

Final Report

Scott River Adult Coho Spawning Ground Surveys

November 2005 – January 2006



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Abstract

The 2005-2006 Adult Coho Spawning Ground Surveys began in the Scott River and tributaries on November 11th, 2005. Surveys were formally initiated at this time because adult Chinook were observed spawning in Shackleford Creek on November 9th, 2005. Coho surveys were started in an effort to positively identify Chinook redds versus coho redds in areas where the two species were using the same spawning grounds. Adult coho spawning ground surveys were completed in a total of 34.10.85 miles; 4.75 miles of mainstem, and 29.35 miles of tributary.

Chinook and coho were both documented spawning in lower Sugar Creek, and lower Shackleford Creek. Adult coho spawning was observed in lower Shackleford Creek, Mill Creek, French Creek, Miners Creek. An early season redd without fish was observed in the Scott River Tailings, what was likely a coho redd was observed in the East Fork (spot survey) and a late season redd in Scott Bar Mill Creek may have been a steelhead.

Two spawned out female carcasses were found in Kidder Creek, but redds were not observed in the survey reach. Heavy flows began the day after the carcasses were found, preventing the opportunity to search for redds further upstream. In addition, the California Dept. of Fish and Game (Klamath Basin Cooperative Spawning Ground Surveys) found five carcasses in the Scott River near Shackleford Creek.

High flow conditions for most of the survey period (Mid-dec – mid-January) prevented regular surveys from occurring in many locations. The precipitation measured at Fort Jones was 262% of average in December, and 221% of average in January.

A total of 33 redds were identified; of the 33; Two were King salmon (Chinook), 14 were positively identified as coho, and an additional 10 were determined to be coho based on run timing and presence of live coho observed in the vicinity of the redd, for a total of 23 coho redds. Six redds are classified as unknown, no fish were observed. These redds were observed early in the season, and could have been Chinook. An additional redd found late in the season (Jan 11th) may be coho, but could potentially have been steelhead.

A significant finding for this survey season was an extensive overlap in the timing of adult Chinook and adult coho spawning. Based on observations over the past five years, it appears that coho begin to actively spawn directly after the first significant rain event. In certain years this can be early enough to occur during the active period of Chinook spawning.

Introduction

Coho salmon (*Oncorhynchus kisutch*) in the Klamath River Basin, the Southern Oregon-Northern California Coast ESU, were listed as threatened by the National Marine Fisheries Service in 1997. In 2001 the State of California began considering a listing of the species as threatened, and in August of 2004 the California Fish and Game Commission acted to add the coho to the list of endangered and threatened species. The listing became effective March 30th, 2005.

Adult coho spawning ground surveys have been performed cooperatively in the Scott River Watershed annually since the winter of 2001-2002. These surveys began in December 2001 as a cooperative effort between local landowners, agencies and concerned volunteers. At this time it was recognized that baseline population and distribution data were needed in order to implement and assess effective restoration efforts.

Spawning ground and carcass surveys in the Scott River Watershed aim to address the following goals:

- ◆ Determine and map the distribution and upper extent of coho spawning.
- ◆ Determine the timing of adult coho migration and spawning.
- ◆ Estimate population sizes utilizing different tributaries.
- ◆ Sample biological parameters.
- ◆ Observe spawning habitats utilized by coho salmon.

Project Objectives:

- 1.) Document the presence of coho salmon within the historic range of distribution and in tributaries not previously documented within the Scott River system. Survey “Index Reaches”, as delineated in the 2001-2002 survey, once per week, or as survey conditions allow.
- 2.) Document distribution of adult coho spawning by brood year. Document the upper extent of spawning in each tributary where coho salmon are observed.
- 3.) Determine the run timing and duration of adult coho spawning in the Scott River.
- 4.) Collect two (2) sets of tissue samples for DNA analysis to understand the genetic relationship of the Scott River coho salmon to other stocks and collect two sets of scale samples to understand the life history of the Scott River coho salmon. One set of tissue and scale samples will go to NOAA Fisheries and one to CDFG.
- 5.) Determine additional site specific information as they relate to spawning: redd composition, substrate composition, temperature, and stream gradient.
- 6.) Population estimates: Perform mark and recapture on carcasses to determine escapement numbers.

Methods

Project Location

This 2005/2006 survey effort took place in the Scott River Watershed, a sub-basin of the Klamath River Basin. The Scott River is located in Siskiyou County, CA. The legal description of the mouth of the Scott River is T45N R10W Sec 6. **See Map # 1 – Vicinity Map.**

Survey Locations

Adult coho spawning ground surveys were completed in the Scott River mainstem, and in the following tributaries: East Fork, Grouse Creek, Kangaroo Creek, Houston Creek, Crater Creek, South Fork Scott River, Sugar Creek, French-Miners Creek, Etna Creek, Patterson Creek, Kidder Creek, Shackleford-Mill Creek, Kelsey Creek, Canyon Creek, Thompkins Creek, and Scott Bar Mill. Some reaches were not surveyed during the season due to flow conditions, or a lack of access. Streams not surveyed at all include: Wildcat Creek, Moffet Creek, Indian Creek, Rattlesnake Creek, Rail Creek.

See **Table I.) Survey Reach Descriptions** for a description of reaches surveyed, and the survey schedule.

Crew Training

Survey training occurred on November 17th, 2005. See **Appendix A – Training Materials.**

Table I. Reach Descriptions

Watershed	Reach Description	Begin Mile	End Mile	Survey Schedule	Survey Crew	Total Miles
Scott Bar Mill						
Lower	Lowest 1/2 mile up of Mill Creek	0.4	0	3	CDFG	0.4
Upper	From RM 2.5 to RM 1.8	2.5	1.8	3	CDFG	0.7
Tompkins Creek						
Lower	Lowest 1.25 miles of Thompkins Creek	1.8	0	2	CDFG	1.8
Upper	From USFS road # 46N64 crossing to Potato Patch	2	1	Once	NOAA	1.0
Middle Creek	Lowest .4 miles of Middle Creek	0.4	0	once	CDFG	0.4
Kelsey Creek	Lower Kelsey from barrier to mouth	0.6	0	once	CDFG	0.6
Kelsey Spawning Channel	Spawning channel	0.2	0	once	CDFG	0.2
Canyon Creek	From the uppermost Maurer property line to the mouth of Canyon Creek	1.1	0	once	NOAA	1.1
Boulder Creek(Scott)	County bridge to mouth	0.2	0	once	CDFG	0.2
Meamber Gulch	Lower			NS	-	0
Shackleford-Mill Creek						
Lower Shackleford A	From wooden bridge to mouth	0.5	0	NS	-	0
Lower Shackleford B	From Milepost 2 to bridge	2.17	0.5	6 times + partial	RCD	1.67
Upper Shackleford	Below the falls	5	4.5	None	RCD	0
Lower Mill A	From Beaver Dam to confluence with Shack	0.6	0	Twice	RCD	0.6
Lower Mill B	From Quartz Valley Rd. Bridge to Beaver Dam			NS	-	0
Middle Mill	From the Quartz Valley Rd bridge to above Emigrant Cr.	3.1	1.7	None	-	0
Emmigrant Creek(trib to Mill)	Confluence with Mill Creek to County Road	0.1	0	None	-	0
Upper Mill Creek	From county road crossing to 1/2 mile above	3.8	3.3	Twice, + once	RCD	0.5
McAdams Creek						
Indian Creek	Upper			NS	-	0
Johnson Creek	Upper			NS	-	0

Table I. Reach Descriptions

Watershed	Reach Description	Begin Mile	End Mile	Survey Schedule	Survey Crew	Total Miles
Patterson Creek(Fort Jones)	Lower			NS	-	0
Rattlesnake Creek	Upper			NS	-	0
Kidder Creek						
Lower	Below Hwy 3 bridge			none	RCD	0
Middle	Above Hwy 3 bridge outside of Greenview			once	RCD	0.8
Upper	Upper FGS property			Once	RCD	0.5
Patterson (Etna)						
Lower	Confluence of Johnson and Patterson Creek to 1/2 mile below Hwy 3(Note this reach is split)	1.05 1.5	0 1.25	None	-	0.0
Mid (FGS)	From Upper Youngs Diversion to Hwy 3 (New Reach)	6.2	4.6	3	RCD/FGS	1.6
Upper (FGS)	From the Falls down	7.9	7.6	Once	RCD	0.3
Etna Creek						
Lower	200 yards below Highway 3 to mouth (New Reach)	2.25	0	None	-	0
Middle	From Etna City Diversion to End of FGS property above town	5.2 4.1	4.6 3.7	twice	RCD	1
Upper	From Mill Creek to Alder Creek	8	6.35	None	-	0
Ruffy Gap (Trib to Etna)	area above mouth	0.2	0	None	-	0
Clarks Creek	TP property above Hwy 3			NS	-	0
French Creek						
Lower	Hwy 3 to mouth (New Reach 2003)	0.7	0	twice	RCD	0.7
Mid and Middle	Mid=Confluence w/Miners to bottom of Krum. Middle = Bottom of Krum to above Hwy 3 bridge	2.43	0.8	5	RCD	1.63
North Fork Area	From below North Fork to confluence of French and Miners	3.43	2.43	Once	RCD	1
Paynes Creek Area	French Creek from 1/4 mile above Paynes Creek to 1/4 mile below (New Reach)	5.25	4.75	Once	RCD	0.5
Duck Lake Area	Above & below mouth of Duck Lake Cr.			NS	-	0

Table I. Reach Descriptions

Watershed	Reach Description	Begin Mile	End Mile	Survey Schedule	Survey Crew	Total Miles
French Creek						
Horse Range Creek	Above mouth		0	None	-	0
Miners Creek	Confluence with French Creek to upper Phelps Property (above second Miners Cr. Road bridge)	0.9	0	4	RCD	0.9
Paynes Cr.	Lowest .2 miles	0.2	0	once	RCD	0.2
North Fork French Cr.	Timber Products	0.7	0	none	-	0
Scott River Tailings A	From .30 miles below Wildcat Cr. To below Sugar Creek.	55	53.45	twice	RCD	1.65
Scott River Tailings B	From Below Sugar Creek to 1/2 mile upstream from Messner gulch	53.45	52.35	twice	RCD	1.1
Sugar Creek						
Lower	From Hwy 3 to mouth	0.7	0	3	RCD	0.7
Upper	From bridge crossing on Rd # 40N23 to cattle guard on Sugar Cr. Rd.	4	1.9	3	RCD/FGS /NOAA	2.1
Wildcat	Mouth up 2 mile			None	-	0
South Fork						
Lower S. Fork	USFS piece	0.7	0.3	None	RCD/NOAA	
Upper S. Fork	800 meters above Fox Cr. to Boulder Cr.	4	2.1	twice	RCD/CDF G/QVIR	1.9
Boulder Creek	Mouth area	0	0.25	Once	CDFG	0.25
Fox Creek	Mouth Area			Once	CDFG	0
East Fork						
East Fork Callahan Spot Survey						
E. Fork-Lower Masterson	Beginning 1.4 miles above mouth of Grouse Cr.	6.3	4.9	None	-	0
East Fork-Upper	Above and Below confluence of Rail Creek	12.1	7	once	RCD	5.1
Upper East Fork	Confluence of Crater and Houston Creek	13.8	12.8	once	RCD/QVIR	1.0
Grouse Cr.	lower .6mile	0.6	0	none	RCD	
Grouse Cr.	Upper USFS to Carmen Cr.	0	1	Once	RCD/QVIR	1
Kangaroo Cr. - Lower	Lower 1 mile of creek	1.1	0.1	Once	RCD	1
Kangaroo Cr. - Upper	USFS piece	2.1	1.4	none	-	0
Rail Creek	Rd 41N39 to end of USFS land	1.25	1.75	none	-	0
				Total		34.10

Survey Schedule

Surveys were scheduled to occur weekly in index reaches, and bi-weekly in the rest of the reaches. However, high flows during much of the survey period (Dec 15th – mid-Jan) prevented a regular survey schedule. Precipitation at Fort Jones was 262% of average in December and 221% of average in January. All surveyed reaches were surveyed 1-6 times, depending on flow conditions. A total of 34.10 miles of stream were surveyed; 4.75 miles of mainstem, and 29.35 miles of tributary.

Adult Coho Spawning Ground Surveys began on November 11th, in Shackleford Creek. Surveys began at this time because live Chinook salmon were observed in lower Shackleford Creek on November 9th. Coho spawning ground surveys were initiated in an attempt to identify Chinook redds, before coho spawning began, in order to correctly identify all salmonid redds in locations where spawning grounds were being used by both species.

Coho surveys were completed on a regular basis until December 16th. Flows after December 16th were too high to survey, with the Scott River and tributaries approaching flood stage between Christmas and New Years. Attempts were made to survey some locations before the end of December, but flows were still too high to survey.



Lower French Creek 12/20/2005



South Fork Scott 12/20/2005

Some locations were surveyed between Jan 1st and the middle of January, but many reaches were not safe to wade until after January 11th. Even after flows receded somewhat, RCD crew leaders did not feel safe wading in elevated flows, because the channel structure had changed in many survey reaches. Crew members no longer knew where the safe crossings were located. See **Map #2 Reach Locations and Survey Schedule**.

Population Estimates

Mark and Recapture estimates were not completed due to the small number of carcasses found.

