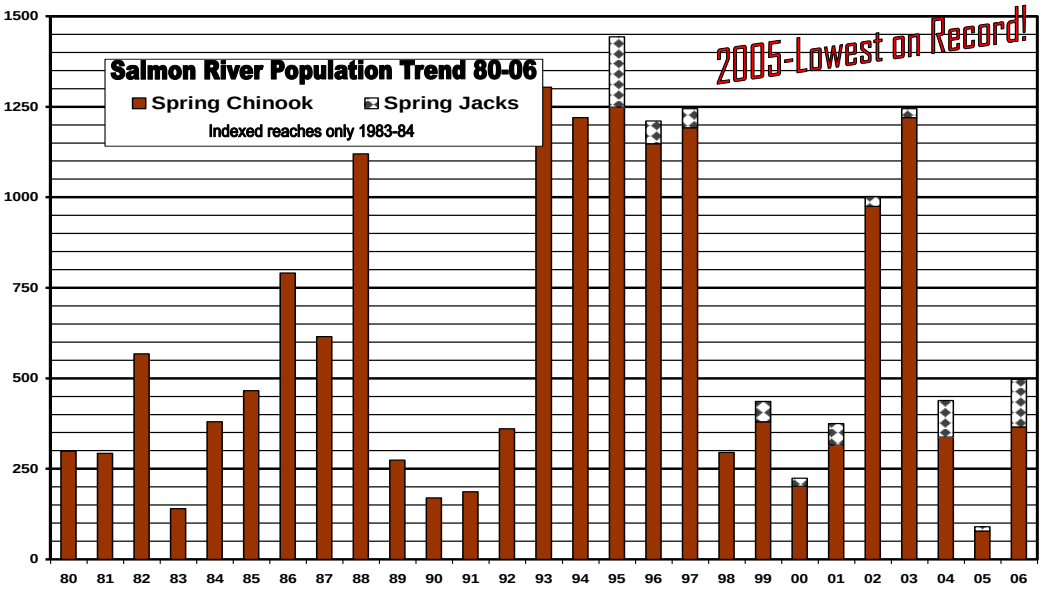
Salmon River Weak Stocks Assessment Program 2006

Final Report
Grant # P0510314
June 1, 2006 through September 30, 2007

Salmon River Restoration Council



* a population estimate was used in 2006 due to wildfire restrictions

Underwater photo of a Chinook spawning near Forks of Salmon, taken by SRRC

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I) Executive Summary

The Salmon River Restoration Council (SRRC) was funded by the California Department of Fish and Game (CDFG) to monitor and assess fish species within the Salmon River referred to as "weak stocks". The CDFG Coho Recovery Strategy, Klamath Fisheries Management Council, the Klamath Fisheries Task Force (TF), and the National Research Council all have identified the need for further research related to abundance, habitat requirements, and limiting factors for weak stocks in the Salmon River.

Through the Salmon River Community Weak Stocks Assessment program, the SRRC has provided information to regulating agencies that is critical to the survival of the diverse fisheries occurring in the Salmon River subbasin. This program continues to provide baseline data, as well as expanding data sets for the under studied species of the Klamath and Salmon Rivers.

The program has focused on the assessment of freshwater life stages of "weak stocks" species, such as spring Chinook, coho salmon and steelhead trout. The program has identified the presence and extent of presence of these species within the basin. The program also provides population trend data as well as biological data that are used in management, further research, and restoration projects.

The Salmon River Restoration Council (SRRC) has performed the tasks identified in our cooperative agreement for the Salmon River Community Weak Stocks Assessment Program for fiscal year 2006 (FY 06). In the Salmon River subbasin the SRRC has continued to provide leadership in heightening stakeholder awareness and enlisting support from many of the stakeholders to help recover the anadromous fisheries and their related resources. The SRRC's mission is to assess, protect, restore, and maintain the Salmon River ecosystems, focusing on the restoration of the anadromous fisheries resources.

Tasks in this project have been performed in cooperation with the California Dept. of Fish and Game (CDFG), U.S. Fish and Wildlife Service (USFWS), U.S. Forest Service (USFS), Karuk Tribe, Yurok Tribe, and the Klamath Salmon Anglers and Guides Association (KSAGA). This collaborative approach has been a major component of the program, providing technical oversight, as well as on the ground assistance.

This project addresses and seeks to fill data gaps for weak stocks. Providing this kind of information may prove invaluable to the recovery of the fisheries resource as cited by the National Research Council report Threatened and Endangered Species of the Klamath River (2003).

> "A small but growing stakeholder group is cooperating with state and federal agencies and tribal interests in the Salmon River basin. High priority has been placed on monitoring of salmon and steelhead runs, improvements in riparian habitat, management of fuels, and assessment and rehabilitation of logging roads (Elder et al. 2002). Given proper funding and agency participation, these efforts may be sufficient to improve conditions for coho and other salmon and steelhead in the watershed."

II) Background

The Salmon River Restoration Council (SRRC) has implemented and completed the tasks and projects set forth in the Salmon River Community Weak Stocks Assessment Program (Weak Stocks Program). The tasks in this program involve monitoring species distribution and life history, including identification of selected habitat requirements for weak stocks. This type of data is currently lacking throughout the Klamath basin. Through this program, SRRC has provided critical data that is otherwise unavailable or unobtainable to research projects in the Pacific Northwest.

The Salmon River's year round clarity and SRRC's close proximity to survey areas has enabled us to provide sound and efficient data sets that are rare and valued by fisheries managers. SRRC's winter and summer steelhead surveys are a prime example of this. SRRC provides CDFG with the only trend data set for the entire Klamath Basin. This data is then used by the California Fish and Game Commission to set regulations on the take of steelhead for Northern California and Southern Oregon.

Other examples of the value of weak stocks program data are the identification of spring Chinook holding or refugia areas and juvenile coho rearing areas. The identification of these sensitive areas has lead to protection from disturbance of the large scale, dredge mining operations occurring on the lower Salmon River.

Through the weak stocks program, the SRRC has collected data on life history, population size, range and health of target species. Fisheries technicians from SRRC, tribes, agencies, and trained community volunteers have collected the data. The Karuk Tribe, CDFG, USFS, National Oceanic and Atmospheric Administration (NOAA) Fisheries, and USFWS have provided technical oversight and review. The (KSAGA), and the Salmon River Spring Chinook Voluntary Recovery Group have acted through this project to further coordination between stakeholders in the recovery of anadromous fisheries. These groups and others, such as the TF Technical Work Group and the Klamath Basin Fish Health Assessment Team, have directed the goals of this project and will be involved in its review and further development.

The overwhelming support for the program within the surrounding community along with increased support from agencies and tribes, has afforded us the ability to exceed the goals in many of the project tasks. Staff and community volunteers contributed $42,265.26 in program and administrative services and mileage. There were also operating expenses totaling $12,642.00 that were contributed. Expenditures for matching agreements during the period 06/01/2006 to 09/01/2007 were $12,228.07. In kind services and mileage of Federal agency, tribal and other non-state specialist are valued at $8,589.20 and the total in kind was **$77,356.36** more than double the match requirement. Please see Appendix J. for a detailed breakdown of expenditures and in kind by line item.

The monitoring and assessment projects in the program that have been completed through funding provided by the CDFG are discussed further in the project summaries, and tasks accomplishments sections of this report. Raw data sets and Global Information System (GIS) maps are also provided in spreadsheet format in the appendices of the report.

The SRRC tracks its restoration work in various ways such as: through the SRRC annual work plan development and review, restoration project reports, photo points, etc.

III) Task Accomplishments

During the 2006 fiscal year the SRRC performed all Tasks outlined in the Statement of Work, Exhibit A of this agreement, including doubling its commitment for In-Kind Services. The participation of the CA Dept. of Fish & Game funds in the facilitation of workshops has been acknowledged on signs, flyers, written communications, event notices, our web site, and in SRRC presentations. Any habitat improvements done under the terms of this contract (#P0510314) have been done in accordance with techniques described in the *California Salmonid Stream Habitat Restoration Manual* and have been pre- approved by the Department's Project Manager. The identification of activities associated with each Task is provided in the following text for Tasks 1 through 5, including Appendices Items. Some of the tasks were also supported by the Klamath Task Force, Karuk Tribe and US Forest Service, as well as by private contributions.

Task 1: Conduct or participate under the oversight and assistance of U.S. Forest Service and Karuk Tribal biologists, in the anadromous salmonid fisheries and water quality surveys (listed below) throughout the Salmon River Hydrologic Area (HA) of the Klamath River Hydrologic Unit. The Grantee will also develop and coordinate community volunteer participation in these surveys.

- Salmon River Fish Work Group Meetings: The SRRC held 4 fisheries monitoring coordination meetings. Attendees included, USFS, CDFG, USFWS, Karuk Hoopa and Yurok tribes, North Coast Regional Water Quality Control Board, KSAGA, Mid Klamath Watershed Council, NOAA Fisheries, Siskiyou and Humboldt Board of Supervisors, Humboldt State University and, community members. The compiled notes from the meetings and attendees lists are included in appendix A of this report.

- The Salmon River spring Chinook Voluntary Recovery Group: During the project period the SRRC held three Voluntary Spring Chinook Recovery Group meetings. Attendees included U.S.F.S., C.D.F.G., N.C.R.W.Q.C.B., the Karuk, Hoopa and Yurok Tribes, U.S.F.W.S., N.O.A.A. Fisheries, U.S.G.S., Oregon dept. of Fish and Wildlife, Klamath Waterkeeper, H.S.U., U.S. Bureau of Reclamation, Salmonid Restoration Federation, Kier and Assoc., N.R.C.S, SRRC and members of the community. At the most recent meeting, April 10, 2007 the group assessed the utility of the Nature Conservancy's, Conservation Planning Workbook for spring Chinook restoration in the Klamath basin, as well as the development of conservation objectives for spring run Chinook in the Klamath Basin. Thirty-five agency and community members attended the meeting. Detailed notes and action items from the meetings are included in appendix A of the report. The group also acts to coordinate Salmon River spring Chinook research and has developed a limiting factors analysis for the species available online at www.srrc.org.

Task 2, 3, 4, and 5: To conduct Fish Health Monitoring and assessment in the Salmon and Klamath River Basin. SRRC will conduct spring Chinook salmon and summer steelhead population snorkel surveys to determine adult upstream run timing and summer holding locations in the Salmon River basin. Conduct spawning, carcass, and redd surveys throughout the basin for spring Chinook salmon, coho salmon, and winter steelhead. The presence of juvenile and adult salmonids observed during snorkel and spawning surveys will be noted. Information on species, life stage, number, location, and date and time of observation will be recorded.

- Fish Health Monitoring: Through this program the SRRC enlisted 64 volunteer hours towards assessment of fish health in the Klamath and Salmon River basin. Fish health research mainly occurred in conjunction with other surveys. Research and monitoring projects included spring Chinook disease assessments, participation in the Klamath Fish Health Assessment Team, including hosting a fish kill response training at Nordheimer Campground, in the spring of 2006.

- Spring Chinook: Through this program the SRRC enlisted 465 volunteer hours towards the assessment and protection of spring Chinook. Research and monitoring projects included spring Chinook run timing assessments, the Salmon River Cooperative Spring Chinook Population Dives, carcass and redd surveys, disease and mortality assessments, refugia monitoring and genetics and otolith research.

- Winter and Summer Steelhead: Through this program the SRRC enlisted 256 volunteer hours towards the assessment and protection of winter steelhead. Research and monitoring projects included, winter steelhead spawning and redd surveys, and the Klamath Salmon Anglers and Guides Association Steelhead Monitoring Program. The CDFG Steelhead Research and Monitoring Program provided technical and field assistance.

- Coho Salmon: Through this program the SRRC enlisted 296 volunteer hours towards the assessment and protection of coho within the Salmon River. Research and monitoring projects included Salmon River juvenile coho presence / absence surveys and Salmon River adult coho spawning and redd surveys completed in cooperation with the USFS and CDFG.

Task 5: Water quality monitoring will include water temperature, turbidity, and flow measurements made at six key sites spread out in the Salmon River Basin.

- The SRRC placed temperature loggers in key refugia areas for spring Chinook and juvenile salmonids; loggers were also placed in the main river channel near refugia areas. Spring Chinook refugia areas were monitored throughout the summer for fish density and correlations between temperature and density. This data will be included in a report soon to be released by the Karuk Tribe and SRRC. Flow measurements were taken for tributaries where spring Chinook or

juvenile salmonids had congregated. Turbidity measurements were made at these key sites and are expressed in terms of water clarity in the summary discussion.

IV) Summary Discussion

A. Methodology

Task 1: Conduct or participate under the oversight and assistance of U.S. Forest Service and Karuk Tribal biologists, in the anadromous salmonid fisheries and water quality surveys (listed below) throughout the Salmon River Hydrologic Area (HA) of the Klamath River Hydrologic Unit. The Grantee will also develop and coordinate community volunteer participation in these surveys.

Tasks and objectives of the Salmon River Weak Stocks Program were performed in cooperation with the aforementioned agencies, tribes, and organizations. The CDFG, USFS, and Karuk Tribal Biologists provided oversight. Nat Pennington, Fisheries Program Coordinator for SRRC directed on-the-ground monitoring projects and also serves to document the programs activities.

SRRC held 4 trainings to increase community knowledge of fisheries monitoring activities within the basin. Training workshops were offered for topics such as winter steelhead surveys, juvenile salmonid identification, spring Chinook and summer steelhead dives, and coho surveys and identification.

SRRC used protocol from CDFG and USFWS for sampling and monitoring activities. Example data sheets and survey maps are included in the appendices of this document. Survey crews consisted of SRRC fisheries technicians, and Karuk Tribal biologists and fisheries technicians. Most surveys were completed with gear either provided by this project or as in kind donation from SRRC. Publications and mailers were used to coordinate with the community and agencies. We have included and example of a flyer for the Winter Steelhead surveys in appendix B. of this report.

Winter steelhead surveys in major tributaries of the Salmon River were performed by SRRC, Karuk Tribe, and USFS fisheries technicians from February – April 2007, and were in cooperation with CDFG. Data was recorded using CDFG protocol and GPS units provided by this project. Surveys were completed by snorkeling the river and walking streambeds looking for live steelhead, carcasses, and redds. Applicable data fields identified in the protocol included: numbers of fish observed, number of redds observed, location of fish and redds, redd length and width, habitat type, and temperature data.

