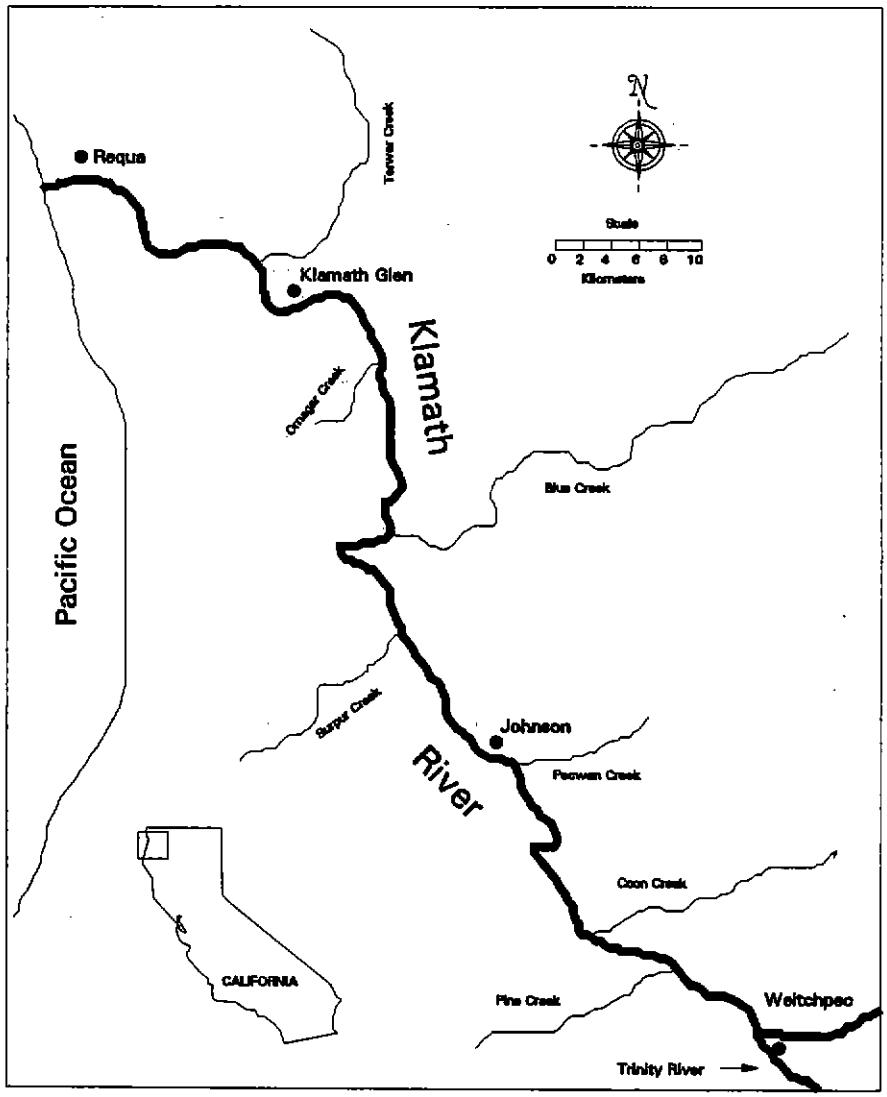
KLAMATH RIVER FISHERIES ASSESSMENT PROGRAM

LATE FALL CHINOOK HARVEST MONITORING ANNUAL REPORT 1991

February 1993
U.S. Fish & Wildlife Service
Coastal California Fishery Resource Office
Arcata, California



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LATE FALL HARVEST MONITORING ANNUAL REPORT

1991

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KLAMATH RIVER FISHERIES ASSESSMENT PROGRAM

ABSTRACT

During the late fall-winter sampling period, an estimated 21 chinook salmon (*Oncorhynchus tshawytscha*) were harvested by the Native American gill net fishery on the Yurok Indian Reservation (YIR). An estimated 28 coho salmon (*O. kisutch*), 35 steelhead trout (*O. mykiss*), and 5 green sturgeon (*Acipenser medirostris*) were also harvested during this period. Recommendations concerning monitoring and data needs for managing these fish are included.

