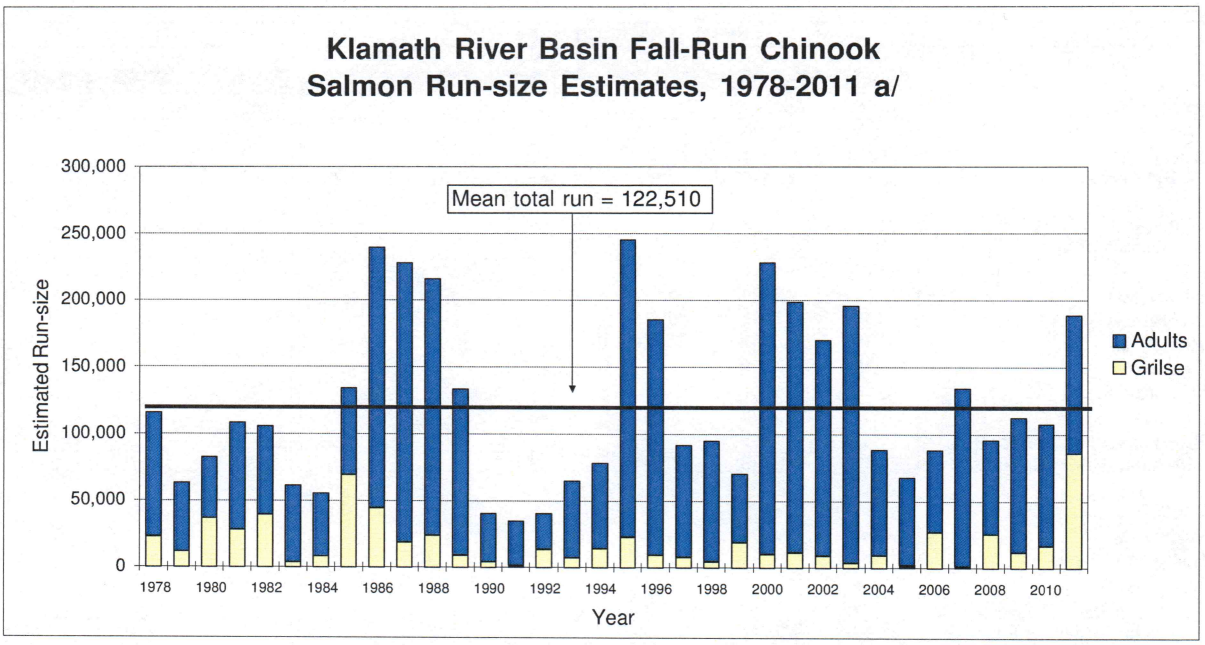
	2011			2012			2013		
Hatchery Spawners	Grilse	Adults	Totals	Grilse	Adults	Totals	Grilse	Adults	Totals
Iron Gate Hatchery (IGH)	9,549	8,490	18,039						
Trinity River Hatchery (TRH)	1,875	13,846	15,721						
Hatchery Spawner Subtotals:	**11,424**	**22,336**	**33,760**	**0**	**0**	**0**	**0**	**0**	**0**
Natural Spawners									
Main Stem Klamath River n/ (excluding IGH)	3,306	3,976	7,282						
Salmon River basin	1,819	3,674	5,493						
Scott River basin	2,499	3,016	5,515						
Shasta River basin	11,187	213	11,400						
Bogus Creek basin	2,303	2,919	5,222						
Misc. Klamath tributaries o/ (above Yurok Reservation)	3,259	3,072	6,331						
Yurok Reservation tribs. (Klamath River) p	418	1,143	1,561						
Klamath Natural Spawner Subtotals:	**24,791**	**18,013**	**42,804**	**0**	**0**	**0**	**0**	**0**	**0**
Main Stem Trinity River dd/ (excluding TRH)	37,818	28,670	66,488						
Misc. Trinity tributaries o/ (above Hoopa Reservation)	96	542	638						
Hoopa Reservation tribs. (Trinity River) p/	94	530	624						
Trinity Natural Spawner Subtotals:	**38,008**	**29,742**	**67,750**	**0**	**0**	**0**	**0**	**0**	**0**
Natural Spawner Subtotals:	**62,799**	**47,755**	**110,554**	**0**	**0**	**0**	**0**	**0**	**0**
Total Spawner Escapement	**74,223**	**70,091**	**144,314**	**0**	**0**	**0**	**0**	**0**	**0**

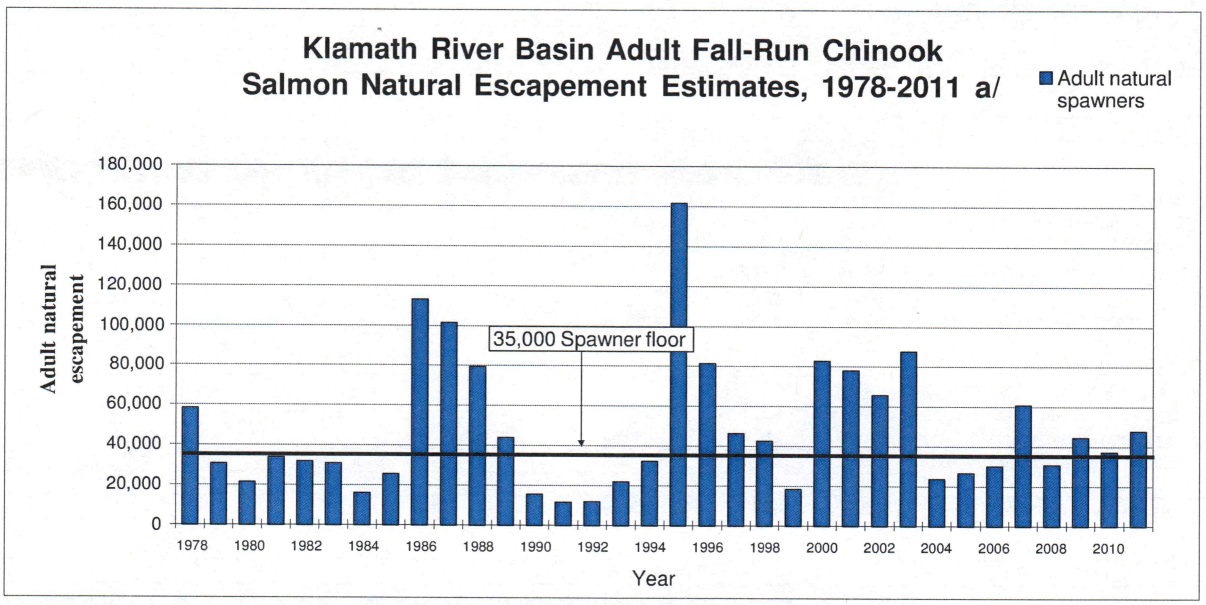
IN-RIVER HARVEST

	2011			2012			2013		
Angler Harvest	Grilse	Adults	Totals	Grilse	Adults	Totals	Grilse	Adults	Totals
Klamath River (below Hwy 101 bridge)	700	624	1,324						
Klamath River (Hwy 101 to Weitchpec)	6,557	912	7,469						
Klamath River (Weitchpec to IGH)	1,480	1,483	2,963						
Trinity River basin	1,259	1,145	2,404						
Angler Harvest Subtotals:	**9,996**	**4,164**	**14,160**	**0**	**0**	**0**	**0**	**0**	**0**
Indian Net Harvest e/									
Klamath River (below Hwy 101 bridge)	429	17,218	17,647						
Klamath River (Hwy 101 to Trinity mouth)	467	4,272	4,739						
Trinity River (Hoopa Reservation)	408	4,881	5,289						
Indian Net Harvest Subtotals:	**1,304**	**26,371**	**27,675**	**0**	**0**	**0**	**0**	**0**	**0**
Total In-river Harvest	**11,300**	**30,535**	**41,835**	**0**	**0**	**0**	**0**	**0**	**0**

IN-RIVER RUN

	2011			2012			2013		
Totals	Grilse	Adults	Totals	Grilse	Adults	Totals	Grilse	Adults	Totals
In-river Harvest and Escapement	85,523	100,626	186,149	0	0	0	0	0	0
Angling Mortality (2.04% of harvest) f/	204	85	289	0	0	0	0	0	0
Net Mortality (8.70% of harvest) f/	113	2,294	2,407	0	0	0	0	0	0
Catch and Release Mortality gg/									
Total In-river Run	**85,840**	**103,005**	**188,845**	**0**	**0**	**0**	**0**	**0**	**0**





a/ 2011 data preliminary

Footnotes for Klamath River Basin Fall Chinook Salmon Spawner Escapement, In-river Harvest and Run-size Estimates, 1978-2011 [a]

a/ Prepared February 8, 2012. All figures are California Department of Fish and Game (CDFG) counts/estimates unless otherwise indicated. All figures for Iron Gate and Trinity River hatcheries represent counts of fish entering those facilities. All spawner escapement figures for the Shasta River basin for 1978-1987 and 1989-2011, plus those for Bogus Creek basin for 1980-1991 and 2003-2011 are based on counts made at counting/video stations located near the mouths of those streams. All remaining spawner escapements and all harvest figures are estimates developed from data obtained through ongoing field investigations in the Klamath-Trinity system. Figures for years through 2010 are final; 2011 figures are preliminary, subject to revision.

b/ Figure 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 2011 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 2001-2011 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.30th.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.30th.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 2010 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).

List of acronyms

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

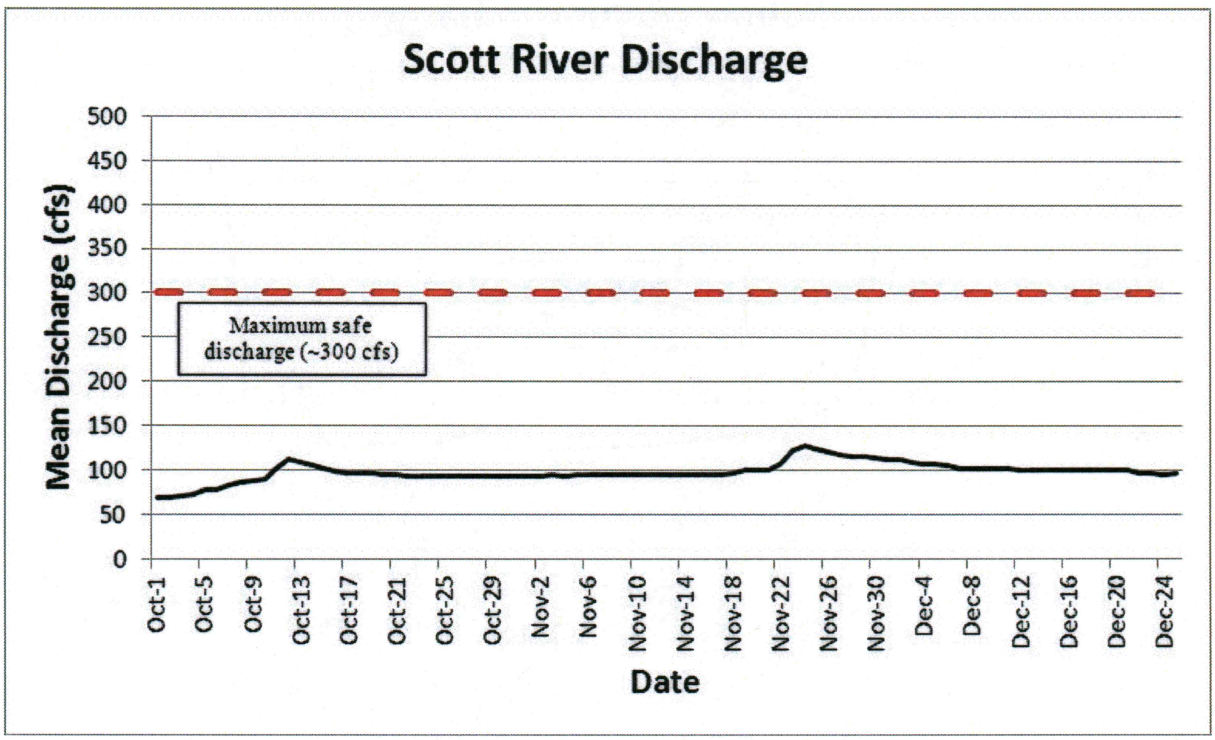
Appendix B – USGS Discharge Charts

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 here provides a daily mean of discharge at the gauge and includes October 1st through December 25th, 2011, which encompasses the redd/carcass survey dates and is inclusive effort by CDFG 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.

