For Administrative Record
<Jim Harp, 10/29/02, 10:41 AM>

Agenda C.4.c
Tribal Comments
November 2002

CHINOOK FRAM UPDATE

The tribes agree with the major recommendations of the SSC and STT.

1. The changes made during the last year should improve the model for the assessment of non-selective fisheries in 2003.

2. Given the stated concerns of the SSC and STT, it is premature for the Council to recommend that the model be used to evaluate mark-selective fisheries in 2003.

The tribes will continue to work together with WDFW to resolve the outstanding issues identified with modeling multi-fishery, multi-month, and multi-year mark-selective fisheries.

Thank you.

RECOMMENDATIONS FOR DEVELOPING FMP CONSERVATION OBJECTIVES FOR SACRAMENTO RIVER WINTER CHINOOK AND SACRAMENTO RIVER SPRING CHINOOK

Sacramento River Winter and Spring Chinook Workgroup

In November 2001, the National Marine Fisheries Service proposed that the Pacific Fishery Management Council (Council) amend the Pacific Coast Salmon Plan (FMP) to specify recovery and long term conservation objectives for Sacramento River winter chinook and Central Valley spring chinook. A workgroup of representatives from National Marine Fisheries Service, the California Department of Fish and Game, the U.S. Fish and Wildlife Service, and the Pacific Fisheries Management Council was formed to assess the potential of the available information to support harvest management measures, and develop recommendations to the Council regarding FMP conservation objectives for the two stocks.

The Workgroup assembled and analyzed the ocean and river recoveries of coded wire tagged Sacramento River winter chinook and Butte Creek spring chinook. Winter chinook are artificially propagated at Livingston Stone National Fish Hatchery. Naturally produced spring chinook are captured and tagged with coded wire as part of CDFG's Butte Creek spring chinook life history investigation.

A cohort analysis of the 1998 brood year of hatchery-produced winter chinook provided an estimate of the fishery impact (landed catch + incidental mortality) rate for ocean and river fisheries. Estimates of the replacement rates of female spawners are available from winter chinook carcass surveys that have been conducted since 1996.

A carcass survey to estimate the size of the Butte Creek spring chinook spawning population and recover tagged fish was conducted in Butte Creek for the first time in 2001. Previous estimates of spawner abundance have been based on snorkel surveys. A cohort analysis of the 1998 brood year will be possible when the 2002 spawning survey recoveries are complete and become available.

Sacramento River Winter Chinook

Cohort analysis of the 1998 brood year hatchery stock yields a preliminary ocean fishery impact rate estimate of 0.21 for age-3 winter chinook in year 2000. The estimate is preliminary because the expansion factors associated with 2001 and 2002 carcass surveys have not been finalized. This amount of take may be consistent with an acceptable rate of recovery of the population; the number of females returning to spawn in 2001 increased by 60% over the number that returned in 1998 (winter chinook carcass survey data).

A conservation objective for winter chinook, expressed as an age-3 ocean fishery impact rate,

should be considered. In the near term, the choice of an appropriate rate could be based on observed spawner replacement rates and associated age-3 ocean impact rates. Implementation of the objective could be accomplished by compounding the expected time-area-specific impact rates over the course of the season, if the relationship between fishing effort and fishery contact (legal + sublegal size encounter) rates can be adequately characterized.

At the present time, however, sufficient data are not available to either 1) observe a correlation between ocean impact rates and spawner replacement rates; or 2) characterize the relationship between time-area specific fishery contact rates and associated effort. If management considerations were limited to the ocean sport fishery south of Point Arena, cohort analysis of brood years 1998 through 2001 may provide sufficient data to characterize the contact rate-effort relationship. Impacts in areas and sectors other than the sport fishery south of Arena could not be ignored and procedures for evaluating them would need to be developed.

Sacramento River Spring Chinook

Substantially more information on the magnitude and distribution of ocean fishery impacts on naturally spawning spring chinook populations will be required for the development of FMP conservation objectives. Reliable estimates of ocean escapement are a critical component for post-season evaluation of ocean fishery impact rates. In principle, a conservation objective for Butte Creek spring chinook, expressed as an age-specific ocean impact rate, is possible and should be considered. Implementation would require continuing and expanding the Butte Creek spring chinook life history investigation. This project is scheduled to terminate at the end of 2004. Continuation of the carcass survey, begun in 2001, will be important both for assessing harvest impacts and the status of the population. Increasing the numbers of tagged fry will also improve the precision of the cohort analysis. Currently, relatively few coded wire tags are recovered in ocean fisheries and spawning surveys from the current releases of less than 200,000 fry. The Workgroup expresses concern regarding the use of Feather River Hatchery spring chinook as a surrogate for naturally spawning spring chinook populations. Use of the Feather River hatchery stock should be conditioned on demonstrating similar ocean distribution and run timing with respect to naturally spawning populations.

Recommendations to the Pacific Fisheries Management Council

1. The Council should delay consideration of FMP conservation objectives for winter chinook and spring chinook for a two year period.

2. The Council should urge the California Department of Fish and Game to continue and expand the program for tagging and recovery of Butte Creek spring chinook. The development of FMP conservation objectives for spring chinook will require considerably more data than are currently available.

3. The Council should urge the U.S. Fish and Wildlife Service and the California Department of Fish and Game to continue and expand programs for recovering tagged fish and assessing the size of the spawning populations of Sacramento River winter chinook and spring chinook.

Future Workgroup Activity

During the next two years, the Workgroup will continue meeting to assess the feasibility of implementing ocean fishery impact rate-based conservation objectives, and develop procedures for evaluating fishery impacts on Sacramento River winter and spring chinook. At the March 2003 Council meeting, the Workgroup will provide a written report summarizing its work completed to date. The Workgroup will also make recommendations, for consideration by the Council and the National Marine Fisheries Service, regarding ocean harvest management measures intended to improve the likelihood of recovery of the two listed stocks of Sacramento River chinook.

September 6, 2002

Pacific Fishery Management Council
7700 NE Ambassador Place, Suite 200
Portland, Oregon 97220-1384

Agenda Item: 4 p.m. Public Comment Period (For Items Not on the Agenda)

Subject: Oregon March Salmon Troll Opportunity in 2002 .

and comments on proposed Oregon March Salmon Troll Opportunity in 2003

To: Dr. Hans Radtke, Chairman

Mr. Donald K. Hansen, Vice Chairman

PFMC Members

The Oregon Salmon Commission would like to take this opportunity to thank the Council for opening Oregon's Salmon Troll Season this year, 2002 on March 20. At this time the Oregon Salmon Commission would ask the Council to consider a March 15th opening date for the 2003 Salmon season in Oregon.

Preliminary data provided by Oregon Department of Fish and Wildlife indicates 46,721 lbs. Of Chinook were landed in weeks 12 and 13 in Oregon ports in 2002. Approximately 84% of the catch was landed in Newport and 16 % in Coos Bay with some minor landings in the remaining Oregon Coastal Ports.

Preliminary data also indicated a dollar value for all ports combined of $151,829.00 equating to an average price of $3.25 per lb.

The catch was a surprise by Oregon Trollers and Oregon Department of Fish and Wildlife. Port samplers were not on hand to do normal Coded Wire Tag recovery.

Being a member of the Salmon Advisory Subpanel, I was concerned, as were ODFW staff at Newport that sampling was not performed.

As you may know Oregon is in a budget crisis and there is no money in the ODFW's budget to provide additional samplers in March. Thus, the Oregon Salmon Commission a State of Oregon Commodity Board took it upon itself to provide $3000.00 to ODFW to hire port samplers for the March time frame if a season is provided in March of 2003.

The Oregon Salmon Commission and Oregon Trollers know the value of recovering CWT's and their usefulness in analyzing catch and their ultimate contribution in updating the Chinook FRAM and the KOHM models used by the Salmon Technical Team.

The Oregon Salmon Commission is committed to requesting the best science available be used and wish to contribute to that end.

NATIONAL MARINE FISHERIES SERVICE REPORT

Situation: National Marine Fisheries Service (NMFS) will report on the status of regulatory and non-regulatory activities and issues affecting ocean salmon fishery management. Mr. Dan Viele will provide a summary of the findings from the Sacramento River Winter and Spring Chinook Workgroup (Exhibit C.1, Attachment 1).

