JOINT STAFF REPORT
CONCERNING COMMERCIAL SEASONS
FOR STURGEON AND SMELT IN 2004

Joint Columbia River Management Staff

Washington Department of Fish and Wildlife
Oregon Department of Fish and Wildlife

December 5, 2003

TABLE OF CONTENTS

LIST OF TABLES

INTRODUCTION

This report describes winter season sturgeon and smelt fisheries in the mainstem Columbia River and includes summaries of stock status, current management plans and guidelines, and past management actions and strategies. Additionally, this report contains information concerning smelt abundances and fisheries in Columbia River tributaries. Fisheries and season proposals described in this report will be considered at a public hearing of the Columbia River Compact to be held at 10:00 A.M. on Friday December 19, 2003 at the Water Resources Education Center located at 4600 S.E. Columbia Way, Vancouver, Washington. The purpose of this hearing is to consider fishing seasons for the commercial harvest of sturgeon and smelt within the mainstem Columbia River. This report has been reviewed by the Technical Advisory Committee (TAC). The TAC functions under *U.S. v. Oregon* and is comprised of biologists from state and federal fish management agencies and the Columbia River treaty Indian tribes.

STURGEON MANAGEMENT AND FISHERIES DOWNSTREAM FROM BONNEVILLE DAM

Stock Status

Sturgeon abundance in the lower Columbia River collapsed at the end of the 19th century due to overfishing, and remained depressed through the first half of the 20th century. The population began to rebound only after the adoption of management actions aimed at protecting broodstock, particularly the 6 foot maximum size limit regulation. Since that time, white sturgeon abundance in the lower Columbia River has increased significantly. The current white sturgeon population is considered to be healthy with the greater than 2 foot population exceeding 1 million fish. In general, indicators of sublegal (<42 inches) and oversize (>60 inches) white sturgeon abundance remain stable at this time. Since 1995, white sturgeon abundance in the lower Columbia River has declined slightly, in contrast to modeling results which predicted that recent management actions would result in increased abundance (Table 1).

Joint state tagging and recovery programs were initiated in 1989 to provide data necessary to estimate the annual abundance of white sturgeon inhabiting the lower Columbia River (downstream of Bonneville Dam). Since 1989, with the exception of 1994, annual abundance estimates have been produced. Abundance estimates for harvestable size (42-60 inches) fish steadily increased from 1990 through 1995 but since 1996 have declined by an average of about 4% per year through 2001 (Table 1). There is evidence that the 1996 and 1997 abundance estimates were negatively impacted by a mass emigration of white sturgeon from the lower Columbia River. Tag recoveries from outside the Columbia River Basin indicate that this emigration began in 1996 and recovery data indicate that the emigrated white sturgeon returned to the lower Columbia River within a couple of years. This emigration likely biased the abundance estimate for the 1995 tag group. Mark/recapture estimators are sensitive to significant numbers of tagged fish leaving the river for extended periods of time and tend to overestimate abundance in these situations, as was the case in 1995.

The harvestable size sturgeon abundance estimate of 122,600 for the 2001 tag group is the lowest estimate since 1993 but is still well above estimates for 1989-1992. Abundance estimates for the 1999 and 2000 tag groups may have been biased low due to timing of tagging operations. In 1999 and 2000 tagging operations occurred primarily during the months of May and June while previous tagging efforts occurred during May through August. Abundance estimates based on fish tagged during June through August tend to fluctuate significantly from year to year. During 1999 and 2000,

tagging in July and August was dropped to reduce variability and produce more precise abundance estimates. Abundance estimates based on May and June tag groups are typically lower than estimates based on July and August tag groups. Additionally, the May and July tag groups may have over emphasized the estuary component of the population so that only a portion of the total population was estimated.

Tagging operations in 2001 were expanded in both time and area to address this bias. Sturgeon were tagged in May, June, and July of 2001 and tagging operations were expanded to include areas outside of the estuary. For the 2001 tag group, abundance estimates for legal size fish were 122,000 based on the May tag group, 121,200 based on the June tag group, and 124,500 based on the July tag group. Tagging operations were conducted in 2002 and 2003; however, analysis recoveries for the 2002 tag group was not completed at the time this report was written and tag recoveries to date for the 2003 tag group are not adequate for abundance estimation purposes.

The unexpected population decline led researchers to re-examine data on white sturgeon growth rates; especially since eulachon, an important food resource for sturgeon, experienced exceptionally low returns during the same period. The analysis indicated that white sturgeon growth slowed by more than half from 1994 to 1995 and a decline of this magnitude profoundly effects modeled projected population growth and associated optimum sustained yield (OSY) harvest rates. White sturgeon growth rates have since gradually returned to normal levels.

The number of sturgeon kept per rod in the sport fishery also declined by an average of four to five percent per year from 1995 through 2000; however, catch rates increased beginning in 2001 which suggested that the decline in legal size white sturgeon abundance has slowed or stopped. Sport catch rates in 2002 were at record high levels with an average of 0.246 sturgeon kept per rod, which exceeded the previous modern (since adoption of the two fish bag limit and 40" minimum size limit in 1989) record high catch rates of 0.236 in 1995 and 0.238 in 1996. During 2001-2003 catch rates ranged between 0.223-0.246 sturgeon kept per rod as compared to 1997-2000 when catch rates ranged between 0.190-0.207 sturgeon kept per rod.

Management efforts to increase abundance in the legal-sized population appear to have been effective. Prior to 2001, a significant portion of the catch consisted of fish recruiting into the legal size slot during that year as compared to 2001 and 2002 which had a greater portion of the catch already within the legal size slot at the beginning of the season. This change in the catch composition implies that abundance of the legal-sized population is increasing. The processing of 2002 and 2003 tag information will allow managers to confirm the trend.

Fishery Management Actions

Sturgeon management began in the late 1800's when excessive harvest levels caused the Columbia River white sturgeon population to collapse. Fishery management focused on the commercial fishery during the early 1900's and expanded to encompass sport fisheries beginning in 1940. Regulations for sport and commercial fisheries became increasingly restrictive and complex as the popularity of sturgeon as a target species increased for both fisheries. Current management actions are based on Joint State Agreements that were initiated in 1997.

Past Management Actions

Sturgeon management actions were initiated in 1899 with the adoption of a 4-foot minimum size limit for commercially landed sturgeon. During 1899-1908 commercial sales of sturgeon was prohibited entirely and beginning in 1909 commercial sturgeon sales were allowed during salmon seasons only. Between 1940 and 1989 fishery management actions primarily consisted of modifying

catch limits for the sport fishery and legal size restrictions for sport and commercial fisheries. Most notable was the adoption of a 6-foot maximum size limit regulation in 1950. The purpose of the maximum size limit restriction was to protect broodstock and aid recovery of the Columbia River white sturgeon population that had collapsed near the end of the 19th century. Additionally, commercial sturgeon setline seasons were established in 1975 only to be replaced by target sturgeon gillnet seasons beginning in 1983. In 1989 target sturgeon gillnet seasons were also eliminated.

Since 1989, lower Columbia white sturgeon fisheries have been managed for OSY. This management target is modeled to optimize harvest while allowing for the rebuilding of the lower Columbia River white sturgeon population to achieve the goal of 2,500 white sturgeon annually recruiting to age 26 when the population reaches equilibrium. Significant management actions taken during 1985-1996 to restrict catch rates within OSY limits included: 1) increasing the minimum size limit in recreational fisheries, 2) reducing the maximum size limit in all fisheries, 3) reducing daily and annual catch limits for recreational fisheries, and 4) adopting catch guidelines for commercial fisheries.

In 1985, sport regulations allowed for a daily catch limit of three fish between 36 and 72 inches with no annual catch limit. By 1996 sport regulations allowed for a daily catch limit of one fish between 42 and 66 inches with a 10 fish annual catch limit in effect. Sport catches had dropped from a peak of 62,400 in 1987 to a low 17,300 in 1990 due in large part to these angling regulation changes. During 1992-1996 sport catches ranged between 33,500 and 45,100 in response to a rebounding population and continued regulation changes. Coincidentally, commercial catches dropped from a peak of 11,600 in 1986 to a low of 3,800 in 1991 due to reductions in fishing opportunities (Tables 2-4). Catch guidelines were adopted for commercial fisheries which limited catch to 6,000 white sturgeon during 1993 and 1994 and 8,000 white sturgeon during 1995 and 1996 (Table 3). These regulation changes culminated in a Joint State Management Agreement concerning lower Columbia River white sturgeon which was intended to guide Columbia River sturgeon management for future years.

Joint State White Sturgeon Management Agreements

The first Joint State Agreement was adopted in October 1996 when the Directors of the Oregon Department of Fish and Wildlife (ODFW) and the Washington Department of Fish and Wildlife (WDFW) signed a management plan titled "The Olympia Accord on Columbia River Sturgeon Fishery Management". This plan contained a variety of fishery regulations including: 1) size limits for recreational and commercial fisheries, 2) daily and annual catch limits for recreational anglers, 3) gear restrictions for recreational fisheries, and 4) the allowance of target sturgeon seasons in the commercial fishery. The cornerstone of this plan was the adoption of a three-year average harvestable number, which was intended to ensure that fisheries impacts did not exceed OSY limits. This harvestable number was further allocated 80% for recreational fisheries and 20% for commercial fisheries. Other fishery management actions enacted in conjunction with the newly adopted Olympia Accord included a 9¾-inch maximum mesh size restriction to reduce handle of oversize sturgeon in commercial fisheries and a 9-inch minimum mesh size restriction for all commercial target sturgeon fisheries to minimize handle of non-target species. The tenets of the plan also allowed for modifications to the Olympia Accord if new information suggested that a change was warranted. During the spring of 1999, abundance estimates for the 1996 and 1997 tag groups were less than expected. Based on this new information the harvestable number was subsequently reduced from 67,300 to 50,000 beginning with 1999 fisheries; however, the 80% sport /20% commercial allocation remained unchanged.

In February 2000 the Directors of ODFW and WDFW agreed to extend the Joint State Agreement for an additional three-year period, 2000-2002. Major tenets included in the original Olympia

Accord remained intact and the harvestable number and sport/commercial allocation remained unchanged from 1999 levels. Prior to initiation of the 2002 season, a preliminary abundance estimate was available for the 2000 tag group and the estimate did not increase as expected. Fishery managers considered reducing the total harvestable number for 2002; however, sport and commercial fisheries occurring in 2001 exhibited significantly improved catch rates over 1997-2000 and abundance estimates for 1999 and 2000 were biased low due to tagging operations (times and areas fished) in place during those years. With this contradictory information on the trend in abundance, no 2001 abundance estimate available, and 2002 as the final year of the 3-year agreement, fishery managers chose not to modify the harvestable number or the 80% sport/20% commercial allocation for 2002.

In December of 2002 the ODFW and WDFW readopted the Joint State Agreement for a third consecutive 3-year period, 2003-2005. The abundance estimate for the 2001 tag group was completed prior to extending the agreement. The 2001 tag group continued a trend of declining abundance estimates; therefore, the harvestable number set forth in the Joint State Agreement was reduced from 50,000 to 40,000. The 80%/20% sport/commercial allocation remained unchanged, which resulted in catch guidelines of 32,000 for sport fisheries and 8,000 for commercial fisheries. Other tenets of the Joint State Agreement remained unchanged from previous agreements.

Major Tenets of the Joint State Agreement on Columbia River Sturgeon Fishery Management

- ✓ **3-year plan extended through 2003-2005**
- ✓ Management based on optimum sustained yield approach.
- ✓ Plan can be modified in-season if new information suggests a change is warranted.

White Sturgeon

- ✓ **Absent significant update, annual harvestable number averages 40,000 for the 3-year period.**
- ✓ **Allocation for fisheries in the lower Columbia River are 20% commercial and 80% sport.**
  - ➢ **8,000 for commercial fisheries**
  - ➢ **32,000 for recreational fisheries**
- ✓ Commercial target seasons allowed as necessary to access allocation and maximize economic benefit consistent with conservation objectives for other species
- ✓ Commercial size limit is 48-60 inches.
- ✓ Recreational size limit is 42-60 inches with one per day and ten per year catch limits plus barbless hooks are required.

Green Sturgeon

- ✓ Green sturgeon-only commercial seasons are not allowed but they may be taken concurrently during white sturgeon seasons provided the green sturgeon catch rate does not exceed harvest rates observed in past fisheries.
- ✓ Commercial size limit is 48-66 inches.
- ✓ Recreational regulations are the same as those for white sturgeon.

Recent Management Actions

Since adoption of the initial Joint State Agreement in 1996 the white sturgeon harvestable number has decreased from 67,300 during 1996-1997 to 50,000 during 1998-2002 to 40,000 in 2003. The declining harvestable number has created a need for increased fishery management restrictions for both sport and commercial fisheries. Deciding on the appropriate methods of restricting fisheries has been a continuous process and has resulted in fishery management protocols being developed for both sport and commercial fisheries.

Sport fishery management required sturgeon retention prohibitions in 1995 and again in 2002. With the sport white sturgeon catch guideline being reduced from 40,000 to 32,000 in 2003 it was

expected that additional retention restrictions would be required in 2003. Public meetings were held and sport sturgeon regulations were considered at several OFWC and WFWC meetings; however consensus could not be reached regarding specific seasons for 2003-2005. The OFWC and WFWC did however reach consensus on sport fishery objectives that are intended to guide season development for 2003-2005. In addition to management objectives the OFWC and the WFWC also considered allocation of the sport fishery catch guideline between the areas downstream (estuary) and upstream (non-estuary) of the Wauna powerlines. Ultimately, the Directors of ODFW and WDFW reached agreement regarding sturgeon allocation for sport fisheries in the lower Columbia River.