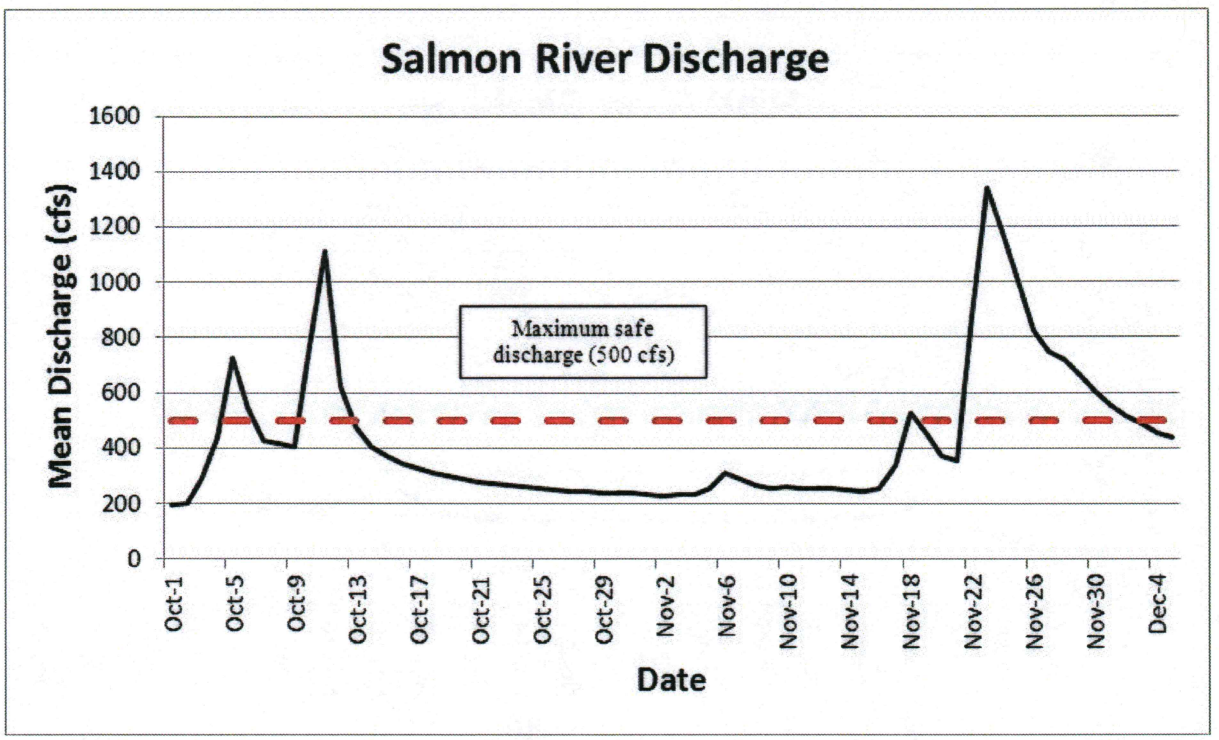


Salmon River

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)

Graph provided here provides a daily mean of discharge at the gauge and includes October 1st through December 5th, 2011, 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 (2011)

Salmon River Redds

Reach	Survey Dates														
	Oct-11	Oct-14	Oct-18	Oct-21	Oct-25	Oct-28	Nov-01	Nov-04	Nov-08	Nov-11	Nov-15	Nov-18	Nov-22	Nov-25	Nov-29
Mainstem															
4A - Otter Bar to Nordheimer Ck	---|	36		20	5	4	10	0	1	---|		1	---|	---|	
4B - Forks to Otter Bar		28	33	3	25	15	5	2	0						
North Fork															
9A - Mile 2 to Forks	NS - High Water	25	68	0	1	0	5	3	6	Holiday			High Water - Flags pulled some reaches	Holiday	N/A
9B - Mile 4 to Mile 2		41	21	6	13^	1	0	0	0			0			N/A
10A - Mile 6 to Mile 4		24	4	1	14	0	0	0	7						N/A
10B - Mile 8 to Mile 6				42	5			4							14
11A - Mile 10 to Mile 8				46							8				0
11B - Mile 12 to Mile 10				22							10				
12 - Mile 16 to Mile 12											3				
South Fork															
5A - Henry Bell to Forks[1]	|------	(71)	(82)	(67)	(71)	(58)	(118)	(44)	(37)	|------			|------	|------	
5B - O'Farrell Gulch to Henry Bell		71	9	22	0	6	8	10	0						N/A
6A - Indian Ck to O'Farrell Gulch		51	32	2	15	2	0	0	0			N/A			
6B - Matthews Ck to Indian Ck		56		7	6		0					N/A			N/A

[1]Reach 5A is not flagged - total number of redds counted each survey

^Only portion of reach accomplished - Mile 4 to canyon

*N/A = surveys performed, but no redd data available because crews pulling or had pulled flagging

*Underline = days which included pulling flagging

Salmon River Tributary Surveys

Tributary	Date	Redds	Chinook	Steelhead
Indian Creek	Nov-15	0	0	0
Knownothing Creek	Oct-11	7	43	0
	Nov-15	5	0	0
	Nov-29	0	0	0
EF Knownothing Creek	Nov-01	4	0	0
WF Knownothing Creek	Oct-31	4	0	0
Little NF Salmon River	Nov-14	11	0	0
Methodist Creek	Oct-11	4	63	0
	Nov-15	8	0	2
Nordheimer Creek	Nov-15	22	0	0
Plummer Creek	Oct-24	1	0	0
St. Claire Creek	Oct-24	0	0	0

Salmon River (Live) Chinook Observation

Reach	Date														
	Oct-11	Oct-14	Oct-18	Oct-21	Oct-25	Oct-28	Nov-01	Nov-04	Nov-08	Nov-11	Nov-15	Nov-18	Nov-22	Nov-25	Nov-29
Mainstem															
4A - Otter Bar to Nordheimer Ck	---|	85		84	9	6	nd	3	25	---|		13	1	---|	
4B - Forks to Otter Bar		112	116	23	112	16	24	12	6						
North Fork															
9A - Mile 2 to Forks	NS - High Water	87	129	114	32	10	31	3	38	Holiday				Holiday	N/A
9B - Mile 4 to Mile 2		85	93	31	51^	18	4	10	12			0	N/A		0
10A - Mile 6 to Mile 4		73	79	nd	15	37	16	nd	9						1
10B - Mile 8 to Mile 6				25	16			7							0
11A - Mile 10 to Mile 8				46							1		0		0
11B - Mile 12 to Mile 10				23							1				
12 - Mile 16 to Mile 12											4				
South Fork															
5A - Henry Bell to Forks	|------	593	129	49	43	24	63	14	2	|------				|------	
5B - O'Farrell Gulch to Henry Bell		123	84	49	13	21	20	35	9						1
6A - Indian Ck to O'Farrell Gulch		103	116	nd	nd	nd	42	24	42			N/A			
6B - Matthews Ck to Indian Ck		34		25	17		2					N/A	N/A		1

^Only portion of reach accomplished - Mile 4 to canyon

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

*N/A = surveys performed, but no fish data available because crews focusing on flag pulling and carcass collection

Salmon River (Live) Steelhead Observation

Reach	Date														
	Oct-11	Oct-14	Oct-18	Oct-21	Oct-25	Oct-28	Nov-01	Nov-04	Nov-08	Nov-11	Nov-15	Nov-18	Nov-22	Nov-25	Nov-29
Mainstem															
4A - Otter Bar to Nordheimer Ck	---|	0		15	0	0	nd	0	125	---|		0	0	---|	
4B - Forks to Otter Bar		0	0	0	19	0	0	0	0						
North Fork															
9A - Mile 2 to Forks	NS - High Water	2	8	0	0	0	0	0	1	Holiday				Holiday	N/A
9B - Mile 4 to Mile 2		0	0	0	1^	0	0	0	0			0	N/A		0
10A - Mile 6 to Mile 4		0	0	nd	0	0	0	nd	0						0
10B - Mile 8 to Mile 6				0	0			0							0
11A - Mile 10 to Mile 8				0							0		0		0
11B - Mile 12 to Mile 10				0							7				
12 - Mile 16 to Mile 12											0				
South Fork															
5A - Henry Bell to Forks	|------	0	0	0	0	0	1	0	0	|------				|------	
5B - O'Farrell Gulch to Henry Bell		0	0	0	0	0	0	0	0						22
6A - Indian Ck to O'Farrell Gulch		0	0	nd	nd	nd	0	0	0			N/A			
6B - Matthews Ck to Indian Ck		0		0	0		0					N/A	0		0

^Only portion of reach accomplished - Mile 4 to canyon
*nd = no data (surveys performed, but datasheets missing)
*N/A = surveys performed, but no fish data available because crews focusing on flag pulling and carcass collection

Scott River Redds

Reach	Date																		
	Oct-10	Oct-13	Oct-17	Oct-20	Oct-24	Oct-27	Oct-31	Nov-03	Nov-07	Nov-10	Nov-14	Nov-17	Nov-21	Nov-24	Nov-28	Dec-01	Dec-08	Dec-12	Dec-19
R1 - Midpoint to Confluence	Holiday	0	3	16	3	7	13	0	2	3	0	0	0	Holiday	2	N/A		N/A	
R2 - Pat Ford to Midpoint		2	1	10	4	4	0	1	1	5	3	0	0		0	N/A		N/A	
R3 - George Allen to Alreds		1	0	1	0	3	2	1	0	8	1	3	0		0	N/A		N/A	
R4 - Townsend Gulch to George Allen		0	0	4	6	0	1	0	3	0	1	0	5			5	N/A		
R5 - Bridge Flat to Townsend Gulch		1	0	2	0	3	9	3	0	2	0	0	4		0	N/A			
R6 - CDFG Weir to Bridge Flat		2	2	0	4	6	17	5	nd		4	0			nd	nd	N/A	N/A	
R7 - USGS Gauge to CDFG Weir		0	5		6	9	14	6	0	0		1			0				
R8 - Meamber Bridge to USGS Gauge		28	13		65	68	ns^	25	8	5	2	10	6		16	N/A	N/A	N/A	N/A
R12 - Sweezy to Eller Lane		4	1		9	12	16	15											
R13 - Horn Lane to Sweezy		0	3		25	22	36	50	50										
R14 - Youngs Dam to Horn Lane		0	6	10	7	28	61	86	97	107	65		88		100	93			
R15 - Fay Lane to Youngs Dam			6	10	14	6	61	69	89	104	101	84	84			63			

*nd = no data (surveys performed, but datasheets missing)
*ns^ = no survey for redds while performing mid-season GPS

Scott River Tributary Surveys

Tributary	Date	Redds	Chinook	Steelhead
Boulder Creek (SF Scott River)	Nov-22	0	0	0
SF Scott River	Nov-23	0	0	0

