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.

Council Task:

1. Provide information and discussion.

Reference Materials: None.

PFMC
10/10/01

Sequence of events in ocean salmon fishery management, January through October 15, 2001.[1/] (Page 1 of 6)

GENERAL MANAGEMENT ACTIONS AND INSEASON CONFERENCES

Mar. 2 — National Marine Fisheries Service (NMFS) provides the Council with a letter outlining the 2001 management guidance for stocks listed under the Endangered Species Act (ESA).

Mar. 6 — NMFS inseason conference number one (at the Council meeting) results in a Council recommendation to open the commercial and recreational fisheries off Oregon 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. 8 — Council adopts three troll and three recreational ocean salmon fishery management options for public review.

Mar. 13-14 — North of Cape Falcon Salmon Forum meets in Portland, Oregon to initiate consideration of recommendations for treaty Indian and non-Indian salmon management options.

Mar. 27-28 — Council holds public hearings on proposed 2001 management options in three locations within the three Pacific Coast states. In addition, the states of Oregon and California hold additional hearings in Tillamook, Oregon and Moss Landing, California, respectively.

Mar. 28-29 — North of Cape Falcon Salmon Forum meets in Tukwila, Washington to further consider recommendations for treaty Indian and non-Indian salmon management options.

Apr. 5 — 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 1 — Ocean salmon seasons implemented as recommended by the Council and published in the *Federal Register* on May 5 (65 FR 26138).

May 3 — NMFS inseason conference number two results in allowing non-Indian commercial troll salmon caught in the May/June fishery north of Cape Falcon to be landed in Oregon ports south of Cape Falcon as long as notice is given to Oregon Department of Fish and Wildlife prior to leaving the area north of Cape Falcon.

May 21 — NMFS inseason conference number three results in a closure of the Horse Mt. to Point Arena (Fort Bragg) non-Indian commercial troll fishery effective midnight, May 21, 2001, because the quota of 3,000 chinook was projected to be met.

June 13 — NMFS inseason conference number four results in:

Closure of the U.S./Canada border to Cape Falcon non-Indian commercial troll fishery effective midnight, June 15, 2001, because the quota of 17,000 chinook was projected to be met.

Changing the late season (September 24 through October 21) recreational set-aside fishery in the La Push area to match Washington state regulations defining the open area as a line from Teahwhit Head northwesterly to "Q" buoy to Cake Rock then true east to the shoreline.

Correcting the opening date for the Quinault all-species treaty troll fishery published in the *Federal Register* to July 1, 2001.

Allowing fishing 7 days per week in the Humbug Mt. to Oregon/California border commercial troll quota fishery effective June 15, 2001.

July 9 — NMFS inseason conference number five results in closure of the non-Indian commercial troll salmon season from the U.S./Canada border to Leadbetter Pt. affective midnight, Monday July 9, 2001, because the quota of 5,349 was projected to be met.

GENERAL MANAGEMENT ACTIONS AND INSEASON CONFERENCES, (continued)

July 18 NMFS inseason conference number six results in:

Opening of the Queets River to Cape Falcon non-Indian commercial troll salmon season on July 20 under a 4-days open and 3-days closed structure with a landing restriction of 65 chinook per vessel per 4-day open period.

Closure of the Cape Falcon to Humbug Mt. selective coho recreational fishery effective midnight July 19, 2001, because the coho quota of 55,000 was projected to be met.

July 26 NMFS inseason conference number seven results in no change to the Queets River to Cape Falcon non-Indian commercial troll salmon season. The next opening is July 27 through July 30 with a landing restriction of 65 chinook per vessel per 4-day open period.

Aug. 1 NMFS inseason conference number eight results in opening the Queets River to Cape Falcon non-Indian commercial troll salmon season on August 3 through August 12 with a landing restriction of 100 chinook per vessel per 10-day open period.

Aug. 8 NMFS inseason conference number nine results in allowing fishing 7 days per week in the Humbug Mt. to Oregon/California border commercial troll quota fishery effective August 9, 2001.

Aug. 14 NMFS inseason conference number ten results in opening the Queets River to Cape Falcon non-Indian commercial troll salmon season on August 17 through August 27 with a landing restriction of 150 chinook per vessel per 11-day open period.

Aug. 17 NMFS inseason conference number eleven results in no action, but an update on North of Falcon recreational fisheries.

Aug. 22 NMFS inseason conference number twelve results in approval of transfer of 20,000 coho from the North of Falcon non-Indian commercial troll salmon fishery to the Leadbetter Pt. to Cape Falcon recreational fishery if necessary.

Aug. 27 NMFS inseason conference number thirteen results in:

Transfer of 20,000 coho from the North of Falcon non-Indian commercial troll salmon fishery to the Leadbetter Pt. to Cape Falcon recreational fishery.

Allowing the Queets River to Leadbetter Pt. recreational fishery to continue on a 7 days per week schedule effective September 7, 2001.

Aug. 29 NMFS inseason conference number fourteen results in opening the Queets River to Cape Falcon non-Indian commercial troll salmon season on August 31 through September 30 with no chinook landing limit.

Sept. 5 NMFS inseason conference number fifteen results in opening of the recreational fishery in the Klipsan Beach to Leadbetter Pt. area 7 days /week effective September 7, 2001.

NON-INDIAN COMMERCIAL TROLL SEASONS

Apr. 1 Cape Falcon to Florence south jetty, Oregon, all-salmon-except-coho fishery opens through July 18. The fishery will reopen July 27 through August 29 and September 1 through October 31.

Florence south jetty to Humbug Mt., Oregon, all-salmon-except-coho fishery opens through July 9. The fishery will reopen July 18 through August 29 and September 1 through October 31.

NON-INDIAN COMMERCIAL TROLL SEASONS, (continued)

May 1	U.S./Canada border to Cape Falcon, all-salmon-except-coho fishery opens through the earlier of Jun. 30 or a 17,000 chinook guideline. The 17,000 chinook guideline includes a subarea guideline of 12,000 chinook for the area between the U.S./Canada border and the Queets River.
	Humbug Mt. to Oregon/California border, all-salmon-except-coho fishery opens through May 31. The fishery is scheduled to reopen June 3 through the earlier of June 30 or a 3,000 chinook quota, and reopen again August 1 through the earlier of August 31 or a 3,000 chinook.
	Horse Mt. to Point Arena, all-salmon-except-coho fishery opens through the earlier of May 31 or a 3,000 chinook quota. The fishery reopens September 1 through September 30.
	Pt. San Pedro to Point Sur, all-salmon-except-coho fishery opens through August 14.
	Point Sur to U.S./Mexico border, all-salmon-except-coho fishery opens through August 14. The fishery reopens September 11 through September 30.
May 21	Horse Mt. to Point Arena, all-salmon-except-coho fishery closes May 21 after reaching the 3,000 chinook quota (actual catch estimated at 4,298).
May 24	Pt. Reyes to Pt. San Pedro, all-salmon-except-coho fishery opens through September 30. The fishery reopens October 1 though October 12.
May 31	Humbug Mt. to Oregon/California border all-salmon-except-coho fishery closed.
June 3	Humbug Mt. to Oregon/California border, all-salmon-except-coho fishery opens through the earlier of June 30 or a chinook quota of 1,500. The fishery is scheduled to reopen August 1 through the earlier of August 31 or a 3,000 chinook quota.
June 15	U.S./Canada border to Cape Falcon, all-salmon-except-coho fishery closes effective midnight June 8, 2001 as chinook guideline is reached.
June 24	Pt. Arena to Pt. Reyes, all-salmon-except-coho fishery opens through September 30.
June 30	Humbug Mt. to Oregon/California border, all-salmon-except-coho fishery closes as scheduled.
July 1	U.S./Canada border to Leadbetter Pt., all-salmon fishery, opens through the earlier of July 27 or a guideline of 6,493 chinook (7,000 in the preseason guideline minus 507 overage from the May through June season) and 12,000 coho with healed adipose fin clips (selective fishery).
July 9	Florence south jetty to Humbug Mt. all-salmon-except-coho fishery closes as scheduled.
	U.S./Canada border to Leadbetter Pt., all-salmon fishery, closes effective midnight, July 9, 2001 as chinook guideline is reached.
July 18	Scheduled closure of the Cape Falcon to Florence south jetty, all-salmon-except-coho fishery. The fishery reopens July 27 through August 29 and September 1 through October 31.
	Florence South Jetty to Humbug Mt., Oregon, all-salmon-except-coho fishery opens through August 29. The fishery reopens September 1 through October 31.
July 20-23	Queets River to Cape Falcon, all-salmon fishery opens through the earlier of September 30 or a quota of 7,607 chinook (6,000 in the preseason guideline plus 1,607 transferred from the July U.S./Canada border to Leadbetter Pt. season) and 53,733 coho (63,000 preseason plus 10,733 from the July U.S./Canada Border to Leadbetter Pt. season minus 20,000 that was transferred to the Leadbetter Pt. to Cape Falcon recreational fishery on August 27) with healed adipose fin clips (selective fishery). Fishery proceeds on a cycle of 4-days open and 3-days closed with landing limit of 65 chinook for the open period.

July 27	Cape Falcon to Florence South Jetty, Oregon, all-salmon-except-coho fishery opens through August 29. The fishery will reopen September 1 through October 31.
	NON-INDIAN COMMERCIAL TROLL SEASONS, (continued)
July 27-30	Queets River to Cape Falcon, all-salmon fishery opens for the second period (4 days) under the same regulations as the initial opening.
Aug. 1	Humbug Mt. to Oregon/California border, all-salmon-except-coho fishery reopens through the earlier of August 31 or a chinook quota of 3,000.
Aug. 3-12	Queets River to Cape Falcon, all-salmon fishery opens for the third period (10 days), with a landing limit of 100 chinook for the open period.
Aug. 14	Pt. San Pedro to Point Sur, all-salmon-except-coho fishery closes.
	Point Sur to U.S./Mexico border, all-salmon-except-coho fishery closes. The fishery reopens September 11 through September 30.
Aug. 17-27	Queets River to Cape Falcon, all-salmon fishery opens for the forth period (11 days), with a landing limit of 150 chinook for the open period.
Aug. 29	Cape Falcon to Florence south jetty, all-salmon-except-coho fishery closes for 2 days. The fishery reopens September 1 through October 31.
	Florence south jetty to Humbug Mt., all-salmon-except-coho fishery closes for 2 days. The fishery reopens September 1 through October 31.
Aug. 31	Queets River to Cape Falcon, all-salmon fishery opens for the remainder of the season with no chinook landing limit.
	The Humbug Mt. to Oregon/California border, all-salmon-except-coho fishery closes as scheduled.
Sept. 1	Cape Falcon to Florence south jetty, all-salmon-except-coho fishery reopens through October 31.
	Florence south jetty to Humbug Mt., all-salmon-except-coho fishery reopens through October 31.
	Humbug Mt. to Humboldt south jetty, all-salmon-except-coho fishery opens through the earlier of September 30 or a quota of 8,000 chinook, of which no more than 2,000 chinook may be landed in the Ports of Brookings, Port Orford, and Gold Beach.
	Horse Mt. to Pt. Arena, all-salmon-except-coho fishery opens through September 30.
Sept. 11	Pt. Sur to U.S./Mexico border, all-salmon-except-coho fishery opens through September 30.
Sept. 30	The Queets River to Cape Falcon all-salmon fishery closes as scheduled.
	The Humbug Mt. to Humboldt south jetty, all-salmon-except-coho fishery closes as scheduled.
	Horse Mt. to Pt. Arena, all-salmon-except-coho fishery closes.
	Pt. Arena to Pt. Reyes, all-salmon-except-coho fishery closes.
	Pt. Reyes to Pt. San Pedro, all-salmon-except-coho fishery closes. Fishery reopens October 1 through October 12.
	Pt. Sur to U.S./Mexico border, all-salmon-except-coho fishery closes.
Oct. 1	Pt. Reyes to Pt. San Pedro, all-salmon-except-coho fishery opens through October 12.
Oct. 12	Pt. Reyes to Pt. San Pedro, all-salmon-except-coho fishery closes.

Oct. 31 — Cape Falcon to Florence south jetty fishery closes.

Florence south jetty to Oregon/California border fishery closes.

TREATY INDIAN COMMERCIAL TROLL SEASONS

May 1 — All-salmon-except-coho fisheries open through the earlier of June 30 or a 18,500 chinook quota for the May through June season (any remainder of the quota is not transferable to the July through September season).

June 30 — The all-salmon-except-coho fisheries close as scheduled.

July 1 — All-salmon fisheries open through the earlier of September 15, an 18,500 chinook quota, or a 90,000 coho quota.

Sept. 15 — The all-salmon fisheries close as scheduled.

RECREATIONAL SEASONS

Feb. 17 — Horse Mt. to Pt. Arena, all-salmon-except-coho fishery opens through November 18.

Mar. 31 — Pigeon Pt. to the U.S./Mexico border, all-salmon-except-coho fishery opens through September 30.

Apr. 1 — Cape Falcon to Humbug Mt., all-salmon-except-coho fishery opens through October 31. The fishery becomes selective for marked hatchery coho beginning June 22 through the earlier of July 31 or a 55,000 coho quota, then reverts back to all-salmon-except-coho for the remainder of the season.

Apr. 14 — Point Arena to Pigeon Pt., all-salmon-except-coho fishery opens through November 13.

May 17 — Humbug Mt. to Horse Mt., all-salmon-except-coho fishery opens through July 8. The fishery reopens July 24 through September 3.

June 22 — Cape Falcon to Humbug Mt., all-salmon selective coho fishery opens through the earlier of July 31 or a quota of 55,000 adipose fin clipped coho. The fishery reopens for all-salmon-except-coho the earlier of August 1 or the attainment of the coho quota, through October 31.

July 1 — U.S./Canada border to Cape Alava, all-salmon fishery opens through the earlier of September 30, a 1,700 chinook guideline, or a 23,400 coho quota. Daily-bag-limit is two fish, but only one may be a chinook; all coho must have a healed adipose fin clip.

Cape Alava to Queets River, all-salmon fishery opens though the earlier of September 23, a 1,000 chinook guideline, or a 53,500 coho quota. Daily-bag-limit is two fish, but only one may be a chinook; all coho must have a healed adipose fin clip. The fishery is scheduled to reopen September 24 through the earlier of October 21, a 100 chinook guideline, or a 500 coho quota.

Queets River to Leadbetter Pt., all-salmon fishery opens Sunday to Thursday though the earlier of September 30, a 19,450 chinook guideline, or a 83,250 coho quota. Daily-bag-limit is two fish, but only one may be a chinook; all coho must have a healed adipose fin clip.

Leadbetter Pt. to Cape Falcon, all-salmon fishery opens Sunday to Thursday though the earlier of September 3, a 7,750 chinook guideline, or a 122,500 coho quota (102,500 preseason plus 20,000 transferred from the Queets River to Cape Falcon non-Indian Commercial troll fishery on August 27). Daily-bag-limit is two fish, but only one may be a chinook; all coho must have a healed adipose fin clip. Closed between Tillamook Head and Cape Falcon beginning August 1.

July 8 — Humbug Mt. to Horse Mt., all-salmon-except-coho fishery closes. Fishery reopens July 24 through September 3.

July 19 — The Cape Falcon to Humbug Mt., all-salmon selective coho fishery closes, effective midnight, Thursday, July 19, 2001, as the coho quota of 55,000 is reached.

July 20	The Cape Falcon to Humbug Mt., all-salmon-except-coho fishery reopens following the closure of the all-salmon selective coho fishery . The fishery closes October 31.
July 24	Humbug Mt. to Horse Mt., all-salmon-except-coho fishery reopens through September 3.
	RECREATIONAL SEASONS (continued)
Sept. 3	The Leadbetter Pt. to Cape Falcon, all-salmon selective coho fishery closes as scheduled.
	Humbug Mt. to Horse Mt., all-salmon-except-coho fishery closes.
Sept. 4	North Head Lighthouse to Tillamook Head, 7 days per week, all-salmon fishery opens though the earlier of September 30, or a 30,352 coho quota (10,000 preseason plus 20,352 remaining after the close of the Leadbetter Pt. to Cape Falcon fishery) . Daily-bag-limit is two fish, but only one may be a chinook; all coho must have a healed adipose fin clip.
Sept. 7	Leadbetter Pt. to Klipsan Beach area is added to the North Head Lighthouse to Tillamook Head, all-salmon fishery.
Sept. 23	The Cape Alava to Queets River, all-salmon selective coho fishery closes as scheduled. Fishery reopens September 24 through the earlier of October 21, a 100 chinook guideline, or a 500 coho quota.
Sept. 24	The 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 500 coho quota.
Sept. 30	The U.S./Canada border to Queets River, all-salmon selective coho fishery closes as scheduled.
	The Queets River to Leadbetter Pt., all-salmon selective coho fishery closes as scheduled.
	The Leadbetter Pt. to Klipsan Beach and North Head Lighthouse to Tillamook Head, all-salmon selective coho fishery closes as scheduled.
	Pigeon Pt. to U.S./Mexico border, all-salmon-except-coho fishery closes.
Oct. 21	Scheduled closure of the La Push area, all-salmon selective coho fishery.
Oct. 31	Cape Falcon to Humbug Mt., all-salmon-except-coho fishery closes.
Nov. 13	Pt. Arena to Pigeon Pt., all-salmon-except-coho fishery closes.
Nov. 18	Horse Mt. to Pt. Arena, all-salmon-except-coho fishery closes.

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

PFMC
10/10/01

Exhibit D.2.c.
Supplemental STT Report
November 2001

STATUS REPORT OF THE 2001 OCEAN SALMON FISHERIES OFF WASHINGTON, OREGON, and CALIFORNIA.
Preliminary Data Through October 15, 2001.

		Season	Effort	CHINOOK			COHO		
	Fishery and Area	Dates	Days fished	Catch	Quota	Percent	Catch	Quota	Percent
	TROLL								
a/	Treaty Indian	*5/1-6/30*	271	17,032	18,500	92%	Non-Retention		
		7/1-9/15	354	8,346	18,500	45%	57,520	90,000	64%
b, c/	Non-Indian North of Falcon	*5/1-6/15*	462	17,551	17,000	103%	Non-Retention		
c/	US/Can. Border - Queets R	*5/1-6/15*	178	4,678	12,000	39%	Non-Retention		
d/	US/Can. Border - Leadbetter Pt.	*7/1-7/9*	125	4,442	6,493	68%	936	12,000	8%
e/	Queets R - Cape Falcon	*7/20-9/30*	612	4,361	7,607	57%	16,151	53,733	30%
	Cape Falcon-Florence S. Jetty	*4/1-7/18*	3,866	110,536	None	NA	Non-Retention		
		7/27-8/29	1,306	44,941	None	NA	Non-Retention		
		9/1-10/31	1,100	34,415	None	NA	Non-Retention		
	Florence S. Jetty - Humbug Mt.	*4/1-7/9*	2,079	39,597	None	NA	Non-Retention		
		7/18-8/29	878	20,342	None	NA	Non-Retention		
		9/1-10/31	522	9,820	None	NA	Non-Retention		
	Humbug Mtn-OR/CA Border	*5/1-5/31*	29	213	None	NA	Non-Retention		
		6/3-6/30	49	443	1,500	30%	Non-Retention		
		8/1-8/31	128	1,115	3,000	37%	Non-Retention		
	Humbug Mt.-Humbolt S Jetty	*9/1-9/30*	372	6,111	8,000	76%	Non-Retention		
c/	Horse Mtn-Pt. Arena	*5/1-5/21*	234	4,307	3,000	144%	Non-Retention		
		9/1-9/30	320	4,376	None	NA	Non-Retention		
	Pt. Arena-Pt. Reyes	*6/24-9/30*	2,184	52,588	None	NA	Non-Retention		
	Pt. Reyes to Pt. San Pedro	*5/24-9/30*	1,664	54,152	None	NA	Non-Retention		
		10/1-10/12	448	5,312	None	NA	Non-Retention		
	Pt. San Pedro-Pt. Sur	*5/1-8/14*	3,898	79,912	None	NA	Non-Retention		
	Pt. Sur-US/Mexico Border	*5/1-8/14*	140	3,064	None	NA	Non-Retention		
		9/11-9/30	0	0	None	NA	Non-Retention		

		Season	Effort	CHINOOK			COHO		
	RECREATIONAL	Dates	Angler Days	Catch	Quota	Percent	Catch	Quota	Percent
b/	US/Canada Border-Cape Alava	*7/1-9/30*	17,854	1,520	1,700	89%	17,806	23,400	76%
b/	Cape Alava-Queets River	*7/1-9/23*	2,878	425	1,000	43%	3,130	5,350	59%
		9/24-10/21	274	52	100	52%	146	500	29%
b/	Queets River-Leadbetter Pt.	*7/1-9/30*	49,029	15,746	19,450	81%	69,177	83,250	83%
b, f/	Leadbetter Pt.-Cape Falcon	*7/1-9/3*	64,712	6,977	7,750	99%	101,254	122,500	83%
	Tillamook Head-N. Head Lighthouse	*9/4-9/30*	11,176	707	w/ above	w/ above	14,312	10,000	143%
	Cape Falcon-Humbug Mtn	*4/1-10/31*	25,220	11,587	None	NA	Non-Retention		
g/	---selective fishery	*6/22-7/19*	47,529	6,169	None	NA	54,627	55,000	99%
	Humbug Mtn-Horse Mtn	*5/17-7/8*	34,958	15,252	None	NA	Non-Retention		
		7/24-9/3	16,164	3,723	None	NA	Non-Retention		
	Horse Mtn-Pt. Arena	*2/17-11/18*	29,187	24,690	None	NA	Non-Retention		
	Pt. Arena-Pigeon Pt.	*4/14-11/13*	61,540	35,095	None	NA	Non-Retention		
	Pigeon Pt.-US/Mexico Border	*3/31-9/30*	37,736	19,914	None	NA	Non-Retention		

	Effort			Chinook Catch			Coho Catch		
TOTALS TO DATE	**2001**	**2000**	**1999**	**2001**	**2000**	**1999**	**2001**	**2000**	**1999**
TROLL									
Treaty Indian	625	232	386	28,100	7,600	27,400	57,520	22,200	33,300
Washington Non-Treaty	943	421	730	20,765	10,300	17,500	7,743	5,300	3,800
Oregon	10,317	6,800	4,700	268,132	129,239	59,600	9,344	12,000	0
California	9,156	17,700	16,500	208,701	429,200	290,900	0	0	0
Total Troll	21,041	25,153	22,316	525,698	576,339	395,400	74,607	39,500	37,100
RECREATIONAL									
Washington	122,738	48,900	50,800	22,818	8,500	9,900	166,677	40,100	40,100
Oregon	122,410	77,700	47,900	26,703	25,300	7,500	93,775	33,200	13,600
California	153,109	207,200	147,100	92,336	178,000	87,800	0	0	0
Total Recreational	398,257	333,800	245,800	141,857	211,800	105,200	260,452	73,300	53,700
PFMC Total	419,298	358,953	268,116	667,555	788,139	500,600	335,059	112,800	90,800

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/ Season closed when chinook quota was achieved.
d/ Preseason chinook guideline of 7,000
e/ Preseason guideline of 6,000 chinook and 63,000 coho quota
f/ Preseason coho quota of 102,500
g/ Season closed when coho quota achieved

I Just wanted to let ~~PFMC~~ you know that we will be giving away our fish. we will be in olympia and in salem at the capital buildings on monday the 10th of sept
we are losing our jobs!
cheap imports are putting us out of business. we need tarriffs started now!
we cant fish for nothing anymo come to Salem or Olympia.
lets solve the problem. befor its to late!