Spring Chinook spawning surveys in the upper South and North Forks of the Salmon River were performed by SRRC, Karuk Tribe, and USFS fisheries technicians from September 15 – October 20, 2006, and were done in cooperation with CDFG. Data was recorded using CDFG protocol and GPS units provided by this project. Spawning surveys were completed by snorkeling the river and walking streambeds looking for live Chinook, carcasses and redds. The protocol was developed from the Klamath River

Cooperative Chinook Spawning and Carcass Surveys Protocol (CDFG). Several fields were added to this protocol including disease infection information, and GPS location of redds. These new fields were added out of a desire to better understand disease in Salmon River spring Chinook and its relationship to spawning success. Other data fields in the protocol included: numbers of fish observed, number of redds observed, location of fish and redds, redd length and width, habitat type, carcass fork length in mm., sex, scars, percent of eggs spawned, scale samples and temperature data. Two sets of scale samples were collected for each carcass when enough scales were available. These samples are analyzed by Al Olsen of the USFS and George Kautsky of the Klamath Fisheries Management Council and Hoopa Tribe and Information from scale analysis is used to classify fish length by age and is helpful in determining life history as well as cohort reconstruction and run size predictions. Scale and tissue samples have also been used by HSU Professors Dr. Andrew Kinziger and Dr. Amy Sprowles in genetic stock identification research.

Coho surveys were performed in suspected habitat by SRRC, Karuk Tribe, and USFS fisheries technicians in November – January 2005-2006, and were in cooperation with CDFG. Data was recorded using CDFG protocol and GPS units provided by this project. Juvenile coho surveys were done while snorkeling. Adults were surveyed by walking streambeds looking for live adults, carcasses and redds. Adult coho survey protocol involved recording data on: numbers of fish observed, number of redds observed, location of fish and redds, redd length and width, habitat type, carcass fork length in mm., sex, scars, percent of eggs spawned, tissue samples for genetic analysis by CDFG, scale samples and temperature data.

B. Spring Chinook

This year's Spring Chinook Timing, Holding, and Population Surveys took place from May through August 2006. The initial surveys involved four snorkel surveys of the lower Salmon River (Brannon's Bar to the Mouth) in May and June 2006 to determine run timing and the head of the spring Chinook run. The Spring Chinook run timing surveys have taken place since 2002. The surveys involve 3- 4 surveyors with 2 swimming in the river and one person in a raft or cataraft as a safety. The entire stretch of river is surveyed from Brannon's Bar to the mouth of the river. The divers are trained and experienced in snorkel survey techniques. Spring Chinook observed during the survey are enumerated by the rower and recorded by sub sections of the reach. Surveyors reported that visibility was good for all but one survey day and were confident that they had seen the majority of Spring Chinook that were present. Data collected during turbid river conditions may be excluded from the data set due to uncertainty. This year was a below average year for the Salmon River Spring Chinook run. This affected the number of fish that were observed and therefore affected the amount representing the Head of the run. The last 5 years data showing the head of the Spring Chinook run is put into graph form and shown in Chart 1. The data has been compiled, analyzed, and QA/QC checked. This data is currently available for revue at www.srrc.org upon request. The distribution of the spring Chinook on the Salmon River from 1990 until 2005 is also shown in Chart 2.

Chart 1

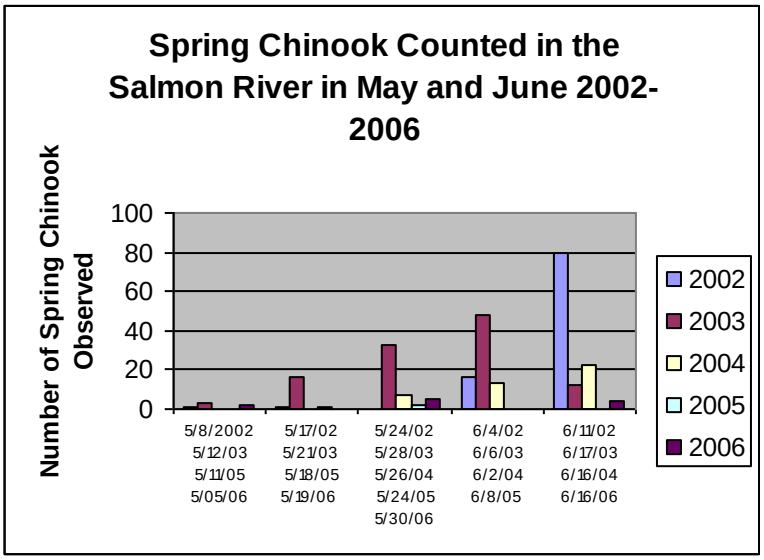
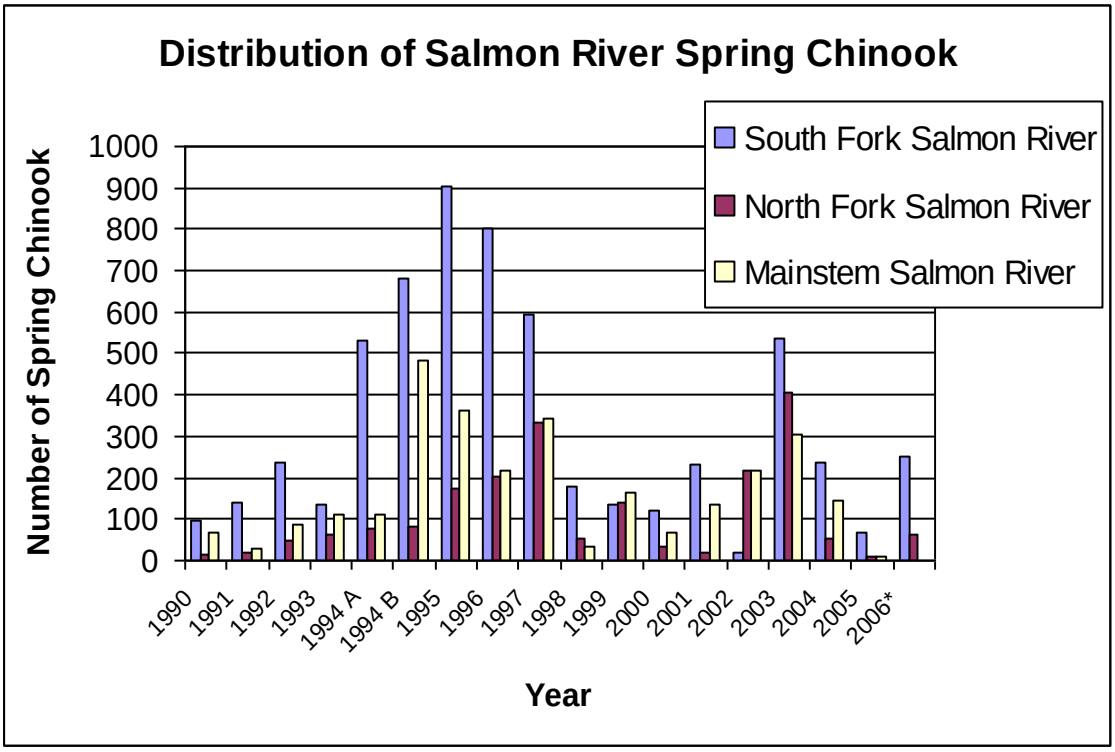


Chart 2



* 2006 data does not include the expansion estimate. It includes 63% of the total area that is usually surveyed due to wildfire.

The Cooperative Salmon River Spring Chinook and Summer Steelhead Dives event successfully assessed the population of spring Chinook salmon present in the Salmon River for the 2006 season. The event enlisted and involved a total of 47 dive participants

and an additional 15 event staff or family member participants. Training was provided for dive participants. A total of 25 agency and community members attended. The Salmon River Fish ID and Snorkel Survey Training Video was produced by the Salmon River Restoration Council, Karuk Tribe and the Mid-Klamath Watershed Council and was shown at the training and during the event. Food for the event was provided by the Salmon River Restoration Council and consisted of two dinners and two breakfasts. The Karuk Tribe contributed food services consisting of a traditional salmon bake, which was a highlight of the event. The Forks of Salmon School donated the use of its kitchen and cafeteria facilities for the event.

The coordination of the 2006 dive was particularly challenging for SRRC. A high water year brought about by flooding and heavy precipitation caused the original survey date to be rescheduled. After deliberation with SRRC, the USFS, and Karuk Tribe a call was made to reschedule until August 9th. SRRC had reviewed Salmon River flows for high water years and determined that 2006 flows were unlikely to drop to a safe level (below 800 CFS as determined by SRRC) before the original survey date. After the coordination group rescheduled the dives, a severe lightning storm caused several large wildfires in the surrounding wilderness areas. The fires were primarily allowed to burn with low suppression priority because they were in wilderness areas, and as the rescheduled date for the dives neared, it became apparent that the fires would be an issue. On August 3rd SRRC held a meeting with the USFS Six Rivers and Klamath Ranger Districts, the Karuk Tribe, and the Orleans Fire Complex Incident Command team. At the meeting it was determined that the stretch of the river between Nordheimer Creek and the mouth of the Salmon was unsafe to survey due to falling debris from the fires and helicopter fill sites. It was also determined at that time that Wooley Creek watershed which was on fire and under a federal closure could not be surveyed. Rescheduling the dives again was not an option. The fires were not expected to be contained any time soon and the fall Chinook migration would likely cloud the survey data if it was postponed any longer. SRRC coordinated closely with both National Forests in an effort to minimize contact between dive vehicles and fire trucks or buses during the event. On August 7th, two days before the dive the Salmon River District Ranger cancelled all Klamath National Forest participation in the dives. Their commitment to assist the effort financially was also broken at this time. The reason behind this move was explained as safety concern. SRRC was faced with a decision, cancel the entire event due to the loss of its largest collaborator or press on. After considering safety concerns and the lack of Klamath USFS workers and funds verse the importance of preserving the 26 year data set we decided we needed to do the survey as planned. SRRC sent out email notifications about the lack of contribution from USFS and requested additional support from its partners. The Klamath USFS committed to bringing all its dive gear for volunteers to use since they would not be using the gear that day anyway. SRRC hustled to find alternative ways to pay for food and drummed up volunteers to keep food and event preparation costs down. The surveys proceeded as planned on August 9th. On that day the North Fork and upper mainstem of the Salmon were surveyed in completion. Another survey was scheduled for the 14th of August to complete the South Fork and the rest of the portions of the survey area that were open. Both survey days were a success, no injuries occurred and surveyors felt that they had seen most of the Salmon that were in their reach. Because there were areas of the river that were not surveyed that normally are SRRC decided to use an expansion

equation to estimate the total population. The actual findings of both surveys are expressed in Table 1 below.

Table 1

Spring Chinook and Summer Steelhead Count
Salmon River, California
August 9th and 14th, 2006

Reach	Date	Miles Surveyed	Spring Chinook Adults	Spring Chinook Jacks	Steelhead Adults	Steelhead 1/2 pounders
Mainstem						
Wooley – Mouth	N/A	4	N/A	N/A	N/A	N/A
Grants – Wooley	N/A	5	N/A	N/A	N/A	N/A
Nordheimer – Grants	N/A	4	N/A	N/A	N/A	N/A
Fong Wah – Nordheimer	N/A	2	N/A	N/A	N/A	N/A
Forks - Fong Wah	8/14/2006	2.5	2	0	1	3
South Fork						
Henry Bell – Forks	8/14/2006	3	28	2	7	8
O'Farrill - Henry Bell	8/14/2006	2	4	0	1	2
Indian - O'Farrill	8/14/2006	2.5	19	33	4	9
Matthews – Indian	8/14/2006	3	14	2	3	1
French – Matthews	8/14/2006	4	45	14	9	6
Cecil – French	8/14/2006	4	35	6	11	7
INDEX: Timber Gulch - Limestone Gulch	8/14/2006	3	30	6	10	5
Petersburg – Cecil	8/14/2006	4	33	15	0	12
Blindhorse – Petersburg	N/A	3	N/A	N/A	N/A	N/A
Little South Fork – Blindhorse	N/A	2	N/A	N/A	N/A	N/A
North Fork						
MP 4 – Forks	8/9/2006	4	2	1	3	4
INDEX: China Point - Deadhorse Gulch	8/9/2006	3	2	1	1	1
MP 8 -MP 4	8/9/2006	4	5	2	0	4
MP 12 - MP 8	8/9/2006	4	17	5	2	3
MP 16 - MP 12	8/9/2006	4	4	0	0	3
White's Gulch - MP 16	8/9/2006	2	5	2	0	0
Idlewild - White's Gulch	8/9/2006	3	17	1	1	9
Mule Bridge – Idlewild	8/9/2006	3	0	0	0	2
Big Creek - Mule Bridge	8/9/2006	3	1	0	0	0
East Fork						
George's – Confluence	8/9/2006	2	1	0	0	0
Shadow - George's	8/9/2006	2.5	1	0	0	2

Wooley Creek						
	N/A	9.5	N/A	N/A	N/A	N/A
TOTAL*		86	233	83	42	75
TOTAL BY SPECIES*			316		117	

*Some data is not available (N/A) due to federal closures from wildfires in the survey area.

Total river miles surveyed -	56.5	**Percent surveyed -**	65.7%
Total river miles not surveyed -	29.5	**Percent not surveyed -**	34.3%

INDEX reach fish counts are split from the reaches they are contained in, not counted twice.

South Fork INDEX is a section of reach 'Cecil to French'. North Fork INDEX is the end of reach 'MP 8 - MP 4' and the beginning of 'MP 4 - Forks'.

The SRRC maintains the ongoing data set for population trend estimates for Salmon River Spring Chinook and Summer Steelhead. In the desire to preserve this 26 year data set's consistency SRRC with the help of CDFG created the expansion equation below to estimate what the total population number for each species would have been if the whole survey area had been accessible. This expansion equation is expressed in Figure 1 below. The population trend chart for the Salmon River spring Chinook is shown in Chart 3 below.

Figure 1.

16 YEAR SPRING CHINOOK DISTRIBUTION

From 1990-2005 the mainstem of the Salmon River (including Wooley Creek) and the upper two reaches of the South Fork Salmon River contained from 26.2% to 71.5% of the Spring Chinook. On average 36.88% of the total observed Spring Chinook were found in the mainstem and the upper two reaches of the South Fork Salmon River.

16 YEAR SUMMER STEELHEAD DISTRIBUTION (INCLUDING HALF-POUNDERS)

Together, from 1990-2005 the mainstem of the Salmon River (including Wooley Creek) and the upper two reaches of the South Fork Salmon River contained from 45% to 87.9% of the summer steelhead. On average 57.64% of the total observed summer steelhead were found in the mainstem and the upper two reaches of the South Fork Salmon River.

EXPANSION EQUATION AND POPULATION ESTIMATE

Developed by SRRC staff in conjunction with Sara Borok C.D.F.G. Biologist
Based on the average contribution of the mainstem and the upper two reaches of the South Fork Salmon River for spring Chinook (36.88) and summer steelhead (57.64), we

estimated that our count was 63.11% of the total population of the spring Chinook and 42.36% of the total population of summer steelhead in the system at the time of our surveys. The projected total population for 2006 is 497 spring Chinook and 290 summer steelhead.