Scott River (Live) Chinook Observations

Reach	Date																		
	Oct-10	Oct-13	Oct-17	Oct-20	Oct-24	Oct-27	Oct-31	Nov-03	Nov-07	Nov-10	Nov-14	Nov-17	Nov-21	Nov-24	Nov-28	Dec-01	Dec-08	Dec-12	Dec-19
R1 - Midpoint to Confluence	Holiday	44	77	224	178	63	106	120	54	41	5	11	6	Holiday	0	1		0	
R2 - Pat Ford to Midpoint		33	9	41	24	82	53	37	33	30	18	40	4		4	1		0	
R3 - George Allen to Alreds		0	7	10	nd	13	20	2	18	15	30	11	5		1	0		0	
R4 - Townsend Gulch to George Allen		4	12	15	36	48	40	54	14	26	45	20	21			nd	0		
R5 - Bridge Flat to Townsend Gulch		6	23	10	40	10	44	25	6	30	23	8	1		4	2			
R6 - CDFG Weir to Bridge Flat		83	42	88	52	57	44	39	nd		15	5			nd	nd	0	0	
R7 - USGS Gauge to CDFG Weir		39	58		44	110	72	83	20	17		8			4				
R8 - Meamber Bridge to USGS Gauge		158	303		317	449	250	197	137	225	129	126	76		23	14	5	3	0
R12 - Sweezy to Eller Lane		15	16		25	59	188	52											
R13 - Horn Lane to Sweezy					82	91		192	135										
R14 - Youngs Dam to Horn Lane		4	36	61	83	89	176	139	133	141	52		31		5	1			
R15 - Fay Lane to Youngs Dam			63	78	104	122	142	138	133	114	89	43	7			0			

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

Scott River (Live) Steelhead Observations

Reach	Date																		
	Oct-10	Oct-13	Oct-17	Oct-20	Oct-24	Oct-27	Oct-31	Nov-03	Nov-07	Nov-10	Nov-14	Nov-17	Nov-21	Nov-24	Nov-28	Dec-01	Dec-08	Dec-12	Dec-19
R1 - Midpoint to Confluence	Holiday	16	0	0	nd	0	0	1	0	0	0	0	0	Holiday	0	0		0	
R2 - Pat Ford to Midpoint		0	0	0	nd	0	0	0	0	0	nd	0	0		0	0		0	
R3 - George Allen to Alreds		nd	0	0	nd	0	0	0	0	0	1	0	0		0	0		0	
R4 - Townsend Gulch to George Allen		nd	0	0	nd	0	0	0	0	0	0	0	0			0	0		
R5 - Bridge Flat to Townsend Gulch		0	4	0	0	0	0	1	0	4	nd	1	0		0	0			
R6 - CDFG Weir to Bridge Flat		12	0	0	0	0	3	0	nd		nd	0			nd	nd	0	0	
R7 - USGS Gauge to CDFG Weir		0	1		0	0	0	5	0	0		0			0				
R8 - Meamber Bridge to USGS Gauge		0	0		nd	nd	nd	0	0	0	0	0	1		0	0	0	0	0
R12 - Sweezy to Eller Lane		0	6		nd	0	0	0											
R13 - Horn Lane to Sweezy					nd	0		0	0										
R14 - Youngs Dam to Horn Lane		0	0	0	0	0	0	0	0	0	0		0		0	0			
R15 - Fay Lane to Youngs Dam			0	2	0	0	0	0	0	0	0	0	0			0			

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

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.

Salmon River Data

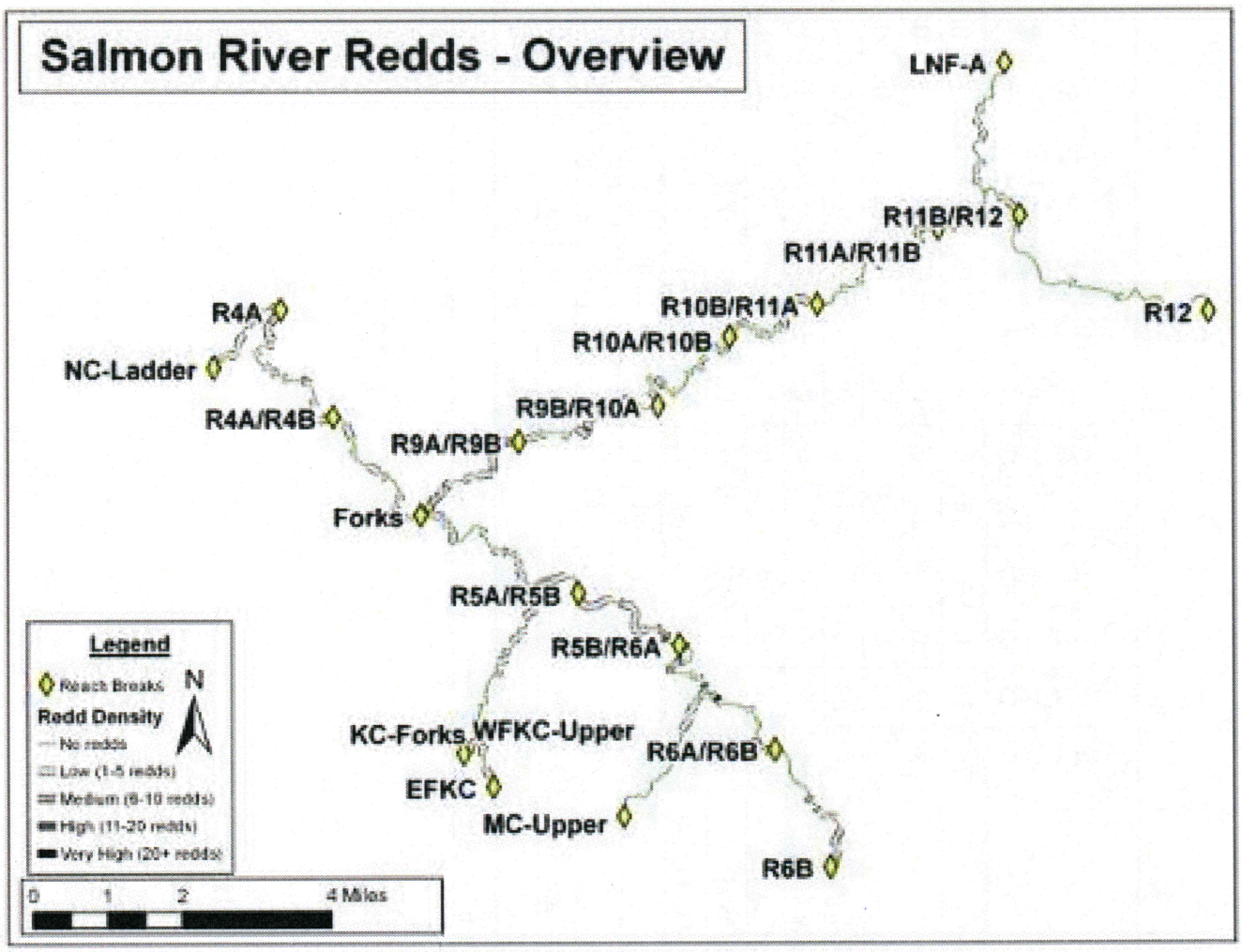


Figure D-SA1. General overview of redd distribution and density for Salmon River surveys. Map is of survey area only and does not include roads, hillslopes, or other landmarks.

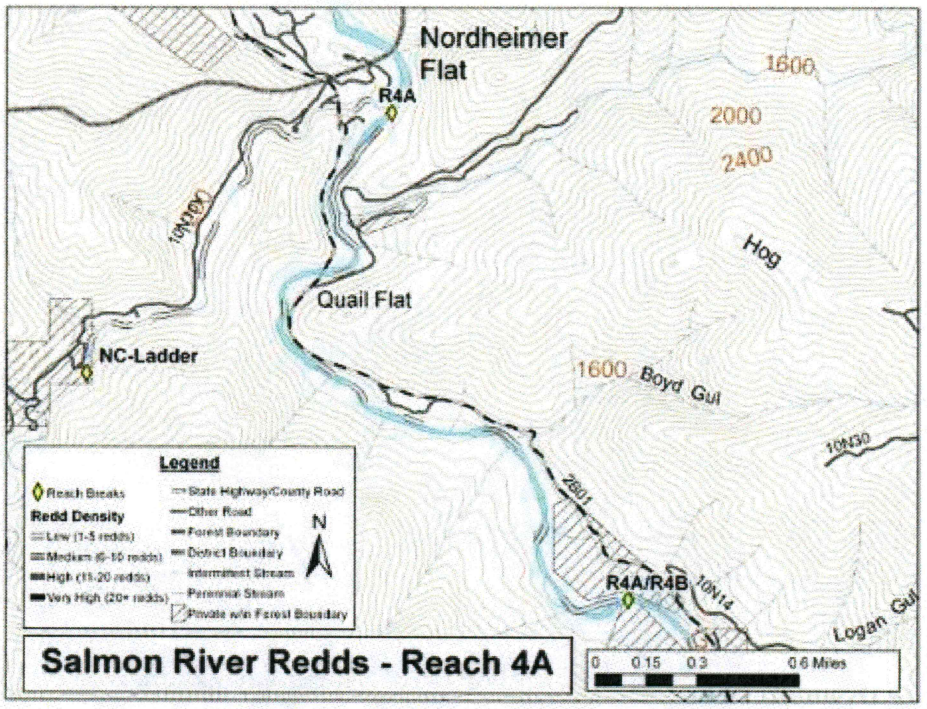


Figure D-SA2. Redd distribution and density for mainstem Salmon River, Reach 4A.

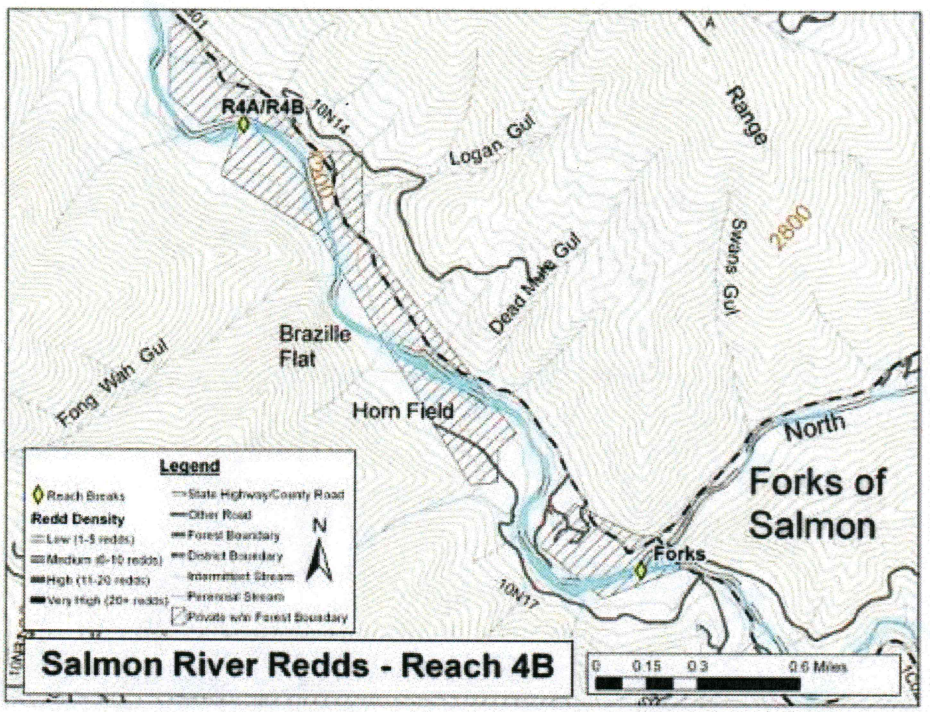


Figure D-SA3. Redd distribution and density for mainstem Salmon River, Reach 4B.