Protocol for Regulations Regarding White Sturgeon Retention in Sport Fisheries During 2003-2005.

Fishery Objectives

- ✓ Minimize emergency inseason action.
- ✓ Balance catch between estuary and non-estuary and maintain diverse sport fishing opportunities.
- ✓ Maintain fishery monitoring and management capabilities.

Catch Guideline and Allocation

- ✓ Manage sport fisheries for a 30,000 catch to provide a management buffer, provide management flexibility, and reduce need for inseason emergency actions.
- ✓ Allocate the 30,000 catch guideline 60% (18,000 fish) for fisheries below the Wauna powerlines and 40% (12,000 fish) for fisheries above the Wauna powerlines.
- ✓ Retention restrictions include Youngs Bay and the Willamette River upstream to Willamette Falls.

The reduced commercial catch guideline also required additional restrictions on commercial fisheries in 2003 to ensure that landings did not exceed the 8,000 white sturgeon catch guideline. Public meetings were held on December 2, 2002 and January 23, 2003 to discuss issues regarding white sturgeon retention during 2003-2005 commercial fisheries. Additionally, a commercial white sturgeon retention and fishery protocol was considered at the December 18, 2002 Compact hearing. Based on the results of the public meetings and instructions received from the Compact the Joint Staff developed a white sturgeon fishery proposal and commercial white sturgeon retention protocol for consideration at the February 6, 2003 Compact hearing. At the February 6, 2003 hearing the Compact adopted a protocol for sturgeon fishery management as described below.

Protocol For Management of White Sturgeon Retention in Commercial Fisheries During 2003-2005.

- ✓ Fisheries should be managed for white sturgeon catch expectations of 2,000 for the winter-summer timeframe (January-July), 2,000 for the early fall timeframe (August), and 3,600 for the late fall timeframe (September-October).
- ✓ Landings during SAFE fisheries are not to exceed 400 white sturgeon for the entire year with winter/spring/summer fisheries not to exceed 300.
- ✓ Allow some level of incidental sturgeon harvest to occur during all target salmon seasons.
- ✓ Conduct limited target sturgeon fisheries during winter and early fall timeframes if feasible.
- ✓ Conduct target sturgeon fisheries during October if necessary to access commercial allocation.
- ✓ Adopt white sturgeon possession and landing limits if necessary to remain within season specific catch expectation or to provide white sturgeon for harvest during subsequent salmon seasons.
- ✓ Until further discussion occurs with the OFWC and the WFWC regarding sturgeon allocation among individual commercial fishers landings and possession limits will be in the form of per vessel limits and these limits will include both mainstem and Select Area fisheries.
- ✓ Joint Staff will conduct an annual post season evaluation of white sturgeon with industry.

Catch of white sturgeon in Select Areas is included in the annual commercial allocation of the harvestable number. Past management practices regarding white sturgeon catch in Select Areas have varied and were developed in consultation with participants of the Select Area commercial fisheries. Prior to 1997 no catch restrictions were in place. Beginning in 1997, white sturgeon catch in Select Areas was limited to 5% of the commercial white sturgeon allocation and this limit was subsequently increased to 10% for 1998 and 1999. Sales of sturgeon were allowed in the Youngs Bay fisheries only prior to 1998 and in all Select Area fisheries thereafter. On April 12, 2000, commercial fishing industry leaders met to discuss the harvest of white sturgeon in Select Areas, as it relates to the commercial allocation, and arrived at the following consensus points:

1) Select Area fisheries should be managed as salmon directed fisheries.
2) Use of gear (mesh size) restrictions should be adopted to target salmon, not sturgeon. New gear restrictions should be phased in to limit economic impact on participating fishers.
3) Enforcement presence is encouraged to ensure compliance with gear restrictions.

The adoption of the sturgeon retention management protocol for 2003-2005 superceded previous agreements regarding Select Area fisheries and beginning in 2003 Select Area sturgeon retention was managed consistent with the adopted protocol for management or retention of white sturgeon in commercial fisheries during 2003-2005.

At the time this report was written discussions were occurring with the sport and commercial fishing industries concerning retention restrictions to be proposed for 2004. A public meeting was held on November 11, 2003 to discuss sport regulations and a public meeting is scheduled for December 11, 2003 to discuss commercial regulations for 2004. Decisions regarding retention regulations are expected to occur at the December 19, 2003 Compact hearing for commercial fisheries and the January 7, 2004 Joint State meeting for sport fisheries.

Sturgeon Fisheries

Reduced salmon fishing opportunities during the last few decades have greatly increased the popularity and importance of sturgeon for both commercial and sport fisheries. The healthy white sturgeon population allowed the commercial industry to develop stable, dependable fisheries in a time when commercial salmon fishing opportunities had been drastically reduced. Similarly, a lack of predictable, dependable salmon sport fisheries have resulted in a large increase in the popularity of sturgeon as a sport fish. In recent years reduced white sturgeon catch guidelines have impacted the stability of commercial and sport sturgeon fisheries with increased white sturgeon sport catch rates and increased commercial salmon fishing opportunities exacerbating the situation and resulting in increased complexity of adopted seasons for both fisheries.

Past Commercial Sturgeon Seasons

After the population collapsed in the late 19th century, the commercial catch of sturgeon remained very low until the mid-1940's. Catches did not exceed 5,000 fish annually until 1969 and since then have exceeded 5,000 fish annually in all years, except in 1991. Catches peaked in the late 1970's and early 1980's when annual landings ranged between 9,400 and 22,800. During the 1990's catches have ranged from a low of 3,800 in 1991 to a high of 13,900 in 1998 (Table 4).

Since the turn of the century the commercial sturgeon fishery has undergone many regulation changes beginning with a ban on sturgeon sales from 1899-1908. Beginning in 1909, regulations were liberalized to allow sturgeon sales, but only during salmon seasons. Sturgeon setline fisheries were instituted in the mid-1970's only to be phased out by the mid-1980's. Target sturgeon gillnet seasons were adopted in the mid-1980's to replace setline seasons but were subsequently eliminated

in 1989. During the 1990's the maximum size limit for white sturgeon was reduced twice from 72 inches to 66 inches in 1993 and from 66 inches to 60 inches in 1997. Annual catch guidelines were adopted beginning in 1993 and were formalized with the adoption of the Olympia Accord in 1997. Under the Olympia Accord, target sturgeon seasons were once again allowed for the purpose of providing the commercial fishery access to the commercial catch guideline while minimizing impacts on listed or depressed salmon stocks and improving market stability for white sturgeon.

Mainstem Commercial Seasons Harvesting White Sturgeon During 1997-2003 and Associated Catches.
Winter
Target sturgeon fisheries consisted of two 30-hour fishing periods per week during the 2nd week of January through mid-February in all of Zones 1-5 during 1997-2002. In 2003 only three 30-hour fishing periods (one per week) followed by one 12-hour period occurred during January. Some sturgeon catch also occurred in spring chinook fisheries adopted for the mid-February through March time frame. Landings associated with these fisheries ranged between 1,500-3,100 white sturgeon with the low in 2003.
Early August
During 1998-2001 target sturgeon fisheries occurred during the first week of August and consisted of a 12-hour fishing period below Longview Bridge. In 2002 a catch of 1,390 white sturgeon occurred during chinook seasons in early August. Landings during 2002 were limited due to the adoption of a five white sturgeon per vessel per day possession and sales limit during the first three fishing periods and prohibition of sturgeon possession and sales during the final two fishing periods. In 2003, a seven sturgeon per vessel per calendar week possession and sales limit was in place during four 12-hour chinook fishing periods which resulted in a catch of 2,170 white sturgeon. White sturgeon landings ranged between 2,500-4,700 during 1998-2001.
Late August
Target chinook seasons occurred in Area 2S or expanded Area 2S during late August. White sturgeon catch occurs during this salmon fishery and landings are typically low. In addition, a seven sturgeon per vessel per calendar week possession and sales limit was in place during 2003. White sturgeon landings during 1997-2003 ranged between 60-410 with the exception of 2001 when 1,020 white sturgeon were landed.
Late Fall
Fisheries occurred during mid-September through the end of October and included both salmon and sturgeon directed fisheries during most years. Target chinook and/or coho fisheries occurred through the late fall timeframe while target sturgeon seasons typically occurred during the last three weeks of October. Salmon seasons typically targeted on coho with chinook seasons varying depending on remaining impacts to listed species. Target sturgeon seasons were adopted in 1997-2000. Due to excessive landings earlier in the year sturgeon sales were prohibited in 2001. In 2002 a five white sturgeon per day per vessel possession and sales limit was in effect for nearly the entire late fall season except for the final 3-day fishing period when sturgeon possession and sales were prohibited. In 2003 sturgeon possession and sales limits ranging from three to nine per vessel per calendar week were in place during the entire late fall time period. Late fall season landings ranged between 3,400 and 8,100 during 1997-2003, excluding 2001.

Since the adoption of the first Joint State Sturgeon Management Agreement in 1997, commercial fisheries have been managed to remain within catch guidelines while maximizing economic benefit consistent with conservation objectives for other species. Commercial fisheries have been developed with input from industry representatives and resulted in predictable and consistent commercial fishing opportunities during 1997-2000. Landings during the winter and early August seasons in 2001 exceeded past years' (1997-2000) landings, which in combination with the reduced catch guideline of 9,100 white sturgeon, resulted in the white sturgeon catch guideline being reached in late August and sturgeon retention being prohibited thereafter (Table 3). During 2002 individual vessel possession and sales limits were adopted during early and late fall seasons in an attempt to maintain moderate weekly landings of sturgeon through the end of October. No target sturgeon seasons were adopted during the fall of 2002 with all landings occurring during salmon fishing seasons.

2003 Commercial Fishery

Commercial fisheries in 2003 were initiated with a winter target sturgeon season that consisted of three 30-hour fishing periods followed by one 12-hour fishing period occurring between January 7-28. Gear regulations included 9-inch minimum and 9¾-inch maximum mesh size restrictions to target the fishery on sturgeon and minimize handle of spring chinook and steelhead. The 2003 winter target sturgeon fishery resulted in a catch of 1,490 white sturgeon compared to the 1997-2002 average of 2,500 white sturgeon. A commercial demonstration salmon season soon followed and consisted of two 16-hour fishing periods on February 17 and 19 and one 10-hour fishing period on March 21 for the purpose of selectively harvesting hatchery-produced spring chinook. The demonstration fishery was restricted to an 8-inch minimum mesh size during the first two periods and a 4¼-inch maximum mesh size during the last period along with shortened nets and drift lengths for all three periods. The first two fishing periods also had a three sturgeon per vessel possession and sales limit during each open period. The catch of sturgeon in this fishery was low with 27 white sturgeon landed, bringing the mainstem winter season sturgeon catch total to 1,520 (Table 5).

The early fall fishery consisted of two chinook salmon/sturgeon seasons. The first season consisted of four nighttime fishing periods occurring during August 4-14 in the mainstem Columbia River below the Warrior Rock (OR)/Lewis River (WA) line. The second season occurred during August 18-28 with the first two nightime fishing periods in the mainstem Columbia River upstream of the I-5 Bridge and the last two nightime fishing periods occurring upstream of the Warrior Rock (OR)/Lewis River (WA) line. August sturgeon catch was to be managed for a catch of <2,000 white sturgeon for the purpose of reserving enough white sturgeon for other anticipated fall seasons. A seven sturgeon possession and sales limit per vessel during each calendar week was imposed during the August seasons in an attempt to remain within the 2,000 fish catch limit. An estimated 15,718 fall chinook, 310 coho, 2,585 white sturgeon, and 11 green sturgeon were landed in August mainstem seasons (Table 5).

Late fall fisheries began on September 15 and were completed on October 31. Late fall fisheries targeted chinook and hatchery-produced coho salmon while managing sturgeon catch to remain within the 8,000 white sturgeon commercial catch guideline and spread catches throughout the remainder of the fall fishing period. Sturgeon possession and sales limits (three to nine per calendar week) were continued into late fall fisheries and as a result, sturgeon retention and sale was allowed throughout the entire late fall season. Late fall fisheries generally occurred in all five commercial fishing zones with area closures in place during the first fishing period and the last fishing period to minimize impacts on wild coho and chum. Late fall fishing seasons totaled 23 fishing days and resulted in estimated landings of 42,710 fall chinook, 149,456 coho, 6 chum, 3,426 white sturgeon, and 25 green sturgeon (Table 5).

Select Area fisheries, designed to target returning salmon reared and released from net pens in off-channel areas, were conducted throughout the year. Select Area salmon target fisheries occurred in Youngs Bay during winter, spring, summer, and fall time frames; in Blind Slough during winter, spring, and fall time frames: in Tongue Point and Deep River during spring and fall time frames; and in Steamboat Slough during the fall time frame. Sturgeon sales were allowed during all winter, spring, and summer Select Area fisheries, but were dis-allowed early in the fall season (beginning September 9) when the annual guideline of 400 white sturgeon was met with an estimated 423 white sturgeon and one green sturgeon landed (Table 3).