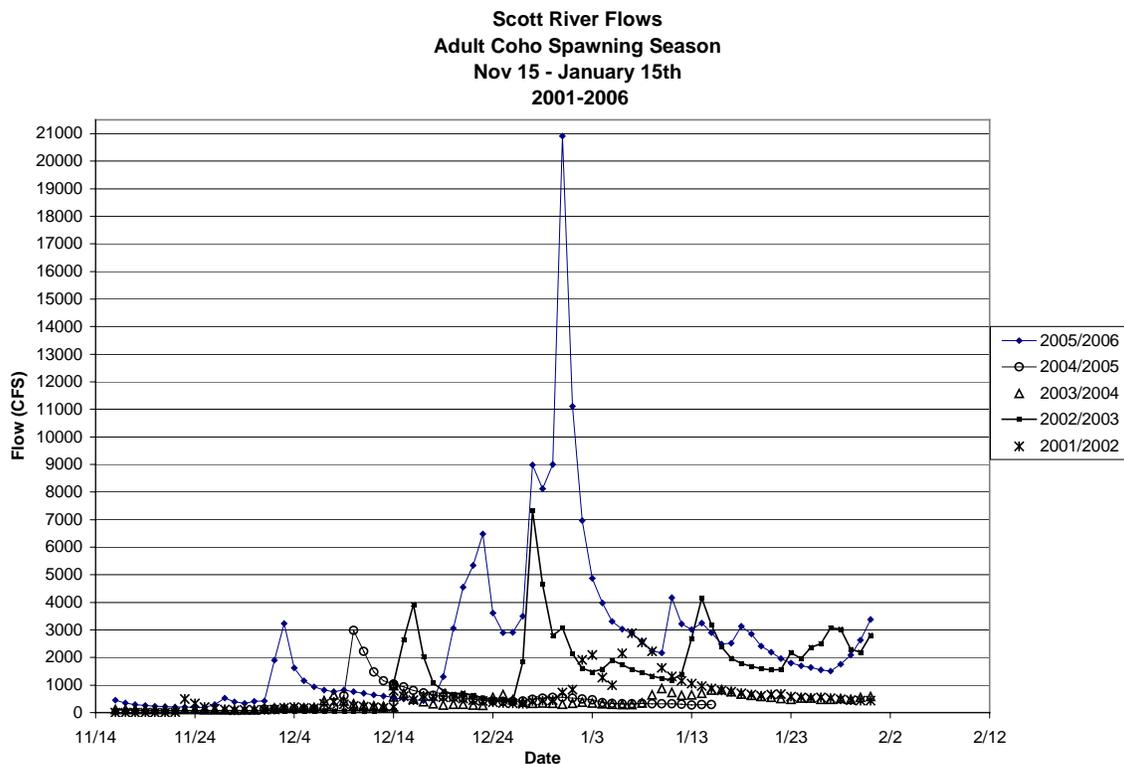
Results

Spawning Distribution

The only documented coho spawning occurred in the following tributaries: lower Sugar Creek, French Creek, Miners Creek, Shackelford Creek, and Mill Creek. Redds without positive identification were observed in Scott Bar Mill Creek, Scott River Tailings, and the East Fork Scott. In addition, carcasses observed in the Scott River mainstem near Shackelford make it likely that spawning occurred in this area. See **Map # 3 Redd Distribution**.

Survey Schedule and Flow conditions

Flows were higher during this spawning period than any time in the past five years. The previous high peak recorded at the USGS gauge was 7330 cfs (12/28/2002). During this spawning period mainstem flows peaked at 20,910 (12/31/2005). Flows in the mainstem remained over 3,000 cfs from Dec 20th to mid January. See **Graph # 1 Scott River flows 2001-2006**.



Graph # 1

The following reaches were surveyed once during the season:

Upper East Fork, upper Grouse Creek, lower Kangaroo Creek, mouth of Fox Creek, mouth of Boulder Creek, upper Patterson, Middle and upper Kidder, upper French (Paynes Creek area), upper Thompkins, Canyon, Kelsey, Middle, and Boulder creeks.

These reaches were scheduled to be surveyed a minimum of twice during the season, however the flow conditions did not allow for survey schedule to be followed.

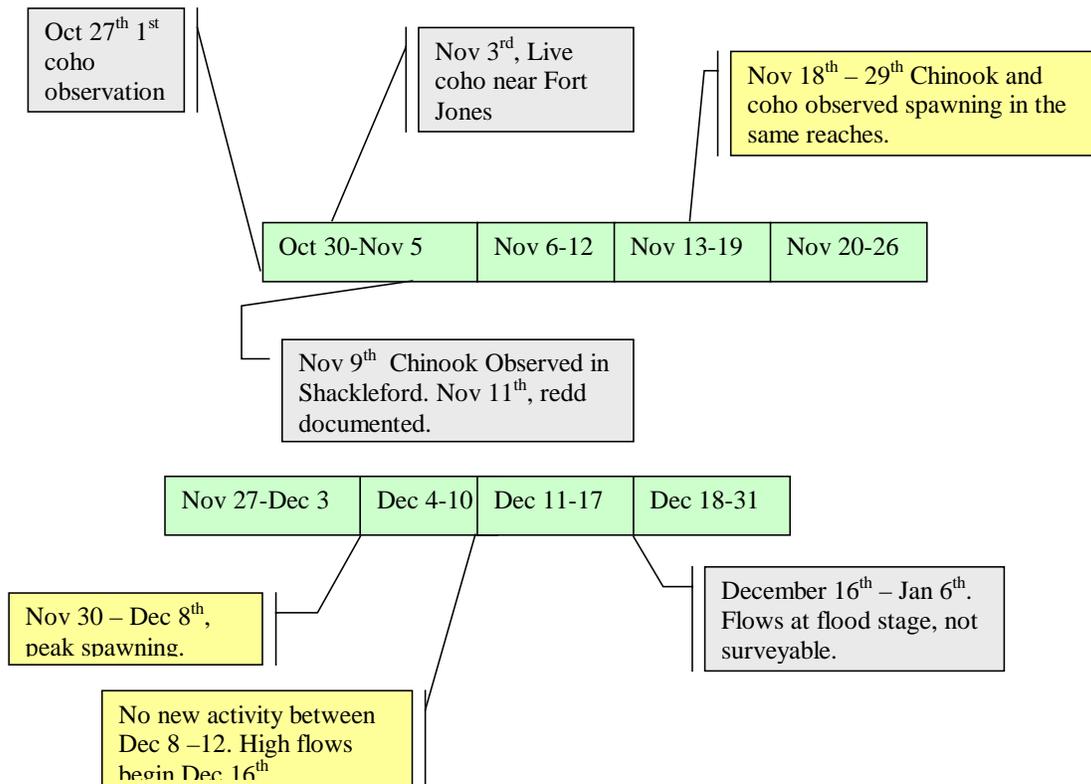
The following reaches were surveyed twice during the season:

Lower Thompkins, lower Mill, upper Mill, middle Etna, lower French Creek, and upper South Fork. These reaches were scheduled to be surveyed weekly; again flow conditions did not allow this schedule.

The following Index Reaches were surveyed multiple times during the season:

Lower and upper Sugar Creek (3), mid-French Creek (5), Miners Creek (4), middle Patterson (3), lower Shackelford-Mill (6) lower and upper Scott Bar Mill (3).

Run Timing



Early fish observations

Live Chinook were observed in Shackleford Creek on November 9th, 2005, after a rain event opened up the mouth of Shackleford Creek. The first survey was completed in Shackleford Creek on November 11th, 2005. One redd was observed at this time, but no fish were observed on the redd. One adult coho and one adult Chinook carcass were found on in lower Shackleford-Mill on November 22nd and November 21st, 2005.



Chinook Salmon Spawning in Shackleford Creek – Nov 10th, 2005

The first live coho observation in the Scott River was October 27th, 2006. The first coho carcass observation was on Nov 17th, in the Scott River Canyon, near Townsend Gulch. (CDFG Fall Chinook Spawning Ground Surveys).

Five coho carcasses were found in the mainstem on November 30th, 2005 (Klamath Basin Cooperative Chinook Surveys). A runoff-event began that evening, with flows exceeding 3,000 cfs on the mainstem. This likely flushed any remaining unobserved carcasses from the system.

Spawning timing

Chinook spawning was observed in Shackleford Creek beginning November 11th, after a rain event. The first documented coho spawning was November 18th, in French Creek. The peak coho spawning appeared to occur between Nov 30th, and December 8th. This occurred directly following the first big run-off event of the season, which opened access to all of Shackleford-Mill, and French-Miners creeks. A comparison with previous years survey data appears to indicate that peak spawning occurs directly following the first major run-off event. See **Table II. Spawning Timing**

Table II. Spawning Timing

	2001/2002	2002/2003	2003/2004	2004/2005	2005/2006
1st Coho (Live) observation	Nov 21 st	Nov 20 th	Dec 16 th	Oct 25 th	Oct 27 th
1st Significant Flow Event	11/22 ,12/7,12/14	4-Dec	7-Dec	12/8,12/14	11/15, 11/26
Peak Spawning Period	12/20-1/2	12/18-12/20	12/1-1-7	12/13-12/24	11/30-12/08

Note: *2004-2005 was the first year the a concerted effort was made during Adult Chinook Surveys to identify live coho salmon.*

Survey Observations

Redd Observations

A total of thirty-three salmon redds were documented during the spawning season. Of the observed redds, two were identified as Chinook redds, 14 were identified with live coho on them, and an additional 10 were determined to be coho redds based on spawning timing and observations of live coho in the near vicinity (total 23 coho redds). We were unable to positively identify six redds. One additional late season redd (Jan 11th) could have been coho or steelhead. See **Appendix B. Redd and Fish Observations. See Table III. Survey Results by Reach.**

Chinook and coho redds were documented in lower Shackleford and lower Sugar Creek. Adult coho spawning was documented in the following tributaries: French Creek, Miners Creek, Shackleford Creek, Mill Creek, Sugar Creek. Redds of unknown origin were documented in the East Fork Scott (not part of formal survey), Scott River Tailings, and Scott Bar Mill Creek, Shackleford and Mill Creek.

Table III. Results by Reach 2006

Stream	Reach Description		Mileage	Live Fish	Carcass	Redds
Boulder Creek(Scott)	Lower	Lower Bridge to Scott	0.20	0	0	0
Canyon Creek	Lower	Lower 1.1 miles	1.10	0	0	0
Clarks Creek		TP Property	NS	NS	NS	NS
East Fork	Upper	Confluence of Crater and Houston	1.00	0	0	0
East Fork -Lower Masterson		~ 1 mile above Grouse Cr. To below Grouse	0	NS	NS	NS
East Fork near Callahan		<i>Spot Survey</i>	NA	0	0	1ss
East Fork Upper Masterson		Above Rail Creek to Kangaroo Creek	5.10	0	0	0
East Fork, Grouse Creel	Lower	Mouth Area	NS	NS	NS	NS
East Fork, Grouse Creel	Upper	USFS to Carmen Creek	1.00	0	0	0
East Fork, Kangaroo	Lower	Mouth up	1.00	0	0	0
East Fork, Kangaroo	Upper	USFS	0	NS	NS	NS
East Fork, Rail Creek	Upper	USFS	0	NS	NS	NS
Etna	Lower	Hwy 3 to mouth	NS	NS	NS	NS
Etna	Middle	Split Reach (formerly Lower Etna)	1.00	0	0	0
Etna	Upper	Mill Creek to City Diversion	NS	NS	NS	NS
Etna, Ruffy Gap		Lowest	0.20	NS	NS	NS
French Cr.	MID	From confluence with Miners down	0.80	4ss, 1 unk	0	2ss
French Creek	Lower	Hwy 3 to mouth	0.70	1 unk	1ss	0
French Creek	Middle	From bottom of Mid-to just above Hwy 3	0.83	-	0	2ss
French Creek	North Fork	Below N Fork to mouth of Miners	1.00	0	0	0
French Creek	Upper	Upper Bridge to Horse Range	NS	NS	NS	NS
French Creek	Upper	Paynes Creek area	0.50	0	0	0
French Creek	Upper	Duck Lake area	NS	NS	NS	NS
French, Horse Range Cr.			NS	NS	NS	NS
French, Miners Creek	Lower a	lowest .3 mi	0.30	1ss	1ss	3 ss
French, Miners Creek	Lower b	Upper Phelps to top of Lower a	0.60	-	0	0
French, North Fork	Lower	Mouth up	NS	NS	NS	NS
Indian Creek	Upper		NS	NS	NS	NS
Johnson Creek	Upper		NS	NS	NS	NS
Kelsey Creek		Barrier to mouth	0.60	0	0	0
Kelsey Spawning Channel		USFS artificial spawning channel	0.20	0	0	0
Kidder Creek	Lower	Below Hwy 3	NS	NS	NS	NS
Kidder Creek	Middle	Mid Kidder - above Hwy 3	0.80	2ss	2 SS spawned	0

NC= Not connected, NA = No access, NS = not surveyed

Table III. Results By Reach 2006

Stream	Reach Description	surveyed Mileage	Live Fish	Carcass	Redds	
Kidder Creek	Upper	Upper FGS	0.50	0	0	
Mcadams			NS	NS	NS	
Meamber Gulch	Lower		NS	NS	NS	
Middle Creek	Lower		0.40	0	0	
Mill Creek (Shackleford)	Lower a	Lower .6 miles of Mill Creek	0.60	3ss, 1 unk	0	4SS 2 unk
Mill Creek (Shackleford)	Lower b	From Quartz Valley Rd Bridge to top of Lower a	NS	NS	NS	NS
Mill Creek (Shackleford)	Middle	Above Quartz Valley Road Bridge	NS	NS	NS	NS
Mill Creek (Shackleford)	Upper	Lowest FGS to Bridge	0.50	0	0	0
Mill, Emmigrant	Lower	Mouth up	NS	NS	NS	NS
Moffet Creek	Middle	USFS	NS	NS	NS	NS
Patterson	Lower		NS	NS	NS	NS
Patterson	Middle	Lower FGS to Hwy 3	1.60	0	0	0
Patterson	Upper	Uppermost FGS from Falls down	0.30		0	0
Patterson (Fort Jones)	Lower		NS	NS	NS	NS
Rattlesnake Creek	Upper		NS	NS	NS	NS
Scott Bar Mill	Lower	Lower	0.40	1ss	0	1
Scott Bar Mill	Upper	Upper	0.70		0	0
Scott River Canyon		Various	-		8ss	0
Scott River Tailings		Rm 53.45-52.35	1.10	2ss, 1 unk	1ss	0
Scott River Talings- 2004		Rm 55-53.45	1.65	5ss	0	1 unk
Shackleford	Lower S	Lower Bridge to Scott	0	NS	NS	NS
Shackleford	Upper	Shackleford at the falls	NS	NS	NS	NS
Shackleford	Lower B	Mile 2 to Lower Bridge	1.67	9ss,2ks,2 unk	1ss,1ks	10ss, 1ks, 4unk
South Fork	Lower	USFS	NS	NS	NS	NS
South Fork	Upper	Above Fox Creek to Boulder Creek	1.90	0	0	0
South Fork, Boulder	Lower	Mouth area	NA	0	0	0
South Fork, Fox Creek	Lower	Mouth area	0.25	0	0	0
Sugar Creek	Upper	From Upper FGS bridge to CattleGuard	2.10	0	0	0
Sugar Creek	Lower	Hwy 3 to mouth	0.70	2ss,1ks	0	1 ks, 1ss
Tompkins Creek	Lower	Mouth up	1.80	0	0	
Tompkins Creek	Upper	Low water crossing to Potatoe Patch	1.00	0	0	0
Wildcat		Lower 2 miles	NS	NS	NS	NS
		Totals	34.10	28 ss, 6 unk 1ks	14ss, 1ks	24 SS, 2KS, 7 unk

NC= Not connected, NA = No access, NS = not surveyed

Observations by tributaries

Scott Canyon and Tributaries

Five adult coho carcasses were found in the Scott River near Shackleford Creek. No coho redds were documented in this reach, however it is highly likely that spawning occurred in this area. The only tributary in the canyon reach with live fish observations was Scott Bar Mill, this live coho was observed on December 8th, 2005. The only redd observed in the canyon was in Scott Bar Mill Creek on January 11, 2006. Based on timing, it is likely that this was a steelhead redd. See **Map # 4 for Redd Locations**.