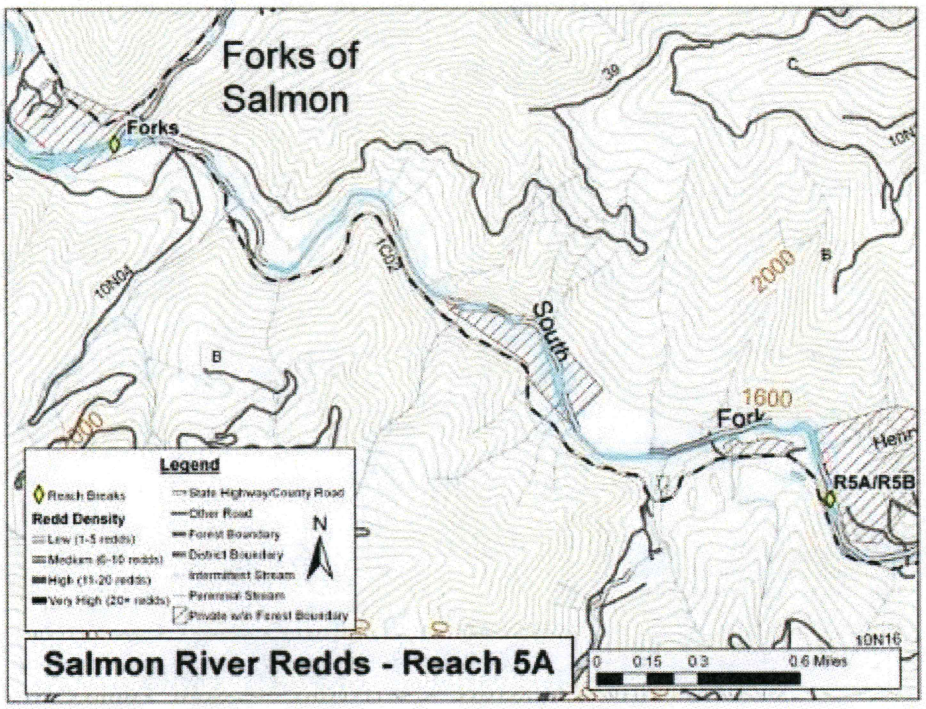


Figure D-SA4. Redd distribution and density for SF Salmon River, Reach 5A.

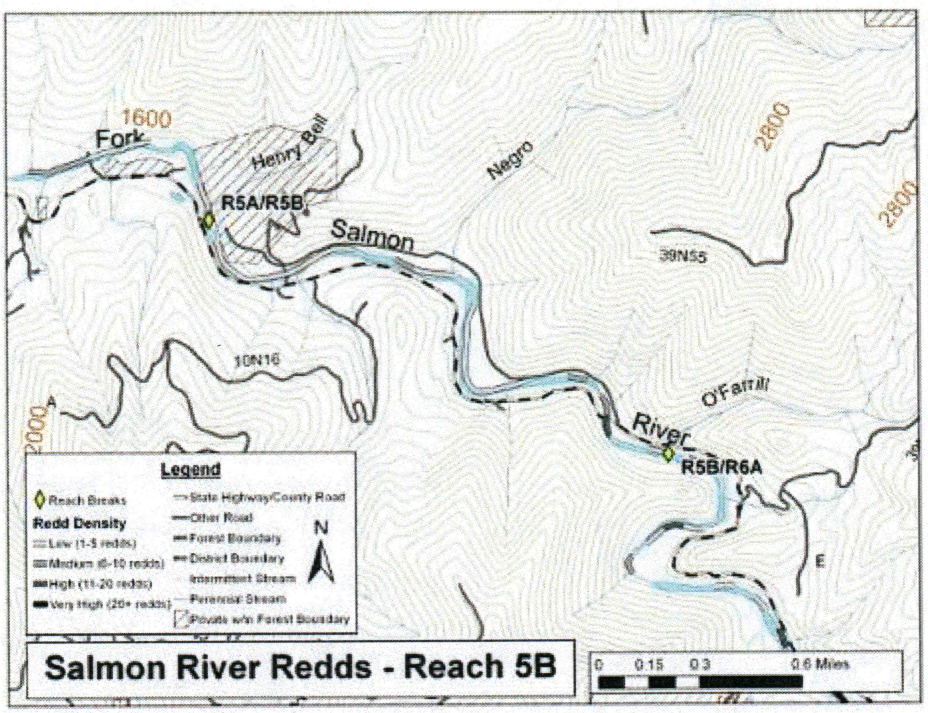


Figure D-SA5. Redd distribution and density for SF Salmon River, Reach 5B.

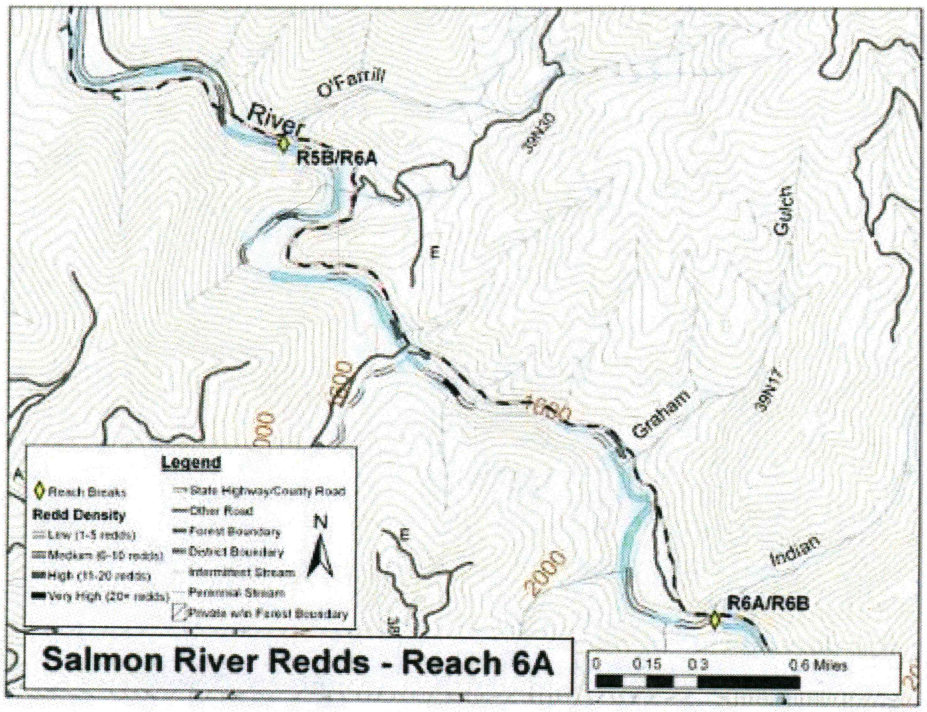


Figure D-SA6. Redd distribution and density for SF Salmon River, Reach 6A.

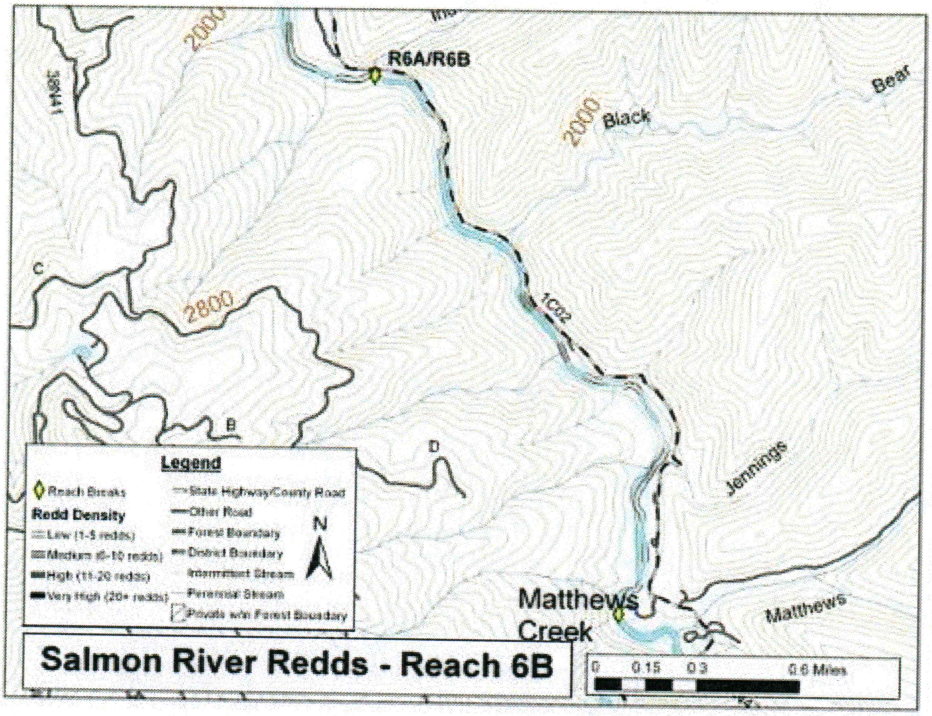


Figure D-SA7. Redd distribution and density for SF Salmon River, Reach 6B.

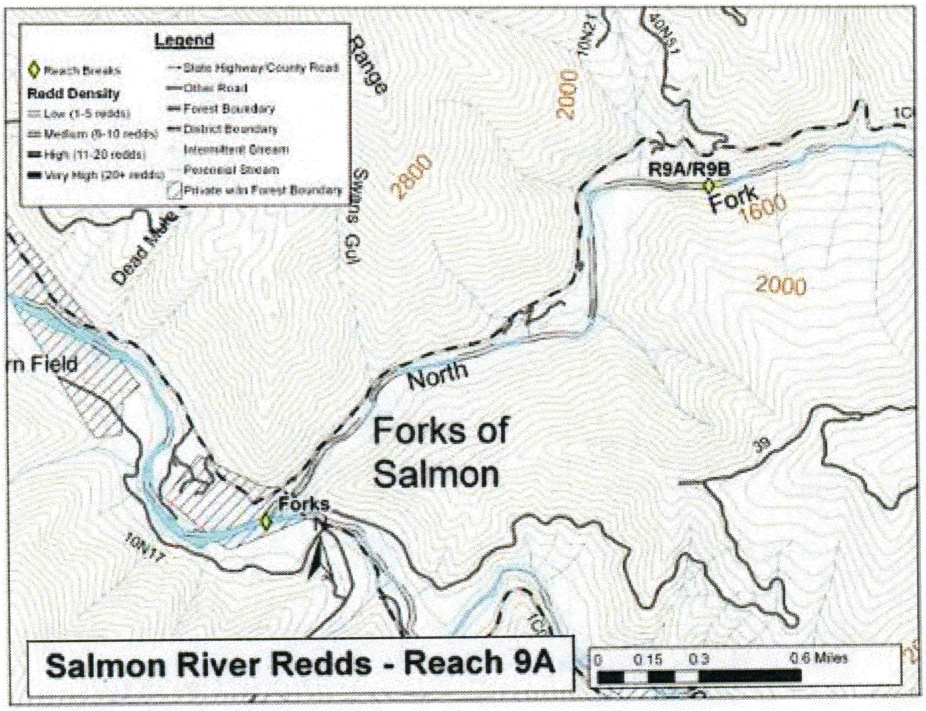


Figure D-SA8. Redd distribution and density for NF Salmon River, Reach 9A.