Spring Chinook Equation
Total count from reaches surveyed in 2006= 314 spring Chinook

16 year average contribution to total system population of reaches surveyed in 2006 = 63.11%

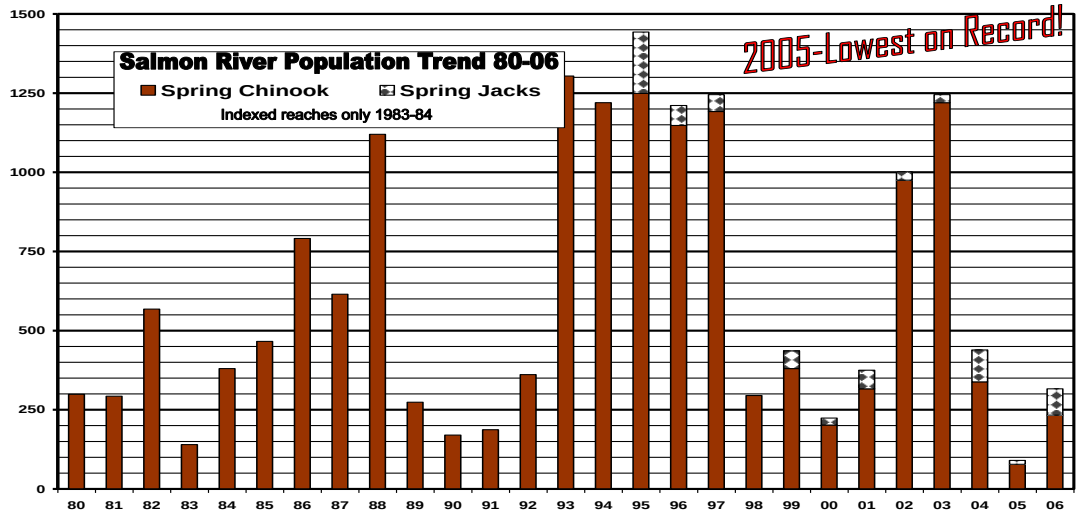
Let n = estimated total population of spring Chinook for 2006
63.11% X n = 314 spring Chinook
n= (314 spring Chinook) / .6311
n = 497 spring Chinook

Summer Steelhead Equation
Total count from reaches surveyed in 2006= 123 summer steelhead

16 year average contribution to total system population of reaches surveyed in 2006 = 42.36%

Let n = estimated total population of summer steelhead for 2006
42.36% X n = 123 spring Chinook
n= (123 summer steelhead) / .4236
n = 290 summer steelhead

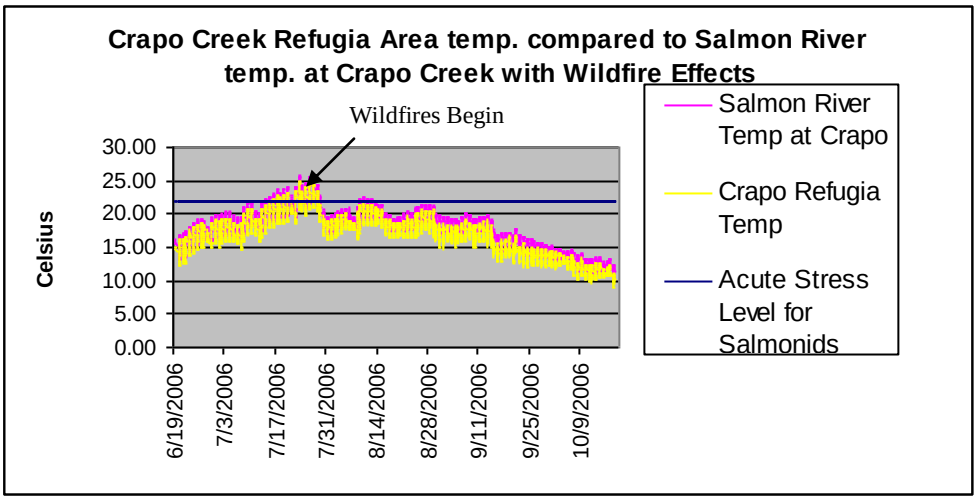
Chart 3



* a population estimate was used in 2006 due to wildfire restrictions

The summertime temperatures in the Salmon often reach stressful levels for Chinook salmon in the months of June, July and August. Spring Chinook can be at risk of disease infection and eventual mortality during these periods. Through the weak stocks program SRRC has monitored and identified key refugia locations within the Salmon River where spring Chinook hold in the summer. These locations are critical to spring Chinook as they spend the summer in fresh water. Threats to these key sites like recreational mining are being monitored and eliminated, by SRRC coordination, with specific user groups like the New 49ers mining association. Data was collected for the Boulder Gulch refugia and the Crapo Creek refugia. Temperature data for the Crapo refugia, charted with the mainstem Salmon River temperature, as well as the stress threshold for Salmonids, is shown in chart 4 below. Wildfires that occurred in the months of July, August, and September had a cooling effect on River temps in the Salmon and Klamath Rivers. The filtering of direct sunlight by smoke cover lasted through fall and cooled the river enough to keep temperatures below acute stress levels for salmonids as shown in Chart 4 below. Due to the high elevation and slow burning nature of the wildfires, fire containment rather than suppression tactics were employed by the U.S.F.S.. This allowed for a predominantly under story burn that was similar to the natural fire regime of the region and also produced a smoke inversion layer that had a cooling effect on rivers throughout the otherwise dry hot summer.

Chart 4.



The SRRC, USFWS and Karuk tribe were funded by the task force to collect and analyze otoliths of Salmon River spring Chinook. This project was implemented in March of 2005 and has continued through the project period. The otoliths were collected from adult carcasses during the spring Chinook redd surveys. The otoliths are given to the USFWS to be analyzed. The growth rings that are imbedded in the otoliths can be used to identify conditions and growth rates for Salmon River spring Chinook and may also allow for selective harvest to avoid harvest of particular stocks. To this date two reports were completed by USFWS relating to the samples provided by this program; USFWS Arcata Fisheries Technical Report Microstructural Natal Signature of Spring Chinook Salmon Otoliths from the Salmon River Drainage, Northern California AFWO-TR01-05, and USFWS Arcata fisheries Technical Report - The Identification of Migratory Juvenile

Spring Chinook Salmon via Rotary screw trap on the Salmon River, California. These reports provide, amongst other things, that spring Chinook salmon from the Salmon River can be identified in the Klamath River or the ocean through the use of the otolith microstructural signature. A third report on studies performed on adult spring Chinook otoliths is in draft. This report will provide information on life history of the Salmon River spring Chinook. SRRC recently submitted a Weak Stocks Program proposal to the C.D.F.G. for 2008 that includes finalizing this report as one of the tasks. Both final reports are provided to CDFG on Compact Discs along with this report.

The SRRC has initiated another project involving otoliths with Rebecca Quinones a graduate student at University of California Davis. This project also will use spring run Chinook otoliths collected by this program. Using information from micro-chemical analysis of individual otolith rings, the levels of calcium and strontium within each ring can be tied to a geographic location for each fish on a daily basis.

The Salmon River cooperative spring Chinook salmon carcass and redd surveys took place from September 15th – October 26th 2006. The surveys were performed through funding from this program and volunteer or cooperative support from the USFS Orleans and Salmon River Ranger Districts, USFWS, the Karuk Tribe and the California Dept. of Fish and Game- Klamath River Project. The Salmon River Restoration Council (SRRC) held survey training on September 15th at the Cecilville Community Club. Each survey crew consisted of at least two surveyors trained in survey protocol, redd and fish identification. Crews recorded the location of fish and redds, redd length and width, habitat type, carcass fork length in mm., sex, scars, percent of eggs spawned, scale samples and temperature data. Two sets of scale samples were collected for each carcass when enough scales were available. Redds were recorded with GPS units and carcasses were measured, sex determined, and analyzed for signs of disease. During disease assessments, trained fish technicians examine the carcasses for external characteristics of Columnaris, Icth, and C. Shasta. During the 2003 survey season examination of 179 spring Chinook carcasses revealed that 53% had Columnaris lesions. In 2004 examination of 9 spring Chinook carcasses revealed that 62% had Columnaris lesions and in 2005 examination of 13 spring Chinook carcasses revealed that 46% had Columnaris lesions. Examination of carcasses in the 2006 spawning season showed a much lower infection rate of only 7% out of 59 carcasses that were observed. This information has been provided to the USFWS California Nevada Fish Health Center and the Klamath Basin Fish Health Assessment Team. Spring Chinook redd data and GIS maps showing GPS redd locations are in appendix C and D of the report. The Surveys took place on 16 continuous miles of the South Fork Salmon River and 8 continuous miles of the North Fork. Repeat surveys occurred on most reaches. A total of 66 miles of the South and North Fork Salmon River were surveyed including repeat surveys. A total of 195 redds were surveyed and mapped during the 2006 season. A total of 59 carcasses were examined for biological information and sample collection. Data from the 2006 spring Chinook carcass surveys is presented in Table 2 below.

Table 2

SRRC Weak Stocks Cooperative Spring Chinook Survey Carcass Data Tables '06										
Total percentage of Spring Chinook carcasses with signs of Columnaris Infection=										7%
Fish Scar Codes: 1=lamprey, 2=gill net, 3=hook, 4=otter bite						**Disease Assessment Codes: 1=Columnaris, 2=Icth, 3=C. Shasta**				
#	Species:	Sex M/F	Fork Length	Spawned Y/N	Scales Y/N	Fin Clip Y/N	Otilith Y/N	Tissue Y/N	Scar #	Disease #
S. Maurer, S Stenhouse				9/21/2006		Stream: South Fork Salmon River Reach:Little Southfork- Grizzly				
1	SPCH	M	83	Y	Y	N	Y	Y	N	None
2	SPCH	F	56	Y	N	N	N	N	?	None
M. Kleeman, E. Williams				9/27/2006		Stream: South Fork Salmon River Reach:Cecilville - French				
1	SPCH	M	44	?	Y	N	Y	Y	N	None
j. Bownman, S. Stenhouse				9/28/2006		Stream: South Fork Salmon River Reach: Blinhorse - Petersburg				
1	SPCH	M	43	Y	Y	N	Y	Y	N	None
I. Swift, J. Cullen				10/4/2006		Stream: North Fork Salmon River Reach: Idlewild- Whites				
1	SPCH	F	70	Y	Y	N	Y	Y	N	None
j. Bownman, S. Addison				10/5/2006		Stream: South Fork Salmon River Reach: Petersburg - Eastfork				
1	SPCH	F	58	Y	Y	N	Y	Y	N	None
2	SPCH	M	43	Y	Y	N		Y	N	None
M. Kleeman, E. Williams				10/5/2006		Stream: South Fork Salmon River Reach: Eastfork				
1	SPCH	F	74	N	Y	N	Y	Y	N	1
A. Jacobs, L. Gough				10/5/2006		Stream: South Fork Salmon River Reach: Cecil- Limestone				
1	SPCH	F	24	Y	Y	N	Y	Y	N	1
2	SPCH	F	16.5	Y	Y	N	Y	Y	N	None
3	SPCH	M	33	Y	Y	N	Y	Y	N	None
N. Pennington, K Denny, P Lauer				10/5/2006		Stream: South Fork Salmon River Reach: Eastfork- Cecilville				
#	Species:	Sex M/F	Fork Length	Spawned Y/N	Scales Y/N	Fin Clip Y/N	Otolith Y/N	Tissue Y/N	Scar #	Disease #
1	SPCH	F	70	Y	Y	N	Y	Y	N	1
S. Stenhouse, M. Bennett				10/5/2006		Stream: South Fork Salmon River Reach: Blindhorse- Petersburg				
1	SPCH	F	63	Y	Y	N	Y	Y	N	None
2	SPCH	M	33	Y	Y	N	Y	Y	N	None
3	SPCH	M	63	Y	Y	N	Y	Y	N	None
4	SPCH	F	66	Y	Y	N	N	Y	N	None
5	SPCH	F	57	Y	N	N	N	N	N	2
6	SPCH	M	61	Y	N	N	N	N	N	None
J. Bowman, S. Addison				10/10/2006		Stream: South Fork Salmon River Reach: Blindhorse- Petersburg				
1	SPCH	F	64	Y	N	N	Y	N	N	None
2	SPCH	F	60	Y	Y	N	Y	Y	N	None
3	SPCH	F	62	Y	Y	N	Y	Y	N	None
4	SPCH	M	42	Y	Y	N	Y	Y	N	None
5	SPCH	F	72	Y	Y	N	Y	Y	N	None
M. Kleeman, TC				10/12/2006		Stream: South Fork Salmon River Reach: Eastfork				
1	SPCH	M	63.5	?	Y	N	Y	Y	N	None
2	SPCH	M	67.8	?	Y	N	N	Y	N	None
3	SPCH	M	60	?	Y	N	N	Y	N	None
4	SPCH	M	53	?	Y	N	Y	Y	N	None
L. Gough, N. Kingery				10/12/2006		Stream: South Fork Salmon River Reach: Eastfork -Cecil Creek				
1	SPCH	M	81	Y	Y	Y	Y	N	1	None
S. Farhi, N. Small, L. Smith				10/12/2006		Stream: South Fork Salmon River Reach: Petersburg- Eastfork				
1	SPCH	M	39.5	Y	N	N	N	N	1	None
2	SPCH	M	47	Y	Y	N	N	N	N	None
3	SPCH	F	46	Y	Y	N	Y	Y	N	None
4	SPCH	M	43	Y	Y	N	N	N	N	None
M. Bennett, S. Addison				10/12/2006		Stream: South Fork Salmon River Reach: French- Matthews				
1	SPCH	F	71	Y	N	N	N		N	None
2	SPCH	M	54	Y	Y	N	Y	N	N	None

3	SPCH	M	78	Y	Y	N	Y	Y	N	1
4	SPCH	M	36	Y	Y	N	Y	N	N	None
j. Bowman, D. Lowe				10/12/2006		Stream: South Fork Salmon River Reach: Cecil- Limestone				
1	SPCH	M	65	Y	N	N	N	N	N	None
2	SPCH	M	71	Y	N	N	N	N	N	None
3	SPCH	M	42	Y	Y	N	Y	N	N	None
4	SPCH	M	47	Y	Y	N	Y	Y	1	None
5	SPCH	M	55	Y	Y	N	Y	Y	N	None
6	SPCH	F	69	Y	Y	N	Y	Y	N	None
7	SPCH	F	58	Y	Y	N	Y	Y	N	None
8	SPCH	M	46	Y	N	N	N	N	N	None
9	SPCH	M	71	Y	Y	N	Y	Y	1	None
I. Swift, J. Hanscom				10/13/2006		Stream: North Fork Salmon River Reach: Idlewild- Whites				
1	SPCH	F	70	Y	Y	Y	Y	Y	N	None
C. Calimpong, J. Bishop, L. Smith				10/13/2006		Stream: North Fork Salmon River Reach:Sawyers- Kelly				
1	SPCH	M	59.5	?	?	?	?	?	N	None
L. Smith, S. Kingery				10/18/2006		Stream: North Fork Salmon River Reach: Idlewild- Whites				
1	SPCH	F	63	Y	Y	N	Y	Y	N	None
2	SPCH	?	?	?	?	?	?	?	?	too decomposed
3	SPCH	?	?	?	?	?	?	?	?	too decomposed
4	SPCH	F	71	Y	N	N	N	N	N	None
5	SPCH	?	?	?	?	?	?	?	?	too decomposed
6	SPCH	?	?	?	?	?	?	?	?	too decomposed
N. Pennington, B. Atwood				10/19/2006		Stream: South Fork Salmon River Reach:East Fork- Cecilville				
1	SPCH	F	64	Y	Y	N	Y	Y	N	None
2	SPCH	F	65	Y	Y	N	N	Y	N	None
L. Gough, K. Denny				10/19/2006		Stream: South Fork Salmon River Reach: Cecil-Limestone				
1	SPCH	M	69	Y	Y	N	Y	Y	N	None
2	SPCH	F	46	Y	N	N	N	N	N	None
3	SPCH	M	90	Y	N	N	N	N	N	None
4	SPCH	F	75	Y	N	N	N	N	N	None

TOTALS:

# CARCASSES:	59
AVG LENTH:	58.06 cm
% SPAWNED:	79.66%
% ? SPAWNED:	18.64%
% NOT SPAWNED:	1.69%
% FEMALE:	40.68%
%MALE:	49.15%

C. Coho Salmon

The SRRC in cooperation with CDFG, the Karuk Tribe, USFS and USFWS has completed four years of coho presence / absence surveys in suspected areas and tributaries of the Salmon River. These surveys were successful in identifying coho salmon in areas where coho were not previously documented within the subbasin. The 2006 – 2007 coho salmon spawning run in the Salmon River was relatively low. During the spawning surveys SRRC and cooperators observed one adult coho and five redds. Spawning observations occurred primarily in the month of December and were limited to

Knownothing and Nordheimer Creek. A summary of the redd and live observations is located in table 3 below. The GIS Map from the Salmon River 2006 coho surveys is located in appendix E. of this report. A coho redd in Knownothing Creek on the S. Fork Salmon is pictured below.