An estimated 7,951 white sturgeon were landed in the combined mainstem and Select Area commercial fisheries in 2003, which is slightly less than the commercial catch guideline of 8,000 white sturgeon (Table 3). Mainstem fisheries landed 95% of the white sturgeon catch or 7,530 fish while Select Area fisheries landed 5% of the white sturgeon catch or 420 fish. An estimated 37 green sturgeon were landed during fall fisheries in 2003, with one from Tongue Point, 11 from the

August mainstem fishery, and 25 from the late fall mainstem fishery. Commercial fisheries occurring in the mainstem Columbia River and associated sturgeon catches are summarized below.

2003 Recreational Fishery

A year-round sturgeon sport fishery on the lower Columbia River in 2003 was expected to result in a retained catch of up to 50,000 white sturgeon from as many as 250,000 angler trips which would exceed the 2003-2005 annual white sturgeon sport catch guideline of 32,000 fish. This catch guideline is part of the sport fishery management protocol described in the "Recent Management Actions" section of this report. The Management protocol also includes inseason area catch allocations of 18,000 for below Wauna, 12,000 for above Wauna, and 2,000 for a management buffer. During late fall of 2002 and early winter of 2003, the Joint Staff met with sport fishing industry representatives to craft fishery proposals for 2003. The Oregon and Washington Joint Sturgeon Staff developed options to manage the fishery for a catch of 30,000, not to exceed 32,000 fish. These sport fishery options were considered at the February 6, 2003 Joint State meeting when the states adopted sport sturgeon fishing regulations for 2003. The regulations prohibited sturgeon retention in the Columbia River downstream of the Wauna powerlines (RM 40) during July 10-September 30, and upstream of the Wauna powerlines during March 24-June 30. A 2,000-fish management buffer was not allocated to estuary or non-estuary fisheries but was kept in reserve to allow for orderly management changes as necessary to prevent exceeding the 32,000 fish catch guideline.

The sport sturgeon fishery initially began as expected with a moderate catch of 4,338 white sturgeon above Wauna prior to the March 24 retention prohibition and a very small catch of 73 white sturgeon below Wauna prior to May when the estuary fishery intensifies. The May estuary catch totaled 4,101, which was the highest catch for May since 1998, and by early June it became apparent that the fishery below Wauna would exceed the catch expectation of 18,000 well before July 10. On June 20 at a Joint State sport meeting, the states prohibited the retention of sturgeon below Wauna effective June 28. The cumulative catch for the fishery below Wauna for January 1 through June 27 was 18,367 white sturgeon from 46,568 angler trips, slightly exceeding the 18,000 fish inseason area catch allocation.

The sport sturgeon season above Wauna reopened to the retention of sturgeon on July 1 and through August 31 an additional 2,473 white sturgeon were caught and retained. During September catch rates increased significantly in the Gorge area, especially for bank anglers. The sturgeon catch for September totaled 3,112, which was three times the expected catch for the month. With gorge catch rates expected to remain strong into October, managers prohibited the retention of sturgeon above Wauna effective November 1 through December 31. The preliminary total catch for the area above Wauna was 13,565 white sturgeon from 96,296 angler trips.

Also, managers did not reopen the fishery below Wauna on October 1 as previously scheduled. The ongoing retention prohibition was extended through December 31 because the 18,000 fish guideline was taken during the summer fishery. The preliminary total catch estimate for the Columbia River below Bonneville Dam in 2003 was 31,932 white sturgeon (compared to the 32,000 annual catch limit) and 52 green sturgeon from 142,864 angler trips (Table 2).

Size Components of Catch and Harvest Shares

The 2003 sport catch in legal foot length groups is projected to be 66% (21,000 fish) in the 3-4 foot size class (42-inch minimum allowable size) and 33% (10,900 fish) in the 4-5 foot size class, as compared to the 1997-2002 averages of 78% and 22%, respectively (Table 6). The 4-5 foot size class comprising 33% of total catch is the largest percentage on record and is a 50% increase over the recent 6-year average. In addition the 10,900 4-5 foot sturgeon catch is the second highest on

record, exceeded only by the 1996 catch of 11,400. As has been the case since 1997, all commercial harvest of white sturgeon in 2003 was within the 4-5 foot size class due to size limit regulations.

The Joint State Agreement sets forth a harvestable number that is allocated 80% for sport fisheries and 20% for commercial fisheries. The harvestable number of 67,300, in effect during 1997 and 1998, was allocated 55,840 for sport fisheries and 13,460 for commercial fisheries. Sport fisheries during 1997 and 1998 were managed to maintain a year round retention fishery through reduced daily and annual catch limits; therefore, catches during these years did not reach the catch guideline. During these same years the commercial fishery did reach its catch guideline and sharing percentages averaged 75% sport and 25% commercial. The harvestable number was reduced to 50,000 in 1999 but the sport/commercial allocation remained unchanged which resulted in a 40,000 catch guideline for sport fisheries and a 10,000 catch guideline for commercial fisheries. In 2003 the harvestable number was reduced to 40,000, and as was the case in 1999-2002, the sport/commercial allocation remained unchanged. Fishery specific catch guidelines are 32,000 for sport fisheries and 8,000 for commercial fisheries. Sport fisheries were able to maintain a year-round retention fishery in 1999 but not during 2000-2003. Since 1999 sport and commercial fishery catch guidelines have been reached each year and sport and commercial shares have averaged 80% and 20%, respectively. During the seven years (1997-2003) of management under Joint State agreements, harvest shares have averaged 79% sport and 21% commercial (Table 4).

2004 Non-Indian Sturgeon Fisheries Recommendations

Commercial Fisheries

Due to the ongoing negotiations regarding the commercial sturgeon retention protocol the Joint Staff had not developed a commercial winter season target sturgeon fishery proposal for 2004 at the time this report was written. The currently adopted commercial sturgeon retention protocol allocated 2,000 white sturgeon to winter fisheries which includes landings during spring chinook fisheries occurring in February and March. During 1999-2002 the winter season consisted of two 30-hour periods per week from the second week of January through mid-February; however, landings in those fisheries generally exceeded 2,000 white sturgeon. The 2003 white sturgeon season was completed on January 28 with a catch of 1,500 white sturgeon. In accordance with the commercial white sturgeon retention protocol a post-season meeting will occur on December 11, 2003 to evaluate the currently adopted protocol and develop a white sturgeon fishing plan for 2004. Based on the results of this meeting the Joint Staff will provide a season recommendation and/or modifications to the currently adopted commercial sturgeon retention protocol for consideration at the December 19 Compact hearing.

Sport Fisheries

The management strategy adopted for 2003 sport fisheries was the result of negotiations between the Directors of the Oregon and Washington Departments of Fish and Wildlife. The retention restrictions resulting from these negotiations were in effect for 2003 only. Discussions regarding sport retention restrictions for 2004-2005 are ongoing; therefore, the Joint Staff has not developed proposals for the 2004 sport fishery at this time. The Joint Staff will propose sport fishery recommendations at the January 7, 2004 Joint State meeting. Fishery recommendations will be consistent with the aforementioned results of negotiations concerning 2004 sport fishery retention restrictions and fishery management objectives and catch allocations adopted by the Oregon and Washington Fish and Wildlife Commissions and the Directors of the Oregon and Washington Departments of Fish and Wildlife.

STURGEON MANAGEMENT AND FISHERIES UPSTREAM FROM BONNEVILLE DAM

Fisheries and Gear

Sturgeon fisheries between Bonneville and McNary dams (Zone 6) consist of treaty Indian commercial and subsistence fisheries and non-Indian sport fisheries. Non-Indian fishing is restricted to hook and line sport fishing only, while Treaty Indian commercial fishing is conducted with three types of gear: hook and line, setlines, and gill nets. Treaty Indian fishers may take sturgeon for subsistence purposes year-round.

Each year the Columbia River Compact and the tribes set specific seasons for commercial setline and gillnet fisheries. Setline seasons are considered target sturgeon fisheries, while gillnet seasons are usually set to target on salmon or steelhead. Although gillnet seasons typically target salmonids, in recent years the winter gillnet season has shifted to a target sturgeon season due to poor prices for steelhead. Treaty Indian subsistence seasons are open the entire year, as were sport seasons prior to 1994. Since 1994 the sturgeon sport fishery has been managed under a quota, and once the quota is reached catch-and-release regulations go into effect for the balance of the year.

Stock Status

The healthy white sturgeon population in the lower Columbia River historically ranged into Zone 6 waters; however, with the construction of Bonneville Dam in 1938 the population became segregated and fish residing above Bonneville Dam were no longer able to migrate between freshwater and marine environments. The population became further segregated with the completion of McNary Dam in 1953, The Dalles Dam in 1957, and John Day Dam in 1968 and separate populations now exist in Bonneville, The Dalles, and John Day pools. Inaccessibility to the marine environment and habitat alterations, primarily due to hydroelectric development, have rendered these populations less productive than those residing below Bonneville Dam.

Abundance of white sturgeon populations in the three Zone 6 reservoirs is estimated every three to five years to monitor the effects of hydro-system mitigation activities and OSY harvest strategies. Mark-recapture population estimates are derived using directed sampling with gill nets and set lines. Significant harvest reductions were enacted beginning in 1988 and populations in all three reservoirs increased as a result of reduced catch and other mitigation efforts. The most recent assessments conducted estimated the abundance of 3-6 foot sturgeon to be 39,700 in Bonneville Reservoir, 15,250 in The Dalles Reservoir, and 13,900 in John Day Reservoir (Table 7).

Past Seasons, Landings, and Management

Commercial white sturgeon catch in the Zone 6 management area increased significantly from a catch of only 600 fish in 1977 to a catch of 11,100 in 1987. Coincidentally sport catches also peaked in 1987 with an estimated 6,700 white sturgeon kept (Table 8). Concern over increasing catch rates and declining white sturgeon abundance prompted representatives from Oregon, Washington, and the Columbia River treaty Indian tribes (Nez Perce, Umatilla, Warm Springs, and Yakama) to form the Sturgeon Management Task Force (Task Force) in 1987. The purpose of the Task Force is to review the status of sturgeon and provide harvest management recommendations for fisheries occurring in the Zone 6 management area. The Task Force's initial action was to recommend that treaty Indian seasons be shortened and the minimum size limit in the sport fishery be increased. The Task Force's recommendations were adopted and took effect in 1988.

Beginning in 1988 treaty Indian setline seasons were reduced from 10 months to four months and sturgeon sales were generally limited to winter seasons, as per the Task Force's recommendations. Sport fishery regulation modifications included a two fish daily catch limit and 40-72 inch size limit restrictions, which combined to reduce sport catch by 40%. Since 1991 Task Force recommended catch guidelines have been adopted for treaty Indian commercial fisheries and recreational fisheries in the Zone 6 management area. During 1991-1996, catch guidelines of 1,250 for Bonneville Pool, 300 for The Dalles Pool, and 100 for John Day Pool were in effect for treaty Indian commercial fisheries while Zone 6 recreational fisheries operated under catch guidelines of 1,350 in Bonneville Reservoir, 100 in The Dalles Reservoir, and 100 in John Day Reservoir (Table 9).

During 1991-1996 the management intent for Zone 6 was to limit harvest rates of 3-6 foot sturgeon in all fisheries to 15% in Bonneville Pool and 10% each in The Dalles and John Day pools. Fishery plans included providing treaty Indian subsistence catch accountability and limiting sturgeon sales in fisheries to levels consistent with the intended harvest rate reduction plan. Retention of sturgeon in Zone 6 sport fisheries was prohibited for the first time on September 16, 1994, after catch was projected to exceed Task Force guidelines. Sport fishery retention closures have been enacted every year since the first closure in 1994 (Table 10). Sport anglers may continue to fish for sturgeon and release them unharmed when catch guidelines are reached and retention is prohibited.

Guidelines are based on OSY harvest rates and current stock assessments. In March of 1997, the Task Force agreed to pool-specific management with catch guidelines, based on OSY, that are designed to allow for adequate survival of juvenile sturgeon through fisheries to increase the number of harvestable and broodstock fish. At this time the states and tribes reassessed the status of Zone 6 sturgeon stocks and modeled new minimum and maximum size limits for OSY management. Based on these analyses, the states and tribes elected to reduce the maximum size limit in all Zone 6 sturgeon fisheries to 60 inches in order to realize a larger catch; consequently, new OSY harvest guidelines were established. New catch guidelines were 1,300 in Bonneville Pool, 400 in The Dalles Pool, and 1,160 in John Day Pool for treaty Indian commercial fisheries and 1,520 in Bonneville Pool, 200 in The Dalles Pool, and 560 in John Day Pool for sport fisheries. Additional data concerning The Dalles Pool sturgeon population prompted adoption of increased catch guidelines of 1,000-1,200 for treaty Indian commercial and 600-800 for sport fisheries during 1998-2000. In 2001 guidelines for The Dalles Pool were reevaluated and the Task Force agreed to use the midpoint of the ranges that were in effect during 1998-2000. Based on the 2001 abundance estimate, the guidelines for John Day Pool were reduced to 335 for treaty Indian commercial and 165 for sport fisheries beginning in 2002 and based on the 2002 abundance estimate, the guidelines for The Dalles Pool were reduced to 900 for treaty Indian commercial and 400 for sport fisheries beginning in 2003. Overall Zone 6 allocation adjustments were made in response to the change in The Dalles Pool catch guidelines, which resulted in new guidelines for Bonneville Pool of 1,200 for treaty Indian commercial and 1,700 for sport fisheries beginning in 2003 (Table 8). Current sturgeon size limits are 48-60" in all treaty Indian fisheries, 48-60" in sport fisheries in The Dalles and John Day pools, and 42-60" in Bonneville Pool sport fisheries.

