

Assessment of Anadromous Salmonid Spawning in Blue Creek,  
Lower Klamath River, California, Fall 1999-2008



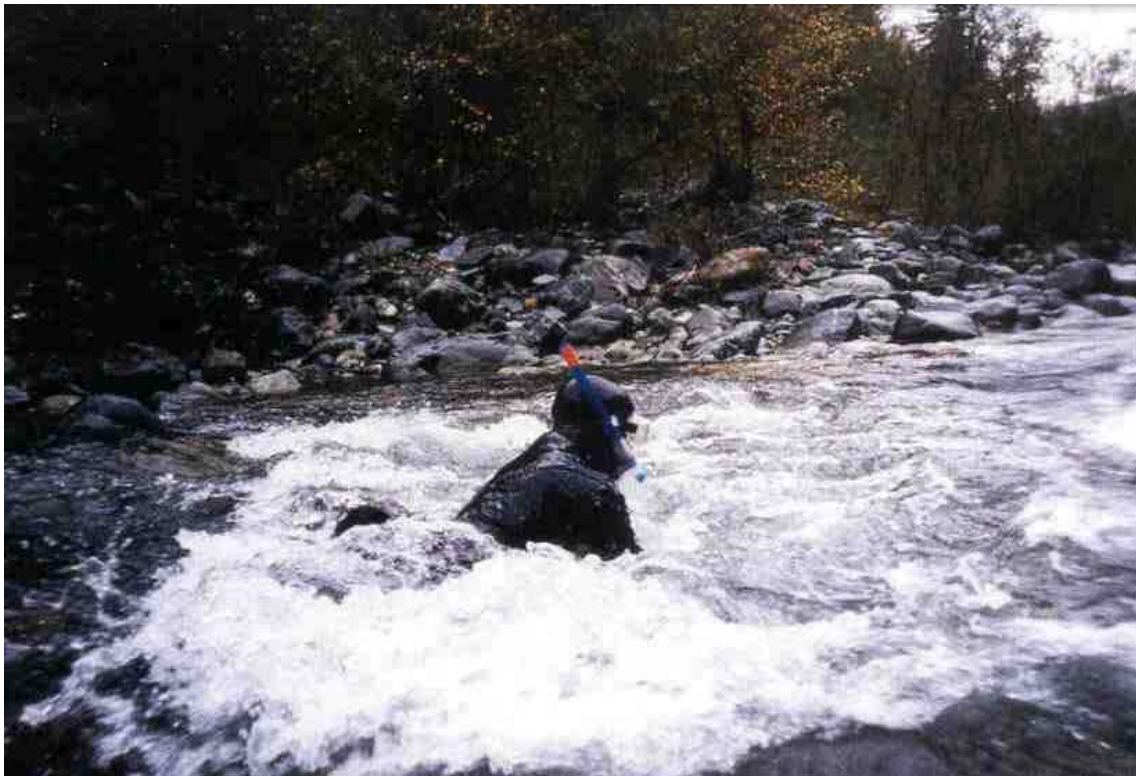
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**1999:**

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**2000:**

- Bureau of Indian Affairs – Watershed Restoration Funding

**2001:**

- National Marine Fisheries Service – Pacific Coastal Salmon Restoration Fund

**2002:**

- National Marine Fisheries Service – Pacific Coastal Salmon Restoration Fund

**2003:**

- National Marine Fisheries Service – Pacific Coastal Salmon Restoration Fund

**2004:**

- National Marine Fisheries Service – Pacific Coastal Salmon Restoration Fund

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## **Abstract**

The Yurok Tribal Fisheries Program (YTFFP) continued long-term monitoring of anadromous salmonid populations in Blue Creek, a fourth order lower Klamath River tributary, during 1999-2008. This project assessed adult escapement and spawning activity during the fall months via direct observation. The resulting information provided a means of assessing the spawning trends of Blue Creek salmonids as well as enhancing knowledge of the life history of these unique fish populations.

Peak weekly counts of adult chinook in lower Blue Creek ranged from a low of 78 adults and 40 jacks in 2006 to a high of 1,090 adult and 31 jacks in 2003. YTFFP documented weekly peak counts of adult coho salmon ranging from a low of seven fish in 2000 to a high of 135 fish in 2004. The peak immigration and spawning period of Blue Creek coho likely occurred after high flows necessitated the cessation of surveys during most years. In addition, Small numbers of adult steelhead were observed each year during fall surveys, with larger numbers of steelhead half-pounders and adult cutthroat trout routinely documented throughout the survey periods.

YTFFP documented total salmon redd numbers in the drainage ranging from a low of 74 redds in 2001 to a high of 433 redds in 2000. Variable access conditions to the upper survey reaches, as well as the premature cessation of surveys due to high flow conditions in many years make the true quantification of salmon redds throughout the basin difficult during most survey seasons.

Salmon carcass recoveries during the fall surveys ranged from a low of three carcasses in 2005 to a high of 171 carcasses in 2008. High predation rates, as well as the premature cessation of surveys due to high flow conditions in many years make the location of carcasses difficult during most survey years in Blue Creek.

The information generated during this project has refined our understanding of adult salmonid migration and spawning trends throughout the fall months. This data continues to provide important information on the long-term population trends and health of salmon in the Blue Creek basin, as well as refine our understanding of spawning habitat preferences throughout the watershed.

## 1.0 Introduction

Historically the Klamath River Basin contained bountiful anadromous fish runs, supporting indigenous peoples throughout the region. Anthropogenic activities over the last 150 years, coupled with natural events, have resulted in substantial declines in these fish populations and widespread reduction and degradation of associated habitat. Concern over diminishing runs resulted in the 1997 listing of Klamath Basin coho salmon (*Oncorhynchus kisutch*) as threatened under the Endangered Species Act (ESA), Klamath River chinook salmon (*O. tshawytscha*), steelhead (*O. mykiss*) and coastal cutthroat trout (*O. clarki clarki*) populations were also petitioned for ESA listing, and despite the listings being determined “Not Warranted”, concern continues to exist over their status and long-term trends.

The lower Klamath Sub-basin, encompassing all tributaries downstream of the Trinity River confluence, has been subjected to substantial timber harvest and related road construction over the last 60 years. These activities, occurring in a region with steep, naturally erodible terrain and high annual rainfall, have contributed to widespread streambed sedimentation and associated habitat degradation and native fish run declines throughout the Sub-basin (Gale and Randolph 2000).

Blue Creek is the largest and most pristine tributary to the lower Klamath, and correspondingly supports the largest anadromous fish populations in the Sub-basin. Out of concern over the proposed collection of broodstock for lower Klamath small-scale rearing projects, the U.S. Fish & Wildlife Service (USFWS) initiated a five-year program in 1988 to evaluate the status of Blue Creek chinook populations (Longenbaugh and Chan 1994). Following its formation in 1994, the Yurok Tribal Fisheries Program (YTFP) assumed responsibility for all monitoring and assessment activities throughout the lower Klamath Sub-basin.

During 1999-2007, YTFP continued long-term monitoring of Blue Creek anadromous salmonid populations. This project continued direct observation snorkel surveys initiated by USFWS and the resulting database has provided a means of assessing the population trends of Blue Creek salmonids as well as enhancing knowledge of the life history of unique Blue Creek fish populations over the past decade. In addition, this project resulted in the ability to assess Blue Creek’s contribution to the overall Klamath Basin chinook salmon run size. Continuation of this monitoring effort will allow for ongoing assessment of long-term population trends and further enhance understanding of the magnitude and importance of Blue Creek’s fish runs in the Klamath Basin.

## 2.0 Study Area

Blue Creek is a fourth order drainage that enters the lower Klamath River at river mile (rm) 16.1 (Figure 1). The headwaters originate in the Chimney Rock and Elk Valley area of the Siskiyou Wilderness, at an elevation of 4,800 feet. The stream flows southwesterly 23 miles to its confluence with the Klamath River at an elevation of 40 feet. The watershed drains 81,296 acres (127 square miles) and is the largest tributary to the Klamath River downstream of the Trinity River confluence at Weitchpec (rm 43.5). The drainage is steep and mountainous with moderate to high channel confinement present throughout the basin.

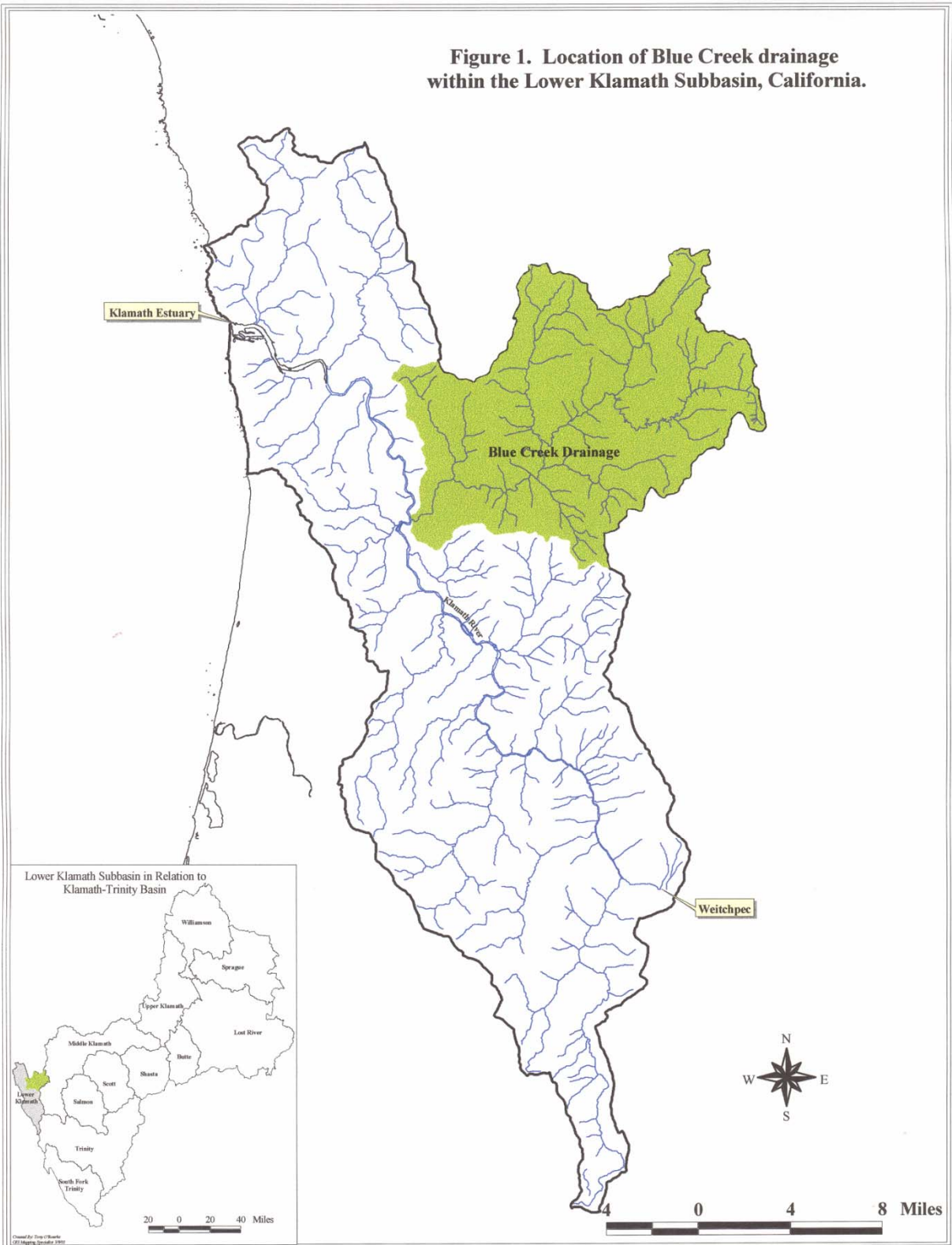
Blue Creek was historically vegetated with moderate to dense timber stands comprised mostly of coastal redwood (*Sequoia sempervirens*), Douglas fir (*Pseudotsuga menziesii*), Port Orford cedar (*Chamaecyparis lawsoniana*), incense cedar (*Libocedrus decurrens*), tanoak (*Lithocarpus densiflora*), and madrone (*Arbutus menziesii*). Dominant riparian species include alder (*Alnus* sp.), willow (*Salix* sp.), California laurel (*Umbellularia californica*), and big leaf maple (*Acer macrophyllum*).

Four major rock types of the Coastal Range and Klamath Mountains provinces underlie the Blue Creek watershed. Proceeding upstream from the mouth, Blue Creek flows through (1) sandstone and shale of the Franciscan Complex, (2) ultramafic rocks (serpentinized peridotite) of the Josephine Ophiolite (3) slate, metagraywacke, and greenstone of the Galice Formation and (4) an assemblage of diverse rock types (mostly metasedimentary) of the Western Paleozoic and Triassic Belt (Wagner and Saucedo 1987, as cited in Chan and Longenbaugh 1994). The streambed substrate is typically dominated by small and large cobble with numerous bedrock and boulder control points.

The Blue Creek watershed has the highest level of precipitation in the Klamath Basin, with annual rainfall averaging approximately 100 inches in the headwaters, 75% of which occurs between November and March (Helley and LaMarche 1973). Stream discharge data collected in lower Blue Creek by the U.S. Geological Survey (USGS) for the period 1965-1978 indicate large seasonal flow variations. Stream flows over this period ranged from 43 cubic feet per second (cfs) on November 1, 1965 to 33,000 cfs on March 2, 1972. The extreme flood event of December 22, 1964, although outside the period of record, was estimated at 48,000 cfs (Chan and Longenbaugh 1994). The recurrence interval of this flood event, based on geomorphic evidence as well as radiocarbon analysis and tree ring counts of material entrained in historic Blue Creek flood deposits, is estimated to be at least 100 years (Helley and LaMarche 1973).

Three tributaries to Blue Creek have been identified as having importance to anadromous salmonid spawning and rearing. These include West Fork Blue Creek, Nickowitz Creek, and Crescent City Fork Blue Creek, which is the largest and lowest gradient tributary accessible to anadromous fish (Figure 2). These three tributaries comprise 41% of the entire watershed area, but both salmon and steelhead only extensively utilize the Crescent City Fork. Small numbers of salmon have previously been documented spawning in the lower one mile of the West Fork (Gale et al. 1998; Longenbaugh and Chan 1994), with steelhead extensively utilizing the majority of the drainage (Hayden 1998; Voight and Gale 1998). To date, only a small number of juvenile and adult salmon have been observed in Nickowitz Creek, but juvenile steelhead have been observed throughout the basin (Hayden 1998; Voight and Gale 1998). A fourth tributary,

**Figure 1. Location of Blue Creek drainage within the Lower Klamath Subbasin, California.**





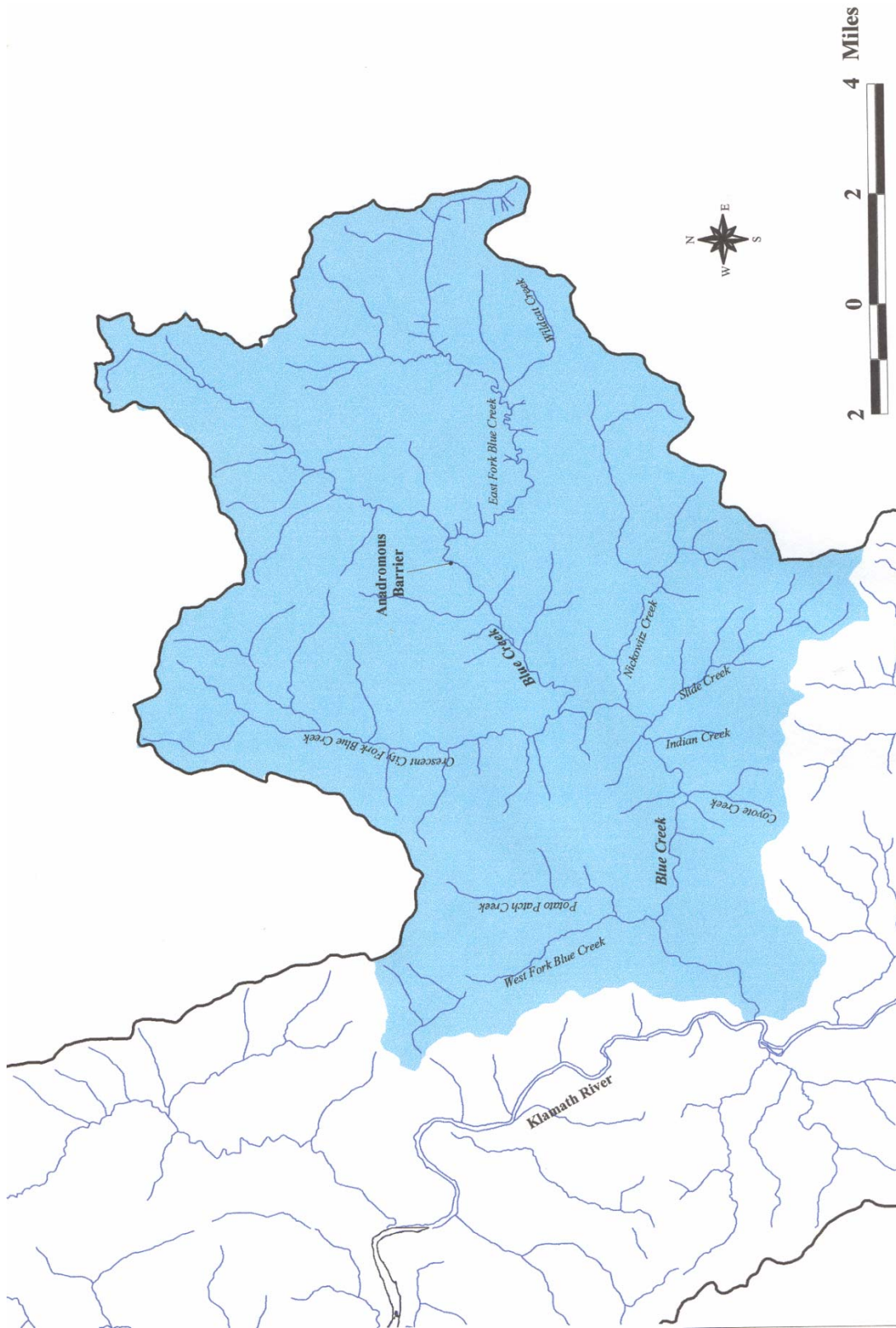


Figure 2. Blue Creek drainage, Lower Klamath River, California.

Slide Creek, has a steep gradient near its mouth, but the lower two miles have consistently supported three age classes of juvenile steelhead (YTFP unpublished survey data).

A natural barrier on the mainstem of Blue Creek is located approximately 0.25 miles below the confluence of the East Fork (rm 15). This barrier, consisting of a very steep boulder jammed gorge, results in a complete blockage of upstream anadromous migration (Gale 1997a). Below the barrier, four species of anadromous salmonids are present: chinook salmon, coho salmon, steelhead trout, and coastal cutthroat trout. Resident rainbow trout are the only species currently present upstream of the anadromous barrier, although brook trout (*Salvelinus fontinalis*) were stocked in upper reaches at an undocumented point earlier in the century (Gale 1997a). Hereinafter, Blue Creek discussions are restricted to the lower 15 miles of stream accessible to anadromous salmonids.