LATE FALL CHINOOK HARVEST MONITORING ANNUAL REPORT

KLAMATH RIVER FISHERIES INVESTIGATION PROGRAM

1991

INTRODUCTION

The Klamath River watershed drains approximately 14,400 square kilometers (km^2) in Oregon and 26,000 km^2 in California. The majority of the watershed in California is within the boundaries of the Six Rivers, Klamath, and Shasta-Trinity National Forests. The Yurok Indian Reservation (YIR), borders the lower 68 km of the Klamath River, the largest tributary in the drainage (Figure 1).

The Klamath River Basin historically supported large runs of chinook salmon (Oncorhynchus tshawytscha) and steelhead trout (O. mykiss), which in past years has contributed considerably to subsistence, sport and commercial fisheries in California. Generations of Native Americans have utilized fishing grounds in the drainage, and their fisheries for salmon, steelhead and sturgeon (Acipenser sp.) have historically provided the mainstay of Native American economy in the area.

Concern about the depletion of anadromous salmonid resources and associated habitat in the basin emerged around the turn of the century, and has accelerated in recent decades coincident with expanded logging and fishing operations, dam building activity, road construction and other development. As in other river systems of the Pacific Northwest, chinook salmon and other anadromous salmonid stocks of the Klamath River Basin have experienced the continued effects of the current drought, habitat degradation and over-exploitation as reflected by the declining runs of the past few years (Rueth, 1992).

In addressing Departmental resource and Native American trust responsibilities concerning the Klamath River Basin resource and YIR, the Assistant Secretaries of Bureau of Indian Affairs (BIA), U.S. Fish and Wildlife Service (USFWS) and National Park Service have entered into annual fiscal Interagency Agreements providing for fisheries investigation programs focusing on the monitoring and evaluation of chinook salmon runs in the Klamath River, and the monitoring of Native American net harvest levels on the YIR. USFWS through Coastal California Fishery Resource Office (CCFRO) conducts the harvest monitoring and provides technical support to BIA concerning anadromous fish management in the Klamath River drainage.

Previously, the monitoring of chinook harvest has been confined to spring chinook (April-July) and fall chinook (mid-July - October). Later arriving chinook, (October-December) typically referred to as "late-fall chinook" have historically been harvested but harvest and escapement estimates have not been made. Due to the decline of other chinook runs in the Klamath River and the restoration effort being undertaken to rebuild anadromous fish stocks, it seems prudent to begin gathering information on these fish. Additionally, information could also be obtained concerning coho,(O. kisutch) steelhead, and sturgeon during this same time period. Accordingly, CCFRO recommended to BIA that an initial effort be expended in 1991 to gather this data.

Methods utilized and results obtained during the 1991 late fall-winter season are detailed in sections summarizing data collected on chinook salmon, coho salmon, steelhead trout, and sturgeon.