Shackleford-Mill

A significant overlap in Chinook and coho spawning was documented in Shackleford-Mill Creek. Chinook were first observed in Shackleford Creek on November 9th, 2005. The first coho sighting in Shackleford Creek was November 22nd, and both Chinook and coho were documented spawning in this reach between November 22 and November 30th. A total of four redds in lower Shackleford, and two redds in lower Mill could not be attributed definitely to either coho or Chinook, due to the overlap in timing.

A beaver dam on lower Mill creek appears to have prevented adult passage until mid-December. No live adult coho, redds or carcasses were observed above this reach during the survey period. See **Map # 5 for Redd Locations**.

Kidder/Patterson/Etna Creek

No fish or redds were observed in either Etna Creek or Patterson Creek. Two live fish and two carcasses were found in Kidder Creek near Greenview. High flows after December 15th prevented surveyors from returning to the creek and finding redds. However, it is highly likely that spawning occurred in this reach. See **Map # 6 for Redd Locations**.

French-Miners Creek.

Live coho were observed in Mid-French Creek on November 18th, 2005. A redd without fish was observed at this time, but was likely coho, as two coho were observed in the vicinity. A total of four coho redds were documented in French Creek, and three coho redds in Miners Creek. See **Map # 7 for Redd Locations**.

South Valley and tributaries

Sugar Creek

The only observed live fish and spawning occurred in lower Sugar Creek, below the Highway 3 bridge. One coho and one Chinook redd were observed in this reach.

Tailings and East Fork

One redd was observed in the Scott River tailings and one redd was observed in the East Fork Scott River near Callahan. Both redds were observed without fish. The redd in the tailings was observed on November 28th, 2004. This period showed overlap in Chinook

and coho timing, so it is difficult to determine which species the redd was. The redd in the East Fork was observed on December 15th, 2005, based on this timing this redd was likely coho. See **Map # 8 for Redd Locations**.

Comparison with previous years

French-Miners Creek and Shackleford-Mill. Creek are the only tributaries with documented spawning in every year for the past five spawning seasons. A reach by reach comparison is difficult, because flow conditions in various years affect fish access to spawning grounds. The 2002/2003 survey season documents the previous run of the 2005/2006 brood class. Comparisons between the two years are difficult, primarily due to the high flows experienced in 2005. Flows prevented surveys for the second half of December and early January.

See **Table IV**. Redds by Reach 2001-2006.

Table IV.) Redds by Survey Year 2001-2005

Stream	Reach	Description	2001	2002	2003	2004	2005
Boulder Creek(Scott)		Lower Bridge to Scott	0	0	0	0	0
Canyon Creek	Lower	Lower 1.1 miles	0	0	0	2	0
Clarks Creek		TP property	NS	0	NS	NC	NS
East Fork	Upper	Gregg Ranch	NS	NS	NS	0	0
<i>East Fork - 2001 Spot survey</i>		From Bridge	5	-	-	-	-
<i>East Fork - 2005 Spot survey</i>		near Callahan	-	-	-	-	1ss
East Fork -Lower Masterson		~ 1 mile above Grouse Cr. To below Grouse	22	0	NS	23	0-SLO
East Fork Upper Masterson		Above Rail Creek to Kangaroo Creek	13	0	NA	1	0
East Fork, Grouse Creek		Lower	NS	0	NS	0	NS
East Fork, Rail Creek	Upper	USFS	NS	NS	0	0	NS
Etna	Lower	Hwy 3 to mouth	NS	NS	NS	50	NS
Etna	Middle	Split Reach (formerly Lower Etna)	NS	0	0	7	NS
Etna	Upper	Mill Creek to City Diversion	1	0	NS	0	0
Etna, Ruffy Gap		Lowest	NS	0	NS	Dry	NS
<i>French Cr. -2001 Spot survey</i>		From Bridge	1	-	-	-	-
French Creek	Lower	Hwy 3 to mouth	NS	NS	0	20	0
French Creek	Mid	From confluence with Miners down	24	1	1	22	2ss
French Creek	Middle	From bottom of Mid-to just above Hwy 3	NS	NS	NS	27	2ss
French Creek	North Fork Area	Below N Fork to mouth of Miners	NS	NS	NS	1	0
French Creek	Upper	Upper Bridge to Horse Range	2	NS	NA	NA	NS
French Creek	Upper	Paynes Creek area	NS	NS	NS	2	0
French Creek	Upper	Duck Lake area	NS	NS	NS	0	NS
French, Horse Range Creek			NS	0	NA	NA	NS
French, North Fork			NS	0	NS	0	NS
Indian Creek	Upper		NS	0	NC	NC	NS
Johnson Creek	Upper		NS	0	NS	NS	NS
Kangaroo	Lower		NS	NS	NS	22	0
Kangaroo	Middle	USFS	NS	0	0	0	NS
Kelsey Creek		Barrier to mouth	0	0	0	1	0
Kelsey Spawning Channel		USFS artificial spawning channel	0	4	0	28	0
Kidder Creek	Lower	Below Hwy 3	NS	0	0	56	0
Kidder Creek	Middle	Mid Kidder - above Hwy 3	NS	0	0	7	0
Kidder Creek	Upper	Upper FGS	0	NS	NS	0	0
Mcadams			NS	0	NC	NC	NS
Meamber Gulch	Lower		NS	0	NC	NC	NS
Middle Creek			0	0	0	0	0
Mill Creek (Shackleford)	Lower a	Lower .6 miles of Mill Creek	30	0	2	29	4ss, 2unk
Mill Creek (Shackleford)	Lower b	From Quartz Valley Rd Bridge to top of Lower a	NS	NS	NS	98	0
Mill Creek (Shackleford)	Middle	Above Quartz Valley Road Bridge	NS	12	1	72	NP

Stream	Reach	Description	2001	2002	2003	2004	2005
Mill Creek (Shackleford)	Upper	Lowest FGS to Bridge	0		0	5	0
Mill, Emmigrant	Lower	Mouth up	NS	0	0	10	NS
Miners Creek	Lower a	Lowest .3 mi	14	0	1	24	3ss
Miners Creek	Lower b	Upper Phelps to top of Lower a	NS	NS	1	19	0
Moffet Creek	Middle	USFS	3	NS	NC	NC	NS
Patterson	Lower		1	0	NS	232	NS
Patterson	Upper	Uppermost FGS from Falls down	1	0	NS	6	0
Patterson (Fort Jones)	Lower		NS	0	NC	NC	NS
Patterson	Middle	Lower FGS to Hwy 3	NS	NS	NS	19	0
Rattlesnake Creek	Upper		NS	0	NC	NC	NS
Scott Bar Mill	Lower	Lower	1	0	0	15	1 unk
Scott Bar Mill	Upper	Upper	NS	0	0	0	0
Scott Canyon		Reach 2	1	-	-	-	0
Scott River Tailings-A		Rm 53.45-52.35	NS	0	0	2	0
Scott River Talings- B		Rm 55-53.45	NS	NS	NS	19	1unk
Shackleford	Lower-A	Lower Bridge to Scott	1	0	0	6	NS
Shackleford	Lower-B	Mile 2 to Lower Bridge	NS	NS	1	70	10ss,1ks,4unk
Shackleford	Upper	Below falls	0	0	NS	1	NS
South Fork	Lower	USFS	17	0	0	0	NS
South Fork	Upper	Creek	25	0	0	15	0
South Fork		Above Fox Creek ^a	26	NS	NS	0	0
South Fork, Boulder Creek	Lower	Mouth area	1	-	0	0	0
South Fork, Fox	Lower	Mouth area	-	-	0	0	0
Sugar Creek	Upper	From Upper FGS bridge to CattleGuard	2	0	0	14	0
Sugar Creek	Lower	Hwy 3 to mouth	21	0	0	26	1ss,1ks
Thompkins Creek	Lower	Mouth up	0	0	0	8	0
Thompkins Creek	Upper	Low water crossing to Potato Patch	NS	NS	0	0	0
Wildcat Creek		Lower 2 miles	NS	0	0	1	NS
Totals			2213	2019	2010	2964	24 SS, 2KS, 7 unk

NC= Not connected, NA = No access, NS = Not Surveyed

a = surveyed in 2004 as part of the Upper South Fork

SLO=surveyed by landowner

NP=no fish passage

Carcasses

A total of 14 coho carcasses, and one Chinook carcass were observed. Nine of the coho carcasses were female, 4 were male, and one was too mangled by predators to determine sex. The Chinook carcass was male. Eight of the coho carcasses were documented in the Scott River Canyon during adult Chinook spawning ground surveys. See **Table V. Carcass Observations**

Table V. Carcass Observations

Date	Stream	Reach	GPS Code	Sex	Forklength (cm)	Ad clip	Right Max Clip	Left Max other clip	TISSUE/SC ALE
12/16/2005	Kidder	Mid		F	65 N	N	N	N	yes
12/16/2005	Kidder	Mid		F	67 N	N	N	N	yes
12/12/05	French	Lower	FRE01C	F	71 N	N	N	N	Y applied 163
12/12/2005	Miners	Min01C	NO GPS	f	u	u	u	u	NO Predation
12/7/2005	Scott	Tailings	SRT06C	F	70 N	N	N	N	yes applied#4254
11/22/2005	Shackleford	Lower	SHA07C	F	72 N	N	Y	N	y applied#4383
11/22/2005	Shackleford	Lower	SHA05C	M	69 N	N	N	N	y chinook
Coho Carcasses found by California Dept. of Fish and Game during Fall Chinook Surveys									
11/17/2005	Scott 3	George Allen to Pat Ford	T. Clayton (USFS)	Female	60 N	N	N	N	Yes
11/17/2005	Scott 4	Townsend Gulch to George Allen	J. Bailey, D.M.	Female	67				Scale
11/21/2005	Scott 7	USGS Gauge to Jones Beach	J. Bailey, W Hammon	Male	76 N	N	N	N	Scale
11/30/2005	Scott 8	Meamber to USGS Gauge	C. Norman, W. Hammon	Female	68 N	N	N	N	Scale
11/30/2005	Scott 8	Meamber to USGS Gauge	C. Norman, W. Hammon	Male	78 N	N	N	N	Scale
11/30/2005	Scott 8	Meamber to USGS Gauge	C. Norman, W. Hammon	Male	75 N	N	N	N	Scale
11/30/2005	Scott 8	Meamber to USGS Gauge	C. Norman, W. Hammon	Male	79 N	N	N	N	Scale
11/30/2005	Scott 8	Meamber to USGS Gauge	C. Norman, W. Hammon	UNKN, Head only uncertain sex	uncertain sex ID				NO

Comparison with previous brood year

The previous brood year was the 2002-2003 run. Survey reaches have been expanded since the 2002-2003 survey efforts.

See **Table IV.** for comparison with surveys from 2002, only for reaches which were surveyed in both years. Total observed redds are directly comparable with the previous run. The only location with documented spawning in 2002 which did not have spawning in 2005 was the Kelsey Creek spawning channel, which had 4 documented redds in 2002. No spawning was observed in new locations.

Table VI.) Redds by Survey Reach 2002 and 2005
Only reaches where surveys occurred each year.

Stream	Reach	Description	2002	2005
Boulder Creek(Scott)		Lower Bridge to Scott	0	0
Canyon Creek	Lower	Lower 1.1 miles	0	0
East Fork -Lower Masterson		~ 1 mile above Grouse Cr. To below Grouse	0	0-SLO
East Fork Upper Masterson		Above Rail Creek to Kangaroo Creek	0	0
Etna	Upper	Mill Creek to City Diversion	0	0
French Creek	Mid	From confluence with Miners down	1	2ss
Kelsey Creek		Barrier to mouth	0	0
Kelsey Spawning Channel		USFS artificial spawning channel	4	0
Kidder Creek	Lower	Below Hwy 3	0	0
Kidder Creek	Middle	Mid Kidder - above Hwy 3	0	0
Middle Creek			0	0
Mill Creek (Shackleford)	Middle	Above Quartz Valley Road Bridge	12	NP
Mill Creek (Shackleford)	Upper	Lowest FGS to Bridge		0
Mill Creek (Shackleford)	Lower a	Lower .6 miles of Mill Creek	0	4ss, 2unk
Miners Creek	Lower a	Lowest .3 mi	0	3ss
Patterson	Upper	Uppermost FGS from Falls down	0	0
Scott Bar Mill	Lower	Lower	0	1 unk
Scott Bar Mill	Upper	Upper	0	0
Shackleford *	Lower-B	Mile 2 to Lower Bridge	NS	10ss,1ks,4unk
Thompkins Creek	Lower	Mouth up	0	0
Sugar Creek	Lower	Hwy 3 to mouth	0	1ss.1ks
South Fork	Upper	Above Fox Creek to Boulder Creek	0	0
South Fork, Boulder Creek		Lower mouth section		0
Sugar Creek	Upper	From Upper FGS bridge to CattleGuard	0	0
Scott River Tailings-A		Rm 53.45-52.35	0	0
		Totals	17	7 SS, 2KS, 6 unk

SLO=surveyed by landowner

NP=no fish passage

* This reach is included in this list because fish passage to the reaches above (Mill Creek), was blocked for the early part of the spawning season.