Allocation is approximately 50:50 between sport and tribal fisheries, although reservoir-specific guidelines are shaped to meet fishery demands. For instance, the sport fishery is allowed a greater share of the Bonneville Pool catch while the treaty Indian fishery is allowed a greater share of the catch in The Dalles and John Day pools. Treaty Indian fishers may continue to take sturgeon for subsistence purposes after commercial seasons have been completed and this catch is not included in the aforementioned commercial catch guidelines. Subsistence catch is estimated through a monitoring program conducted by the Yakama Nation and for the past decade catch has averaged 420 sturgeon annually.

2003 Sturgeon Fisheries

During 2003, Zone 6 commercial and sport fisheries were managed in accordance with catch guidelines set forth by the Task Force (Table 9). As has been the case since 1997, the Columbia River tribes adopted 48-60 inch size limit restrictions for all sturgeon fisheries occurring in 2003. Fisheries occurring in Zone 6 in 2003 included treaty ceremonial and subsistence (C & S), treaty Indian commercial setline and gillnet, and non-Indian sport fisheries. Through November 3, a total of 1,521 white sturgeon have been landed in treaty Indian commercial fisheries and 2,137 white sturgeon have been kept in non-Indian sport fisheries (Table 8).

2003 Setline Fisheries

The treaty Indian winter setline fishery was open from January 1-31 in all three reservoirs and produced a total catch of 20 white sturgeon, which was double the 2002 catch, but still less than recent years. By the completion of the winter commercial gillnet season, the sturgeon catch guideline was reached in The Dalles Pool, but not in the other two pools. Additional summer setline seasons were adopted for Bonneville and John Day pools during June 9 – July 11 and July 22 - August 23 with landings totaling 73 in the Bonneville Pool and 54 in John Day Pool (Table 11).

Following the completion of fall salmon fishing seasons, the catch guidelines for Bonneville and John Day pools had not been met; therefore, a commercial setline season was adopted for October 13 until the attainment of pool specific guidelines for Bonneville and John Day pools. Through November 3 an estimated 25 white sturgeon have been landed in Bonneville Pool and 10 in John Day Pool. Based on current catch rates the catch guidelines for these pools will not be reached prior to the end of the year (Table 12).

2003 Gillnet Fishery

The treaty Indian winter season commercial fishery was open during February 1 through March 21 and produced white sturgeon landings of 271 in Bonneville Pool, 866 in The Dalles Pool, and 202 in John Day Pool. The catch guideline for The Dalles Pool was reduced in 2003 from 1,100 to 900 which resulted in the guideline being reached by the end of the winter season (Table 12). Sales of sturgeon caught during fall gillnet commercial fisheries were not allowed in 2003, as has been the case since 1990. Landings for the Bonneville Pool through November 20 totaled 398 as compared to the 1,200 fish catch guideline. Even with the recently adopted commercial setline fishery in effect the 1,200 fish catch guideline would not be met; therefore, an additional commercial gillnet fishing season was adopted for Bonneville Pool from 6 AM December 1 through 6 PM December 14. The catch estimate for this 14-day fishery is 300 fish.

2003 Subsistence Fishery

Treaty Indian subsistence sturgeon fishing is open year-round, with small sanctuary closures around dams. Subsistence fishery catch in 2003 was 325 white sturgeon (Table 8).

2003 Sport Fishery

Sport retention seasons for each Zone 6 reservoir began January 1 and remained open until Task Force catch guidelines were projected to be reached. In 2003 the Task Force catch guideline was decreased from 700 to 400 in The Dalles Pool. Catch guidelines were reached in The Dalles Pool on June 21, in Bonneville Pool on July 7, and in the John Day Pool on July 28 with catches of 432, 1,542, and 163, respectively (Table 9). In 2003 retention was prohibited in The Dalles Pool effective June 21 which was three weeks earlier than in 2002 (July 12) but was similar to 1998-2000 (June 8-19). Retention was prohibited in Bonneville Pool for nearly six months in 2003, as compared to

2002 (2 months), 2001 (4½ months), and 1995-2000 (8-9 months). The John Day Pool retention fishery occurred year-round during 1999-2001, for eight months in 2002, and for seven months in 2003.

2004 Treaty Indian Sturgeon Fisheries Recommendations

As per permanent regulations, treaty Indian commercial setline seasons are scheduled to begin January 1, 2004 and to end January 31, 2004. The Task Force is expected to meet in January to review 2003 harvests and agree to management options for 2004, including catch guidelines.

SMELT MANAGEMENT AND FISHERIES

Stock Status

Smelt, less commonly known as eulachon, annually ascend the Columbia River to spawn in the mainstem Columbia River and its tributaries downstream of Bonneville Dam. Typically, the fish enter the Columbia River in early to mid-January, followed by tributary entry in mid to late January. Smelt annually ascend the Cowlitz River, with inconsistent runs entering the Grays, Elochoman, Lewis, Kalama, and Sandy rivers. Peak tributary abundance is usually in February, with variable abundance through March, and an occasional showing in April.

Smelt return to freshwater at 3, 4, and 5 years of age. Soon after freshwater entry, spawning occurs in the lower Columbia River Basin. The majority of the tributary spawning occurs in the Cowlitz River, but has been known to occur in Grays, Lewis, Kalama, and Sandy rivers also. Smelt are broadcast spawners preferring areas with a coarse sandy bottom. Females produce 20,000-60,000 eggs and the adults die following spawning. Eggs, which are sticky, settle to the bottom, and incubate for about 30-40 days dependent on water temperature. Young smelt larvae are about 4 mm in length and drift with the current to sea.

Columbia River Returns

The smelt fishery can be traced back to the late 1800's and landings can be used to index relative annual abundance. Commercial landings do not necessarily lend themselves to developing annual population estimates because consumer demand for the fish and adopted seasons affect the effort put forth by the fishers, which in turn affects the total landings. Fisheries are valuable however; in ascertaining the relative strength of the run from year to year. Adopted fishing seasons and effort expended by commercial fishers can also affect catch per unit effort (CPUE) data, as measured in pounds per delivery from the commercial fishery; however, this data is still valuable for describing relative variations in annual run strength. For instance, smelt returns have increased dramatically since 2000 and this has been reflected in commercial landings and CPUE data collected during 2001-2003 Tables 13-14). Commercial landings and CPUE data may also be affected by environmental conditions such as water temperature. Smelt are very sensitive to variations in water temperature, with water temperatures less that 40°F often stalling their upstream migration.

Run sizes, as indexed by commercial landings, remained relatively stable for several decades, with the exception of 1984, until landings dropped suddenly in 1993 and remained low for several years thereafter. The eruption of Mt. St. Helens severely impacted spawning in the Cowlitz River in 1980 and subsequent returns in 1984. Smelt returns in 1984 could also have been impacted by the record large El Nino event of 1982-1983. Commercial landings from 1938-1989 averaged 2.1 million pounds annually. In 1993, smelt strayed to many Washington coastal streams and bays due to cold Columbia River water temperature, as is evidenced by landings of only 500,000 pounds in the Columbia River Basin. Landings in 1994 were only 43,000 pounds and beginning in 1995, fishery

restrictions were enacted. Due to reduced seasons during 1995-2000 landings are not completely comparable with previous years; however, it is apparent that the abundance of smelt in the Columbia River Basin was much reduced during 1993-2000 (Table 13).

Although total commercial landings remained low in 2000, other abundance indices suggested a significant improvement in the smelt return for 2000. Total landings were likely artificially low due to management constraints imposed on fisheries. Other abundance indices; such as 1) improved CPUE in the commercial fishery, 2) excellent sport dipping during a portion of the season, and 3) large larval abundance over wide areas during an extended period of time all suggested that the 2000 return was significantly improved in comparison to extremely poor returns of 1994-1999. The 2001 return continued the trend of increasing abundances that began in 2000 and is the first year since 1988 in which smelt returned to the Sandy River. The 2001 return, as indexed by commercial landings and CPUE data, was the largest return since 1993. In spite of limited fishing opportunities, landings from commercial fisheries in the Columbia and Cowlitz rivers were the third largest since 1993 and the CPUE in the Columbia River commercial fishery was a record high. Commercial fisheries in the Columbia River Basin increased in 2002, as compared to 2001, but were still far less than fishing opportunities available during 1938-1994. Total landings in 2002 were the largest since 1992 and CPUE in the Columbia River commercial fishery was the third highest on record (since 1988). During low abundance years, the Columbia River commercial fishing industry lost a significant portion of their smelt markets to other fisheries. In spite of limited market availability total landings in 2003 exceeded 2002, making it the largest total since 1992. Observed CPUE's were the fifth highest on record and were 4-20 times greater than those observed during 1994-2000 (Table 14). The 2003 season was also remarkable in that smelt were commercially landed from the Sandy River for the first time since the 1980's.

Based on the poor parental returns observed in 1999-2000, the outlook for the 2004 smelt run of age 4 and 5 fish would be below average; however, good parent returns observed in 2001 would suggest a strong return of age 3 fish in 2004. These direct relationships between parent and progeny are confounded by the fact that smelt have very high fecundity rates and ocean rearing conditions are likely the overriding factor in determining stock abundance for the upcoming year, as was the case in 2001-2003. It is important to note that since 1999 ocean conditions off the Oregon and Washington coasts have been favorable for early ocean survival of juvenile smelt.

Ocean Abundance

The Pacific Decadal Oscillation (PDO) index based on North Pacific sea-surface temperature and pressure correlates with changes in northeast Pacific marine ecosystem productivity. Warm PDO eras have coincided with enhanced coastal ocean biological productivity in Alaska and inhibited productivity off the west coast of the contiguous United States, while cold PDO eras have coincided with the opposite north-south pattern of marine productivity. Pacific climate changes observed from late 1998 through 2001 indicate favorable productivity in the coastal waters where eulachon migrate. These conditions, especially during the first year of ocean residency, would improve larvae-spawner survival rates and the increased eulachon returns to the Columbia River during 2001-2003 support this hypothesis. If this relationship holds, returns during 2004 should also be strong. Warmer ocean conditions in 2002 and 2003 have probably had only modest impacts on survival of the 1999-2001 broods that comprise the 2004 run.

Recent trends in eulachon abundance also follow another measure of ocean climate, the tropical Southern Oscillation Index (SOI), denoted by El Nino and La Nina events. In 1977, the index changed from a regular oscillation of El Nino and La Nina anomalies to fairly persistent El Nino conditions continuing up through 1988. Eulachon returns were variable during this time. The period of 1990-1998 was dominated by extreme and persistent El Nino conditions and during this time

eulachon returns saw a precipitous decline. Eulachon returns to the Columbia River remained at record low levels during 1993-2000. Beginning in 1998, La Nina conditions developed and eulachon returns began increasing in 2001 in response to improved ocean rearing conditions. The sharp decline (1993-2000) and subsequent increase (2001-2003) in spawner abundance, lag the onset of persistent El Nino and La Nina conditions by about three to four years which is the dominant life cycle of eulachon.

Columbia River smelt are caught in the spring shrimp fisheries off the West Coast of Vancouver Island (WCVI); therefore, bycatch and test fishery information gathered by the Canadian Department of Fish and Oceans (CDFO) during their annual spring shrimp surveys can be used as a predictor for Columbia River returns. In comparison to 1999 the eulachon biomass indices off the WCVI increased significantly during 2000-2003. The biomass level in 2003 was the third largest since the mid 1970s which indicates that a significant number of smelt are in the ocean at this time. The estimate for Age 2+ smelt is higher than any other year except 2002, which would predict a large return of Age 3 fish in the winter of 2004 (Table 15).

Other pelagic fish such as anchovy, sardine, and herring all exhibited significant abundance increases during the past few years. Additionally, salmonid returns to the Columbia River have generally been at near record high levels during 2001-2003, which also suggests an improvement in ocean rearing conditions. The strong smelt returns to the Columbia River in 2001-2003, plus large abundances of other ocean rearing species during the same time period, suggest that smelt have recovered and a large return is likely in 2004.

Juvenile Production

Beginning in the early 1990's increased effort was expended to develop more direct measures of brood-year strength, rather than relying on landing of spawners in the commercial fishery. A smelt larval sampling program was initiated in 1994 for the Cowlitz River and was expanded to include the Kalama River in 1995, the mainstem Columbia River in 1997, and other Columbia River tributaries in 1998. Larval sampling was also conducted in the Cowlitz River in 1986 (Table 16). Larval sampling can help determine relative spawning success and when coupled with information on adult returns from sport and commercial fisheries helps provide some indication of the relative annual run strength. In past years the average larval densities at selected index sites have been used as a measure of relative brood strength. Years of high larval densities, such as 2000-2001, should correspond with good returns 3 to 4 years later; however, this is not always the case, especially in years when ocean rearing conditions change significantly. For example, the larval densities in 1999 were low relative to other years, yet returns in 2002 and 2003 were large.

In past years larval sampling techniques did not include multiple passes which could result in the data collected not accurately reflecting the overall abundance or peak out-migration. Beginning in 2003, multiple passes over the out-migration season were conducted at the Price Island and Clifton Channel sites, which will provide the data necessary to identify the peak out-migration as well as the duration of the 2003 out-migration from the bulk of the production areas. This new approach will be repeated in the coming years, providing the data necessary to develop a more meaningful method of comparing annual brood-year run strengths and possibly impacting comparison with past years data. Larval sampling may continue in the tributaries, but only to verify production. Improved larval density data need to be analyzed in conjunction with ocean climate condition data to improve the accuracy of abundance forecasts for future years. Unfortunately, the larval sampling program was not initiated until the runs had declined and therefore it is difficult to correlate larval catch rates to relative run strength, as indexed by commercial landings and CPUE's, at this time. With increased run sizes and fisheries occurring in recent years the additional years of data collected may help define this relationship.