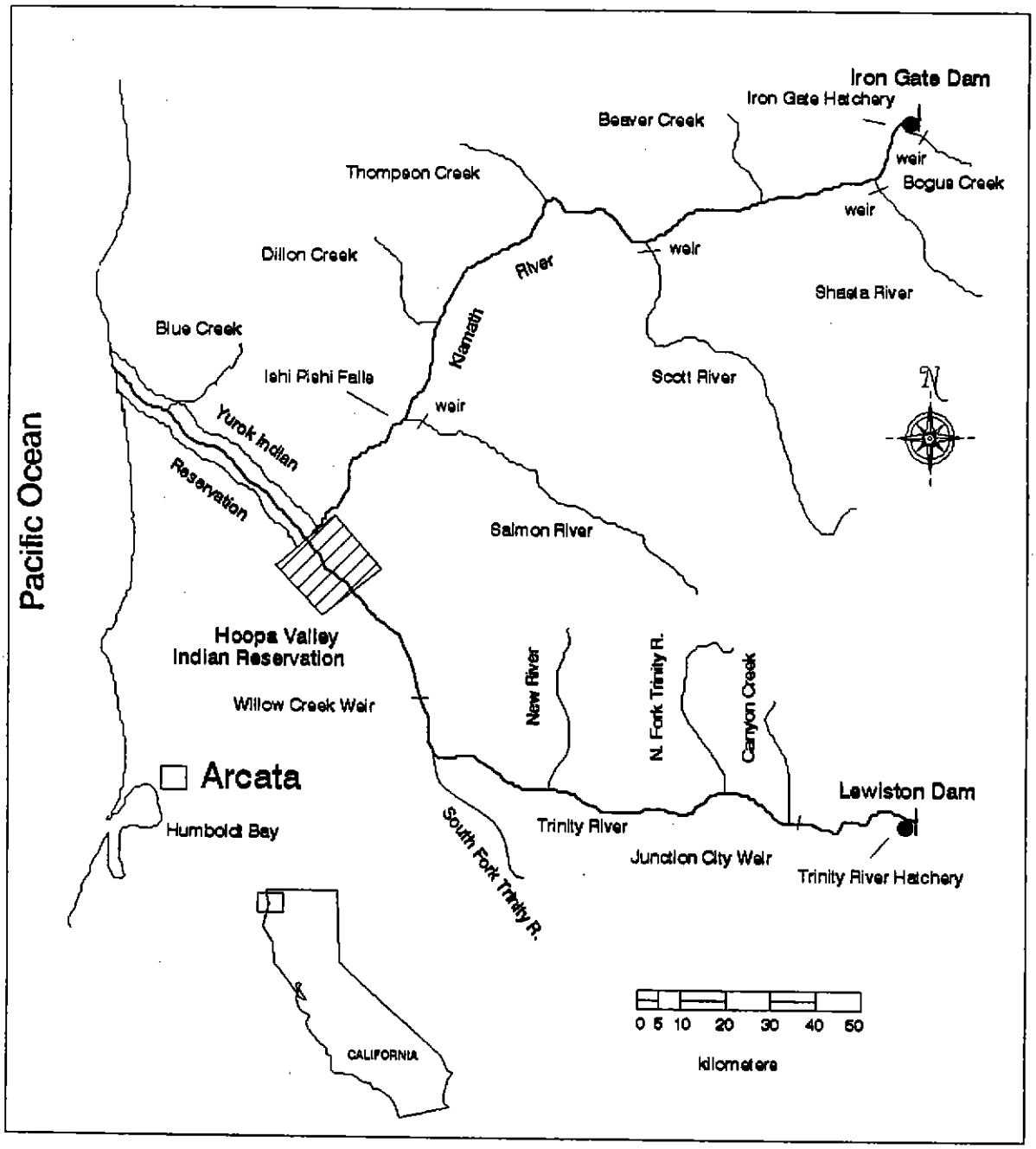

FIGURE 1. Overview map of the Klamath-Trinity River basin accessible to anadromous fish.

METHODS

CCFRO biologists employed a stratified random sampling methodology to assess late fall-winter season net harvest levels for chinook salmon, coho salmon, steelhead trout and sturgeon on the YIR. Net harvest monitoring data were collected and compiled from three contiguous areas (Estuary, Middle Klamath and Upper Klamath) on the YIR in 1991 (Figure 2.). The Estuary Area was defined as the lower 6 kilometers (km) of the river from the mouth to the crossing of the U.S. Highway 101 bridge. The Middle Klamath Area composed the next 27 km of river from the crossing of the Highway 101 bridge to Surpur Creek, 33 km upstream from the mouth. The Upper Klamath Area included the next 37 km stretch of river from Surpur Creek to Weitchpec. During the 1991 late fall-winter fishery, Department of Interior (DOI) regulations divided the reservation into two management zones that differ from the above areas. Area I included the portion of the Klamath River from the mouth to the U.S. Highway 101 bridge, River kilometer (rkm) 6. Area II began at the crossing of the U.S. Highway 101 bridge and continued upriver to the confluence of the Trinity River (rkm 70).