Project Coordinator: Nat Pennington pointing to a coho redd on Knownothing Creek

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Table 3.

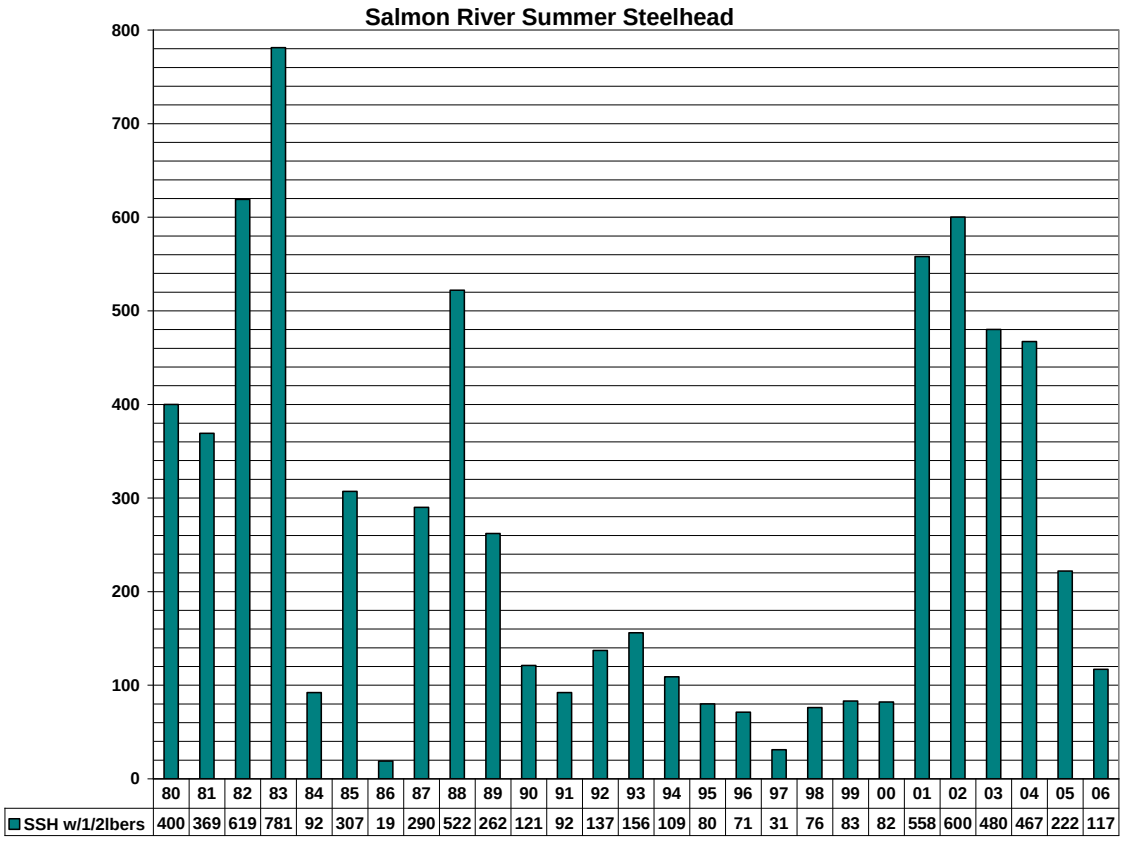
Salmon River Coho Redd Data 2006

Stream	Date	Weather	Crew	Site #	Habitat Type	# Fish	Redd length	Redd width	Pott depth	Substrate, Subdominant
Whites Gulch	12/28/2006	sunny	P.Lauer K.Denny B.Atwood	0	na	na	na	na	na	na
Black Bear Creek	12/5/2006	clear	I. Swift J. Hanscom	0	na	na	na	na	na	na
Knownothing Creek	12/7/2006	na	A. Jacobs I. Swift	1	Pool	0	1.5	0.5	0.25	2,3
				2	Riffle	0	2.3	1.5	0.3	2,3
Crawford Creek	12/12/2006	na	A. Jacobs I. Swift	na	na	na	na	na	na	na
Indian Creek	12/12/2006	na	A. Jacobs I. Swift	na	na	na	na	na	na	na
Nordheimer Creek	12/5/2006	clear	L. Gough B. Atwood	1	Riffle	0	2	1	na	2
				2	Pool	1	2	1	na	2
				3	Run	0	3	2	na	2
				4	Run	0	3	2	na	2
East Fork Creek	1/9/2007	Sunny	P.Lauer K. Denny	na	na	na	na	na	na	na
Methodist Creek	1/2/2007	Cloudy	P. Lauer B. Atwood	na	na	na	na	na	na	na

D. Winter and Summer Steelhead

The Cooperative Salmon River Spring Chinook and Summer Steelhead Dives event successfully assessed the population of spring Chinook salmon present in the Salmon River for the 2006 season. The event enlisted and involved a total of 47 dive participants and an additional 15 event staff or family member participants. Training was provided for dive participants. A training video was produced by the Salmon River Restoration Council, Karuk Tribe and the Mid-Klamath Watershed Council and was shown at the training and during the event. A total of 75 half pounder steelhead (14 – 18 in.) and 42 adult steelhead were observed during the survey. The complete data set for reaches surveyed during the event is shown above in Table 1 above. The 25 year trend data set for summer steelhead maintained by the SRRC is shown in chart 5 below.

Chart 5



	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	00	01	02	03	04	05	06
SSH w/1/2lbers	400	369	619	781	92	307	19	290	522	262	121	92	137	156	109	80	71	31	76	83	82	558	600	480	467	222	117

* a population estimate was used in 2006 due to wildfire restrictions

During the 2006 winter and summer steelhead spawning season SRRC and cooperators performed 20 stream surveys to identify presence / absence and population trends of steelhead in the Salmon River and tributaries. SRRC and cooperators have performed these surveys since 1999. Project cooperators include; USFS, CDFG, USFWS, NOAA, and the Karuk Tribe. Training was held February 27th at the Forks of Salmon Community Club. The Data from these surveys, the GIS map, and an example of a steelhead data sheet can be found in appendices F - H. Four experienced crews of 2 people worked with tribes and agencies to conduct 8 days of spawning surveys. Starting in February, and going until the middle of April, surveys were conducted once a week. Bill Chesney, CDFG Steelhead Research and Monitoring Project (SRAMP) provided technical assistance and protocol oversight. Many volunteer participants are veteran fisherman with knowledge of current and historical range and species distributions. Trained crews assessed the condition of proposed and recently removed fish barriers, assessing the success and /or potential benefits of fish passage projects. Focus was placed on barriers that are proposed for removal or have already been removed by CDFG. SRRC helped to facilitate the removal of a fish blocking culvert with a bridge replacement on Kelly's Gulch during the project period and has since planted the area with native riparian vegetation. If future Weak Stocks Program funding is secured the SRRC will continue to monitor and restore this watershed and document the effectiveness of the barrier removal

projects in the Salmon River. The summary data for the Salmon River Winter Steelhead Redd Surveys is displayed in Table 4 below.

Table 4

Salmon River Restoration Council, Weak Stocks Assessment Program											
Cooperative Winter Steelhead Redd Survey Results											
South Fork	1999 Redds	2000 Redds	2001 Redds	2002 Redds	2003 Redds	2004 Redds	2005 Redds	2006 Redds	2007 Redds	# of Surveys 1999-2007	**Total Redds identified in surveys 99'-07'**
East Fork	24	36	15	N/A	10	8	2	2	N/A	14	97
Knownothing	17	6	0	N/A	1	13	10	0	0	20	47
St.Clare		2	0	4	9	5	8	6	N/A	12	34
Blindhorse-Petersburg	N/A	N/A	0	N/A	18	5	5	0	N/A	6	28
Petersburg-Cecil Creek	5	16	0	N/A	12	9	6	0	N/A	10	48
Black Bear	7	0	0	N/A	1	2	3	0	6	13	19
Indian Creek	N/A	0	N/A	N/A	0	0	0	0	N/A	5	0
Negro Creek	N/A	0	N/A	N/A	2	0	0	0	3	5	5
Crawford Creek	1	N/A	0	0	23	12	9	0	10	11	55
Methodist	2	3	0	0	0	6	7	3	5	21	26
Matthews	N/A	N/A	N/A	0	0	0	0	0	N/A	4	0
Cecil Creek	0	N/A	N/A	N/A	0	0	1	0	0	5	1
Plummer Creek	N/A	N/A	0	N/A	11	5	4	0	N/A	4	20
Hotelling Creek	N/A	N/A	N/A	0	0	N/A	N/A	0	0	6	0
Mainstem	1999 Redds	2000 Redds	2001 Redds	2002 Redds	2003 Redds	2004 Redds	2005 Redds	2006 Redds	2007 Redds	# of Surveys 1999-2007	**Total Redds identified in surveys 99'-07'**
Butler Creek	N/A	2	0	3	0	0	0	1	0	7	6
Merrill Creek	N/A	N/A	N/A	0	9	3	2	0	0	13	14
Somes Creek	N/A	N/A	N/A	N/A	0	N/A	N/A	0	N/A	0	0
1mi. North Fork to Nordhiemer	N/A	N/A	6	N/A	0	N/A	N/A	0	N/A	1	6
Nordhiemer Creek	2	15	0	N/A	0	13	9	0	0	14	39
Crapo	N/A	N/A	N/A	0	0	N/A	N/A	0	N/A	1	0
North Fork	1999 Redds	2000 Redds	2001 Redds	2002 Redds	2003 Redds	2004 Redds	2005 Redds	2006 Redds	2007 Redds	# of Surveys 1999-2007	**Total Redds identified in surveys 99'-07'**
North Russian(3mile-Mouth)	10	23	0	3	6	9	4	3	0	18	58
Specimen (LogJam-Mouth)	1	9	0	3	23	4	7	0	0	17	47

Little NF (Specimen-Mouth)	4	5	0	N/A	12	6	8	0	N/A	13	35
Kelly's Gulch	N/A	N/A	N/A	0	0	0	0	0	5	8	5
Jackass	0	N/A	N/A	N/A	0	0	1	0	0	6	1
South Russian	N/A	N/A	N/A	N/A	0	0	0	0	N/A	3	0
White's Gulch	N/A	N/A	N/A	4	0	1	0	0	7	8	12
Eddys Gulch	N/A	N/A	0	N/A	0	3	2	0	0	6	5
Mule Bridge - Whites	1	2	N/A	N/A	3	N/A	N/A	0	N/A	6	6
Redd & Survey Totals 99' - 06'	74	119	21	17	140	104	88	15	36	257	614

E. Water Quality Monitoring:

Water Quality Monitoring Relationship: Through this program the SRRC enlisted 67.5 hours in volunteer support toward monitoring water quality in the Salmon River. The SRRC placed temperature loggers in key refugia areas for spring Chinook and juvenile salmonids; loggers were also placed in the main river channel near refugia areas. Spring Chinook refugia areas were monitored throughout the summer for fish density and correlations between temperature and density. Flow measurements were taken for tributaries where spring Chinook or juvenile salmonids had congregated. Turbidity measurements were made at these key sites and are expressed in terms of water clarity in the summary discussion.

The SRRC and cooperators maintain approximately 50 hobo temps in the Salmon River and its tributaries each year, and monitor flow at approximately 20 sites once a month during the summer months. The data is provided to KRIS, Agencies, Tribes, the TMDL process and others.

The Goals of the monitoring program include establishing baseline data, supporting the TMDL process, correlating temperatures with fish behavior, identifying fisheries refugia conditions, and identifying opportunities to improve habitat and involving community members in the monitoring process. With a baseline data set, we can also assess the effectiveness of restoration projects and of land management activities.

Select data sets for key tributaries and reaches of the Salmon River including; the Mainstem Salmon, Nordheimer Creek and Crapo Creek are included in appendix I. of the CD included with this report. Chart 3 above displays the importance of the Crapo cold water refugia for salmonids in mid summer particularly for adult spring Chinook.

The Salmon River is the largest cold-water contributor to the Klamath River. It is listed for temperature impairment under the TMDL process. Temperature monitoring data shows that temperatures are consistently above the stressful level for Salmonids during

the summer months. In 2006 temperatures reached a maximum of approximately 27 ˚C in the Mainstem Salmon during the month of July.

The Salmon River Subbasin Restoration Strategy prescribes the development of a long range-monitoring plan for the Salmon River between 2004 and 2008. In order to be effective this plan should include the input of all our collaborators. The release of the Salmon River TMDL should help guide our monitoring efforts for the future.

V) Recommendations

The SRRC and cooperators should continue to monitor key habitats within the basin for presence and abundance of Weak Stocks. Efforts should be continued to protect these habitats.

The SRRC should continue the Weak Stocks Program placing priority on continuous monitoring of areas within the basin with historical and relatively recent data sets.

The SRRC should continue to work with agencies tribes and stakeholders to monitor and restore species in high risk or of high value for fisheries recovery.

The SRRC should continue to create and foster groups like the Salmon River Voluntary Spring Chinook Recovery Team who are working towards collaborative restoration of the Salmon River fisheries resource.