Council Task:

1. Provide information and discussion.

Reference Materials:

1. *Recommendations for Developing FMP Conservation Objectives for Sacramento River Winter Chinook and Sacramento River Spring Chinook* (Exhibit C.1, Attachment 1).

Agenda Order:

a. Agendum Overview — Bill Robinson
b. Reports and Comments of Advisory Bodies
c. Public Comment
d. Council Discussion

PFMC
10/17/02

2003 SALMON SEASON OPENINGS IN OREGON AND WASHINGTON PRIOR TO MAY 1

The *2002 Federal Regulations for West Coast Salmon Fisheries* indicate the Council will consider inseason recommendations to open commercial seasons for all salmon except coho prior to May 1 in areas north of Cape Falcon. When this subject was discussed at the March 2002 Council meeting, NMFS indicated that opening fisheries prior to May 1 may require reinitiation of consultation under Section 7 of the Endangered Species Act (ESA) for impacts associated with listed species, including Columbia Basin spring chinook stocks. The purpose of this report is to remind interested parties to provide notice at the November Council meeting if they intend to request an early opening, so the Council could then direct the Salmon Technical Team (STT) to perform an appropriate analysis.

Prior to 2002, recreational and commercial salmon seasons in Oregon between Cape Falcon and Humbug Mt. opened April 1. In 2002, those seasons and the commercial season between Humbug Mt. and the Oregon/California border opened March 20. The early opening was designed to allow access to abundant chinook stocks before coho contact rates increased later in the season. Catch in the commercial fishery between Cape Falcon and Humbug Mt. was substantial during March 2002 (see below), while effort in the Brookings area was minor. No directed recreational salmon effort was observed during March, although the early opening was not anticipated and occurred on relatively short notice.

March 2002 Oregon commercial troll salmon effort and catch.

Area	Effort (Boat Days)	Chinook Catch
Tillamook	13	131
Newport	186	3,938
Coos Bay	168	2,593
Brookings	3	5
Total	370	6,667

The *2002 Federal Regulations for West Coast Salmon Fisheries* specify that for the 2003 non-Indian commercial salmon fisheries between Cape Falcon and the Oregon/California border and for the recreational salmon fishery between Cape Falcon and Humbug Mt., the season will open March 15, and the openings could be modified following review at the November 2002 Council meeting. The purpose of this report is to remind the Council of those opening dates and of the opportunity to modify those openings at this Council meeting.

PFMC
10/17/02

TABLE C.2.b. Sequence of events in ocean salmon fishery management, 2002.[a/] (Page 1 of 7)

GENERAL MANAGEMENT ACTIONS AND INSEASON CONFERENCES

Mar. 11	National Marine Fisheries Service (NMFS) provides the Council with a letter outlining the 2002 management guidance for stocks listed under the Endangered Species Act (ESA).
Mar. 12	NMFS inseason conference number one (at the Council meeting) results in a Council recommendation to open the commercial fishery off Oregon from Cape Falcon to the Oregon/California border on March 20 for all salmon except coho, and the recreational fishery from Cape Falcon to Humbug Mt. on April 1 for all salmon except coho. There were no requests for test fisheries opening prior to May 1.
Mar. 14	Council adopts three troll and three recreational ocean salmon fishery management options for public review.
Mar. 20-21	North of Cape Falcon Salmon Forum meets in Portland, Oregon to initiate consideration of recommendations for treaty Indian and non-Indian salmon management options.
Apr. 1-2	Council holds public hearings on proposed 2002 management options in three locations within the three Pacific Coast states. The states of Oregon and California hold additional hearings in Tillamook, Oregon and Moss Landing, California, respectively.
Apr. 2-3	North of Cape Falcon Salmon Forum meets in Seattle, Washington to further consider recommendations for treaty Indian and non-Indian salmon management options.
Apr. 11	Council adopts final ocean salmon fishery management recommendations for approval and implementation by the U.S. Secretary of Commerce. The proposed measures include selective fisheries and comply with the salmon fishery management plan (FMP) and the current biological opinions for listed species. An emergency rule is not required for implementation.
May 7	Ocean salmon seasons implemented as recommended by the Council and published in the *Federal Register* on May 7 (67 FR 36016).
June 5	NMFS inseason conference number two results in closure of the U.S./Canada border to Cape Falcon non-Indian commercial troll fishery effective midnight, June 7, 2002, as the 50,000 chinook quota was projected to be taken.
June 26	NMFS inseason conference number three results in an initial opening period of the non-Indian commercial troll salmon season from the U.S./Canada border to Cape Falcon from July 1-8 with a 250 fish landing limit per vessel for the eight-day period.
July 11	NMFS inseason conference number four results in a second opening period of the non-Indian commercial troll salmon season from the U.S./Canada border to Cape Falcon from July 12-22 with a 400 fish landing limit per vessel for the 11-day period and requirements to land fish within 24 hours of the closure and to provide notice to Oregon Department of Fish and Wildlife for vessels landing fish south of Cape Falcon.
July 18	NMFS inseason conference number five results a minimum size limit of 28 inches for chinook in the Westport, La Push, and Neah Bay ocean recreational salmon fishery and a minimum size limit of 26 inches in the Columbia River ocean recreational salmon fishery, to slow the chinook catch rate. The respective chinook guidelines for the four areas north of Cape Falcon were combined into one quota for the entire area and recalculated to account for hook-and-release mortality of fish less than the new minimum sizes. The new quota is 42,769 (47,500 preseason plus 569 rollover from May/June fishery minus 5,300 hook-and-release mortality).
July 23	NMFS inseason conference number six results in closure of the Horse Mt. to Point Arena non-Indian commercial salmon fishery effective July 23, 2002, as the 10,000 chinook quota was projected to be taken.

July 25 NMFS inseason conference number seven results in an update of the Cape Falcon to Humbug Mt. selective recreational coho fishery, but no action was taken as the quota was not projected to be taken until the following week.

GENERAL MANAGEMENT ACTIONS AND INSEASON CONFERENCES, (continued)

July 25 NMFS inseason conference number eight results in a third opening period of the non-Indian commercial troll salmon season from the U.S./Canada border to Cape Falcon from July 26 to August 5 with a 500 fish landing limit per vessel for the 11-day period.

July 26 NMFS inseason conference number nine results in closure of the Humbug Mt. to Oregon/California border non-Indian commercial salmon fishery effective July 26,2002 as the 1,500 chinook quota was projected to be taken.

July 29 NMFS inseason conference number ten results in closure of the Cape Falcon to Humbug Mt. selective recreational coho fishery effective August 1, 2002 as the quota of 22,500 adipose fin clipped coho was projected to be taken.

Aug. 2 NMFS inseason conference number eleven results in a forth opening period of the non-Indian commercial troll salmon season from the U.S./Canada border to Cape Falcon from August 9-18 with a 400 fish landing limit per vessel for the 10-day period and rescinding the restriction of a maximum of 4 spreads per line in the Cape Falcon to Leadbetter Point area to allow better access to coho.

Aug. 14 NMFS inseason conference number twelve results in prohibiting chinook retention in the Columbia River, La Push, and Neah Bay recreational ocean fisheries effective August 8, 2002; changing the bag limit in the Westport recreational ocean salmon fishery to two salmon, no more than one of which may be a chinook, effective August 11-15; and closing the Westport fishery on Friday and Saturday, August 16-17 pending an update. The overall chinook quota for the north of Cape Falcon recreational ocean salmon fishery was reduced by 1,800 chinook to 40,969 to account for hook-and-release mortality associated with the coho-only regulation for the Columbia River, La Push, and Neah Bay areas.

Aug. 15 NMFS inseason conference number thirteen results in allowing two additional days in the Westport recreational ocean salmon fishery, August 18-19, with closure of the fishery effective midnight August 19, 2002.

Aug. 21 NMFS inseason conference number fourteen results in a fifth opening period of the non-Indian commercial troll salmon season from the U.S./Canada border to Cape Falcon from August 22-28 with a 250 fish landing limit per vessel for the seven-day period.