David Quashnick
Fisherman 30 years! "whats next!
Columbia river youngs Bay
Bristol Bay, Cook Inlet

UPDATE OF ONGOING FISHERIES

Situation: A summary of the management events for the 2001 salmon season (updated through October 15) is contained in Exhibit D.2.b. There have been no inseason management conferences or actions since the last reported conference (number 15) on September 5, 2001, 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. Dell Simmons, Chair of the Salmon Technical Team (STT), will provide detailed effort and harvest data for the 2001 salmon season (Exhibit D.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 15, 2001 (Exhibit D.2.b, Sequence of Events).
2. Written Public Comment (Exhibit D.2.e, Public Comment).
3. Status Report of the 2001 Ocean Salmon Fisheries off Washington, Oregon, and California (Exhibit D.2.c, Supplemental STT Report).

PFMC
10/10/01

PACIFIC FISHERY MANAGEMENT COUNCIL SCHEDULE FOR DEVELOPING 2002 OCEAN SALMON FISHERY MANAGEMENT MEASURES

Jan. 22-25	The Salmon Technical Team (STT) and Council staff economist meet in Portland, Oregon to draft *Review of 2001 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. (Feb. 8 print date, mailed to the Council Feb. 28, and available to the public March 5).
Feb. 19-22	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. (Feb. 27 print date, mailed to the Council Feb. 28, and available to the public March 5).
Feb. 28 through Mar. 10	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.
Mar. 5	Council reports summarizing the 2002 salmon season and projecting the expected salmon stock abundance for 2002 are available to the public from the Council office.
Mar. 11-15	Council and advisory entities meet at the Red Lion Hotel Sacramento, Sacramento, California to adopt 2002 regulatory options for public review. The Council adopts preliminary options on March 12, tentative options for STT analysis on March 13, and final options for public review on March 15.
Mar. 18 though Apr. 7	Management agencies, tribes, and public develop their final recommendations for the regulatory options. North of Cape Falcon Forum meetings are tentatively scheduled for March 20-21 (Portland area) and April 3-4 (Seattle area).
Mar. 26	Council staff distributes *Preseason Report II Analysis of Proposed Regulatory Options for 2002 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.
Apr. 1-3	Sites and dates of public hearings to review the Council's proposed regulatory options are: Westport, Washington (Apr. 1); North Bend, Oregon (Apr. 1); and Eureka, California (Apr. 2). Additional hearings will be held by Oregon Department of Fish and Wildlife and California Department of Fish and Game as follows: Tillamook, Oregon (Apr. 2) and Moss Landing, California (Apr. 3). Comments on the options will also be taken during the Council meeting on Apr. 9 in Portland, Oregon.
Apr. 8-12	Council and advisory entities meet at the to adopt final regulatory measures Double Tree Hotel-Columbia River, Portland, Oregon. The Council will tentatively adopt final regulatory measures for analysis by the STT on April 9. Final adoption of recommendations to National Marine Fisheries Service will be completed on April 11.
April 13-17	The STT completes *Preseason Report III Analysis of Council Adopted Regulatory Measures for 2002 Ocean Salmon Fisheries*.
April 24	Council staff mails newsletter with 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.

PFMC
10/10/01

SALMON ADVISORY SUBPANEL REPORT ON SALMON OPTION HEARING SITES

The Salmon Advisory Subpanel supports the Council staff's proposed 2002 salmon option hearing sites with the exception that the Oregon advisors are divided regarding the North Bend/Coos Bay site. One advisory believed the site should be moved north to Florence or Winchester Bay. Another opposed that move. A solution may be to add a hearing site in Newport while leaving the North Bend/Coos Bay site intact. This hearing could be hosed by either the Council or Oregon Department of Fish and Wildlife.

PFMC
10/29/01

SALMON OPTION HEARING SITES

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 2002 process and schedule is contained in Exhibit D.3.b. It follows the same format as in previous years.

For 2002, Council staff recommends one salmon management option hearing per coastal state, the same schedule as in 2001. The hearings would be:

April 1 Westport, Washington and North Bend, Oregon
April 2 Eureka, California

In 2002, the March Council meeting will occur in Sacramento and the April Council meeting in Portland. Therefore, the public comment period on Tuesday of the April meeting in Portland 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
Westport	49	30	22	4	18	24	30
Astoria	28	23	16	-	14	-	-
Tillamook	-	-	-	28	-	13	16 [2/]
North Bend/Coos Bay	22	30	27	15	31	36	18
Eureka	30	45	27	16	18	37	12
Sacramento	16	-	-	13	-	-	-
Santa Rosa	-	-	-	-	-	4	-
Moss Landing [2/]	-	-	-	100	51	50	33

1/ Sites in bold are proposed for Council staffing in 2002.
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 2002 ocean salmon management measures (Exhibit D.3.b).

References:

1. Proposed Pacific Fishery Management Council Schedule for Developing 2002 Ocean Salmon Fishery Management Measures (Exhibit D.3.b, 2002 Management Schedule).

PFMC
10/10/01

PACIFIC COAST SALMON PLAN AMENDMENT
MANAGEMENT OBJECTIVES FOR LISTED CENTRAL VALLEY CHINOOK

I. Need and Purpose for Action

A. Current fishery management plan (FMP) Management Objectives - Three Central Valley chinook stocks are included in the FMP: Sacramento River fall chinook, Sacramento River winter chinook, and Sacramento River spring chinook. The FMP has a management objective for Sacramento River fall chinook based on the combined spawning escapement of hatchery and naturally spawning adult fall chinook. The FMP objectives for winter and spring chinook are NMFS' jeopardy standard. In the case of winter chinook the jeopardy standard is the reasonable and prudent alternative from the 1997 biological opinion. In the case of spring chinook, which was listed under the California and federal evolutionarily significant units (ESAs) in 1999, the objective is undefined. This is a result of NMFS' 2000 biological opinion, which concluded the existing winter chinook ESA requirements and the action taken in 2000 by the California Fish and Game Commission delaying the opening of the recreational seasons off San Francisco and Monterey, made additional constraints on ocean fisheries managed under the FMP unnecessary.

B. Need for Action

1. Status of the Populations - Since 1997, the spawning populations of winter chinook have increased; the preliminary estimate for the 2000 run is between 8,000 and 11,000 fish, based on the carcass survey, and about 5,500 fish based on the Red Bluff Diversion Dam count. Spawning populations of spring chinook have also increased in the Sacramento River Basin, particularly the Butte Creek run.

2. NMFS Section 7 Consultation - The 1997 biological opinion required constraints on ocean harvest sufficient to produce a 31% increase in the winter chinook adult replacement rate relative to a base period of 1989 to 1993. The opinion provided the requirement would remain in effect through the 2001 salmon seasons, and that NMFS would then reassess the need for restrictions on ocean harvest to protect winter chinook. The requirement has been implemented by the Council and NMFS based on a harvest model (WCOHM), which relies on recoveries of marked fish during the 1970s. Six years of carcass surveys are now available and the relatively large recent releases of coded wire tagged winter chinook from Livingston Stone National Fish Hatchery are beginning to provide better data on the distribution of winter chinook in ocean fisheries. This new information needs to be integrated into management methodologies.

3. Management Objectives - As winter and spring chinook populations recover and new data on the impact of ocean fisheries on the stocks become available, management objectives should be reviewed and appropriately modified. NMFS can accomplish this through the Section 7 process by issuing new biological opinions for winter and spring chinook. However, a more comprehensive set of objectives could be developed by the Council through the plan amendment process. An FMP amendment could provide near term recovery objectives as well as a framework for management following de-listing. The amendment process allows for far more participation and review by resource agencies, affected users, and other entities, such as the Salmon Technical Team (STT) and Scientific and Statistical Committee (SSC), than occurs under the NMFS Section 7 process.

C. Proposed Action - Develop an FMP amendment which would provide management objectives for Central Valley chinook that address the recovery and long term management needs of Sacramento River winter chinook and Central Valley spring chinook. The amendment team would include representation from state agencies, NMFS, the Salmon Advisory Subpanel (SAS), STT, and SSC. It would be expected the Amendment Team would coordinate with the Central Valley Technical Recovery Team, particularly with respect to new de-listing criteria the TRT will develop.

II. Components of the Amendment

A. The amendment must include spring and winter chinook management measures that meet requirements of state and federal ESAs. An amendment would need a no-jeopardy opinion from NMFS, as occurred with Amendment 13, prior to final adoption by NMFS. Near term management goals could be based on attainment of certain spawner escapement objectives, or maximum exploitation rates, consistent with ESA recovery goals. In addressing the needs of spring and winter chinook, the amendment could modify the existing objective for Sacramento River fall chinook.

B. The amendment should also include a framework for management of de-listed populations, whether as separate management entities or integrated under a broader scheme for Central Valley Chinook.

III. Management Objectives for Winter and Spring Chinook while Amendment is under Development

A. NMFS will issue a new biological opinion prior to approving the 2002 seasons that will provide incidental take authorization for ocean fisheries with respect to Sacramento River winter and spring chinook while the plan amendment is being developed. The opinion will summarize much of the newly available information on stock status and harvest impacts.

B. The opinion will continue the winter chinook protection measures of recent years. The requirements, however, will not be expressed in terms of an increased adult spawner replacement rate relative to a base period, and will not necessarily require use of the WCOHM for implementation. The opinion will be similar to the 1990 opinion in that it will place restrictions on the opening dates of recreational and commercial fisheries off California and provide minimum size limit restrictions in fisheries prior to May.

PFMC
10/16/01

Current FMP Objectives for Central Valley Chinook

- Sacramento River Fall Chinook - Escapement goal range of 122,000 - 180,000 natural and hatchery spawners.

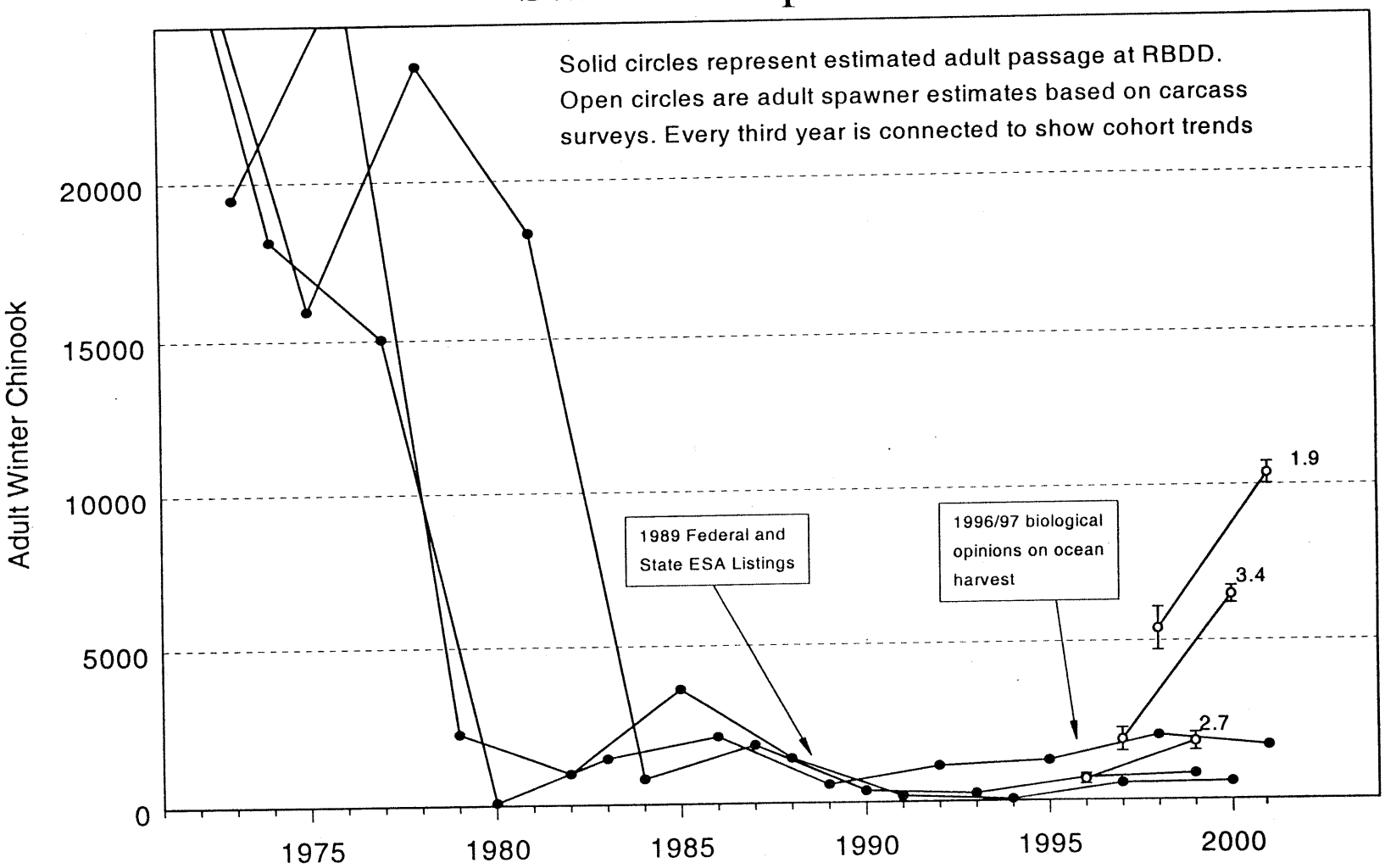
- Sacramento River Winter Chinook - NMFS 1997 jeopardy standard: 31% increase in the winter chinook adult replacement rate relative to a base period of 1989-1993 (equivalent to a 1.77 replacement rate).

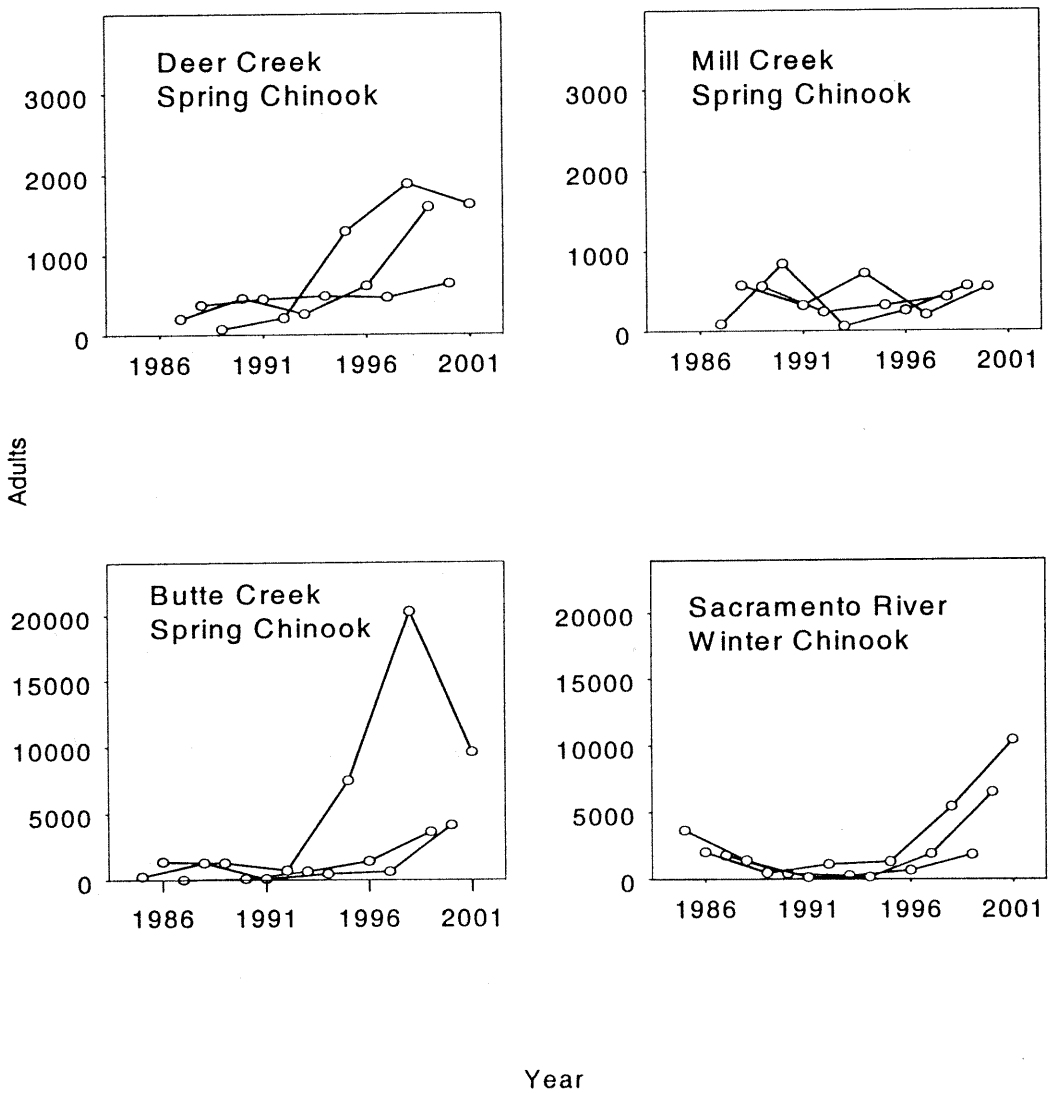
- Sacramento River Spring Chinook - Undefined

  NMFS 2000 biological opinion concluded that the existing winter chinook ESA requirements and delayed opening of the recreational seasons south of Point Arena made additional constraints on ocean fisheries unnecessary.

Exhibit D.4.b
Supplemental NMFS PowerPoint Presentation
November 2001

Status of Populations




Deer Creek
Spring Chinook
Mill Creek
Spring Chinook
Butte Creek
Spring Chinook
Sacramento River
Winter Chinook
Adults
Year
0
1000
2000
3000
5000
10000
15000
20000
1986
1991
1996
2001

NMFS Section 7 Consultations

Winter Chinook

- The 1997 winter run biological opinion required constraints on ocean harvest sufficient to produce a 31% increase in the winter chinook adult replacement rate (as measured at RBDD) relative to a base period of 1989-1993. To be reassessed following the 2001 seasons.
- Implemented by the Winter Chinook Ocean Harvest Model
- New Information
  - Six years of carcass survey data
  - CWT recoveries from Livingston Stone releases

Spring Chinook

- Currently no objectives - any changes in winter chinook management should also consider spring run

Future Management Objectives

- Provided by NMFS through a new Biological Opinion
- Developed by PFMC through Plan Amendment Process
  - Near term recovery goals
  - Management based on recent fisheries data
  - Long term management framework
  - Participation by resource agencies and users
  - Review by STT, SSC, and public

Proposed Action

- The Council develop an FMP amendment that provides management objectives for Central Valley chinook. The amendment would address recovery and long term management needs of Sacramento River winter chinook and Central Valley spring chinook.

Proposed Action

- While the plan amendment is under development, the protective measures in place for winter chinook would be continued, under a new Biological Opinion, generally at the level that has existed for the past two years.
- Recreational openings south of Arena of April 1/mid-April
- Minimum size limit of 24 inches prior to May 1

Proposed Action
(continued)

- Suspension of the requirement for a 31% increase in the cohort replacement rate

- Commercial impacts on winter and spring chinook would continue to be constrained by ESA requirements for California coastal chinook (17% maximum harvest rate on Klamath River fall chinook)

- NMFS recommends no changes for the 2002 recreational season openings south of Point Arena.

SALMON ADVISORY SUBPANEL COMMENTS ON SACRAMENTO WINTER RUN CHINOOK MANAGEMENT

Dr. Dan Viele, National Marine Fisheries Service, reviewed the issue on our October 26, 2001 conference call. In lieu of the development and implementation of a new biological opinion, the Salmon Advisory Subpanel (SAS) supports the proposal to begin the Council plan amendment process for managing California Central Valley chinook stocks. We believe the framework amendment process would better facilitate user group input and participation. California members of the SAS will testify on regulatory issues specific to the interim time period during the public comment period.

PFMC
10/29/01

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

The Scientific and Statistical Committee (SSC) Salmon Subcommittee and the Salmon Technical Team (STT) jointly sponsored a meeting on October 22 and 23, 2001 in Portland, Oregon to provide a thorough overview of both the coho salmon Fishery Regulation and Assessment Model (FRAM) and the Klamath Ocean Harvest Model (KOHM). The SSC is appreciative of the effort made by the STT and specifically, Mr. Jim Packer and Mr. Larrie LaVoy of the Washington Department of Fish and Wildlife (WDFW) for their presentation of the coho FRAM and Mr. Michael Mohr of the National Marine Fisheries Service (NMFS) for his presentation of the KOHM. Their respective discussions allowed the SSC a unique opportunity to better understand both of these models.

Development of both models has progressed rapidly in the past few months, as the modelers push to be ready for 2002 season setting. Both model revisions represent substantial improvements over the models currently in use. However, at this point neither model is ready for use. The SSC is prepared to approve both models for use in 2002, provisional on completion of tasks detailed in the following discussions. The SSC Salmon Subcommittee and the STT have scheduled two joint meetings in early 2002 to review the models for final approval. The coho FRAM meeting is scheduled for early January while the KOHM meeting will be held in early February 2002 . If the models are not deemed ready for use at that time then the previous versions will be used for 2002 season setting.