As with many of the tributaries to the lower Klamath River, widespread timber harvesting has occurred along portions of Blue Creek. Since the early 1960's, extensive road networks have been constructed and timber has been removed throughout virtually all of the West Fork drainage and lower eight miles of the mainstem. Green Diamond Resource Company (GDRC - formerly Simpson Timber Company) owns the land surrounding the lower 8.1 miles of Blue Creek and logging continues to date in this portion of the watershed.

Upstream of GDRC property, the creek runs through Six Rivers National Forest (SRNF) land. Virtually the entire Federally-owned portion of the Blue Creek basin is located in the Siskiyou Wilderness Area. The main exception is the portions of the Crescent City Fork not included in the Siskiyou Wilderness, which are classified as Matrix land. The Matrix, defined as all land outside of the Reserves and "Congressionally Withdrawn Areas" (i.e. Wilderness Areas), is subject to timber harvest activities (FEMAT 1993).

An arterial logging road parallels the southern side of Blue Creek several hundred feet above the creek, from rm 2.1 to 6.0. This main road (GDRC Road #B-10) crosses Blue Creek at river mile 2.1, providing the only bridge crossing in the basin. Little used roads branch off this maintained road, providing additional vehicle and/or ATV streamside access at rms 1.4, 5.6, and 8.1.

Road access into the federally owned portion of the watershed (above rm 8.1) is very limited. A few old logging spur roads in the upper half of the Crescent City Fork provide vehicle access to within a half mile of the stream channel, and the USFS road #13N45 provides access (via Orleans and the "G-O" road) to within 1.5 miles of the mainstem anadromous barrier. Foot access to the stream channel from these roads is difficult due to steep terrain and dense vegetation. Use of these access points typically requires an overnight campout, as well as requiring survey crews to exit the channel via the GDRC road network beginning at rm 8.1 or via a foot trail to the South Red Mountain Road (USFS road #13N34).

## **3.0 Methods & Materials**

### **3.1 Fall Spawning Surveys**

The Yurok Tribal Fisheries Program conducted snorkel surveys, as well as occasional kayak float surveys to assess salmonid spawning activity during the fall and winter from 1999-2007. Spawning survey data collection methods remained consistent between years. All surveys were conducted using direct observation (mask and snorkel) techniques until heavy fall/winter rains resulted in ineffective and/or unsafe snorkeling conditions. In select years, kayak and/or streambank foot surveys were conducted on limited portions of the basin during periods that snorkel surveys were not feasible (Gale et al. 1998).

#### **3.1.1 Equipment**

Data collection utilized two different methodologies: direct observation via mask and snorkel and kayak float surveys. Snorkel surveys required the use of either a full 7mm neoprene wetsuit or a drysuit, dive hood, gloves, and mask and snorkel. Kayak surveyors wore dry suits and accessed the stream via a 2-person AIRE inflatable kayak. All crews wore felt-soled stream boots for added traction on wet, slippery surfaces, and carried waistpack dry bags containing data collection kits.

#### **3.1.2 Snorkel Survey Methods**

The U.S. Fish and Wildlife Service (USFWS) began performing fall Blue Creek spawning surveys in 1988. Initially USFWS performed bi-weekly surveys of four separate stream reaches of lower Blue Creek to collect trend data on adult spawning escapement, habitat utilization, run composition, and the timing and duration of fall spawning runs. Consistent bi-weekly “index” surveys were attempted by USFWS for these lower four reaches in 1988-92 (excluding 1989). USFWS conducted sporadic surveys of portions of the upper basin and significant tributaries, but comprehensive basin-wide surveys were never performed.

YTFP continued and expanded these efforts during the period 1994-1998 (Gale 2003; Gale et al. 1998). To maintain this trend data, YTFP surveyed four “index” reaches covering the lower 10.3 miles of Blue Creek each week during the 1994-1996 project period. For consistency and logistical reasons, reaches #1-4 were based on reaches established by USFWS during their 1989-1993 surveys. To provide comprehensive basin-wide coverage, YTFP expanded spawning survey efforts in 1995-1998 to include an additional 13.1 miles of the Blue Creek drainage. These reaches included the upper portion of the mainstem (between reach #4 and the anadromous barrier), Crescent City Fork, Nickowitz Creek and West Fork Blue Creek.

These efforts were continued for the 1999-2007 survey seasons, with slight expansions being made in the addition of an unnamed tributary in upper Crescent City Fork (“Doctor Rock Creek” – reach #7b). Whenever feasible, YTFP performed surveys of reaches #1-4 once a week during the fall spawning season. The fall survey season was typically initiated in late September or October prior to the arrival of late-fall chinook and continued until heavy rains commenced and flow conditions became unsafe and/or unsuitable for snorkel surveys. Reaches #5-9 were typically surveyed bi-weekly after the first fall chinook appeared in lower Blue Creek.

Reach delineations are as follows (Figure 3):

- **Reach #1:**

From the confluence with the Klamath River upstream to the Simpson road #B-10 bridge crossing (total length: 2.1 miles).

- **Reach #2:**

Upstream from the Blue Creek Bridge to the “B-10X” road access at river mile 5.6 (total length: 3.5 miles).

- **Reach #3:**

Between the “B-10X” road access and the Slide Creek confluence pool, 8.1 miles from the mouth (total length: 2.5 miles).

- **Reach #4:**

Between the Slide Creek confluence pool and the mouth of the Crescent City Fork (total length: 2.2 miles).

- **Reach #5:**

The upper mainstem of Blue Creek, from the Crescent City Fork (CCF) confluence to the anadromous barrier (total length: 4.25 miles).

- **Reach #6:**

The lower portion of the CCF, between the mouth and the U.S. Forest Service (USFS) Road # 13N34A trail access (total length: 3.5 miles).

- **Reach #7:**

The upper portion of the CCF, between the USFS Road # 13N34A trail access and the USFS Road #14N01C trail access (total length: 3.5 miles).

- **Reach #7b:**

Unnamed tributary to the CCF (“Doctor Rock Creek”) – enters the CCF in T13N, R3E, NE ¼ Section 9 (total length: 0.75-1.0 miles).

- **Reach #8:**

The lower portion of West Fork Blue Creek, from the Potato Patch Creek confluence to the mouth (total length: 0.85 miles).

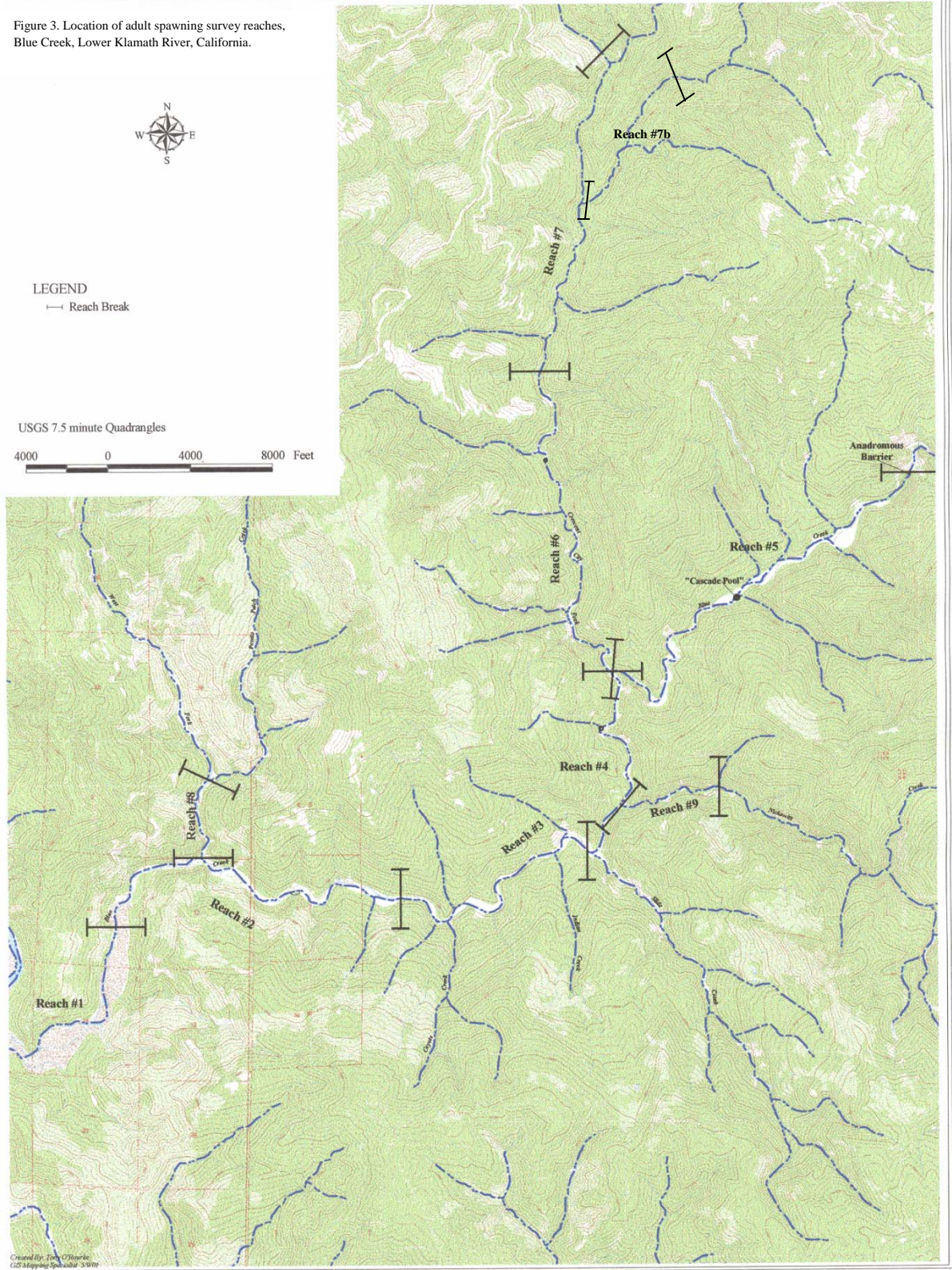
- **Reach #9:**

Lower portion of Nickowitz Creek, upstream from its confluence with Blue Creek (total length: 0.75-1.0 miles).

Snorkel survey crews, consisting of two to four divers, swam downstream in parallel lanes and collected data on redds, live fish, carcasses, and other biological observations (test redds, predators, etc.). In an attempt to provide comparable counts and maximum coverage of the stream channel, additional crewmembers surveyed at times of increased flows and/or reduced



Figure 3. Location of adult spawning survey reaches, Blue Creek, Lower Klamath River, California.



water visibility. When heavy rain resulted in unsuitable snorkeling conditions, surveys were postponed until conditions improved. In order to maximize consistency between surveys, crews followed specific protocols. These protocols were as follows:

- 1) **Redds.** Each identified “area” of redd construction was assigned a location number (“R-#”) and its geographical location marked on a topographic map. Multiple redds in one location would be counted and described separately in the notes but grouped together under one location number on the map. Each new area of redd construction was flagged at the downstream extent of the disturbed substrate to prevent double counting between surveys. Pertinent data such as overall redd dimensions (length x width), depth of the mound (or “tail-spill”) and pit, and other site-specific observations such as fish presence, habitat type, construction stage, and redd age, were recorded in a field notebook.
- 2) **Live Fish Sightings.** In addition to adult chinook salmon, YTFP also collected biological data on any other adult salmonids observed. Data collection protocols for live fish were essentially the same as for redds. Each fish sighting was assigned a location number (“F-#”) and corresponding site location on the survey map. For each site, the number of each species observed and the habitat type was recorded. In addition, crews recorded the estimated age class (adult vs. jack), sex, and relative condition of observed fish, as well as the presence of any clips, marks, or scars. Factors such as fluctuating stream-flow and water visibility, large schools of fish, and/or swiftly darting fish frequently limited collection of some of the above data.
- 3) **Carcasses.** The location of each carcass sighting was assigned a corresponding number (“C-#”) on the survey map as they were encountered during a survey. In addition, the following biological data for each carcass was recorded: species, sex, fork length, estimated % “spent”, the relative condition, and any identifying clips, marks or scars. A scale sample was collected from each carcass when feasible. Finally, a piece of flagging with the date was attached to the carcass so that it would not be recounted on a later date. When discovering an adipose fin-clipped carcass, crews removed the head for coded-wire tag retrieval.

## 4.0 Results & Discussion

Summarized survey data by week and reach for 1999-2008 are presented in Tables 1-10. Annual peak weekly counts for 1988-2008 are presented in Figure 4. Summarized data and detailed discussion for surveys conducted in 1994-1996 can be found in Gale et al. (1998) and data and discussion for surveys conducted in 1997-1998 can be found in Gale (2003). The U.S. Fish and Wildlife Service conducted surveys in 1988 and 1990-1992 and their data for those years are presented in Figure 4 (Chan and Longenbaugh 1994; Gilroy et al. 1992; Longenbaugh and Chan 1994; Stern and Noble 1990).

### 1999

The fall survey season began the week of 27-Sep and continued for 15 weeks to 31 Dec 97 (Table 1). Surveys concluded due to waning chinook numbers and a near cessation of spawning activity. In general, reaches #1-4 were surveyed bi-weekly until early October, after which surveys were conducted on a weekly basis as streamflow and water clarity conditions permitted (Table 1). Heavy rains and high stream flows resulted in the cancellation of reach #1-4 surveys during the weeks of 24 Nov, 16 Dec, and 24 Dec 97. Chinook salmon live counts and redd totals for reaches #1-4 are presented in Figure 5. Spatial and temporal trends in salmon redd observations for 1999 are detailed in Figures 15-16.

Surveys of reaches #5-9 were performed on a bi-weekly basis as survey conditions permitted during October and November (Table 1). All three upper reaches (#5-7) were surveyed three times between 09 Oct and 06 Nov 97. YTFP completed two spawning surveys of the West Fork (#8), once during late November and again in mid-December. Lower Nickowitz Creek (#9) was surveyed once in early November (Table 1).

### 2000

YTFP performed 12 weeks of spawning surveys over a 13-week period during the 1998 fall season (Table 2). Surveys began during the week of 25-Sep-00 and concluded on 20-Dec-00, with heavy rain and high flows resulting in incomplete and/or cancelled surveys during the week of 11-Dec-00 (Table 2). Reach #1-4 surveys were conducted biweekly until mid-October, after which they were conducted weekly through the end of the survey season (Table 2). Chinook salmon live counts and redd totals for reaches #1-4 are presented in Figure 6. Spatial and temporal trends in salmon redd observations for 2000 are detailed in Figures 17-18.

The upper reaches (#5-7) were surveyed four times during the 2000 survey season, occurring biweekly between early November and mid-December (Table 2). The West Fork was surveyed three times between late November and mid-December, while lower Nickowitz Creek was surveyed once on 06-Nov-00.

### 2001

Fall surveys began during the week of 24-Sep-01 and continued for 10 weeks to 27-Nov-01 (Table 3). Surveys were halted after this point due to continuous high flows and resultant unsafe and ineffective survey conditions. Surveys were limited to the lower two reaches during the first two survey weeks, as past surveys have revealed that minimal to no fish are found in the upper reaches until significant numbers are fish observed in these lower reaches. Reaches #1-4 were



all surveyed weekly beginning in the week of 15-Oct-01 (Table 3). Heavy rains and high stream flows resulted in the cancellation of reaches #3-4 on 16-Nov-01 and reaches #-14 during the week of 26-Nov-01. In addition, high flows and poor water visibility hampered the effectiveness of reach #1-4 surveys during the week of 19-Nov-01 (Table 3). Chinook salmon live counts and redd totals for reaches #1-4 are presented in Figure 7. Spatial and temporal trends in salmon redd observations for 2001 are detailed in Figures 19-20.

The upper reaches (#5-7) were surveyed once during the week of 05-Nov-01, with additional surveys not possible due to high flows, as well as heavy snowfall and an inability to access the G-O road and the Red Mountain Road (Table 3). The West Fork was surveyed twice during the latter half of November, while no surveys were conducted in Nickowitz Creek due to high flows.

## 2002

Surveys occurred over a 12 week period from the week of 23-Sep through 11-Dec-02 (Table 4). As was the case in 2001, only reaches #1-2 were surveyed through mid-October as fall rains had not yet occurred to trigger fish movement into Blue Creek and up into the upper reaches. High flows resulted in poor water quality during reach #1-4 surveys on 12-Nov-02, hampering our ability to effectively count recently immigrated fish. As a result, these surveys were repeated later that week when conditions had improved (Table 4). High flows and poor visibility also hampered reach #1-4 surveys during the final survey week of 09-Sep-02. Surveys were halted after this point due to continuous high flows and unsafe survey conditions. Chinook salmon live counts and redd totals for reaches #1-4 are presented in Figure 8. Note that the large counts of adult chinook, coho and steelhead in reach #1 during the first three survey weeks are the result of fish seeking refuge from the mainstem Klamath during the fall 2002 Klamath River fish kill. Spatial and temporal trends in salmon redd observations for 2002 are detailed in Figures 21-22.

Surveys of reaches #5-7 were conducted twice during the survey season, first during the week of 18-Nov-02 and finally during the week of 02-Dec-02 (Table 4). The West Fork (reach #8) was surveyed once on 22-Nov-02, while Lower Nickowitz Creek (reach #9) was not surveyed during 2002. Additional surveys in reaches #5-9 were not conducted due to high flows and poor access and survey conditions.

## 2003

YTFP performed 10 weeks of spawning surveys over a 13-week period during the 2003 fall season (Table 5). Due to low flows and lack of rain, only reach #1 was surveyed through the middle of October to monitor any fish immigration into lower Blue Creek from the mainstem Klamath River. All four lower reaches were surveyed weekly beginning in late October and were continued through early December, at which time high flows and unsafe survey conditions prevented any further reach #1-4 surveys for the season (Table 5). Chinook salmon live counts and redd totals for reaches #1-4 are presented in Figure 9. Spatial and temporal trends in salmon redd observations for 2003 are detailed in Figures 23-24.



The upper mainstem (reach #5) was surveyed once during the season in late November, with high flows and unsafe survey conditions preventing any additional surveys (Table 5). Reach #6 (lower Crescent City Fork) was surveyed three times during the season, in mid-November, late November, and late December. Reach #7 (upper Crescent City Fork) was surveyed four times during the season, including the same times as the three reach #6 surveys and also an additional survey in early December. 2003 was the first year that YTFP crews surveyed “Doctor Rock Creek”, an unnamed tributary to the upper Crescent City Fork where juvenile salmon had previously been observed during summer abundance surveys. The lower ~0.75-1.0 miles of this tributary were surveyed twice during the season in early and late December.