Discussion

Overlap of Chinook and coho spawning

A significant runoff event in early November provided fish passage into Shackleford-Mill, and sections of the Scott Valley where Chinook salmon do not usually spawn. Chinook and coho salmon were observed spawning in the same reaches in late November. During the survey period many redds were observed which did not have fish on them during the survey period. Some of these redds could not be assigned to a species, due to the timing.

A combination of professional judgement and analysis of the timing of these redds, and other factors were used to determine if a redd could be classified as Chinook, or coho.

The factors are as follows:

- 1.) Redds observed after Thanksgiving were likely to be coho, as the Chinook run appeared to be completed at this time.(M. Hampton CDFG, pers comm.)
- 2.) Observation of live coho in a survey reach, in the vicinity of the redd, during the period when the survey occurred.
- 3.) Observed behavior of spawning coho. It has been observed for the past several years that Chinook tend to sit on the redds; that is, they do not retreat much when surveyors approach. In contrast, coho tend to retreat, and can take 10-20 minutes to return to the redds. From these observations, it can be inferred that redds observed without coho, during the active coho spawning period might be coho.

A total of six redds were left as unverified. Timing of these redds, as well as location makes it difficult to determine if the redds were Chinook or coho. For example, in lower Shackleford on one survey day both Chinook and coho were observed spawning at the same location(ie same riffle).

Potential undocumented redds

Two spawned out coho carcasses were found in Kidder Creek, near Greenview. No redds were observed in the survey reach. The day after they were found, the flows had come up and were too high to survey, so no redds were found in Kidder Creek. It is highly likely that spawning occurred in this section of Kidder Creek. In addition, five coho carcasses were found in the Scott River near Shackleford Creek.

Comparison with previous years

The observed overlap in timing of Chinook and coho spawning, as well as flow conditions during the survey period make it difficult to draw comparisons between 2002 (previous brood year) and 2005, especially on a reach by reach basis.

For example, in Shackleford-Mill in 2005 the early high flow events did not open access over the beaver dams on lower Mill. This confined spawning to the lowest 0.6 miles of Mill Creek and lower Shackleford, likely until the high flow events in mid-December.

The total redds for Shackleford-Mill in 2002 was 12 coho redds in Mill Creek. In 2005 14 coho redds, and 4 unverified redds and one Chinook redd were documented in Shackleford-Mill. However, in 2002, lower Shackleford was not surveyed, and may have had spawning which was not documented.

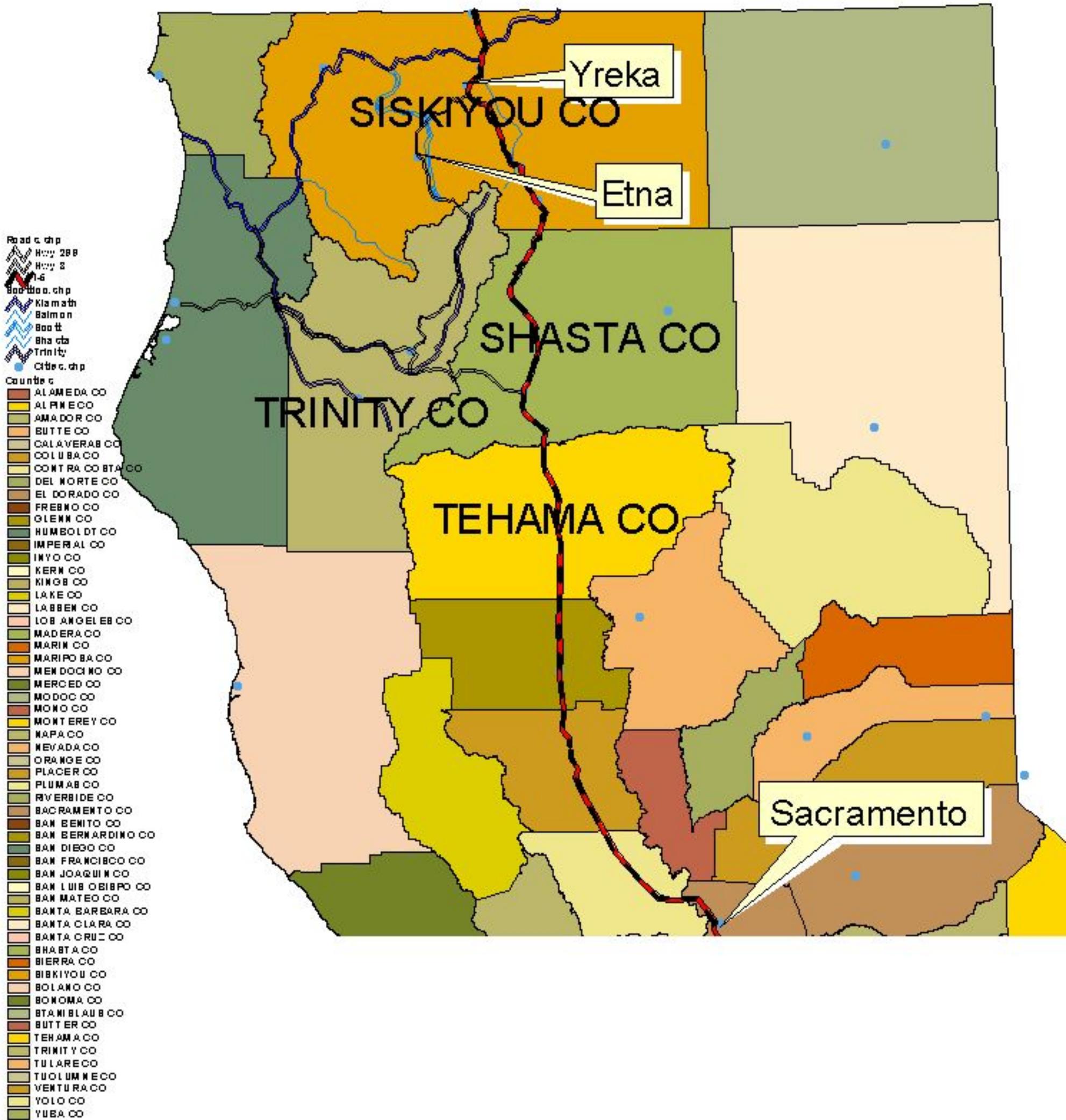
Comparing redds observed only in reaches which were surveyed in 2002 show the same numbers of redds identified in 2005 as the previous brood year.

Overall distribution of coho spawning

Data collected over the past five survey seasons indicate that reaches in French-Miners Creek and Shackleford-Mill Creek can be considered hotspots of coho spawning. These reaches show spawning activity every year, including both of the two weaker brood years. Those reaches are: Mid-French, Miners Creek, Lower Mill, Lower Shackleford, and lower Sugar Creek.