The SRRC should continue to develop individual programs and partnerships, for projects such as: fisheries protection, fish barrier removal, riparian assessment, watershed and restoration monitoring.

The SRRC should continue to enlist community members to serve as program and project managers. SRRC should seek specific funding for each of these programs and projects and develop, expand, and diversify respective funding sources.

The SRRC should continue to foster stakeholder coordinated resource management planning and recovery work groups.

The SRRC should continue to expand the effectiveness of the more recently formed Anadromous Fish Barrier Removal Committee, Roads Stewardship Work Group, Forest and Fire Management Roundtable, and Suction Dredging Awareness Work Group involving as many of the respective stakeholders as possible.

The SRRC should continue to educate and enlist cooperation and support from many more stakeholders, including funding sources, decision makers and experts, regarding the significance of the Salmon River in the recovery of a number of anadromous fish runs in the Klamath Basin and of our local community based effort.

VII) Measurables

- Identify the watershed / sub-basin plan or assessment in which the Project monitoring is identified as a priority

Elder, D., B. Olson, A. Olson, J. Villeponteaux, P. Brucker. 2002 Salmon River Subbasin Restoration Strategy: Steps to Recovery and Conservation of Aquatic Resources. Prepared for the Klamath River Basin Fisheries Task Force, Yreka Fish and Wildlife Office, Yreka, CA. Available: http://www.r5.fs.fed.us/klamath/mgmt/analysis.html

- Name the priority habitat limiting factors identified in that plan that were addressed by the project monitoring.

1. Water quantity (lack of flow, diversions, runoff)
2. Water quality (temperature, chemistry, turbidity)
3. Riparian dysfunction (lack of shade, nutrients, roughness of elements)
4. Excessive sediment yield (pool and gravel quality)
5. Spawning requirements (passage, gravel, resting areas-pools)
6. Escape cover / shelter (velocity, lack of woody debris, pools)

- Type of monitoring included in the project.

Monitoring involved; snorkel surveys, stream surveys, carcass and redd surveys, temperature monitoring, GPS, downstream migrant trapping and biological sampling of fish carcasses. Genetic and otolith research project contributions.

- # Of fish blockages identified

2 small fish blockages were identified and removed during the project. One large fish barrier in the form of an 8 foot culvert was removed and replaced on Kelly's Gulch during the project. Many other larger fish blockages were identified by SRRC before the project began. These have been monitored and assessed and proposals have been developed and submitted by SRRC for there removal.

- # Of miles of suitable habitat above these blockages

Approximately 4 Miles.

- Water Quality limitations addressed by the project.

lack of flow, diversions, runoff, temperature

- Is the project related to key salmon management questions regarding salmon recovery and/or sustainability of healthy salmon stocky?

Absolutely

- Name any comprehensive monitoring strategy/program that the project is a part of.

The SRRC has the most comprehensive monitoring strategy for Salmon River fisheries. SRRC cooperates with all other monitoring strategies that take place within the Salmon River including the CDFG Klamath River Project.

- # of publications produced reporting on key management or restoration data, information, and needs.

A total of 6 publications were produced during the grant period.

- Was information gained on salmon stocks that will reduce the risk of over fishing?

Yes

- Does the project focus on sustainability, restoration (where needed) and the maintenance of watershed and salmon population health?

Yes

- # of workshops/training events held with the project.

seven

- # of publications completed and distributed within the project

six

- # of schools or classrooms and other institutions reached withtin the project

Four public schools

- Include a description of the results of student/teacher evaluations.

No student/teacher evaluations occurred relating to this project.

VII) Acknowledgements

The Salmon River Restoration Council would like to acknowledge the following organizations and individuals for their contributions to the implementation of this project.

The California Dept. of Fish and Game
The Klamath Fisheries Restoration Task Force
The U.S. Fish and Wildlife Service
The U.S. Forest Service, Ukonom and Salmon River Ranger Districts
The Karuk Tribe
The Mid- Klamath Watershed Council
The Klamath Salmon Anglers and Guides Association
The Salmon River Community
Humboldt State University
University of California Davis

VIII) References

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Appendix A - Klamath Salmon Spring Chinook Voluntary Recovery Work Group Meeting
Orleans, California **April 10, 2007- 10:00am – 4:00pm**

Proposed Agenda

1) **Introductions** (5 Minutes)

Petey Brucker-SRRC
Scott Vander – USGS Klamath Falls
John Beeman – USGS – Klamath Falls
Torrey Tyler - USBR Klamath Falls
Roger Smith – ODFW – Klamath Supervisor
Will Harling - MKWC
Regina Chichizola - Klamath Waterkeeper
Amy Sprowles – Genetics Dept. - HSU
Susan Corum – Karuk Water Quality
Sara Borok – CDFG – Arcata - KRP
LeRoy Cyr – USFS - Orleans RD – Fisheries Biologist
Billy Mattunin – Hoopa - Fisheries Biologist
Toz Soto – Karuk Fisheries Director
Scott Grecan – EPIC – Spring Chinook Coordinator
Heather Reese- Salmon Restoration Federation
Anderew Kinsinger – HSU Genetic Department
Nat Pennington – SRRC – Fisheries Coorinator
Rosie Karr – HSU - Student
Greg Bryant – NOAA – Coho Recovery Team Coordinator
Tom Shaw – USFWS - Fisheries Biologist Fisheries Biologist
Nancy Bailey – MKWC Project Coordinator
Pat Higgins – Kier and Assoc. Global Warming
Sam Flanagan – NOAA recovery Team
Bob Atwood – SRRC Americorp
Justin Ly – NRCS – Klamath Program
Alex Corum – Karuk - Fisheries Biologist
Jane Sartori- PSFMC – Otolith Analysis Expert
Laura Smith- SRRC AmeriCorps
Dave Hillemeier- Yurok Fisheries Director
Mark Hampton – CDFG – Klamath River Program – Project Supervisor

2) Review Agenda- (Amend, if needed, and Adopt) (5 Minutes)

3) 2006 Salmon River Dives Results - (SRRC- Pennington) (15 minutes)

The surveys on the Salmon River for Spring Chinook have been going on for 20 years. Main Corroborators are CDFG and USFS. We usually incorporate 70 volunteers in an effort to dive the entire river in one to two days.
Last year there were 3 simultaneous wildfires happening in the Salmon River watershed. At one point our staging area was on fire. We rescheduled and were able to do most of the survey. Unfortunately there were federal closures on about 35% of the river. We covered that missing information by using an expansion equation and Nat is going to present that number crunching. See Bar Graph Distribution of Salmon River Spring Chinook. We used only the past 16 years of data, because earlier records had already been expanded upon. Essentially we took all 16 years that we had data on, figured in the average contribution of those reaches that we weren't able to survey last year (due to the fires). Then we expanded on the reaches that we were able to survey. See explanation on "16 Year Spring Chinook Distribution"

Tom Shaw asked if we separated jacks also.
Nat- yes, we just took the average ratio of jacks to adults on what was surveyed (about 34%, which is remarkably high) and extended that ratio for the expanded numbers.
Sara- Last year's fall Chinook had the ratio of about 36% jacks to adults, so that was right on par with fall Chinooks.
Nat sent out for peer review and he got a comment from Sara Borok, who suggested that we average them reach by reach for the 16 year histories. Nat did that and there were 3 more fish estimated, so he felt like that was a good way of double checking the expansion equation.
Pat Higgins- commented on the comparison between the Klamath/ Salmon and Rogue
Asked for any additional comments on the calculations/methods.
Announced that there are cd's available with lots of Salmon River data and some underwater video.

4) Spring Chinook population surveys and other 2006 population data for the Klamath/Trinity Basin and Ocean (Basin Cooperators) (15 minutes)

Petey brought attention to the megatable that is attached to the agenda and asked if people could help filling our information gaps, especially the data for the Trinity River.
Pat- the S Fork Trinity River sees fluctuations in numbers of natural spawners. The south fork surveys are 15 mile reaches and is wondering how reliable those numbers are. If they are dependant on reach counts, then they may be dubious. He asked Sara if they are putting more effort into them.
Sara, they are putting effort into them, and are relying on volunteers.
Rodger- asked Pat about the impact of forest fires and logging.
Pat-yes with logging and fires, they saw extreme changes in river channel. But mostly the USFS has been on its best behavior in SF Trinity and commercial/private logging has been restricted.
Tom S- a guy named John Lang said that in maybe Hayfork Creek, they saw about 90 sp Chinook and 0 redds; poaching is a major issue there
Dave H- in the South fork, in '64, they had an estimated over a 1000 fish. He thinks that the counts are pretty good ballpark index count
Toz- has there been out-migrant trapping on the S fork?
Dave- not in recent years

Petey- after the 87 fire in the Salmon River, there was this one creek that was decomposed granite on the N fork and there was quite a bit of sediment rushing into the river. Then the USFS put catchments into the bottom and there was an estimated 100 cu yards of sediment caught and 100 cu yards washed down the river. This was before salvage logging, and only a result of the fire.
Will- There was previous logging there…..Fire can have both negative and positive affects.
Toz- It's disturbing to hear people say fire is hard on fish. It does more good than harm. Up the Klamath River, by Dillon Creek, there is a 7 or 8 year fire cycle. Dead fish in refugia areas, even at the mouth of the Salmon. Some do make it up, but temperature is the main problem
Pat- Fish have long memories. They have the Scott in their mind's eye. Someday the Scott could be rehabilitated and the fish would come back.

5) Progress Report, Review, and Identification of Next Steps for the Limiting Factor Analysis for Salmon River stock – (SRRC-Brucker, NOAA - Bryant) (30 minutes)

Petey- summary of six goals. Limiting factor Analysis
Greg Bryant and Sam Flannigan from NOAA gave an overview of Limiting Factor analysis
Identify key areas for restoration:

- Conservation Action Planning CAP, a graphic explanation, systematic approach to identifyg specific indicators and attributes on the ground at a landscape scale.
- Get data from KRIS into a workbook to generate outputs.
- Send the workbook out to all agencies. Spatial data, water quality, habitat, etc.
- Basin cooperators are invited to feed into this and also to use the book as a resource.
- Physical processes as the effect the species.

Sam- Power Point Presentation re CAP workbook and process

- Threats Assessment Structure
- Life history stage targets
- Attributes (channel structure, estuarine function, disease and predation, etc)
- Indicators (measurable field data, (e.g. % fines, etc.)

Objectives
Pull together Existing Data to characterize habitat quality
Establish reference values for indicators and threats
Link observed habitat conditions to upslope conditions
Identify threats (sources) posed by land management
Create a custom Access Database to house data
Enable updates by cooperators

Indicator Rankings (handouts detail this)
Associated White Papers, workbook uses all research that has been done. Documents are embedded that back up
Data Sources being pulled from many sources USFS, DFG USFWS, etc.
Raw Data entered into Data Base

Greg- The workbook is very data based. However in some areas, data is scarce or not easily quantifiable (e.g. pesticides in the Scott Valley). General narratives are used in these cases. Additional data sources will be continually evaluated, so the workbook will be evolving.
With DFG they are working to come up with consistent approach.
For more information contact: Southern Oregon/ Northern California Recovery Coordinator (707) 825-5162 Grag.bryant@noaa.gov

http://swr.nmfs.noaa.gov/recovery/

Estuarine conditions are so important. Coho and Steelhead use estuaries for only a few weeks. Spring and Fall Salmon may use them more. Data gaps are being identified and highlighted.

This CAP project will be put out to all agencies and organizations for peer review. This will assist all cooperators in keeping focused
Pat- Mid Klamath Tributaries are not being clearly represented in data. They are so critical as refugia areas and cold water contributors. Tying in the use of the non-natal fish of the tribs to this database is important.

6) Klamath Basin Chinook Stock Identification Projects - 60 Minutes
a) Genetic Methodology and Research Needs-(HSU- Drs. Kinziger & Sprowles, SRRC- Pennington) (20 Minutes)

1. Hybridization between spring run and fall run Chinook returning to Trinity River Hatchery (genotyped over 1000 fish from that system alone)
2. Genetic stock ID of Klamath Trinity Basin Chinook
3. Future genetic studies

All work funded by Hoopa Valley tribe.

1. Hybridization between spring run and fall run Chinook salmon returning to the Trinity River Hatchery – professors and students from HSU and Santa Cruz

Overall, spring and fall run are thought to be really different entities in their life histories:
Migration time (Springers: late Feb. to early June; Fall: July to Sept.)
Maturation state (Springers: immature and hold; Fall: Mature and no hold)
Spawn time/location (Springers: Sept to mid-Oct. / upstream; Fall: mid-Sept. through mid-Dec./ downstream).

On the east coast, would call them different species

On the Trinity this situation is very different than Salmon River. There is Lewiston dam and the trinity river hatchery blocked upstream migration, changed flow and spawning 'break.' Spring run and fall run are mixing quite a bit now, especially in the area right below the dam. The hatchery tries to avoid breeding spring run and fall run.

OBJECTIVES:
Use genetic tools to
1Determine if spring run and fall run….
2
Methods: weekly samples of Chinook returning to Trinity River hatchery in 1992 (of 40 samples each week)
370 individuals at 29 loci (24 microsat and 5 allozyme loci)
Showed graph of genetic differentiation, comparing first week to all the other weeks. The maximum value of differentiation is .016, which is not a huge amount of genetic differentiation.
Then, did Assignment tests with genetic stock, gave 'q' value for spring to intermediary to fall run. They saw a lot of spring signature types and then a gradual transition to a lot of intermediary types, then a lot of fall types
Results summary

Genetically distance spring and fall run returning to Trinity River Hatchery (TRH)
1Low genetic divergence
Weak cline through time
2 intermediate q's with 90% credible intervals ranging from 0 to 1
Consistent with extensive hybridization between spring and fall run
Hybrid simulation analyses (results not shown)
Not an artifact of insufficient genetic data

2. Genetic stock ID of Klamath Trinity Basin Chinook
There is some ability to do stock ID in the Trinity, but it is complicated by the extensive hybridization between the fall run and spring run.
Hybridization can come from mating in the river or matins in the hatchery. Because of the dam, ~80%of the spawning occurs in the 10-12 km below the dam, so there are tremendous amounts of inter-mating. It is possible, because the TRH uses a spawning hiatus during the overlap with spring and fall, it could be responsible for maintaining the genetic difference between the two runs. They have been using that break (where they don't spawn fish for ~10 days) for about 10 years.
Tom- did you ever compare the Salmon River fish genetically?
Andrew- no, it would be really interesting to look at the Salmon River as a parallel system
Pat- it is ironic that the South fork stocks are so low that we can't even get enough samples to get genetic info.
Petey- haven't you been finding out that you can use scales?
Andrew- it's not the scales exactly, but the tissue that comes off with the scales
Amy- there is a quandary with using the scales. There plenty of historic stocks of scales to yield genetic info from the past. But how far back to you want to go when coming up with genetic standards of stock differences? You want that information, but you also want to have genetic information that is most relevant to the runs current runs that you will be sampling.