West Fork Blue Creek (reach #8) was surveyed twice during the 2003 season, first in mid-November and lastly in early December (Table 5). Lower Nickowitz Creek (reach #9) was surveyed once in early December.

## 2004

Fall surveys began in early October 2004 and a total of 10 weeks of surveys were conducted over a 12-week period (Table 6). As with 2003, only reach #1 was surveyed through mid-October to monitor any potential immigration into Lower Blue Creek prior to the onset of fall rains. Weekly surveys of reaches #1-4 began the week of 20-Oct and continued through the end of November, at which time high flows and unsafe survey conditions prevented additional surveys until late December (Table 6). Chinook salmon live counts and redd totals for reaches #1-4 are presented in Figure 10. Spatial and temporal trends in salmon redd observations for 2004 are detailed in Figures 25-26.

The upper mainstem (reach #5) was surveyed once during the season in mid-November, with high flows and unsafe survey conditions preventing any additional surveys (Table 6). Reach #6 (lower Crescent City Fork) was first surveyed in late October, with subsequent surveys in conjunction with reach #7 (upper Crescent City Fork) in early and late November and mid-December. “Doctor Rock Creek” (reach #7b – upper CCF tributary) was surveyed once on 20-Dec-2004. West Fork Blue Creek (reach #8) was surveyed twice in 2004, first in late October and lastly on 20-Dec-2004. Nickowitz Creek (reach #9) was not surveyed during 2004.

## 2005

YTFP conducted a total of six weeks of surveys over a nine week period during the 2005 fall spawning season (Table 7). The lower two reaches were first surveyed on 19-Oct and all four reaches were surveyed weekly beginning the week of 31-Oct-2005. High flows and poor visibility conditions prevented surveys during the week of 07-Nov and again caused the cancellation of surveys from 22-Nov through 12-Dec-2005 (Table 7). Chinook salmon live counts and redd totals for reaches #1-4 are presented in Figure 11. Persistent high flows from late November through mid-December prevented surveys during this time period. This resulted in an inadequate number of surveys during the peak spawning period to properly enumerate redds throughout the basin. As a result, no spatial or temporal redd trend analysis was possible for 2005.

The lower Crescent City Fork (reach #6) was first surveyed on 03-Nov-2005 and again surveyed in mid-November in conjunction with the upper CCF (reach #7) and upper mainstem (reach #5)

(Table 7). High stream flows prevented any additional upper reach surveys until mid-December, at which time heavy snow pack prevented access to the trail accesses for these reaches. West Fork Blue Creek was surveyed once on 22-Nov-2005 (Table 7).

## 2006

2006 proved to be the most challenging survey season to date due to extensive rainfall and continued high flows and unsafe survey conditions beginning on 31-Oct-2006. YFTP conducted its first set of reach #1-4 surveys during the week of 23-Oct-2006 (Table 8). The first rainfall of the season began on 31-Oct and resultant high flows and unsuitable survey conditions occurred through the end of December. YFTP was able to survey reaches #1-4 during the week of 30-Oct-2006 and then had to cancel weekly surveys until the week of 27-Oct, during which time the crew was able to survey reaches #1-4 but the high flows and poor water visibility compromised fish counts (Table 8). Surveys were again attempted the following week but only reach #1 could safely be surveyed and the reach #2-4 surveys had to be cancelled. High flows persisted through December and hence surveys were then cancelled for the remainder of the season. Chinook salmon live counts and redd totals for reaches #1-4 are presented in Figure 12. Persistent high flows throughout November and December prevented effective surveys after early November. This resulted in an inadequate number of surveys during the peak spawning period to properly enumerate redds throughout the basin. As a result, no spatial or temporal redd trend analysis was possible for 2006.

Reach #5 (upper mainstem Blue Creek) was surveyed once on 06-Nov and the two Crescent City Fork Reaches (reaches #6-7) were surveyed once during the week of 20-Nov-2006 (Table 8). High flows and infeasible access conditions prevented any additional upper reach surveys during 2006. West Fork Blue Creek (reach #8) and Lower Nickowitz Creek (reach #9) were not surveyed during 2006 for the same reasons.

## 2007

Fall surveys began in early October 2007 and a total of nine weeks of surveys were conducted over an 11-week period (Table 9). As occurred in previous years, only the lower two reaches were surveyed early in the season to monitor any potential immigration prior to the onset of fall rains. Weekly surveys of reaches #1-4 were conducted from late October through mid-December, with the exception of the cancellation of surveys during the week of 19-Nov-2007 due to high flows and poor water visibility (Table 9). Chinook salmon live counts and redd totals for reaches #1-4 are presented in Figure 13. Spatial and temporal trends in salmon redd observations for 2007 are detailed in Figures 27-28.

The Crescent City Fork reaches were surveyed a total of three times between early November and mid-December, while the upper mainstem was surveyed twice between late November and mid-December (Table 9). West Fork Blue Creek and Lower Nickowitz Creek were each surveyed once in early December.

## 2008

YFTP performed eight weeks of spawning surveys over a 10-week period during the 2008 fall season. Bi-weekly surveys of reaches #1-4 were conducted from early October until the first substantial fall rain in early November, after which surveys were conducted weekly through mid-

December (Table 10). Chinook salmon live counts and redd totals for reaches #1-4 are presented in Figure 14. Spatial and temporal trends in salmon redd observations for 2008 are detailed in Figures 29-30.

The lower Crescent City Fork reach was surveyed a total of three times between late October and mid-December, while the upper was surveyed twice in mid-November and mid-December (Table 10). The upper mainstem was surveyed three times from late October through mid-December. West Fork Blue Creek was surveyed twice and Lower Nickowitz Creek was surveyed once in the latter half of November (Table 10).



Table 1. Summary of adult salmonids, redds, and carcasses observed by reach during snorkel surveys, Blue Creek, Lower Klamath River, California, 1999.

Date	Reach	Chinook		Coho		Steelhead		Adult Cutthroat	Other Salmonid	Unidentified Adult Salmonid	Chinook	
		Adult	Jack	Adult	Jack	1/2 Pounder	Adult				New Redds	Carcasses
30-Sep-99	1	0	0	0	0	5	1	0	0	0	0	0
30-Sep-99	2	0	0	0	0	17	3	2	0	0	0	0
29-Sep-99	3	0	0	0	0	5	0	0	0	0	0	0
29-Sep-99	4	0	0	0	0	6	0	1	0	0	0	0
<b>Total:</b>		0	0	0	0	33	4	3	0	0	0	0
13-Oct-99	1	0	1	0	0	2	0	0	0	0	0	0
13-Oct-99	2	0	0	0	0	8	0	4	0	0	0	0
12-Oct-99	3	0	0	0	0	6	0	0	0	0	0	0
12-Oct-99	4	0	0	0	0	0	0	0	0	0	0	0
<b>Total:</b>		0	1	0	0	16	0	4	0	0	0	0
29-Oct-99	1	15	3	0	0	3	4	0	0	0	0	0
29-Oct-99	2	192	50	1	0	17	1	3	0	0	2	0
27-Oct-99	3	2	2	0	0	6	3	0	0	0	1	0
27-Oct-99	4	3	0	0	0	7	0	0	0	0	0	0
<b>Total:</b>		212	55	1	0	33	8	3	0	0	3	0
5-Nov-99	1	4	1	0	0	6	6	0	0	0	0	1
5-Nov-99	2	159	42	0	0	9	1	4	0	0	7	0
5-Nov-99	3	66	20	4	0	2	0	1	0	0	2	0
4-Nov-99	4	120	39	2	0	4	1	3	0	0	5	0
4-Nov-99	5	22	6	1	0	0	0	0	0	0	3	0
4-Nov-99	6	0	0	0	0	0	0	0	0	0	0	0
3-Nov-99	7	0	0	0	0	0	0	0	0	0	0	0
9-Nov-99	9	0	0	0	0	0	0	0	0	0	0	0
<b>Total:</b>		371	108	7	0	21	8	8	0	0	17	1
11-Nov-99	2	- Kayak Survey (No Fish Counts) -									4	0
11-Nov-99	3	- Kayak Survey (No Fish Counts) -									9	0
<b>Total:</b>											13	0
13-Nov-99	1	40	3	0	0	2	2	1	1 Chum	0	2	0
13-Nov-99	2	153	26	0	0	11	1	3	0	0	6	1 (Coho)
12-Nov-99	3	26	2	0	0	1	1	0	0	0	1	1 (SH 1/2lb)
12-Nov-99	4	116	12	6	0	3	1	0	0	0	11	1
<b>Total:</b>		335	43	6	0	17	5	4	1 Chum	0	20	3
*19-Nov-99	1	16	2	0	0	1	1	0	1 Chum	0	3	1
*19-Nov-99	2	44	8	0	0	0	1	1	0	0	11	2
18-Nov-99	3	44	2	1	0	2	0	2	0	0	3	1
18-Nov-99	4	70	13	6	0	1	0	2	0	0	2	2
16-Nov-99	5	32	8	1	0	0	1	0	0	0	7	0
17-Nov-99	6	35	2	2	0	0	0	0	0	0	5	0
16-Nov-99	7	12	3	0	0	0	0	0	0	0	2	0
<b>Total:</b>		253	38	10	0	4	3	5	1 Chum	0	33	6
23-Nov-99	3	- Kayak Survey (No Fish Counts) -									3	1
23-Nov-99	2	- Kayak Survey (No Fish Counts) -									0	0
<b>Total:</b>											3	1
24-Nov-99	8	12	0	0	0	0	0	0	0	0	2	0
<b>Total:</b>		12	0	0	0	0	0	0	0	0	2	0
*30-Nov-99	5	6	0	0	0	0	0	0	0	0	4	0
30-Nov-99	6	51	2	3	0	0	1	0	0	0	12	1
29-Nov-99	7	9	1	0	0	0	0	0	0	0	2	0
<b>Total:</b>		66	3	3	0	0	1	0	0	0	18	1
7-Dec-99	1	Survey cancelled due to heavy rain/poor water visibility										
*6-Dec-99	2	28	2	0	0	1	1	1	0	0	16	3
6-Dec-99	3	6	0	0	0	2	0	0	0	0	1	0
6-Dec-99	4	2	0	0	0	2	0	0	0	0	1	0
<b>Total:</b>		36	2	0	0	5	1	1	0	0	18	3
16-Dec-99	1	- Bankside Survey (No Fish Counts) -										
15-Dec-99	7	4	0	6	1	0	0	0	0	0	4	2
15-Dec-99	8	8	0	0	0	0	0	0	0	0	0	0
<b>Total:</b>		12	0	6	1	0	0	0	0	0	4	2
23-Dec-99	1	8	0	0	0	0	0	0	0	0	0	1
23-Dec-99	2	32	4	3	0	1	0	1	0	0	14	8
21-Dec-99	3	4	0	0	0	7	1	0	0	0	2	0
21-Dec-99	4	4	0	0	0	0	1	0	0	0	0	1
21-Dec-99	6	11	0	3	0	0	0	0	0	0	11	2
<b>Total:</b>		59	4	6	0	8	2	1	0	0	27	12

\* - High flows and poor water visibility compromised fish counts during these surveys.

Table 2. Summary of adult salmonids, redds, and carcasses observed by reach during snorkel surveys, Blue Creek, Lower Klamath River, California, 2000.

Date	Reach	Chinook		Coho		Steelhead		Adult Outthroat (>12")	Unidentified Adult Salmonid	New Redds	Carcasses	
		Adult	Jack	Adult	Jack	Adult	1/2 pounder					
27-Sep-00	1	0	0	0	0	17	171	0	0	0	0	
28-Sep-00	2	0	0	0	0	21	159	3	0	0	1 Adult Chum	
27-Sep-00	3	0	0	0	0	0	28	2	0	0	0	
27-Sep-00	4	0	0	0	0	2	5	0	0	0	0	
	Total:	0	0	0	0	40	363	5	0	0	0	
12-Oct-00	1	1	0	0	0	4	213	0	0	0	0	
12-Oct-00	2	1	0	0	0	10	135	1	0	0	0	
11-Oct-00	3	1	0	0	0	0	14	5	0	0	0	
11-Oct-00	4	0	0	0	0	0	8	0	0	0	0	
	Total:	3	0	0	0	14	370	6	0	0	0	
18-Oct-00	1	1	0	0	0	8	322	0	0	0	0	
18-Oct-00	2	1	0	0	0	5	119	3	0	1	0	
17-Oct-00	3	0	0	0	0	2	13	0	0	0	0	
17-Oct-00	4	1	0	0	0	0	2	1	0	0	0	
	Total:	3	0	0	0	15	456	4	0	1	0	
26-Oct-00	1	8	0	0	0	1	58	0	0	1	0	
26-Oct-00	2	46	6	0	0	0	50	2	0	2	0	
25-Oct-00	3	10	0	0	0	1	8	2	0	0	0	
25-Oct-00	4	13	3	0	0	0	0	0	0	0	0	
	Total:	77	9	0	0	2	116	4	0	3	0	
2-Nov-00	1	94	19	0	0	1	8	0	0	0	0	
1-Nov-00	2	416	42	0	0	3	99	4	0	2	1	
1-Nov-00	3	120	11	1	0	0	4	2	0	5	0	
2-Nov-00	4	94	10	0	0	0	0	1	0	0	1	
01-02-Nov-00	5	71	3	0	0	0	0	0	0	3	0	
1-Nov-00	6	9	2	2	0	0	0	0	0	0	0	
31-Oct-00	7	0	0	0	0	0	0	0	0	0	0	
	Total:	804	87	3	0	4	111	7	0	10	2	
8-Nov-00	1	71	24	0	0	0	211	1	0	1	1	
8-Nov-00	2	441	93	3	0	2	15	1	0	3	1	
7-Nov-00	3	92	11	0	0	0	0	0	0	3	0	
7-Nov-00	4	91	17	2	0	0	1	2	0	4	0	
	Total:	695	145	5	0	2	227	4	0	11	2	
16-Nov-00	1	98	21	0	0	0	27*	0	0	2	0	
15-Nov-00	2	487	94	4	1	4	73	4	0	19	0	
15-Nov-00	3	79	19	0	0	2	2	0	0	4	0	
15-Nov-00	4	106	17	0	0	0	0	0	0	5	0	
14-Nov-00	5	63	7	0	0	0	0	0	0	14	0	
14-Nov-00	6	26	7	0	0	0	0	0	0	2	0	
13-Nov-00	7	0	0	0	0	0	0	0	0	0	0	
	Total:	859	165	4	1	6	75	4	0	46	0	
21-Nov-00	1	191	33	0	0	3	244	0	0	2	0	
21-Nov-00	2	396	80	5	1	0	55	1	0	15	2	
20-Nov-00	3	78	13	0	0	0	0	0	0	3	0	
20-Nov-00	4	88	10	1	0	0	5	0	0	21	0	
24-Nov-00	8	0	0	0	0	0	0	0	0	0	0	
	Total:	753	136	6	1	3	304	1	0	41	2	
1-Dec-00	1	104	25	0	0	4	62*	0	0	15	3	
1-Dec-00	2*	259	26	1	0	3	47	0	0	63	3	
1-Dec-00	3	75	10	0	0	0	2	0	0	18	0	
28-Nov-00	4	90	7	0	0	0	0	0	0	8	1	
27-28-Nov-00	5	70	17	0	0	0	0	0	0	46	3	
1-Dec-00	6	31	2	3	3	0	0	0	0	4	0	
30-Nov-00	7	1	0	3	1	0	0	0	0	0	0	
	Total:	630	87	7	4	7	49	0	0	154	10	
7-Dec-00	1	123	28	2	0	5	5*	0	0	21	1	
7-Dec-00	2	326	87	2	0	1	57	2	0	89	23	
6-Dec-00	3	93	26	0	0	0	8	1	0	19	5	
6-Dec-00	4	78	12	1	0	0	0	0	0	3	1	
4-Dec-00	8	5	0	0	0	0	0	0	0	4	0	
6-Dec-00	9	0	0	0	0	0	0	0	0	3	0	
	Total:	625	153	5	0	6	65	3	0	139	30	
12-Dec-00	1	59	23	0	0	0	0*	0	0	6	11	
11-Dec-00	2			Foot Survey for Carcasses Only Due to Poor Water Visibility							-	16
11-Dec-00	3			Survey Cancelled Due to High Flows/Poor Water Visibility								
11-Dec-00	4			Survey Cancelled Due to High Flows/Poor Water Visibility								
12-13-Dec-00	5	34	5	0	0	0	0	0	0	9	5	
13-Dec-00	6	29	2	5	2	0	0	0	0	7	0	
12-Dec-00	7	3	0	0	0	0	0	0	0	1	0	
11-Dec-00	8	1	0	0	0	0	0	0	0	2	5	
	Total:	126	30	5	2	0	0	0	0	25	37	
20-Dec-00	1	48	2	0	0	11	0	0*	0	1	11	
20-Dec-00	2	62	6	1	0	9	4	0	0	1	9	
19-Dec-00	3	26	3	0	0	3	0	0	0	0	4	
19-Dec-00	4	22	4	0	0	2	2	0	0	0	2	
	Total:	158	15	1	0	25	6	0	0	2	26	

Table 3. Summary of adult salmonids, redds, and carcasses observed by reach during snorkel surveys, Blue Creek, Lower Klamath River, California, 2001.