Coho FRAM

The coho cohort analysis project, which has been underway since 1994, has been completed. Complete cohort data for the years 1986-1991 have been generated for all pertinent coho salmon stocks. These data include estimates of exploitation rates and contribution rates for all stocks and fisheries; the numbers of modeled stocks and fisheries have been substantially increased from the previous base period data used in the coho FRAM. The coho cohort analysis project was a major undertaking that is reflected by the amount of time required for its completion. All those that contributed to the completion of this project are to be commended.

The major proposed change to the coho FRAM model for the 2002 salmon fishery management process is to replace the old 1979-1981 base period data with the new 1986-1991 base period data from the coho cohort analysis. The new base period data are a significant improvement in stocks and fisheries covered by the model compared to the 1979-1981 base period. There are no changes proposed to coho FRAM for the overall fishery impact assessment methodologies or the algorithms used in the model. Other changes that will occur if the new 1986-1991 base period is adopted are:

- The number of modeled stocks increases from 37 to 128.
- The number of modeled fisheries increases from 66 (27 Council fisheries) to 206 (25 Council fisheries). For Council fisheries, the separate Eureka and Crescent City fishery areas in the old base period have been combined into a single fishery in the new base period (California-Klamath Management Zone [KMZ]).
- The number of modeled time periods has decreased from 13 monthly periods (December to December) to four periods (January–June, July, August, September-December).

Currently, the coho FRAM has been run using each of the new base period years individually. The most critical problem that must be resolved before FRAM could use the new base period data is a methodology for combining or “averaging” fishery exploitation rate and stock contribution rate estimates across the six base period years. There was considerable discussion of how this might be done. Work efforts on the coho FRAM during the next two months will focus on resolving this issue.

If the above problem can be resolved, there are several additional issues related to coho FRAM data input and output that must be addressed before the new base period data can be used in the 2002 salmon fishery management process:

1. Preseason forecasts will be needed for each of the 128 modeled stock units in the new base period. Those responsible for producing these forecasts need to be aware of these new

requirements and prepare forecasts in a format compatible with the updated FRAM. Many of the added stocks currently have separate forecasts that are combined for the current FRAM.
2. All output reports needed for the Council, South of Falcon, and North of Falcon management processes must be developed and need to incorporate the new stocks and fishery units.
3. The Terminal Area Management Models (TAMMs), which have been external to the FRAM model with the old base period, will now be internal to the model. Those who have supplied input for the TAMMs in the past need to know the new data requirements and formats for this information to be used in the updated FRAM. In addition, reports analogous to the TAMM output sheets will need to be developed.
4. Washington coastal coho stocks are now part of the updated FRAM where they were not in the past. Analyses for these stocks have been conducted external to the model. A decision needs to be made whether this will continue or whether the updated FRAM will now be used for these stocks.
5. There are a number of other management models that use output from the FRAM as input. Users of these models need to make sure the developers of the updated FRAM are aware of their data requirements so these data are available during the management process.

Finally, the SSC recommends that Model Evaluation Subgroups be formed for both the coho and chinook FRAM models. 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 can 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.
- Review and validate changes to the model.
- Conduct a postseason assessment of model performance.
- Develop comprehensive documentation.

Klamath Ocean Harvest Model

The KOHM revision is near completion, and the model may be ready to use for setting the 2002 fisheries. The revision included transferring all supporting data from spreadsheets into databases, error checking of all data, and converting the KOHM from a spreadsheet into a programming language. Two new databases were created: a Regulation database documenting all ocean chinook fishery regulations since 1978 and an Effort database that documents the number of chinook landed and effort in the sport and commercial fisheries. A revised cohort analysis, using the corrected data, was done on the five components (Trinity hatchery fingerling, Trinity hatchery yearling, Iron Gate Hatchery fingerling, Iron Gate Hatchery yearling, and natural fish) of the Klamath fall chinook production. Many of the parameters used in the KOHM have changed as they are derived from the cohort reconstruction. The new KOHM models contact rates (defined as number of chinook brought to the boat) as a function of effort. There is a direct and explicit link between fishing effort and the number of days the fishing season was open in each unit.

The KOHM revision is a vast improvement of the model. Major components of the model are designed as independent sub-models which can be revised as our understanding improves (e.g., size at age, contact rates vs. effort). Documentation of the models and the supporting data sets is impressively thorough and comprehensive, greatly enhancing the utility of the model.

Mr. Mohr stated there are three unresolved issues: (1) how to account for non-Klamath catch, primarily from the Rogue River and Central Valley; (2) what is the appropriate contact rate to use for naturally produced fish and; (3) a comparison of the new model with the old model and, more importantly, a hindcast of the new model using abundance and harvest estimates from previous years.

Important changes and improvements incorporated into the new model include:

1. The model uses ocean abundance estimates beginning September 1 rather than May 1 allowing earlier fisheries to be modeled.
2. Drop off mortality, shaker mortality, and straying are modeled.
3. Sport and troll fisheries are modeled in all units on a monthly basis.
4. The KMZ was split into Oregon and California units: KO (California-Oregon border to Humbug Mountain) and KC (California-Oregon border to Horse Mountain.

5. The Southern California (SOC) unit was split into two units: SF (Pt. Arena to Pigeon Pt.) and MO (Pigeon Pt. to Pt. Sur).
6. The proportion of legal size fish in a unit is now based on a size-at-age model.
7. There is monthly accounting of natural mortality.
8. The base period used for cohort reconstruction was expanded from 1986-1990 to 1986-present.
9 There is age specific accounting of river fisheries and spawners.

PFMC
10/31/01

Exhibit D.5.c
Supplemental SAS Report
November 2001

SALMON ADVISORY SUBPANEL COMMENTS ON RESULTS OF SCIENTIFIC AND STATISTICAL COMMITTEE METHODOLOGY REVIEW

Klamath Ocean Harvest Model (KOHM)

The Salmon Advisory Subpanel (SAS) was briefed by Mr. Allen Grover (California Department of Fish and Game/Salmon Technical Team [STT]) on the status of the new KOHM. Contingent upon Scientific and Statistical Committee (SSC) concurrence and the model's finalization in February 2002, we support the new model. We complement the STT on its hard work in putting together a model that will better serve the needs of the resource and the fishing communities.

Coho Fishery Regulation Assessment Model (FRAM)

The SAS was briefed by Mr. Dell Simmons (NMFS/STT) and Dr. Gary Morishima (Northwest Indian Fisheries Science Center/STT) on the status of the Coho FRAM. In order to become more fully educated to the details of the new model, many of us plan to attend the January 3, 2002 meeting between the STT, SSC, and Washington Department of Fish and Wildlife. While we agree that we need the new model and we could potentially face a situation of the state and tribes using a different model than the STT for the 2002 preseason planning, we need more information before we can make a "carte blanche" recommendation that the model be adopted for use in 2002.

PFMC
10/30/01

Salmon Technical Team Comments on the Methodological Review of Revisions to the Klamath Ocean Harvest Model and the Coho Fishery Regulation Assessment Model

KOHM

A complete revision of the Klamath Ocean Harvest Model (KOHM) is not yet available for review. Substantial effort will be required over the next few months to complete remaining technical analyses and prepare an operational version of the revised KOHM. Presuming that the remaining tasks are completed, the Salmon Technical Team (STT) recommends that the revised KOHM be applied beginning in 2002. However, the completed model should be reviewed in February 2002 before the revised KOHM is implemented for planning 2002 seasons.

Based on a review of the progress to date, the STT believes that the methods reflected in the effort to revise the KOHM represent a thoughtful, well-reasoned approach that can expected to substantially improve the capacity of the Council to evaluate the impacts of fishery regulatory impacts on Klamath fall chinook. The revised model represents a significant improvement from the existing KOHM in several important ways, including:

- Available data and information regarding Klamath fall chinook from a variety of sources are integrated into a cohesive form with a sound theoretical basis.

- A new historical database has been created which contains CWT data, catches, effort, and escapements necessary to parameterize the KOHM.

- The fishery-time strata employed in the revised KOHM model provide for separate assessment of troll and sport fisheries and refinement of management areas. These stratifications and changes in parameterization improve visibility of the assumptions employed in the estimation of fishery impacts.

- Cohort analysis procedures have been modified to provide consistency with algorithms used in model projections, including incorporation of drop off mortalities and new release mortality rates.

- Cohort analyses have been performed on five components of Klamath fall chinook production.

- The structure of the KOHM and data employed for parameterization is now more transparent:

    - ❖ Methods, assumptions, and algorithms have been documented, improving understanding the components that affect impact predictions and the significance of key model parameters.

    - ❖ The KOHM has been coded in a procedural programming language, improving the ability to understand and modify algorithms and identify interrelationships between model parameters.

    - ❖ Visibility of underlying data has been improved.

    - ❖ The new structure uses all historical data as well as provides for incorporating future data and parameters that may improve the prediction of fishery impacts.

Two primary tasks remain before the revised KOHM can be considered to be ready for application in Council planning processed: (1) remaining technical development must be completed; and (2) the model must be validated.

Some issues remain regarding the appropriate representation of components of Klamath fall chinook production, estimation of contributions of non-Klamath stocks to total ocean catches, and effort assumptions relating to proposed season structures..

The STT recommends that validation testing be principally based on an evaluation of model structure and parameterization and on results of backcasting. The information presented at the November SSC-STT meeting provides a sound foundation for understanding the model structure and parameterization. Backcasting would consist of inputing actual observed values of effort and abundance into the KOHM and comparing model estimates of harvest rates, escapements, and allocations with observed historical data.

The determination of whether or not the revised KOHM should be applied should not be based on a comparison of results with the existing KOHM. It is likely that results of the revised KOHM will differ from those of the current KOHM in several ways due to differences in structure, databases, and parameterization. A comparison of old and new versions of the KOHM may provide users with some insight into model behavior, but would not provide useful information regarding the performance of the revised KOHM in accurately estimating fishery impacts.

Coho FRAM

The STT recommends that the Council approve the use of the new base period dataset for Coho FRAM, provided that remaining tasks are satisfactorily completed in time for implementation for the 2002 management season.

An operational version of the new Coho FRAM is not yet available for review. However, no changes in algorithms or functional structure from the current Coho FRAM are involved. Proposed changes center about input data, specifically the development of a new base period data set. Estimation methods for the generation of base period data rely upon the Mixed Stock Model (MSM) supplemented by other data (e.g., escapements), estimation methods, and models. These methods have largely been previously reviewed so the development of the new base period data primarily involves the application of approved methods to a specific set of data.

There are trade-offs involved in changing base period data sets. The current base period for Coho FRAM reflects exploitation patterns observed from 1979-1981. Fisheries during this period were consistent, occurred over an extensive geographic area, and were intensive so that CWT recovery data were of high quality. However, tagging of stocks contributing to fisheries during this period was incomplete so that data were not available to directly estimate base period impacts for some populations of concern.

The proposed new base period covers the years from 1986-1991. CWT releases for many more groups of fish contributed to fisheries during this time period, but fishing patterns were inconsistent. As management attention focused on the protection of individual stocks, uncertainty over estimates of fishery impacts increased as harvest rates were reduced and fishery regimes became more variable.

For the new base period, agencies were consulted extensively to ensure that representative CWT groups were selected and that the correct data were employed for development of new base period data. The methods employed to generate the new base period data attribute all catch to modeled stock groups, and eliminate many ad-hoc data manipulations and terminal fishery calculations that had to be done outside the model in the past.

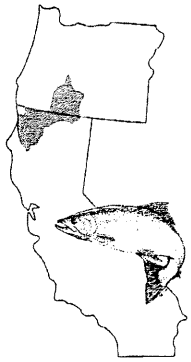
Considering these trade-offs, the STT believes that the new 1986-1991 base period database represents a substantial improvement over the 1979-1981 base period data currently used by Coho FRAM.

Changes in fishery and stock stratifications resulting from the use of a new base period are summarized in the following table:

	Current Data Set	**Proposed New Data Set**
Base Period Catch Years	1979-1981	1986-1991
Stocks	37	128
Fisheries	66	247
Time Periods	13 (Dec-Dec)	4 (Jan-June, July,Aug, Sep-Dec)
CWT Groups in Base	380 (10.8 million tags)	2500 (44.2 million tags)
Stocks without CWT data during base	3 (Skagit, Grays Harbor, Willapa)	None

Several tasks remain to be completed before the new Coho FRAM model will be ready for use in the 2002 preseason process. Methods for combining data from individual base period years must be developed, abundance forecasts will be required for a greater number of stocks, serviceable formats will be needed for reporting model results, and support programs for generating model inputs (e.g., effort predictors) must prepared. Testing of Coho FRAM with the new base period is expected to be completed by the end of December and be available for distribution in January 2002.

The STT strongly recommends that WDFW move quickly to initiate efforts to familiarize co-managers and users with changes resulting from the use of a new base period for Coho FRAM. Model users will need to feel comfortable with revised stock and fishery strata as well as the ability of Coho FRAM to accurately estimate impacts using the new data set. Coho FRAM is seminal to the capacity of various interests to reach agreement on coho management coastwide during preseason planning processes. Controversy surrounding the results of old versus new Coho FRAMs cannot help but increase the difficulty of developing fishery regulatory packages in a timely manner. The STT notes that it will not be possible to run two versions of Coho FRAM in parallel, given the differences in stock and fishery stratifications between the current and new base period data sets.



Klamath Fishery Management Council

Working to Restore Anadromous Fish in the Klamath River Basin

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Tel: (530) 842-5763 Fax: (530) 842-4517

California Commercial Salmon Fishing Industry

California Department of Fish and Game

California Offshore Sport Fishery

Hoopa Valley Indian Tribe

Klamath In-River Sport Fishery

National Marine Fisheries Service

Non-Hoopa Indian Representative

Oregon Commercial Salmon Fishing Industry

Oregon Department of Fish and Wildlife

Pacific Fishery Management Council

U.S. Department of the Interior

October 23, 2001

RECEIVED

OCT 25 2001

PFMC

Mr. Jim Lone, Chair
Pacific Fishery Management Council
2130 SW Fifth Avenue, Suite 224
Portland, Oregon 97201

Dear Jim,

As you know, members of the Klamath Fishery Management Council's Technical Advisory Team and the Pacific Fishery Management Council's Salmon Technical Team have been working for several years on a revision of the Klamath Ocean Harvest Model (KOHM) and the data sets and analyses which support it. At the October 17-18, 2001 meeting of the Klamath Council, Michael Mohr, the project leader, presented an overview of the model revisions and discussed the prospects for its use by the Pacific Fishery Management Council in developing the 2002 salmon seasons.

The proposed revisions to the KOHM introduce over 20 significant improvements to the existing model. Among the major achievements is the explicit modeling of contact rate as a function of fishing effort and the extension of the base period from 1986-1990 to 1986-present. The authors have developed methodologies which allow the inclusion of all fisheries data accrued since 1986, and also provide the flexibility to select subsets of the data that best represent current fleet conditions. Other important changes include the explicit formulation of contact, harvest, and impact rates; explicit accounting of minimum size limits via a size-at-age submodel; explicit accounting of hook-and-release mortality and drop-off mortality; partitioning of the Klamath Management Zone data and forecasts into two management areas (CA-OR border to Humbug Mountain and Horse Mountain to the CA-OR border); partitioning of the Southern California data and forecasts into two management areas (Pt. Arena to Pigeon Pt. and Pigeon Pt. to Pt. Sur); implementation of the KOHM in the form of a programming language rather than a spreadsheet; and review, correction and implementation of the data set of releases and recoveries of coded wire tags in a relational database rather than a spreadsheet. At least as significant as the methodological advances is

the documentation of the KOHM produced by the team. The documentation clearly sets out the objective criteria used to develop the model and provides the formulas used to estimate and forecast quantities. The importance of this cannot be stressed enough: it will allow future implementation and modification of the KOHM to proceed in an open and orderly fashion.

The Klamath Fishery Management Council endorses the KOHM revision and forwards it to the Pacific Fishery Management Council's Scientific and Statistical Committee and Salmon Technical Team for review, with the expectation that it will be used as a management tool in development of the 2002 salmon seasons. We understand that prior to the March 2002 meeting of the Pacific Fishery Management Council, additional evaluation of the KOHM, in the form of hindcasting, will occur and that further adjustments may be recommended. Finally, the Klamath Fishery Management Council wishes to express its appreciation to Michael Mohr of the National Marine Fisheries Service, Allen Grover and Melodie Palmer-Zwahlen of the California Department of Fish and Game, and Michael Burner of the Oregon Department of Fish and Wildlife for their effort and diligence.

Sincerely,

Dan Viele

Dan Viele
Chair

Washington Trollers Association
PO Box 7431
Bellevue WA 98008
(425)747-9287; Fax (425)747-2568
Doug Fricke, President

Washington Trollers Association

October 22, 2001

Pacific Fishery Management Council
Dr. Peter Lawson, Chair, SSC Salmon Subcommittee.
Chuck Tracy, Salmon Technical Team
FAX) (502)326-6831

Subject: Review of Coho FRAM Model

Dear Dr. Lawson, Mr. Tracy and Members of the Team:

In your work on the Coho FRAM Model this week, October 23 and 24, we ask that you review the contribution rate for OCN's in the Washington, Area 3 troll fishery. The rate used in 2001 for August was 599 that is way above all other contribution rates in the Washington areas. We believe this to be an artifact of landings in Area 3 caught in Oregon during the 1979-81 base period.

The attached figure shows the established OCN contribution rates for each Washington catch area for both troll and sport. The August troll contribution for Area 3 is clearly an "outlier" and makes no sense. Looking at the attached table of contribution rates for the troll fishery these kinds of contribution rates are not seen elsewhere in the Washington coast and it is necessary to go to the Tillamook area and south along the Oregon Coast before these rates are seen and exceeded.

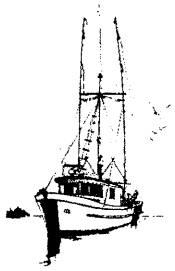
During the base period, there was a significant fleet of trollers, trip boats, that fished out of La Push, Area 3. These boats ranged widely but usually delivered back to La Push. Most of the boats had arrangements with their local buyers that resulted in bonuses at the end of the season. Based on the high OCN contribution rates for Area 3, it appears that a significant number of boats were operating off Oregon but delivering back to La Push. The only way to know for sure would be to review landing tickets. But even then there may not be resolution as buyers generally just mark the area fished as the local area and did not ask the fisherman where the fish were caught.

The WTA respectfully requests that the contribution rate for OCN's in the troll fishery for Area 3 be revised downward to about 250/10,000, the approximate rate in Areas 1 and 2. There is a precedent for this. The team threw out the tag data for fall Chinook in Area 3 for the Straits of Juan de Fuca Chinook at the April 2001 Council meeting in Sacramento.

Thank you for your consideration.

Sincerely,

Gary R. Graham
Director – Technical Affairs - WTA



CONTRIBUTION OF 2001 CRITICAL COHO STOCKS TO WASHINGTON AND OREGON FISHERIES

2/21/01

STOCK CONTRIBUTION PER 10,000 TOTAL CATCH

Area: Troll Fisheries	Skagit	Stilly /Sno	Hood Canal	Straits	Quil Falls	Hoh	Queets	Grays Harbor	Ore CSTL	Col Early	Col Late
Cape Flattery											
July	368	1306	739	343	290	64	161	530	153	1912	2198
August	412	1754	707	329	231	51	180	656	91	1698	1347
Quillayute											
July	273	1096	469	247	382	84	214	338	169	2368	2604
August	252	1042	542	238	319	71	166	445	599	2409	2473
Grays Harbor											
July	194	736	362	192	225	50	128	417	135	2766	3260
August	137	583	302	151	167	37	153	538	254	4286	2756
Columbia River											
July	58	214	107	42	106	23	42	296	212	3517	4677
August	20	53	45	38	133	30	28	77	250	6439	2773
Tillamook											
July	43	114	104	16	192	42	52	163	812	5145	2526
August	21	82	53	8	8	2	47	132	606	6616	1949
Newport											
July	13	52	23	12	90	20	25	111	861	7352	1006
August	6	7	16	5	20	5	15	103	1276	7233	765
Coos Bay											
July	5	10	16	8	10	2	12	90	1291	7184	1007
August	2	2	2	3	28	6	5	23	2413	7025	283
Percent Natural	**90%**	**72%**	**16%**	**60%**	**60%**	**100%**	**55%**	**43%**	**28%**	**N/A**	**N/A**

RESULTS OF SCIENTIFIC AND STATISTICAL COMMITTEE METHODOLOGY REVIEW

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 methodologies the SSC is expected to report on at this time are:

- Revision of the Klamath Ocean Harvest Model (KOHM).
- Coho cohort analysis project and integration into the Coho FRAM.

Council Action:

1. Approve methodology changes as appropriate for implementation in the 2002 salmon season.
2. Provide guidance as needed for any unresolved methodology issues.

Reference Materials:

1. Exhibit D.5.b, Supplemental SSC Report.

PFMC
10/16/01

Quinault Indian Nation

POST OFFICE BOX 189 □ TAHOLAH, WASHINGTON 98587 □ TELEPHONE (360) 276-8211

October 3, 2001

Mr. Chuck Tracy
Staff Officer, Salmon
Pacific Fishery Management Council
7700 NE Ambassador Place, Suite 200
Portland, Oregon 97220-1384

Dear Mr. Tracy:

We have completed review of the Salmon Technical Team's (STT) 9/4/01 draft report, *Queets Coho Stock Assessment*, and offer the following comments. First, we want to thank the STT for seeking this review and accepting our comments. In addition, we want to commend the Team for their objective analysis of this important topic.

We concur with all of the conclusions reached by the STT. The small run sizes observed in 1997-1999 were not due to excessive harvest, but resulted from poor survival conditions, mostly in the marine environment. We believe that deteriorated freshwater conditions caused by unusually large and frequent high-flow conditions also contributed to poor returns in those years.

We agree that the Queets coho stock is not likely to cause an overfishing concern in the near future. Marine conditions are improving, and there are sufficient management safeguards in place to prevent overfishing of this run.

We support the STT recommendation for a comprehensive review of available information regarding appropriate MSY escapement ranges. The data set for Queets coho is among the most reliable and consistently formulated sources for coastal coho salmon. This review will help formulate an up-to-date and comprehensive understanding of Queets coho production characteristics and the significance of recent changes in marine and freshwater productive capacities. We look forward to assisting the STT in this task.