Tissue Sampling-
Scott, Shasta, Salmon, Blue or Ormgard Creek (would like some samples from there, lower in the system, because historically they were quite a bit different genetically), Iron Gate,
Have about 1600 samples and have assayed ~1000 of them, mostly from Trinity Riv.

There are two types of Molecular Markers being used: SNPs and Microsatellites. Microsatellites are kind of standard and came about in the 1990s.
Last summer Andrew and Amy did a pilot study to compare the two systems:

Assayed 70 SNPs
9696 chinook form the Klamath
Iron Gate hatchery
Trinity River hatchery
Salmon River

Collaboration
HSU and gene collaboration
SNP pilot results-the 70 SNPs assayed illustrated low power for genetic identification. The SNPs don't seem the way to go for stock identification in the Klamath. (They were using genetic markers that had been identified in a project from Alaska.) SNPs could be useful for the Klamath, but would have to first do the extensive background work to get Klamath specific identifiers.
But the only locus that gave some significant results were locus Ots_C3N3 and the Salmon River Fall, there was a 75% frequency of allele2, and the Salmon River Spring run, there was 68% of allele 1 at that same loci. So, there was a high difference between Salmon River fall and spring run fish at that loci. However, all Iron Gate hatchery fish, had the same allele as the Salmon River fall run fish. So, if using mainstem fish, would not be able to tell if the fish was fall run Salmon River or iron gate hatchery fish. Would have to have more than one loci.
Hatcheries can change allele frequency within just a few generations.

So, microsatellites seem to be the marker of choice for current Klamath Trinity River genetic stock identification
Are going to be using 12 loci
There are some big advantages of SNPs, because can be cross-laboratory.
They do real-time micro-sat work in Alaska.
There is a robot that runs the microsats and it is working at 10-15% capacity. The limiting factor is the technicians.

Andrew's gut feeling is that long-term operation of hatcheries in the Klamath basin where they shared stocks between the hatcheries (TRH releasing Iron Gate fish, for example) has erased some of the finer scale differentiations between the stocks of the basin fish.

Difference between microsatellites and mitochondrial DNA: Mitochondrial is used more for determining which species something is, where microsats are more used for within species differentiation; is closer to a genetic/ dna fingerprint.
Everything below Iron gate was probably less than 20% of the historic run of the Klamath basin.
Dave H- noted that someone else's work showed that the more recent divergences would be between the runs in a basin and then the older divergence would be the between different basins. For example: the spring and fall of the Trinity were more closely related than the spring run Salmon river and the spring run Trinity River.

3. Future genetic studies in the Klamath

Assessment of historical genetic structure of Chinook Salmon
Archived scales available from 1913 at CDFG
Collaboration with CDFG
DNA from scales?

Baseline for restoration
What diversity remains? Lost? Reintroduction.

ONE STUDY FOR HISTORICAL SAMPLES TO COMPARE PRESENT STOCKS TO OLD - PERFORM A PILOT STUDY T SEE WHAT DATA CN BE RETRIEVED – FULL STUDY WOULD HAVE TO LOOK AT 600-1,000 AND WE NEED TO SEE IF WE HAVE SAMPLES

SECOND LOOK INTO USING GSI FOR KLAMATH STOCKS
FOR LIFE HISTORY, SELECTIVE HARVEST, STOCK SEGREGATION

FLUSH OUT THE DATA SET --- NOW WE HAVE ONLY HIGHEST NUMBERS- NEXT STEP TO FLUSH OUT SMALLER STOCKS AS CONTRIBUTORS TO THE OVERLL POPULATION

HSU should look at NOAA status review information

There are several archive scales in CDFG from 1913 and could be transferred to HSU archival data base – and possibly get DNA samples off of them

What diversity, what was lost, what stocks could be used for reintroduction

Are there any old stuffed fish available.
HSU is a year or 2 away from using data for catch composition in the lower river.

Amy- There are always markers used elsewhere- Anytime we do a genetic study we need to look at as large a sample as possible
Relate old data sets to the markers is difficult and could be very expensive.
Need to archive all of the information

NEED STUDY PLAN FOR GENETICS FOR

Project Croos – uses a standards set of genetic markers coast wide
For broad scale stocks. In the Klamath Basin HSU has elected to use a smaller ste of genetic markers to give finer info for specific stocks in the Klamath Basin.

Garza is using standard markers to develop a coast wide analysis

Key Questions to answer-

Look at historical data

Hone in on capabilities of GSI in the Klamath

First things is to look at data gaps- middle, lower, s. fork tribs

NEED TO CATALOGUE DATA and samples that are AVAILABLE

OLSEN DATA RESEARCH IS AVAILABLE

CONTACT SARA Borok FOR SCALES

GENETIC RSEARCH PROJECTS
1) SEE IF THE EXISTING SCALES WORK FOR GENETIC ANALYSIS

2) STOCK IDENTIFICATION FOR HARVEST MGT PURPOSES – OCEAN AND IN –RIVER

A BIG ISSUE FOR SPRING CHINOOK IS THEIR BEING INTERCEPTED IN THE FISHERIES IN THE OCEAN

We should look at PSFMC data base ocean distribution

ICEP tagging studies show that fish are all over the place

Is there anything that we can do to reduce the impact in the Klamath Spring Chinook before they come back into the Klamath River.

b) Project Croos- Ocean Stocks – Handout (10 Minutes)

. c) Other stock identification activities in the Klamath/Trinity (15 Minutes)

Rebecca Quinones may be doing her doctorate work on some aspects of stock identification in the Klamath River Basin.

LUNCH BREAK

7) Spring Chinook Otolith Investigations, Status Reports, and Management & Recovery Plans (SRRC-Pennington/Brucker, Shaw-USFWS) (30 Minutes)

Petey- If we can identify stocks, the otolith studies will help track a life history

Nat- What are the main questions we need to answer through Genetic Stock Identification (GSI)? Get a study plan together. RFPs coming up SRRC will be making proposals
Pat- First thing to do is fill the data gaps.
Leroy- we have a good deal of Spring Salmon data, from using tissue mostly.
Amy- It's possible to get good DNA from scales.
What is the emergency plan if the stock is about to collapse? Genetic studies will help to decide what rootstock to use in an emergency.
There are bones from the upper Klamath (Jeff Mitchell's). Historical data from ancient DNA samples will be helpful in making decisions. Compare to current day stocks.
It is doable at HSU.
Next step with GSI. Flesh out data to look at separate subbasins. Also look at historical markers from other areas. Use different markers (develop new ones) for increasing the accuracy in fish id-ing. Relate old data sets to new markers.

Link limiting factors with otoliths
Stock to repopulate?
Selective Harvest decisions
Reintroduction?
Petey- propose that we collect otoliths this fall
Sample protocol ---- scales, otolith, tissue,
Otolith removal and preservation workshop
Work with HSU - educational- and CDFG- Jane S.
CDFG collected otoliths form Iron Gate Dam, Shasta, Scott,
CDFG collected genetic tissue samples and sent to M Garza
Use otoliths to identify bottlenecks that reduce survival

SRRC's proposal for stock identification for $56,000 ranked 12th amongst many on a contingency list of grants to fund.. They will resubmit it.

GREG BRYANT & SAM FLANNAGAN
WHAT ARE THE KEY QUESTIONS-
---- HARVEST, REINTRODUCTION, LIFE HISTORY PATTERNS, SEPARATE STOCKS IN THE KLAMATH,
There is a state appropriations bill that has a tag written by PCFFA. If it passes it will pay for evaluating all information on limiting factors for Salmonids (esp. Coho) The Arcata office of NOAA has more information about this document. NOAA KLAMATH Coho SALMON RECOVERY PLAN - DUE IN AUGUST ---- THERE ARE NO GUIDELINES AND RECOVERY Through THE ESA. Arcata office is working on a draft for internal review. Publication on July 11. It doesn't lay out specific recommendations, but will evaluate and pull together data that limit salmonids, focusing on coho. There will be some Chinook. This will stop at Spencer creek and includes 3 dams.

Nat- There are otoliths from Salmon River Spring runs that have been collected since 2004. They have the potential use of natal signatures in stock identification (report and analysis by Jane S; funded by the Task Force). Juveniles and also spring and fall (fresh) carcasses have been collected and analyzed.
Inner annual natal signatures were made by the thermal incubation temperature difference. 2002-2005
Dave- Temperature is driving these marks? Natal waters temp will show up on otolith. (as long as they are unique enough) Expense?
Jane- Depends on what you are looking for. If it's only a natal signature, that's simple. But the hope is to trace life histories and learn much much more about the patterns
Petey- A question for us, is this tool useful for the Klamath Basin?
In every given year, about 5% over summer and go out at a year and a half. Are these more likely to come back?
One tidbit from Jane's report is that there seem to be "nursery" areas in the Salmon where the fish react similarly as to estuarine environments. In one time period, the fish grew substantially. The trap was at the mouth of the salmon, and the fish probably had not been down in the Klamath yet. This is abnormal in other systems.
Dave- Al Olson's thesis corroborates that survival and escapement increases with estuarine (or similar environment) time.
Petey- Correlate water temperature with otolith increments. (They didn't have that in place with this recent otolith study)
Website for report: Scagitsystemcooperative.com

8) **Report on 2006 Klamath Spring Chinook Harvest Management and 2007 Klamath Chinook Projection and Harvest Management** (Hillemeier-Yurok Tribe, Hoopa Tribe – George Kautsky, Karuk Tribe- Reed, and CDFG- Sara Borok) (30 Minutes)

Law enforcement has asked USFW to put dates on regulations for springer protection for harvest, for above the S fork trin. Sara is asking for suggestions.
Creel budget comes out of the Trinity for the Klamath --- Creel
No real time monitoring in Klamath
CDFG regulation for 2007can't take Springers above Weitchpec – till august 15----
Want hard dates for Springer regs. ---
Need to give Sara B. comments---
The sport harvest is between 4000 and 8000. It is going to be 2 adults per day, 4/week. The sport limit for the basin is 12000. It is going to be a fast and furious season, depending on the type of water year. Last year's Springer harvest #'s from aug.6 thru season from ocean to Weitchpec 125 grilse and 35 adults.
Dave- the lower river recreational fishery is a big data gap,. That is the only fishery that is not monitored for protection of spring Chinook. It is going to take many years of info before it is useable, so when the opportunities come along, it would be great to help the state prioritize studying that.
Sara put out a cry for money for monitoring and
Scott- follow up on Dave's point. What are the specific places where we can put pressure on the state?
Dave- with the fish and game commission; that at for this day and age there would be a fishery that is not regulated
Nat- regarding last year's fish and game commission " the present problem was not discovered until early Jan…. the distribution of KRSC is limited to two subbasins… wild KRSC salmon stocks have also been identified as a source of future restoration of salmon stocks in the upper basin" should the dam s be taken out.

Dave- most of the meetings to the Yurok tribal council was to close the fishery 3 days a week, no selling of Green sturgeon, no bartering of any spring Chinook to anyone not in the tribe. These self-imposed regulations are pretty much unanimously supported these days.

Petey- it's always the Yuroks, the Hoopas and the Karuks who come to these spring Chinook things.
Thank you.

Dave- another thing that people are beginning to realize is if the dams come out, where are the stocks for re-introduction of spring Chinook going to come from?

9) Use of Salmon River stock in Reintroduction into the Upper Klamath Basin
(Karuk Tribe- Soto, Yurok Tribe - Hillemeier, SRRC- Brucker) (20 Minutes)

Petey- this is something that has been coming out with the dam relicensing meetings. The four tribes worked on a re-introduction plan. It's been coming out that the Salmon River stocks could be pretty important. Initially they tried to say that the Salmon River spring chinook were not true spring Chinook, because they weren't true river type. That is where this genetic research and historic timing issues come in as crucial information.

Nat- will Toz please touch on the Karuk tribe and spring Chinook harvest
Toz- historically there was harvest. It is thought that spring chinook are the seed stock for a population. They currently do not harvest spring chinook

The Karuks have a "chiipich," which is a yearling plus, which is about a ½ pound Chinook outmigrating. They still get some these days from iron gate and they are about 200mm. How spring chinook life history would have functioned in the upper basin:
it would just be typical of any spring Chinook population, where they would develop slower…
Nat- I would imagine, that it would be hard for any fall chin to develop and be successful in the upper basin.
___- the spring Chinook were the predominant run in the upper basin; the Sprague and the Williamson. There were some fall Chinook, but not until later on.
Dave-doesn't the Sprague have a lot of sub-surface flow.
Roger- yes, there is a series of springs, in spring creek,

Petey there are several status reports. The Rogue River recovery plan had great things for springers. It is good as far as a reference; how do we look at things, how can we try to protect springers.
Roger- another one that would be good to look at would be the re-introduction of salmon on the Deschutes. It is very comparable to the Klamath as a basin to model on
Yes, people liked this idea

John B with USGS together with BOR money and Karuks and USFW in Arcata
They got involved last year, the other cooperators started in 2005.
They are going to get radio telemetry stations from the ____ on down to river mile 13.
They did a few 100. last year they did hatchery fish.

They have a map that shows where there are antennas that they have out listening for fish. They use the info collected to estimate survival as fish move through the river. How many are detected at each station. As far as the Salmon River goes… the fish are pretty small. (The ones that you could tag would not be the most representative fish for the salmon)
John and his colleagues use radio tags and PIT tags
METHODS
- 80-100 mm fish??? Too small
- Radio tags >= .37g
- Cost ~$200 per tag
- Acoustic tags ~0.6 g
- PIT tags ~0.07 g but have pretty low probability of recapturing the tags
  - Low *p*
  - ~$3 per tag
- Sample size depends on *p* and desired precision

Tom- if pit tags are so inexpensive, it might be an okay idea to pick a year, mass tag; wait 3 years and see who comes back.

John had Summary of Survival Data from Juvenile Coho Salmon in the Klamath River, that was generated from their study. They expect to have it out later on this year, but he brought copies and passed it around.

Petey- Jack West in 1991 made a prediction that there was the capacity for 44,000 fish in the Salmon River in the south fork, the north fork and the east fork.
Is there anything we want to talk about as far as re-introduction to the upper basin?
We are glad to have Roger down here, and knew that that was something that he had been interested in.
Scotty-look at the upper Deschutes, the rogue and the salmon, as far as stocks for the re-introduction, in that order, and then look into the snake.
Roger- was curious about looking at the Deschutes for re-introduction stocks
Tom S- why would you look at just one stock for re-introduction? Why not use a whole spectrum, so that you have diversity of fish for timing,…
Roger- but how do you protect the native wild stocks, such as on the salmon, from being weakend, by the introduction of foreign fish
Pat- doesn't think that you will need to introduce fish. If you take the dams out, the fish will find that cool water. He is really dubious about transplanting fish from other basins. We need to get the dams out, or the river is going to die for all salmon species. If we do it before the pacific decadal oscillation cycle in 2015 (2025?), etc then he doesn't think the upper basin will be populated. When you look at transplants of pacific salmon stocks in the range of pacific salmon, they don't take.
____- we have a 100 year history of failed transplanted stock attempts. There has been two examples of success stories, one is on the Eel river. There have to be some buffers …

the Shasta was the largest population of spring Chinook in the lower basin, at least on the California side , it was about 40,000 before Dwinnell dam went in. then, within 3 years of the dam, it was gone

Scott- hearing pieces of global warming, and it is important to address global warming in the restoration plan. He has heard that run timing is expected to be an initial indicator of global warming effects.
Dave- the dams have delayed the cooling of the rivers, and there is evidence to show that they have delayed the run timing of fall chin by two weeks.