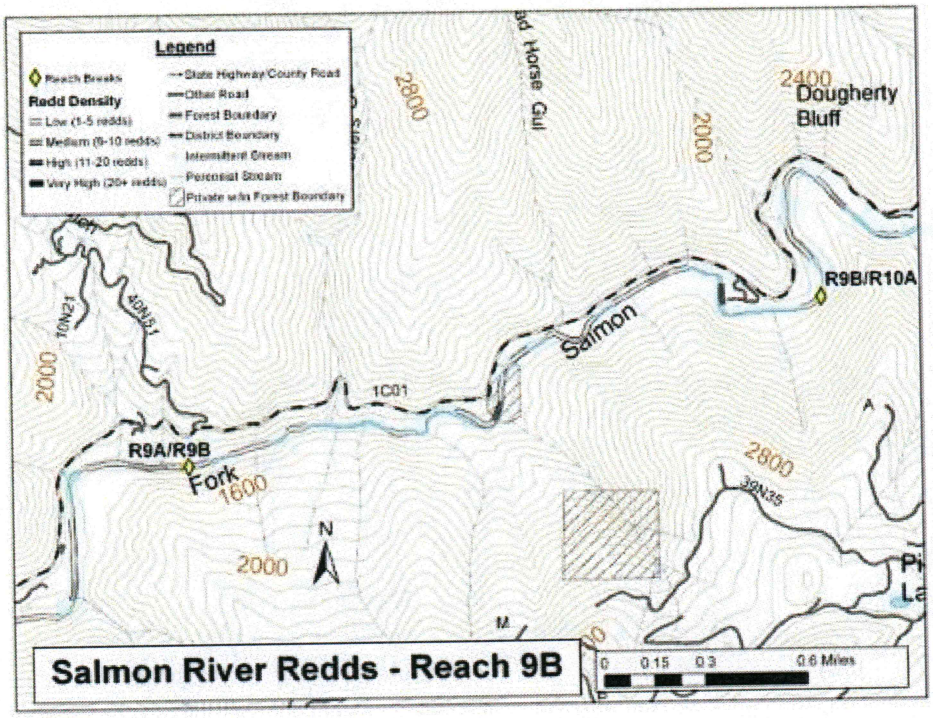


Figure D-SA9. Redd distribution and density for NF Salmon River, Reach 9B.

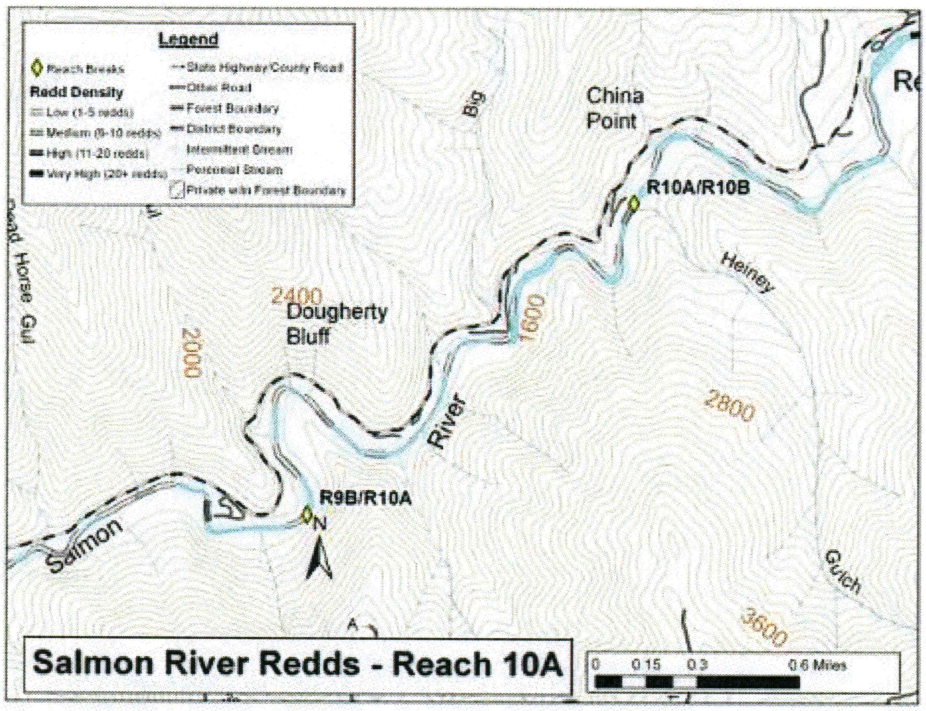


Figure D-SA10. Redd distribution and density for NF Salmon River, Reach 10A.

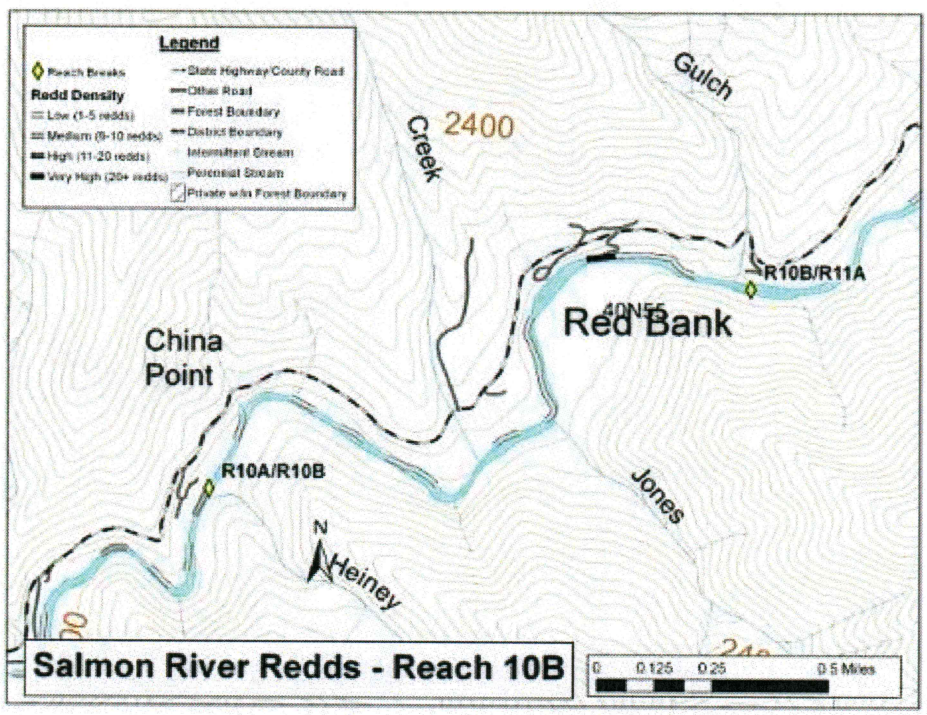


Figure D-SA11. Redd distribution and density for NF Salmon River, Reach 10B.

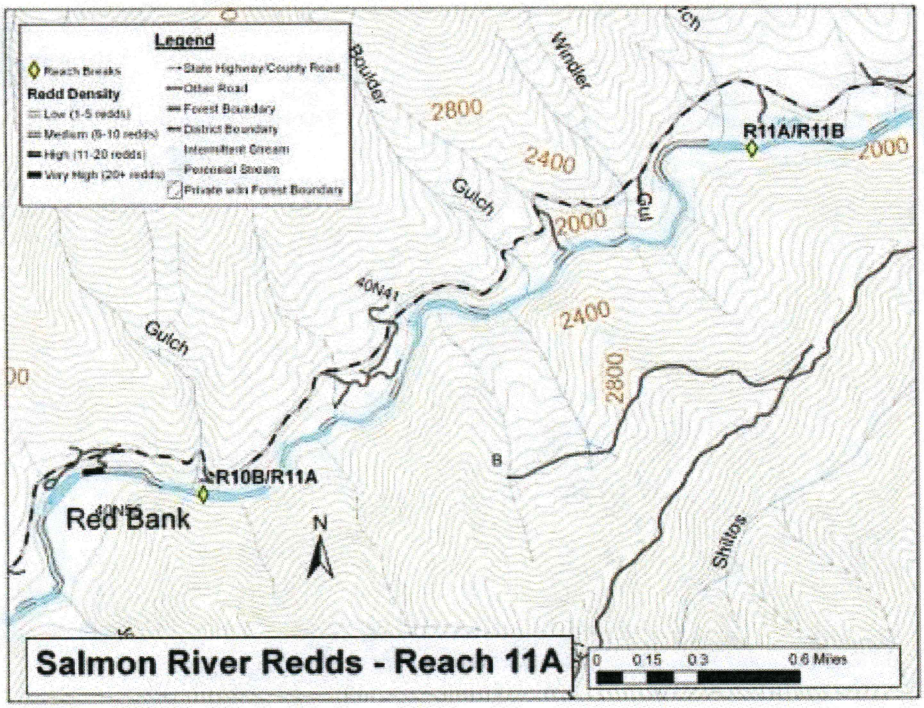


Figure D-SA12. Redd distribution and density for NF Salmon River, Reach 11A.

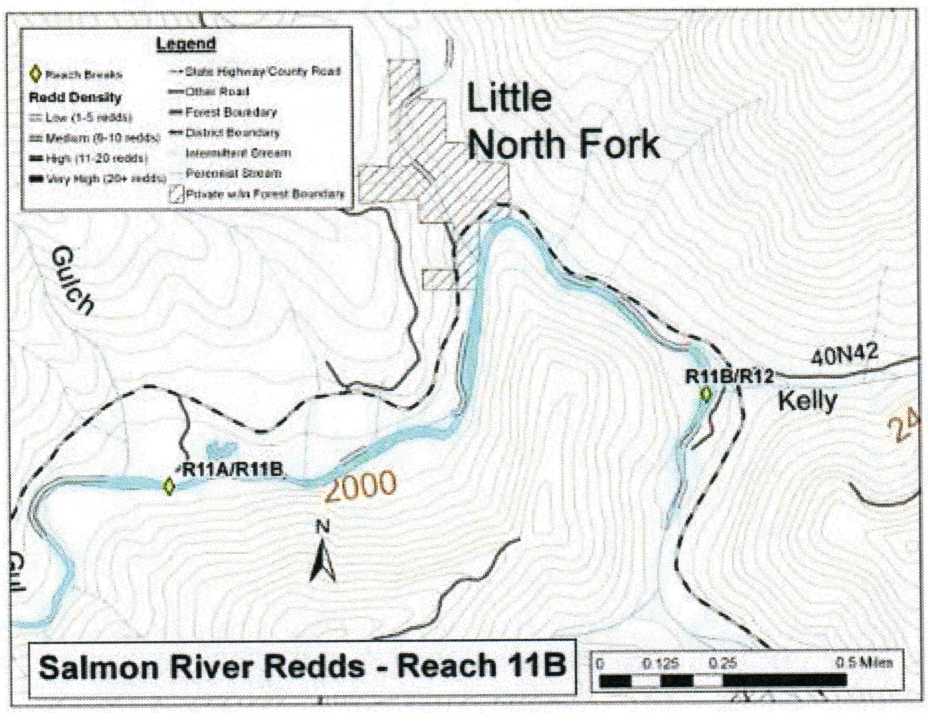


Figure D-SA13. Redd distribution and density for NF Salmon River, Reach 11B.