Fishery Management Actions

Prior to 1995 only minor regulation changes were adopted for Columbia River commercial and sport smelt fishing seasons. During 1960-1977 commercial smelt fisheries were open year round 3½ days per week, except for 1965 and 1966 when the season was expanded to 4½ days per week. Beginning in 1978 the commercial season was expanded to seven days per week. Prior to 1986 the season was open the entire year but beginning in 1986 the season was reduced to the December-March time frame to better reflect the run timing of Columbia River smelt. Prior to 1997 the sport fishery was open seven days per week the entire year.

Past Management Actions

As Columbia River smelt abundance began to decline during the early 1990's, fishery managers recognized the need to restrict fisheries to increase escapement to spawning areas. Lower Columbia River mainstem and tributary commercial fisheries were greatly reduced during the late 1990's, with 1995 being the first year of these restrictive fisheries. During 1995 and 1996, commercial fisheries were restricted to fewer fishing days per week, but the season extended through the end of March. During 1997-2000, commercial fisheries were further reduced to test fisheries, which ended in mid to late February. These test fisheries were intended to allow minimal smelt catch to provide fishery managers with data necessary to assess the annual run strength and provide an opportunity to sample catch for biological data. Seasons during these test fisheries were severely restricted in both days per week fished and duration of the fishing season. Sport fisheries in Washington tributaries were closed early during 1997, 1998, and 1999 in response to continued poor smelt returns to the Columbia River. Both commercial and sport fisheries were extended into late February during 2000 in response to a larger than expected return (Table 17 and 18).

Seasons were liberalized in 2001 when a strong return of smelt was observed for the first time since 1993. In 2001 both sport and commercial fisheries were extended through the end of March for the first time since 1996; however, the number of days open was again limited to one to two days per week for the purpose of assessing abundance. The trend of increasing abundance continued and fishing opportunities were expanded again in 2002 in response to the increased abundance. In 2002 the commercial fishery was expanded from two days per week in January to three days per week in February and March. Similarly, the 2002 Washington tributary sport fisheries were two days per week during January through late February and seven days per week thereafter with all Washington tributaries open during January through March. With extremely large returns expected in 2003 the commercial fishery expanded to four days per week during January-March and the sport fishery in Washington tributaries expanded to seven day per week during January-March. Fisheries were consistent with Level Three fisheries prescribed in the Joint State Eulachon Management Plan and season lengths were the maximum allowed under the Joint State plan.

The Oregon and Washington Joint State's smelt management and stock assessment activities include commercial landings accounting, on-board monitoring of commercial fisheries, sampling of catch for biological data and age structure, and indexing larval production. The commercial fishery monitoring program was initiated in 1997 and focuses primarily on the lower Columbia River commercial fishery. Data gathered during catch sampling and fishery monitoring includes daily landings, CPUE, length, weight, sex, and otolith collection and allows for analysis of catch trends by time and area, run timing trends, and sex and age composition through time. Otoliths have been collected annually since 1987 and aging of the entire collection will allow for better understanding of the population dynamics of Columbia River smelt and possible development of parent/recruit relationships. These data work in conjunction to provide managers with tools to monitor annual abundance and stock status.

Joint State Eulachon Management Plan

Beginning in 1999 the Washington and Oregon Departments of Fish and Wildlife began work on a Joint State Eulachon Management Plan to guide all aspects of smelt management for future years. During 1999, WDFW and ODFW developed an interim Eulachon Management Plan to guide fishery management decisions in the year 2000 because a draft plan had not been completed prior to adoption of sport and commercial fishing seasons for that year. The interim plan included recommended fishery restrictions for the year 2000 and was adopted by the Columbia River Compact at a hearing in mid-December. Fisheries adopted during 2000 were consistent with the interim Eulachon Management Plan.

The WDFW, with input from ODFW, has completed a eulachon management plan which contains recommended policies concerning smelt fishery management. These policies are considered wise-use management precepts that are consistent with the need to maintain an ecosystem approach to resource decisions. The ecological importance of eulachon is underscored in much of the body of research in the Northeast Pacific ecosystem and should be the fundamental consideration when making fishery management decisions affecting the health of this resource.

Policy Recommendations for Eulachon Conservation and Fishery Management From the Joint State Eulachon Management Plan

Conservation Policy

- ✓ Maintain healthy populations of eulachon while assuring the integrity of the ecosystem and habitat upon which they depend.
- ✓ Management actions will consider the role of eulachon in both the marine and freshwater ecosystems and the need to maintain sufficient populations of eulachon for proper ecosystem functioning.
- ✓ A precautionary approach to resource management shall be utilized.
- ✓ Consider the best scientific information available and strive to improve the information base for eulachon.

Fishery Management Recommendations

- ✓ Maintain commercial and recreational fishing opportunity in the lower Columbia River, to include opportunities in both mainstem and tributaries for both fleets.

The management plan includes recommendations concerning fisheries occurring in the mainstem Columbia River and its tributaries below Bonneville Dam. Fishery recommendations have been separated into three separate levels depending on expected run size with run size expectations being based on: 1) parental run strength as indexed by fishery landings, 2) juvenile production as indicated by larval sampling, and 3) estimates of ocean productivity. Columbia River smelt fishing seasons have been adopted in accordance with the Joint State Eulachon Management Plan since 2001.

Excerpts From the Joint State Eulachon Management Plan Describing Fisheries Recommended at Varying Run Size Expectations.
Level One Fisheries
Level One fisheries are recommended when there is great uncertainty in run strength or indications for a poor return. Level One fisheries would be the most conservative , similar to those adopted in 1997-2000, and should be scheduled to effect a harvest rate of 10% or less. Data obtained from these fisheries should give us a better index of run strength and productivity. The purpose of Level One fisheries would be to gain some insight on spawning returns to the lower Columbia River and its tributaries. The intent would be to capture some of the variability of eulachon returns and further develop a fishery database while minimizing the risk of overexploiting the return. The Joint Staff recommends one 12 - 24 hour fishing period per week for the mainstem Columbia River commercial fishery. Sport and commercial dipnet fisheries consisting of one 12-24 hour fishing period per week would be used to monitor returns to the Cowlitz River. The daily bag limit for Washington tributaries should be 10 lbs per person at these low levels of abundance. The Joint Staff recommends these fisheries be adopted for the January through March time frame with fisheries closed during the remainder of the year, except December as described below, as per permanent rules. These fisheries would be used to gain some real time insight of run size strength. Days and hours to be fished should be developed with the respective participants. The commercial fishery can be shaped to maximize marketing opportunities and the sport fishery could, for instance, be conducted during a weekend day to maximize opportunity. Fishery monitoring data would be one factor used to make in-season decisions about increase of the fisheries to Level Two or Three. December opportunity should be allowed 24 hours a day and seven days per week in the mainstem Columbia commercial and sport fisheries, as previously noted.
Level Two Fisheries
When fishery data indicates a promising abundance in the spawning return and productivity indices are favorable, yet it is still uncertain whether the run is moderate or strong, then fishing time would be increased to collect additional data concerning relative eulachon abundance. The trigger to extend the fishery from Level One to Two should be carefully deliberated. The Joint Staff does not currently have a specific recommendation for a Level Two trigger. We believe evidence of increased run strength beyond what was observed solely in Level One fisheries (e.g., the presence of significant concentrations of birds and marine mammals attending the run) should be considered as well when ramping up fisheries. The Joint Staff recommends a two or three day commercial fishery in the mainstem Columbia River. The sport and commercial dipnet fisheries in the Cowlitz River should be similarly increased to two or three days. Managers could also consider whether to expand sport and commercial fisheries to lower Columbia tributaries other than the Cowlitz River. The Joint Staff recommends these fisheries be adopted for the January through March time frame with fisheries closed during the remainder of the year, except December in the mainstem, as per permanent rules. Fishery monitoring data would be one factor used to decide if it would be appropriate to increase fisheries to Level Three or decrease fisheries to Level One.
Level Three Fisheries
Level Three fisheries are the most liberal that the Joint Staff would recommend. The decision to adopt Level Three fishing opportunity would be based on very positive indicators of strong abundance and productivity and therefore a very low risk of overexploitation. The Joint Staff recommends that Level Three fisheries be conducted up to four days per week in the Columbia River with additional commercial opportunity of up to four days per week in all lower Columbia River tributaries. Sport fishing would be open in all tributaries for four to seven days per week. The Joint Staff recommends these fisheries be adopted for the January through March time frame with fisheries closed during the remainder of the year, except for December in the mainstem when fisheries are open with no daily closures, as per permanent rules. Increasing the daily bag limit for Washington sport dippers from ten pounds per person per day is appropriate at this level of fishing. The increase could range from 15 to 25 pounds, the latter value would be consistent with Oregon regulations. Fishery monitoring data would be one factor used to decide if it would be appropriate to decrease fisheries to Level Two or One.

Smelt Fisheries

Smelt fisheries occur in the mainstem Columbia River and several tributaries, primarily the Cowlitz River. Mainstem fisheries consist primarily of a commercial fishery using gill nets with some commercial fishers using small trawls. Sport dip net fishing is nearly non-existent in the mainstem Columbia River. Tributary fisheries include both sport and commercial fisheries with the Cowlitz River providing the most consistent fishing opportunities. Both fisheries use dip nets to capture smelt with most sport fisheries being bank fisheries and most commercial fisheries occurring by boat.

Past Commercial Seasons

Commercial fisheries operated 7 days per week in the lower Columbia River beginning in 1978 and in the tributaries beginning in 1976. Prior to that, weekly open periods of 4-5 days were in effect. In 1986, the year-round commercial smelt season was modified to open December 1 and close March 31 to more closely follow the actual presence of smelt in the Columbia River Basin. Large trawl gear was also prohibited in 1986. The seven-day per week fisheries remained in effect through 1994; however, poor landings in 1993 and 1994 prompted the states to reevaluate smelt fishing seasons in 1995 (Tables 14 and 17).

In 1995, following two consecutively poor smelt runs and with the outlook for another poor return, the commercial smelt season in the mainstem and tributaries was reduced from seven days to 3½ days per week. This emergency regulation was adopted at the December Compact hearing and became effective January 7, 1995 through March 31, 1995. In 1996, fishery restrictions enacted by the Columbia River Compact in late January modified the season from February 3 through March 31. The mainstem Columbia River and the tributary seasons were reduced to 4¼ days per week, with the fisheries operating during different days of the week. The 1997 commercial fisheries were modified to test fisheries by the Compact at hearings in January and February. The test fisheries included one 36-hour fishing period per week on Thursdays and Fridays from January 30 through February 21 in the mainstem Columbia River and on Tuesdays and Wednesdays from January 28 through February 19 in the tributaries. The 1998 commercial fishery was modified to a test fishery at the December Compact hearing. The mainstem Columbia River was open for twelve hours on Mondays and Fridays from January 2 through February 13, 1998 and the tributaries were open for twelve hours on Tuesdays and Wednesdays from January 6 through February 18, 1998. Washington tributaries were closed to commercial smelt fishing effective February 2, 1998.

For 1999 Washington tributaries were closed to commercial smelt fishing and two test fisheries were adopted for the lower Columbia River at the December Compact hearing; 1) a standard test fishery and 2) a reduced test fishery. The standard test fishery was open during daylight hours (7 AM - 7 PM) on every Wednesday between December 30 and February 10. The standard test fishery was open to all Columbia River commercial fishers with appropriate license and legal gear. The reduced test fishery was limited to 1-3 commercial fishers and was originally scheduled to be open during daylight hours on every Sunday between December 27, 1998 and February 7, 1999. The reduced test fishery was adopted as an experiment to determine if 1-3 boats fishing shorter drifts could provide data comparable to that produced by the standard test fishery. Fishers were allowed to sell the catch to help finance the program and were required to have an ODFW or WDFW biologist on board while fishing. The fishery was bogged down with several logistical problems but was finally initiated on Sunday January 31, 1999 and operated for two additional days on February 7 (Sunday) and February 18 (Thursday). In comparison to the standard test fishery, the reduced test fishery sampled less area which made results from the two fisheries difficult to compare. In general Joint Staff biologists felt that the data collected by the reduced test fishery were not adequate for use in stock status evaluation or for fishery management purposes.

Smelt fisheries in 2000 reflected the continued trend of conservative management that was initiated in 1995. At the December Compact hearing the 7-day per week mainstem commercial fishery was closed and a standard test fishery consisting of one 12-hour fishing period per week was adopted in its place. In mid-February, the Compact met to consider an extension of the ongoing mainstem fishery. Based on improved CPUE in the mainstem commercial fishery, compared to recent years, and an excellent sport fishery occurring in the Cowlitz River the Compact extended the mainstem commercial fishery for one 12-hour fishing period to gain additional information concerning the strength of the smelt run in 2000. CPUE in the mainstem commercial fishery and catch rate in the Cowlitz River sport fishery dropped considerably; therefore, no additional fishing periods were

adopted and the mainstem fishery was completed on February 23, 2000. As was the case in 1999, Washington tributaries were closed to commercial fishing the entire season.