Scott River 2005/2006 Adult Coho Surveys

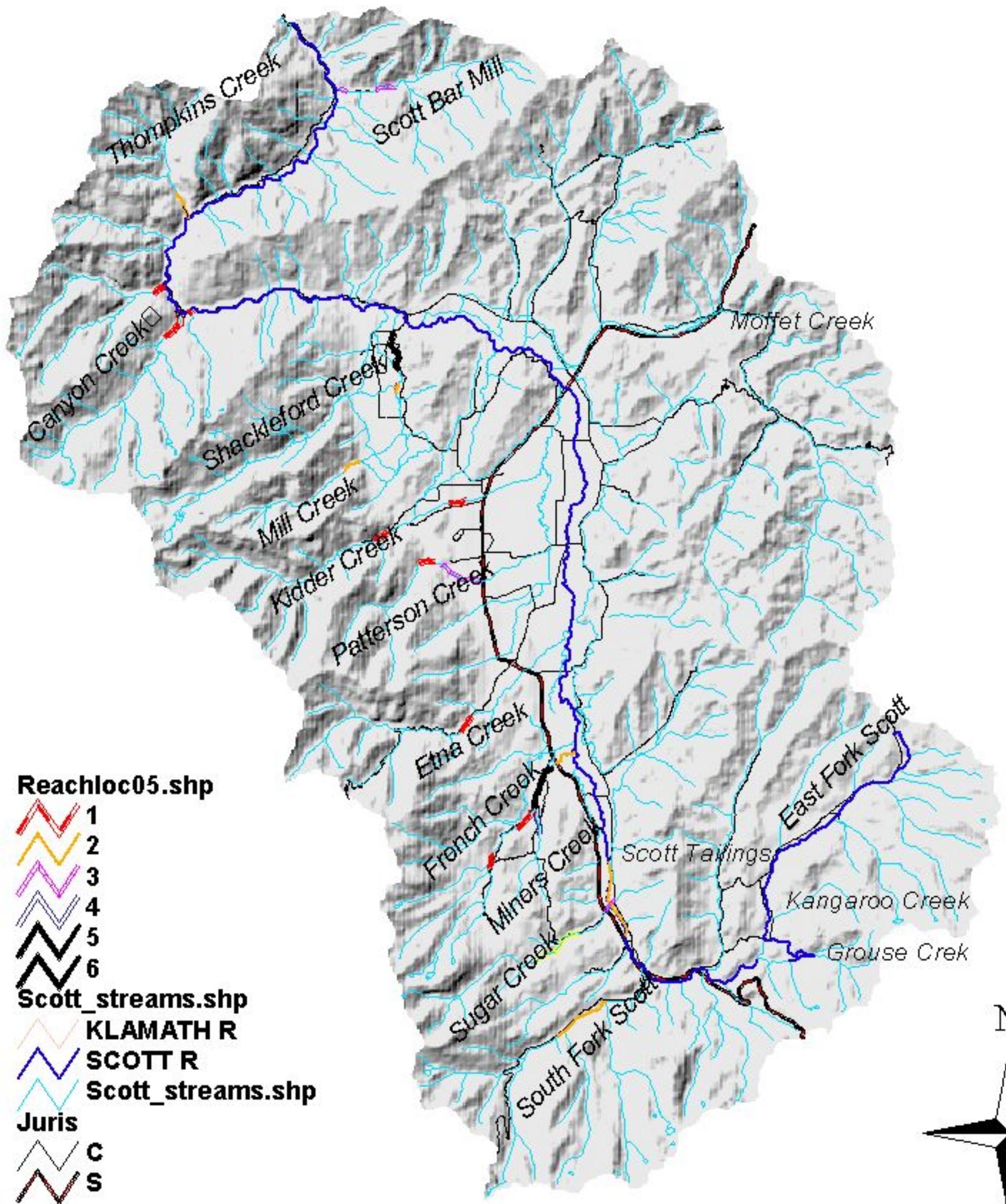
Map # 1 Vicinity Map



Scott River 2005/2006 Adult Coho Surveys

Reach Locations & Survey Schedule

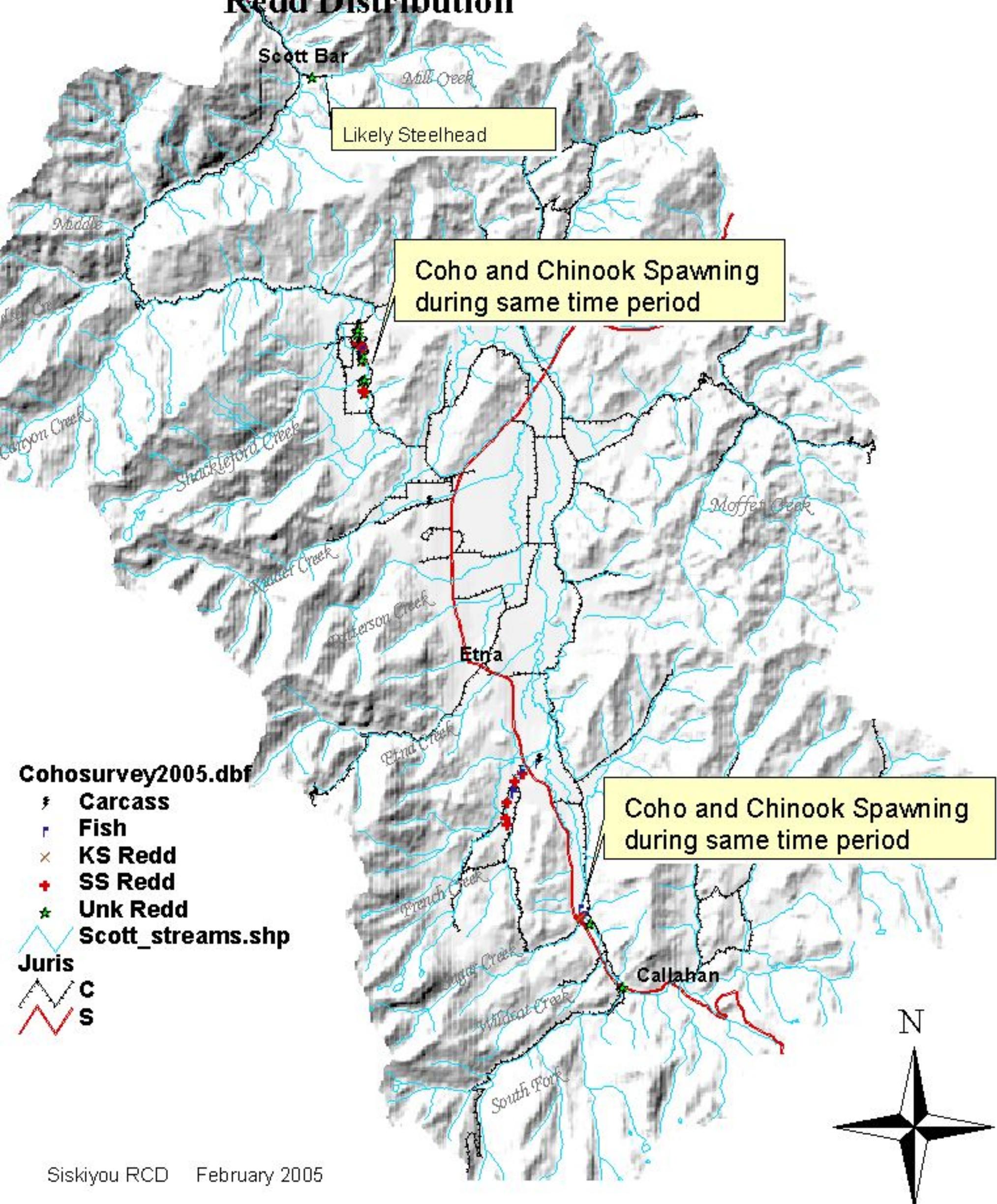
Map # 2



Scott River Adult Coho Survey 2005-2006

Map # 3

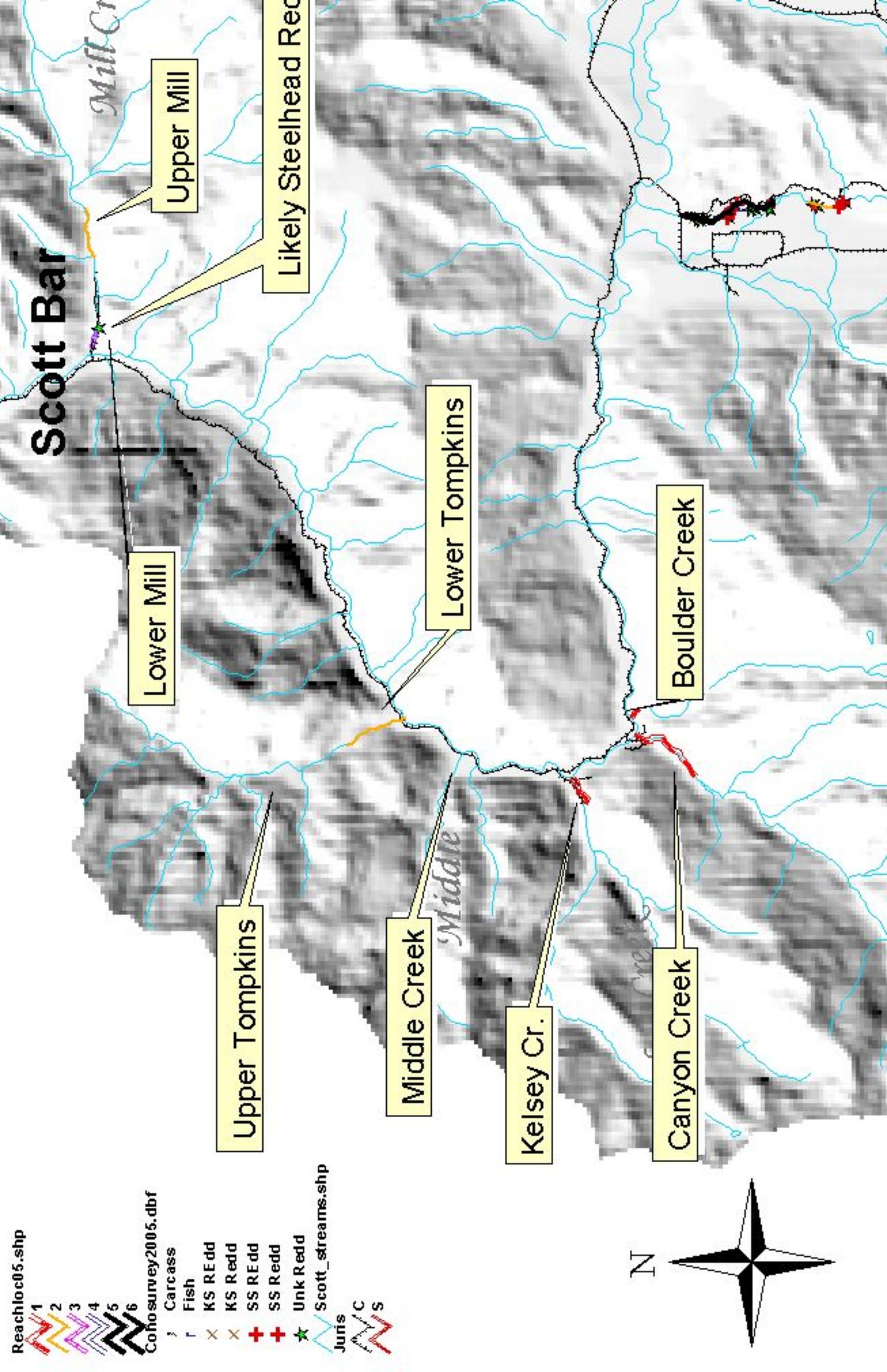
Redd Distribution



Scott River 2005-2006 Adult Coho Surveys

Scott Canyon Tributaries

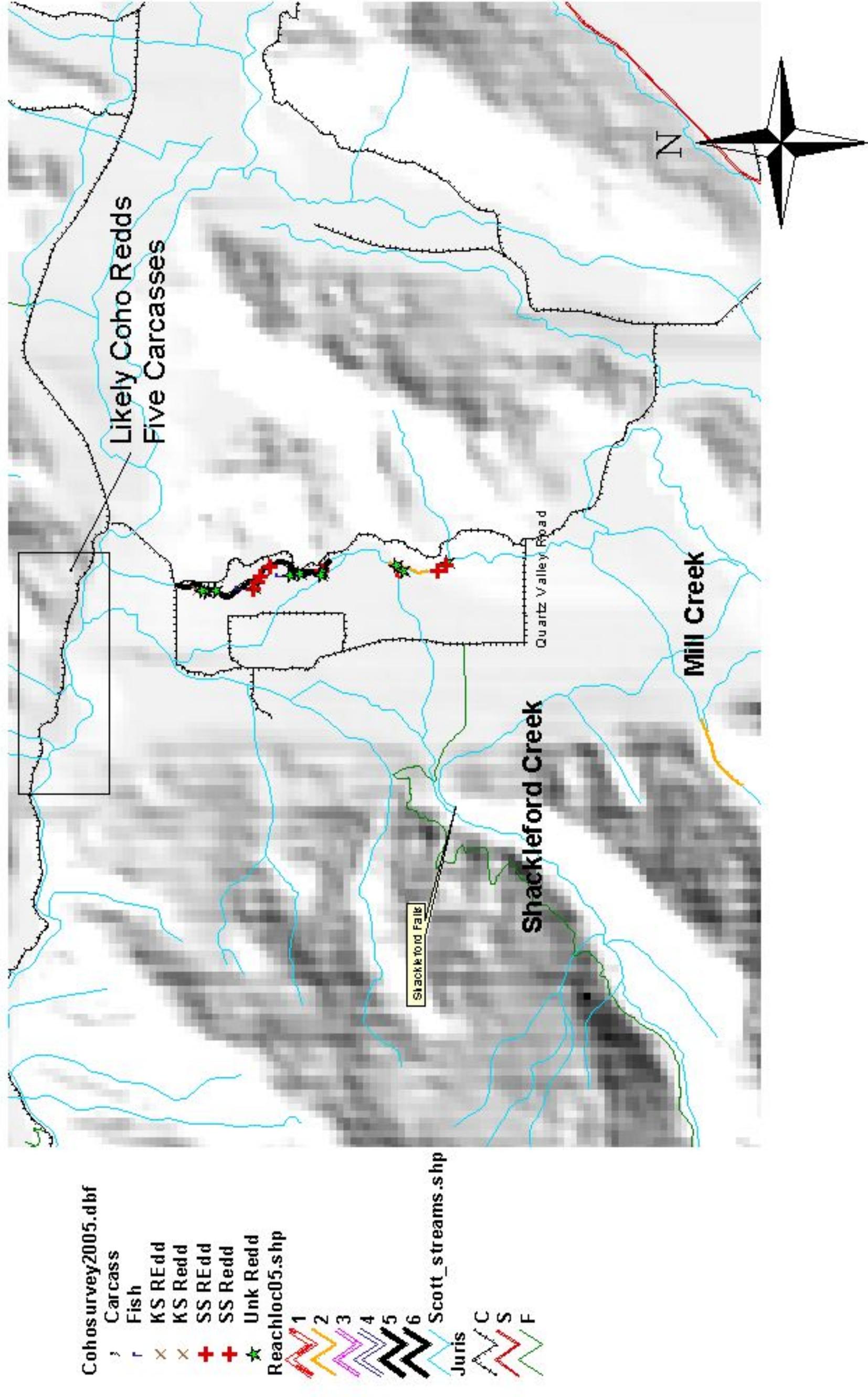
Map # 4



Scott River 2005/2006 Adult Coho Surveys

Map # 5

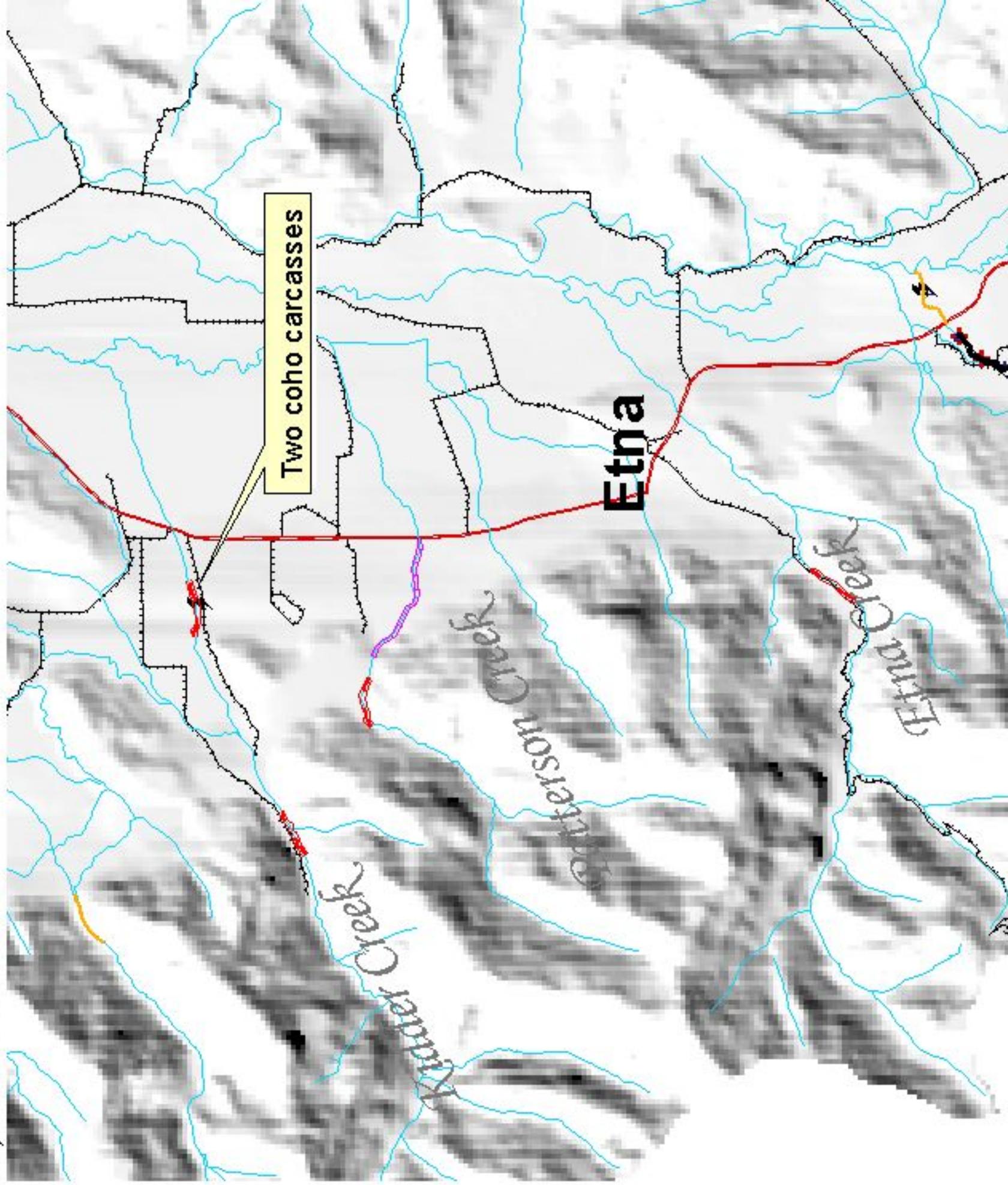
Redds - Shackleford-Mill



Scott River 2005/2006 Adult Coho Surveys

Map # 6

Kidder, Patterson, Etna Creek



Reachloc05.shp

1

2

3

4

5

6

Cohosurvey2005.dbf

⚡ Carcass

| Fish

x KS Redd

x KS Redd

+ SS Redd

+ SS Redd

★ Unk Redd

Scott_streams.shp

Juris

C

S

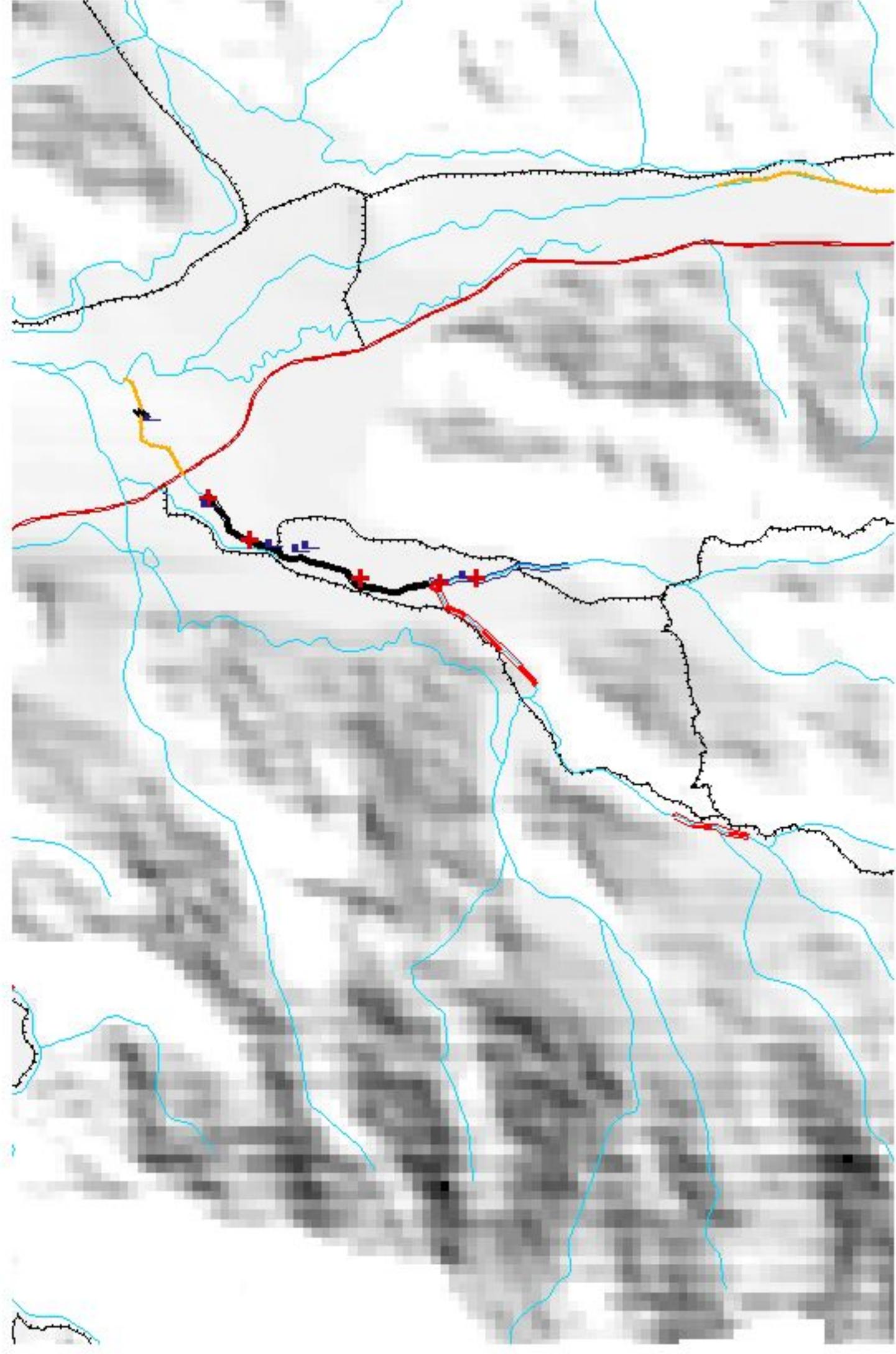
N



Scott River 2005/2006 Adult Coho Surveys

French and Miners Creek

Map # 7



Coho survey 2005.dbf

- ⚡ Carcass
- Fish
- × KS Redd
- × KS Redd
- + SS Redd
- + SS Redd
- ★ Unk Redd

Reachloc05.shp

- 1
- 2
- 3
- 4
- 5
- 6

Scott_streams.shp

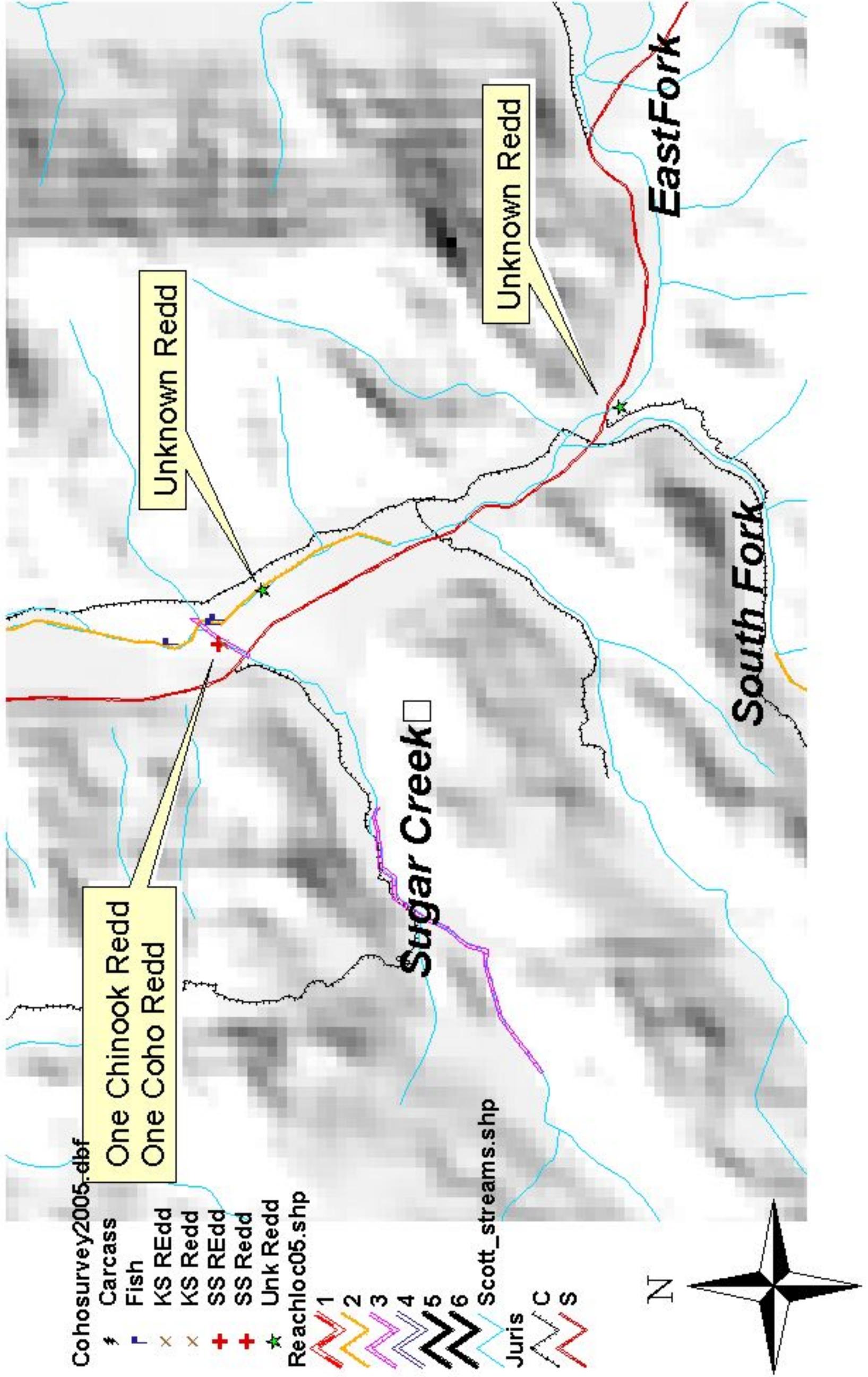
- Juris
- C
- S



Scott River 2005/2006 Adult Coho Surveys

Sugar Creek, Tailings, East Fork

Map # 8



Appendix A – Training Materials

Scott River Adult Coho Survey Training
November 16th, 2005
Siskiyou RCD office 10:00-12:30

Project Background

Adult coho spawning ground surveys have been conducted annually in the Scott River and tributaries since the winter of 2001-2002. Efforts the first year were organized with a small group of volunteers, in a response to the observed presence of a significant number of spawners. Surveys have continued annually since 2001. Each year reaches have been expanded to encompass more of the known habitat. In 2004-2005 French Creek and Shackleford Creek were established as Mark and Recapture reaches. This mark and Recapture effort will be continued this survey season.

In the Scott River there are three brood classes. The spawners from 2001 and 2004 represent the strongest brood class. The two others years have shown very low numbers.

During last years survey effort a total of 47.2 miles of tributary and mainstem were surveyed. Total counts for the season were 960 redds, 569 carcasses, and 1577 live fish. In contrast, during the 2002-2003 surveys (this years brood class), a total of 46.0 miles of tributary and mainstem were surveyed. Total counts for the season were: 20 redds, 2, carcasses, and 17 live fish. [totals for 2003-2004: 24.35 miles(reaches with activity in 2002-2003) 6 redds, 6 carcasses, 8 live fish]

Project Objectives:

- 1) Document the presence of coho salmon in streams within the historic range of distribution and in new tributaries not previously documented within the Scott River system. Survey “index reaches”, as delineated in the 2001-2002 survey, once per week once the spawning begins (Mid-November-January), or as determined by run timing.
- 2) Document the extent of coho spawning distribution in each of the tributaries where adult coho salmon were observed.
- 3) Determine the run timing and duration of adult coho salmon spawning in the Scott River.
- 4) Collect two sets of tissue samples for DNA analysis to understand the genetic relationship of the Scott River coho salmon to other stocks and collect two sets of scale samples to understand the life history of the Scott River coho salmon. One set of tissue and scale samples will go to NOAA Fisheries and one to CDFG.
- 5.) Determine additional site specific information as they relate to spawning: velocity, substrate composition, temperature and stream gradient.

2005-2006 Scott River Adult Coho Spawning Ground Surveys

Scott River Adult Coho Surveys 2005-2006

Redd Identification and Marking

Redd identification will follow the standard identification process used during the Fall Chinook salmon surveys. Redds will be counted if they are nearly completed and if there is an **80%** confidence by the surveyor that it is a redd. Redds with coho salmon on them are counted as “**Redds with Fish**” and distinguished from “**Redds without Fish**” in the field notes.

Redd Identification