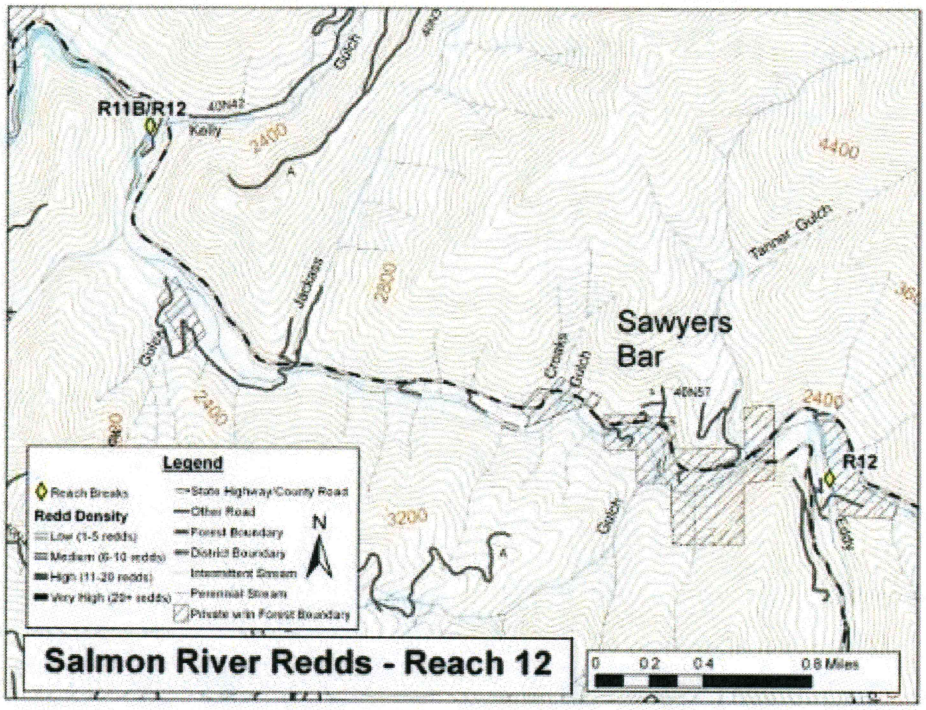


Figure D-SA13. Redd distribution and density for NF Salmon River, Reach 12.

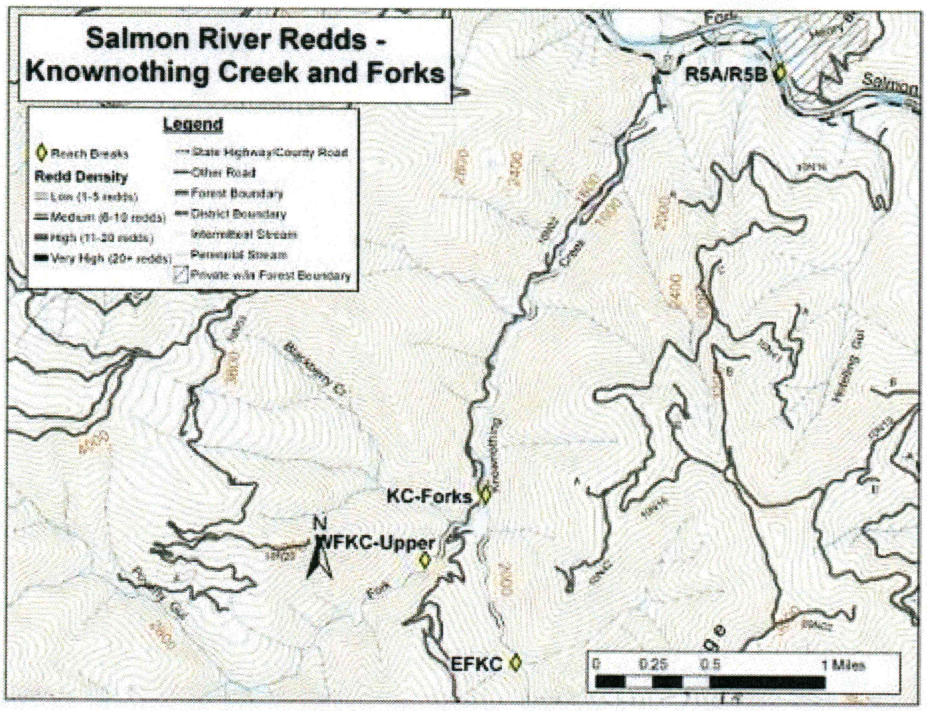


Figure D-SA14. Redd distribution and density for Knownothing Creek.

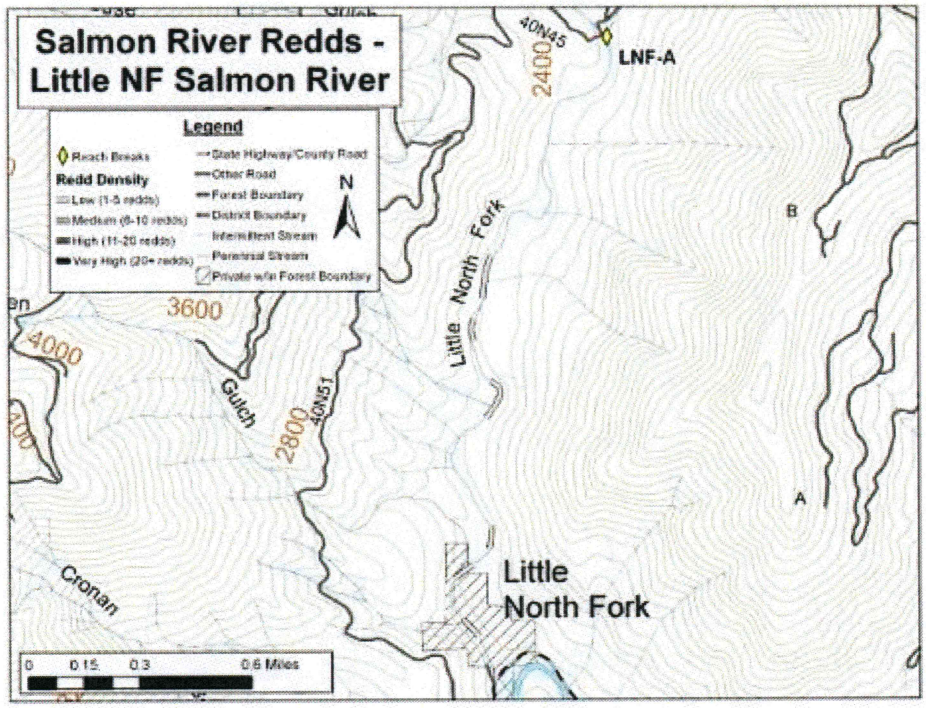


Figure D-SA15. Redd distribution and density for Little North Fork Salmon River.

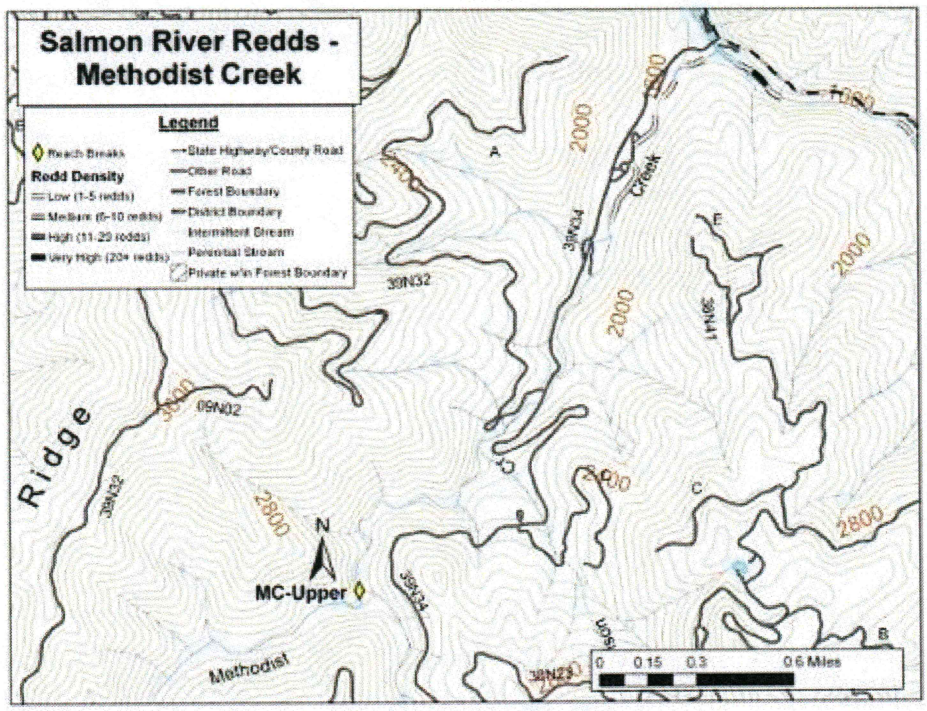


Figure D-SA16. Redd distribution and density for Methodist Creek.

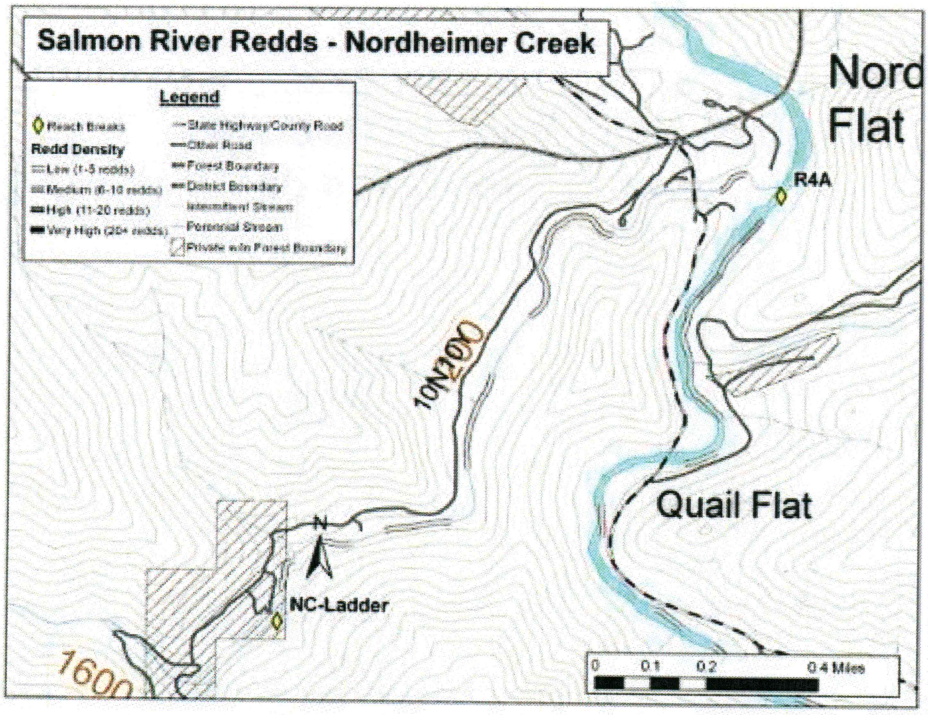


Figure D-SA17. Redd distribution and density for Nordheimer Creek.