Please contact me at (360)276-8211 ext. 368 if you have any questions regarding these comments.

Sincerely,

Ed Johnstone

Ed Johnstone, Fisheries Policy Spokesperson

MAKAH FISHERIES MANAGEMENT
P.O. Box 115 Neah Bay WA 98357
360-645-3160 - FAX 360-645-2323

MEMORANDUM

From: Russell Svec, Fisheries Program Manager
To: Salmon Technical Team, PFMC
Date: October 5, 2001
Subject: Comments on September 4 Draft of Queets Coho Stock Assessment

---

Thank you for providing Makah Fisheries Management with a review copy of the September 4 draft of the Queets Coho Stock Assessment. The Makah Tribe has been concerned about the status of the Queets coho stock for many years, and we appreciate the opportunity to review this document. This memorandum summarizes our comments on this report.

In general, we agree with the STT's conclusions and recommendations in this draft report. The team arrived at a conclusion similar to the point that we have been making: that Queets coho are not overfished, but that the broods 1994 through 1996 experienced low marine survival, due to changing ocean conditions. For several years we have recommended that independent indicators of marine survival (not averages) be incorporated into the pre-season forecast for the Queets coho stock. We hope that the STT requires future forecasts to incorporate such indicators.

We also hope that the Council adopts your recommendation for a review of the lower end of the MSY escapement range. Although we recognize the biological importance of "surplus escapement", it is clear from Figure 6 (spawners vs. smolt production) that escapement below 5,800 does not condemn the stock to depletion.

We are also impressed with your approach to comparing the effects of freshwater productivity, marine survival, and fishery impacts. Holding two factors constant, and varying the third clearly shows where the impacts to this stock have been. This approach could serve as a model for assessments of other salmon stocks, if the need arises for "overfishing reports" in the future.

We do have some concerns, however, about the sections, "Management Objectives" and "Current Management Approach", as well as technical comments on some of the material in the section "Assessment of Stock Status".

Management Objectives and **Current Management Approach**

This section, which should inform the reader as to how the fishery agencies manage the Queets coho stock, needs more specific information on annual management measures directed at the three stock components of Queets fall coho (natural, supplemental and hatchery). As it is currently written, neither the casual reader, nor the technical fishery staff can understand how the management objectives for wild, supplemental and hatchery coho have been applied to real-life management on a year-to-year basis.

The second paragraph of this section states:

> Generally, predicted ocean impacts on the Queets stock result from catch ceilings that are based on results from the Coho FRAM model; in-river impacts are based on anticipated harvest rates from fishing schedules.

What exactly does this sentence say? That predicted ocean impacts result from ceilings based on FRAM? Our understanding of the process was that it is the other way around: that the ocean catch ceilings result from analysis of impacts predicted by coho FRAM runs, and from co-manager agreement as to what impacts are acceptable. Likewise, aren't the harvest rates planned each year for in-river fisheries based on the analysis of what impacts are acceptable there?

The fourth paragraph of this section states:

> Without agreement between QIN and WDFW, escapements for Queets coho are supposed to fall within the established MSY range of 5,800 to 14,500 adults.

"Supposed" by whom? This statement confuses the cause and the effects. We understood that the process was the reverse of that: that if the escapement is predicted to fall below the established range, then QIN and WDFW negotiate an agreement on how the in-river fisheries should be managed.

Also, since ocean treaty fisheries are affected by management regimes developed by WDFW and QIN, we request that you remove or change the language in the paragraph which reads:

> ...but QIN and WDFW have continued to cooperate in establishing management regimes that meet the needs of treaty and nontreaty fisheries within the limitations resulting from the status of the resource.

This sentence should reflect the fact that these agreements have met the needs of only *freshwater* treaty fisheries. Past agreements between the QIN and WDFW have often not met the needs of the Makah Tribal ocean troll fishery

Under the discussion of Management Objectives, for Hatchery Production, the report states:

> Impacts of ocean fisheries and variations in marine survival rates have undermined the capacity of the coho run to meet the needs of the tribal community. Fish and fishing have always been central to the culture and economy of the Queets village on the Quinault Indian Reservation. Because of the extended run timing of coho, the status of the returning run has a profound effect on the ability of tribal fisheries to harvest chinook and steelhead. In the past two decades, the status of coho has been frequently depressed and the social fabric of the community has suffered as a result.

In the first sentence, the reference to "ocean fisheries undermining the capacity of the run" should either be removed, or changed to refer to ocean fisheries outside of the Council's jurisdiction. The next and last sentences should be changed to also reflect the culture, economy, and social fabric of the all coastal Indian tribes. Reduced salmon catches have had severe adverse effects on the culture, economy, and social fabric of the Makah, Quileute, and Hoh Tribe as well.

.

In addition, under Management Objectives, for Hatchery Production, the report reads:

> The primary objective of the Salmon River hatchery production is to provide harvest opportunities to preterminal and terminal area fisheries.

It is important to show the reader whether this management objective has been met. The report should provide estimates of catch of these hatchery coho in preterminal and terminal area fisheries.

Finally, the section, "Current Management Approach" ends with:

> When spawning escapements fall substantially below the established range, the QIN and WDFW have adopted management regimes that are intended to increase spawning escapements by an acceptable amount over brood year levels.

What is "acceptable amount" of increase? Here the annual application of management objectives must be more clearly explained. Is there some acceptable percentage increase that the agencies have agreed upon in advance? Is it an increase based on the needs of the stock, or on the needs of the fishery? How do QIN and WDFW arrive at this "acceptable" increase?

This section on management of the stock needs to more clearly explain the annual management process. It would be more clear to the reader if it included a table showing the results of this process. The table should include, year-by-year, the FRAM projected escapement, the agreed-upon "acceptable" escapement, and the actual (post-season count) escapement for wild Queets coho. It should include enough years that the reader can compare the agreed-upon (pre-season) escapement with the actual brood-year escapement.

Other Technical Comments

On page 3, under "Natural Coho Production" the report summarizes the freshwater habitat types in the Queets basin, and how the coho use those habitats. More discussion is needed here to explain how (or whether) their use of a variety of habitat types makes them more susceptible to disturbance of those habitats. In particular, since the Clearwater basin has been subjected to heavy clearcut logging, you might include some discussion of impacts from that logging on coho production in the Clearwater, and in the Queets basin as a whole. In this regard, the report should more clearly describe the habitat problems in the river, and should elaborate on the findings of the NMFS Biological Review Team. Most notably, these findings include effects of habitat degradation in lower river basins on peak flows, scour, sedimentation, etc: "*These stocks have been reduced from historical levels by large scale habitat degradation in the lower river basins...*" (NMFS 1995, page 131, as cited in this report).

Figure 6 is very illustrative of the relationship between wild spawners and smolt production. It would be improved, however, if the data points in this graph were labeled to show which brood years they represent.

Figure 9 (Queets River coho ocean exploitation rate) and Figure 10 (Terminal harvest rate). What is the source of this information, for wild and supplemental coho? Is this from FRAM, or is it from a post-season (CWT-based?) cohort reconstruction. Please cite sources of this information. We request that the STT include a table in this report showing these annual ocean and in-river catch data for each of the three stock components of Queets fall coho.

Also, why does one graph (Figure 9) refer to an "exploitation rate" while the other (Figure 10) refers to a "harvest rate"? The reader might infer from this that fish caught in the ocean are "exploited", while those caught in the river are merely "harvested"? Whichever term is used, it should be used consistently, or there should be an explanation of the difference.

Thank you once again for the opportunity to review this document. We look forward to seeing the final report and to an improved approach to managing the Queets coho stock.

Exhibit D.6.b
Attachment 3
November 2001

State of Washington
DEPARTMENT OF FISH AND WILDLIFE

Mailing Address: 600 Capitol Way N • Olympia, WA 98501-1091 • (360) 902-2200, TDD (360) 902-2207
Main Office Location: Natural Resources Building • 1111 Washington Street SE • Olympia, WA

Date : October 5, 2001

Subject: WDFW memorandum to Pacific Fishery Management Council Salmon Technical Team on draft Queets Coho Stock Assessment report

The Washington Department of Fish and Wildlife (WDFW) has completed an initial technical review of the draft Queets Coho Stock Assessment report, and has the following comments and observations. We would like to thank the Salmon Technical Team for the opportunity to review this document and provide our input.

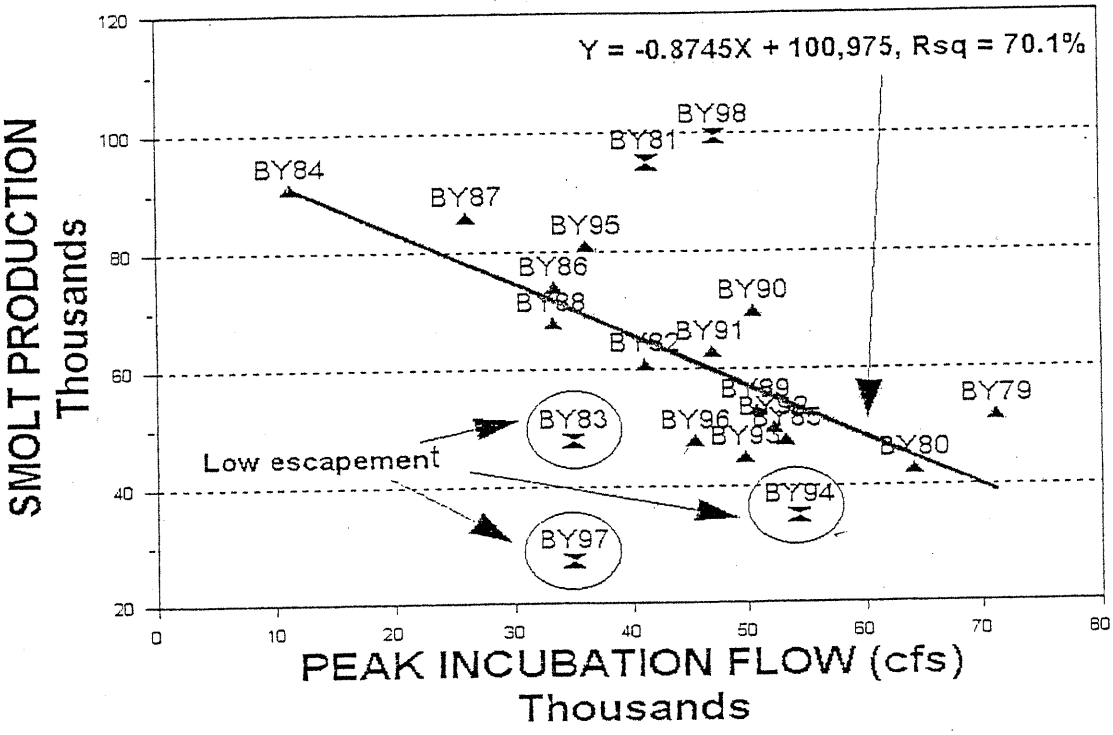
The major shortcoming of the current draft report is that it does not directly review all the key causes of the recent low Queets wild coho escapements that triggered the overfishing status review. The draft report discusses some of the issues that have had some influence on the productivity of the stock over the long term (harvest and marine survival rate changes over time), but did not examine in detail the freshwater production issues for this population, which explain a large portion of the productivity function for this population and the failure of the population to meet the stated minimum escapement goals.

Peak fall flow during the coho egg incubation period explains 70% (excluding the three years in the smolt production database with low escapement) of the inter-annual variation in smolt production for the Clearwater basin, independent of the level of parent spawners (Figure 1). The poor 1997 escapement (1994 brood year) can be attributed to a high peak incubation flow, combined with an exceptionally low parent escapement of only 1,100 fish, and poor marine survival in the 2 % range. The 1998 escapement (1995 brood year) was the outcome of very good smolt production (340,000 smolts, due to an adequate escapement and subsequent favorable fall streamflows) that was "done in" by a very poor marine survival of < 2 %. The 1999 escapement (1996 brood) was the progeny of a good parent escapement (9,000) exposed to fairly high fall incubation flows that resulted in only fair smolt production, which was again subjected to mediocre marine survival (~4 %). Harvest was obviously not a major controlling factor in the spawning escapements, given the low (<20 %) exploitation rates during this period.

The adult escapement-to-adult recruit "Ricker" model used in the report to examine stock productivity for this population was not an appropriate approach, given WDFW has observed that a more accurate production function for coho is the Beverton-Holt model, especially when coho escapement-to-smolt relationships are examined. Furthermore, escapement-to-adult production function analyses for salmon couple together the freshwater and marine survival components, which are not synchronous. Indeed, the comment in the draft report referring to the adult escapement-stock recruitment relationship as "noisy" (page 21) can be largely attributed to the very large variations in marine survival that have been observed in Washington salmon populations, such as the 14 fold variation in coho marine survival rates that has been observed at the nearby WDFW Bingham Cr. coho research station (data summarized in the WDFW memorandum 2001 Wild Coho Forecasts for Puget Sound and Washington Coastal Systems, Dave Seiler, WDFW, Olympia, WA). In regards to the one extraneous data point in the escapement-to-adult recruitment relationship that could be construed to support a Ricker type production curve (i.e. reduced adult production at higher escapement levels), the 1996 brood year, it must be noted that the emerging fry from this brood were exposed to a record high 91,000 cfs flow event and likely resulted in extreme displacement of many of the newly emerged fry, which was felt to be the primary reason smolt production fell

considerably below the production prediction regression line fit in Figure 1 (WDFW memorandum 1999 Wild Coho forecasts, Dave Seiler, WDFW), which contributed, in conjunction with subsequent poor marine survival to the poor adult production for that brood. Given these issues, a more appropriate production analysis would be to examine the smolt production vs. escapement function, which is **the** productivity relationship for this or any other coho population.

Figure 1: Queets River peak incubation flow and subsequent smolt production (source – Dave Seiler, WDFW)



In regards to the supplemental origin coho, WDFW would like to review at further length the issue of how "supplemental" origin coho are being considered in regards to the escapement goal in the report. For example, page 1 of the report discussed how the "2000 observed spawning escapement of 8,621 (7939 wild, 682 supplemental) coho was with the escapement range established for Queets coho". WDFW currently does not consider that the supplemental adults are (directly) creditable towards the natural escapement goal, because of continued uncertainty about the contribution of these fish, when spawning in the wild, to subsequent wild production at this time. In regards to the observation on page 12 that the marine survival rate of supplemented fish being continually lower than the wild fish being largely related to ventral fin clips being used on the supplemental fish, WDFW has (generally) observed also that hatchery origin smolts have marine survival rates lower than naturally reared smolts (Mike Gross, WDFW, pers. comm.).

WDFW would like to also like to incorporate into the report the following comments and/or observations:
1) mass marking of the hatchery coho production (they are not currently mass marked) would be beneficial to wild coho management in the Queets, as it would allow more troll and sport harvest of the hatchery production in marine and freshwater fisheries, reducing the stray rate of these fish into the natural population. 2) the forecast description in appendix B can be more accurately described as using recent year marine survival rates * the brood year smolt production estimate. Other approaches were discussed, but not used for the official forecast, and 3) the hatchery and supplemental production review sections of the report seem to occupy an inordinate portion of the total report content.

In conclusion, WDFW has several serious concerns about the content and structure of the current draft report, and would like to see review and revision of the document to incorporate more pertinent data and conclusions regarding the productivity and status of the Queets wild coho population.

Sincerely,

Jeff Haymes

Coho Program Manager

CC: Dave Seiler, WDFW
Doug Milward, WDFW and STT
Mike Gross, WDFW
Tim Flint, WDFW
Bob Gibbons, WDFW
Gary Morishima, Quinault Tribe

QUEETS COHO
Stock Assessment

Salmon Technical Team
Pacific Fishery Management Council
7700 NE Ambassador Place, Suite 200
Portland, OR 97220-1384
(503) 326-6352

TABLE OF CONTENTS

EXECUTIVE SUMMARY

In 1997, 1998, and 1999, the Queets coho stock failed to meet the lower bound of its MSY escapement goal range. In 2000, the Council instructed the STT to complete a stock assessment of Queets coho in response to the retroactive application of overfishing criteria adopted under Amendment 14 to the Salmon Framework Management Plan (FMP), which became effective in September 2000.

In the 3 years when Queets coho were not anticipated to meet their MSY escapement goal, the QIN and WDFW agreed on annual management objectives, which were below the MSY range. Under Amendment 12, the overfishing definition required review of the stock status in the event of failure to achieve the management objective for 3 consecutive years. In 1998, the spawning escapement of 4,102 wild and 1,413 supplemental origin natural spawners exceeded the anticipated level of 4,030 total natural spawners. Consequently, an overfishing review was not required under Amendment 12. When NMFS approved Amendment 14 on September 27, 2000, the threshold for triggering an overfishing concern was changed and was applied retroactively. The threshold became the failure to achieve the MSY escapement range in three consecutive years. Because natural spawning escapement of Queets River coho salmon was less than the lower bound of the estimated MSY range for three consecutive years, the stock triggered an overfishing concern under Amendment 14, even though it did not meet the overfishing criteria under Amendment 12.

The STT evaluated the degree to which various factors (freshwater production, marine survival and harvest) may have contributed to the low spawning escapements in 1997 through 1999. Available information indicates that Queets coho, like many other stocks, suffered from recent production problems when marine survival of progeny was very low. The STT concludes that Queets coho are not overfished. Consequently, development of a rebuilding plan and criteria for determining an end of overfishing are not warranted at this time.

In 2000, the observed spawning escapement of 8,621 (7,939 wild, 682 supplemental) was within the spawning escapement range of 5,800-14,500 established for Queets coho. Spawning escapements in 2001 are also anticipated to exceed the lower end of the escapement range. Marine survival appears to have improved from the low levels observed during the mid-late 1990s. The STT believes that it is unlikely that Queets coho will trigger a conservation alert or overfishing concern in the near future.

The STT's preliminary examination of the historic relationship between spawners and subsequent production suggests that the current escapement range for this stock should be reexamined. The STT recommends that the Council and co-managers undertake a comprehensive review of available information to determine if the lower end of the current MSY escapement range is still appropriate.

The preseason forecasts of the ocean abundance of Queets Natural coho for the years 1997-1999 were all below the lower bound of the escapement goal range. The STT therefore concludes that abundance forecast estimation error did not contribute to the low spawning escapements of Queets coho from 1997 – 1999.

INTRODUCTION

The Salmon Technical Team (STT) was instructed by the Pacific Fishery Management Council (Council) to complete a stock assessment of Queets coho in response to the retroactive application of overfishing criteria adopted under Amendment 14 to the Salmon Framework Management Plan (FMP), which became effective in September 2000. Prior to the adoption of Amendment 14, an overfishing concern was not triggered because escapements of Queets coho exceeded annual target levels established by agreement of the Quinault Indian Nation (QIN) and Washington Department of Fish and Wildlife (WDFW). The STT is responsible for determining the status of Queets coho and developing recommendations for any management changes to rebuild the stock for application beginning in 2002 (Section 3.2.3.2 of Amendment 14) if the stock is determined to be overfished.

Under Amendment 12 to the FMP, the management objective for Queets River coho salmon was to provide 5,800 to 14,500 natural spawners each year, a range that was expected to provide maximum sustainable yield (MSY). However, the FMP also states: "Under those orders for Washington coastal and Puget Sound stocks (U.S. v. Washington, 626 F. Supp. 1405 [1985] and *Hoh v. Baldrige* No. 81-742 [R] C), the treaty tribes and WDFW may agree to annual spawner targets that differ from the MSP or MSY objectives." Under Amendment 12, the overfishing definition required review of the stock status in the event of failure to achieve the management objective for 3 consecutive years. In 1997, 1998, and 1999, in light of anticipated poor marine survival and low forecast run sizes, the QIN and WDFW agreed on annual anticipated spawning escapement levels below the MSY range. Anticipated natural spawning escapement in 1997, 1998, and 1999 were 2,121 (wild), 4,030 (3,466 wild and 564 supplemental), and 5,749 (3,351 wild and 2,398 supplemental), respectively. In 1998, spawning escapement of 5,515 natural spawners (4,102 wild and 1,413 supplemental) exceeded the anticipated level of 4,030 total natural spawners. Consequently, an overfishing review was not required under Amendment 12.

When NMFS approved Amendment 14 on September 27, 2000, the threshold for triggering an overfishing concern was changed and was applied retroactively. The threshold became the failure to achieve the MSY escapement range in three consecutive years. Because natural spawning escapement of Queets River coho salmon was less than the lower bound of the estimated MSY range in 1997, 1998, and 1999, the stock triggered an overfishing concern retroactively, even though it did not meet the overfishing criteria under Amendment 12.

In 2000, Queets River coho stock achieved its escapement objective with 8,621 natural spawners (7,939 naturally produced and 682 supplemental spawners). Thus the stock would not currently trigger an overfishing concern

STOCK DESCRIPTION

Location & Geography

The Queets River drains the western slopes of the Olympic Mountains, entering the Pacific Ocean near the village of Queets on the Quinault Reservation. Originating high in Olympics, the 82.7 km long (871 linear stream km) Queets drains a watershed of approximately 1152 km^2, making it the third largest river on the west coast of Washington (Figure 1).

The bedrock geology of the Queets basin consists of Tertiary sandstone with minor inclusions of basaltic rock overlain by accumulations of Pleistocene alpine glacial till and outwash, lacustrine deposits, and Holocene alluvium deposited by landslides and fluvial transport (Tabor, 1978.). The headwaters of the Queets flow through coastal temperate rainforest.

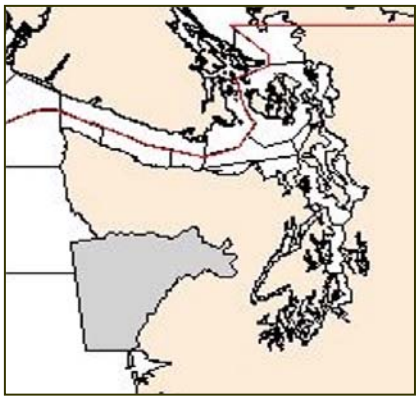


Figure 1. Vicinity map of Queets River

The Clearwater River is the largest tributary of the Queets; it drains an area of approximately 400 km^2 and enters the Queets River at the northwest corner of the Quinault Indian Reservation. Other major tributaries of the Queets River include the Salmon River, Matheny Creek, Sams River, and Tshletshty Creek.