Date	Reach	Chinook		Coho		Steelhead		Adult	Unidentified	New Redds	Carcasses	
		Adult	Jack	Adult	Jack	Adult	1/2 pounder	Cutthroat (>12")	Adult Salmonid			
26-Sep-01	1	0	0	0	0	0	10	3	0	0	0	
26-Sep-01	2	0	0	0	0	2	4	2	0	0	0	
	Total:	0	0	0	0	2	14	5	0	0	0	
9-Oct-01	1	0	0	0	0	2	28	0	0	0	0	
	Total:	0	0	0	0	2	28	0	0	0	0	
16-Oct-01	1	0	0	0	1	8	14	0	0	0	0	
16-Oct-01	2	0	0	0	0	0	10	1	0	0	0	
17-Oct-01	3	0	0	0	0	0	7	0	0	0	0	
17-Oct-01	4	0	0	0	0	2	9	0	0	0	0	
	Total:	0	0	0	1	10	40	1	0	0	0	
26-Oct-01	1	9	0	5	0	1	35	0	0	1	1	
26-Oct-00	2	7	1	1	0	0	21	0	2	2	1 (coho)	
25-Oct-00	3	8	0	2	0	0	6	2	0	0	0	
25-Oct-00	4	0	0	1	0	2	4	0	0	0	0	
	Total:	24	1	9	0	3	66	2	2	3	1	
1-Nov-01	1	34	2	1	0	3	158	2	0	4	3 (2 coho)	
1-Nov-01	2	47	5	4	0	2	1	0	0	5	1	
31-Oct-01	3	25	0	0	0	2	5	1	0	2	0	
31-Oct-01	4	4	0	0	0	1	6	0	0	0	0	
	Total:	110	7	5	0	8	170	3	0	11	1	
9-Nov-01	1	36	1	2	0	2	NR	4	0	0	1 (coho)	
8-Nov-01	2	54	5	2	0	1	1	0	0	3	2 (1 coho)	
9-Nov-01	3	4	0	0	0	0	13	1	0	2	0	
	4	55	9	6	0	3	15	2	0	12	2	
7-Nov-01	5	4	1	3	0	0	2	1	0	7	1 (coho)	
7-Nov-01	6	3	0	0	0	0	0	0	0	0	0	
6-Nov-01	7	0	0	0	0	0	0	0	0	0	0	
		156	16	13	0	6	31	8	0	24	2	
15-Nov-01	1	115	23	4	0	3	8	0	0	3	0	
15-Nov-01	2	183	5	7	0	4	2	0	0	4	1 (coho)	
16-Nov-01	3			- Survey Cancelled Due to High Flows/Poor Water Visibility -								
16-Nov-01	4			- Survey Cancelled Due to High Flows/Poor Water Visibility -								
		298	28	11	0	7	10	0	0	7	0	
20-Nov-01	1*	36	2	0	0	3	0	0	0	0	0	
19-Nov-01	2**	196	11	3	0	2	142	2	0	17	0	
19-Nov-01	3**	101	12	8	0	2	0	0	0	5	1 (coho)	
19-Nov-01	4**	155	23	20	0	2	11	2	0	2	1	
20-Nov-01	8***	14	3	3	0	1	0	0	0	5	1	
		502	51	34	0	10	153	4	0	29	2	
27-Nov-01	1-7			- Reach #1-7 Surveys Cancelled Due To High Flows/Poor Water Visibility -								
27-Nov-01	8***	15	2	1	0	0	0	0	0	0	0	
		15	2	1	0	0	0	0	0	0	0	
- Surveys halted after 27-Nov-01 due to continuous high flows and resultant poor/unsafe survey conditions -												

\* - Survey hampered by high flows and poor water visibility

\*\* - Last ~1/3 of survey hampered by increasing flows and decreasing water visibility

\*\*\* - Survey hampered by reduced water visibility



Table 4. Summary of adult salmonids, redds, and carcasses observed by reach during snorkel surveys, Blue Creek, Lower Klamath River, California, 2002.

Date	Reach	Chinook		Coho		Steelhead		Adult Cutthroat (>12")	Adult Chum	Unidentified Adult Salmonid	New Redds	Carcasses
		Adult	Jack	Adult	Jack	Adult	1/2 pounder					
26-Sep-02	1	476	0	189	0	13	13	0	0	0	0	274
26-Sep-02	2	0	0	0	0	1	30	5	0	0	0	0
	Total:	476	0	189	0	14	43	5	0	0	0	274
18-Oct-02	1	38	0	687	0	67	0	0	0	0	0	1
18-Oct-02	2	0	0	0	0	0	17	0	0	0	0	0
	Total:	38	0	687	0	67	17	0	0	0	0	1
30-Oct-02	1	21	71	4	0	707	413	0	0	0	0	0
29-Oct-02	2	0	0	0	0	1	24	3	0	0	0	0
29-Oct-02	3	0	0	0	0	1	9	0	0	0	0	0
29-Oct-02	4	0	0	0	0	1	7	0	0	0	0	0
	Total:	21	71	4	0	710	453	3	0	0	0	0
12-Nov-02	1*	62	7	5	0	34	121	0	0	0	0	0
12-Nov-02	2*	44	5	0	0	1	15	0	0	0	11	1
12-Nov-02	3*	85	0	0	0	1	0	0	0	0	1	0
12-Nov-02	4*	44	4	9	0	5	1	0	0	0	0	0
	Total:	235	16	14	0	41	137	0	0	0	12	1
15-Nov-02	1	51	2	3	0	6	132	0	0	0	4	0
15-Nov-02	2	158	14	2	0	0	52	0	1	0	14	1
14-Nov-02	3	72	5	2	0	0	0	0	0	1	0	0
14-Nov-02	4	67	0	6	0	6	0	0	0	1	0	0
	Total:	348	21	13	0	12	184	0	1	2	18	1
21-Nov-02	1	42	0	1	0	14	220	0	1	0	7	0
21-Nov-02	2	174	9	13	0	5	55	4	1	0	32	1
20-Nov-02	3	69	2	0	0	1	0	0	0	0	5	1
20-Nov-02	4	54	1	18	0	11	11	0	0	0	0	0
18-Nov-02	5	69	5	1	0	0	0	0	0	0	17	0
19-Nov-02	6	53	3	33	1	0	0	0	0	0	3	0
19-Nov-02	7	11	1	0	0	0	1	0	0	0	0	0
22-Nov-02	8	0	0	0	0	0	0	0	0	0	0	0
	Total:	472	21	66	1	31	287	4	2	0	64	2
26-Nov-02	1	28	2	3	0	4	65	0	0	0	5	1
26-Nov-02	2	105	11	0	0	5	0	0	1	0	11	3
25-Nov-02	3	58	2	0	0	0	0	0	1	0	7	2
25-Nov-02	4	72	3	10	0	10	0	0	0	0	12	0
	Total:	263	18	13	0	19	65	0	2	0	35	6
5-Dec-02	1	35	2	1	0	2	0	0	0	0	4	0
5-Dec-02	2	77	6	7	0	3	20	0	0	0	4	8
4-Dec-02	3	42	0	0	0	1	0	0	0	0	2	2
4-Dec-02	4	52	1	20	0	8	0	0	0	0	1	0
4-Dec-02	5	76	4	1	0	1	0	0	0	0	17	1
3-Dec-02	6**	6	1	22	0	0	0	0	0	0	10	0
3-Dec-02	7	7	0	0	0	0	0	0	0	0	5	0
	Total:	295	14	51	0	15	20	0	0	0	43	11
11-Dec-02	1*	65	0	0	0	5	0	0	0	0	4	4
11-Dec-02	2*	56	4	2	0	7	3	0	0	0	0	4
10-Dec-02	3*	12	2	0	0	2	2	0	0	1	0	3
10-Dec-02	4*	37	1	1	0	4	0	0	0	0	1	2
	Total:	170	7	3	0	18	5	0	0	1	5	13
- Surveys halted after 10-Dec-02 due to continuous high flows and resultant poor/unsafe survey conditions -												

\* - Survey hampered by high flows and poor water visibility

\*\* - Last ~1/4 mile not surveyed due to crew injury

Table 5. Summary of adult salmonids, redds, and carcasses observed by reach during snorkel surveys, Blue Creek, Lower Klamath River, California, 2003.

Date	Reach	Chinook		Coho		Steelhead		Adult	Adult	Unidentified	New Redds	Carcasses
		Adult	Jack	Adult	Jack	Adult	1/2 pounder	Cutthroat (>12")	Chum	Adult Salmonid		
29-Sep-03	1	0	0	0	0	0	0	0	0	0	0	0
	Total:	0	0	0	0	0	0	0	0	0	0	0
16-Oct-03	1	0	0	0	0	1	15	0	0	0	0	0
	Total:	0	0	0	0	1	15	0	0	0	0	0
29-Oct-03	1	2	0	1	0	8	13	0	0	0	0	0
29-Oct-03	2	1	1	1	0	4	12	1	0	0	1	0
30-Oct-03	3	0	0	0	0	2	6	0	0	0	0	0
30-Oct-03	4	0	0	0	0	1	14	0	0	0	0	0
	Total:	3	1	2	0	15	45	1	0	0	1	0
05-Nov-03	1	5	0	5	0	4	18	0	0	1	0	0
05-Nov-03	2	24	8	1	0	0	13	1	0	0	3	1
04-Nov-03	3	1	0	0	0	0	0	0	0	0	0	0
04-Nov-03	4	2	0	0	0	0	7	0	0	0	0	0
	Total:	32	8	6	0	4	38	1	0	1	3	1
12-Nov-03	1	228	14	21	0	15	7	0	1	0	4	0
12-Nov-03	2	643	21	46	0	0	31	2	1	0	26	0
11-Nov-03	3	110	4	11	0	0	19	0	0	0	12	0
11-Nov-03	4	55	6	2	0	0	0	0	0	0	2	0
13-Nov-03	6	3	0	1	0	0	0	0	0	0	1	0
13-Nov-03	7	0	0	0	0	0	0	0	0	0	0	0
	Total:	1,036	45	80	0	15	57	2	2	0	44	0
19-Nov-03	1	246	12	7	0	3	1	0	0	0	10	0
19-Nov-03	2	463	14	19	0	7	29	0	2	0	49	4
19-Nov-03	3	204	3	2	0	0	1	0	0	0	14	0
19-Nov-03	4	177	2	7	0	0	16	0	0	0	7	1
18-Nov-03	8	4	0	0	0	0	0	0	0	0	0	0
	Total:	1,094	31	35	0	10	47	0	2	0	80	5
25-Nov-03	1	212	6	7	0	4	0	0	1	0	7	0
24-Nov-03	2	438	21	21	0	7	25	2	1	0	53	3
24-Nov-03	3	186	2	7	0	0	3	0	2	0	8	3
24-Nov-03	4	147	8	6	0	0	7	0	0	0	13	1
25-Nov-03	5	188	0	3	0	1	19	0	0	0	18	2
25-Nov-03	6	63	2	16	7	0	0	0	0	0	28	0
25-Nov-03	7	2	1	3	0	0	1	0	0	0	1	0
	Total:	1,236	40	63	7	12	55	2	4	0	128	9
3-Dec-03	1*	199	3	3	0	1	4	0	0	0	13	3
3-Dec-03	2*	323	9	10	1	3	7	0	0	0	57	23
2-Dec-03	3*	118	2	1	0	0	0	0	0	0	13	8
2-Dec-03	4*	121	4	0	0	1	13	0	0	0	6	3
4-Dec-03	8*	8	0	0	0	0	0	0	0	0	0	0
4-Dec-03	9*	0	0	0	0	0	0	0	0	0	0	0
	Total:	769	18	14	1	5	24	0	0	0	89	37
- Reach #1-5 surveys halted after 04-Dec-03 due to continuous high flows and resultant poor/unsafe survey conditions -												
9-Dec-03	7	14	2	2	0	0	0	0	0	0	3	0
10-Dec-03	7b	1	0	3	2	0	0	0	0	0	2	0
	Total:	15	2	5	2	0	0	0	0	0	5	0
23-Dec-03	6	27	1	0	1	1	0	0	0	3	5	5
23-Dec-03	7	9	1	8	0	0	0	0	0	0	3	1
23-Dec-03	7b	1	1	2	0	0	0	0	0	0	3	1
	Total:	37	3	10	1	1	0	0	0	3	11	7

\* - Fish counts hampered by increased flows and reduced water visibility

Table 6. Summary of adult salmonids, redds, and carcasses observed by reach during snorkel surveys, Blue Creek, Lower Klamath River, California, 2004.

Date	Reach	Chinook		Coho		Steelhead		Adult	Unidentified	New Redds	Carcasses
		Adult	Jack	Adult	Jack	Adult	1/2 pounder	Cutthroat (>12")	Adult Salmonid		
5-Oct-04	1	0	0	0	0	4	109	0	0	0	0
	Total:	0	0	0	0	4	109	0	0	0	0
11-Oct-04	1	0	0	1	0	3	29	1	0	0	0
	Total:	0	0	1	0	3	29	1	0	0	0
20-Oct-04	1	13	10	10	0	4	5	0	0	0	1
20-Oct-04	2	30	1	0	0	4	9	0	4	0	0
21-Oct-04	3	12	6	17	0	10	3	1	0	0	0
21-Oct-04	4	15	0	7	1	1	3	0	0	0	0
25-Oct-04	6	10	2	2	0	0	0	0	0	0	0
27-Oct-04	8	0	0	2	0	0	0	0	0	0	0
	Total:	80	19	38	1	19	20	1	4	0	1
28-Oct-04	1	3	2	24	1	2	33	0	1	0	0
28-Oct-04	2	68	14	49	0	27	2	1	0	0	0
29-Oct-04	3	25	15	27	7	3	0	2	0	1	0
29-Oct-04	4	12	5	13	0	4	0	0	0	0	0
	Total:	108	36	113	8	36	35	3	1	1	0
5-Nov-04	1	13	3	9	0	1	79	0	0	0	0
5-Nov-04	2	104	50	47	1	13	0	0	0	4	0
4-Nov-04	3	7	8	33	0	2	3	1	0	1	0
4-Nov-04	4	13	8	22	0	1	2	0	0	0	0
8-Nov-04	6	4	0	24	2	0	0	0	0	0	1
8-Nov-04	7	0	0	0	0	0	0	0	0	0	0
	Total:	141	69	135	3	17	84	1	0	5	1
11-Nov-04	1	17	11	5	0	5	102	0	0	0	1
11-Nov-04	2	101	36	41	0	2	11	2	2	20	0
10-Nov-04	3	12	12	27	0	0	1	0	0	0	0
10-Nov-04	4	14	5	20	2	0	1	1	1	2	1
	Total:	144	64	93	2	7	115	3	3	22	2
19-Nov-04	1	8	6	7	0	1	72	0	0	1	0
19-Nov-04	2	81	71	28	0	23	14	7	0	3	2
18-Nov-04	3	8	7	23	0	0	1	0	0	6	0
18-Nov-04	4	21	14	26	1	0	0	1	0	2	Recap (11/4/04)
17-Nov-04	5	15	7	7	1	1	0	0	0	7	2
22-Nov-04	6	2	0	5	2	0	0	0	0	4	0
22-Nov-04	7	0	0	0	0	0	0	0	0	0	0
	Total:	135	105	96	4	25	87	8	0	23	4
24-Nov-04	1	10	14	2	0	0	3	0	0	1	1
24-Nov-04	2	63	83	27	3	6	11	0	0	15	1
23-Nov-04	3	10	2	22	0	0	9	0	0	4	1
23-Nov-04	4	19	14	31	0	0	2	1	0	0	1
	Total:	102	113	82	3	6	25	1	0	20	4
1-Dec-04	1	21	22	0	0	1	45	0	0	1	1
1-Dec-04	2	59	77	29	0	0	4	0	0	16	4
30-Nov-04	3	14	5	15	0	0	11	0	0	1	0
30-Nov-04	4	13	15	37	1	1	4	3	0	0	3
	Total:	107	119	81	1	2	64	3	0	18	8
- Surveys halted from 01-Dec-04 through 16-Dec-04 due to high flows and resultant poor/unsafe survey conditions -											
22-Dec-04	1	9	8	0	0	19	38	0	0	0	6
22-Dec-04	2	5	2	1	0	10	11	0	0	0	1
21-Dec-04	3	0	0	2	1	7	0	0	0	0	0
21-Dec-04	4	2	0	5	0	3	12	0	0	0	0
16-Dec-04	6	12	4	11	0	2	4	0	0	2	0
16-Dec-04	7	2	0	41	0	0	0	0	0	3	1
20-Dec-04	7b	0	0	34	0	0	0	0	0	0	0
20-Dec-04	8	6	2	0	0	0	28	0	0	1	2
	Total:	36	16	94	1	41	93	0	0	6	10

Table 7. Summary of adult salmonids, redds, and carcasses observed by reach during snorkel surveys, Blue Creek, Lower Klamath River, California, 2005.

Date	Reach	Chinook		Coho		Steelhead		Adult	Unidentified	New Redds	Carcasses	
		Adult	Jack	Adult	Jack	Adult	1/2 pounder	Cutthroat (>12')	Adult Salmonid			
19-Oct-05	1	2	7	0	0	4	150	0	0	0	0	
19-Oct-05	2	11	22	12	0	4	13	0	0	0	0	
	Total:	13	29	12	0	8	163	0	0	0	0	
25-Oct-05	1	0	22	4	0	3	53	0	0	0	0	
25-Oct-05	2	16	23	4	0	7	0	0	0	0	0	
26-Oct-05	3	3	4	3	0	0	8	0	0	0	0	
26-Oct-05	4	4	1	0	0	1	0	0	0	0	0	
	Total:	23	50	11	0	11	0	0	0	0	0	
02-Nov-05	1	11	9	19	1	2	102	0	0	0	0	
02-Nov-05	2	50	49	3	1	0	0	0	0	0	0	
03-Nov-05	3	11	2	2	0	0	8	0	0	0	0	
03-Nov-05	4	12	10	5	0	0	0	0	0	0	0	
03-Nov-05	6	0	0	4	0	0	0	0	0	0	0	
	Total:	84	70	33	2	2	110	0	0	0	0	
09-Nov-05	1			- Survey Cancelled Due to High Flows/Poor Water Visibility -								
09-Nov-05	2			- Survey Cancelled Due to High Flows/Poor Water Visibility -								
08-Nov-05	3			- Survey Cancelled Due to High Flows/Poor Water Visibility -								
08-Nov-05	4			- Survey Cancelled Due to High Flows/Poor Water Visibility -								
	Total:	0	0	0	0	0	0	0	0	0	0	
15-Nov-05	1	11	3	0	0	0	0	0	0	0	0	
15-Nov-05	2	33	9	4	0	5	4	0	0	12	0	
16-Nov-05	3	10	2	2	0	2	0	0	0	0	0	
16-Nov-05	4	16	10	11	0	0	0	0	0	0	0	
15-Nov-05	5	11	13	3	1	0	0	0	0	0	0	
16-Nov-05	6	25	17	37	7	0	0	0	0	0	0	
15-Nov-05	7	5	2	4	0	0	0	0	0	0	0	
	Total:	111	56	61	8	7	4	0	0	12	0	
21-Nov-05	1	31	14	4	1	1	3	0	0	0	0	
21-Nov-05	2	38	39	8	0	3	0	0	0	2	1	
22-Nov-05	3	16	3	2	0	1	0	0	1	0	0	
22-Nov-05	4	29	12	11	1	0	1	0	0	7	1	
22-Nov-05	8	1	0	0	0	0	0	0	0	0	0	
	Total:	115	68	25	2	5	4	0	1	9	2	
- Surveys halted from 22-Nov-05 through 12-Dec-05 due to high flows and resultant poor/unsafe survey conditions -												
12-Dec-05	1	14	8	1	0	0	0	0	0	5	1 (coho)	
12-Dec-05	2	5	2	0	0	2	35	0	0	0	0	
13-Dec-05	3	2	0	0	0	0	0	0	0	0	0	
13-Dec-05	4	1	0	1	0	4	0	0	0	0	0	
	Total:	22	10	2	0	6	35	0	0	5	0	

Table 8. Summary of adult salmonids, redds, and carcasses observed by reach during snorkel surveys, Blue Creek, Lower Klamath River, California, 2006.