Aug. 29 NMFS inseason conference number fifteen results in closure of the Columbia River recreational fishery effective midnight September 2, and provided a contingency to transfer 5,000 coho from the Westport recreational area quota to the Columbia River recreational area, if necessary to continue the Columbia River area recreational fishery through September 2. This contingency was not exercised.

Aug. 30 NMFS inseason conference number sixteen results in an update of the non-Indian commercial troll salmon season from the U.S./Canada border to Cape Falcon, and a determination that the fishery remain closed for the season.

Sep. 4 NMFS inseason conference number seventeen results in transfer of the remaining coho from Neah Bay (3,433), and La Push (1,130) quotas, and up to 9,000 from the Westport quota to the Columbia River area recreational fishery, and reopening of the Columbia River fishery September 6-15 for selective retention adipose fin clipped coho only.

Sep. 9	NMFS inseason conference number eighteen results in closure of the Humbug Mt. to Oregon/California border non-Indian commercial salmon fishery effective September 9, 2002 as the 2,000 chinook quota was projected to be taken.
Sep. 19	NMFS inseason conference number nineteen results in closure of the Oregon/California border to Humboldt south jetty non-Indian commercial salmon fishery effective September 20, 2002 as the 10,000 chinook quota was projected to be taken.

GENERAL MANAGEMENT ACTIONS AND INSEASON CONFERENCES, (continued)

Sep. 24 — NMFS inseason conference number twenty results in reopening of the Oregon/California border to Humboldt south jetty non-Indian commercial salmon fishery September 26-27 with a 40 fish per day possession and landing limit, an 80 fish per vessel landing limit for the two-day open period, a requirement that all fish must be landed within the area and within 24 hours of closure, and a requirement that no fish from outside the area may be landed during the open period or within 24 hours of closure.

Sep. 26 — NMFS inseason conference number twenty one results in continuation of the Quileute Tribal Ceremonial and Subsistence troll fishery September 16 to October 15, 2002 with no minimum size limit and a 20 fish per day retention limit.

NON-INDIAN COMMERCIAL TROLL SEASONS

Mar. 20 — Cape Falcon to Florence south jetty, non-Indian commercial all-salmon-except-coho fishery opens through July 15. The fishery reopens August 1 through 29 and September 1 through October 31.

Florence south jetty to Humbug Mt., non-Indian commercial all-salmon-except-coho fishery opens through June 30. The fishery reopens July 17 through August 29 and September 1 through October 31.

Humbug Mt. to Oregon/California border, non-Indian commercial all-salmon-except-coho fishery opens through May 31. The fishery is scheduled to reopen June 1 through the earlier of June 30 or a 3,000 chinook quota, July 1 through the earlier of July 31 or a 1,500 chinook quota, August 1 through the earlier of August 29 or a 3,000 chinook quota, and September 1 through the earlier of September 30 or a 2,000 chinook quota.

May 1 — U.S./Canada border to Cape Falcon, non-Indian commercial all-salmon-except-coho fishery opens through the earlier of June 30 or a 50,000 chinook quota.

Pt. Arena to Pigeon Point, non-Indian commercial all-salmon-except-coho fishery opens through September 30.

Pigeon Point to U.S./Mexico border, non-Indian commercial all-salmon-except-coho fishery opens through September 30.

May 31 — Humbug Mt. to Oregon/California border, non-Indian commercial all-salmon-except-coho fishery closes. The fishery is scheduled to reopen June 1 through the earlier of June 30 or a 3,000 chinook quota, July 1 through the earlier of July 31 or a 1,500 chinook quota, August 1 through the earlier of August 29 or a 3,000 chinook quota, and September 1 through the earlier of September 30 or a 2,000 chinook quota.

June 1 — Humbug Mt. to Oregon/California border, non-Indian commercial all-salmon-except-coho fishery reopens through the earlier of June 30 or a 3,000 chinook quota.

June 7 — U.S./Canada border to Cape Falcon, non-Indian commercial all-salmon-except-coho fishery closes effective midnight as the 50,000 chinook quota is reached.

June 30 — Florence South Jetty to Humbug Mt., non-Indian commercial all-salmon-except-coho fishery closes. The fishery reopens July 17 through August 29, and September 1 through October 31.

Humbug Mt. to Oregon/California border, non-Indian commercial all-salmon-except-coho fishery closes as scheduled. The fishery is scheduled to reopen July 1 through the earlier of July 31 or a 1,500 chinook quota, August 1 through the earlier of August 29 or a 3,000 chinook quota, and September 1 through the earlier of September 30 or a 2,000 chinook quota.

July 1 — Humbug Mt. to Oregon/California border, all-salmon-except-coho fishery reopens through the earlier of July 29 or a 1,500 chinook quota.

NON-INDIAN COMMERCIAL TROLL SEASONS, (continued)

July 1-8	U.S./Canada border to Cape Falcon, non-Indian commercial all-salmon-except-coho fishery opens with a 250 chinook landing limit per vessel for the eight day open period. The fishery is scheduled to run through the earlier of September 8 or a 35,532 chinook quota (32,500 preseason plus 3,032 rollover from May/June season).
July 12-22	U.S./Canada border to Cape Falcon, non-Indian commercial all-salmon-except-coho fishery opens with a 400 chinook landing limit per vessel for the eleven day open period.
July 15	Cape Falcon to Florence south jetty, non-Indian commercial all-salmon-except-coho fishery closes. The fishery reopens August 1 through 29 and September 1 through October 31
July 17	Florence south jetty to Humbug Mt., Oregon, all-salmon-except-coho fishery opens through August 29.
July 20	Horse Mt. to Point Arena, non-Indian commercial all-salmon-except-coho fishery opens through the earlier of July 30 or a 10,000 chinook quota.
July 23	Horse Mt. to Point Arena, non-Indian commercial all-salmon-except-coho fishery closes effective midnight as the 10,000 chinook quota is reached. The fishery reopens August 1 through August 30 and September 1 through September 30.
July 26	Humbug Mt. to Oregon/California border, non-Indian commercial all-salmon-except-coho fishery closes effective midnight as the 1,500 chinook quota is reached.
July 26-Aug. 5	U.S./Canada border to Cape Falcon, non-Indian commercial all-salmon-except-coho fishery opens with a 500 chinook landing limit per vessel for the eleven day open period.
Aug. 1-5	Leadbetter Point to Cape Falcon, non-Indian commercial fishery opens for the selective retention of coho with a healed adipose fin clip and the chinook landing restrictions for the U.S./Canada border to Cape Falcon fishery. Coho retention is scheduled to run through the earlier of September 8 or a subarea quota of 5,000 coho, or a chinook 35,532 quota for the U.S./Canada border to Cape Falcon, non-Indian commercial fishery.
Aug. 1	Horse Mt. to Point Arena, non-Indian commercial all-salmon-except-coho fishery opens through August 30.
	Humbug Mt. to Oregon/California, border non-Indian commercial all-salmon-except-coho fishery reopens through the earlier of August 29 or a 3,000 chinook quota.
	Cape Falcon to Florence south jetty, Oregon, non-Indian commercial all-salmon-except-coho fishery reopens through August 29.
Aug. 9-18	U.S./Canada border to Cape Falcon, non-Indian commercial fishery opens with a 400 chinook landing limit per vessel for the ten day open period.
Aug. 16	Oregon/California border to Humboldt south jetty, non-Indian commercial all-salmon-except-coho fishery opens through the earlier of August 30 or a 3,000 chinook quota. The fishery reopens September 1 through the earlier of September 30 or a 10,000 chinook quota.
Aug. 22-28	U.S./Canada border to Cape Falcon, non-Indian commercial fishery opens for the final period with a 250 chinook landing limit per vessel for the seven day open period.
Aug. 29	Cape Falcon to Florence south jetty, non-Indian commercial all-salmon-except-coho fishery closes for 2 days. The fishery reopens September 1 through October 31.