The redd is the “nest” where the eggs have been deposited. The female coho salmon constructs her redd similarly to that of other salmonids. She selects an appropriate site, usually with the right size of gravel (generally 1/2”-4” diameter), depth and velocity of water (1-3 fps), then begins by digging a depression (pott) and depositing some of her eggs while the male fertilizes them. She then moves slightly upstream, digging another depression and at the same time backfilling and covering the eggs she has deposited. The eggs are buried in the cleaned gravel several inches to a foot or more deep. Over the course of several days, the female continues to deposit her eggs, working in an upstream direction. When the redd is completed it looks like a tear-dropped shaped mound of gravel extending downstream, approximately 4-5 feet long and 2-3 feet wide, below the last excavation, or pott (approx. 3-8 inches deep). The gravels are generally uniform in size and are often very shiny from recently being moved.

Flagging the Redd

Redds will be marked with hot pink flagging hung on the bank opposite the head of the pott of each redd to prevent duplicate counting on subsequent passes. The flag will be labeled with:

- ◆ date
- ◆ site code
- ◆ surveyors initials.

Data collection

The following information will be recorded on the data sheets; Length and width of the redd, depth of the pott, and dominant substrate composition

Location by GPS

Hand-held Global Positioning System (GPS) units will be used when possible to record the location electronically (waypoint) of each carcass, redd or live fish. GPS waypoints will be labeled with a stream code, sequential number and a single letter code, denoting carcass (C), redd (R), or fish (F), as well as the beginning and end of each reach surveyed (B or E). Other sites were noted with an (S), for “special”.

Ex.: S F K 0 7 R = South Fork #7 Redd

All GPS units will be set prior to the survey using Datum WGS 84 and coordinates in Lat/Long (h.ddd°mm.mmm). In addition, all sightings should also be field mapped.

2005-2006 Scott River Adult Coho Spawning Ground Surveys

Fish Identification (See Fish ID Sheet)

Morphological variation present in both coho and chinook requires utilizing a suite of characteristics to confirm the identity of coho salmon. The following characteristics can be used:

Size – coho salmon adults are generally smaller than Chinook.

Gums - White gums at the base of the teeth have been acknowledged as the most reliable characteristic for identification of coho.

Spots - These are black in color and can vary from circular spots to irregularly shaped spots and are generally small in size.

Color - Coho salmon, both male and female, can exhibit extremely brilliant pink to red coloration over the lower 2/3rds of the body. In contrast, most chinook exhibit olive to red coloration and usually only in males.

Kype - Both males and females have a fairly pronounced kype, with the male being larger and more hooked than the female. In chinook only the male has a kype and it is much less pronounced than coho.

Nares -Nares are enlarged and white in coloration.

Anal fin – The lowest rays of anal fin of coho salmon are nearly as long as the upper rays. Fold the anal fin over to line up the lower rays with the upper rays.

Caudal Peduncle - The caudal peduncle of a coho is generally thicker than that of a chinook. It will be noticeable when picking up the carcass as it is difficult to grip the coho by the peduncle.

Sex - Males are identified by their larger more hooked kype, brilliant pink to red coloration and larger size.

Females are identified by their smaller kype, slightly duller coloration and smaller body size.

Jacks (2 yr. old males) are distinguished from other males and females by their smaller size (<40cm).

Additionally, if there is doubt on the sex of a carcass the anal opening can be squeezed to determine the presence of milt, which indicates a male. In addition, the carcass can be opened up with a knife in order to view the egg skeins (female) or milt sacs (male).

Origin – Hatchery fish are identified by either the lack of an adipose fin or by a maxillary clip (right indicating Trinity River Hatchery and left indicating Irongate Hatchery). **For adipose clipped fish the head will be sampled (cut off with a knife) to determine the hatchery origin by coded-wire tag.**

Scott River Watershed Adult Coho Salmon Spawning Survey 2005-2006
GPS Codes for Streams

Datum for all Garmin GPS units should be set at WGS84, and Projection in Lat/Long Decimal Degrees

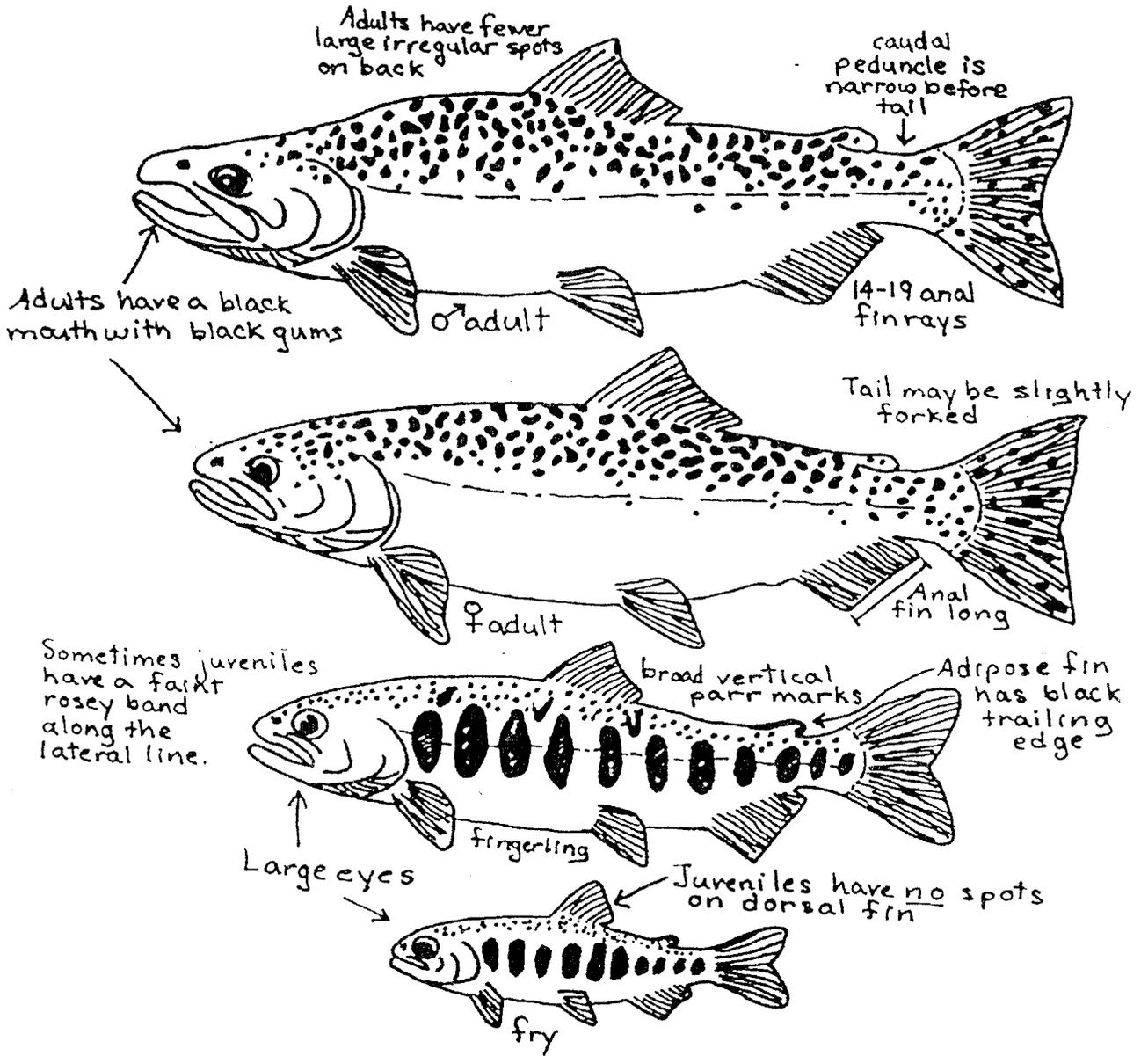
Naming Convention: S F K 07 K R = South Fork # 7 King salmon Redd