Date	Reach	Chinook		Coho		Steelhead		Adult Outthroat (>12")	Unidentified Adult Salmonid	New Redds	Carcasses	
		Adult	Jack	Adult	Jack	Adult	1/2 pounder					
24-Oct-06	1	2	0	1	0	0	0	0	0	0	1	
24-Oct-06	2	5	4	0	0	1	0	0	0	0	0	
25-Oct-06	3	2	13	0	0	0	0	0	0	1	0	
25-Oct-06	4	0	1	0	0	0	0	0	0	0	0	
	Total:	9	18	1	0	1	0	0	0	1	1	
02-Nov-06	1	19	3	1	0	0	0	0	0	1	0	
02-Nov-06	2	23	19	0	0	0	0	0	0	0	0	
02-Nov-06	3	16	10	0	0	0	0	0	0	2	0	
03-Nov-06	4	20	8	0	0	0	0	0	0	0	0	
06-Nov-06	5	16	0	0	1	0	0	0	0	1	1	
	Total:	94	40	1	1	0	0	0	0	4	1	
- Reach #1-5 surveys halted from 06-Nov-06 through 30-Nov-06 due to high flows and resultant poor/unsafe survey conditions -												
21-Nov-06	6	64	17	12	0	0	0	0	0	4	1	
22-Nov-06	7	34	1	2	0	0	0	0	1	1	0	
	Total:	98	18	14	0	0	0	0	1	5	1	
30-Nov-06	1*	27	10	1	0	2	0	0	0	0	0	
01-Dec-06	2*	11	4	0	0	0	0	0	0	0	0	
30-Nov-06	3*	42	2	0	0	1	0	0	0	4	1	
01-Dec-06	4*	8	1	1	0	0	0	0	0	0	0	
	Total:	88	17	2	0	3	0	0	0	4	1	
06-Dec-06	1	39	2	0	0	3	0	0	1	0	0	
06-Dec-06	2			Survey cancelled due to high flows/unsafe survey conditions								
06-Dec-06	3			Survey cancelled due to high flows/unsafe survey conditions								
06-Dec-06	4			Survey cancelled due to high flows/unsafe survey conditions								
	Total:	39	2	0	0	3	0	0	1	0	0	
- Surveys halted after 06-Dec-06 due to continuous high flows and resultant poor/unsafe survey conditions -												

\* - High flows and poor water visibility compromised fish counts during these surveys.



Table 9. Summary of adult salmonids, redds, and carcasses observed by reach during snorkel surveys, Blue Creek, Lower Klamath River, California, 2007.

Date	Reach	Chinook		Coho		Steelhead		Adult	Unidentified	New Redds	Carcasses	
		Adult	Jack	Adult	Jack	Adult	1/2 pounder	Cutthroat (>12')	Adult Salmonid			
03-Oct-07	1	5	0	0	0	9	11	0	0	0	0	
03-Oct-07	2	1	0	0	0	0	3	15	1	0	0	
	Total:	6	0	0	0	9	14	15	1	0	0	
17-Oct-07	1	3	0	0	0	1	0	2	0	1	0	
	Total:	3	0	0	0	1	0	2	0	1	0	
25-Oct-07	1	170	10	1	0	0	0	0	0	0	0	
25-Oct-07	2	67	3	0	0	4	0	2	0	0	0	
	Total:	237	13	1	0	4	0	2	0	0	0	
30-Oct-07	1	92	8	4	0	3	0	0	0	1	0	
30-Oct-07	2	109	5	0	0	1	1	0	0	0	0	
31-Oct-07	3	42	3	0	0	7	0	0	0	0	0	
31-Oct-07	4	41	0	0	0	1	0	0	0	0	0	
	Total:	284	16	4	0	12	1	0	0	1	0	
09-Nov-07	1	108	7	2	0	4	0	0	0	0	0	
09-Nov-07	2	123	2	3	0	1	0	0	0	6	2	
08-Nov-07	3	41	5	1	0	1	0	0	0	0	0	
08-Nov-07	4	44	2	5	0	0	0	0	0	0	0	
07-Nov-07	6	7	0	0	0	1	0	0	0	0	0	
07-Nov-07	7	0	0	0	0	0	1	0	0	0	0	
	Total:	323	16	11	0	7	1	0	0	6	2	
15-Nov-07	1	109	3	0	0	1	0	0	0	2	0	
15-Nov-07	2	158	4	2	0	2	0	0	0	4	0	
16-Nov-07	3	97	1	1	0	2	0	0	0	1	0	
16-Nov-07	4	43	0	1	0	1	0	0	0	1	1	
	Total:	407	8	4	0	6	0	0	0	8	1	
21-Nov-07	1	- Survey Cancelled Due to High Flows/Poor Water Visibility -										
21-Nov-07	2	- Survey Cancelled Due to High Flows/Poor Water Visibility -										
20-Nov-07	3	- Survey Cancelled Due to High Flows/Poor Water Visibility -										
20-Nov-07	4	- Survey Cancelled Due to High Flows/Poor Water Visibility -										
	Total:	0	0	0	0	0	0	0	0	0	0	
26-Nov-07	1	55	1	0	0	1	0	0	0	7	0	
26-Nov-07	2	84	2	7	0	0	0	0	0	7	3	
27-Nov-07	3	62	1	0	0	3	0	0	0	8	0	
27-Nov-07	4	71	10	0	0	0	0	0	0	4	0	
28-Nov-07	5	32	1	1	0	0	0	0	0	6	2	
27-Nov-07	6	63	3	6	0	0	0	0	0	4	0	
	Total:	367	18	14	0	4	0	0	0	36	5	
05-Dec-07	7	0	0	1	0	0	0	0	0	0	0	
03-Dec-07	8	0	0	0	0	0	0	0	0	0	0	
06-Dec-07	9	0	0	0	0	0	0	0	0	0	0	
	Total:	0	0	0	0	0	0	0	0	0	0	
10-Dec-07	1	13	1	0	0	0	0	0	0	1	2	
10-Dec-07	2	51	0	0	0	6	0	0	0	14	0	
11-Dec-07	3	29	1	0	0	4	0	0	0	5	1	
11-Dec-07	4	25	2	1	0	1	0	0	0	6	2	
12-Dec-07	5	20	1	2	0	0	0	0	0	2	3	
12-Dec-07	6	3	1	21	0	0	0	0	0	6	0	
13-Dec-07	7	4	0	1	0	0	0	0	0	1	1	
	Total:	145	6	25	0	11	0	0	0	35	9	

Table 10. Summary of adult salmonids, redds, and carcasses observed by reach during snorkel surveys, Blue Creek, Lower Klamath River, California, 2008.

Date	Reach	Chinook		Coho		Steelhead		Adult Cutthroat (>12")	Unidentified Adult Salmonid	New Redds	Carcasses
		Adult	Jack	Adult	Jack	Adult	1/2 pounder				
7-Oct-08	1	19	34	0	0	3	0	1	0	0	0
7-Oct-08	2	10	5	1	0	3	0	0	0	0	0
8-Oct-08	3	7	13	0	0	1	0	0	0	0	0
8-Oct-08	4	2	4	0	0	0	0	0	0	0	0
Total:		38	56	1	0	7	0	1	0	0	0
21-Oct-08	1	12	8	0	0	2	0	0	0	0	0
21-Oct-08	2	7	15	0	0	1	0	10	0	0	0
20-Oct-08	3	4	12	0	0	2	0	0	0	0	0
20-Oct-08	4	1	9	0	0	0	0	1	0	0	0
Total:		24	44	0	0	5	0	11	0	0	0
30-Oct-08	1	12	10	0	0	0	0	0	0	0	0
30-Oct-08	2	17	7	0	0	1	0	2	0	2	1
29-Oct-08	3	4	11	0	0	1	0	0	0	0	0
29-Oct-08	4	8	2	0	0	1	1	0	0	0	0
28-Oct-08	5	2	4	0	0	0	0	0	0	0	0
28-Oct-08	6	1	0	0	0	0	0	0	0	0	1
Total:		44	34	0	0	3	1	2	0	2	2
10-Nov-08	1	74	17	4	0	0	1	0	0	2	0
10-Nov-08	2	117	39	0	0	2	0	0	0	6	0
11-Nov-05	3	49	7	0	0	0	0	0	0	1	0
11-Nov-05	4	67	13	0	0	0	0	0	0	3	0
Total:		352	110	4	0	5	2	2	0	14	3
18-Nov-08	1	94	33	6	0	0	0	0	0	16	3
18-Nov-08	2	190	23	2	0	1	0	0	0	12	6
17-Nov-08	3	76	23	0	0	0	0	0	0	5	0
17-Nov-08	4	49	10	0	0	0	0	0	0	1	0
19-Nov-08	5	108	34	0	0	0	0	0	0	24	0
19-Nov-08	6	133	0	1	0	0	0	0	0	6	0
19-Nov-08	7	38	14	2	0	0	0	0	0	0	0
20-Nov-08	8	2	0	0	0	0	0	0	0	0	0
20-Nov-08	9	5	0	0	0	0	0	0	0	4	0
Total:		695	137	11	0	1	0	0	0	68	9
25-Nov-08	1	66	49	1	0	2	0	0	0	1	12
25-Nov-08	2	188	1	2	0	6	0	0	0	10	9
24-Nov-08	3	76	2	0	0	0	0	0	0	2	5
24-Nov-08	4	44	16	2	0	5	0	0	0	2	1
26-Nov-08	8	1	1	0	0	0	0	0	0	1	0
Total:		375	69	5	0	13	0	0	0	16	27
3-Dec-08	1	58	23	0	0	5	0	0	0	4	6
3-Dec-08	2	58	44	6	0	5	0	0	0	17	32
2-Dec-08	3	31	15	1	0	3	0	0	0	0	5
2-Dec-08	4	51	38	2	0	3	0	0	0	10	11
Total:		198	120	9	0	16	0	0	0	31	54
10-Dec-08	1	67	24	2	0	3	0	0	0	13	17
10-Dec-08	2	52	14	7	1	5	0	0	0	4	22
9-Dec-08	3	14	8	1	0	0	0	0	0	3	10
9-Dec-08	4	33	37	3	0	6	0	0	0	9	10
10-Dec-08	5	21	7	1	1	0	0	0	0	43	12
8-Dec-08	6	29	6	0	0	0	0	0	0	3	5
8-Dec-08	7	1	0	0	1	0	0	0	0	14	0
Total:		217	96	14	3	14	0	0	0	89	76

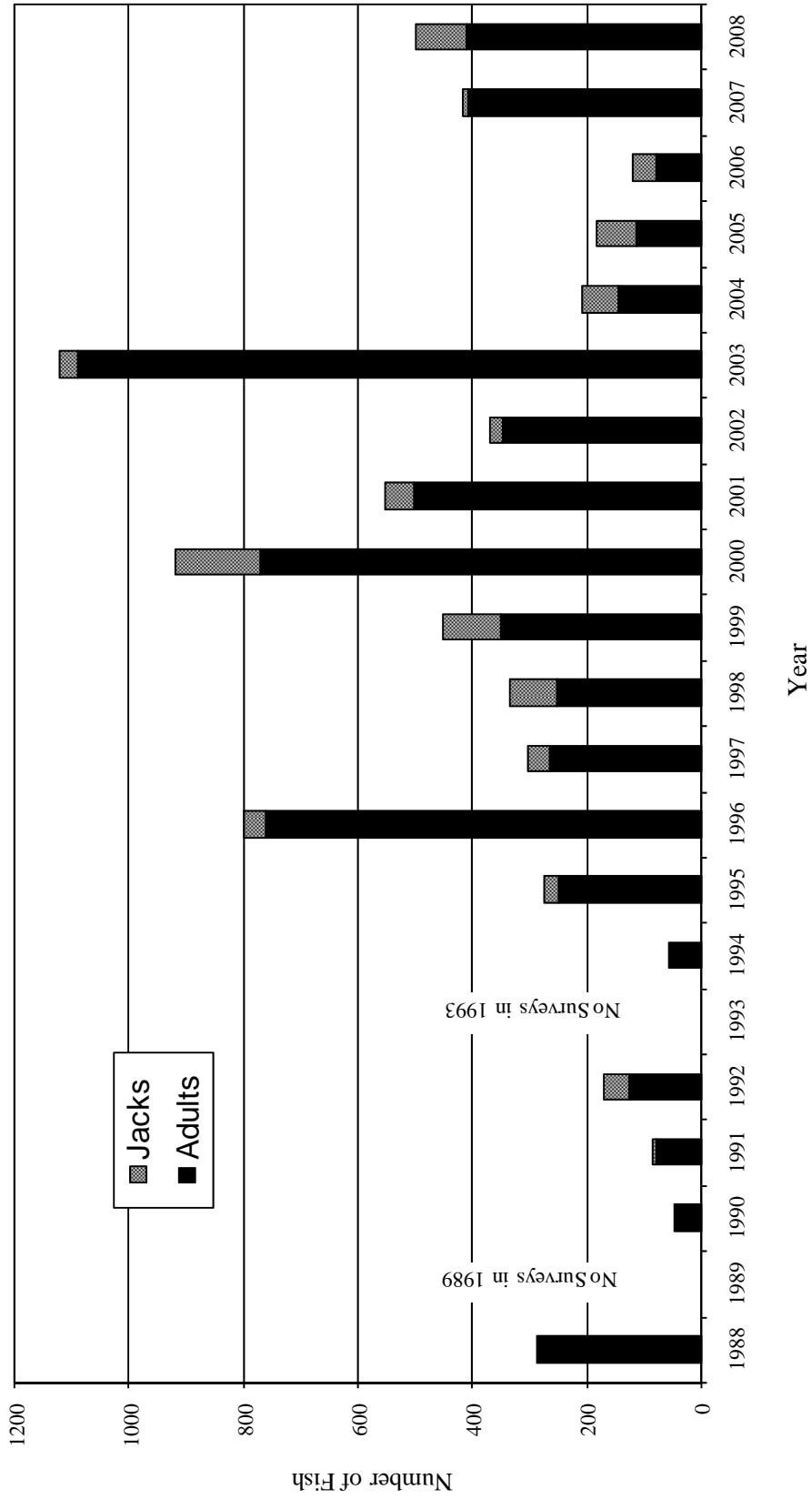


Figure 4. Annual peak counts of late-fall run chinook in reaches #1-4, Blue Creek, lower Klamath River, California. 1988-2008.

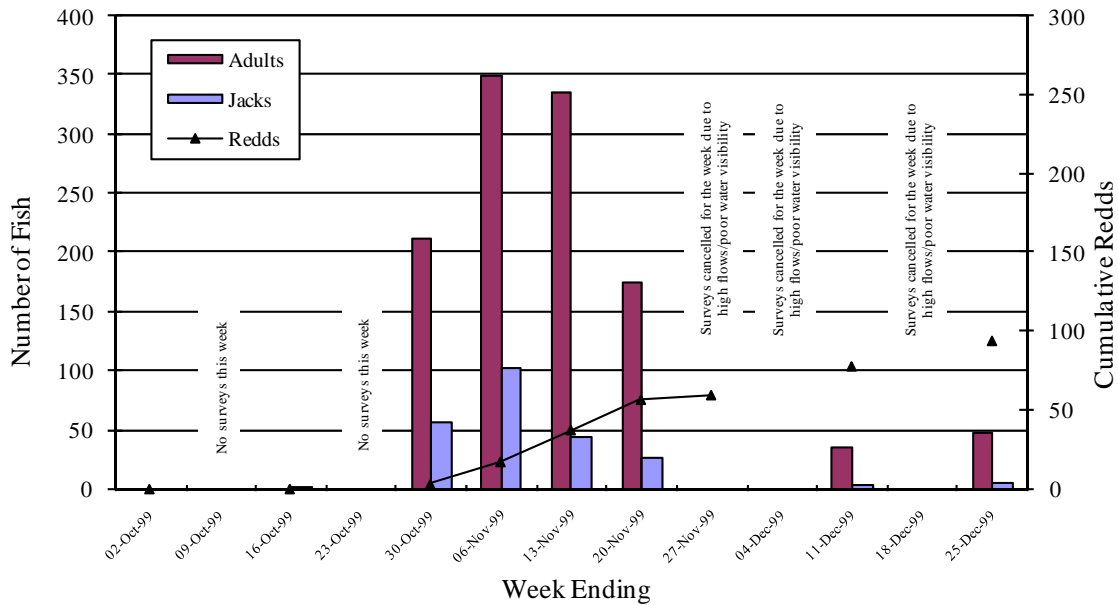


Figure 5. Total number of chinook salmon observed weekly and cumulative number of observed redds in reaches #1-4, Blue Creek, lower Klamath River, California, 1999.

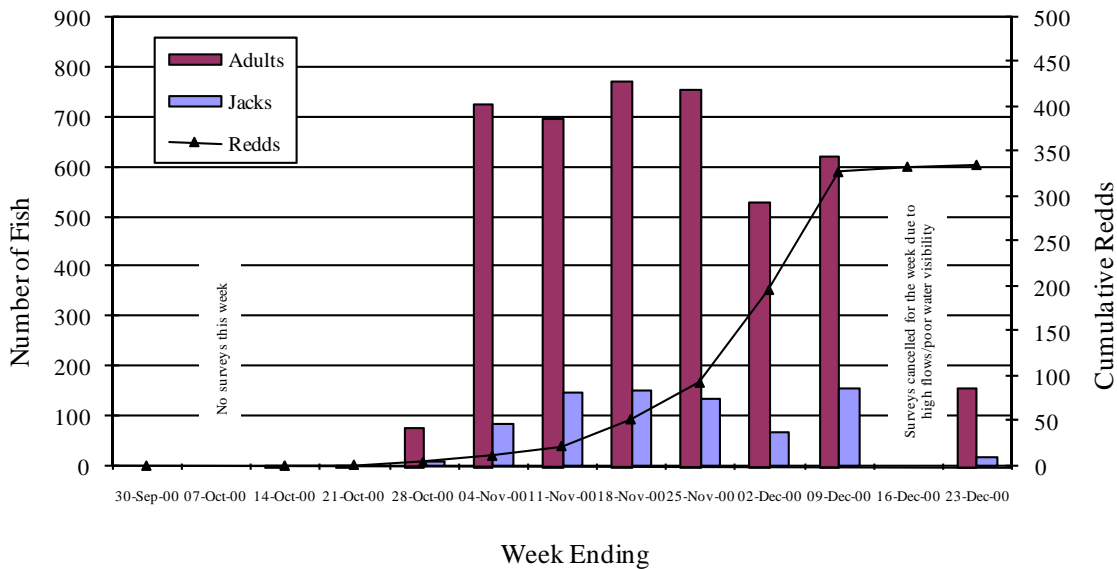


Figure 6. Total number of chinook salmon observed weekly and cumulative number of observed redds in reaches #1-4, Blue Creek, lower Klamath River, California, 2000.