The Queets watershed is almost entirely forested. A large majority of the Queets mainstem lies predominantly within the protected old growth forest of the Olympic National Park (Figure 2).

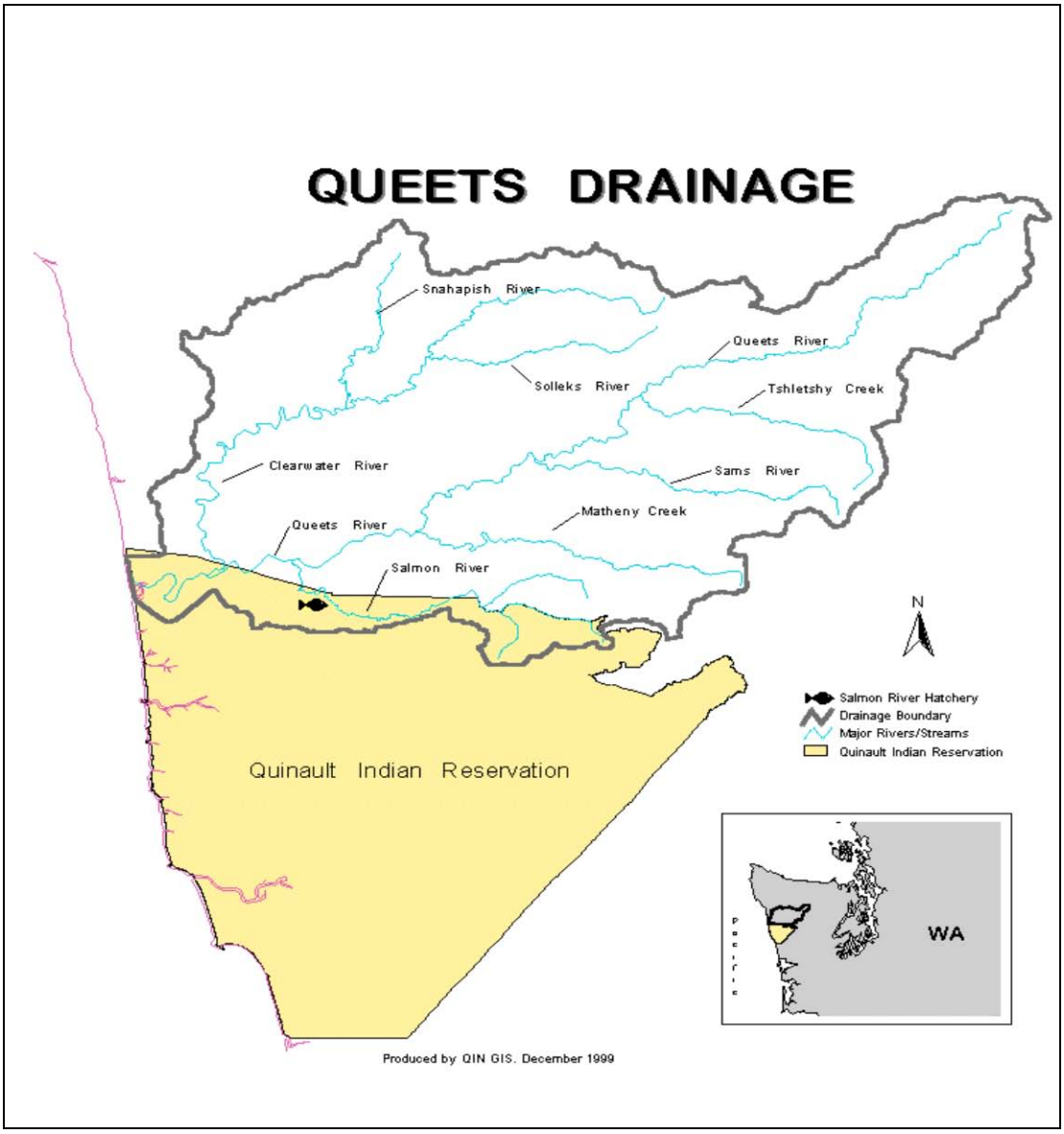


Figure 2. Queets watershed

The Clearwater River watershed has been subjected to intensive logging by the Washington State Department of Natural Resources (DNR) and private timber companies. The contrast between the upper

Queets and the Clearwater has provided fertile ground for research, primarily by the University of Washington (Naiman, 1998) and theDNR. The Salmon River is contained almost entirely within the Quinault Indian Reservation. Matheny Creek and Sams River flow principally through land managed by the United States Forest Service.

Coho Production Components

The Queets River system supports various species of salmonids including coho, cutthroat, winter and summer steelhead, and spring-summer and fall chinook. Coho use almost all of the accessible tributaries draining into the Queets River.

The Queets coho run is managed as a unit under the determinations of the U.S. District Court in *U.S. v. Washington,* 384 F. Supp. 312 (W.D. Wash. 1974), *and Hoh Indian Tribe v. Baldrige*, 522 F. Supp. 683 (W.D. Wash. 1981). There are three components to the run: (1) natural; (2) supplemental; and (3) hatchery.

Natural Coho Production

Natural coho production in the Queets system has been extensively studied since the 1970s. Research indicates that the dynamics of coho populations in the Queets are quite complex; the dependence of the species upon different habitat types during different life history stages makes the stock susceptible to a variety of factors that affect environmental conditions at certain times of the year.

The capacity of various tributaries of the Queets to support coho populations varies depending upon their positions within the watershed and geomorphologies that result in different types of habitat. Naturally-produced coho are dependent on a variety of habitat types within the Queets basin: (1) lower mainstem; (2) low gradient tributaries; (3) off-channel ponds; (4) upper mainstem; and (5) high gradient tributaries (Lestelle et. al. 1993). Utilization of these habitat types varies, depending upon life history stage. Low and high gradient tributaries and the upper mainstem are the primary spawning areas, although some spawning also occurs in the lower mainstem and the outlet channels of off-channel rearing habitats. The lower mainstem and lower gradient tributaries are the primary areas used for summer rearing with other habitat types occupied to a lesser degree. Lower gradient tributaries and off-channel ponds are most heavily utilized during the overwintering period, while juvenile coho rarely occupy upper mainstem and high gradient tributaries during this life history stage.

Coho smolts have been trapped annually since 1979, and coded-wire-tags (CWTs) have been applied to fish collected at various locations since 1981. Research by Peterson (1985) suggests that fish migrating from off-channel ponds return to their natal streams for spawning since CWTs from fish tagged in off-channel ponds were recovered from carcasses and brood stock collection operations in high gradient tributaries and the upper mainstem. In contrast, coho smolts tagged in tributaries return predominantly to the tagging site to spawn.

Supplemental Production

The status of Queets coho in relation to the escapement range established for this stock has frequently limited ocean and terminal fisheries. Survival of naturally-produced fish has been low relative to coho produced in Puget Sound. In addition, the complexity of the freshwater life history patterns of coho combined with an unstable environment such as the Queets watershed causes substantial variability in the freshwater survival of Queets coho. To address chronic production problems in the Queets system, a supplementation program was undertaken beginning with the 1984 brood. The program has been modified over time as results of supplementation efforts have become available.

The supplementation project is designed to stabilize and improve the weak stock status. Wild coho broodstock are captured from the portion of the basin being supplemented. Resulting progeny are released back into the general area of adult capture to minimize or eliminate the risk of genetic change. Currently, progeny are reared to yearling-size smolts before being released into natural or semi-natural ponds located in the upper portion of the basin for acclimation (early supplementation efforts also involved seeding underutilized rearing habitat with fry). Once released, yearlings are weaned from their hatchery diet during their residence in the ponds and are allowed to migrate of their own volition.

All supplemental production is marked to facilitate evaluation and ensure that none of the fish returning as adults are utilized for broodstock.[1] Therefore, any supplemental production is only one generation removed from the wild population. Returning fish are allowed to spawn naturally with the intent to provide a reliable source of fry to seed rearing habitat throughout the system. Recovery data indicate that adults from supplemental releases return to spawn predominantly in suitable habitat in close proximity to the acclimation areas where the smolts were held shortly prior to release.

The Queets supplementation program is unique on the Washington Coast. The supplementation project was initially conducted as a joint effort by WDFW and QIN. The QIN has conducted nearly 100% of the work since the early 1990's. From 1990 through 1995, the project was funded as a Pacific Salmon Treaty research project.

Hatchery Production

The QIN operates a fish culture facility at river mile 4 on the Salmon River, a major tributary to the Queets. Coho reared at that facility are of early-timed stock from the Quinault National Fish Hatchery. The early and compressed run timing of Salmon River hatchery coho enables the terminal area fishery to mount a more intensive fishery on the hatchery component than the wild stock component (Figure 3). Wild stock concerns played an important role in the placement and development of the Salmon River facility. The Salmon River watershed consists of only 7% of the total Queets Basin. Therefore, any affects of naturally spawning hatchery fish would be minimized by location and spawning timing of the hatchery coho. Early hatchery spawning places the hatchery stock at a competitive disadvantage compared to the wild stock. Although hatchery production has been occurring for several years, it is apparent that wild production still occurs based on the bi-modal spawning timing within the Salmon River.

[1] Supplemental groups have been 100% visually marked with a ventral clip previous through the 1996 brood year. The 1997 brood year supplemental groups was 100% adipose clipped. The ventral fin clip was selected because it was believed to result in less mortality than the pectoral fin clip. Other external marks were considered but not used due either to their experimental, still-in-the-development-stages design, our inexperience with other techniques or high cost and inefficient application of certain marks.

Two external marks were required to differentiate between supplementation fish released from remote sites on the Clearwater River and those released from remote sites on the Queets River. A visual mark was required to enable broodstock crews to avoid using supplemented coho for spawning another generation and to minimize handling stress in the broodstock collection nets. The mark was also used by spawning ground surveyors in their mark sampling of coho carcasses throughout the river system.

The adipose clip was not employed because it was sequestered as an indicator of CWTed hatchery coho from Salmon River. Two different external marks were required to determine if Clearwater released fish would stray to the Queets and vice-versa. As the project proceeded, it became evident that fish acclimated to and released as smolts from sites in the Clearwater and Queets basins homed almost invariably to their basin of release.

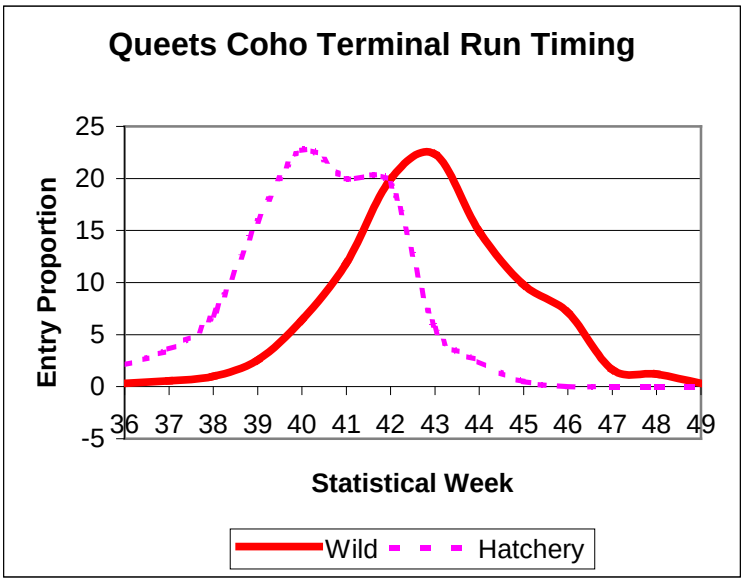


Figure 3. Terminal run timing of Queets natural and hatchery coho.

Management Objectives

Natural Production: Queets coho are managed for natural production, that is, fishery impacts are constrained to try to maintain spawner abundance within the range of maximum sustainable harvest over the long-term. The natural and supplemental components are managed to achieve an annual spawning escapement level determined by agreement of WDFW and QIN.

The current spawning escapement range (5,800 - 14,500 adults) was developed during the early 1980s as a result of two workshops sponsored by the National Marine Fisheries Service (NMFS), Quinault Treaty Area Tribes (Quinault, Quileute, and Hoh), U.S. Fish and Wildlife (USFWS), and Washington Department of Fisheries (WDF) to evaluate the technical basis for setting escapement goals for coho originating in rivers along the Northwest Coast (Lestelle et.al. 1983). The spawning escapement range was derived by estimating maximum smolt production from available habitat and estimates of smolt production per female at two spawner densities: (1) low spawner density where productivity is presumed to be linear and (2) spawning density associated with maximum smolt production.

Supplemental Production: The primary objective of the supplementation effort is to augment natural spawning escapement while maintaining the long-term fitness of the stock. The project was designed to stabilize and improve natural coho abundance to reduce the likelihood that the chronic weak status of the stock would continue.

Hatchery Production: Impacts of ocean fisheries outside of Council jurisdiction and variations in marine survival rates have undermined the capacity of the coho run to meet the needs of the tribal community. Fish and fishing have always been central to the culture and economy of the Queets village on the Quinault Indian Reservation. Because of the extended run timing of coho, the status of the returning run has a profound effect on the ability of tribal fisheries to harvest chinook and steelhead. In the past two decades, the status of coho has been frequently depressed and the social fabric of the community has suffered as a result.

The primary objective of the Salmon River hatchery production is to provide harvest opportunities to preterminal and terminal area fisheries. U.S. preterminal ocean fisheries north of Cape Falcon have been operating under weak stock considerations with fixed quotas. Because all production components are aggregated for purposes of treaty:nontreaty allocation, opportunities arise to provide for differential harvest impacts. The general intent was to have as much of the hatchery production as possible contributing to these quotas, thereby reducing the overall wild coho impacts. For terminal area fisheries, the production of an early-timed hatchery run provides the capacity to harvest hatchery fish at a higher rate than wild fish. The differential run timing of hatchery from the natural and supplemental runs is intended to provide maximum opportunity to harvest hatchery fish while minimizing the incidental harvest of commingled stocks of wild coho and other species.

Salmon River hatchery fish are not mass marked, but are double index tagged to provide a means to assess non-retention mortality in mark-selective fisheries.

Current Management Objectives for Populations Within the Queets basin:

Individual Population	Management Objective	Basis for Objective
Queets Natural	Obtain escapements in the escapement range to optimize future returns	Manage for natural production
Queets Supplemental	Obtain wild broodstock to contribute to natural spawning	Increase natural production
Salmon River Hatchery	Provide early timed coho	Augmentation of Catch

Current Management Approach

Allowable impact levels on the Queets stock are established through the PFMC preseason planning process and "North of Falcon" forum, with in-river fisheries established through discussions between QIN and WDFW. Annual abundance forecasts for individual stocks drive the North of Falcon process (Appendix B).

The status of the Queets stock has been chronically weak and has frequently been a limiting consideration in establishing allowable harvest levels for ocean fisheries. Generally, predicted ocean impacts on the Queets stock are based on results from the Coho FRAM model; in-river impacts are based on anticipated harvest rates from fishing schedules. Annual management regimes for ocean and in-river fisheries are documented in agreements between QIN and WDFW each season.

Queets coho were managed under a *Hoh v. Baldrige* framework plan for Washington coastal stocks until the mid 1990s. The framework plan has not been renewed, but QIN and WDFW have continued to cooperate in establishing management regimes that attempt to meet the needs of fisheries within the limitations resulting from the status of the resource.

Without agreement between QIN and WDFW, the salmon FMP stipulates that escapements for Queets coho are to fall within the established MSY range of 5,800 to 14,500 adults. When escapements within this range are not possible, QIN and WDFW have established fishing regimes for ocean and inriver fisheries that are expected to result in anticipated and mutually agreed levels of spawning escapements. When the Queets stock is depressed, management of inriver fisheries is directed at commingled stocks of returning hatchery coho, chinook, and steelhead so that impacts on naturally-spawning fish are minimized. When spawning escapements fall substantially below the established range, the QIN and WDFW have adopted management regimes that are intended to increase spawning escapements by an amount they found to be acceptable over brood year levels.

ASSESSMENT OF STOCK STATUS

Naturally produced Queets coho rear in freshwater for approximately 18 months prior to their seaward migration during May-June. The vast majority of adults mature as three years olds after spending 18 months in marine waters (some sexually mature males return as two years old jacks). The National Marine Fisheries Service described the status of Olympic Peninsula coho as follows:

> *Coho salmon abundance within this ESU is moderate, but stable. These stocks have been reduced from historical levels by large scale habitat degradation in the lower river basins, but there is a significant portion of coho salmon habitat in several rivers protected within the boundaries of the Olympia National Park. This habitat refuge, along with the relatively moderate use of hatchery production (primarily from native stocks), appears to have protected these coho salmon stocks from the serious losses experienced in adjacent regions. While there is continuing cause for concern about habitat destruction and hatchery practices within the ESU, the BRT concluded that there is sufficient native, natural, self-sustaining production of coho salmon that this ESU is not in danger of extinction and is not likely to become endangered in the foreseeable future unless conditions change substantially.* (NMFS 1995, p 131.)

Spawning Escapements

Estimates of spawning escapements for Queets coho are available for 1976 through 2000 (Table 1). Each year, escapement is estimated through spawning ground surveys that expand observed redd counts by standard expansion factors of one (1) adult male and one (1) female per redd. Expansion factors were validated through a study in the West Branch of the Hoquiam River (Annual Reports to the Northwest Indian Fisheries Commission, 1988, 1989, 1990). The QIN has conducted the vast majority of the adult and juvenile population assessment work on the Queets since the late 1980's. Estimates of wild, supplemental, and hatchery composition of natural spawners are based on CWT recoveries. During the 1990s, wild-origin spawners ranged from slightly over 1,000 to nearly 9,000; the contribution of fish produced by supplementation efforts to natural spawning escapements ranged from less than 100 to 3,600; hatchery escapements ranged from 1,400 to nearly 6,000, but are not counted as natural spawning escapement. Available data indicate that Salmon River hatchery fish home to and are either trapped for broodstock or spawn naturally within Salmon River. Hatchery and natural coho spawning in the Salmon River are distinguished by timing.

Table 1. Queets natural terminal area spawning escapements. Excludes wild broodstock taken for the supplementation program. Source: QIN 2000.

Escapement Year	Wild	Suppl	Total Natural	Hatchery
1976	1,200		1,200	100
1977	1,900		1,900	300
1978	2,700		2,700	600
1979	6,800		6,800	1,600
1980	4,700		4,700	2,400
1981	4,800		4,800	2,400
1982	7,000		7,000	4,500
1983	2,282		2,282	1,100
1984	9,200		9,200	4,042
1985	4,001		4,001	1,228
1986	5,160		5,160	3,654
1987	4,747		4,747	2,401
1988	4,288	3,897	8,185	4,782
1989	4,501	693	5,194	1,872
1990	5,422	1,793	7,215	4,123
1991	6,525		6,525	4,129
1992	6,266	922	7,188	1,402
1993	5,020	2,208	7,228	5,938
1994	1,105	95	1,200	2,901
1995	6,181	592	6,773	2,385
1996	8,993	3,574	12,567	5,191
1997	1,851		1,851	2,137
1998	4,102	1,413	5,515	3,504
1999	4,791	521	5,312	3,551
2000	7,939	682	8,621	3,065

In 1997, 1998, and 1999, the Queets River coho natural spawning escapement fell below the lower bound of the MSY escapement goal range (Figure 4). We believe that this failure was due primarily to poor marine survival. Harvest impacts were dramatically reduced in these years and, while curtailment of harvest could have met the escapement goal in 1998, available evidence does not indicate that harvest is the primary cause of the escapement shortfall.

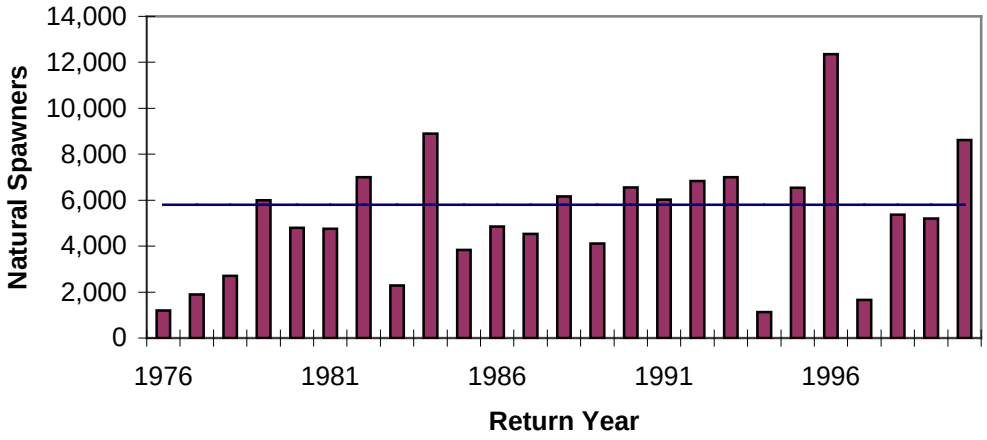


Figure 4. Natural spawning escapement of Queets coho salmon. Escapement includes natural spawners from both wild and supplemental production, and the horizontal line represents the lower bound of the MSY escapement goal range.

Smolt Production

Natural

Natural smolt production has been estimated annually since the early 1980's through smolt trapping, tagging, and recapture experiments. The QIN installs smolt traps at as many as 18 various tributaries and overwintering ponds each spring. From the early 1980s through the early 1990s, WDFW operated a trap in the lower Clearwater River where smolts were recovered to provide a smolt yield estimate through mark-recapture of tagged fish.

Time series of smolt production are available for the Clearwater and the entire Queets system separately (Table 2). The Clearwater smolt production is estimated by a simple mark-recapture program via a scoop trap located near the mouth of the Clearwater River. Smolt production from the Queets basin is estimated from data collected during night seining operations in the lower Queets mainstem. The estimate is made through the use of a linear programming model that incorporates the CWT, fin clip data, and Clearwater scoop trap data.

Table 2. Queets natural smolt production. Source QIN 2000.