Next to last Character: K = King salmon , S= Silver

Last Character is: R = Redd – individual
 F = Fish(if on fish on Redd use R), indicate # of fish in notes
 C = Carcass

Boulder Cr. (South Fork)	BOU
Boulder Cr.(Scott)	SRB
Canyon Cr.	CAN
Clark Cr.	CLA
East Fork Scott	EFK
Emigrant Creek	EMI
Etna Cr.	ETN
French Cr.	FRE
Grouse Creek	GRO
Horse Range Cr.	HRC
Indian Creek	IND
Johnson Creek	JOH
Kangaroo Cr.	KAN
Kelsey Channel	KCH
Kelsey Creek	KEL
Kidder Creek	KID
McAdams Cr.	MCA
Meamber Gulch	MEA
Middle Creek	MID
Mill Cr. (Scott Bar)	SBM
Mill Creek	SML
Miners Cr.	MIN
Moffet Creek	MOF
North Fork French	NFF
Patterson Creek (Scott)	PSR
Patterson Creek(Etna)	PAT
Rattlesnake Cr.	RAT
Ruffy Gap Trib	RUF
Shackleford	SHK
Shackleford-Mill	SHM
South Fork Scott	SFK
Sugar Creek	SUG
Thompkins Creek	TOM
Wildcat Cr.	WIL
Wooliver	WOO
Scott River Tailings	TAI

Chinook

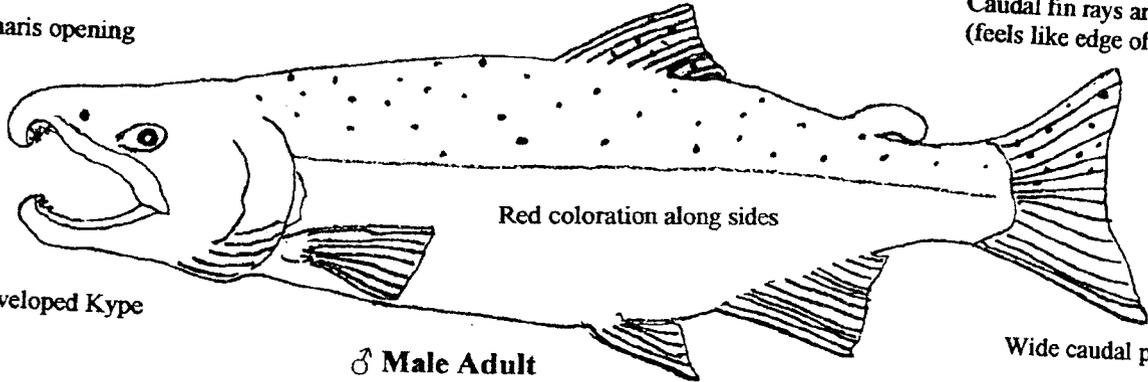


Coho

Small black dots scattered on upper back and upper lobe of the caudal fin only

White naris opening

Caudal fin rays are rough
(feels like edge of a dime)



Red coloration along sides

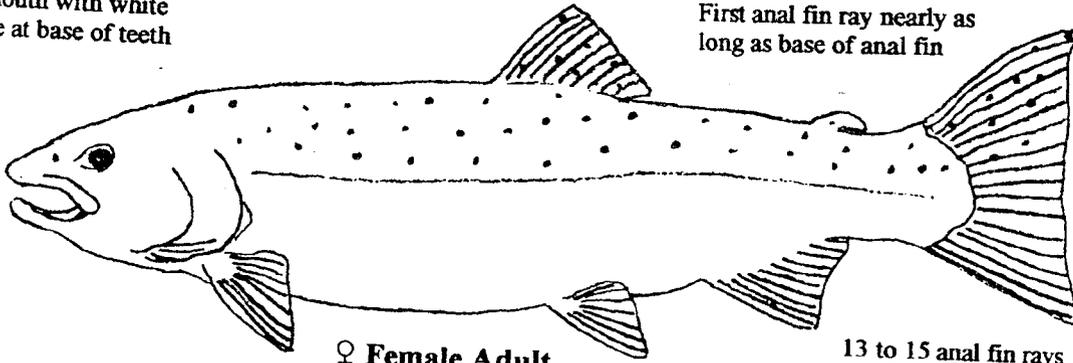
Wide caudal peduncle

Well Developed Kype

♂ Male Adult

Black mouth with white
gum line at base of teeth

First anal fin ray nearly as
long as base of anal fin



13 to 15 anal fin rays

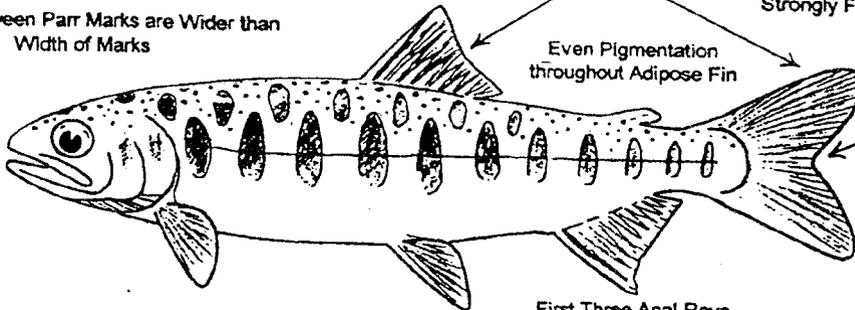
♀ Female Adult

Spaces Between Parr Marks are Wider than
Width of Marks

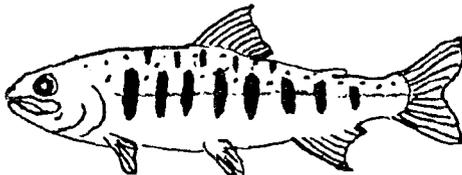
No Spots on Fins

Strongly Forked Tail

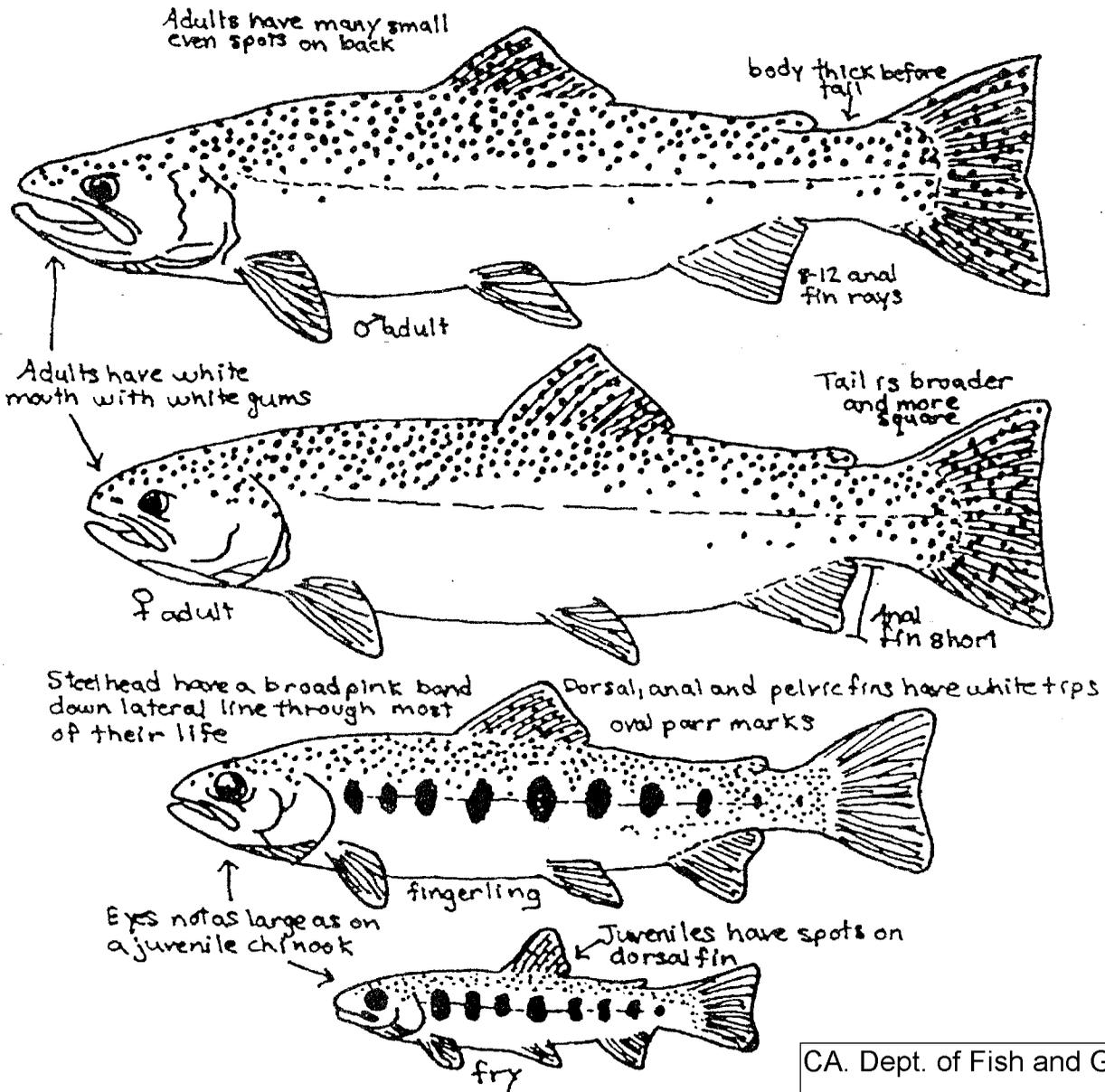
Even Pigmentation
throughout Adipose Fin



First Three Anal Rays
Elongated



Steelhead



Appendix B – Redd Observations

Scott River Adult Coho Surveys 2005-2006

Date	Stream	Reach	GPS Code	Habitat	# Fish	Redd Length (M)	Redd Width (M)	Pott Depth (cm)	SUB D/S	Lat	Long	Notes
12/16/05	Boulder	Lower			NF	NF	NA	NA	NA	NA	NA	
12/15/05	Boulder (South Fork)	Lower 1/3			NF	NF	NA	NA	NA	NA	NA	
12/13/05	Canyon	Lower			NF	NF	NA	NA	NA	NA	NA	
11/25/05	East Fork	Upper Mast			0	NF	NA	NA	NA	NA	NA	Upper Mast Br to Rail Cr.
12/14/05	East Fork	Gregg Ranch			0	NF	NA	NA	NA	NA	NA	
12/15/05	East Fork	Spot survey near Callahan			0	NM	NM	NM	NM	516961	4572743	No fish on Redd
01/06/05	Etna	Mid-FGS										Could not survey due
12/09/05	Etna	Mid-FGS			0	NF	NA	NA	NA	NA	NA	
12/16/05	Etna	Mid-FGS										
01/10/05	French	Mid				NF	NA	NA	NA	NA	NA	Partial reach due to high flows
11/18/05	French	Lower	FRE04F	F	1*	NF	NA	NA	NA	41 24.892	122 51.105	Species Unk
11/18/05	French	Mid	FRE02F	F	1	NF	NA	NA	NA	41 24.023	122 52.037	coho
11/18/05	French	Mid	FRE03F	F	1	NF	NA	NA	NA	41 24.119	122 52.064	coho
11/18/05	French	Mid	FRE01R	R	0	2.5	1.5	0.1	2/1	41 23.753	122 52.264	coho - lives observed in vicinity
11/29/05	French	Mid	FRE08F	F	1*	NF	NA	NA	NA	41 24.581	122 51.733	Species Unk
12/06/05	French	Mid	FRE20F	F	1	NF	NA	NA	NA	41 24.082	122 52.054	
12/06/05	French	Mid	FRE21F	R	1	NF	NA	NA	NA	41 24.220	122 52.019	
12/06/05	French	Mid	FRE22R	F	0	3.8	1.1	0.15	2/3	41 24.588	122 52.678	coho in reach
12/12/05	French	Mid	FRE09R	R	0	1.4	0.8	0.2	3			.25 mile below Miners Cr Rd Bridge
12/12/05	French	Mid	FRE09R	R	0	1.7	0.95	0.14	3			.25 mile below Miners Cr Rd Bridge
12/09/05	French	N Fork			0	NF	NA	NA	NA			