Late Fall- Winter Fishery

Fishing began on October 30, 1991 after a two week closure, following the traditional fall chinook fishery. Under pre-season DOI regulations, the Estuary Area, the Middle Klamath Area and the Upper Klamath Area were open to gill net fishing from Monday at 1700 hr to the following Monday at 0900 hr. Field crews, each consisting of one biologist and one Native American technician monitored the fishery from the mouth to Surpur Creek (Estuary and Middle Klamath Areas) and the area from Johnsons to Weitchpec (Upper Klamath Area) on a periodic basis from October 30 through December 13.

During the late fall-winter monitoring period, Native American fishers were contacted while in their boats, at their riverside camps, or at boat landings in the area. Information obtained included number of fish caught, species, and number of nets fished. River surveys, including net counts, were scheduled to coincide with hours when fishers typically checked their nets. Native American fishers not contacted on the river were later interviewed at their residences. When possible, harvested fish were examined for tags, fin clips and seal and otter-bite damage. Snouts were removed from adipose fin clipped (Ad-clip) salmon for subsequent coded-wire tag (CWT) recovery and identification. Fork length was also measured to the nearest centimeter and scales were collected for age analysis. A subsample of fish were also weighed to the nearest pound and these weights were converted to kilograms.

The following procedures were used in estimating harvest for the 3 Klamath monitoring areas during the late fall-winter fishery.