Brood YR	Clearwater	Queets	Total
1979	52,900	115,400	168,300
1980	42,600	92,900	135,500
1981	99,800	224,472	324,272
1982	60,600	182,431	243,031
1983	48,200	105,541	153,741
1984	90,800	176,135	266,935
1985	47,500	73,150	120,650
1986	73,600	122,195	195,795
1987	86,000	172,711	258,711
1988	67,800	308,177	375,977
1989	52,600	138,103	190,703
1990	77,500	174,658	252,158
1991	63,100	83,215	146,315
1992	49,900	193,926	243,826
1993	43,900	141,700	185,600
1994	34,900	63,842	98,742
1995	81,500	258,287	339,787
1996	47,807	88,947	136,754
1997	27,314	48,763	76,077
1998*	98,831	226,564	322,395

*preliminary

The smolt production for the Clearwater and the entire Queets system indicates a slight negative trend for the data set available (Figure 5). The total Queets smolt production has ranged from 76,000 – 375,000 since the 1980's. During the 2000 smolt season, the Quinault Indian Nation captured and tagged a record number of smolts (52,500).

Two components of freshwater production that could lead to low returns are insufficient spawning escapement, and decreased productivity of freshwater habitat reflected in smolt production per spawner.

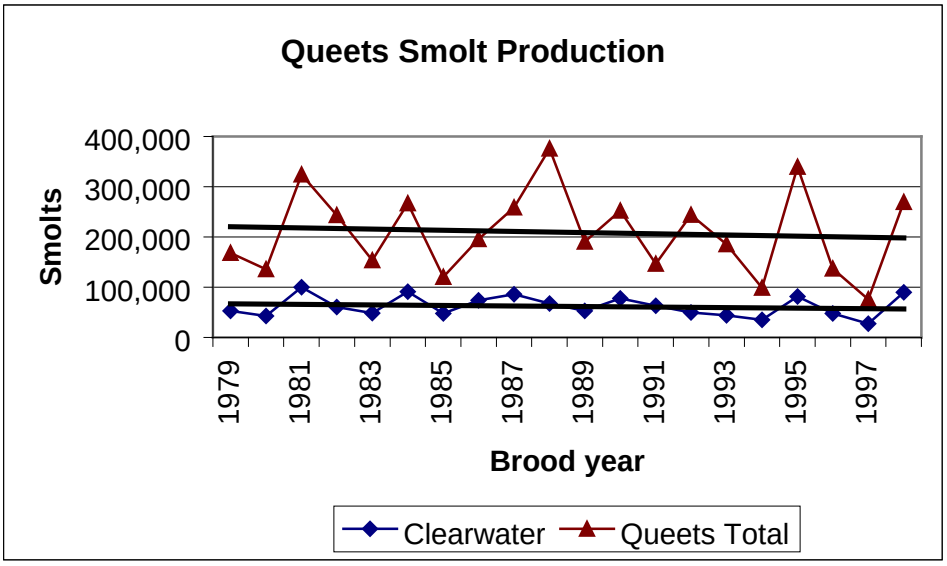


Figure 5. Estimated coho smolt production from Queets and Clearwater basins.

The CWTs used for smolt production estimates also provide estimates of harvest in ocean and terminal fisheries. Examination of the production relationship (Figure 6) suggests that for natural escapements greater than approximately 5,000 adult spawners, smolt production is relatively independent of spawning escapement. The returns from 1997 through 1999 were produced from spawning escapements in 1994 through 1996. Of these broods, only the 1994 escapement was less than the MSY escapement goal range of 5,800 to 14,500.

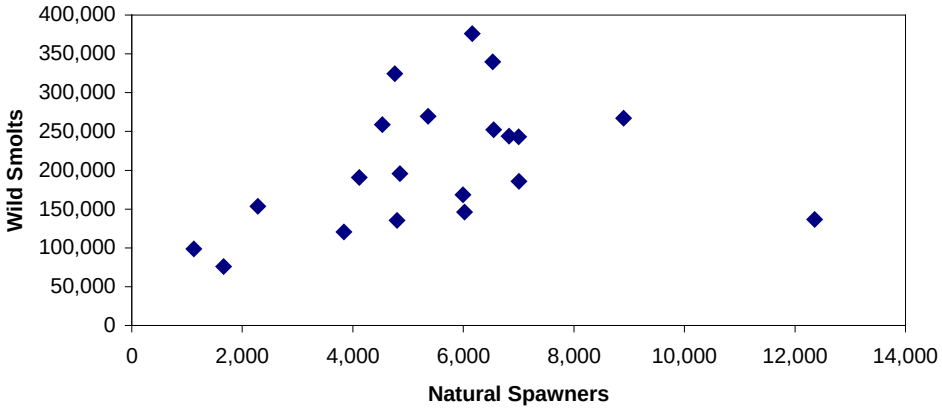


Figure 6. Relationship between natural spawning escapement and subsequent smolt production for Queets River coho salmon.

Estimates of smolt production per spawner (Figure 7), while quite variable, do not show any evidence of a declining trend over time. Peak fall flows during coho egg incubation contribute to the variability in smolt production per spawner. While there was extremely low productivity from the 1996 brood (1999 return year), the 1994 and 1995 broods experienced higher than average freshwater productivity. Total natural smolt production from the Queets basin shows the effects of low escapement in 1994 and low freshwater productivity in 1996 as the second and fourth lowest years of smolt production in the 20-year period for which we have estimates (Figure 5). However total smolt production from the 1997 brood was the lowest observed natural smolt production, and resulted in a spawning escapement of 7,939 in 2000.

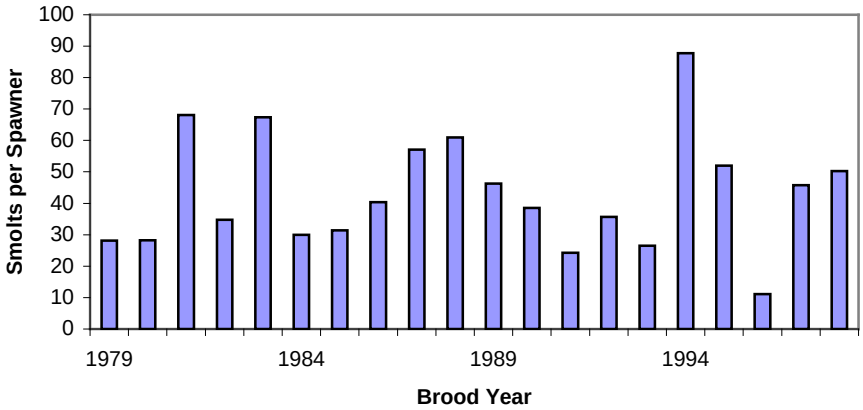


Figure 7. Freshwater productivity. Productivity was calculated as natural smolt emigration divided by the number of natural spawners from wild and supplemental production.

River flow conditions may have affected production from the 1996 brood. In March of 1997, extremely high flows were observed over an extended period during the egg incubation and fry emergence of the 1996 brood. This event triggered the largest landslide observed in the Queets drainage in the last 30 years. A major landslide in the upper Solleks River (tributary to the Clearwater) brought an enormous quantity of debris and sediment into the Clearwater system, substantially changing channel characteristics. WDFW researchers have suggested that coho smolt production for the Clearwater River may be related to peak daily plows during the egg incubation period with high flows leading to high egg and fry mortality and thus low production.

Supplemental Production Releases

Queets coho have been supplemented since the 1985 brood (Table 3). In the initial years of the project, both smolt and fry were planted in habitat believed to be underseeded. Beginning with the 1989 brood, supplementation efforts released only smolts since the available data indicated that fry plants were not successful in increasing production. Production of the 1988 brood was lost due to an outbreak of disease. In the winter of 1999, high water during a severe storm flooded holding ponds; since the capacity to separate progeny by area of broodstock selection was lost, normal supplementation efforts could not proceed. All remaining production was ad-clipped and smolts were allowed to leave hatchery holding ponds on their own volition.

Table 3. Supplemental Releases of Queets Coho

Brood Year	Smolt year	Harvest year	Marked (CWTed)	Unmarked (non-CWT)	Total Supplemental Release
1985	1987	1988	72,210	64,790	137,000
1986	1988	1989	99,323	108,677	208,000
1987	1989	1990	96,075	182,925	279,000
1988	1990	1991			
1989	1991	1992	33,900	0	33,900
1990	1992	1993	72,162	130,665	202,827
1991	1993	1994	63,788	16,320	80,108
1992	1994	1995	84,978	32,136	117,114
1993	1995	1996	111,759	59,672	171,431
1994	1996	1997	38,669	1,415	40,084
1995	1997	1998	125,326	52,313	177,639
1996	1998	1999	216,146	8,041	224,187
1997	1999	2000	46,353	9,091	55,444
1998	2000	2001	0	0	0

Marine Survival

Reconstructed adult runs divided by smolt emigration provide estimates of marine survival for both natural and supplemental production (Figure 8). While marine survival of supplementation fish has been consistently lower than that of natural production (likely due to the use of ventral fin clips to identify supplemental releases and potential losses from time of outplanting to migration), both show similar patterns. Because the record is longer and more complete for natural production than for supplementation, we will focus on the marine survival of naturally produced smolts.

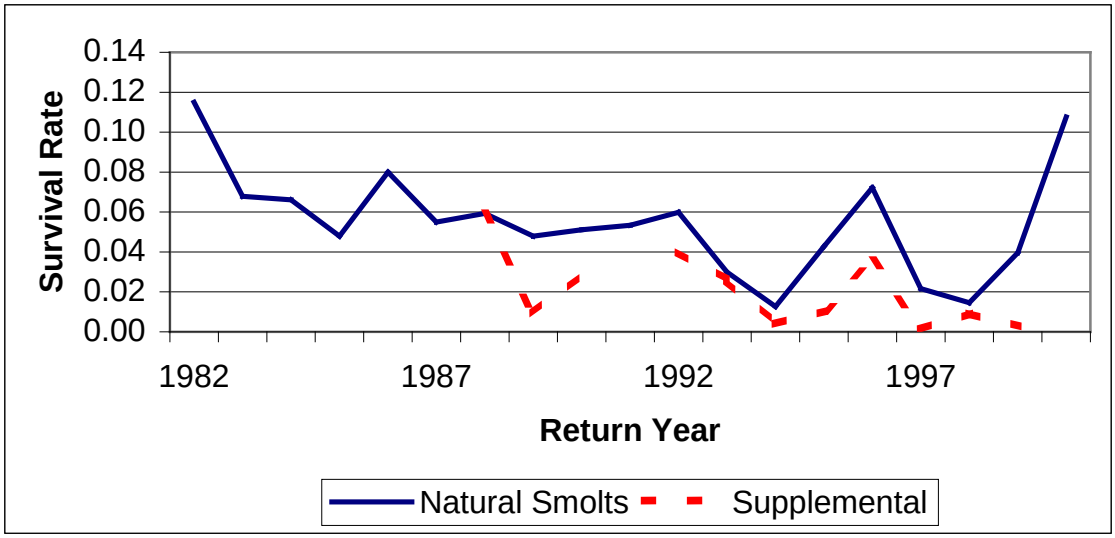


Figure 8. Marine survival of natural and supplemental smolts calculated as ocean recruits (marine catch + terminal run) divided by smolt outmigrants.

There was a declining trend in marine survival in the 1980s and 1990s, and with the exception of the 1996 return year, the naturally produced runs from 1992 through 1999 consistently experienced the lowest marine survival. Low marine survival of Queets coho during the 1990s is consistent with current understanding of recent marine environmental regimes. The productivity in the marine environment of the California Current system has been relatively low since the late 1970s (the 1990s have been some of the lowest productivity years in this period).

In contrast, marine survival of the 1997 brood, which emigrated in 1999 and returned in 2000, was the highest observed since the 1979 brood. All indications are that during most of the 1990s, the California Current system experienced a protracted period of abnormally high temperature. During this time, subtropical and transitional assemblages of copepods and euphausiids dominated the plankton community (Peterson and Mackas, in press[2]). In the fish communities we also saw northward range extensions and increased abundance of species associated with warm water. In 1999, there was an abrupt disappearance of the subtropical neritic copepods from the coastal waters off Oregon and Washington, and a return of boreal and subarctic copepods in the plankton community. Large numbers of anchovies have also been spawning in the Columbia River plume, an event that has not occurred since the 1977 regime shift.

The changes that occurred in 1999 have persisted since then, and while it is too early to say that a regime shift has occurred, this bodes well for the marine survival of coho for at least the next couple of years.

Harvest Impacts

Ocean Fishery Impacts

Queets coho migrate to the north and are more vulnerable to Canadian fisheries than they are to Council fisheries in U.S. waters. Beginning in 1997, Canada curtailed fisheries targeting coho salmon out of

[2] Peterson, W.T., and D.L. Mackas. In press. Shifts in zooplankton abundance and species composition off central Oregon and southwest British Columbia. Pisces Press.

concern for depressed Canadian coho stocks. While there has been a general declining trend in ocean fishery impacts on wild Queets coho since the 1982 return year, primarily due to restrictive management actions taken in U.S. fisheries, the coho conservation measures implemented by Canada are readily apparent as a dramatic decrease in ocean exploitation rates in 1997 (Figure 9).

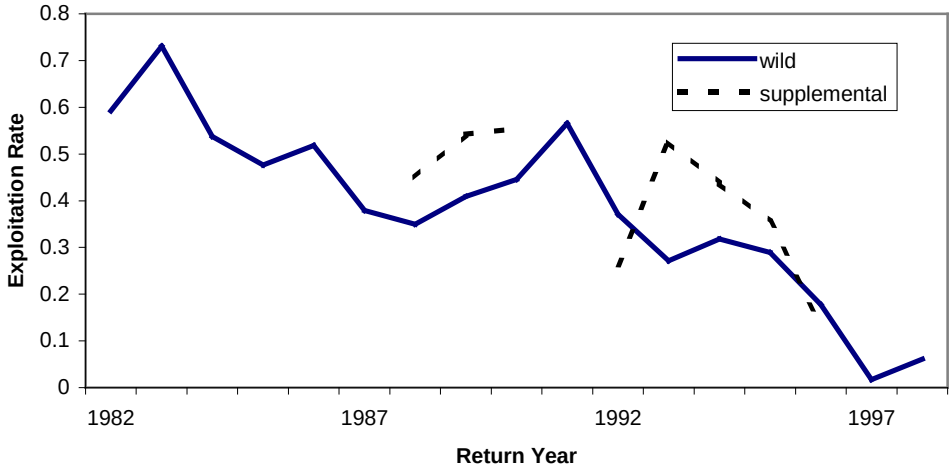


Figure 9. Queets River coho ocean exploitation rate. Exploitation rate calculated as ocean catch divided by ocean recruits (catch + terminal run).

Terminal Fishery Impacts

Terminal harvest impacts on Queets River coho salmon have been highly variable, but during the low marine survival period beginning in 1992, the terminal harvest rate on wild coho has consistently been restrained to well below 20% for all tribal fisheries and freshwater sport fisheries combined (Figure. 10).

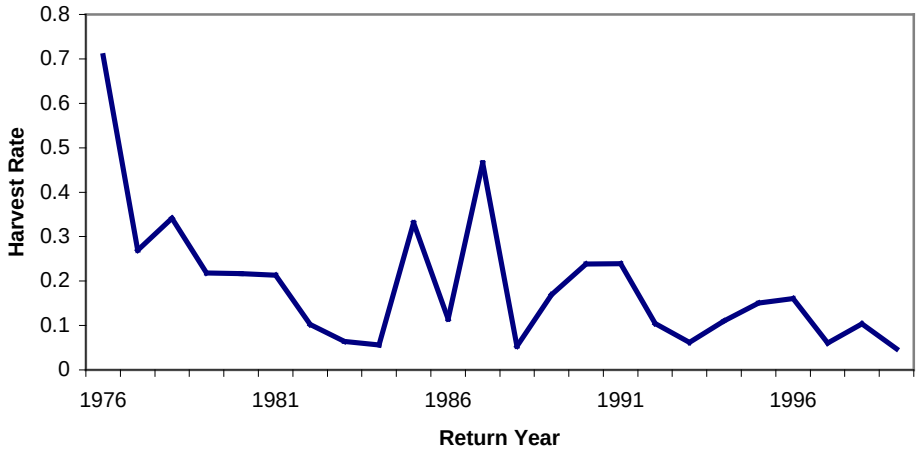


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Figure 10. Terminal harvest rate of natural Queets River coho. Harvest rate calculated as tribal and freshwater sport harvest divided by terminal run size.

Total Fishery Impacts

Total fishery impacts have declined in a pattern very similar to the decline in ocean fishery impacts (Figure 11). Fishery impacts have declined from exploitation rates on the order of 60 to 70% in the 1980's to less than 20% in the recent years when Queets coho natural escapement fell below the MSY goal range. Total fishery exploitation rate was estimated to be 7.7% in 1997 and 15.8% in 1998. Because the terminal harvest rate was even lower in 1999 than it was in 1997, Canadian fisheries directed at coho remained closed, and all U.S. ocean fisheries were selective for hatchery coho, total harvest impacts in 1999 and in 2000 were probably less than 10%.

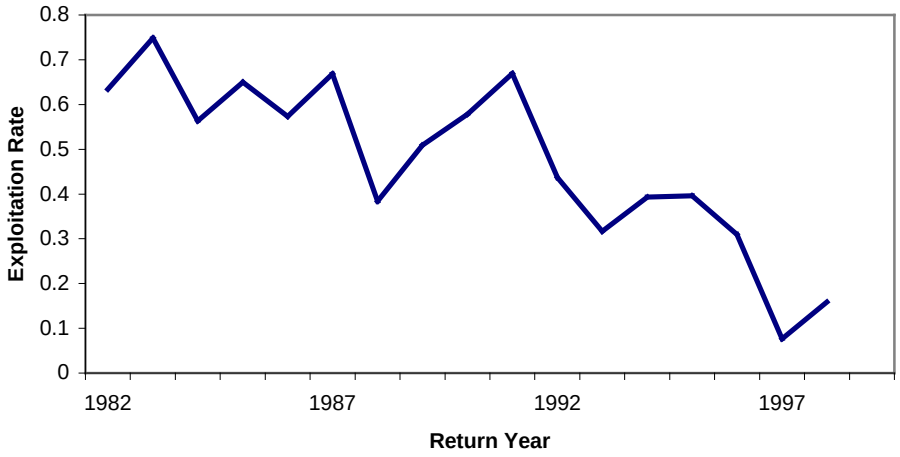


Figure 11. Total fishery exploitation rate. Exploitation rate calculated as (ocean + freshwater catch) divided by ocean recruits.

Discussion

With the information presented, it is possible to examine the relative contribution of different factors to the low escapements of Queets coho in 1997, 1998, and 1999. The STT analyzed the effects of each factor (freshwater survival, marine survival, and harvest) by assuming each factor remained constant over a number of years and examining what the resulting 1997 – 1999 escapements would have been.

If there had been average smolt production from the freshwater environment with no variability, and the broods had experienced the observed marine survival and fishing regimes since 1982, the MSY escapement goal would have been met in 1999 (Figure 12), but not in 1997 or 1998. Similarly, if there had been no fishing at all on Queets coho from 1997 – 1999, escapements would still have failed to achieve the goal range in 1997 and 1999 (Figure 14). On the other hand, if all broods had experienced marine survival equal to the average marine survival of the 1982 through 1988 return years (7.02%), the observed smolt production and fishing regimes would have produced spawning escapements within the MSY goal range in all three years even without any supplementation (assuming 10% total exploitation rates in 1999 and 2000). The period from 1982 through 1988 was selected arbitrarily, simply because it was a period of relatively high survival within the data set, all of which was collected since the marine regime shift that occurred in the late 1970s. In fact actual natural smolt production and fishing regimes would have produced escapements within the goal range in every year since 1988, except for 2000, if the smolts had experienced marine survival similar to that of the 1982 through 1988 returns (Figure 13).

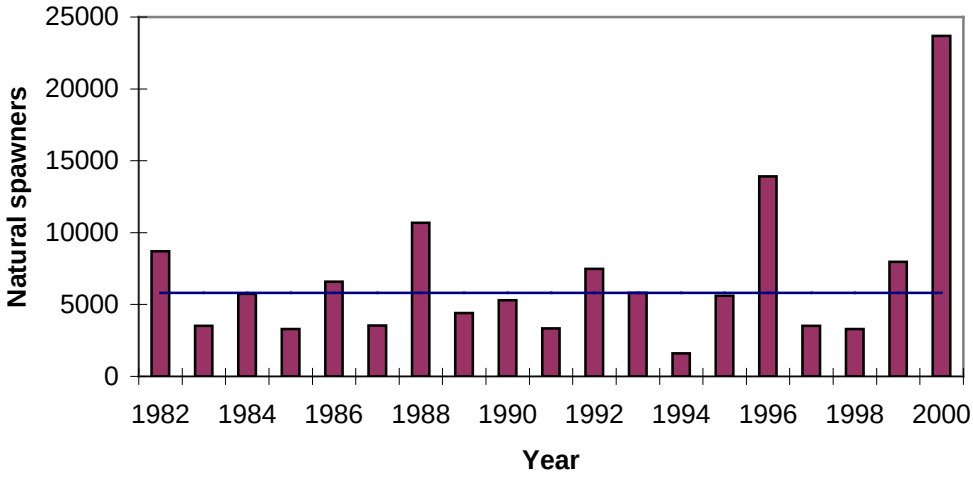


Figure 12. Effect of variability in freshwater production. Scenario generated by applying observed marine survival rates and fishing regimes to constant natural smolt production equal to the 1979 to 1997 average. A total exploitation rate of 10% was assumed for 1999 and 2000.

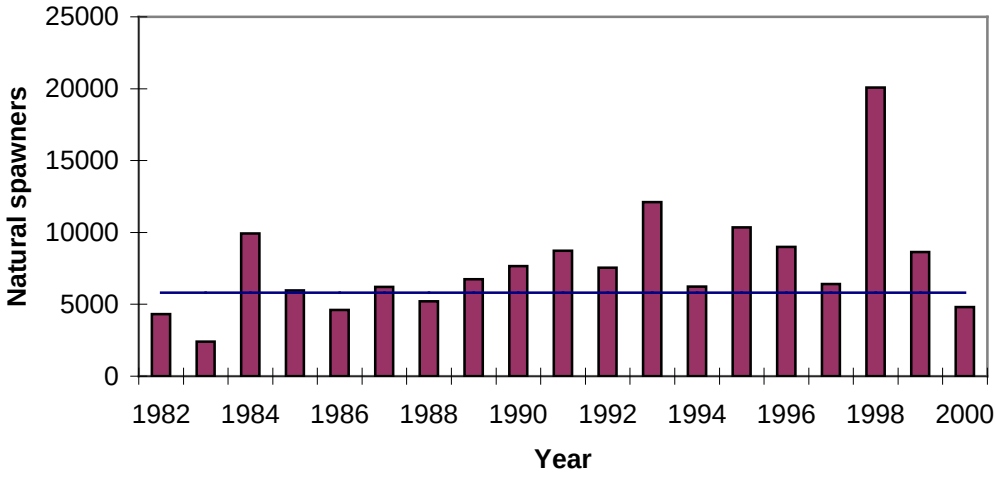


Figure 13. Effect of marine survival. Scenario generated by applying 1982-1988 average marine survival to observed natural smolt production and fishing regimes (10% total exploitation rate assumed in 1999 and 2000).