	Florence south jetty to Humbug Mt., non-Indian commercial all-salmon-except-coho fishery closes for 2 days. The fishery reopens September 1 through October 31.
	Scheduled closure of the Humbug Mt. to Oregon/California border, non-Indian commercial all-salmon-except-coho fishery. The fishery reopens September 1 through the earlier of September 30 or a 2,000 chinook quota.
	NON-INDIAN COMMERCIAL TROLL SEASONS, (continued)
Aug. 30	Oregon/California border to Humboldt south jetty, non-Indian commercial all-salmon-except-coho fishery closes as scheduled.
	Horse Mt. to Point Arena, non-Indian commercial all-salmon-except-coho fishery closes for one day. Fishery reopens September 1 through September 30.
Sep. 1	Cape Falcon to Florence south jetty, non-Indian commercial all-salmon-except-coho fishery reopens through October 31.
	Florence south jetty to Humbug Mt., non-Indian commercial all-salmon-except-coho fishery reopens through October 31.
	Humbug Mt. to Oregon/California, border non-Indian commercial all-salmon-except-coho fishery reopens through the earlier of September 30 or a 2,000 chinook quota.
	Oregon/California border to Humboldt south jetty, non-Indian commercial all-salmon-except-coho fishery reopens through the earlier of September 30 or a quota of 10,000 chinook.
	Horse Mt. to Pt. Arena, all-salmon-except-coho fishery reopens through September 30.
Sep. 9	Humbug Mt. to Oregon/California, border non-Indian commercial all-salmon-except-coho fishery closes effective midnight as the 2,000 chinook quota is reached.
Sep. 20	Oregon/California border to Humboldt south jetty, non-Indian commercial all-salmon-except-coho fishery closes for five days.
Sep. 26	Oregon/California border to Humboldt south jetty, non-Indian commercial all-salmon-except-coho fishery opens through September 27.
Sep. 27	Oregon/California border to Humboldt south jetty, non-Indian commercial all-salmon-except-coho fishery closes effective midnight as the 10,000 chinook quota is reached.
Sep. 30	Pigeon Pt. to U.S./Mexico border, non-Indian commercial all-salmon-except-coho fishery closes.
	Pt. Arena to Pigeon Pt., non-Indian commercial all-salmon-except-coho fishery closes.
	Horse Mt. to Pt. Arena, non-Indian commercial all-salmon-except-coho fishery closes.
Oct. 1	Pt. Reyes to Pt. San Pedro, non-Indian commercial all-salmon-except-coho fishery opens Mondays through Fridays, through October 18.
Oct. 18	Pt. Reyes to Pt. San Pedro, non-Indian commercial all-salmon-except-coho fishery closes.
Oct. 31	Cape Falcon to Florence south jetty non-Indian commercial all-salmon-except-coho fishery closes.
	Florence south jetty to Humbug Mt., non-Indian commercial all-salmon-except-coho fishery closes.
	TREATY INDIAN COMMERCIAL TROLL SEASONS

May 1	All-salmon-except-coho fisheries open through the earlier of June 30 or a 30,000 chinook quota for the May through June season (any remainder of the quota is not transferable to the July 1 through September 15 season).
June 30	All-salmon-except-coho fisheries close as scheduled.
July 1	All-salmon fisheries open through the earlier of September 15, a 30,000 chinook quota, or a 60,000 coho quota.
Sept. 15	All-salmon fisheries close.

RECREATIONAL SEASONS

Feb. 16	Horse Mt. to Pt. Arena, all-salmon-except-coho fishery opens through July 7. The fishery is scheduled to reopen July 20 through November 17.
Mar. 30	Pigeon Pt. to the U.S./Mexico border, all-salmon-except-coho fishery opens through September 29.
Apr. 1	Cape Falcon to Humbug Mt., all-salmon-except-coho fishery opens through October 31. The fishery allows retention of adipose fin clipped coho beginning July 7 through the earlier of August 4 or a 22,500 coho quota, then reverts back to all-salmon-except-coho for the remainder of the season.
Apr. 13	Point Arena to Pigeon Pt., all-salmon-except-coho fishery opens through November 10.
May 15	Humbug Mt. to Horse Mt., all-salmon-except-coho fishery opens through June 30. The fishery reopens July 3 through 4, and reopens again August 1 through September 15.
May 25	U.S./Canada border to Cape Falcon, all-salmon-except-coho fishery opens through the earlier of June 16 or a 20,000 chinook quota.
June 16	U.S./Canada border to Cape Falcon, all-salmon-except-coho fishery closes as scheduled.
June 30	Queets River to Leadbetter Pt., all-salmon fishery opens though the earlier of September 8, a 32,000 chinook guideline, or a 39,280 coho quota. Fishery runs Sunday to Thursday through August 15, and seven days per week starting August 16. Daily-bag-limit is two fish; all coho must have a healed adipose fin clip. Humbug Mt. to Horse Mt., all-salmon-except-coho fishery closes. The fishery reopens July 3 through 4, and August 1 through September 15.
July 3	Humbug Mt. to Horse Mt., all-salmon-except-coho fishery reopens through July 4.
July 4	Humbug Mt. to Horse Mt., all-salmon-except-coho fishery closes. The fishery reopens August 1 through September 3.
July 7	U.S./Canada border to Cape Alava, all-salmon fishery opens seven days per week through the earlier of September 8, a 2,600 chinook guideline, or a 11,780 coho quota. Daily-bag-limit is two fish; all coho must have a healed adipose fin clip. Cape Alava to Queets River, all-salmon fishery opens seven days per week though the earlier of September 8, a 1,500 chinook guideline, or a 2,770 coho quota. Daily-bag-limit is two fish; all coho must have a healed adipose fin clip. Leadbetter Pt. to Cape Falcon, all-salmon fishery opens though the earlier of September 30, a 11,200 chinook guideline, or a 55,700 coho quota. Fishery runs Sundays through Thursdays, through August 15, and seven days per week starting August 16. Daily-bag-limit is two fish; all coho must have a healed adipose fin clip. Closed between Tillamook Head and Cape Falcon beginning August 1.

	Horse Mt. to Pt. Arena, all-salmon-except-coho fishery closes. The fishery is scheduled to reopen July 20 through November 17.
	Cape Falcon to Humbug Mt., all-salmon selective coho fishery opens seven days per week through the earlier of August 4 or a quota of 22,500 coho; all coho must have a healed adipose fin clip. The fishery reopens for all-salmon-except-coho the earlier of August 5 or the attainment of the coho quota, through October 31.
July 20	Horse Mt. to Pt. Arena, all-salmon-except-coho fishery reopens through November 17.
July 21	U.S./Canada border to Cape Alava, Cape Alava to Queets River, and Queets River to Leadbetter Pt., fisheries increase chinook minimum length from 24 inches to 28 inches; Leadbetter Pt. to Cape Falcon all-salmon fishery increases chinook minimum length from 24 inches to 26 inches.

RECREATIONAL SEASONS, (continued)

July 26	Cape Falcon to Humbug Mt., all-salmon selective coho fishery closes as the coho quota of 22,500 is reached.
July 27	Cape Falcon to Humbug Mt., all-salmon-except-coho fishery reopens following the closure of the all-salmon selective coho fishery through October 31.
Aug. 1	Humbug Mt. to Horse Mt., all-salmon-except-coho fishery reopens through September 15.
Aug. 8	U.S./Canada border to Cape Alava, Cape Alava to Queets River, and Leadbetter Pt. to Cape Falcon fisheries prohibit retention of chinook.
	Queets River to Leadbetter Pt., all-salmon fishery bag limit changed to two fish, only one of which may be a chinook.
Aug. 15	Queets River to Leadbetter Pt., all-salmon fishery closes for two days.
Aug. 18	Queets River to Leadbetter Pt., all-salmon fishery reopens through August 19.
Aug. 19	Queets River to Leadbetter Pt., all-salmon fishery closes.
Sep. 2	Leadbetter Pt. to Cape Falcon, selective coho fishery closes for 3 days.
Sep. 6	Leadbetter Pt. to Cape Falcon, selective coho fishery opens through September 15.
Sep. 8	U.S./Canada border to Cape Alava, selective coho fishery closes as scheduled.
	Cape Alava to Queets River, selective coho fishery closes as scheduled.
Sep. 15	Humbug Mt. to Horse Mt., all-salmon-except-coho fishery closes.
	Leadbetter Pt. to Cape Falcon, selective coho fishery closes as the north of Cape Falcon recreational quota of 40,933 chinook is reached.
Sep. 21	La Push area (Teahwhit Head to "Q" buoy to Cake Rock east to the shoreline), all-salmon selective coho fishery reopens through the earlier of October 21, a 100 chinook guideline, or a 100 coho quota.
Sep. 29	Pigeon Pt. to U.S./Mexico border, all-salmon-except-coho fishery closes.
Oct. 6	La Push area, all-salmon selective coho fishery closes as scheduled.
Oct. 31	Cape Falcon to Humbug Mt., all-salmon-except-coho fishery closes.