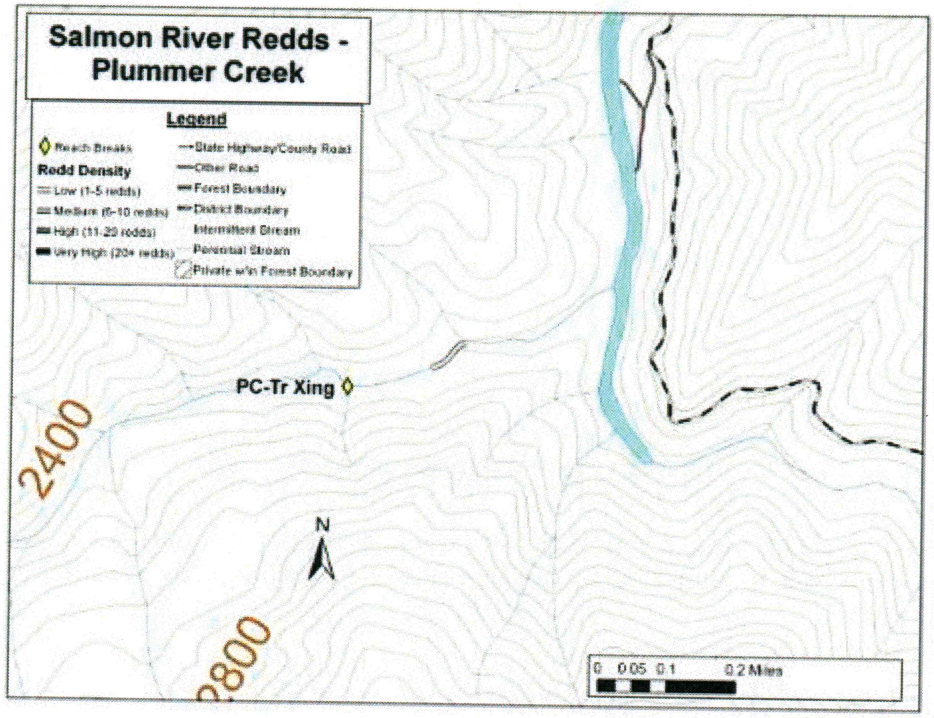


Figure D-SA18. Redd distribution and density for Plummer Creek.

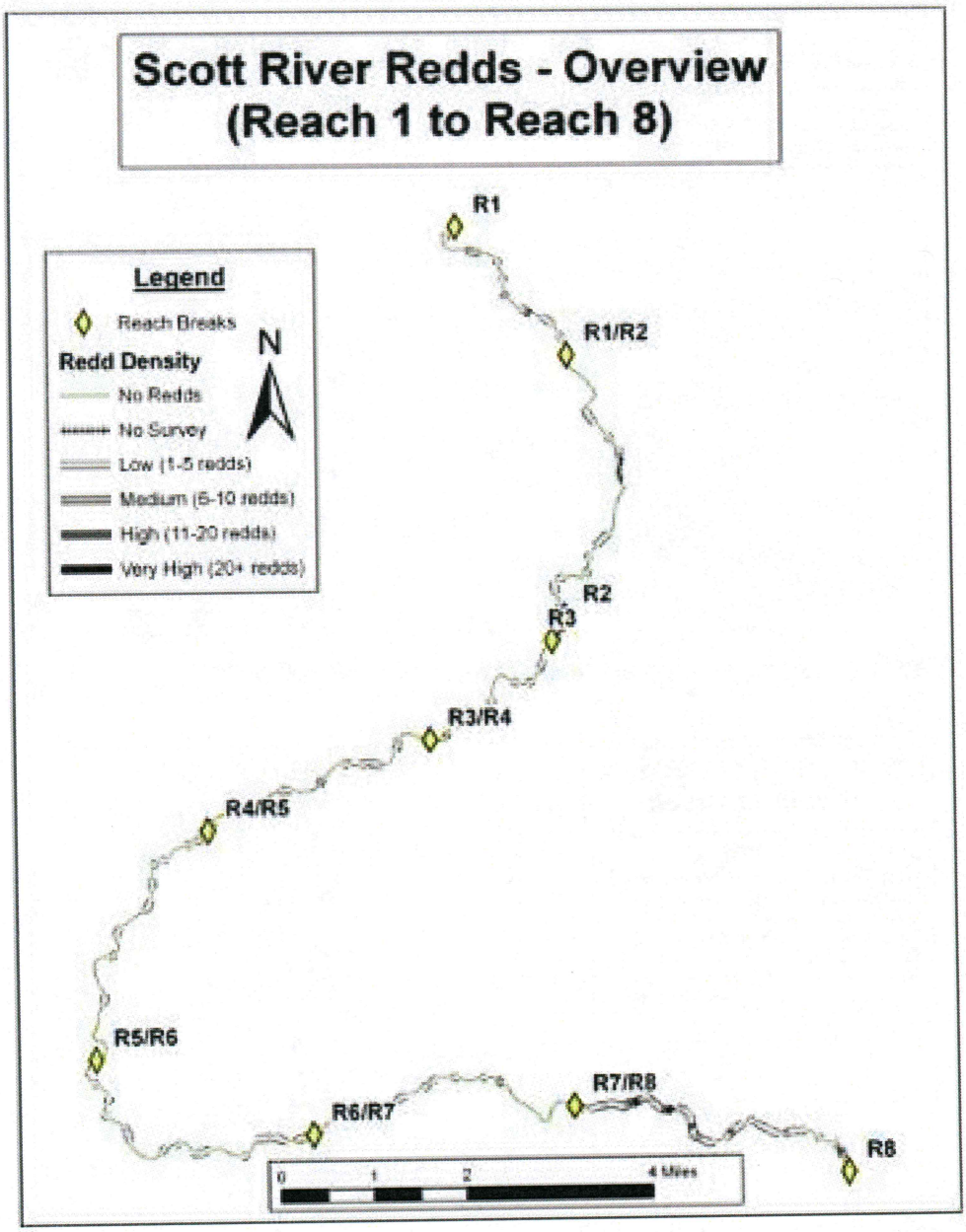


Figure D-SC1. General overview of redd distribution and density for Scott River surveys, Reach 1 through Reach 8. Map is of survey area only and does not include roads, hillslopes, or other landmarks.

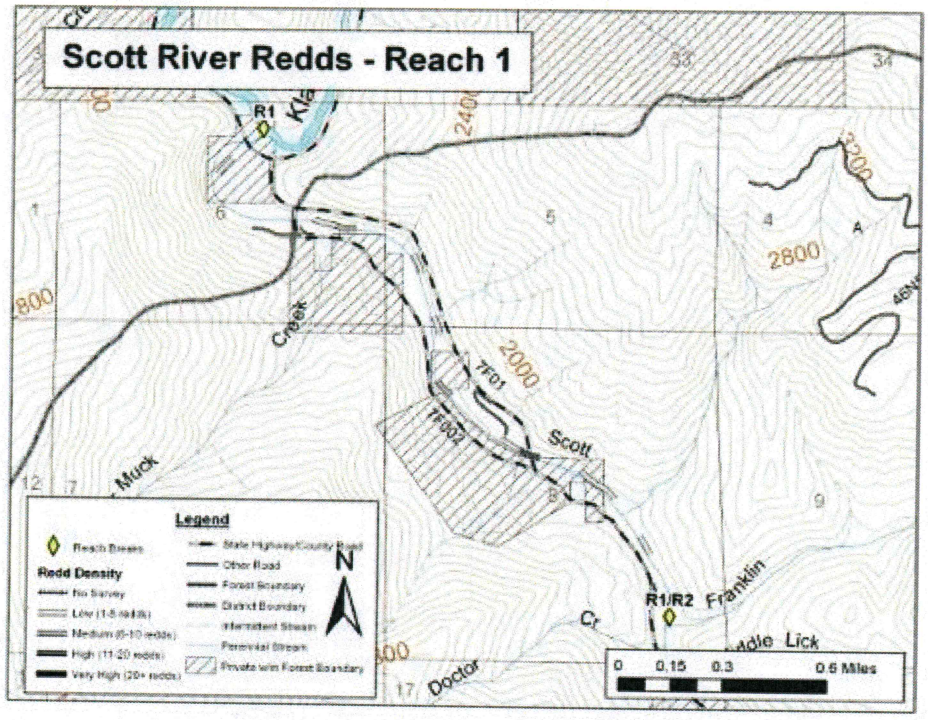


Figure D-SC2. Redd distribution and density for Scott River, Reach 1.

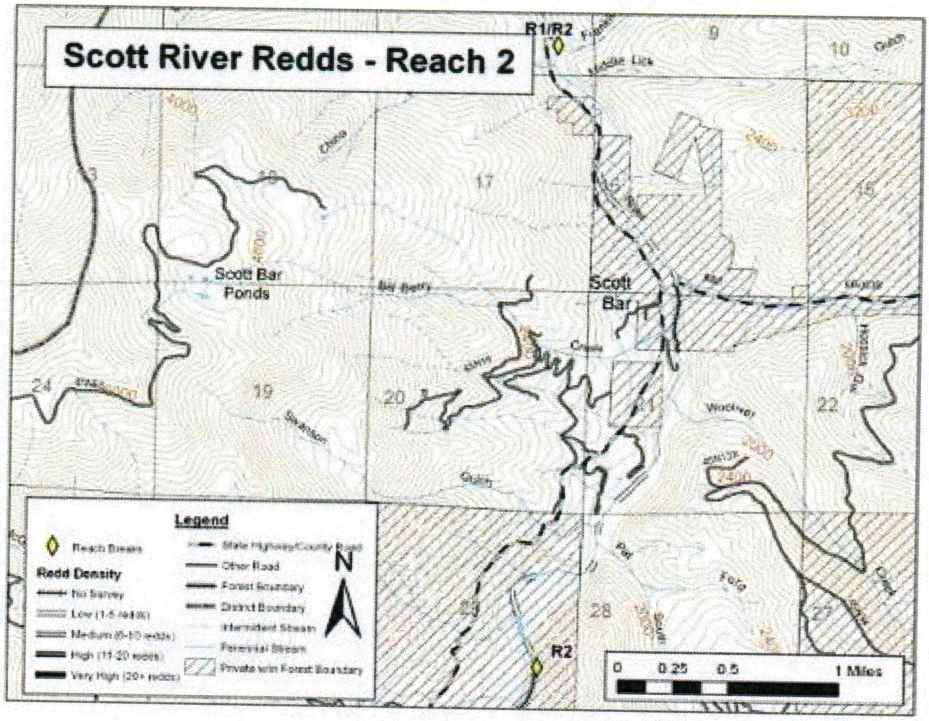


Figure D-SC3. Redd distribution and density for Scott River, Reach 2.

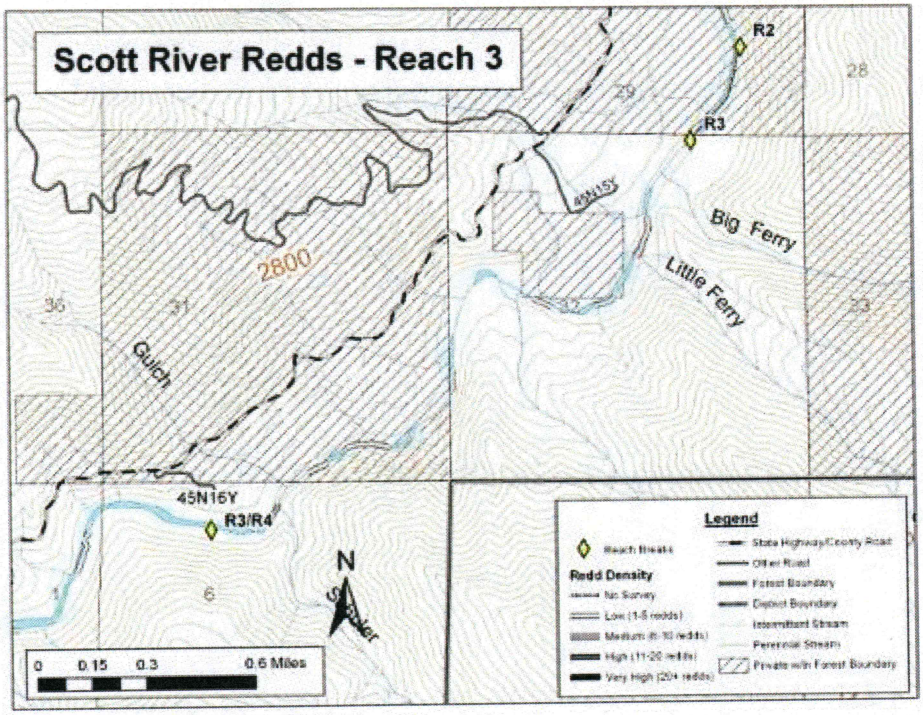


Figure D-SC4. Redd distribution and density for Scott River, Reach 3.