The poor parental returns in 1997 and 1998 and the moderate increase in abundance in 2000, suggested that the 2001 return would not be large in spite of improved ocean rearing conditions; therefore, a test fishery consistent with a Level One fishery was adopted at the December Compact hearing. The 2001 smelt test fishery began on January 3 with one 18-hour fishing period per week, but by late February the CPUE in the commercial fishery was high and smelt had entered the Cowlitz River. The ongoing mainstem smelt fishery was modified to a Level Two fishery with the addition of one 18-hour fishing period per week during March 12-26. Columbia River landings were the largest since 1985 and the CPUE was the largest in the database (Tables 17 and 22). Commercial smelt fishing occurred in the Cowlitz River for the first time since 1997. The Cowlitz River was originally open for one 12-hour fishing period per week, but in response to the unexpectedly strong return commercial fisheries were expanded to two 12-hour fishing periods per week during March 11-18 and three 12-hour fishing periods per week during March 19-31. All other Washington tributaries were closed to commercial smelt fishing for the season. Commercial landings in the Cowlitz River were the largest since 1995, but were well below the large catch years when landings reached 2-4 million pounds annually.

The improved 2001 commercial fishery predicted a large abundance of returning spawners in 2002 and ocean productivity was favorable, but due to poor parental returns in 1998 and 1999 there was uncertainty in whether the run would be moderate or strong. In accordance with the newly finalized Joint State Eulachon Management Plan, a Level Two fishery consisting of two 18-hour fishing periods per week from January 2 through March 31 was adopted at the December Compact hearing. Significant smelt landings occurred during January for the first time since 1990. Catch rates improved each week and by the last week in January CPUE's were over 3,900 pounds per delivery and an additional 18-hour fishing period per week was adopted for February 1 through March 31, consistent with a Level Three fishery described in the Joint State Eulachon Management Plan. Landings in the 2002 fishery were estimated to be about 58,000 pounds, which, along with the CPUE, were the third largest since 1988 (Table 14).

2003 Commercial Fisheries

Positive abundance indicators for the 2003 return included favorable ocean conditions, larger adult smelt returns in 2001 and 2002, large smelt by-catch in ocean shrimp fisheries, increased salmonid abundance in recent years, and strong abundance of other pelagic fish such as sardines. With the expectation of a large return, a Level Three fishery consisting of four 18-hour fishing periods per week (3 AM-9 PM Sunday, Tuesday, Thursday, and Friday) during January 1 through March 31 in the mainstem Columbia River was adopted at the December Compact hearing. Four days per week is the maximum allowed under the Joint State Eulachon Management Plan. The mainstem Columbia River was also open seven days per week during December 1-31 as per permanent regulations.

Smelt effort and landings in January were low due to limited markets, but CPUE's were slightly higher than those observed in 2002. Landings increased during late January through February with the peak weekly catch (32,300 pounds) occurring during February 18-23. Landings in the 2003 Columbia River fishery were estimated to be about 70,400 pounds which was larger than the previous year's landings, but only half the 159,000 pounds landed in 2001. The season total CPUE of 1,100 lbs/delivery was less than the previous two years', but much higher than the average CPUE (160 lbs/delivery) observed during 1994-2000 fisheries (Table 14).

Initial regulations for Washington tributary fisheries were kept toward the conservative end of the Level Three fishery options until the large abundance could be confirmed by commercial and sport landings and CPUE data. The Cowlitz, Kalama, and Lewis rivers were open January 1, 2003 to

commercial smelt dipping on Sunday, Tuesday, and Wednesday nights (6 PM to 6AM the next day). Additional days and hours were added to the tributary fisheries effective March 7, 2003 through March 31, 2003: 4 PM Sundays to 10 AM Mondays, 4 PM Tuesdays to 10 AM Wednesdays, 4 PM Wednesdays to 10 PM Thursdays, and 4 PM Fridays to 10 AM Saturdays. The Sandy River in Oregon was open year-round, 7 days a week, 24 hours a day, per permanent regulations.

Early in the season, the Cowlitz River provided most of the catch. In February the run shifted more toward the Lewis River, and commercial operations were shifted accordingly. No commercial take occurred in the Kalama River, as fish were far fewer than what could be taken in the nearby Lewis River. Smelt were commercially harvested in the Sandy River for the first time since 1985 and only the third time since 1981.

Recreational Fisheries

The sport smelt fishery is a longstanding fishery that occurs in tributaries using dip net gear and historically has been open year-round. Smelt dippers in Washington were allowed 20 pounds per person each day, but beginning May 1, 1998 the limit was changed to 10 pounds per person. In Oregon the limit remains 25 pounds per person each day. The sport dip net fishery is very popular, drawing thousands of participants. Smelt are used for human consumption and are also in great demand for sturgeon bait. Annual sport catch estimates are not available; however, limited past creel census information suggests that the sport catch may equal the commercial landings in years with long availability of smelt.

In 1997, sport dipping in the Cowlitz River was poor throughout the run and based on the low abundance indicated by commercial and sport test fisheries the sport fishery was closed effective February 28, 1997 (Table 18). Washington tributaries were closed for recreational smelt dipping again in 1998 with the closure effective February 2, 1998. In 1999 Washington tributaries were open to recreational smelt dipping, but only on Wednesdays and Saturdays from January 2, 1999 through February 13, 1999. During 2000 the Cowlitz River was open to recreational dipping on Fridays and Saturdays from January 1, 2000 through February 26, 2000 while all other Washington tributaries were closed to smelt dipping the entire year.

The Cowlitz River was the only Washington tributary initially open to sport smelt dipping in 2001. The sport fishery began slowly with no significant catches occurring prior to the end of February. The fishery improved significantly in early March when smelt entered the Cowlitz River, which prompted the WDFW to open all Washington tributaries, including the Cowlitz River, on Saturdays, Sundays, and Wednesdays from March 7-31, 2001. Landings of smelt in the Sandy River sport fishery occurred for the first time since 1988.

All Washington tributaries were open from 6 AM to 10 PM on Saturdays, Sundays, and Wednesdays from January 1 through February 25, 2002 with a 10-pound daily limit. Beginning February 26, 2002 all Washington tributaries were open 7-days per week, 6 AM to 10 PM and the daily bag limit was increased to 20 pounds. All Oregon tributaries were open to sport dipping seven days per week the entire year as per permanent regulations; however, no sport fisheries occurred in Oregon waters due to lack of returns.

Due to favorable ocean conditions and good smelt bycatch in the shrimp fisheries, the 2003 season started off at Level Three. All Washington tributaries were open from 6 AM to 10 PM, seven days a week, from January 1 through March 31, 2003. The mainstem Columbia River was open to Oregon and Washington fishers seven days per week on a 24-hour basis. Initially, Washington recreational eulachon fisheries were restricted to a 10-pound daily limit, however; on February 12, 2003, the daily bag limit was increased to 20 pounds per person. Most dipping occurred in the Lewis and Cowlitz rivers, with some reports of dipping occurring in the Grays River also. All Oregon

tributaries were open to sport dipping seven days per week the entire year as per permanent regulations and as was the case in 2002 dipping occurred in the Sandy River.

2004 Mainstem Commercial Smelt Fishery Recommendation

Joint Staff Recommendation	
The Joint Staff will recommend the following commercial smelt fishing season at the December 19, 2003 Compact hearing.	
Season:	Open four 18-hour periods per week beginning January 1, 2004 and continuing through March 31, 2004.
Open Days:	Sunday, Tuesday, Thursday, and Friday
Hours:	3 A.M. to 9 P.M.
Gear:	As per permanent regulations

This proposed fishery is consistent with Level Three fisheries described in the Joint State Eulachon Management Plan and four days are the maximum number of days allowed under this management plan. Positive abundance indicators for 2004 include adult eulachon returns during 2001-2003, increased salmonid abundances in recent years, high levels of smelt bycatch in Canadian ocean shrimp fisheries, and strong abundances of other pelagic fish such as sardines. Participation in the mainstem fishery has declined in recent years due to large returns supporting full tributary fisheries that reduce markets for fish landed in mainstem fisheries. Reduced effort, in combination with the fishery structure and large run size expectation, will nearly eliminate the possibility of this fishery resulting in overexploitation of the return.

ENDANGERED SPECIES ACT (ESA)

Salmon and Steelhead

Since 1991 almost all Columbia Basin salmon and steelhead stocks have been listed under the Federal ESA. Chinook included in the upper Columbia spring, upper Willamette spring, Snake River spring/summer, and lower Columbia River spring/fall Evolutionarily Significant Units (ESU) plus steelhead included in the upper Willamette, lower Columbia River, mid-Columbia River, upper Columbia River, and Snake River ESU's may be present in the mainstem Columbia River during the time when fisheries described in this report occur and therefore may be impacted by these fisheries. Impacts associated with fisheries described in this report are included in the "Interim management agreement for upriver spring chinook, summer chinook, and sockeye" that was completed in 2001. Fisheries described in this report are also in accordance with the Fisheries Management and Evaluation Plan (FMEP) for upper Willamette spring chinook in freshwater fisheries of the Willamette basin and lower Columbia River mainstem, which was prepared by the ODFW and accepted by the NMFS. Impacts to listed species from fisheries described in this report are expected to be *de minimus*.

Smelt

Columbia River smelt are not listed under the ESA. In mid-1999 Columbia River smelt were petitioned for listing under the ESA and that petition was accepted and reviewed by the NMFS. The NMFS did not propose that smelt be listed under the ESA due to the lack of adequate information for stock status determination.

Marbled Murrelet

No change in status since 1994; the winter, spring, and summer fisheries are still not likely to adversely affect the listed marbled murrelet.

FUTURE MEETINGS

Additional Compact hearings may be scheduled as necessary to make modifications to seasons that may be adopted from recommendations in this report. A Joint State meeting is scheduled for Wednesday January 7, 2004 at 10:00 A.M. at the Water Resources Center located at 4600 S.E. Columbia Way, Vancouver, Washington to consider sturgeon sport fishing seasons in the Columbia River downstream of Bonneville Dam. The next Columbia River Compact Hearing is scheduled for Thursday, February 5, 2004 at 10:00 A.M. at the Museum of the Oregon Territory located at 211 Tumwater Drive, Oregon City, Oregon. The purpose of this meeting will be to review salmon, sturgeon, steelhead, and smelt stock status and consider commercial fishing seasons and miscellaneous regulations in the mainstem Columbia River.

Table 1. Estimated Abundance of Harvestable White Sturgeon in the Lower Columbia River, 1989-2002.

	Total Length Interval (inches)		
Year	42-48	48-60	42-60
1989	32,500	16,800	49,300
1990	26,100	12,000	38,100
1991	32,900	11,700	44,600
1992	59,900	8,700	68,600
1993	85,000	14,200	99,200
1994	N/A	N/A	N/A
1995	143,200	59,000	202,200
1996	131,700	33,500	165,200
1997	123,700	33,400	157,100
1998	161,600	24,700	186,300
1999	116,800	17,600	134,400
2000	119,200	17,000	136,200
2001	100,200	22,400	122,600
2002	*N/A*	*N/A*	*N/A*

Table 2. Annual Sport and Commercial Catches of White Sturgeon in the Lower Columbia River and Comparisons to Catch Guidelines, 1993-2003.

	Sport		Commercial	
	Catch	Guideline	Catch	Guideline
1993	37,900	--	8,150	6,000
1994	33,500	--	6,400	6,000
1995	45,100	--	6,200	8,000
1996	42,800	--	8,400	8,000
1997	38,200	53,840	12,800	13,460
1998	41,600	53,840	13,900	13,460
1999	39,800	40,000	9,500	10,000
2000	40,500	40,000	10,870	10,000
2001	41,200	39,500	9,310	9,100
2002	38,300	38,300	9,620	9,800
2003 [1]	31,900	32,000	7,950	8,000

1. Preliminary.

Table 3. Commercial Catch of White Sturgeon by Season, Annual Commercial Catch, and Comparisons to Catch Guidelines, 1993-2003.

	Mainstem					Select Area				
Year	Winter	Early August	Late August	Late Fall	Total	Spring/ Summer	Fall	Total	Grand Total	Guide-line
1993	990	0	0	7,010	8,000	30	20	50	8,150	6,000
1994	2,990	0	0	3,380	6,370	30	0	30	6,400	6,000
1995	0	0	0	5,980	5,980	110	70	180	6,200	8,000
1996	800	0	330	6,580	7,710	580	110	690	8,400	8,000
1997	2,710	1,740	140	7,790	12,380	350	100	450	12,800	13,460
1998	2,680	2,540	90	8,060	13,370	360	170	530	13,900	13,460
1999	1,780	2,770	60	4,180	8,790	520	190	710	9,500	10,000
2000	2,260	2,490	300	5,130	10,180	540	160	690	10,870	10,000
2001	3,060	4,720	1,020	0	8,800	490	20	510	9,310	9,100
2002	2,720	1,340	380	4,200	8,640	650	330	980	9,620	9,800
2003 [1]	1,520	2,170	410	3,430	7,530	250	170	420	7,950	8,000

1. Preliminary

Table 4. Sport and Commercial Sturgeon Catch (in 1,000's) and White Sturgeon Catch Sharing Percentages in the Lower Columbia River, 1977-2003.