Pat-it is ironic now that we are coming out of denial about global warming, that we are talking about building more dams, when we should be talking about the hydrologic functions of rivers.

Petey- talking to Bill Tripp and Ron Reed told him about the burning in the summertime, which cleared out undergrowth. That allowed for there to be snowpack underneath the trees..

Scott- well, what is our contingency plan to have Springers in the system at all?

Amy- is gathering that the issue for re-introduction is between getting the most native historic stock genetically of fish versus what will survive? Right?
The last project that she worked on was funded to try to eliminate the introduced stock from the genetically native stock.
Roger- right, that is the concern, of introducing a stock that would breed with the current native wild stocks, on the salmon, but change, for example, the timing of everything and lead to the elimination of all fish, the introduced and the current successful wild stocks that they would have mated with.
Information – is there an emergency plan for captive brood stock = mating pairs to prevent regression
Re-establish the South Fork run
Nat- as far as the Salmon River, he talked to some people at Bodega bay, and they had experience rearing juveniles in pens to adulthood, and then breeding them and putting their eggs in natal streams where they want to introduce the fish.
____- listed some problems with that. He had experience with the ESA with winter run stock in the Sacramento. Where Oregon has a jump up on us is with their extensive habitat surveys and life history surveys. They were able to develop a more appropriate PBA that is more data intensive.

Petey- there are a couple things on the agenda that we haven't directly gotten to, but we have discussed along the way, for example, funding sources

10) Discuss Priority Data Gaps to Address and Key Research and Monitoring Needs – (
(Basin Cooperators) (30 Minutes)

Assessment of Survival of Salmon River Spring Chinook Juvenile Outmigration in the Klamath River (Karuk Tribe-Soto, USGS- Beeman) (15 Minutes)

11) Identify Funding Opportunities and Proposals to Develop– (Cooperators) (20 Minutes)

12) Identify 2007 Spring Chinook Calendar of Activities and Work Plan - (SRRC – Pennington, Brucker) **(**35 Minutes)

13) Review Assignments and Confirm Date, Time and Location of Next Work Group Meeting and other Work Group Actions to take place in next 2-4 months.- (10 Minutes)

Petey- unless there is some longer range framework or overarching thing, he worries that all the efforts will not come together. How do we tie it together?

Spring Chinook week will be July 24th, and is going to have the SRF and their 2nd annual Spring Salmon confab. We are going to start with the voluntary dive effort, have the symposium, then a workshop and our education festival called Jammin' for the salmon.
There will be a follow for this meeting on the Friday of that week. There will be workshops and tours with the SRF
NEED TO MEET QUARTERLY MEETINGS-
DIVE WEEKIS NEXT MEETING
FALL IS THE NEXT MEETING

Reintroduction

The amount of transferred genetic showed that there was not a lot of cross breeding from out of basin stocks. Only American River summer steelhead had successful –

Springers were almost extinct in the 1900 ----

Upper Basin salmon stocks – there is ancient DNA

Magnesun Act
LOOK AT DATA SETS (SNALE, Upper Columbia, rogue) were markers different from these areas.

Resulting poer of micro-sat is the number of alleles. Alaska has 12-15 alleles. Klamath has 50 or so. Might want to use different set of marker for the Klamath would give us stronger separation.

Use of population Viabiltiy Model - feedback into PFMC – could use to look at the uniqueness for different species-runs life history patterns

5-8 % for Springers
3-5 % for fall

Tag some of the rescued fish

90% of the successful life history patterns - Increments reflect 1 days growth

Success rate of the fish that leave the system later—Olsen showed that the high % pf survival were

Workshop on what are key questions --- identify what tools are available

NEED TO GET PUBLICATION – Beamer et al. status review

SHOULD NEVER GO ABOVE 1 SPRINGER A DAY – EXCEPT ABOVE SOUTH FORK-

Protect early run of Springers
Neil Manji has verbiage on spring

WHAT ARE THE PRESSURE POINTS AND TIMES ---
FISH AND GAME COMMISION – IF YOU ALLOWING FISHERY IN THE LOWER RIVER WE NEED THE NUMBER

HOW CAN YOU WEED OUR OFD BASIN NOISE TO COMPARE IT TO.

USGS REPORT ON COHO

PLAN NEEDS TO COVER THE ENTIRE BASIN – HIGH ELEVATION

WE NEED TO LOOK AT A GLOBAL WARMING PLAN –

CHNAGES IN RUN TIME. AND THE SIZE OF THE FISH HAS DECREASED

DO WE HAVE DATA ON KLMATH RIVER ON THESE CHANGES
MOUNT SHASTA OIS P[REDICTED TO HAVE MORE SNOW.

NEED TO WATCH WHAT IS GOING ON FROM 4-6K FEET TO LOOK AT RAIN ON SNOW.

TRINITY RAIN ON SNOW IN THE TRINITY IN 1997

NEED TO HAVE STOCKS THROUGHOUT THE BASIN TO MAINTAIN DIVERSITY

WE MAY NEED TO RESTORE THE MOST HISTORIC NATIVE STOCKS
NEED TO LOOK AT WHICH STOCKS HAVE THE MOST SUCCESSFUL STRATEGY – SO THAT WE MAINTIN THE EXISTING STOCKS (SR)

NEED TO WORRY ABOUT INTROGRESSION

ARE THERE ANY STUDIES TO TRY AND SEE HOW TO ELIMINATE INTRO-GRESSION

THE CHALENGES FROM DISEASE ARE BIG PROBLEM AND WILL SLECT THE STOCKS

RECOVERY PLAN – (KLAMATH TRIBES NEED QUICK)- BUT WE SHOULD GO SLOW AND ADAPT TO WHAT OCCURS.

FALL CHINOOK WERE USED IN THE REINTRO PLAN – OUT OF BASIN TRANSFER – THE ONLY STOCK THAT WERE LEGAL FO USE BY CFG WERE THE IG FLL CHINOOOK. FALL CHINOOOK WOULD HVE LO BEEN TH MOST AVAILABL. TRINITY RIVER WAS THE BEST STOCK, BUT IT WOULD BE CONSIDERED AN OUT OF BASIN TRANSFER.

WE NEED TO IDENTFY WHAT THE OBJECTIVE IS - NEE TO GET FIH CULTURE- TRIBES

NEED TO LOOK AT EXPERIMENTAL DESIGN - NEED TO LOOK AT OBJECTIVES TO DRIVE THE RESEARCH

NEED TO HAVE AN EMERGENCY PLAN ------

CAPTIVE BROOD STOCK CONDITIONS FOR COHO –
NO ONE HAS IDENTIFED WHAT THE CONDITIONS NEED TO BE IN ORDER FOR THE FISH TO MAKE IT.

LOOK AT CONNECIVITY

CHARACTERIZE- HABITAT, CONDITIONS, AND OCEAN CONDITIONS TO LOOK AT WHAT A CAPTIVE BROOD STOCK.

WINTER RUN IN SAC – CAPTIVE BROOD STOCK PROGRAM ----- 1994 – 200 FISH – NOW THERE ARE OVER 20, 000

IN THE COHO RECOVERY STRATEGY WE NEEDED TO USE -- LACEY – WITH CAPTIVE BROOD STOCK – DEVELOP CONSERVATION TENANTS
WHERE WILL THE

NEED TO IDENTIFY HOW DO WE DEVELOP THE DETAILED STUDIES
TO LOOK AT

LOOK AT THE OLD SYMPOSIUM OUTPUTS

PUT KFAT WEBSITE ADDRESS TO GROUP

LOOK OUTSIDE THE SALMO AND PIECE TOGETHER A RECOVERY STRATEGY FOR GOALS-TO GET IN THE PFMC PLAN FOR A BASIIN WIDE LEVEL

NEW REGIONAL MANAGER GARY STACEY

NEED TOGET HANSEN/TUREK INVOLVED – MOST OF THE PERSONNEL ISSUES ARE SETTLED

CFG – USFS-USFS BUDGETS ARE DECREASING

CDFG DOESN'T HAVE ENOUGH MPONEY FOR THE CORE MPONITORIN PROGRAM TO ACCOMPLISH THEIR

THE TIME IS RIPE FOR THE FOCUS

WE NEED TO GET ONE VOICE TO ASK FOR ONE THING

Do a temp model and see what 2 degrees d do to fish. The dams have delayed the run timing.

KFAT MEETING BV

NEED TO FOCUS ON PROPOSALS

Appendix C - 2006 Salmon River Spring Chinook Redd & Carcass Survey

WEEK OF:

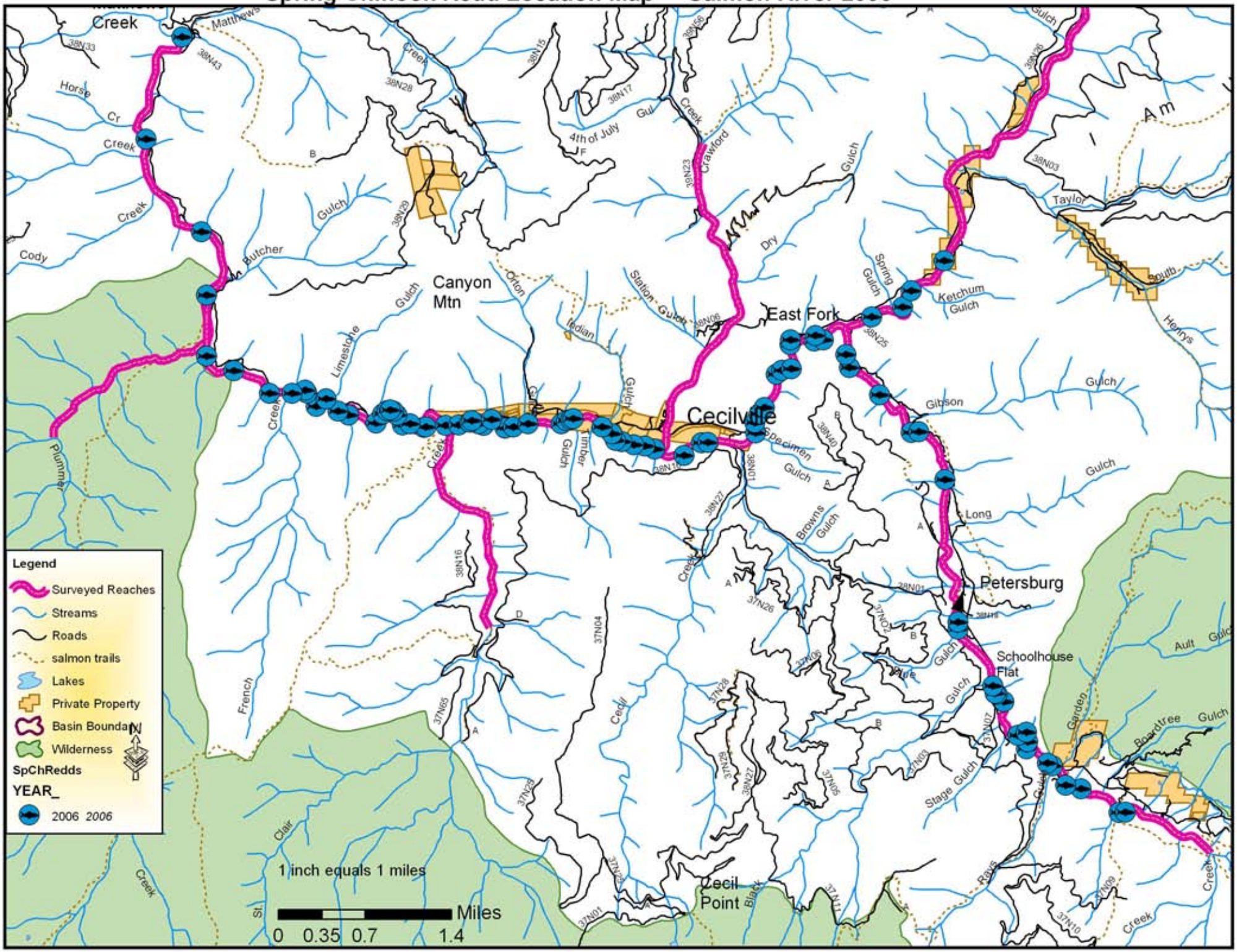
REACH	9/18/2006	9/25/2006	10/2/2006	10/9/2006	10/16/2006	Totals
South Fork:						
Little South Fork-Blindhorse (A)	R= 10 9/21 LSF-Griz C= 1 F= 5	R= 5 Griz-BH 9/26 C= 0 F= 18 R= 11 Griz-BH 9/28 C= 0 F= 18	R= 2 C= 0 F= 15	R=0 C=0 F=4	R=2 C=0 F=1	R=30 C=1
Blindhorse-Petersburg (B)	R= 4 C= 0 F= 24	R= 9 C= 1 F= 57	R=5 C=6 F=49	R=3 10/12 C=0 F=4 R=3 10/10 C=5 F=10	R= C= F=	R=24 C=12
Petersburg-East Fork Conf. (C)	R= 1 C= 0 F= 13	R= 6 C= 0 F= 17	R=4 C=2 F=25	R=5 C=4 F=7	R=3 C=0 F=1	R=19 C=6
East Fork Conf.-Cecil (C)	R= 3 C= 0 F= 8	R= 3 C= 0 F= ?	R=3 C=1 F=?	R=7 C=1 F=8	R=5 C=2 F=5	R=21 C=4
Cecil-French (D)	R= 1 Cecil-Limestone C= 0 F= 33	R= 3 Cecil to 17mile C= 1 F= 16	R=17 C=3 F=58	R=4 C=9 F=45	R=? C=4 F=?	R=25 C=17
French-Matthews (E)	R= C= F=	R=15 Limestone-Smith C=0 F=15	R=5 C=0 F=?	R=16 C=4 F=17	R= C= F=	R=36 C=4
South Fork Totals=						R=155 C=37
East Fork:						
Shadow-George's (F)	No Data					
George's-South Fork Conf. (G)	R= 0 C= 0 F= 5	R= 1 C= 0 F= 9	R=4 C=1 F=17	R=0 C=4 F=6	R=2 C=0 F=0	R=7 C=5
East Fork Totals=						R=7 C=5