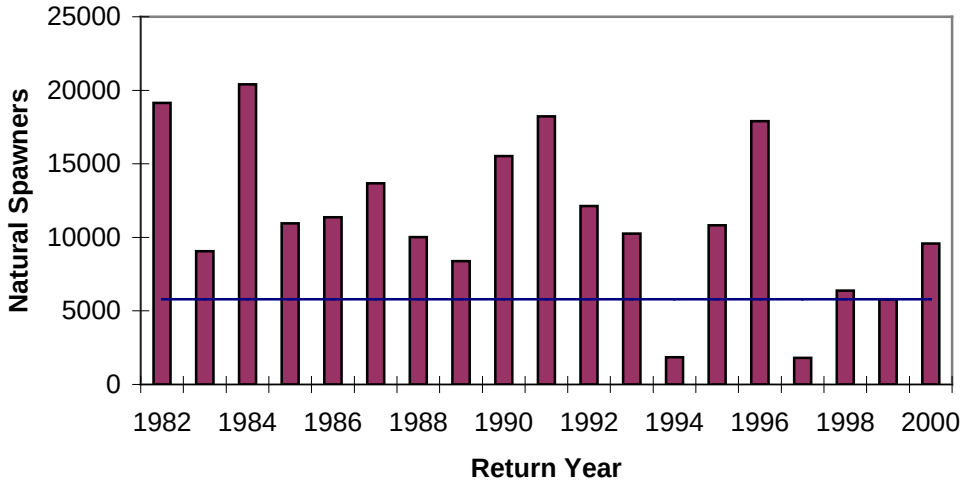


Figure 14. Effect of harvest. Scenario generated by eliminating all harvest on observed ocean run sizes.

Therefore, we believe that a protracted period of very poor marine survival in the 1990s was the primary cause of the Queets coho spawning escapements falling short of the lower bound of the MSY goal range from 1997 through 1999. While further reductions in fishing impacts could have met this lower bound in 1998, fishing impacts were maintained at low levels in all 3 years. Natural spawning escapement in both 1998 and 1999, while below the MSY goal range, exceeded 5,000 natural spawners and was within the range where smolt production appears to be relatively independent of spawning escapement (Figure 6). Although the spawning escapement in 1997 was one of the lowest on record, the progeny of that spawning run met the escapement goal in 2000, and escapement is projected to be within the goal range again in 2001. In addition, all indications are that the forecast for 2001 is a conservative one.

Abundance of Queets River coho is forecast by applying an assumed marine survival rate to smolt emigration estimates for the returning brood. The marine survival rate used for the 2001 forecast was 3.82%. If the 1999 smolt emigration had experienced 1982-1988 average marine survival (7%), the escapement in 2000 would have been below the lower end of the MSY range (Figure 14). Marine survival on the order of 12% would have been necessary to produce the observed 2000 abundance from the 1999 smolt emigration, and marine conditions experienced by smolts in 2000 were similar to those experienced by smolts in 1999. The fact that coho mark rates coastwide in 2001 have been consistently lower than forecast also argues that the returns of natural coho populations should be larger than forecast this year.

CONCLUSION AND RECOMMENDATIONS

The STT evaluated the degree to which various factors (e.g., freshwater production, marine survival and harvest) may have contributed to the low spawning escapements in 1997 through 1999. Available information indicates that Queets coho, like many other stocks, suffered from recent production problems when survival of progeny was very low. The 1997 poor escapement resulted from low parent escapement and experienced high peak winter flows and had low smolt production, which was then subjected to poor marine survival. The 1998 escapement was the outcome of good smolt production that experienced very low marine survival. The 1999 escapement had good parent escapement, but experienced high winter flows and had relatively low smolt production. This brood was also impacted by

relatively low marine survival. The STT concludes that Queets coho are not overfished. Consequently, development of a rebuilding plan and criteria[3] for determining an end of overfishing are not warranted at this time.

In 2000, the observed spawning escapement of 8,621 (7,939 wild, 682 supplemental) was within the spawning escapement range of 5,800-14,500 established for Queets coho. Spawning escapements in 2001 are also anticipated to exceed the lower end of the escapement range. Marine survival appears to have improved from the low levels observed during the mid-late 1990s. The STT believes that it is unlikely that Queets coho will trigger a conservation alert or overfishing concern in the near future.

However, if escapement in 2001 is below the lower end of the established escapement range, the STT recommends that the Council initiate a full status review for this stock.

Fishing plans are developed annually by the Council and state and tribal managers to address concerns for individual stocks. Procedures to bring stocks in danger of overfishing to the attention of the Council through issuance of alerts, coupled with annual abundance forecasts and stock-specific planning provide adequate protection against overfishing.

The STT's preliminary examination of the historic relationship between spawners and subsequent production suggests that the current escapement range for this stock should be reexamined (Appendix A). The STT recommends that the Council and co-mangers undertake a comprehensive review of available information to determine if the lower end of the current MSY escapement range is still appropriate.

The FMP under amendment 14 requires the STT to 'consider if excessive fishing has been inadvertently allowed by estimation errors…'. The preseason forecasts of the ocean abundance of Queets Natural coho for the years 1997-1999 were all below the lower bound of the escapement goal range (Appendix B). The STT therefore concludes that abundance forecast estimation error did not contribute to the low spawning escapements of Queets coho from 1997 – 1999.

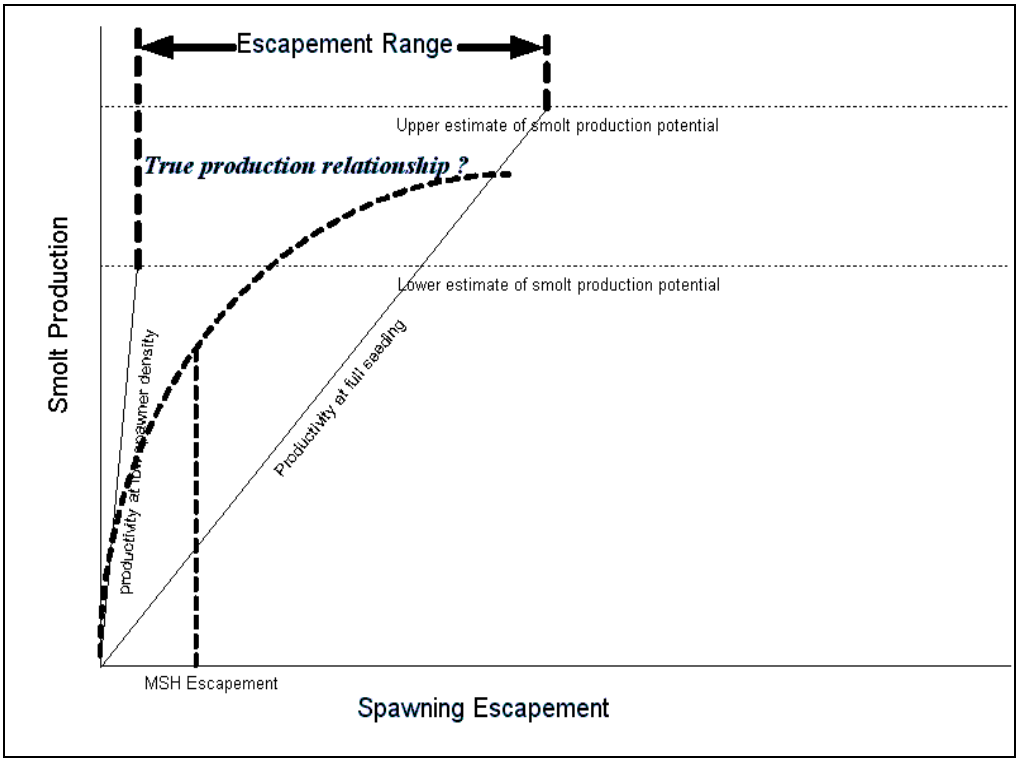
[3] The FMP specifies that criteria defining an end to overfishing are to be developed as part of a rebuilding plan.

Appendix A – Preliminary Examination of Queets Coho Stock- Production Relations

Derivation of Current Spawning Escapement Range

The current spawning escapement range for Queets coho was established in the early 1980s as a result of two workshops that were sponsored by the Quinault Treaty Area tribes (Quinault, Quileute, and Hoh), the Washington Department of Fisheries, the National Marine Fisheries Service, and the U.S. Fish & Wildlife Service to evaluate the technical basis for establishing escapement goals on Washington north coastal rivers. The spawning escapement range was derived from two estimates of smolt production capacity and two estimates of productivity. Estimates of habitat carrying capacity were derived from measurements of three habitat types: tributary, mainstem, and lakes/ponds multiplied by a range of utilization values drawn from the literature. Estimates of productivity (summer low flow) at low spawner density and at full seeding were also drawn from the literature. At that time, there was insufficient data to estimate these values for north coastal river systems.

The true form of the stock-production relationship was unknown; three types of models were considered: Ricker, Beverton-Holt, and rectilinear. The low end of the range was the number of spawners needed to produce the lower estimate of smolt capacity at low spawner density (highest efficiency); the upper end of the range was the number of spawners required to produce the higher estimate at the productivity estimated to fully seed available habitat. The Western District Court of Washington *(U.S. v. Washington)* determined that the true MSH escapement was likely to lie within this range in 1982.



Derivation of Spawning Escapement Range for Washington Coastal Coho

Preliminary Stock-Recruit Analysis Based on Adult Production and Natural Spawning Escapement

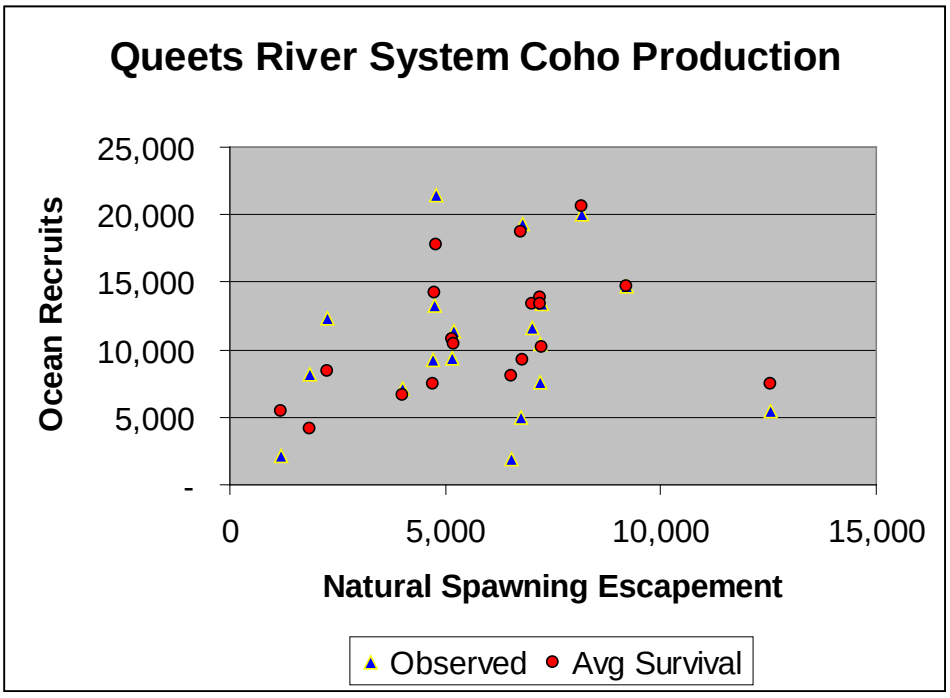
Since the time the escapement goal was established, additional information has become available to evaluate the relationship between production and parent spawning escapement for Queets coho. Smolt production is now believed to depend critically upon over-winter survival rather than summer flow conditions. The STT performed a preliminary analysis of available data relating production of Queets coho to natural spawning escapements. The data employed are presented in the table below. The column titled "Observed recruits" represents smolt production multiplied by the estimated marine survival rates for untagged smolts. The column titled "Average Recruits" represents smolt production multiplied by the 1979-1997 brood year average marine survival rate. This filters out the effect of variability in marine survival conditions, leaving the remaining "noise" in the data to any density dependent effects and variability in freshwater habitat conditions affecting juvenile survival.

Queets Coho Production Data (BY 1997 preliminary; BY 1998 projected)

Brood Year	Natural Escmt	Estimated Smolt Prod	Marine Survival Rate	Observed Recruits	Average Recruits
1979	6,800	168,300	0.1150	19,355	9,252
1980	4,700	135,500	0.0679	9,200	7,449
1981	4,800	324,272	0.0661	21,434	17,826
1982	7,000	243,031	0.0479	11,641	13,360
1983	2,282	153,741	0.0800	12,299	8,452
1984	9,200	266,935	0.0550	14,681	14,674
1985	4,001	120,650	0.0593	7,155	6,633
1986	5,160	195,795	0.0479	9,379	10,764
1987	4,747	258,711	0.0511	13,220	14,222
1988	8,185	375,977	0.0534	20,077	20,669
1989	5,194	190,703	0.0599	11,423	10,484
1990	7,215	252,158	0.0299	7,540	13,862
1991	6,525	146,315	0.0127	1,858	8,043
1992	7,188	243,826	0.0428	10,436	13,404
1993	7,228	185,600	0.0722	13,400	10,203
1994	1,200	98,742	0.0216	2,133	5,428
1995	6,773	339,787	0.0146	4,961	18,679
1996	12,567	136,754	0.0396	5,415	7,518
1997*	1,851	76,077	0.1076	8,186	4,182
1998*	5,515	322,395	NA	NA	17,723

* Preliminary

Observed and Average recruitment estimates produced by natural spawning escapements are depicted in the figure below.

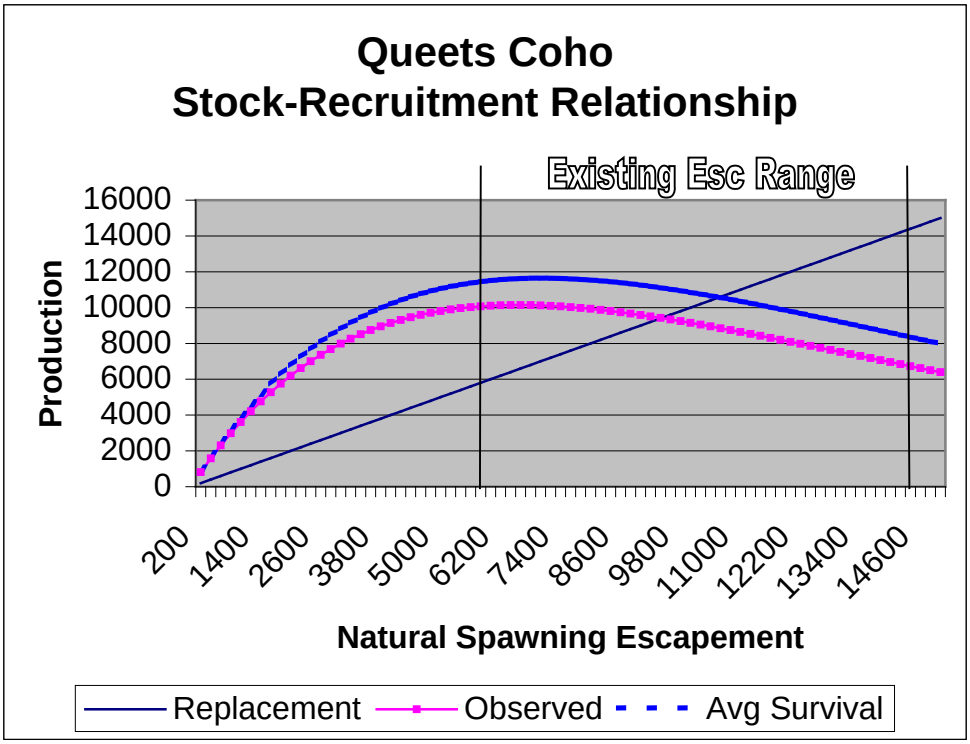


These data suggest that production of Queets coho peaks when natural spawning escapements approach 5,000 to 8,000 and that production may decrease at higher escapement levels. Data for the 1979-1997 brood years were fit to a standard Ricker Stock-Recruit model. Estimates of key statistics are summarized below. As is typical with stock-recruitment analysis, the data are "noisy." A graph depicting the general form of the stock-recruitment relationship under observed and average survival assumptions is also presented.

Queets Stock-Recruit Analysis (Ricker Model)

	Observed	Average Survival
R-squared	0.34451	0.5371
Alpha	4.557515	4.235651
Beta	0.00016	0.00013
MaxProd	10,279	12,269
Esc @ MaxProd	6,131	7,874
MSY	5,522	6,264
Esc @MSY	3,679	4,558
Exp Rate @ MSY	60%	58%

This simple analysis suggests that the MSY escapement level for Queets coho may lie below the lower end of the current spawning escapement range (5,800).



Estimates of escapement at maximum production were compared against those resulting from methods used to determine "full seeding" escapements for Oregon Coastal Natural Coho under Amendment 14. The spawning escapement associated with maximum production for Queets coho would be 6,900, using the average spawners/mile for the OCN stock. This value is comparable to the escapement at maximum production for Queets coho (6,100 to 7,900) estimated through stock-recruitment analysis.

Available data for Queets coho indicate that the stock is not in danger of extinction at escapement values much lower than the existing escapement range 5,800 spawners. Spawning escapements for this stock have been as low as 1,200 (in 1994). Using the 4 fish/mile value employed for the OCN stock, the "critical" spawning escapement level would approach 900.

Relationships Between Smolt Production and Natural Spawning Escapements

Figure 6 in the body of the report depicts data on smolts produced by natural spawning escapements in the Queets system. State and tribal co-managers may find it helpful to analyze these data to try to separate the effects of freshwater production from impacts of marine survival on adult recruitment when evaluating the current spawning escapement goal range.

Tributary Spawning Habitat for Coho Salmon in the Queets River System

Clearwater Tributary			Queets River (excluding Clearwater)		
Stream Name	**WRIA**	**Miles**	**Stream Name**	**WRIA**	**Miles**
lower tribs		1.0	Fisher	.0018	1.5
Hurst and tribs	.0025	7.4	Elk	.0019	5.4
Hunt	.0032	0.9	Harlow	.0134	1.5
Warring	.0033	0.2	McKinnon	.0138	2.4
Elkhorn	.0036	0.7	Salmon and tribs	.0139	18.9
Mink	.0037	1.2	Hibbard	.0156	0.5
Shale and tribs	.0041	6.3	Hartzell	.0156 A	0.3
WFK Miller and tribs	.0048	7.5	Tacoma	.0157	8.0
EFK Miller and tribs	.0049	5.5	Mud	.0163	3.1
Christmas	.0065	7.5	Matheny	.0165	11.8
Peterson	.0068	0.5	Ticket	.0198	3.7
Deception	.0070	1.5	Phelan	.0199	1.3
Prairie	.0071	0.5	North	.0202	2.1
Snahapish and tribs	.0077	10.8	Sams	.0205	7.0
Bull	.0085	1.0	unnamed	.0234	1.0
Stequaleho	.0094	1.8	unnamed	.0234A	0.8
Solleks	.0103	7.1	Coal	.0235	1.0
Kunamakst	.0117	0.2	Vein	.0237	2.2
misc. tribs		15.8	Tshletshy	.0240	2.5
			unnamed	.0265	0.6
			unnamed	.0266	0.8
			Harlow and trib	.0267	2.0
			Bob	.0269	0.5
			Paradise	.0274	2.0
			misc. tribs		6.9
SubTotal Tribs		77.4	SubTotal Tribs		87.8
Mainstem	.0024	34.5	Mainstem	.0016	22.2

Miles of Coho Spawning Habitat Queets System		221.9
OCN Values	**Fish/mile**	**Comparable Spawning Escapement Levels for Queets Coho**
"Critical Escapement"	4	888
Full seeding North	24	5,326
Full seeding North-Central	47	10,429
Full seeding South	12	2,663
Total OCN	31	6,879

Appendix B - Preseason Abundance Forecasts for Queets Coho

Each year, a preseason abundance forecast of December Age-2 ocean recruits for Queets coho is developed jointly by QIN and WDFW. The methodology used for estimating the preseason abundance forecast is documented each year. The preseason forecasts for natural production based on estimates of smolt production multiplied by recent year average marine survival rates (Note: mortalities associated with selective fisheries in recent years are not taken into consideration in estimates of marine survival).

The supplemental and hatchery forecasts are estimated by the product of brood year smolt releases and an historical average of estimated marine survival rates for each respective smolt release.

1979-2001 Queets Preseason Abundance Forecasts for Natural and Supplemental Production.

CY	Natural (1000's of Fish)	Basis	Supplemental (1000's of Fish)	Basis
1979				
1980				
1981				
1982				
1983				
1984	4.1			
1985	6.6			
1986	3.9	75-82 BY Avg		
1987	8.3			
1988	10.3			
1989	13.6			
1990	13.6	Avg smolt-adult survival rate		
1991	16.1	Avg smolt-adult survival rate		
1992	11.7	79-87 BY Avg		
1993	12.9	84-88 BY Avg	NA	Incl in Natural
1994	6.9	82 BY	NA	Incl in Natural
1995	12.1	84-90 BY Avg	3.8	85-90 BY Avg
1996	8.3	84-91 BY Avg	4.8	85-91 BY Avg
1997	4.3	84-92 BY Avg	1.0	85-92 BY Avg
1998	4.2	lowest obs surv rate 84-93 BY	0.7	lowest obs surv rate since 85
1999	4.3	90-94 BY Avg	3.0	90-94 BY Avg
2000	2.7	92-95 BY Avg	0.8	92-95 BY Avg
2001	12.0	92-94 BY Avg	0.0	Flooding at production facility

Adult ocean recruits for natural and supplemental coho were relatively depressed in the mid-late 1990s. The steepness of the declining slope can be directly attributed to the reduced marine survival during the last five (5) years. The El Nino effects on the 1994 brood and resulting contributions need particular attention (Figure 1).