Nov. 10	Pt. Arena to Pigeon Pt., all-salmon-except-coho fishery closes.
Nov. 17	Horse Mt. to Pt. Arena, all-salmon-except-coho fishery closes.

a/ Unless stated otherwise, season openings or modifications of restrictions are effective at 0001 hours of the listed date. Closures are effective at midnight.

STATUS REPORT OF THE 2002 OCEAN SALMON FISHERIES OFF WASHINGTON, OREGON, and CALIFORNIA.
Preliminary Data Through October 15, 2002.

	Fishery and Area	Season Dates	Effort Days fished	CHINOOK Catch	CHINOOK Quota	CHINOOK Percent	COHO Catch	COHO Quota	COHO Percent
	TROLL								
a/	Treaty Indian	5/1-6/30	159	16,161	30,000	54%	Non-Retention		
		7/1-9/15	174	22,954	30,000	77%	17,493	60,000	29%
b/, c/	Non-Indian North of Falcon	5/1-6/7	710	46,986	50,000	94%	Non-Retention		
d/		7/1-8/28	1,000	35,082	35,532	99%	Non-Retention		
	Leadbetter Pt. - Cape Falcon	8/1-8/28	w/above	w/ above	w/ above	w/ above	1,687	5,000	34%
	Cape Falcon-Florence S. Jetty	3/20-7/15	2,610	40,707	None	NA	Non-Retention		
		8/1-8/29	753	13,124	None	NA	Non-Retention		
		9/1-10/31	1,650	62,325	None	NA	Non-Retention		
	Florence S. Jetty - Humbug Mt.	3/20-6/30	2,730	67,068	None	NA	Non-Retention		
		7/17-8/29	784	19,742	None	NA	Non-Retention		
		9/1-10/31	680	23,185	None	NA	Non-Retention		
	Humbug Mtn-OR/CA Border	3/20-5/31	42	227	None	NA	Non-Retention		
		6/1-6/30	69	897	3,000	30%	Non-Retention		
		7/1-7/26	80	1,446	1,500	96%	Non-Retention		
		8/1-8/29	67	1,337	3,000	45%	Non-Retention		
		9/1-9/9	70	2,305	2,000	115%	Non-Retention		
	OR/CA Border -Humboldt S. Jetty	8/16-8/30	115	2,100	3,000	70%	Non-Retention		
		9/1-9/27	400	9,300	10,000	93%	Non-Retention		
	Horse Mtn-Pt. Arena	7/20-7/23	200	17,290	10,000	173%	Non-Retention		
		8/1-8/30	935	33,100	None		Non-Retention		
		9/1-9/30	300	6,900	None	NA	Non-Retention		
	Pt. Arena-Pigeon Pt.	5/1-9/30	6,500	272,700	None	NA	Non-Retention		
	Pt. Reyes to Pt. San Pedro	10/1-10/18	50	700	None	NA	Non-Retention		
	Pigeon Pt.-US/Mexico Border	5/1-9/30	3,100	7,120	None	NA	Non-Retention		

	RECREATIONAL	Season Dates	Effort Angler Days	CHINOOK Catch	CHINOOK Quota	CHINOOK Percent	COHO Catch	COHO Quota	COHO Percent
c/	US/Canada Border to Cape Falcon	5/25-6/16	17317	19,437	20,000		Non-Retention		
b/, e/	US/Canada Border-Cape Alava	7/7-9/8	10,563	3,783	2,600	146%	8,347	11,780	71%
b/, e/	Cape Alava-Queets River	7/7-9/8	2,595	1,724	1,600	108%	1,640	2,770	59%
		9/21-10/6	509	130	100	130%	27	100	27%
b/, e/	Queets River-Leadbetter Pt.	6/30-8/19	29,296	26,987	32,000	84%	19,000	39,280	48%
b/, e/	Leadbetter Pt.-Cape Falcon	7/7-9/15	47,132	8,458	11,200	76%	59,601	55,700	107%
	Cape Falcon-Humbug Mtn	4/1-10/31	34,000	20,300	None	NA	Non-Retention		
		7/7-7/29	33,381	12,298	None	NA	21,088	22,500	94%
	Humbug Mtn-Horse Mtn	5/15-6/30	15,600	11,200	None	NA	Non-Retention		
		7/3-7/4	1,228	635	None	NA	Non-Retention		
		8/1-9/15	26,693	14,060	None	NA	Non-Retention		
	Horse Mtn-Pt. Arena	2/16-7/7	18,300	19,200	None	NA	Non-Retention		
		7/20-11/17	13,200	11,800	None	NA	Non-Retention		
	Pt. Arena-Pigeon Pt.	4/13-11/10	85,800	84,600	None	NA	Non-Retention		
	Pigeon Pt.-US/Mexico Border	3/30-9/29	56,200	40,300	None	NA	Non-Retention		

TOTALS TO DATE	Effort 2002	Effort 2001	Effort 2000	Chinook Catch 2002	Chinook Catch 2001	Chinook Catch 2000	Coho Catch 2002	Coho Catch 2001	Coho Catch 2000
TROLL									
Treaty Indian	333	539	241	39,115	25,382	7,660	17,493	36,755	22,174
Washington Non-Indian	1,310	764	421	54,425	21,229	10,269	170	8,112	5,267
Oregon	9,483	10,125	6,167	231,720	259,449	113,911	1,500	9,367	12,258
California	11,600	12,600	20,100	143,290	179,600	479,100	0	0	0
Total Troll	22,726	24,028	26,929	468,550	485,660	610,940	19,163	54,234	39,699
RECREATIONAL									
Washington	65,898	126,400	48,900	57,743	22,974	8,478	74,183	168,062	68,199
Oregon	94,536	113,520	65,150	45,307	27,104	20,975	36,102	94,342	25,975
California	194,700	161,000	210,400	171,800	95,200	183,000	1,200	1,300	400
Total Recreational	355,134	400,920	324,450	274,850	145,278	212,453	111,485	263,704	94,574
PFMC Total	377,860	424,948	351,379	743,400	630,938	823,393	130,648	317,938	134,273

→correction by Allen Grover -<this should be 349,210?

a/ Treaty troll effort is reported as landings.
b/ Numbers shown as chinook quotas for non-Indian troll and recreational fisheries North of Falcon are guidelines rather than quotas. Only the total chinook allowable catch is a quota.
c/ All coho fisheries are mark selective for coho with healed adipose fin clips.
d/ Preseason chinook quideline of 32,500 chinook.
e/ For areas north of Cape Falcon, the total allowable chinook catch quota as of August 31, 2002 was 40,933 resulting from a 47,500 preseason quota plus 550 remaining from May-June chinook fishery minus 5,300 for hooking mortality associated with inseason change in size limits minus 1,817 for hooking mortality associated with inseason change to chinook nonretention in all areas except Leadbetter Point to Queets River. Values for indidual

UPDATE OF ONGOING FISHERIES

Situation: A summary of the management events for the 2002 salmon season (updated through October 9) is contained in Exhibit C.2.b. There have been three inseason management conferences or actions since the September Council meeting, and no additional conferences are expected during the remainder of the season. The only ocean salmon fishing seasons remaining are the all-salmon-except-coho seasons for the recreational fisheries between Horse Mountain and Pigeon Point, California (which close in November), the recreational and commercial fisheries off central Oregon (which close October 31), and the limited area state water fisheries off Oregon.

Mr. Allen Grover, Vice Chair of the Salmon Technical Team (STT), will provide detailed effort and harvest data for the 2002 salmon season (Exhibit C.2.c) in his report to the Council.

Council Task:

1. Discuss issues relevant to inseason management of salmon fisheries.

Reference Materials:

1. Sequence of Events in Ocean Salmon Fishery Management, January through October 9, 2002 (Exhibit C.2.b, Sequence of Events).
2. Status Report of the 2002 Ocean Salmon Fisheries off Washington, Oregon, and California (Exhibit C.2.c, Supplemental STT Report).