2006 Salmon River Spring Chinook Redd & Carcass Survey

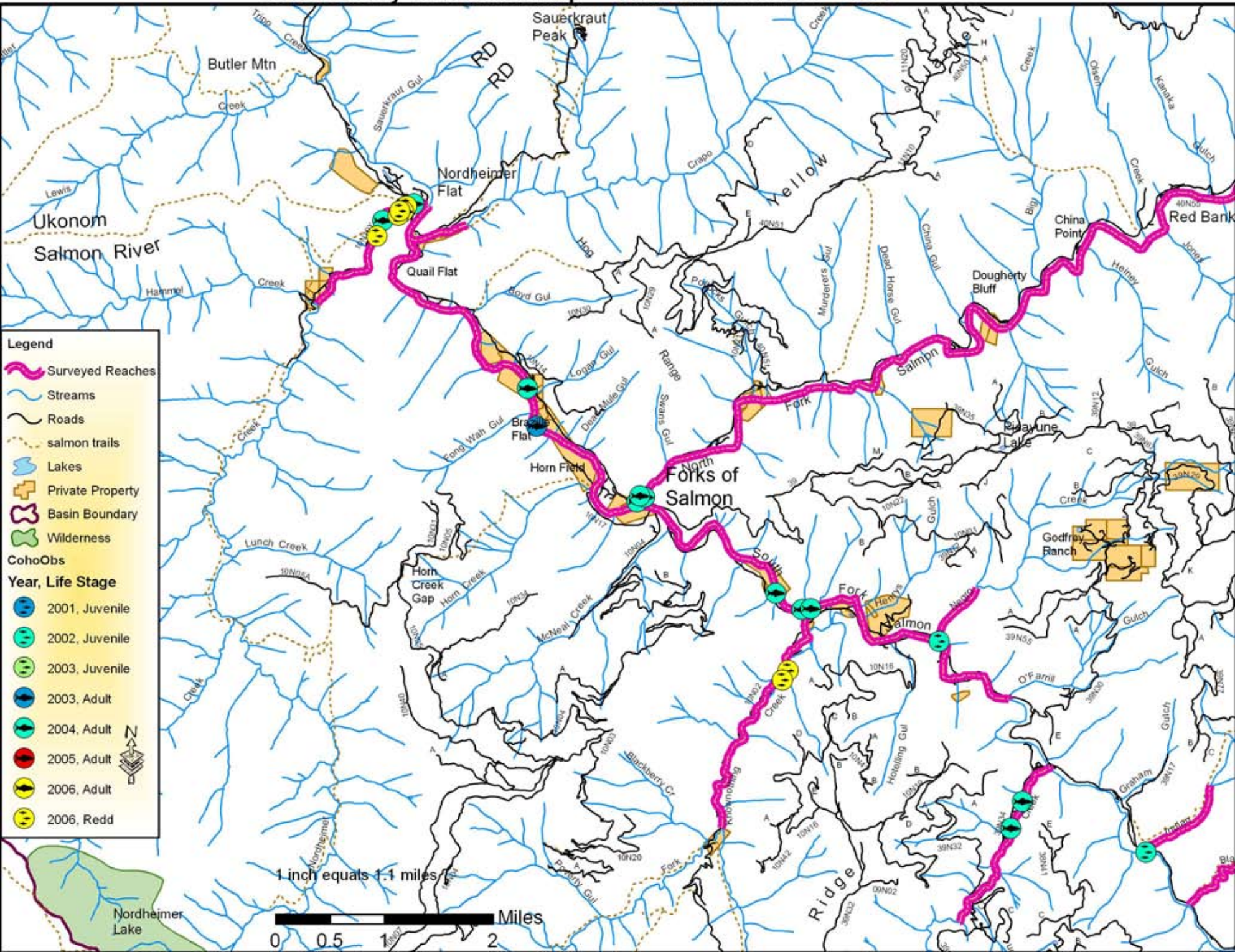
WEEK OF:

REACH	9/18/2006	9/25/2006	10/2/2006	10/9/2006	10/16/2006	Totals
North Fork:						
Right Hand Fork-Big (H)	R= C= F=	R= C= F=	R= C= F=	R= C= F=	R= C= F=	R= C=
Big-Mule Bridge (I)	R= C= F=	R= C= F=	R= 2 C= 0 F= 0	R= C= F=	R=0 C=0 F=0	R=2 C=0
Mule Bridge-Idlewild (J)	R= C= F=	R= C= F=	R= 3 C= 0 F= 5	R= C= F=	R=3 C=0 F=2	R=6 C=0
Idlewild-White's (J)	R= C= F=	R= C= F=	R=9 C=1 F=14	R=1 C=1 F=14	R=6 C=6 F=0	R=16 C=8
White's-16 (K)	R= C= F=	R= C= F=	R= C= F=	R=3 C=0 F=0	R= C= F=	R=3 C=0
16-14	R= C= F=	R= C= F=	R= C= F=	R=3 C=0 F=0	R= C= F=	R=3 C=0
Sawyer's-Kelly Gulch (14-?)	R= C= F=	R= C= F=	R= C= F=	R=3 C=1 F=7	R= C= F=	R=3 C=1
North Fork Totals=						R=33 C=9
Overall Totals=						**R=195** **C=59**

Spring Chinook Redd Location Map - Salmon River 2006



Coho Survey & Location Map - Salmon River 2001 - 2006



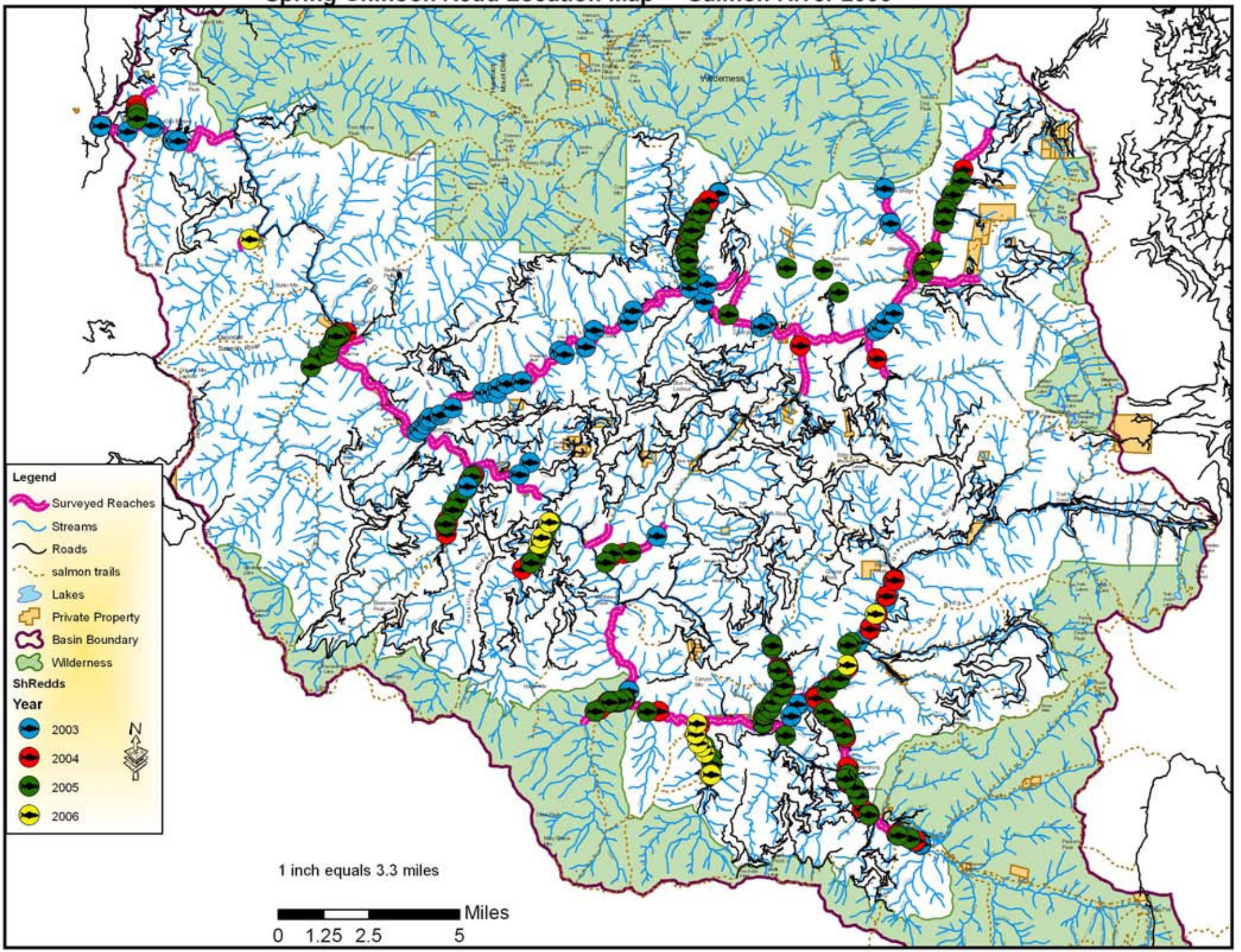
Appendix F - Winter Steelhead Redd Location and Habitat Survey Data 2007

Stream	date	crew	weather	method	turbidity	redd #	fish on redd	% canopy over redd	instream cover	proximity to cover	enhanced	Habitat type	spawning area available	spawning area used	Comments
Whites	4/9/2007	I. Swift J. Hanscom	clear/cloudy	walk	clear	1	0	75	white water	15	n	riffle	10x3	7x3	incomplete r
						2	0	75	undercut ledge, white water	5	n	riffle	4x3	4x3	
Nordheimer	4/6/2007	I. Swift Nanny	clear	walk	clear	0									
Kelly's	3/23/2007	P. Lauer K. Denny	clear	walk	clear	1	0	90	white water, boulder	4	n	riffle	3x5	2x5	
						2	0	70	boulder	2	n	pool	2x3	1x2	
						3	0	60	white water	1	n	riffle	3x3	2x3	
						4	0	75	boulder	1	n	riffle	2x2	2x2	
						5	0	75	white water	1	n	riffle	1x3	1x3	
Crawford	3/20/2007	K. Denny A. Jacobs	cloudy	walk	lightly turbid	1	0	100	wood	1	n	riffle	3x2	1.5x1	
						2	0	100	wood	1	n	pool	3x2	2x1	
						3	0	20	ledge	5	n	pool	12x5	3x1	
						4	0	40	none	na	n	pool	6x3	2x1	
						5	0	70	ledge	4	n	pool	5x3	3x1	
						6	0	30	wood	2	n	pool	5x3	3x1	
Butler	3/23/2007	B. Atwood J. Bishop	clear	walk	clear	0	0	na	na	na	na	na	na	na	boulders sho
Merril	3/23/2007	B. Atwood J. Bishop	clear	walk	clear	0	0	na	na	na	na	na	na	na	saw an 8" liv
North Russian	3/20/2007	L. Smith B. Atwood	cloudy	walk	lightly turbid	0	0	na	na	na	n	na	na	na	injured crev

Negro	3/16/2007	A. Jacobs C. Gunther	clear	walk	lightly turbid	1	0	100	u ledge	2	n	riffle	10x4	4x3	above new v
						2	0	80	boulder white water	1	n	riffle	3x2	3x2	at intake
						3	0	10	none	na	n	run	7x4	5x2	right above
Cecil	3/12/2007	A. Jacobs I. Swift	clear	walk	lightly turbid	0	0	na	na	na	n	na	na	na	
Crawford	3/6/2007	A. Jacobs K. Denny	cloudy	walk	turbid	1	0	100	undercut ledge	1	n	run	6x2	4x2	another redd
						2	0	80	wood	2	n	pool	5x3	3x2	
						3	0	60	pool, undercut ledge	3	n	pool	10x3	4x2	
						4	0	80	wood	1	n	pool	4x3	2.5x1	
Methodist	3/6/2007	I. Swift J. Hanscom	clear	walk	turbid	0	0	na	na	na	na	na	na	na	
Kelly's	3/18/2007	I. Swift J. Hanscom	clear	walk	clear	0	0	na	na	na	na	na	na	na	
Jackass	3/18/2007	I. Swift J. Hanscom	clear	walk	clear	0	0	na	na	na	na	na	na	na	
Whites	3/15/2007	P. Lauer K. Denny	clear	walk	turbid	1	0	99	white water pool wood	1	n	pool	5x3	2x1	
						2	0	90	wood	1	n	riffle	4x3	2x1	
						3	0	75	wood	1	n	run	5x2	2x1	
						4	0	40	boulder white water	2	n	pool	15x3	3x1	
						5	0	40	boulder white water	3	n	pool	5x3	2x2	hobo site
Methodist	3/20/2007	I. Swift J. Hanscom	clear	walk	clear	1	0	75	wood white water pool ect!	3 ft-15 ft	n	run r	10x3	6x3	good habitat

						2	0	65	white water	3	n	riffle	6x4	6x4	pretty define
						3	0	50	boulder white water	4ft-10ft	n	riffle	5x3	5x3	defined
						4	0	5	white water	15	n	riffle	12x3	7x3	defined
						5	0	10	white water log	20	n	run	7x2	7x2	pretty sandy
Black Bear	3/20/2007	C. Gunther P. Lauer	rain	walk	lightly turbid	1	0	10	boulder white water	3	n	pool	15x6	1x1	
						2	0	10	white water undercut	1	n	pool	15x10	2x2	this redd an
						3	0	10	white water undercut	1	n	pool	15x10	3x2	
						4	0	40	white water boulder	3	n	riffle	4x3	3x3	
						5	0	80	boulder white water	6	n	pool	10x10	4x3	this redd an
						6	0	70	boulder white water	4	n	pool	10x10	3x2	
Whites Gulch	3/2/2007	K.Denny P. Lauer	cloudy/rain	walk	lightly turbid	0	0	na	na	na	na	na	na	na	
Merril	3/2/2007	L. Smith L. Gough	cloudy	walk	turbid	0	0	na	na	na	na	na	na	na	
Kelly's	3/2/2007	B. Atwood George	clear	walk	clear	0	0	na	na	na	na	na	na	na	below bridge
Hoteling	3/2/2007	N.Pennington B. Atwood Tyler	clear	walk	snow and cold	0	0	na	na	na	na	na	na	na	

Spring Chinook Redd Location Map - Salmon River 2006



Appendix H - Steelhead Redd Location and Habitat Survey

Stream:_____ Reach: _____ Date: _____
Crew:_____
Start Time :_____ Water Temp: _____ Air Temp: _____ End Time: _____ Water Temp. _____
Air Temp.: _____ Weather: Clear Cloudy Rain Snow Method: Walk Dive Float
Turbidity: Clear Lightly Turbid Turbid Muddy

Redd #	# of fish on redd	% Canopy Over Redd	Instream Cover (none, wood, boulder, white water, undercut ledge, pool)	Proximity to instream cover in ft.	Habitat Type (pool, riffle, run,)	Spawning Area Available (L x W)	Spawning Area Used (L x W)	G.P.S. Reference #	Comments:

Total # of Redds _____ Total # of Steelhead _____