	White Sturgeon					Green Sturgeon		
	Sport		Commercial[1]		Total	Sport	Commercial[1]	Total
Year	Catch	%	Catch	%	Catch	Catch	Catch	Catch
1977	25.8	73	9.7	27	35.5	0.0	0.8	0.8
1978	30.4	76	9.8	24	40.2	0.0	1.7	1.7
1979	31.4	61	20.5	39	51.9	0.0	1.2	1.2
1977-1979 Average	29.2	70	13.3	30	42.5	0.0	1.2	1.2
1980	27.0	74	9.4	26	36.4	0.0	1.7	1.7
1981	27.2	65	14.9	35	42.1	0.0	0.2	0.2
1982	25.1	68	11.6	32	36.7	0.0	0.8	0.8
1983	36.0	74	12.4	26	48.4	0.1	0.7	0.8
1984	42.0	71	17.5	29	59.5	0.1	2.7	2.8
1980-1984 Average	31.5	70	13.2	30	44.6	<0.1	1.2	1.3
1985	43.8	84	8.4	16	52.2	0.5	1.6	2.1
1986	49.8	81	11.6	19	61.4	0.4	6.0	6.4
1987	62.4	87	9.7	13	72.1	0.2	4.9	5.1
1988	43.1	86	6.8	14	49.9	0.1	3.3	3.4
1989	25.4	84	5.0	16	30.4	0.1	1.7	1.8
1985-1989 Average	44.9	84	8.3	16	53.2	<0.1	3.5	3.8
1990	17.3	77	5.3	23	22.6	0.1	2.2	2.3
1991	22.7	86	3.8	14	26.5	<0.1	3.2	3.2
1992	40.1	87	6.2	13	46.3	0.1	2.2	2.3
1993	37.9	82	8.1	18	46.0	<0.1	2.2	2.2
1994	33.5	84	6.4	16	39.9	0.1	0.2	0.3
1990-1994 Average	30.3	83	6.0	17	36.3	0.1	2.0	2.1
1995	45.1	88	6.2	12	51.3	<0.1	0.4	0.4
1996	42.8	84	8.4	16	51.2	0.1	0.6	0.7
1997	38.2	75	12.8	25	51.0	<0.1	1.6	1.6
1998	41.6	75	13.9	25	55.5	0.1	0.7	0.8
1999	39.8	80	9.5	20	49.3	0.1	0.8	0.9
1995-1999 Average	41.5	80	10.2	20	51.7	0.1	0.8	0.9
2000	40.5	79	10.9	21	51.4	<0.1	1.2	1.2
2001	41.2	82	9.3	18	50.5	0.1	0.3	0.4
2002	38.3	80	9.6	20	47.9	0.1	0.2	0.2
2003[2]	31.9	80	8.0	20	39.9	0.1	<0.1	0.1

1. *Includes Youngs Bay (1979-present) and other Select Area landings (1998-present).*
2. *Preliminary.*

Table 5. Gear, Fishing Periods, and Associated Sturgeon Catch for Mainstem Columbia River Commercial Seasons, 2003.
Winter - Target Sturgeon (Zones 1 – 5)
9-inch minimum and 9¾-inch maximum mesh size restrictions Three 30-hr (Noon - 6 PM) and one 12-hr (6 AM – 6 PM) fishing periods during January 7-28 No restriction on number of sturgeon possessed or sold **1,490** white sturgeon and **zero** green sturgeon
Winter - Target Chinook (Zones 1 – 4)
8-inch minimum and 9 ¾-inch maximum mesh size restrictions Two 16-hr (5 AM-9 PM) fishing periods on February 17 and 19 Maximum of **3** white sturgeon possessed or sold per vessel during each calendar week and 4¼-inch maximum mesh size restriction One 10-hr fishing period on March 21 No restriction on number of sturgeon possessed or sold **27** white sturgeon and **zero** green sturgeon
Early August – Chinook/Sturgeon (Zones 1 – 3)
8-inch minimum and 9¾-inch maximum mesh size restrictions Four nighttime (7 PM - 7 AM) fishing periods during August 4-14 Maximum of **7** white/green sturgeon possessed or sold per vessel during each calendar week **2,174** white sturgeon and **10** green sturgeon
Late August (Extended Area 2S) – Chinook/Sturgeon (Zones 4 – 5)[1]
9-inch minimum and 9¾-inch maximum mesh size restrictions Four nighttime (8 PM - 6 AM) fishing periods during August 18-28 Maximum of **7** white/green sturgeon possessed or sold per vessel during each calendar week **411** white sturgeon and **1** green sturgeon
Late Fall – Target Coho (Zones 1 – 3)
6-inch maximum mesh size restriction One daytime (7 AM - 7 PM) fishing period on September 15 Maximum of **3** white/green sturgeon possessed or sold per vessel during each calendar week **1** white sturgeon and **1** green sturgeon
Late Fall (Extended Area 2S) – Chinook/Sturgeon (Zones 4 – 5)
8-inch minimum and 9¾-inch maximum mesh size restrictions One nighttime (8 PM – 12 AM) fishing period on September 15 Maximum of **3** white/green sturgeon possessed or sold per vessel during each calendar week **54** white sturgeon and **zero** green sturgeon
Late Fall – Salmon/Sturgeon (Zones 1 - 5)
No minimum and 9¾-inch maximum mesh size restrictions in Zones 1-3 8-inch minimum and 9¾-inch maximum mesh size restrictions in Zones 4-5 Eight days during September 17 – October 2 Maximum of **3** white/green sturgeon possessed or sold per vessel during each calendar week **1,013** white sturgeon and **21** green sturgeon
Late Fall – Salmon/Sturgeon (Zones 1 - 5)[2]
No minimum and 9¾-inch maximum mesh size restrictions 13½ days during October 5-31 October 5-9: Maximum of **3** white/green sturgeon possessed or sold per vessel during each calendar week October 10-31: Maximum of **9** white/green sturgeon possessed or sold per vessel during each calendar week **2,358** white sturgeon and **3** green sturgeon

1. *All of Zones 4-5 open during August 25-28.*
2. *Zone 1 closed during October 29-31.*

Table 6. Estimated Catch of White Sturgeon (in 1000's) in Legal Foot-length Groups in Lower Columbia River Commercial and Sport Fisheries, 1977-2003. [1]

	Sport Fisheries [2]							Commercial Fisheries [3]				
	3-4 Ft		4-5 Ft		5-6 Ft			4-5 Ft		5-6 Ft		
Year	No.	%	No.	%	No.	%	Total	No.	%	No.	%	Total
1977	20.1	78	4.4	17	1.3	5	25.8	9.1	94	0.6	6	9.7
1978	23.1	76	5.7	19	1.6	5	30.4	9.2	94	0.6	6	9.8
1979	23.5	75	6.1	19	1.8	6	31.4	19.2	94	1.3	6	20.5
1977-1979 Average	22.2	76	5.4	18	1.6	5	29.2	12.5	94	0.8	6	13.3
1980	21.3	79	4.1	15	1.6	6	27.0	9.1	97	0.3	3	9.4
1981	21.3	78	4.5	17	1.4	5	27.2	14.2	95	0.7	5	14.9
1982	19.7	78	4.3	17	1.1	4	25.1	10.8	93	0.8	7	11.6
1983	26.2	73	7.2	20	2.6	7	36.0	11.2	90	1.2	10	12.4
1984	34.2	81	6.5	15	1.2	3	42.0	16.1	92	1.4	8	17.5
1980-1984 Average	24.5	78	5.3	15	1.6	5	31.5	12.3	93	0.9	7	13.2
1985	37.0	84	5.3	12	1.5	3	43.8	7.6	90	0.8	10	8.4
1986	42.3	85	6.0	12	1.5	3	49.8	10.4	90	1.1	9	11.6
1987	55.0	88	5.9	9	1.6	3	62.4	8.8	91	0.8	8	9.7
1988	37.5	87	4.2	9	1.5	3	43.1	6.2	91	0.6	9	6.8
1989	20.8	82	3.5	14	1.0	4	25.4	4.5	90	0.5	10	5.0
1985-1989 Average	38.5	86	5.0	11	1.4	3	44.9	7.5	90	0.8	10	8.3
1990	14.0	81	2.5	14	0.7	4	17.3	4.6	87	0.6	11	5.3
1991	19.6	86	2.2	10	0.8	4	22.7	3.4	89	0.3	8	3.8
1992	34.9	87	4.2	10	1.0	3	40.1	6.0	97	0.2	3	6.2
1993	33.4	88	3.9	10	0.6	2	37.9	7.9	98	0.2	2	8.1
1994	25.9	77	7.0	21	0.6	2	33.5	6.3	98	0.1	2	6.4
1990-1994 Average	25.6	84	4.0	13	0.7	2	30.3	5.6	93	0.3	5	6.0
1995	35.9	80	8.9	20	0.3	1	45.1	6.1	98	0.1	2	6.2
1996	30.7	72	11.4	27	0.6	1	42.8	8.3	99	0.1	1	8.4
1997	29.0	76	9.1	24	<0.1	<1	38.2	12.8	100	0.0	0	12.8
1998	32.1	77	9.4	23	0.1	<1	41.6	13.9	100	0.0	0	13.9
1999	31.9	80	7.9	20	<0.1	<1	39.8	9.5	100	0.0	0	9.5
1995-1999 Average	31.9	77	9.3	22	0.2	<1	41.5	10.1	99	<0.1	<1	10.2
2000	33.3	82	7.2	18	<0.1	<1	40.5	10.9	100	0.0	0	10.9
2001	31.4	76	9.8	24	<0.1	<1	41.2	9.3	100	0.0	0	9.3
2002	29.1	78	8.4	22	<0.1	<1	37.5	9.8	100	0.0	0	9.8
2003 [4]	21.0	66	10.9	33	<0.1	<1	31.9	8.0	100	0.0	0	8.0

1. *Individual columns may not add up to total column due to rounding errors.*
2. *White sturgeon legal size limits were 36"-72" during 1977-1988, 40"-72" during 1989-1993, 42"-66" during 1994-1996, and 42"-60" thereafter.*
3. *White sturgeon legal size limits were 48"-72" during 1977-1992, 48"-66" during 1993-1996, 48"-60" thereafter.*
4. *Preliminary numbers*

Table 7. Annual 3-6 Foot Abundance Estimates by Reservoir in the Zone 6 Management Area of the Columbia River.

Bonneville Pool		The Dalles Pool		John Day Pool	
Year(s)	Abundance Estimate	Year	Abundance Estimate	Year	Abundance Estimate
1976-1978	5,400	1987	18,900	1990	2,200
1989	17,900	1988	6,300	1996	24,100
1994	19,800	1994	6,500	2001	13,900
1999	39,700	1997	46,800		
2003	N/A	2002	15,300		

Table 8. Treaty Indian Commercial and Subsistence and Non-Indian Sport Catch of White Sturgeon in the Columbia River, Between Bonneville and McNary Dams (in 1000's), 1977-2003.

	Treaty Indian Commercial			Treaty Indian	Non-Indian
Year	Gill Net	Setline	Total	Subsistence [1]	Sport [2]
1977	0.3	0.3	0.6	--	--
1978	0.4	0.3	0.7	--	--
1979	0.6	0.7	1.3	--	--
1980	0.4	1.4	1.8	--	5.0
1981	0.2	1.8	2.0	--	5.0
1982	0.2	1.1	1.3	--	5.0
1983	0.3	1.1	1.4	--	5.0
1984	1.1	1.7	2.8	--	5.0
1985	3.0	2.0	5.0	--	5.0
1986	6.2	3.3	9.5	--	5.0
1987	7.9	3.2	11.1	--	6.7
1988	3.8	0.4	4.1	--	3.3
1989	3.1	0.4	3.5	0.5	4.0
1990	3.1	0.3	3.4	--	3.1
1991	1.2	0.3	1.5	--	2.6
1992	0.6	1.0	1.6	0.2	2.0
1993	2.0	<0.1	2.0	0.3	2.6
1994	1.5	0.1	1.6	0.7	2.6
1995	2.0	0.1	2.1	1.1	1.5
1996	0.5	1.1	1.6	0.5	1.5
1997	2.6	1.0	3.6	0.2	2.1
1998	2.8	0.9	3.7	0.2	3.1
1999	1.7	1.4	3.1	0.2	2.4
2000	2.2	1.1	3.3	0.3	2.5
2001	2.4	0.9	3.3	0.5	2.4
2002	1.5	0.5	2.0	0.4	2.6
2003[3]	1.3	0.2	1.5	0.4	2.1

1. *Subsistence catch numbers prior to 1992 not available, except for fall season of 1989.*
2. *Sport catch was estimated to average 5,000 per year 1980-86, and since 1987, estimates are based on creel surveys and angler-returned catch records.*
3. *Preliminary, includes incomplete commercial data (complete for winter season, partial for summer and fall seasons) and preliminary annual subsistence and sport catch estimates.*

Table 9. Annual Catch Estimates and Guidelines for Commercial and Sport Fisheries Occurring in the Zone 6 Management Area, 1991-2003.