Scott River Adult Coho Surveys 2005-2006

Date	Stream	Reach	GPS Code	Habitat	# Fish	Redd Length (M)	Redd Width (M)	Pott Depth (cm)	SUB D/S	Lat	Long	Notes
12/12/05	French	Lower	FRE01C			NF	NA	NA	NA			
12/15/05	French	J&H				NF	NA	NA	NA			anchor ice observed throughout reach
12/14/05	Grouse	Upper										
12/09/05	Kangaroo	Upper			0	NF	NA	NA	NA			
01/10/06	Kangaroo	Lower			0	NF	NA	NA	NA			
12/16/05	Kelsey	Lower			NF	NF	NA	NA	NA			
12/15/05	Kidder	Upper				NF	NA	NA	NA			high flows, good visibility
12/16/05	Kidder	Mid			2	NF	NA	NA	NA			
12/16/05	Middle	Lower			NF	NF	NA	NA	NA			
11/13/05	Mill	Lower	LM03R	R	0	1.2	0.8	0.4	4/3	41 35.789	122 57.767	
11/13/05	Mill	Lower	LM04R	R	0	2.4	0.9	0.45	4/3	41 35.840	122 57.716	
11/30/05	Mill	Upper			0	NF	NA	NA	NA			
12/07/05	Mill	Lower	SKM01R	R	2	3	1.25	0.1	3/4	41 35.462	122 57.692	
12/07/05	Mill	Lower	SKM02R	R	1	3	1.25	0.5	2/3/4	41 35.527	122 57.76	
12/08/05	Mill	Lower	SHM05R	R	0	2.6	1	0.2	2/1	41 35.463	122 57.689	
12/08/05	Mill	Lower	SHM06R	F	1	3	1.25	0.15	2/1	41 35.474	122 57.708	
01/09/06	Mill	Upper			0	NF	NA	NA	NA			
12/06/05	Miners	Lower	Min02F	F	1					41 23.162	122 52.249	Lower .25 miles
12/06/05	Miners	Lower	Min03R	F	0	2.9	0.8	0.12	2/1	41 23.118	122 52.262	Lower .25 miles
12/06/05	Miners	Lower	Min03R	F	0	3.00	1.00	0.14	2/1	41 23.118	122 52.262	Lower .25 miles
12/12/05	Miners	Lower	Min04R	R	0	1.3	0.8	0.8	3			just below dam at
01/10/06	Miners	Lower			0	NF	NA	NA	NA			
01/06/05	Patterson	Mid			NF	NF	NA	NA	NA			
12/07/05	Patterson	Mid			NF	NF	NA	NA	NA			
12/09/05	Patterson	Upper			NF	NF	NA	NA	NA			

Scott River Adult Coho Surveys 2005-2006

Date	Stream	Reach	GPS Code	Habitat	# Fish	Redd Length (M)	Redd Width (M)	Pott Depth (cm)	SUB D/S	Lat	Long	Notes
12/16/05	Patterson	Mid			NF	NF	NA	NA	NA			
11/28/05	Scott	Tailings	SRT02R	R	1	8.3	1.4	0.04	2/3	41 20.272	122 49.126	species unk
11/28/05	Scott	Tailings	SRT03F	F	2	NF	NA	NA	NA			coho
12/07/05	Scott	Tailings	SRT05F	P	2	NF	NA	NA	NA	41 20.499	122 49.312	
12/08/05	Scott Bar Mill	Lower		P	1	NF	NA	NA	NA			
12/08/05	Scott Bar Mill	Upper				NF	NA	NA	NA			
12/16/05	Scott Bar Mill	Lower	SBMSF			NF	NA	NA	NA			
12/16/05	Scott Bar Mill	Upper				NF	NA	NA	NA			
01/05/06	Scott Bar Mill	Upper				NF	NA	NA	NA			could not complete due to flows
01/11/06	Scott Bar Mill	Lower	SMB01SR	F	0	2	1.5	0.3	3/2			partial reach due to flows
01/11/06	Scott Bar Mill	Upper				NF	NA	NA	NA			high flows made survey difficult
01/26/06	Scott Bar Mill	Lower				NF	NA	NA	NA			
01/09/05	Shackleford	Lower			NF	NF	NA	NA	NA			
11/11/05	Shackleford	Lower	SHM03RK	R	0	4.5	1.5	-	3	41.37262	122.57962	no lives
11/11/05	Shackleford	Lower	SHM01F	P/R	1 KS	NF	NA	NA	NA	41.3683	122.57804	1 jack KS
11/11/05	Shackleford	Lower	SHM02F	P/R	1	NF	NA	NA	NA	41.3722	122.57975	species unk
11/22/05	Shackleford	Lower	SHA02R	R	0	2.25	1.9	0.13	2/3	41 36.543	122 57.797	
11/22/05	Shackleford	Lower	SHA03R	F	1	6.5	1.3	0.15	2/3	41 36.752	122 57.720	
11/22/05	Shackleford	Lower	SHA04R	F	1	4.1	1.2	0.15	2/3	41 36.876	122 57.939	
11/22/05	Shackleford	Lower	SHA06R	R	0	3.7	1.7	0.13	2/3	41 37.155	122 57.964	
11/30/05	Shackleford	Lower	SHA07R	R	2	1.8	1	0.2	2/3	41 36.374	122 57.764	2 coho live
11/30/05	Shackleford	Lower	SHA08R	R	0	9.2	0.9	0.13	2/3	41 36.389	122 57.808	no lives
11/30/05	Shackleford	Lower	SHA08R	F/s	0	4.8	0.95	0.9	2/3	41 36.389	122 57.808	
11/30/05	Shackleford	Lower	SHA09F	R	1					41 36.568	122 57.805	1 live spawned F ds of SHA02R
11/30/05	Shackleford	Lower	SHA10R	R	0	6.9	1.6	0.15	2/3	41 36.614	122 57.806	no lives
11/30/05	Shackleford	Lower	SHA12R	F	1	4.3	1.2	0.17	2/3	41 36.820	122 57.818	coho live
11/30/05	Shackleford	Lower	SHA13R	R	1	4.35	1.4	0.1	2/3	41 36.847	122 57.871	coho live
11/30/05	Shackleford	Lower	SHA14R	R	0	3.2	0.9	0.2	2/3	41 36.885	122 57.940	no lives
11/30/05	Shackleford	Lower	SHA16F	F	1	5.4	1.2	0.4	2/1	41 37.230	122 57.973	species unk
11/30/05	Shackleford	Lower	SHA17R	R	1	4	1	0.2	2/3	41 37.284	122 57.953	Chinook

Scott River Adult Coho Surveys 2005-2006

Date	Stream	Reach	GPS Code	Habitat	# Fish	Redd Length (M)	Redd Width (M)	Pott Depth (cm)	SUB D/S	Lat	Long	Notes
11/30/05	Shackleford	Lower	SHA11F	F	1					41 36.799	122 57.789	coho live
11/30/05	Shackleford	Lower	SHA15F	F	1					41 36.981	122 57.929	coho live
12/05/05	Shackleford	Lower	SHA18R	F	0	6.7	1.1	0.8	2/3	41 36.385	122 57.788	
12/12/05	Shackleford	Lower			NF	NF	NA	NA	NA			
12/05/05	South Fork	Upper			NF	NF	NA	NA	NA			
12/15/05	South Fork	Upper			NF	NF	NA	NA	NA			
11/08/05	Sugar	Lower	Sug01R	R	1	NA	NA	N/A	1/2			1 fish & Redd, destroyed by scour event
11/08/05	Sugar	Lower	Sug03RK		2	3	1	N/A	2/3			2 coho in reach
12/07/05	Sugar Creek	Upper			NF	NF	NA	NA	NA			
12/14/05	Sugar Creek	Upper			NF	NF	NA	NA	NA			
12/26/05	Sugar Creek	Lower			NF	NF	NA	NA	NA			
12/26/05	Sugar Creek	Upper			NF	NF	NA	NA	NA			Not Complete due to flows
12/15/05	Thompkins	Upper			NF	NF	NA	NA	NA			
12/05/05	Thompkins	Lower			NF	NF	NA	NA	NA			
12/15/05	Thompkins	Lower			NF	NF	NA	NA	NA			

Appendix C – GPS Coordinates

Scott River Adult Coho Spawning Ground Surveys -2005/2006

ID	Stream	Date	Easting	Northing	Type	Tissue	Scale	GPS source
East Fork	East Fork	20051211	516961	4572743	Unk Redd			
FRE01B	French	20060106	510822	4581695	Begin			
Fre01C	French	20051212	512547	4584731	Carcass	Yes	Yes	Garmin 12XL
FRE01R	French	20051118	510872	4582520	SS Redd			
FRE02F	French	20051118	511188	4583020	Fish			
FRE04F	French	20051118	512483	4584629	Fish			
FRE06B	French	20051113	510827	4581749	Begin			
FRE07E	French	20050113	511686	4584076	End			
FRE08F	French	20051129	511609	4584053	Fish			
Fre09R	French	20051212	511260	4583638	SS Redd			
Fre09R	French	20051212	511260	4583638	SS Redd			
FRE20F	French	20051206	511164	4583129	Fish			
FRE21F	French	20051206	511212	4583384	Fish			
FRE22R	French	20051206	511686	4584065	SS Redd			
Kidder	Kidder	20051216	506676	4598392	Carcass	Yes	Yes	Map
Kidder	Kidder	20051216	506676	4598392	Carcass	Yes	Yes	Map
LM02BD	Mill (Shack)	20051113	503213	4604756	Beaver Dam			
LM03R	Mill (Shack)	20051113	503195	4604778	Unk Redd			
LM04R	Mill (Shack)	20051113	503267	4604872	Unk Redd			
LM05E	Mill (Shack)	20051113	503305	4604959	End			
LMo1B	Mill (Shack)	20051113	503163	4604423	Begin			
LSMbeg	Scott Bar Mill	20051216	500410	4620864	Begin			
LSMend	Scott Bar Mill	20051216	500016	4620946	End			
LTHbeg	Tomkins	20051215	491183	4615307	Begin			
LTHend	Tomkins	20051215	491792	4614015	End			
MIL01B	Mill (Shack)	20051130	500226	4600265	Begin			
MIL02E	Mill (Shack)	20021130	501166	4600767	End			
MIN01B	Miners	20061206	510900	4581251	Begin			
Min01C	Miners	20051212	510851	4581509	Carcass	No	No	Map
MIN02F	Miners	20051206	510895	4581426	Fish			
MIN03R	Miners	20051206	510877	4581343	SS Redd			
Min03R	Miners	20051206	510877	4581343	SS Redd			
Min04R	Miners	20051212	510823	4581719	SS Redd			
MINJV1	Miners	20051206	510877	4581371	Juvenile			
SBM01SR	Scott Bar Mill	20060111	500507	4620874	Unk Redd			
SH01E	Shackleford	20051113	503082	4604845	End			
SHA01B	Shackleford	20051122	503300	4605742	Begin			
SHA02R	Shackleford	20051122	503153	4606177	Unk Redd			
SHA03R	Shackleford	20051122	503260	4606564	SS Redd			
SHA04R	Shackleford	20051122	502955	4606794	SS Redd			
SHA05C	Shackleford	20051122	502951	4606864	Carcass	Yes	Yes	Garmin 12 XL
SHA06R	Shackleford	20051122	502921	4607309	Unk Redd			
SHA07C	Shackleford	20051122	502985	4607684	Carcass	Yes	Yes	Garmin 12 XL
SHA07R	Shackleford	20051130	503199	4605864	SS Redd			
SHA08E	Shackleford	20051122	502977	4607839	End			
SHA08R	Shackleford	20051130	503137	4605893	Unk Redd			
SHA08R	Shackleford	20051130	503137	4605893	Unk Redd			
SHA09F	Shackleford	20051130	503142	4606223	Fish			

Scott River Adult Coho Spawning Ground Surveys -2005/2006

ID	Stream	Date	Easting	Northing	Type	Tissue	Scale	GPS source
SHA10R	Shackleford	20051130	503141	4606308	Unk Redd			
SHA11F	Shackleford	20051130	503163	4606651	Fish			
SHA12R	Shackleford	20051130	503124	4606690	SS Redd			
SHA13R	Shackleford	20051130	503050	4606740	SS Redd			
SHA14R	Shackleford	20051130	502955	4606810	Unk Redd			
SHA15F	Shackleford	20051130	502969	4606988	Fish			
SHA16R	Shackleford	20051130	502909	4607449	Unk Redd			
SHA17R	Shackleford	20051130	502936	4607547	KS Redd			
SHA18R	Shackleford	20051205	503166	4605884	Unk Redd			
SHM02F	Shackleford	20051111	502905	4607431	Fish			
SHM03R	Shackleford	20051111	502923	4607507	Unk Redd			
SHM05R	Shackleford	20051208	503303	4604180	Unk Redd			
SHM06R	Shackleford	20051208	503277	4604199	SS Redd			
SHMo1F	Shackleford	20051111	503144	4606436	Fish			
SKM01R		20051208	503206	4604298	SS Redd			
SKM02R		20051208	503206	4604298	SS Redd			
SRM01R	Scott River	20051209	512844	4584918	KS Redd			
SRM02R	Scott River	20051209	513053	4584416	KS Redd			
SRM03R	Scott River	20051209	513231	4583905	KS Redd			
SRM04R	Scott River	20051209	513248	4583905	KS Redd			
SRM04R	Scott River	20051209	513267	4583899	KS Redd			
SRM06R	Scott River	20051209	513507	4583832	KS Redd			
SRM07R	Scott River	20051209	514478	4581464	KS Redd			
SRM08F	Scott River	20051209	514014	4582539	KS Redd			
SRT01B	Tailings	20051128	515707	4574826	Begin			
SRT02R	Tailings	20051128	515258	4576085	Unk Redd			
SRT03F	Tailings	20051128	514763	4576940	Fish			
SRT04E	Tailings	20051128	514766	4578904	End			
SRT05F	Tailings	20051207	514998	4576506	Fish			
SRT06F	Tailings	20051207	514947	4576546	Carcass	Yes	Yes	Garmin 12 XL
Sug01R	Sugar	20051108	514758	4576496	SS Redd			
Sug03R	Sugar	20051108	514758	4576448	KS Redd			
UKIDB	Kidder	20051215	502037	4596324	Begin			
UKIDE	Kidder	20051215	502746	4596858	End			
USMbeg	Scott Bar Mill	20051216	503117	4621234	Begin			
USMend	Scott Bar Mill	2051216	502033	4621020	End			