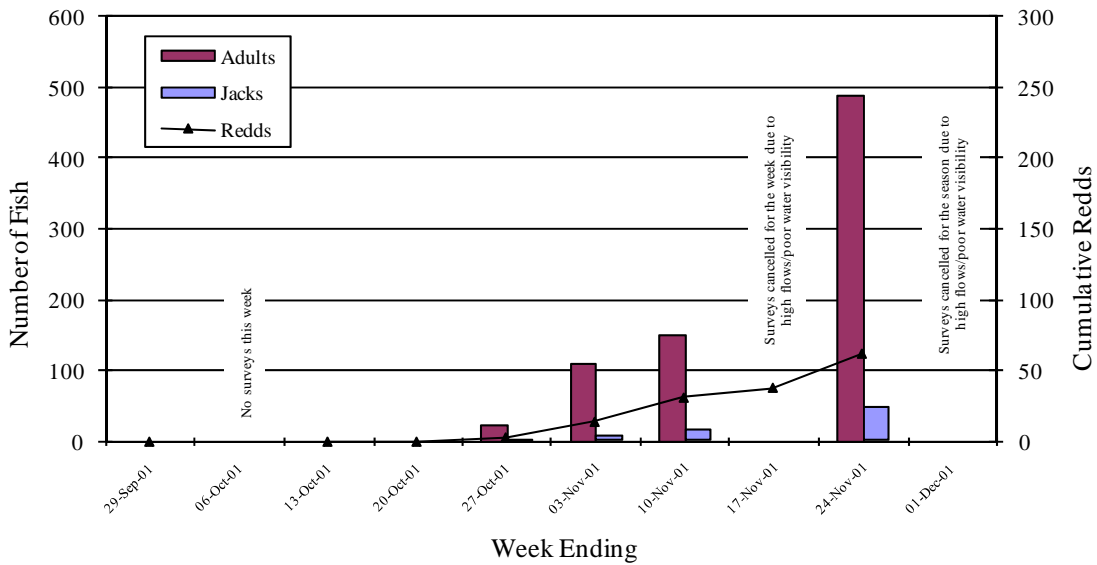


Figure 7. Total number of chinook salmon observed weekly and cumulative number of observed redds in reaches #1-4, Blue Creek, lower Klamath River, California, 2001.

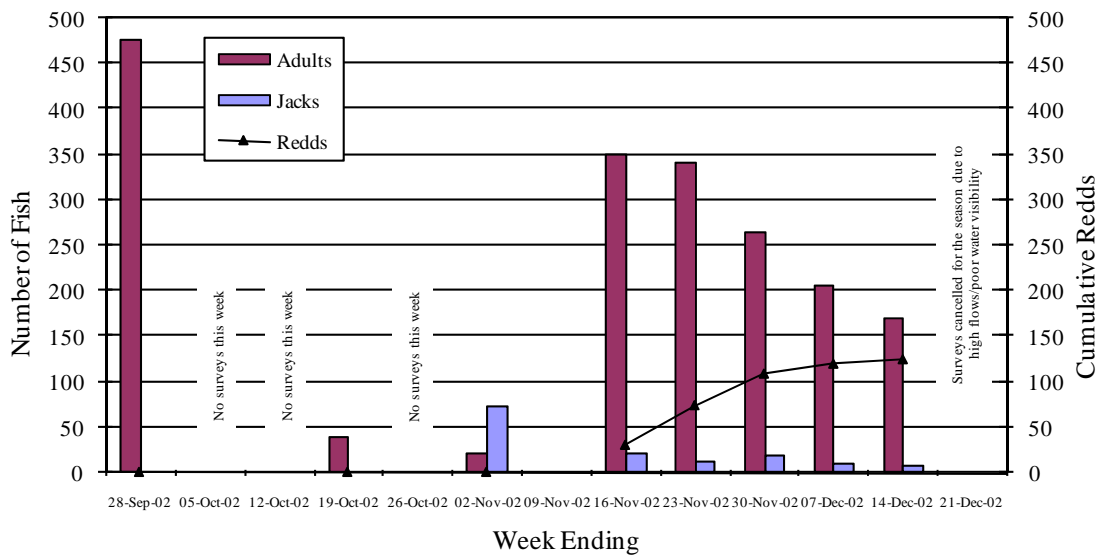


Figure 8. Total number of chinook salmon observed weekly and cumulative number of observed redds in reaches #1-4, Blue Creek, lower Klamath River, California, 2002.



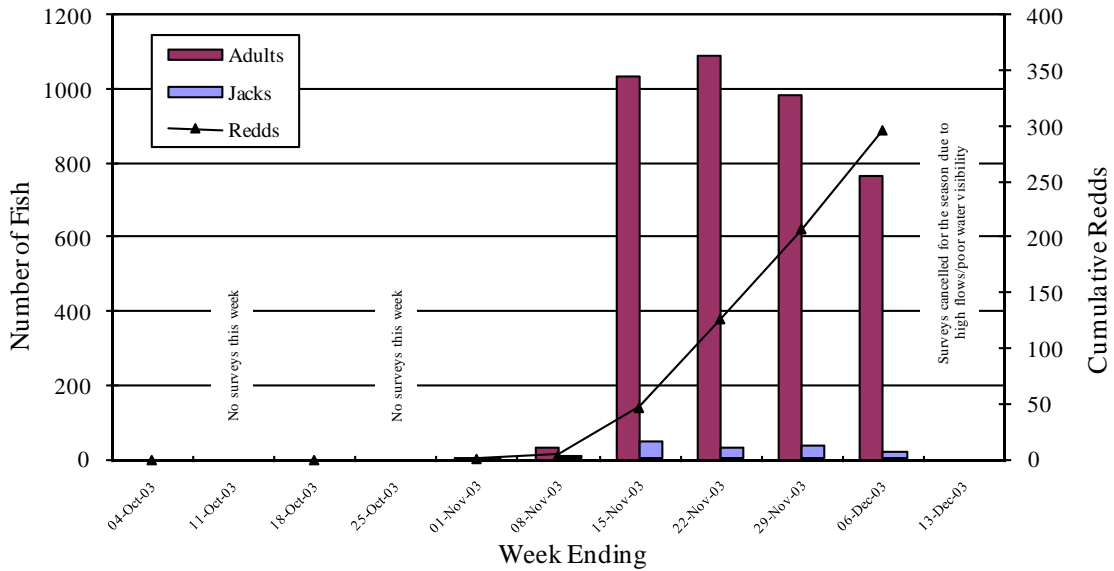


Figure 9. Total number of chinook salmon observed weekly and cumulative number of observed redds in reaches #1-4, Blue Creek, lower Klamath River, California, 2003.

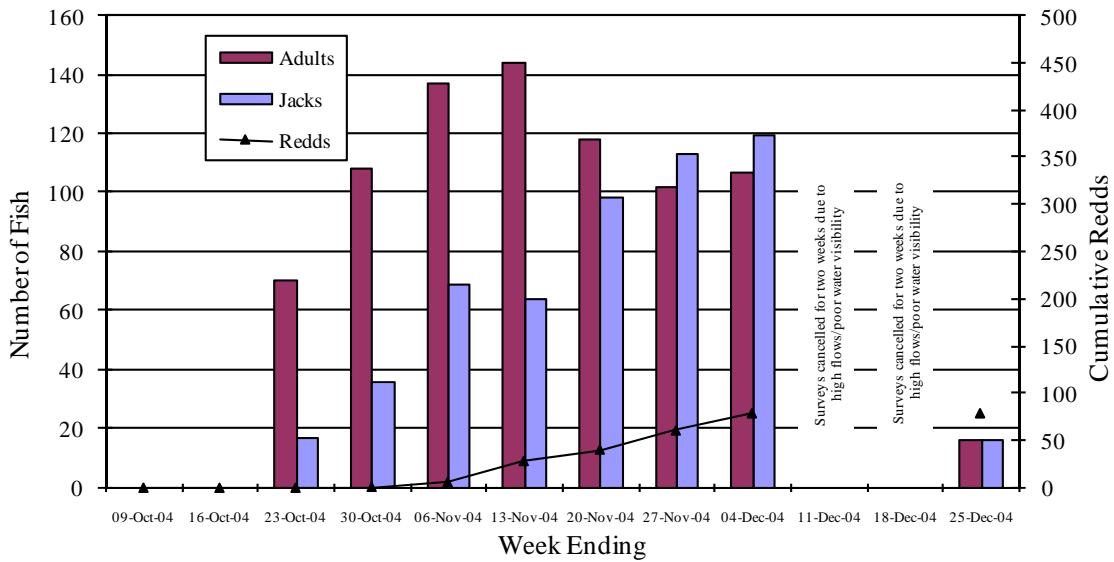


Figure 10. Total number of chinook salmon observed weekly and cumulative number of observed redds in reaches #1-4, Blue Creek, lower Klamath River, California, 2004.

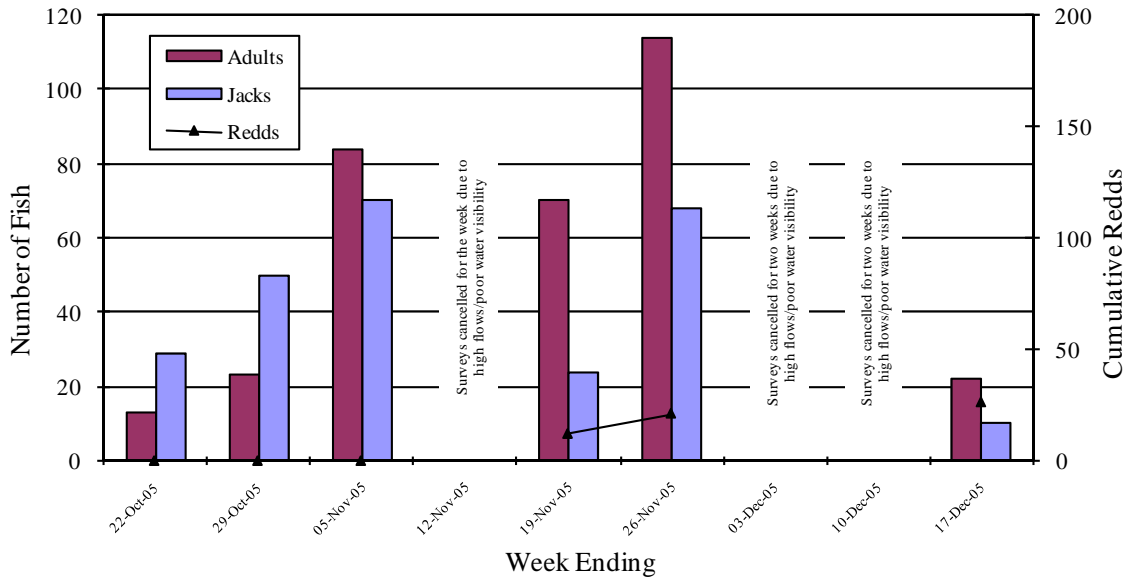


Figure 11. Total number of chinook salmon observed weekly and cumulative number of observed redds in reaches #1-4, Blue Creek, lower Klamath River, California, 2005.

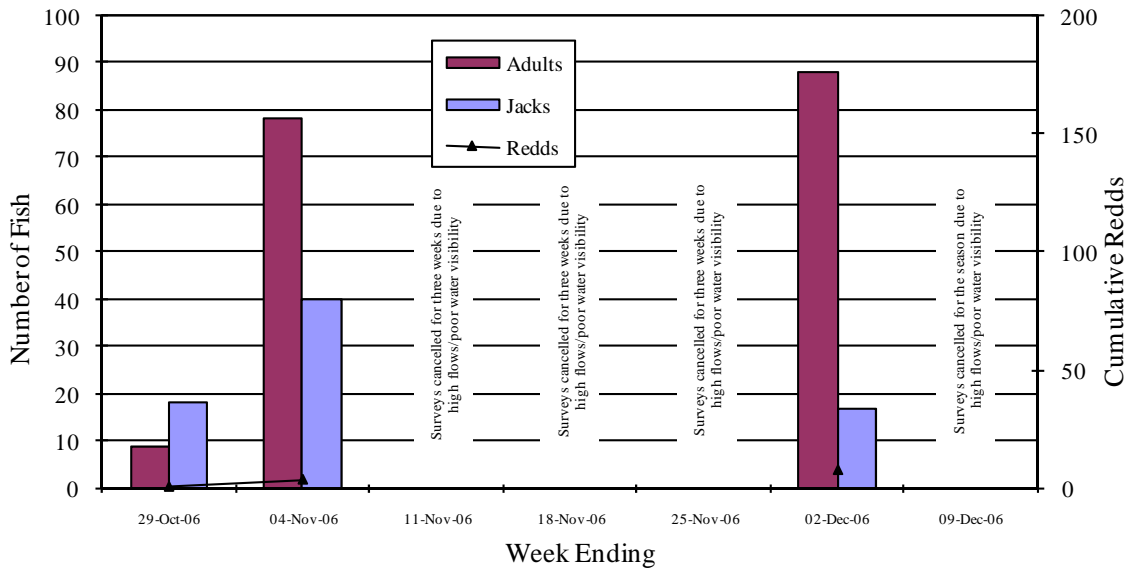


Figure 12. Total number of chinook salmon observed weekly and cumulative number of observed redds in reaches #1-4, Blue Creek, lower Klamath River, California, 2006.

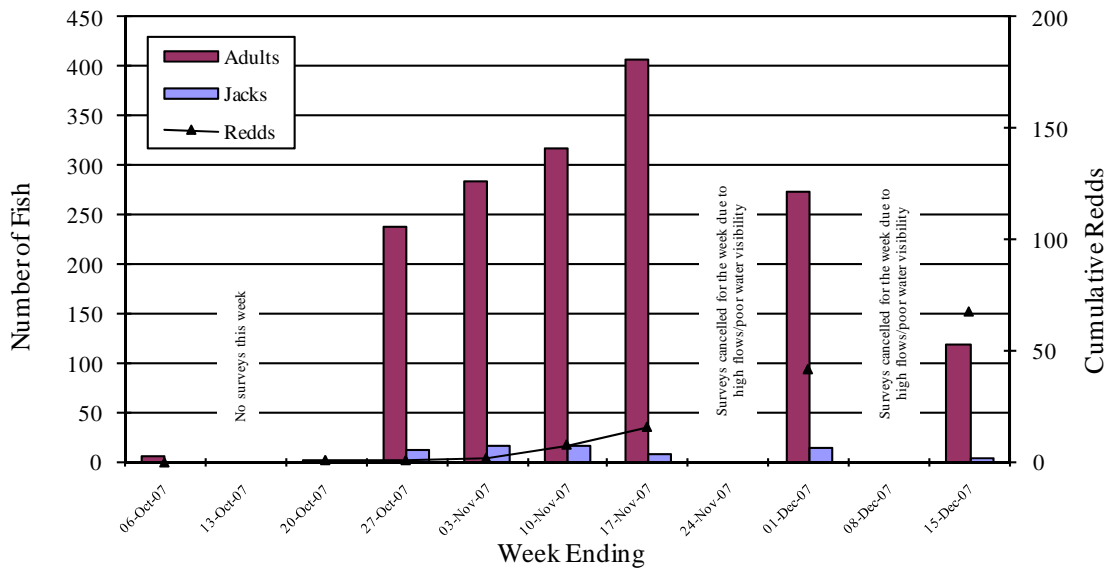


Figure 13. Total number of chinook salmon observed weekly and cumulative number of observed redds in reaches #1-4, Blue Creek, lower Klamath River, California, 2007.

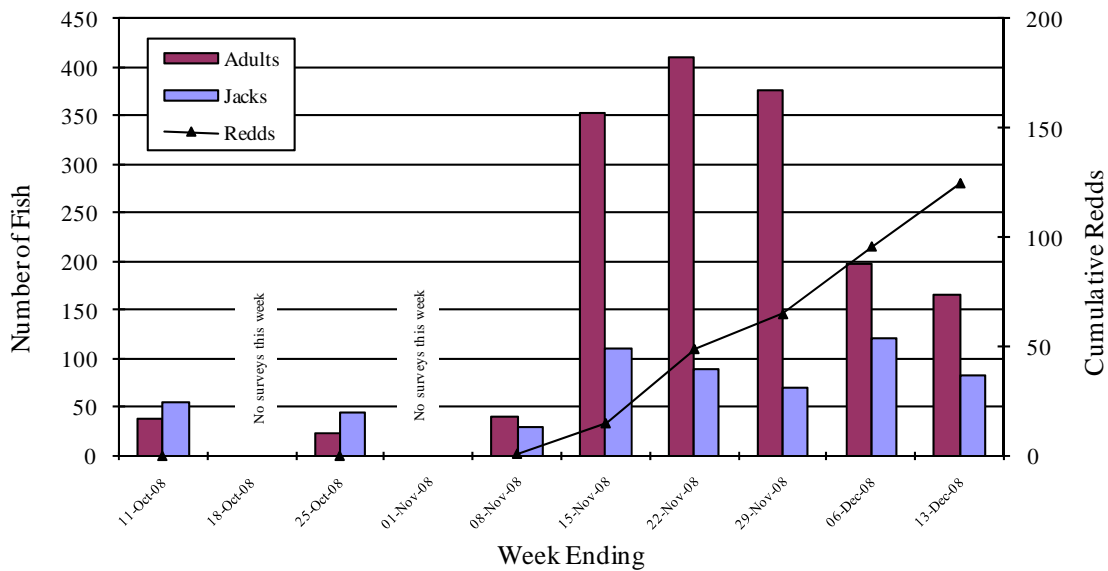


Figure 14. Total number of chinook salmon observed weekly and cumulative number of observed redds in reaches #1-4, Blue Creek, lower Klamath River, California, 2008.

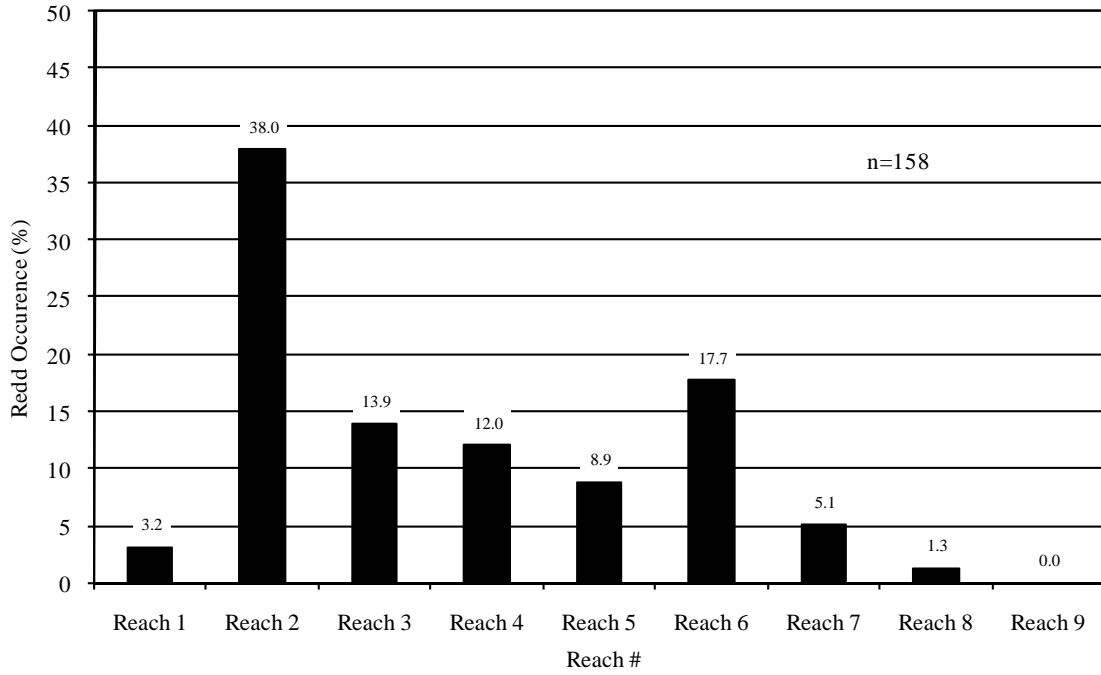


Figure 15. Percent occurrence by reach of observed salmon redds, Blue Creek, lower Klamath River, California, fall 1999.