Agenda Order:

a.	Agendum Overview	Chuck Tracy
b.	Sequence of Events	
c.	Status of Fisheries	Allen Grover
d.	Reports and Comments of Advisory Bodies	
e.	Public Comment	
f.	Council Discussion	

PFMC
1/3/13

PACIFIC FISHERY MANAGEMENT COUNCIL SCHEDULE FOR DEVELOPING 2003 OCEAN SALMON FISHERY MANAGEMENT MEASURES

Jan. 21-24	The Salmon Technical Team (STT) and Council staff economist meet in Portland, Oregon to draft *Review of 2002 Ocean Salmon Fisheries*. This report summarizes seasons, quotas, harvest, escapement, socioeconomic statistics, achievement of management goals, and impacts on species listed under the Endangered Species Act. (February 7 print date, mailed to the Council February 27, and available to the public March 4.)
Feb. 18-21	STT meets in Portland, Oregon to complete *Preseason Report I Stock Abundance Analysis for 2002 Ocean Salmon Fisheries*. This report provides key salmon stock abundance estimates and precision, harvest and escapement estimates when recent regulatory regimes are projected on 2002 abundance, and other pertinent information to aid development of management options. (February 26 print date, mailed to the Council February 27, and available to the public March 4.)
Feb. 27 through March 9	State agencies, tribes, and fishers review preseason abundance projections and range of probable fishery options. The Klamath Fishery Management Council completes recommendations for ocean management options affecting Klamath River fall chinook.
March 4	Council reports summarizing the 2002 salmon season and projecting the expected salmon stock abundance for 2003 are available to the public from the Council office.
March 10-14	Council and advisory entities meet at the Red Lion Hotel Sacramento, Sacramento, California to adopt 2003 regulatory options for public review. The Council adopts preliminary options on March 11, tentative options for STT analysis on March 12, and final options for public review on March 14.
March 17 though April 6	Management agencies, tribes, and public develop their final recommendations for the regulatory options. North of Cape Falcon Forum meetings are tentatively scheduled for March 19-20 (Portland area) and April 2-3 (Seattle area). Council staff completes a preliminary draft *Environmental Assessment for the Proposed 2002 Management Measures for the Ocean Salmon Fishery Managed under the Pacific Coast Salmon Plan.*
March 25	Council staff distributes *Preseason Report II Analysis of Proposed Regulatory Options for 2003 Ocean Salmon Fisheries* to the public. The report includes the public hearing schedule, comment instructions, option highlights, and tables summarizing the biological and economic impacts of the proposed management options.
March 31 and April 1	Sites and dates of public hearings to review the Council's proposed regulatory options are: Westport, Washington (March 31); North Bend, Oregon (March 31); and Eureka, California (April 1). Additional hearings will be held by Oregon Department of Fish and Wildlife and California Department of Fish and Game as follows: Tillamook, Oregon (April 1) and Moss Landing, California (April 2). Comments on the options will also be taken during the Council meeting on April 8 in Vancouver, Washington.
April 7-11	Council and advisory entities meet to adopt final regulatory measures at the Red Lion Hotel at the Quay in Vancouver, Washington. The Council will tentatively adopt final regulatory measures for analysis by the STT on April 8. Final adoption of recommendations to National Marine Fisheries Service will be completed on April 10.
April 12-16	The STT completes *Preseason Report III Analysis of Council-Adopted Regulatory Measures for 2003 Ocean Salmon Fisheries*.
April 17-27	Council staff completes final *Environmental Assessment for the Proposed 2002 Management Measures for the Ocean Salmon Fishery Managed under the Pacific Coast Salmon Plan* for submission to NMFS.
	Council staff distributes adopted ocean salmon fishing management recommendations.
May 1	NMFS implements federal ocean salmon fishing regulations, and *Preseason Report III* is made available to the public.

SALMON MANAGEMENT 2003 OPTION HEARING SITES AND PRESEASON SCHEDULE

Situation: To plan, announce, and meet *Federal Register* deadlines for public hearing sites and the entire preseason salmon management process, staff needs to confirm details of the process prior to the end of November. The proposed 2003 process and schedule is contained in Exhibit C.3 Attachment 1. It follows the same format as in previous years.

For 2003, Council staff recommends one salmon management option hearing per coastal state, the same schedule as in 2002. The hearings would be:

March 31 Westport, Washington and Coos Bay, Oregon
April 1 Eureka, California

In 2003, the March Council meeting will occur in Sacramento, California and the April Council meeting in Vancouver, Washington. Therefore, the public comment period on Tuesday of the April meeting in Vancouver also serves as a public comment opportunity. If the states desire to have additional hearings, we suggest they organize and staff them as was done last year. The table below provides the public attendance at the hearing sites since 1995 for Council reference.

Hearing Site Location[1/]	Public Attendance							
	1995	1996	1997	1998	1999	2000	2001	2002
Westport	49	30	22	4	18	24	30	11
Astoria	28	23	16	-	14	-	-	-
Tillamook	-	-	-	28	-	13	16 [2/]	18 [2/]
North Bend/Coos Bay	22	30	27	15	31	36	18	40
Eureka	30	45	27	16	18	37	12	25
Sacramento	16	-	-	13	-	-	-	-
Santa Rosa	-	-	-	-	-	4	-	-
Moss Landing[2/]	-	-	-	100	51	50	33	14

1/ Sites in bold are proposed for Council staffing in 2003.
2/ Hearing staffed by state personnel.

Council Action:

1. Confirm Council-staffed hearing sites and state intentions for additional hearings.
2. Approve staff's overall proposed schedule and process for developing 2003 ocean salmon management measures (Exhibit C.3, Attachment 1).

References:

1. Proposed Pacific Fishery Management Council Schedule for Developing 2003 Ocean Salmon Fishery Management Measures (Exhibit C.3, Attachment 1).

Agenda Order:

a. Agendum Overview — Chuck Tracy
b. Agency and Tribal Comments
c. Reports and Comments of Advisory Bodies
d. **Council Action:** Approve Hearing Sites and Management Schedule

PFMC
10/15/02

SCIENTIFIC AND STATISTICAL COMMITTEE REPORT ON RESULTS OF SCIENTIFIC AND STATISTICAL COMMITTEE METHODOLOGY REVIEW

Mr. Jim Packer and Mr. Larrie LaVoy of the Washington Department of Fish and Wildlife (WDFW) presented a progress report to a joint meeting of the Scientific and Statistical Committee (SSC) Salmon Subcommittee and the Salmon Technical Team (STT) on modifications to the chinook Fisheries Regulation Assessment Model (FRAM). This meeting was held on October 15, 2002 in Portland. Their report described two important changes to the model for the 2003 management season:

1. Chinook FRAM has been recalibrated and the period for model validation runs has been expanded.
2. Chinook FRAM has been changed to accommodate the modeling of mark-selective fisheries.

Model Recalibration and Validation

The chinook FRAM recalibration changes include:

- Extending the database used for model calibration to include 1997-2000 return year data.
- Moving some out-of-base period stocks back into the base year period.
- Adding a White River Hatchery yearling stock to the coded-wire tag data used by the FRAM model.

In addition, catches for the period 1983-2000 were updated and new "validation" model runs were produced for this period. All these changes should improve the model.

Changes to Accommodate Mark-Selective Fisheries

As was done previously for coho FRAM, the capability for each stock in the model to have both marked (adipose fin clipped) and unmarked components was added. The same selective fisheries algorithms used in the coho FRAM were implemented in chinook FRAM. These algorithms calculate impacts in mark-selective fisheries following the recommendations of the Selective Fishery Evaluation Committee of the Pacific Salmon Commission. They are based on four user-defined parameters: release mortality rate, marked fish recognition error, unmarked fish recognition error, and drop-off mortality rate. The program estimates encounters in the selective fishery as the number of fish that would have been landed without mark-selective regulations. Mortalities of unmarked fish are estimated based upon the user-defined parameters applied to the estimated encounters. A special selective fishery report has been developed to summarize all stock impacts for each fishery.