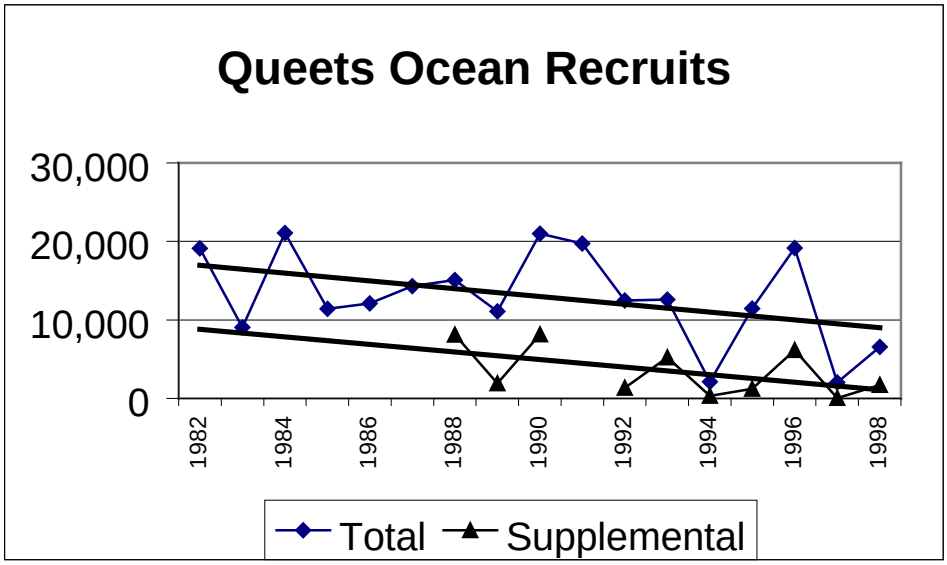


Figure 1. Estimated ocean recruitment of Queets natural and supplemental coho.

The forecast error based on preseason and postseason estimates of natural and supplemental recruits is depicted in Figure 2. The method for estimating the forecast may change from year to year based on anticipated ocean survival conditions. Negative values indicate that the preseason forecast was under-estimated. Preseason forecasts and observed values of ocean escapement of natural production are reported in pre-season I, table III-3.

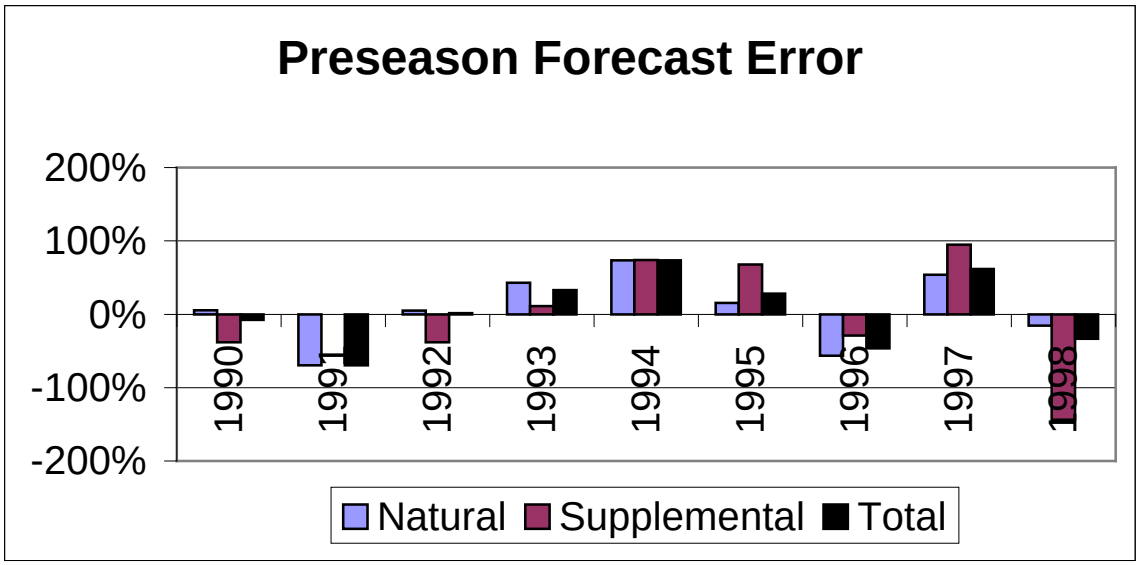


Figure 2. Preseason forecast error for Queets natural and supplemental production.

Preseason abundance forecasts for the hatchery component of the Queets coho run are summarized below.

Calendar Year	Hatchery (Thousands)	Basis
1979		
1980		
1981		
1982		
1983		
1984	1.9	
1985	4.9	
1986	4.2	75-82 BY Avg
1987	3.7	
1988	19.45	
1989	32.3	
1990	28.5	Avg smolt-adult survival rate
1991	21.9	Avg smolt-adult survival rate
1992	18.2	86-90 BY Avg
1993	29.8	83-88 BY Avg
1994	8.1	89 BY
1995	18.1	83-90 BY Avg
1996	23.3	83-91 BY Avg
1997	15.8	83-92 BY Avg
1998	4.6	lowest obs surv rate since 83
1999	10.8	90-94 BY Avg
2000	11.0	92-95 BY Avg
2001	10.0	92-95 BY Avg

Forecasts for Queets coho are driven by marine survival predictions. Survivals of Queets natural and supplemental coho are estimated through CWT data. Over the period of available data, the marine survival of natural and supplemental smolts has ranged from 1.3 to 11.5% and from slightly less than 1.0 to 5.9%, respectively (Figure 3 - Hooking mortalities associated with selective fisheries in recent years are not taken into account).

Marine survival has declined over time, primarily due to the highest observed marine survival rate for the 1982 return year and the poor marine survivals during the last 5 years. The preliminary estimate for survival of natural coho for the 1997 brood was the second highest on record.

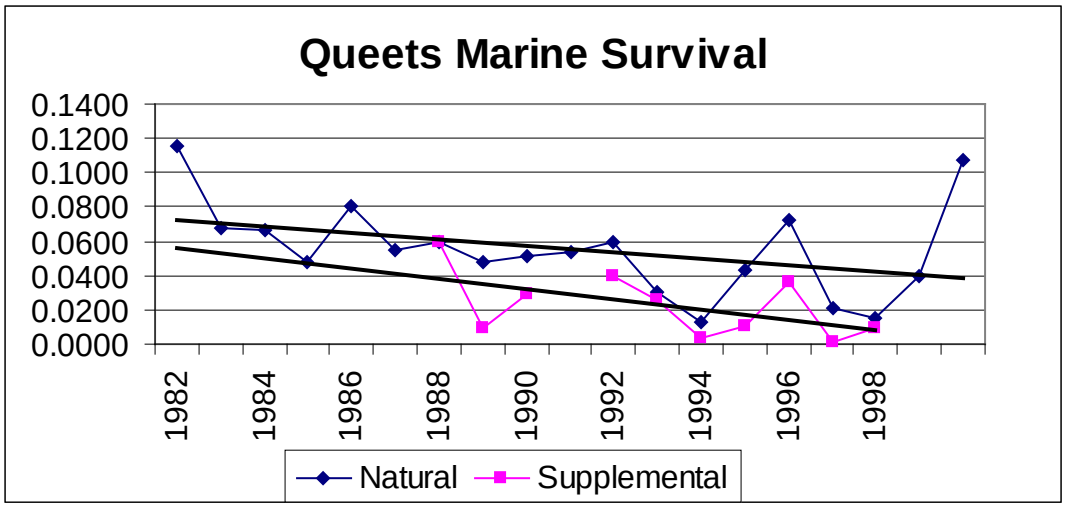


Figure 3. Estimated marine survival rate for Queets natural and supplemental coho smolts.

Queets Coho Marine Survival Rate Estimates Based on CWTs

	Queets Wild		Queets	Salmon
Bd Year	Tagged	Untagged	Supplemental	River
1979	0.0966	0.1150		
1980	0.0570	0.0679		
1981	0.0555	0.0661		
1982	0.0402	0.0479		
1983	0.0672	0.0800		0.0262
1984	0.0462	0.0550		0.0338
1985	0.0498	0.0593	0.0594	0.0348
1986	0.0402	0.0479	0.0092	0.0234
1987	0.0429	0.0511	0.0292	0.0325
1988	0.0449	0.0534		0.0354
1989	0.0503	0.0599	0.0399	0.0126
1990	0.0251	0.0299	0.0258	0.0282
1991	0.0107	0.0127	0.0039	0.0081
1992	0.0360	0.0428	0.0105	0.0120
1993	0.0606	0.0722	0.0358	0.0251
1994	0.0182	0.0216	0.0013	0.0085
1995	0.0123	0.0146	0.0092	0.0193
1996	0.0333	0.0396	0.0027	0.0135
1997*	0.1076			

* Preliminary

Exhibit D.6.c.
Supplemental HSG Report
November 2001

HABITAT STEERING GROUP COMMENTS ON THE QUEETS RIVER COHO STATUS REVIEW

The Habitat Steering Group (HSG) discussed the contents and recommendations outlined in the Queets Coho Stock Assessment prepared by the Council's Salmon Technical Team (STT) (Exhibit D.6.b.). The HSG agrees with the STT's recommendation that the Council and co-managers undertake a comprehensive review of the available information to determine if the lower end of the current maximum sustainable yield escapement range for Queets coho is still appropriate. Further, the HSG recommends that the co-managers review and consider the current status of the habitat given past forest practices in the Queets watershed when setting the new spawning escapement goal. This consideration should include a number of habitat issues that could be limiting factors, such as over-wintering (rearing) habitat, nutrient cycling, incubation flows, and summer temperatures.

The HSG has an interest in Queets coho habitat and requests a joint presentation from the co-managers regarding its current status at the HSG's April 2002 meeting in Portland.

PFMC
10/31/01

SALMON ADVISORY SUBPANEL COMMENTS ON QUEETS RIVER COHO STATUS REVIEW

Referring to Exhibit D.6.b, "Queets Coho Stock Assessment" produced by the Salmon Technical Team (STT), the Salmon Advisory Subpanel agrees with the STT's conclusion that the Queets Coho stock is not overfished and no further action needs to be taken.

PFMC
10/31/01

Exhibit D.6.c
Supplemental SSC Report
November 2001

SCIENTIFIC AND STATISTICAL COMMITTEE COMMENTS ON
QUEETS RIVER COHO STATUS REVIEW

Mr. Dell Simmons presented the Salmon Technical Team's (STT's) Queets Coho Stock Assessment to the Scientific and Statistical Committee (SSC). The Queets system is unique in the richness of data appropriate for coho salmon productivity analysis. The analysis presented by the STT makes a good case that poor marine survival was the immediate cause of the low spawner escapements in 1997, 1998, and 1999. Breaking out the factors of harvest, marine survival, and freshwater survival, and isolating the effect of each on natural spawner escapements was an effective technique. The SSC also discussed Washington Department of Fish and Wildlife's response and concluded it did not change our evaluation of the STT status review.

The SSC agrees a review of the maximum sustainable yield escapement range for Queets natural coho is warranted; however, the SSC does not necessarily agree the data suggest the range should be lowered.

PFMC
10/31/01

EXCERPT FROM THE PACIFIC COAST SALMON PLAN (2000)

3.2.3 Overfishing Concern

> *"For a fishery that is overfished, any fishery management plan, amendment, or proposed regulations . . . for such fishery shall–(A) specify a time period for ending overfishing and rebuilding the fishery that shall–(I) be as short as possible, taking into account the status and biology of any overfished stocks of fish, the needs of the fishing communities, recommendations by international organizations in which the United States participates, and the interaction of the overfished stock within the marine ecosystem; and (ii) not exceed 10 years, except in cases where the biology of the stock of fish, other environmental conditions, or management measures under an international agreement in which the United States participates dictate otherwise. . ."*
>
> *Magnuson-Stevens Act, § 304(e)(4)*

The Magnuson-Stevens Act requires overfishing be ended and stocks rebuilt in as short a period as possible and, depending on other factors, no longer than ten years. For healthy salmon stocks which may experience a sudden reduction in production and/or spawner escapement, the limitation on fishing impacts provided by the Council's MSY or MSY proxy conservation objectives provide a stock rebuilding plan that should be effective within a single salmon generation (two years for pinks, three years for coho, and three to five years for chinook). However, additional actions may be necessary to prevent overfishing of stocks suffering from chronic depression due to fishery impacts outside Council authority or from habitat degradation or long-term environmental fluctuations. Such stocks may meet the criteria invoking the Council's overfishing concern.

3.2.3.1 Criteria

The Council's criteria for an overfishing concern are met if, in three consecutive years, the postseason estimates indicate a natural stock has fallen short of its conservation objective (MSY, MSP, or spawner floor as noted for some harvest rate objectives) in Table 3-1. It is possible that this situation could represent normal variation, as has been seen in the past for several previously referenced salmon stocks which were reviewed under the Council's former overfishing definition. However, the occurrence of three consecutive years of reduced stock size or spawner escapements, depending on the magnitude of the short-fall, could signal the beginning of a critical downward trend (e.g., Oregon coastal coho) which may result in fishing that jeopardizes the capacity of the stock to produce MSY over the long term if appropriate actions are not taken to ensure the automatic rebuilding feature of the conservation objectives is achieved.

3.2.3.2 Assessment

When an overfishing concern is triggered, the Council will direct its STT to work with state and tribal fishery managers to complete an assessment of the stock within one year (generally, between April and the March Council meeting of the following year). The assessment will appraise the actual level and source of fishing impacts on the stock, consider if excessive fishing has been inadvertently allowed by estimation errors or other factors, identify any other pertinent factors leading to the overfishing concern, and assess the overall significance of the present stock depression with regard to achieving MSY on a continuing basis.

Depending on its findings, the STT will recommend any needed adjustments to annual management measures to assure the conservation objective is met, or recommend adjustments to the conservation objective which may more closely reflect the MSY or ensure rebuilding to that level. Within the constraints presented by the biology of the stock, variations in environmental conditions, and the needs of the fishing communities, the STT recommendations should identify actions that will recover the stock in as short a time as possible, preferably within ten years or less, and provide criteria for identifying stock recovery and the end of the overfishing concern. The STT recommendations should cover harvest

management, potential enhancement activities, hatchery practices, and any needed research. The STT may identify the need for special programs or analyses by experts outside the Council advisors to assure the long-term recovery of the salmon population in question. Due to a lack of data for some stocks, environmental variation, economic and social impacts, and habitat losses or problems beyond the control or management authority of the Council, it is likely that recovery of depressed stocks in some cases could take much longer than ten years.
In addition to the STT assessment, the Council will direct its Habitat Steering Group (HSG) to work with federal, state, local, and tribal habitat experts to review the status of the essential fish habitat affecting this stock and, as appropriate, provide recommendations to the Council for restoration and enhancement measures within a suitable time frame.

3.2.3.3 Council Action

Following its review of the STT report, the Council will specify the actions that will comprise its immediate response for ensuring that the stock's conservation objective is met or a rebuilding plan is properly implemented and any inadvertent excessive fishing within Council jurisdiction is ended. The Council's rebuilding plan will establish the criteria that identify recovery of the stock and the end of the overfishing concern. In some cases, it may become necessary to modify the existing conservation objective/rebuilding plan to respond to habitat or other long-term changes. Even if fishing is not the primary factor in the depression of the stock or stock complex, the Council must act to limit the exploitation rate of fisheries within its jurisdiction so as not to limit recovery of the stock or fisheries, or as is necessary to comply with ESA jeopardy standards. In cases where no action within Council authority can be identified which has a reasonable expectation of providing benefits to the stock unit in question, the Council will identify the actions required by other entities to recover the depressed stock. Upon review of the report from the HSG, the Council will take actions to promote any needed restitution of the identified habitat problems.

For those fishery management actions within Council authority and expertise, the Council may change analytical or procedural methodologies to improve the accuracy of estimates for abundance, harvest impacts, and MSY escapement levels, and/or reduce ocean harvest impacts when shown to be effective in stock recovery. For those causes beyond Council control or expertise, the Council may make recommendations to those entities which have the authority and expertise to change preseason prediction methodology, improve habitat, modify enhancement activities, and re-evaluate management and conservation objectives for potential modification through the appropriate Council process.

3.2.3.4 End of Overfishing Concern

The criteria for determining the end of an overfishing concern will be included as a part of any rebuilding plan adopted by the Council. Additionally, an overfishing concern will be ended if the STT stock analysis provides a clear finding that the Council's ability to affect the overall trend in the stock abundance through harvest restrictions is virtually nil under the "exceptions" criteria below for natural stocks.

PFMC
10/15/01

Exhibit D.6
Situation Summary
November 2001

QUEETS RIVER COHO STATUS REVIEW

Situation: The failure to achieve spawning escapement goals for three consecutive years triggers an overfishing concern under Amendment 14 to the *Pacific Coast Salmon Plan* (implemented September 2000). The Salmon Technical Team (STT) is responsible for determining the status of such a stock and developing recommendations for management measures to ensure the stock is not overfished. The Habitat Steering Group (HSG) is responsible for reviewing the status of essential fish habitat (EFH) for the stock and making recommendations for any needed restoration and enhancement measures. Attachment 1 contains an excerpt from Amendment 14 which details the overfishing concern procedures.

Natural spawning escapements of Queets coho did not fall within the range established as the maximum sustainable yield goal in Amendment 14 (5,800-14,500 naturally spawning adults) for 1997-1999. In addition, the preseason projection for 2000 indicated the stock would again fall short of the established goal. With that information at its June 2000 meeting, the Council requested Washington Department of Fish and Wildlife (WDFW) and the Quinault Indian Nation to take the lead in assembling pertinent data to help the STT complete an assessment of Queets coho by September 2001.

Since the November 2000 Council meeting, estimates for the 2000 spawning escapement of Queets coho and abundance projections for 2001 have become available. The current estimates demonstrate the 2000 return was greater than expected and was within the goal range (8,100 wild and supplemental adults). The 2001 return is expected to be sufficient to also meet the spawning escapement goal this year.

As requested by the Council, the STT has developed a stock assessment report for Queets coho, (Exhibit D.6.b, STT Report) a draft of the report was reviewed by the Washington co-managers, and their comments (Exhibit D.6.b, Attachments 1, 2, and 3) were incorporated into the final report. The STT will brief the Council on the results of the report and make recommendations for appropriate Council action.

Council Action:

1. Consider the STT stock assessment report and recommendations to prevent overfishing and assure rebuilding of Queets coho.
2. Identify Council management recommendations for Queets coho that will avoid overfishing and assure stock levels that allow achievement of the fishery management plan (FMP) conservation objective within the shortest time possible, considering biological, social, economic, and international treaty constraints.
3. Provide direction as necessary to the HSG regarding assessment of any identified habitat issues affecting abundance or productivity of Queets coho.

Reference Materials:

1. Excerpt from the *Pacific Coast Salmon Plan* (2000), (Exhibit D.6, Attachment 1).
2. Queets Coho Stock Assessment, (Exhibit D.6.b, STT Report).
3. Quinault Indian Nation Comments on Draft Queets Coho Stock Assessment, (Exhibit D.6.b, Attachment 1).
4. Makah Fisheries Management Comments on Draft Queets Coho Stock Assessment, (Exhibit D.6.b, Attachment 2).
5. WDFW Comments on Draft Queets Coho Stock Assessment, (Exhibit D.6.b, Attachment 3).

PFMC
10/15/01

SACRAMENTO WINTER CHINOOK MANAGEMENT

Situation: This is a two part agenda item which considers the present and future management of listed Central Valley chinook stocks. The first part deals with considering an inseason change to the opening date for the 2002 recreational fishery off California, south of Point Arena, based on our current knowledge of impacts on Sacramento winter chinook. The second part deals with establishing long-term management objectives for listed Central Valley chinook in the salmon fishery management plan (FMP).

Inseason Management

To help accomplish the no jeopardy management standard for endangered Sacramento River winter chinook, the Council has recommended the season opening dates for the 2002 ocean recreational fishery be April 13 between Point Arena and Pigeon Point and March 30 between Pigeon Point and the U.S./Mexico Border. However, at its November 2001 meeting, the Council is to review this decision to determine if earlier openings are possible. Mr. Dan Viele, National Marine Fisheries Service (NMFS), will provide the Council with a review of the winter chinook status and recommendations for the 2002 opening.

Long-Term Management Objective

The current Salmon FMP conservation objective for Sacramento winter chinook is based on the jeopardy standard of the 1997 Biological Opinion (BO) which requires no less than a 31% increase in the adult spawner replacement rate relative to the 1989-1993 mean. The BO also indicated that NMFS would reassess the need for restrictions on ocean harvest after the 2001 season.

Subsequent to the 1999 listing of the Central Valley spring chinook evolutionarily significant units (ESUs), NMFS reinitiated consultation on the Salmon FMP. NMFS issued a BO in 2000 which concluded that ocean fisheries managed under the FMP were not likely to jeopardize Central Valley spring chinook, and no additional Endangered Species Act constraints for that ESU were required. That opinion was based on the fact that existing restrictions for winter chinook under the 1997 BO and the action taken by the California Fish and Game Commission and the Council in delaying the opening of the recreational season provided sufficient protection. A FMP conservation objective has yet to be developed for Central Valley spring chinook.

A comprehensive set of management objectives for winter and spring run chinook could be developed by the Council through the FMP amendment process. The objectives developed in the amendment process could cover a wide range of stock status, including listed, delisted, and recovered. An FMP amendment, on which NMFS would subsequently consult, would provide opportunity for input from resource agencies, user groups, and other affected entities. In any event, a new or interim BO will need be issued prior to the 2002 season to provide a continuation of protection measures until such time as a FMP amendment is completed.

Council Action:

1. **Consider inseason recommendations to open the 2002 recreational salmon fishery south of Point Arena prior to April 13, based on the latest information on stock status of listed Central Valley stocks and fishery impacts.**
2. **Consider options for protection measures for listed Central Valley spring chinook and Sacramento winter chinook in an interim BO which will affect 2002 ocean salmon fisheries.**
3. **Discuss options, scheduling, and personnel needed for a potential amendment process regarding long-term management objectives for Central Valley chinook stocks.**

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Reference Materials:

1. Pacific Coast Salmon Plan Amendment Management Objectives for Listed Central Valley Chinook (Exhibit D.4.b, NMFS Report).

PFMC
10/16/01