1. Weekly effort was estimated using data from the days monitoring occurred, using this formula:

   Weekly Effort Estimate =

   $$[\Sigma(\text{net counts})] * \left[\frac{7}{(\#\text{days sampled})}\right]$$

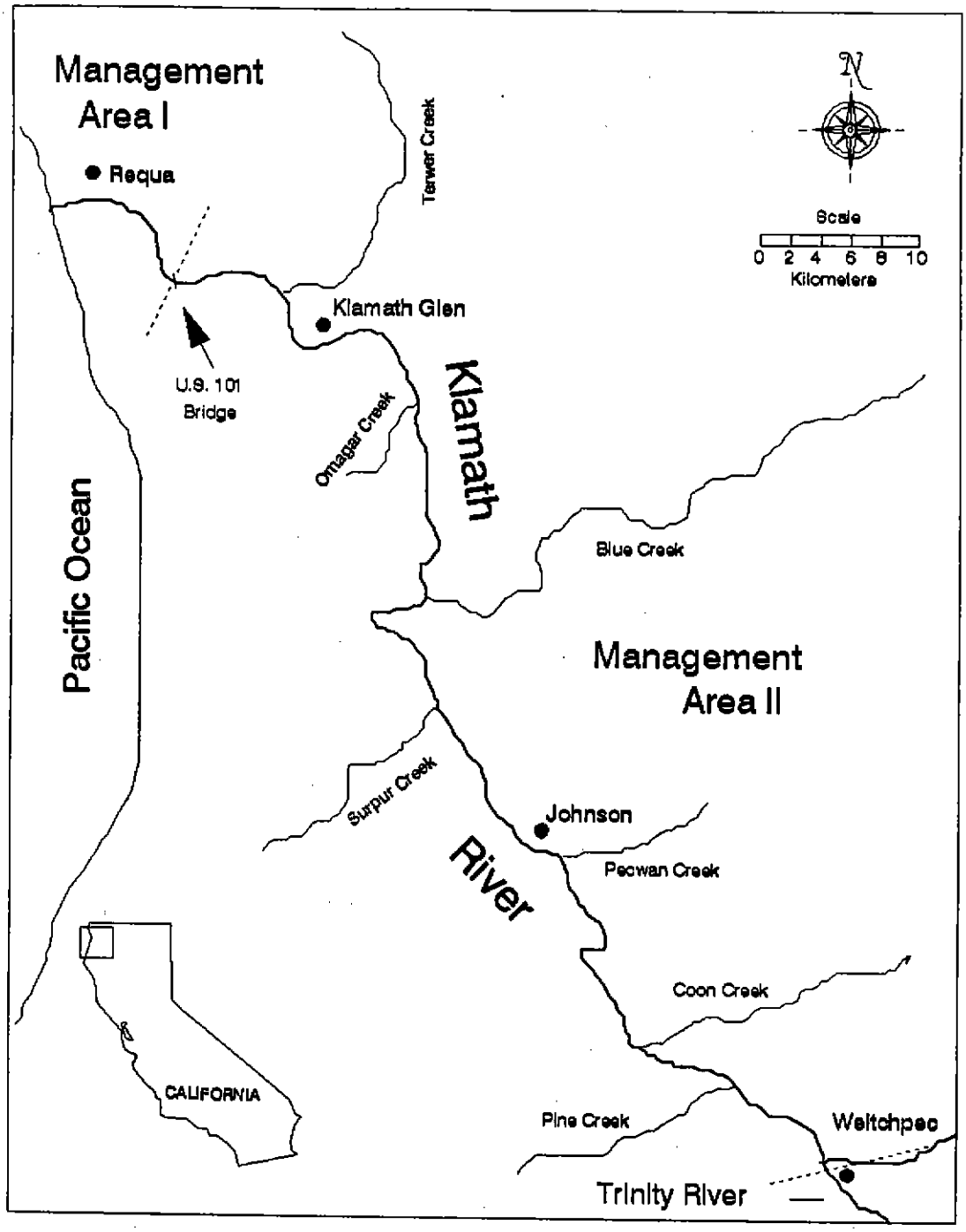

Figure 2. Map of lower Klamath River and net harvest monitoring areas used during 1991.

2. Weekly catch effort by species was derived using this formula:

$$\text{Weekly Catch Effort} = \frac{[\Sigma(\text{fish by spp.})]}{(\ \#\ \text{nets})}$$

3. Total weekly catch by species was estimated using this formula:

$$\hat{C} = (\text{Weekly Catch Effort}) * (\text{Weekly Effort})$$

RESULTS AND DISCUSSION

EFFORT

The majority of fishing effort occurred in the Upper Klamath Area followed by the Middle Klamath Area, with the least amount of effort occurring in the Estuary Area. Most of the effort was using set nets, with some drift nets, and a few dip nets (Table 1). Nearly all of the effort (92%) occurred prior to the week of November 18, 1991.

Effort in the Upper and Middle Klamath Areas peaked the week of November 4 - 10, 1991 with 6 set nets and 4 drift nets in the Upper Klamath area, and 4 set nets in the Middle Klamath Area. In the Estuary Area the peak net count occurred the week of October 28 - November 3, 1991 with 3 set nets and 2 dip nets. During the rest of the season, November 4 - December 13, 1991, no fishing effort was observed in the Estuary Area.

Adult Fall Chinook

An estimated 21 fall chinook salmon were harvested by the net fishery on the Klamath River within the YIR during the late fall-winter period. (Table 2). Nineteen chinook were harvested by set net, 0 by drift net and 2 by dip net. Harvest estimates corresponding to the DOI Management Areas were 2 adult fall chinook harvested in Management Area I, (10%) (Estuary and Middle Klamath Areas), and 19 adult fall chinook for Management Area II (90%) (Upper Klamath Area).

A total of 2 adult fall chinook was harvested in the Estuary Area. The peak weekly harvest in the Estuary occurred the week of October 28 - November 3, 1991.

No adult fall chinook were harvested in the Middle Klamath.

A total of 19 adult fall chinook were harvested in the Upper Klamath Area. Weekly harvest in the Upper Klamath Area ranged from a low of 0 in many weeks to 6 the week of November 4-10, 1991. This peak harvest corresponds to the peak net count.

Coho Salmon

An estimated 28 coho salmon were harvested by the fishery on the YIR (Table 2). Thirteen were harvested by set net, 10 by drift net, and 5 by dip net. The majority of the harvest occurred in the Upper Klamath Area (82%), followed by the Estuary Area (18%) (Table 2). The corresponding figures for Management area I and II were 5 coho (18%) and 23 coho (82%) respectively.

Five coho were harvested in the Estuary Area. The peak weekly harvest of 3 coho occurred October 28 - November 3, 1991. Two of the three were biosampled, with an average length of 72 cm.

Table 1. Fishing effort (# of nets) by area and week.