The chinook FRAM is considerably more complex than the coho FRAM, because:

- Chinook FRAM is a multiple-age model while coho FRAM is a single-age model.
- Chinook FRAM incorporates a growth algorithm that is applied to sub-legal fish.
- Chinook FRAM calculates "shaker" mortality for sub-legal sized fish.

The most important task yet to be completed before chinook FRAM potentially could be used to evaluate salmon fishery proposals which include mark-selective fisheries for 2003 is modification to the terminal area management modules (TAMMs). The TAMMs need to be changed to accept marked and unmarked estimates of abundance by stock and separately estimate impacts for these marked and unmarked components. This work is on-going and should be completed in January 2003.

A continuing problem with both the coho and chinook FRAMs is the lack of documentation and validation for these models. There is a need to document how each model works (model algorithms, data inputs, model assumptions, etc.) and how the models are used (model recalibration, model validation, etc.). With the continued lack of documentation, the viability of both models could be threatened by the departure of one or two key people with the most complete understanding of all model aspects.

Conclusions and Recommendations

The SSC has the following conclusions and recommendations concerning the modified chinook FRAM and its use in the 2003 management process:

1. The material presented to the review group indicated that the modified chinook FRAM is capable of duplicating the results of the previous version of the model in the absence of mark- selective fisheries. Therefore, the modified FRAM can be used to assess impacts if mark-selective fisheries are not under consideration and the changes to the TAMMs described above are made.
2. The SSC cannot evaluate the model as a tool for assessing mark-selective fisheries, because of the lack of written documentation and appropriate model validation. Therefore, the SSC cannot support the use of the modified chinook FRAM to evaluate mark-selective fishery proposals in 2003.
3. If the Council chooses to use the modified chinook FRAM to evaluate mark-selective fishery proposals in 2003, the SSC supports the STT recommendation to establish buffers for management targets to compensate for the increased bias and uncertainty of model estimates (Exhibit C.4.c Supplemental STT Report).
4. As has been recommended in previous SSC statements on the FRAM models, Model Evaluation Subgroups should be formed for both the coho and chinook FRAMs. These groups should have participants from all interested agencies. The purpose of these groups would be to:

    - Increase the number of people who understand the model, can run the model, and make changes to the model, so the departure of any single person does not disrupt the viability of the FRAMs.
    - Propose changes to the model which would improve the model for its intended management purposes.
    - Validate the current model.
    - Review and validate any changes to the model.
    - Conduct postseason evaluations of model performance.
    - Conduct a sensitivity analysis of model outputs to specific model inputs.

Model documentation is required for the SSC to identify the specific issues related to the model that need detailed review. Review is necessary to identify the strengths and weaknesses of the chinook FRAM in relation to Council-managed fisheries. A detailed review should occur in 2003, prior to the use of the model in 2004.

PFMC
10/29/02

SALMON TECHNICAL TEAM COMMENTS
METHODOLOGY REVIEW – MODIFICATION OF CHINOOK FRAM

On October 15, 2002, the Salmon Technical Team (STT) met jointly with the Scientific & Statistical Committee's (SSC) Salmon Subcommittee to review modifications to chinook FRAM which are proposed for implementation beginning with the 2003 season. These modifications were undertaken pursuant to a WDFW-tribal agreement and work plan for the purpose of enabling chinook FRAM to generate estimates of impacts of mark selective fisheries (MSF).

The STT applauds the care and diligence that has been devoted to these modifications and appreciates the thoughtful efforts of agency staff to prepare materials for review. However, at the time of the STT's review, modifications were not complete. Additional work was still required to finalize reporting formats and to complete integration of terminal area management modules (TAMMs) to estimate terminal run sizes, escapements, and exploitation rates for Puget Sound stocks (in addition to incorporating marked and unmarked fish components into calculations, modification of the methods used to compute exploitation rates for South Puget Sound stocks is in progress).

The modifications to chinook FRAM reviewed by the STT generally involved splitting each modeled stock into two components to represent marked and unmarked fish with identical base period exploitation patterns and maturation rates. Parameters for drop off, release mortality, mark recognition error, and unmarked retention error are incorporated per recommendations of the Pacific Salmon Commission's (PSC) Selective Fishery Evaluation Committee, along with a special report formatted to present estimates of selective fisheries impacts on individual stocks. Modifications also include the addition of the White River hatchery yearling stock to the model.

The structural modifications to chinook FRAM are analogous to those employed for coho. For both models, MSFs will increase the uncertainty surrounding estimates of mortalities of unmarked fish due to the heightened significance of various parameters in chinook FRAM, such as drop off and release mortalities, unmarked retention error, and mark recognition error. The values of these parameters are not known with a high degree of certainty and it will not be possible to directly observe mortalities of unmarked fish on stocks of concern. For both models, new methods will be required for future calibrations if there is a need to develop new estimates of exploitation rates based on CWT data collected during time periods affected by MSFs.

However, despite these similarities, there are significant and important differences between the two models that result in greater uncertainties with chinook FRAM than with coho FRAM. These uncertainties could significantly affect the utility of the modified version of chinook FRAM and its acceptability as a means to estimate mortalities of unmarked fish in MSFs. These differences are summarized in Table 1.

Table 1. Summary of differences between chinook and coho FRAM modified for evaluation of mark selective fisheries.

Coho FRAM	Chinook FRAM	Significance
Fish are harvested predominantly as three year olds and escapement accrues in the same year	Fish are harvested at multiple ages and stages of maturity. Some of the fish not harvested in one year accrue to escapements in the same year while others become available for harvest in subsequent years or are lost to natural mortality.	Impacts of a MSF in preterminal areas can have residual effects that last for years after the fishery occurs. These effects become more complex as additional MSFs are implemented in subsequent years.
Monthly time step	Multi-month time step	The longer time step raises at least two issues: (a) Procedures to estimate impacts of inconsistent regulations within a time step will likely be necessary (e.g., a fishery may operate as a retention fishery for part of a time step, a non-retention fishery during another part, and a MSF during yet another part). While it may be possible to address the estimation problem externally, procedures and methods to address this problem have not been presented for STT review; and (b) Computation of sub-legal mortalities depends upon stock-specific growth functions and *"base period sub legal encounter rates."* Long time steps suggest that growth during a time step could be a more significant factor in estimation of both catch and non-catch fishing mortality on unmarked chinook than for coho.
Size limits are not considered as a factor for estimating shaker encounters	Shaker encounters are based on stock-specific growth functions and stock-age-fishery specific "base period encounter rates"	For Chinook, MSFs will exacerbate the problems of estimating incidental mortalities of sublegal fish because of multiple age class and growth considerations. The STT has not reviewed the technical basis for parameter values used for *"base period encounter rates."*
Single release mortality rate	Single release mortality rate directed primarily at sub-legal mortalities	Since legal sized unmarked fish would not be retained regardless of size, there may be a need to further modify Chinook FRAM to incorporate different release mortality rates for sublegal and legal-sized fish.
Includes all major stocks coastwide	Limited to a subset of stocks that contribute primarily to fisheries off the Washington coast and in Puget Sound.	Chinook FRAM does not represent all the stocks that are expected to be encountered in a fishery. Consequently, when catch quotas are modeled, stock-specific impacts are estimated relative to the proportion of the catch comprised of the stocks included in the model during the base period, i.e., the proportion of unmodeled stocks relative to the modeled stocks remains constant. When quotas of marked fish are evaluated in MSFs, this assumption implies that the unrepresented stocks are marked at the same rate as the stocks that are included in the model; the validity of this assumption seems highly improbable. Mark rates of unrepresented fish are likely to be lower than for the populations targeted by MSFs. Unless additional parameters and algorithms are incorporated into the model to reflect differences in anticipated mark rates of marked and unmarked fish from unrepresented stocks, the model will likely generate biased estimates of impacts of MSFs on both marked and unmarked fish.