Year	Bonneville Pool		The Dalles Pool		John Day Pool	
	Catch	Guideline	Catch	Guideline	Catch	Guideline
			Commercial Fisheries			
1991	999	1,250	457	300	39	100
1992	1,146	"	431	"	23	"
1993	1,415	"	579	"	12	"
1994	1,176	"	309	"	117	"
1995	1,421	"	312	"	308	"
1996	1,005	"	230	"	360	"
1997	1,852	1,300	498	400	1,260	1,160
1998	1,462	"	1,108	1,000-1,200	1,100	"
1999	1,280	"	1,051	"	760	"
2000	1,165	"	1,342	"	788	"
2001	1,287	"	1,215	1,100	755	"
2002	472	"	1,152	"	326	335
2003[1]	398	1,200	866	900	265	"
			Sport Fisheries			
1991	2,270	1,350	199	100	150	100
1992	1,717	"	139	"	147	"
1993	2,307	"	158	"	144	"
1994	2,223	"	154	"	234	"
1995	1,370	"	50	"	53	"
1996	1,353	"	80	"	62	"
1997	1,463	1,520	178	200	464	560
1998	1,626	"	857	600-800	593	"
1999	1,235	"	695	"	422	"
2000	1,262	"	809	"	434	"
2001	1,426	"	677	700	299	"
2002	1,560	"	878	"	187	165
2003[2]	1,542	1,700	432	400	163	"

1. *Preliminary, includes incomplete commercial data (complete for winter seasons, partial estimates summer and fall seasons).*
2. *Preliminary sport catch estimates.*

Table 10. Sport Fishery Retention Restrictions in the Zone 6 Management Area, 1994-2003. [1]

Year	Bonneville Pool	The Dalles Pool	John Day Pool
1994	All of Zone 6 closed to retention during September 16-December 31.		
1995	April 25-December 31	June 1-December 31	June 1-December 31
1996	April 1-December 31	May 1-December 31	May 1-December 31
1997	April 5-December 31	May 5-December 31	September 2-December 31
1998	April 20-December 31	June 8-December 31	November 23-December 31
1999	April 17-December 31	June 12-December 31	Retention allowed all year
2000	April 8-December 31	June 19-December 31	Retention allowed all year
2001	August 13-December 31	April 9-December 31	Retention allowed all year
2002	August 5-September 27	July 13-December 31	August 24-December 31
2003	July 7-December 31	June 21-December 31	July 28-December 31

1. *Dates during which catch and release only restrictions were in effect.*

Table 11. Treaty Indian Commercial Setline and Gill Net Seasons and White Sturgeon Catch in the Columbia River, Between Bonneville and McNary Dams, 2000-2003.

Fishery	Date	Open Pools	Length	Mesh Size	Catch
		2000			
Setline	January 1-31	All	1 month	--	60
"	March 20-June 10	BO	82 days	--	514
"	March 20-July 31	JD	133 days	--	156
"	August 8-August 20	JD	13 days	--	49
"	October 2-December 31	JD	91 days	--	160
Winter	February 1-March 18	All	46 days	None	2,388
Sockeye	Closed season	--	--	--	--
Fall	Closed Season	--	--	--	--
Total					**3,327**
		2001			
Setline	January 1-31	All	1 month	--	35
"	June 1-August 18 [1]	BO, JD	79 days	--	638
"	October 1-December 31	BO, JD	3 months	--	293
Winter	February 1-March 14	All	42 days	None	1,961
Spring	Closed season	--	--	--	--
Sockeye	Closed season	--	--	--	4
Fall	November 14-20	BO, JD	7 days	8½" minimum	368
"	November 23-30	BO	8 days	Diver nets only	
"	November 23-December 7	JD	15 days	--	--
Total					**3,299**
		2002			
Setline	January 1-31	All	1 month	--	10
"	June 1-August 17	BO, TD	78 days	--	229
"	October 1-27	TD	27 days	--	101
"	October 1-December 15	BO	2½ months	--	108
Winter	February 1-March 21 [2]	All	49 days	None	1,502
Spring	Closed season	--	--	--	--
Sockeye	Closed season	--	--	--	--
Fall	Closed season	--	--	--	--
Total					**1,950**
		2003 [3]			
Setline	January 1-31	All	1 month	--	20
"	June 9-August 23 (Closed July 12-21)	BO, JD	68 days	--	127
"	October 13-further notice	BO, JD	NA	--	35 [4]
Winter	February 1-March 21	All	49 days	None	1,339
Spring	Closed season	--	--	--	--
Sockeye	Closed season	--	--	--	--
Fall	Closed season	--	--	--	--
Total					**1,521** [4]

1. *Includes 38 sturgeon landed during hook and line fisheries.*
2. *John Day Pool closed March 15, 2002.*
3. *Preliminary.*
4. *Fishery remains open until pool specific guidelines are reached. Catch estimates through November 3, 2003.*

Table 12. Treaty Indian Season Specific Landings by Pool and Associated Catch Guidelines, 2003. [1]						
Reservoir	January Setline	Winter Gill Net	Summer Setline	Fall Setline	Commercial Total	Guideline
Bonneville	20	271	73	25 [2]	389	1,200
The Dalles	0	866	0	0	866	900
John Day	0	202	54	10 [2]	266	335
Total	20	1,339	127	35 [2]	1,521	2,435

1. *Preliminary.*
2. *Fishery remains open. Catch estimate through November 3, 2003.*

Table 13. Columbia River and Tributary Smelt Commercial Landings (in thousands of pounds), 1938-2003.								
Year(s)		Columbia River	Grays River	Cowlitz River	Kalama River	Lewis River	Sandy River	Total
1938-1949	Range	200-1,000	0-59	1-3,000	0-77	0-2,000	0-1,400	1,000-5,700
	Average	610	18	1,400	13	300	300	3,000
1950-1959	Range	400-1,300	0-16	0-2,000	0-44	0-900	0-500	1,300-2,600
	Average	800	3	700	11	200	100	1,800
1960-1969	Range	100-800	0-53	1,000	0-0	0-82	0-0	800-1,500
	Average	700	10	600	0	8	0	1,100
1970-1979	Range	900	0-6	100	0-300	0-900	0-800	500-3,200
	Average	300	1	1,400	4	100	100	2,000
1980-1989	Range	53-500	0-35	100-3,700	0-8	0-2,700	0-300	500-3,800
	Average	200	4	2,500	1	600	59	2,400
1990		6.4	0.0	2,756.2	0.0	21.6	0.0	2,784.2
1991		5.8	0.0	2,944.6	0.0	0.0	0.0	2,950.4
1992		0.8	0.0	3,673.0	0.0	0.0	0.0	3,673.8
1993		33.2	0.0	413.9	66.8	0.0	0.0	513.9
1994		0.2	0.0	43.2	0.0	0.0	0.0	43.4
1995		7.7	0.0	431.4	0.9	0.0	0.0	440.4
1996		7.1	0.0	2.0	0.0	0.0	0.0	9.1
1997		37.1	0.0	21.5	0.0	0.0	0.0	58.6
1998		11.9	0.0	0.2	0.0	0.0	0.0	12.0
1999		20.9	0.0	0.0	0.0	0.0	0.0	20.8
2000		31.0	0.0	0.0	0.0	0.0	0.0	31.0
2001		158.8	0.0	154.3	0.0	0.0	0.0	313.1
2002		58.0	0.0	169.6	0.0	493.6	0.0	721.2
2003		66.9	0.0	464.4	0.0	529.1	23.0	1,083.4

Table 14. Weekly CPUE' s Through mid-February and Total CPUE and Catch in Columbia River Commercial Fisheries, 1988-2003. [1]

	CPUE's By Statistical Week								Season Totals	
Year	1	2	3	4	5	6	7	8	CPUE	Catch
1988	0	0	125	702	78	214	0	0	535	14,500
1989	0	0	0	101	0	0	0	0	1,396	58,600
1990	0	409	445	1,650	0	0	0	0	709	6,400
1991	0	0	86	113	0	107	685	0	389	5,800
1992	0	0	0	0	0	232	290	0	192	2,300
1993	0	0	0	0	18	0	224	2,136	1,841	29,500
1994	0	53	0	0	0	0	0	0	59	235
1995	150	59	8	48	550	157	265	31	180	7,600
1996	50	46	41	151	124	0	445	59	95	7,100
1997	0	22	79	94	168	216	672	214	304	37,100
1998	0	0	40	223	94	30	17	0	134	11,800
1999	0	25	21	123	146	183	297	110	172	20,800
2000	151	37	195	63	371	123	312	266	185	31,040
2001	0	0	0	0	0	520	1,604	2,322	1,985	158,800
2002	27	371	733	3,925	1,433	1,041	164	0	1,567	57,990
2003	64	497	1,260	0	445	590	778	4,350	1,133	66,880

1. CPUE-Catch per unit effort as measured by pounds per delivery.

Table 15. Age Composition of Eulachon Bycatch in the West Vancouver Island Shrimp Fishery, 1999-2003.

	No. of Age 1+	Columbia River Return Year			No. of Age 2+	Columbia River Return Year		
Ocean Year	Smelt (millions)	Age 3	Age 4	Age 5	Smelt (millions)	Age 3	Age 4	Age 5
1999	11.8	2001	2002	2003	21.2	2000	2001	2002
2000	208.9	2002	2003	**2004**	27.8	2001	2002	2003
2001	102.6	2003	**2004**	2005	219.2	2002	2003	**2004**
2002	311.7	**2004**	2005	2006	458.8	2003	**2004**	2005
2003	215.6	2005	2006	2007	270.7	**2004**	2005	2006

Table 16. Results of Larval Sampling Program in the Lower Columbia River Basin. [1]

	Catch (Larvae Per M^3)						
Year	Mainstem Columbia	Cowlitz River	Elochoman River	Grays River	Kalama River	Lewis River	Sandy River
1986	--	8.1	--	--	--	--	--
1994	--	0.7	--	--	--	--	--
1995	--	19.2	--	--	32.4	--	--
1996	--	1.2	--	--	0.2	--	--
1997	3.9	0.7	--	--	0.3	0.0	--
1998	0.9	0.5	2.8	22.1	0.3	0.0	0.1
1999	0.7	0.5	1.2	2.5	0.4	0.0	0.1
2000	1.3	54.9	26.6	3.5	0.1	0.2	0.1
2001	87.3	450.7	139.5	N/S	5.5	17.6	N/S
2002	28.2	283.0	N/S	N/S	0.5	0.6	N/S
2003	8.9	1.4	N/S	24.5	N/S	36.2	0.1

1. Interannual comparisons of abundance are tentative as sampling has not been systematic from year to year. N/S = not sampled

Table 17. Mainstem Columbia River Commercial Smelt Seasons, 1960-2003.			
Year	Season	Weekly Period	Days Open
1960-1964	Jan. 1 – Dec. 31	12 PM Sat – 12 AM Wed	~255
1965-1966	Jan. 1 – Dec. 31	12 AM Sat – 12 AM Thu	~307
1967-1977	Jan. 1 – Dec. 31	12 PM Sat – 12 AM Wed	~255
1978-1984	Jan. 1 – Dec. 31	7 days/week	365
1985	Jan. 1 – Dec. 31 (Feb. 22 – Mar.1)	7 days/week (Lower deadline at Cowlitz R)	365
1986-1994	Dec. 1 – Mar. 31	7 days/week	121
1995	Dec. 7 – Jan. 7 Jan. 7 – Mar. 31	7 days/week 8 PM Sat – 8 AM Wed	38 48
1996	Dec. 1 – Feb. 2 Feb. 3 – Mar. 31	7 days/week Noon Mon – 6 PM Fri	64 32
1997	Dec. 1 – Jan. 27 Jan. 30 – Feb. 21	7 days/week 6 AM Thu – 6 PM Fri	58 8
1998	Dec. 1 – Dec. 31 Jan. 2 – Feb. 13	7 days/week 6 AM – 6 PM Mon & Fri	31 13
1999	Dec. 1 - Dec. 23 Dec. 30 - Feb 10	7 days/week 7 AM - 7 PM Wed	23 7
2000	Dec 1 - Dec 26 Dec 29 - Feb 23	7 days/week 7 AM - 7 PM Wed	26 9
2001	Dec 1 - Dec 31 Jan. 3 - Mar. 7 Mar. 12 - Mar. 31	7 days/week 3 AM - 9 PM Wed 3 AM - 9 PM Mon & Wed	31 10 6
2002	Dec 1 - Dec 31 Jan 2 - Jan 31 Feb 1 - Mar 31	7 days/week 3 AM - 9 PM Sun & Wed 3 AM - 9 PM Sun, Wed & Fri	31 9 26
2003	Dec 1 - Dec 31 Jan 1 - March 31	7 days/week 3 AM - 9 PM Sun, Tues, Thur, & Fri	31 9

Table 18. Lower Columbia River Basin Sport Smelt Seasons, 1960-2003	
1960-1996	Columbia River and tributaries open seven days per week the entire year.
1997	Columbia River and Oregon tributaries open seven days per week the entire year. Washington tributaries closed effective February 28.
1998	Columbia River and Oregon tributaries open seven days per week the entire year. Washington tributaries closed effective February 2.
1999	Columbia River and Oregon tributaries open seven days per week the entire year. Washington tributaries were open on Wednesdays and Saturdays from January 2, 1999 through February 13, 1999.
2000	The Oregon portion of the Columbia River and Oregon tributaries open 7 days per week the entire year. The Cowlitz River was open on Fridays and Saturdays from December 31, 1999 through February 26, 2000. The Washington portion of the Columbia River and all other Washington tributaries were closed the entire year.
2001	The Oregon portion of the Columbia River and Oregon tributaries open seven days per week the entire year and the Washington portion of the Columbia River was open 7 days per week during February 24-March 31, 2001. The Cowlitz River was open on Saturdays during January 6- March 6, 2001. All Washington tributaries, including the Cowlitz River, were open on Saturdays, Sundays, and Wednesdays during March 7-18, 2001 and Saturdays, Sundays, Mondays, and Wednesdays during March 19-31, 2001.
2002	The Columbia River and Oregon tributaries open 7 days per week the entire year. Washington tributaries open Saturdays, Sundays, and Wednesday from 6 AM to 10 PM during January 1-February 25, 2002. Washington tributaries open 7 days per week from 6 AM to 10 PM during February 26-March 31, 2002.
2003	The Columbia River and Oregon tributaries open 7 days per week the entire year. Washington tributaries open 7 days per week from 6 AM to 10 PM during January 1-March 31, 2003.