Date	Estuary		Middle Klamath		Upper Klamath	
	Set	Dip	Set	Drift	Set	Drift
Oct 28–03	3	2	3	0	6	0
Nov 04–10	0	0	4	0	6	4
Nov 11–17	0	0	0	0	7	0
Nov 18–24	0	0	1	0	0	0
Nov 25–01	0	0	0	0	0	0
Dec 02–08	0	0	0	0	1	0
Dec 09–15	0	0	0	0	1	0
Totals	3	2	8	0	21	4

Table 2. Harvest by area and week.

	Chinook	Coho	Steelhead	Sturgeon
Estuary				
Oct 28–03	2	5	0	0
Nov 04–10	0	0	0	0
Nov 11–17	0	0	0	0
Nov 18–24	0	0	0	0
Nov 25–01	0	0	0	0
Dec 02–08	0	0	0	0
Dec 09–15	0	0	0	0
TOTAL	2	5	0	0
Middle Klamath				
Oct 28–03	0	0	0	5
Nov 04–10	0	0	0	0
Nov 11–17	0	0	0	0
Nov 18–24	0	0	0	0
Nov 25–01	0	0	0	0
Dec 02–08	0	0	0	0
Dec 09–15	0	0	0	0
TOTAL	0	0	0	5
Upper Klamath				
Oct 28–03	6	3	6	0
Nov 04–10	9	16	16	0
Nov 11–17	4	4	0	0
Nov 18–24	0	0	0	0
Nov 25–01	0	0	0	0
Dec 02–08	0	0	3	0
Dec 09–15	0	0	10	0
TOTAL	19	23	35	0
Totals	21	28	35	5

In the Upper Klamath Area, the peak weekly harvest of five coho occurred the week of November 4-10, 1991.

Steelhead Trout

An estimated 35 steelhead trout were harvested by the net fishery on the YIR. Twenty-six steelhead were harvested by set net, and 9 by drift net. All the steelhead were harvested in the Upper Klamath Area (Table 2).

The peak weekly harvest of five steelhead occurred the week of November 4-10, 1991. The peak net count also occurred the week of November 4-10, 1991. Of the 35 steelhead caught, 2 were biosampled, with an average length of 45 cm.

Sturgeon

An estimated 5 green sturgeon were harvested by the fishery on the YIR. The sturgeon were harvested by set net in the Middle Klamath Area the week of October 28 - November 3, 1991 (Table 2).

RECOMMENDATIONS

In 1987, an agreement was reached between ocean and in-river user groups to share the allowable harvest. This shifted a greater part of the allowable harvest to the in-river fisheries, resulting in a need to monitor and manage the Native American net fishery, and in-river sport harvest. In 1991 the late fall and winter in-river harvest was monitored for the first time. The data and other information seem to indicate that the chinook and coho entered the river prior to the late fall-winter season, possibly during the two week closure or previously. Late run adult chinook were showing up in Blue Creek the last week in October, and totaled about 84 fish for the season (Gilroy, 1992). The Yurok Accelerated Stocking Program was capturing fish between October 11 and December 17, 1991. A total of 96 chinook were caught with the majority (84) occurring between October 12 and November 9, 1991, the remaining (12) between November 10 and December 17, 1991 (USFWS 1992). The tribal effort is meant to focus on late fall run Blue Creek fish. This information may indicate that: 1) The late fall run chinook arrive earlier than previously thought, 2) Chinook and coho runs are very depressed, and 3) Efforts to catch late fall chinook for broodstock could have a considerable impact on returns to natural spawning areas.

If late fall chinook arrive in the Klamath River during the Native American and sport quota fisheries after undergoing ocean harvest rates, they are likely being harvested at the maximum rate allowable in order to allow sufficient spawners for rebuilding depressed populations. The continued harvest (broodstock and otherwise), of these fish in the river after the quota season, should be a cause of concern and examined. Although data collected during this current effort is scanty, it indicates that a more intensive investigation should take place. As this was the first year that the fishery was monitored, and fall chinook are a species of concern, we recommend the following:

- Harvest monitoring of the late fall-winter Native American net harvest be continued to provide more information as to how the fishery is affecting fall chinook stocks.

- Determine the time span of each run so they can be managed more effectively.

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