Conclusions and Recommendations:

1. Review of model structure insufficient. The modified chinook FRAM is proposed as a tool for generating estimates of mortalities of unmarked stocks in Council and inside fisheries. The principal objectives of the Council's management of ocean salmon fisheries is directed at constraining impacts on natural stocks, which are of course unmarked. The STT cannot adequately evaluate the performance of the proposed modification of chinook FRAM in abstract terms. The STT review was extremely limited in scope, being focused primarily on structural modifications. While this type of review can identify potential issues and concerns, it is not sufficient to enable the STT to evaluate the model's utility as a tool to estimate impacts of MSFs on chinook salmon. **The significance of modeling issues must be examined within the context of specific proposals for MSFs and their potential impacts on individual natural stocks of interest to the Council.**

2. Mortalities of unmarked fish likely underestimated. The structure of Chinook FRAM would probably generate underestimates of mortalities of unmarked fish in MSFs. The magnitude and significance of such bias would be dependent upon the location of the MSF; it is clear, however, that the bias would be expected to increase exponentially as MSF harvest rates on marked fish increase. **The STT's review has identified several factors that lead it to conclude that the proposed modifications to chinook FRAM would likely underestimate mortalities of unmarked fish in MSFs.** Some of the key factors are summarized as follows:

> Catch Algorithms. The algorithms employed to estimate fishing mortality do not reflect the potential impacts of increasing the proportion of unmarked fish in the exploited population as MSFs are conducted over time. Since the chinook FRAM computes mortalities as if they occur instantaneously and independently for each fishery at the beginning of a time period, estimates of mortalities of unmarked fish are likely to be underestimated. The catch algorithms do not account for mortalities due to potential multiple encounters, that is fish that survive after being released in a MSF would be expected to become available for recapture. This issue is related to the duration and intensity of MSFs – see summary in Table 1 regarding time step differences.
>
> The proportion of the catch represented by model stocks. Mark rates of unrepresented fish are likely to be lower than for the populations targeted by MSFs. As a result, the model will likely generate biased estimates of impacts of MSFs on both marked and unmarked fish. See summary regarding stock representation in Table 1.

3. Management buffers should be considered. It is clear that MSFs would introduce bias and increase the uncertainty in estimates of mortalities of unmarked fish. If the modified Chinook FRAM is adopted as a means to estimate impacts of MSFs, the Council should interpret results in light of these likely effects. **The STT recommends that the Council consider incorporating an explicit methodology to establish buffers for management targets (e.g., reduce model targets for exploitation rates below ESA jeopardy standards) to compensate for increased bias and uncertainty.** The magnitude of the required buffers is likely to depend on the stocks and MSFs involved so the procedures to determine the appropriate buffer size could become quite complex.

4. Spill over (domino effects). *(a) Interactions with other models and management processes.* Chinook FRAM depends upon the PSC chinook model to generate parameter values required to estimate the impacts of Council and inside fisheries on stocks of concern. Depending on the location and magnitude of MSFs, the **abundance and exploitation rates of marked and unmarked fish from the same cohort could change differentially over time.** If this occurs, significant changes to the PSC chinook model would be required and, more importantly, substantive multi-jurisdictional policy issues that could alter the basis for chinook salmon management in Aggregate Abundance Based Management regimes will eventually have to be addressed by the PSC; *(b) Preseason Abundance Forecasts.* Since chinook FRAM is a single year model, procedures external to the model will be required to track differences in abundance and mortalities of marked and unmarked fish across years. Many preseason abundance forecasts are based on sibling relationships of hatchery fish. Because hatchery fish are likely to be marked, and subject to different patterns of exploitation rates than associated unmarked populations, **separate forecasts may be required for marked and unmarked population components,** depending upon where the MSF occurs and the magnitude of mortality differences in exploitation rates between marked and unmarked fish. Consequently,

adjustments to preseason forecasting methodologies may be a necessary part of the application environment for using the chinook FRAM. A new report summarizing pre-terminal exploitation rates and escapements by age for individual stocks should be developed to support this process.

5. Model Documentation. **The STT strongly recommends that a high priority be placed on updating model documentation** At the very least, documentation of the original chinook FRAM should be redistributed to the STT and SSC, along with a summary of key equations and the sequence of computations, and a description of procedures employed to generate estimates of exploitation rate patterns for stocks lacking CWT data during the model base period. The membership of the STT and SSC has changed since Chinook FRAM was initially reviewed several years ago. Further, changes to model calibration procedures and data, as well as structural modifications to address MSFs have not been formally documented. This creates a situation where the details of the model and its data requirements are largely retained within the personal memories of only a few individuals. Under such circumstances, model maintenance can become problematic. Further, the model itself becomes more vulnerable to criticism as a mysterious "black box." Because the preseason planning processes that support Council decisions depend so heavily upon models, it is important for fishery managers and those affected by Council decisions to have as much confidence as possible in those models. Improved documentation is a key component in facilitating understanding of the inner workings of the models relied upon by the Council.

6. Additional Review. The STT is also concerned that the model is not yet fully integrated into external systems that support its application. For example, (a) the model interface with TAMMs, which are vital to the development of fishing plans and evaluation of regimes in light of ESA consultation standards for Puget Sound stocks, has not yet been completed; and (b) procedures have not been developed to address implications of multi-year impacts of MSFs, such as effects of differences in fishery exploitation and escapement rates of marked and unmarked population components on preseason abundance forecasts. **The STT recommends that an additional technical review be conducted before March 2003, after the interface with the TAMMs is completed.**

7. Model Implementation for Non-Mark Selective Fisheries. The materials provided for STT review indicate that the modified chinook FRAM is capable of replicating results of the previous version of the model in the absence of MSFs.

8. Model Implementation for Mark Selective Fisheries. The STT is not confident that the modified version of chinook FRAM will generate reliable estimates of mortalities of unmarked fish in MSFs. Potential implications of biases and errors that would be introduced into the STT's assessments by the proposed model become more significant as the intensities (as reflected by the proportion of marked fish subjected to the fishery which is removed) of MSFs increase.

9. Model Use for 2003 Chinook Fisheries. **The STT recommends that the modified version of chinook FRAM be adopted for evaluation of non-mark selective fisheries, provided that the functionality of the TAMM interfaces required to assess impacts on Puget Sound stocks is verified. At this time, the STT recommends that the modified chinook FRAM not be adopted as standard methodology to evaluate MSFs that would significantly impact stocks of concern to the Council. The STT recommends that an additional technical review of the capacity of the modified version of chinook FRAM to adequately evaluate MSFs be conducted in March 2003.** The timing of this review would allow the STT to examine specific MSFs that are under consideration within the context of 2003 preseason abundance forecasts. Upon completion of its review, the STT would provide its recommendations regarding the use of the modified version of chinook FRAM for evaluation of 2003 MSFs that may impacts stocks of concern to the Council.

10. 2003 Methodology Review. **The STT recommends that the modified chinook FRAM be reevaluated in depth during the 2003 methodology review cycle.** This would provide adequate time to analyze and address the concerns noted above, and the model could then be adopted as standard methodology.

11. Model Evaluation Workgroup. **The STT again strongly recommends that a multiagency team, similar to the 'Model Evaluation Subgroup' that existed in the late 1990s, be formed.** Many of the concerns expressed above, especially in relation to model documentation, management buffers, and model calibration and maintenance could be addressed through such a group.

SCIENTIFIC AND STATISTICAL COMMITTEE METHODOLOGY REVIEW REPORT

Situation: Each year, the Scientific and Statistical Committee (SSC) completes a methodology review to help assure new or significantly modified methodologies employed to estimate impacts of the Council's salmon management use the best available science. This review is preparatory to the Council's adoption, at the November meeting, of all anticipated methodology changes to be implemented in the coming season, or, in certain limited cases, of providing directions for handling any unresolved methodology problems prior to the formulation of salmon management options in March. Because there is insufficient time to review new or modified methods at the March meeting, the Council may reject their use if they have not been approved the preceding November.

The methodology the SSC is expected to report on at this time is:

- Analysis of selective fisheries in the Chinook Fisheries Regulation Assessment Model (FRAM).

Council Action:

1. Approve methodology changes as appropriate for implementation in the 2003 salmon season.
2. Provide guidance as needed for any unresolved methodology issues.

Reference Materials:

1. Exhibit C.4.b, Supplemental SSC Report.
2. Exhibit C.4.d, Supplemental STT Report

Agenda Order:

a. Agendum Overview — Chuck Tracy
b. SSC Report — Pete Lawson
c. Agency and Tribal Reports and Comments
d. Reports and Comments of Advisory Bodies
e. Public Comment
f. **Council Action:** Adopt Methodology Changes as Appropriate

PFMC
10/15/02