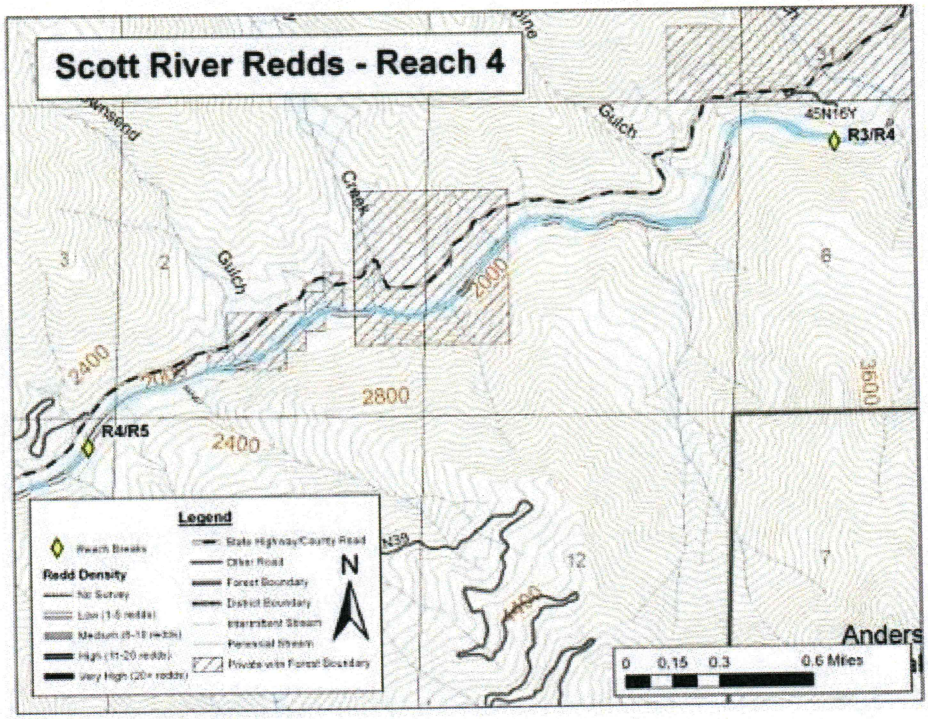


Figure D-SC5. Redd distribution and density for Scott River, Reach 4.

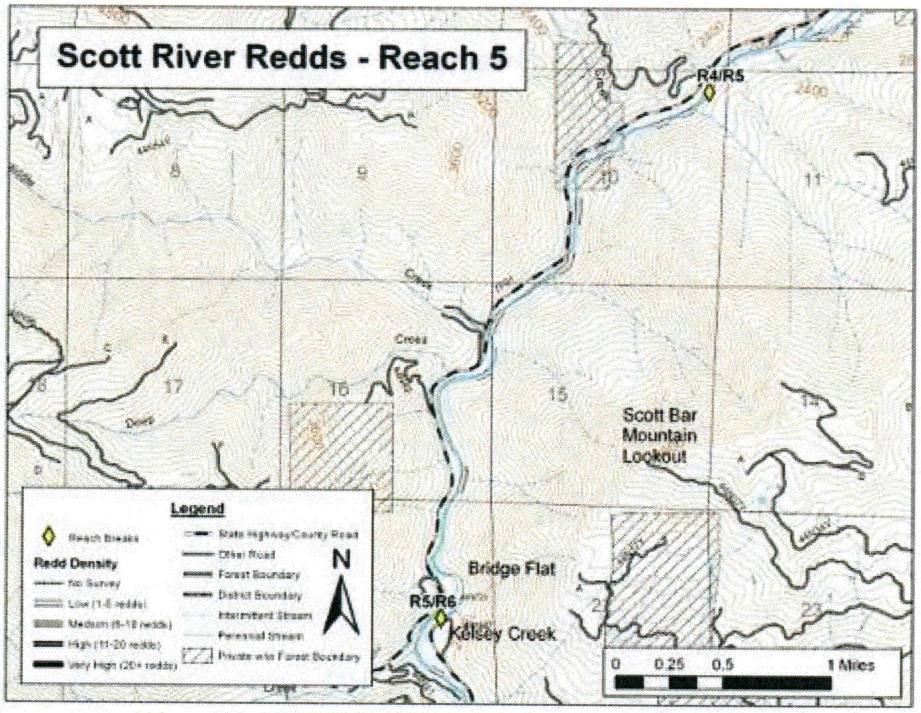


Figure D-SC6. Redd distribution and density for Scott River, Reach 5.

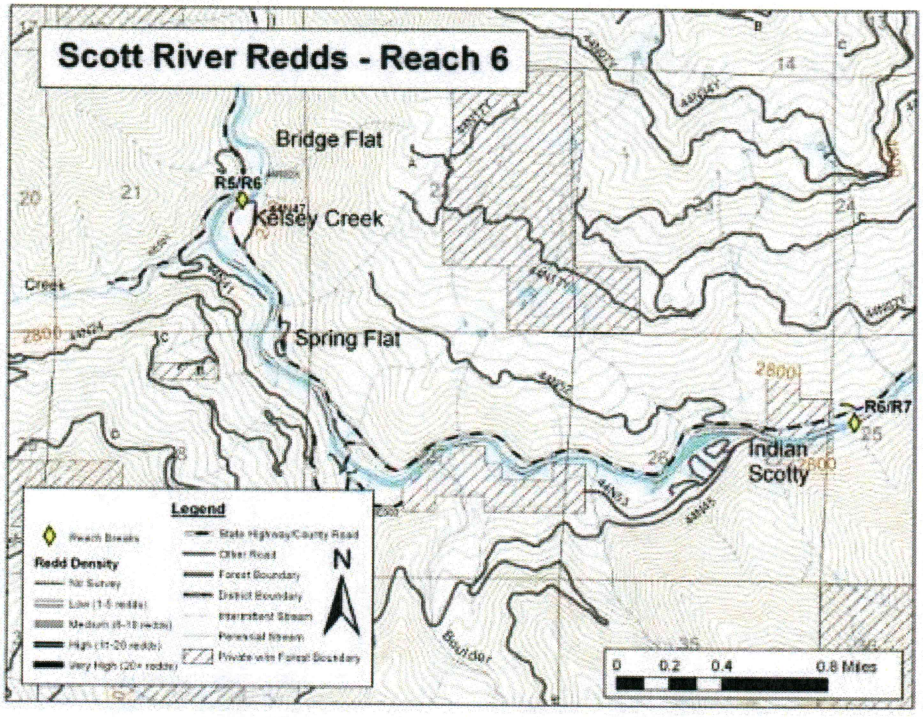


Figure D-SC7. Redd distribution and density for Scott River, Reach 6.

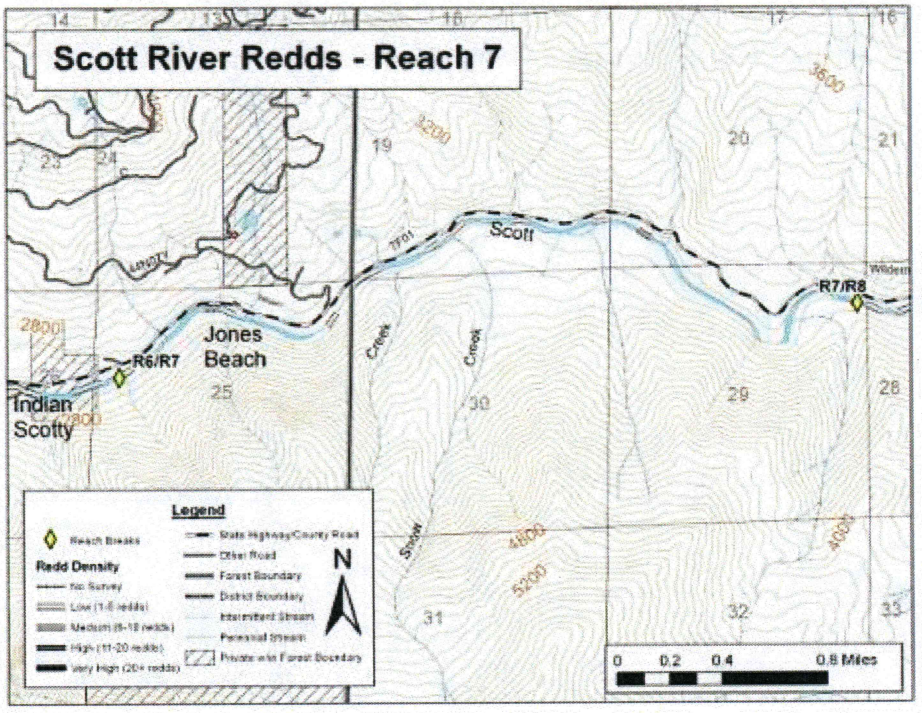


Figure D-SC8. Redd distribution and density for Scott River, Reach 7.

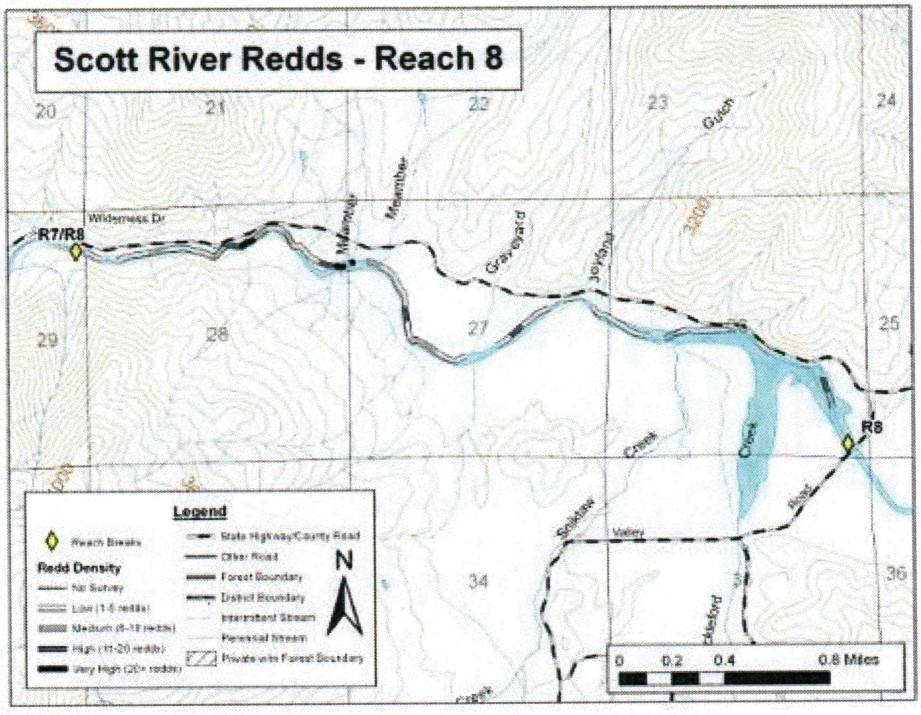


Figure D-SC9. Redd distribution and density for Scott River, Reach 8.

Appendix E – List of Cooperators and Contributions

Federal
U.S. Fish and Wildlife Service

U.S. Forest Service
-Klamath National Forest
-Six Rivers National Forest

State
California Department of Fish and Game
-Arcata Office
-Yreka Office

Tribal
Karuk Tribe
Yurok Tribe
Quartz Valley Indian Reservation

Other
Local volunteers
Forks of Salmon School District
Mid-Klamath Watershed Council
Northern California Resource Center
Salmon River Restoration Council
Scott Valley Resource Conservation District