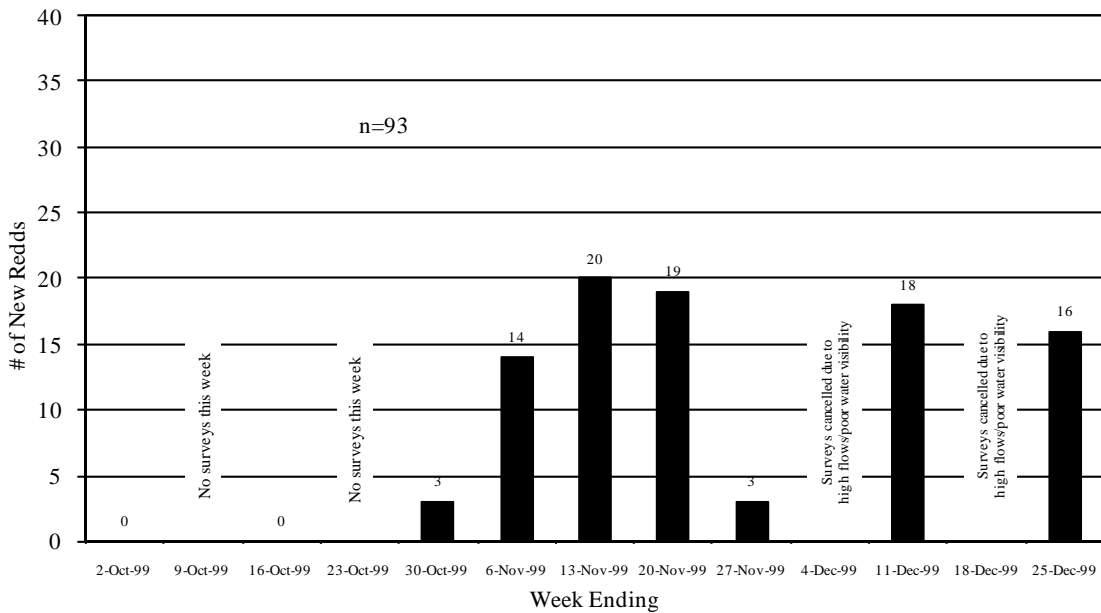


Figure 16. Number of new salmon redds observed in reaches #1-4 by week, Blue Creek, lower Klamath River, California, 1999.

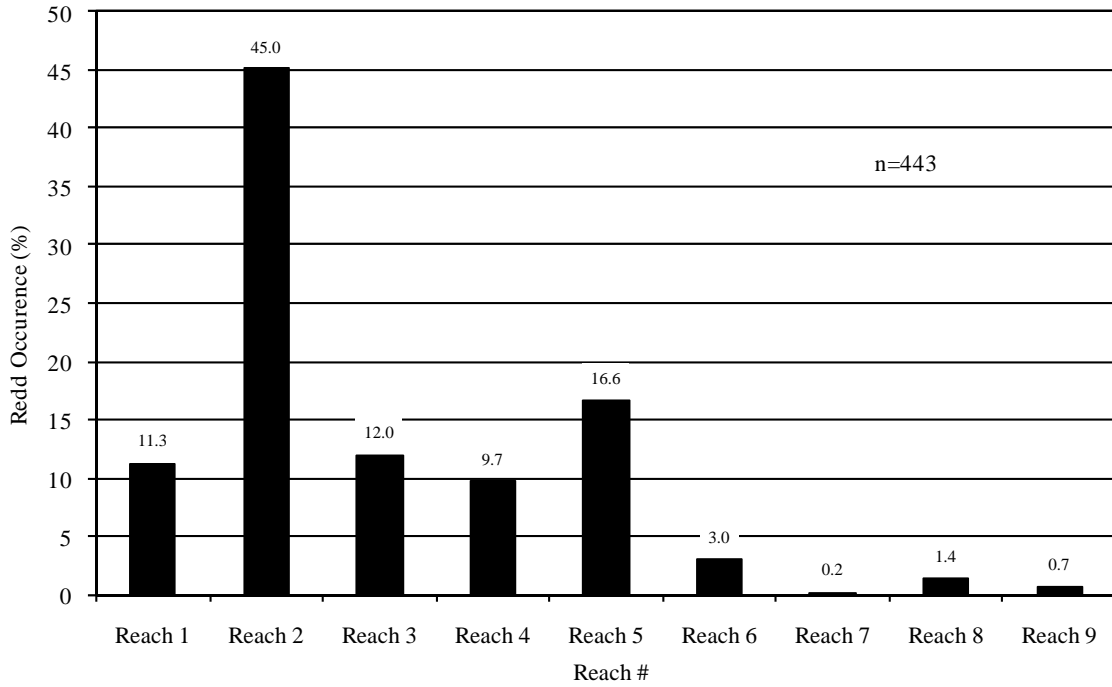


Figure 17. Percent occurrence by reach of observed salmon redds, Blue Creek, lower Klamath River, California, fall 2000.

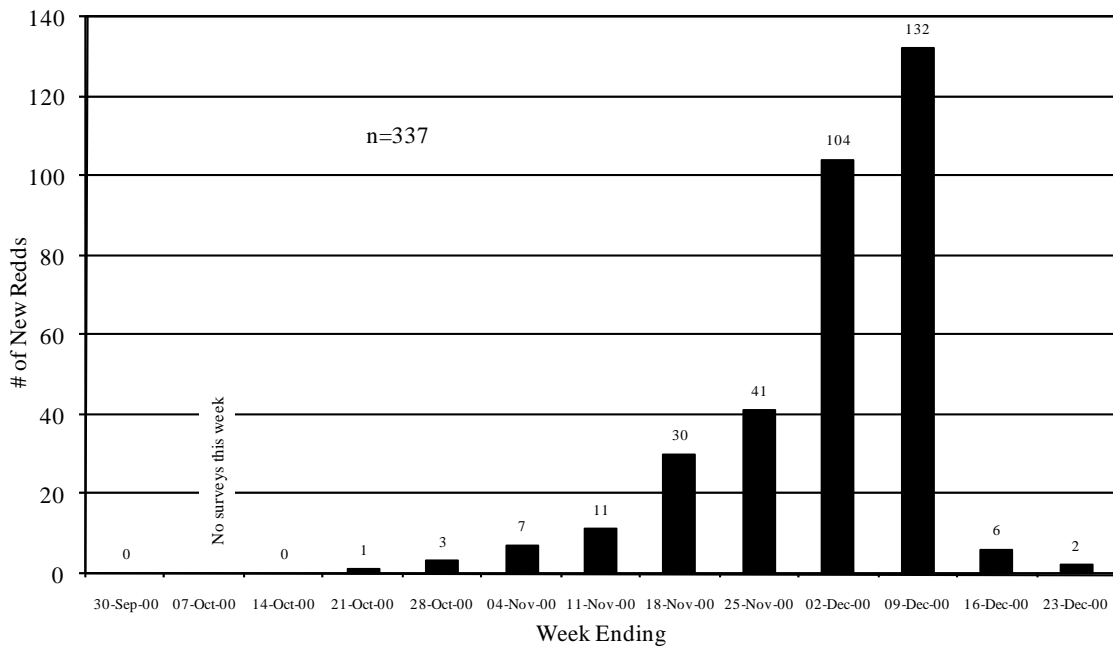


Figure 18. Number of new salmon redds observed in reaches #1-4 by week, Blue Creek, lower Klamath River, California, 2000.

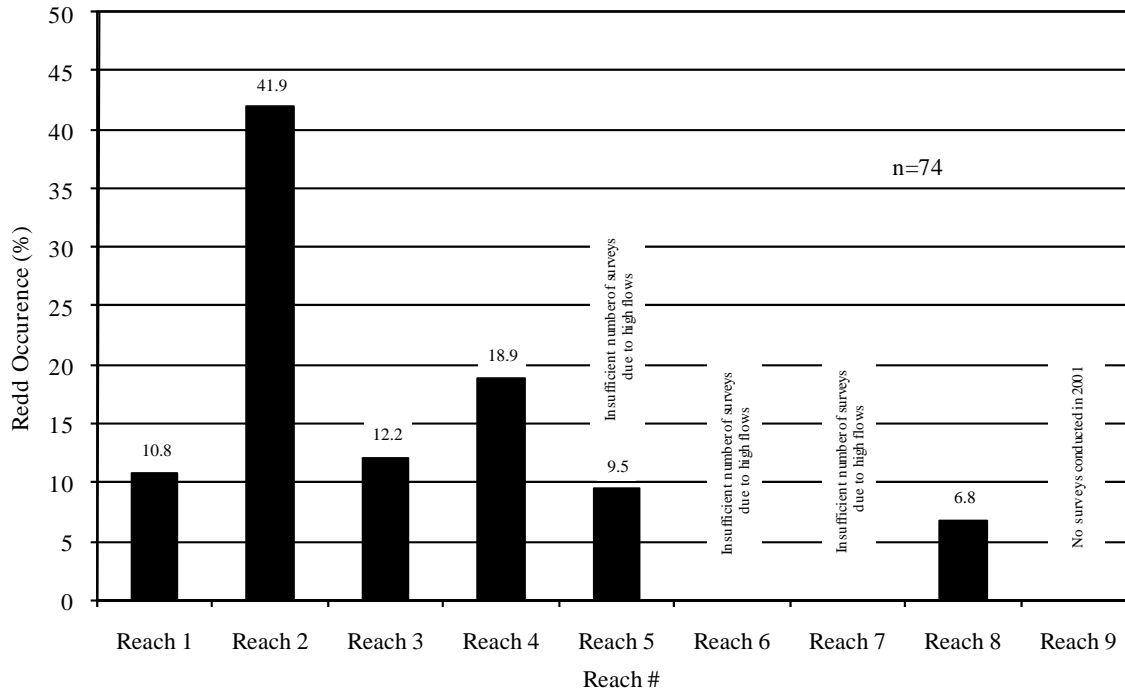


Figure 19. Percent occurrence by reach of observed salmon redds, Blue Creek, lower Klamath River, California, fall 2001.

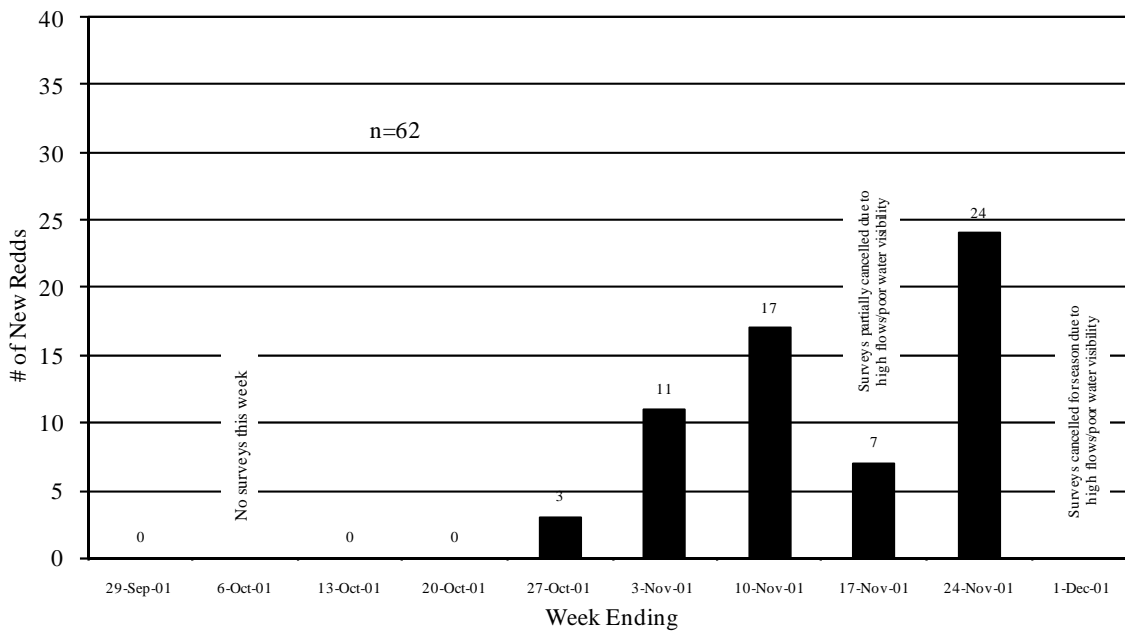


Figure 20. Number of new salmon redds observed in reaches #1-4 by week, Blue Creek, lower Klamath River, California, 2001.



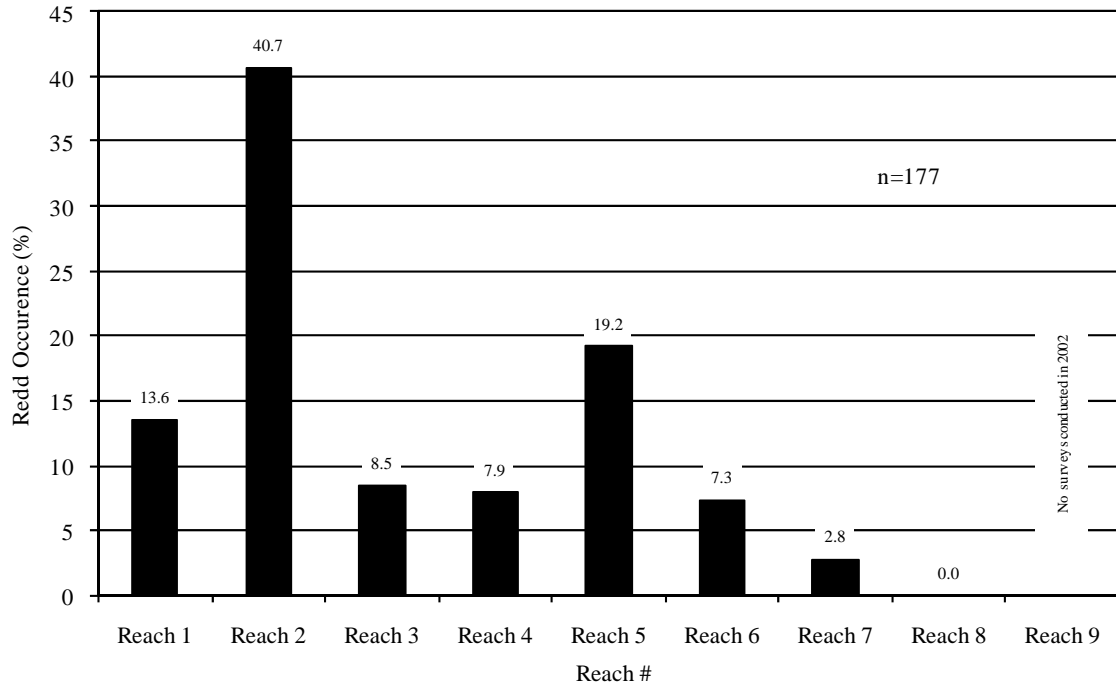


Figure 21. Percent occurrence by reach of observed salmon redds, Blue Creek, lower Klamath River, California, fall 2002.

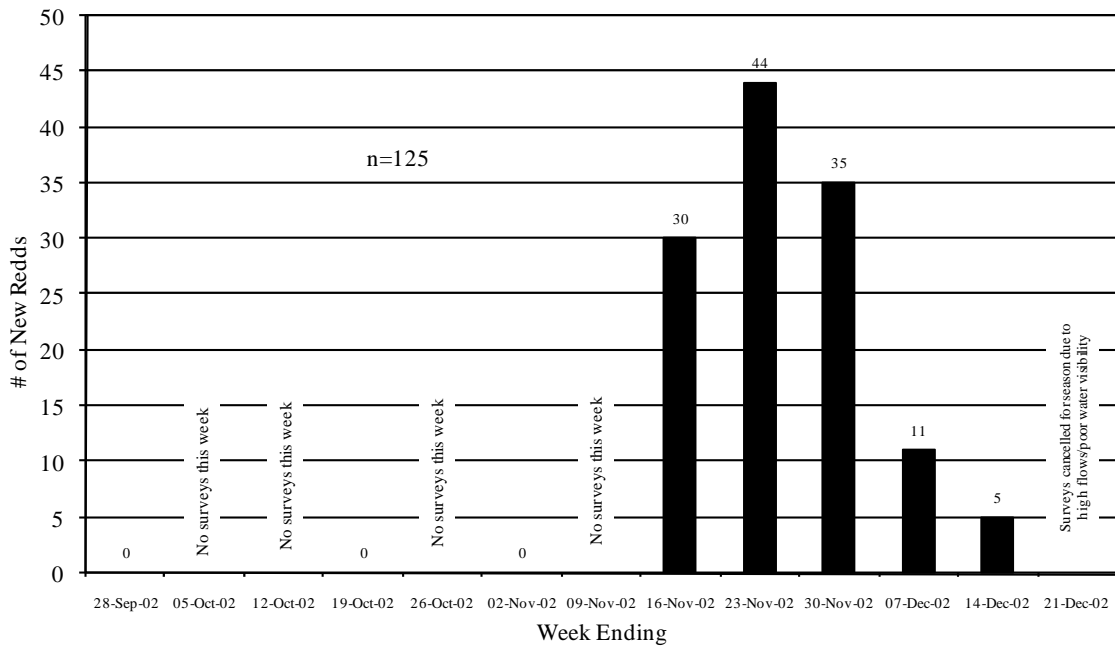


Figure 22. Number of new salmon redds observed in reaches #1-4 by week, Blue Creek, lower Klamath River, California, 2002.

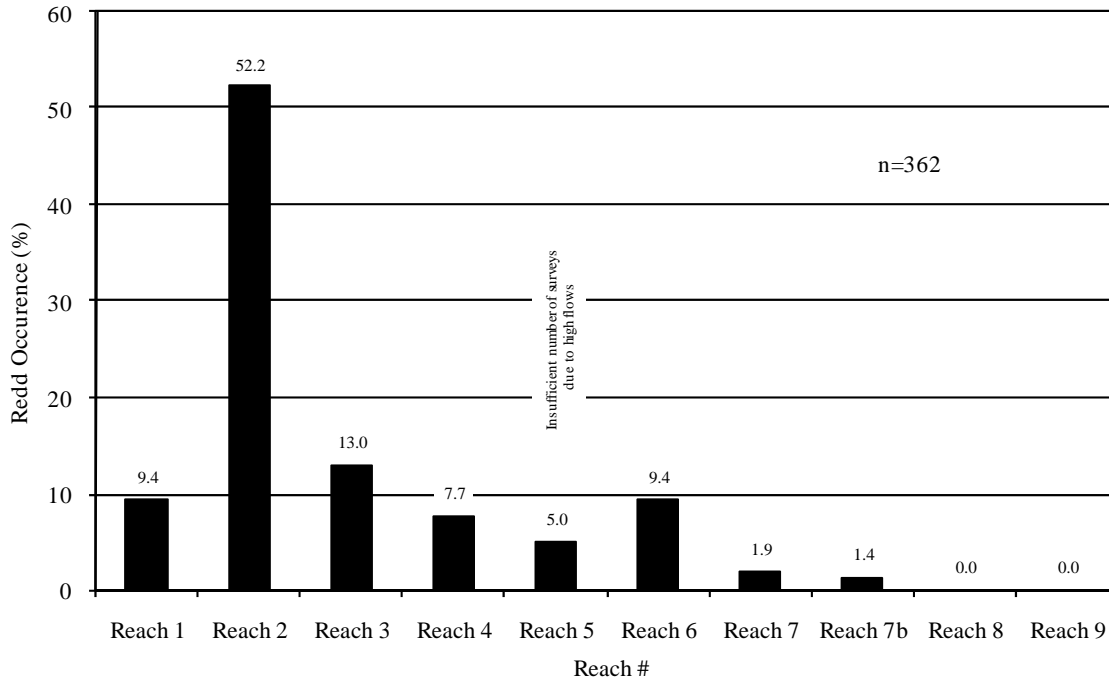


Figure 23. Percent occurrence by reach of observed salmon redds, Blue Creek, lower Klamath River, California, fall 2003.

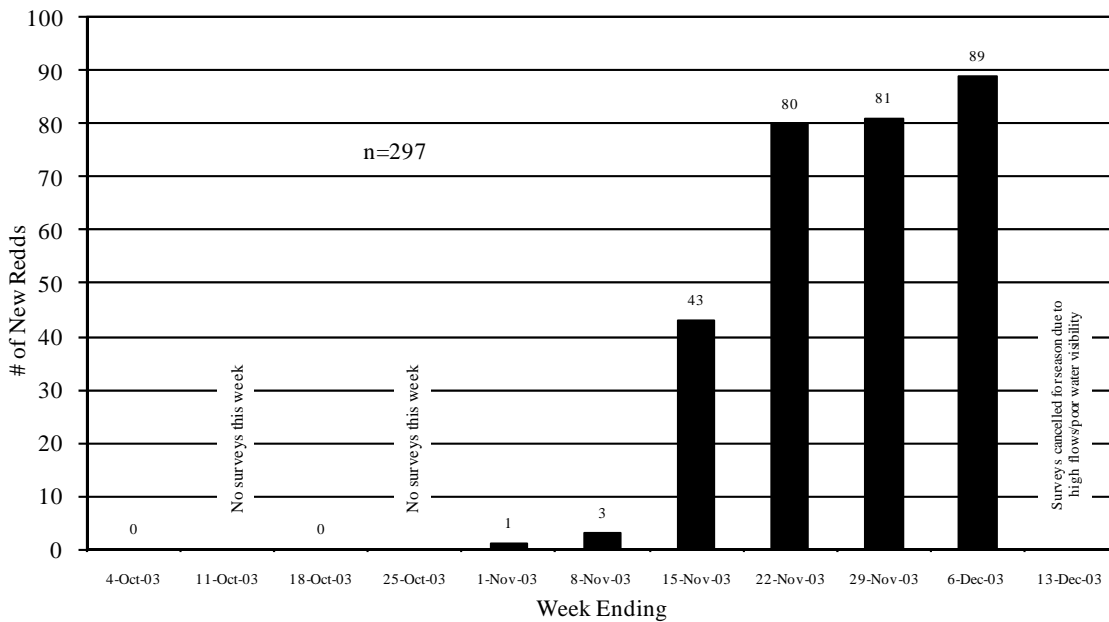


Figure 24. Number of new salmon redds observed in reaches #1-4 by week, Blue Creek, lower Klamath River, California, 2003.

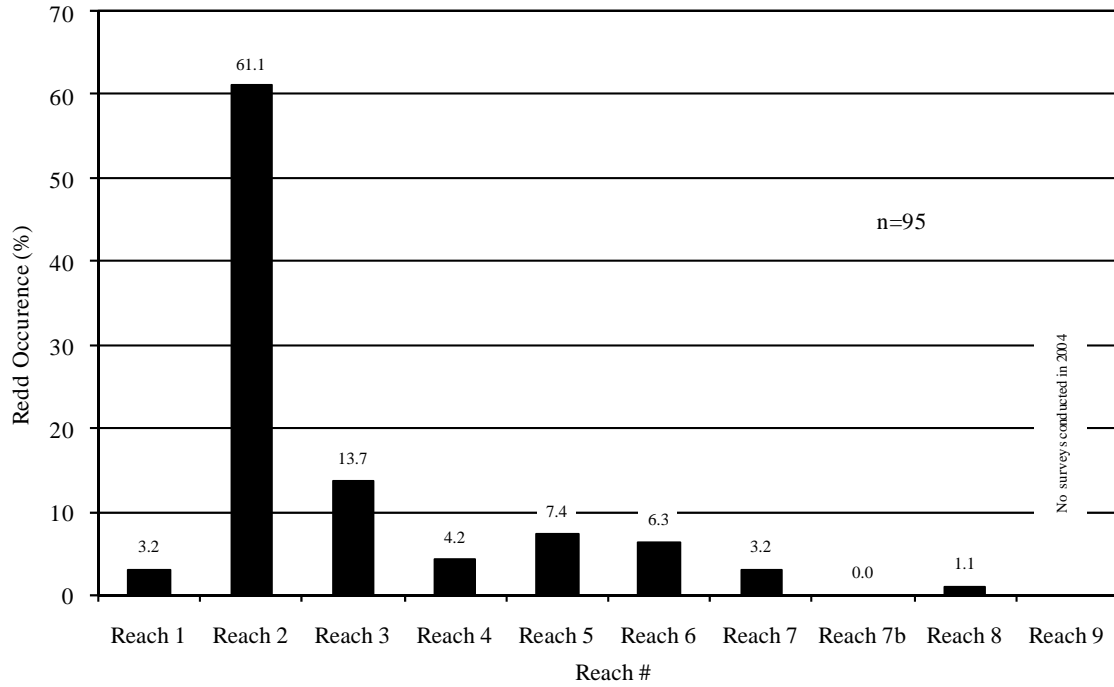


Figure 25. Percent occurrence by reach of observed salmon redds, Blue Creek, lower Klamath River, California, fall 2004.

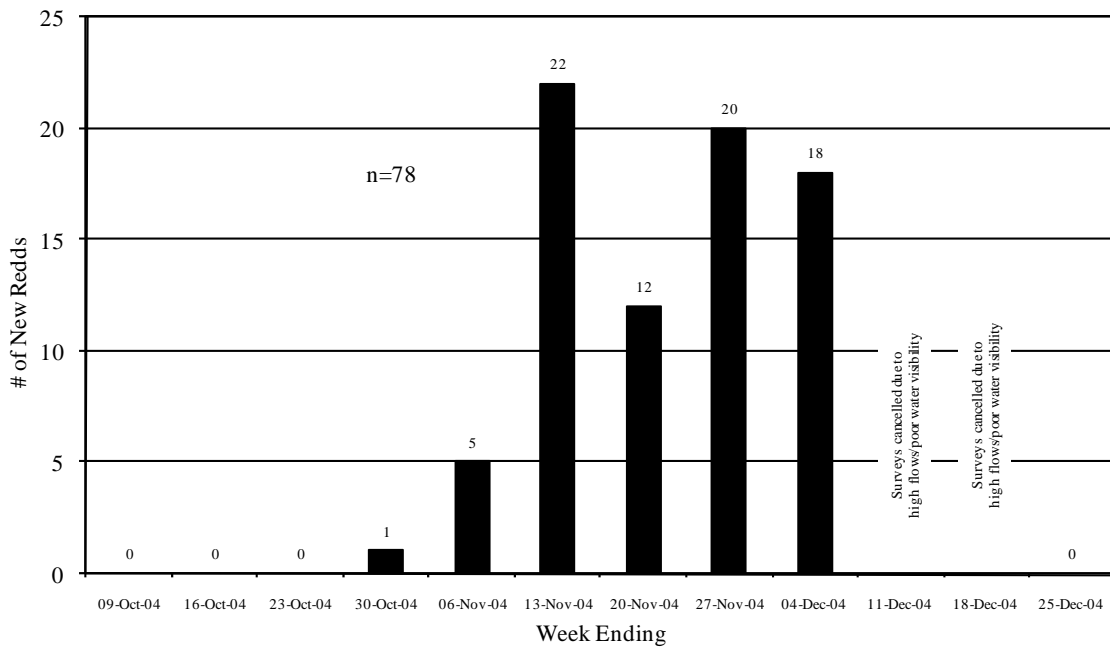


Figure 26. Number of new salmon redds observed in reaches #1-4 by week, Blue Creek, lower Klamath River, California, 2004.

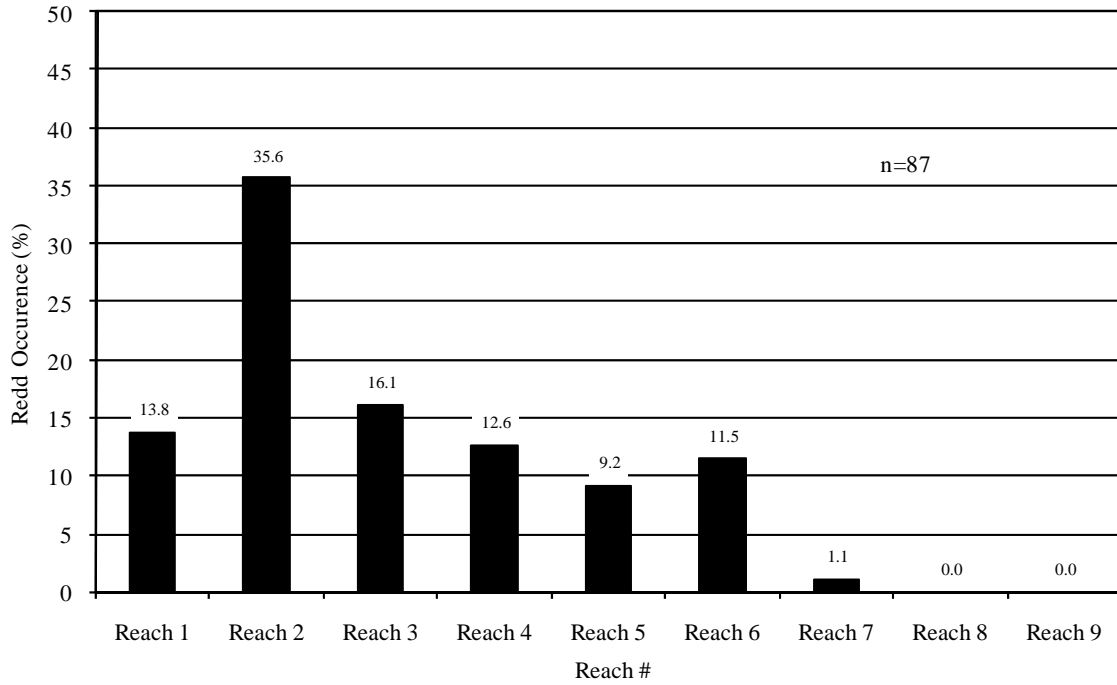


Figure 27. Percent occurrence by reach of observed salmon redds, Blue Creek, lower Klamath River, California, fall 2007.

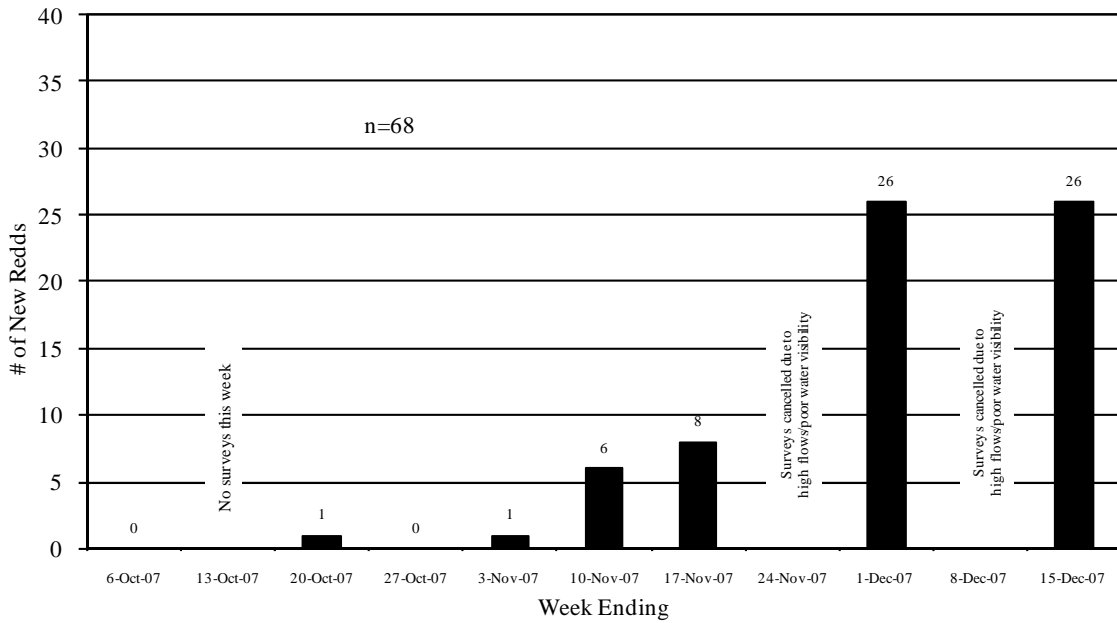


Figure 28. Number of new salmon redds observed in reaches #1-4 by week, Blue Creek, lower Klamath River, California, 2007.

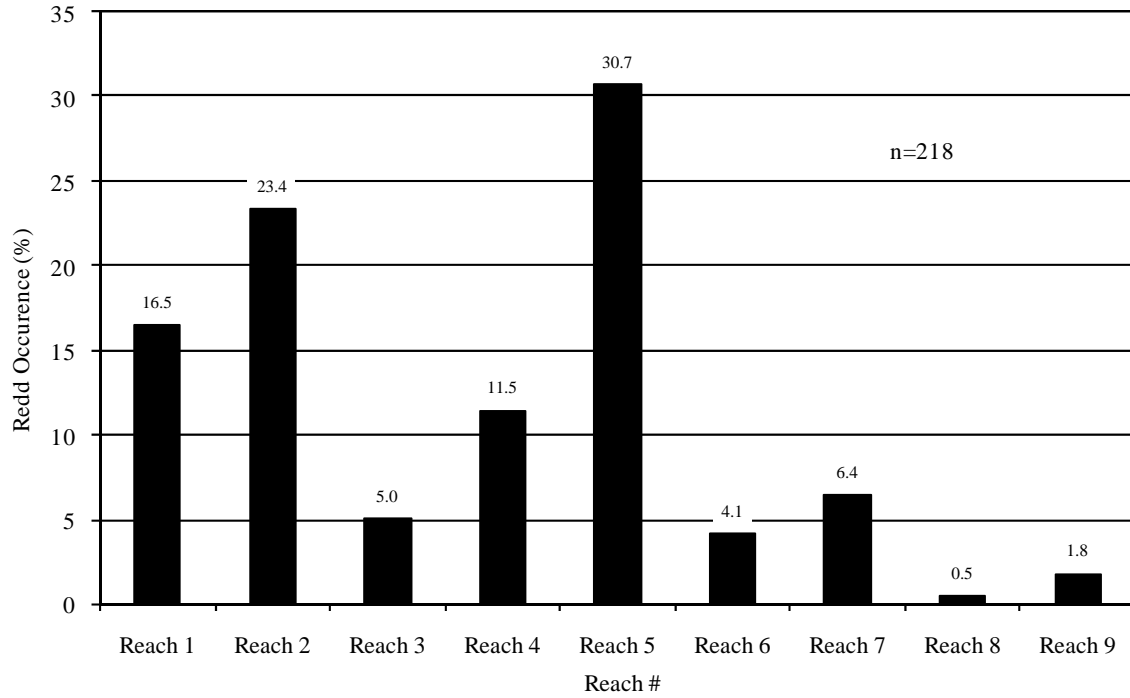


Figure 29. Percent occurrence by reach of observed salmon redds, Blue Creek, lower Klamath River, California, fall 2008.

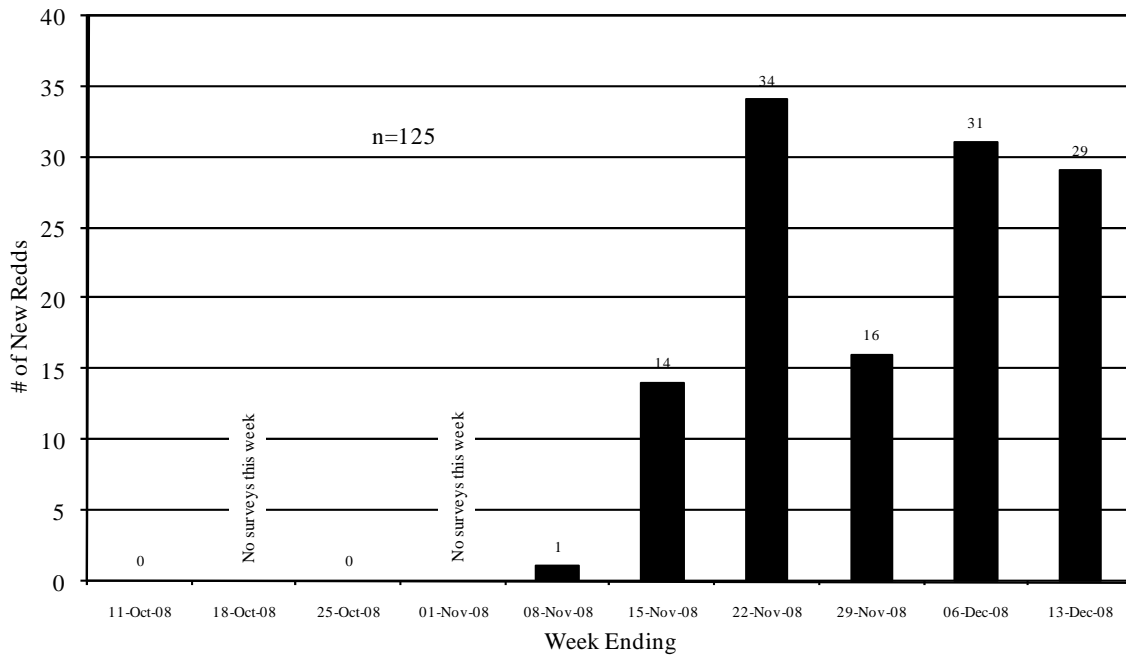


Figure 30. Number of new salmon redds observed in reaches #1-4 by week, Blue Creek, lower Klamath River, California, 2008.

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