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May 1, 2012

Mr. Phil Anderson
Director
Washington Department of Fish and Wildlife
600 Capitol Way North
Olympia, Washington 98501-1091

Mr. Michael Grayum
Executive Director
Northwest Indian Fisheries Commission
6730 Martin Way East
Olympia, Washington 98516

Dear Mr. Anderson and Mr. Grayum:

Enclosed is the finalized summary fisheries document of the parties for 2012-13 management year that represents the results of negotiations between the Washington Department of Fish and Wildlife and the Northwest treaty tribes during the North of Falcon and Pacific Fisheries Management Council (PFMC) pre-season planning forums. This document contains summaries of agreed fishing arrangements for treaty and non-treaty salmon fisheries in the ocean north of Cape Falcon, Oregon and in Puget Sound. Further details, including stock-by-stock management objectives, may be found in the Puget Sound Chinook Harvest Management Plan approved by the National Marine Fisheries Service (NMFS) under the Endangered Species Act (ESA), in the respective parties' regulation summaries, in Status Report documents (as required by the Puget Sound Salmon Management Plan), and other state-tribal understandings.

The fishing arrangements contained in this document are based on pre-season expectations of stock abundance and, in some instances, may be modified on the basis of information obtained in-season and by agreement between the parties. If any changes to the assumptions used to develop these fishing arrangements should occur that would significantly affect the achievement of the parties' agreed management objectives, the parties agree to meet to consider the need to make necessary changes to these fisheries. The agreed upon fisheries document includes non-treaty commercial and recreational fisheries, treaty commercial, and treaty ceremonial and subsistence fisheries. Individual treaty tribes may conduct additional ceremonial and subsistence fisheries not detailed in this agreement, consistent with provisions of the Puget Sound Salmon Management Plan. This document does not specifically address steelhead fishing plans.

Final Fishery Regulation Analysis Model (FRAM) model run summary tables appended to the agreed upon fisheries document provide our assessment of impacts on key natural coho and Chinook salmon populations.

Final fishing plans for some Nooksack River treaty net fisheries remain unresolved at this time and are noted by bolded language within brackets. Tribal managers will continue to work on resolution of this issue.

Detailed descriptions of the management intent and descriptions of monitoring, sampling and enforcement activities for conducting Chinook mark selective sport fisheries in Puget Sound during the 2012-2013 management year are also included and are a part of this fisheries agreement.

Sincerely,

Pat Pattillo
Special Assistant to the Director
Department of Fish and Wildlife

Gary Graves
Director, Fishery Programs
Northwest Indian Fisheries Commission

Enclosure

cc: Northwest Tribal Fisheries Managers and Biologists
Washington Fish and Wildlife Commissioners

5/1/12

2012-13 Co-Managers'

List of Agreed Fisheries

(May 1, 2012 – April 30, 2013)

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(Bracketed and bolded language signifies areas where some unresolved issues remain. Additional Co-manager discussions will occur prior to the fisheries to resolve these remaining issues.)

Part I. Treaty/Non-Treaty OCEAN Fisheries (FRAM #1512 (Chinook) & #1229 (Coho))

Treaty Troll Quota	55,000 Chinook; 47,500 Coho
Non-treaty TAC	99,000 Chinook (non-mark selective equivalent of 95,000); 83,000 Coho.
NT Troll TAC	47,500 Chinook; Mark Selective Fishery impacts associated with a landed catch of 13,280 Coho
Recreational TAC	51,500 Chinook (includes non-selective quota of 43,500 and mark selective fishery impacts associated with a landed catch of 8,000 Chinook) and Mark Selective Fishery impacts associated with a landed catch of 69,720 Coho.

1.1 Treaty Troll: Areas 2, 3, 4 & 4B

5/1-6/30	Chinook directed fishery with sub quota of 27,500 Chinook. May 1 through June 30 or attainment of 27,500 Chinook sub quota, whichever comes first. All salmon except Coho. If the Chinook quota for the May-June fishery is not fully utilized, the excess fish may be transferred into the later all-salmon season on an impact-neutral basis with no more than 3,850 Chinook or 77% of any remaining Chinook from the May-June fishery. If the Chinook quota is exceeded, the excess will be deducted from the later all-salmon season.
7/1-9/15	All salmon species with sub quota of 27,500 Chinook <u>or</u> quota of 47,500 Coho. Chum release 8/1-9/30. July 1 through September 15, or attainment of 27,500 Chinook or 47,500 Coho, whichever comes first.

1.2 Non-Treaty Troll: U.S./Canada border to Cape Falcon

5/1- thru earliest of 6/30 or pre-season Chinook sub-quota of 31,700	All salmon except Coho with 31,700 Chinook quota; Open May 1-June 30, 7 days per week. An in-season conference call will occur when it is projected that 24,975 Chinook have been landed to consider modifying the open period and adding landing and possession limits. Mandatory Yelloweye Rockfish Conservation Area, Columbia and Cape Flattery Control Zones closed. Trip limits, gear restrictions, and guidelines may be implemented or adjusted in-season. Vessels must land their fish within 24 hours of any closure of this fishery; under state law, vessels must report their catch on a state fish receiving ticket. Vessels fishing, or in possession of salmon while fishing north of Leadbetter Point must land and deliver their fish within the area and north of Leadbetter Point. Vessels fishing, or in possession of salmon while fishing south of Leadbetter Point must land and deliver their fish within the area and south of Leadbetter Point, except that Oregon permitted vessels may also land their fish in Garibaldi.

7/1 thru earliest of 9/18 or pre-season Chinook sub-quota of 15,800 or Mark Selective Fishery quota of 13,280 Coho.	Open July 1-4, then Friday through Tuesday with a landing and possession limit of 40 Chinook and 35 marked Coho per vessel per open period. All salmon, except no Chum retention north of Cape Alava, Washington in August and September (all retained Coho must have a healed adipose fin clip). Mandatory Yelloweye Rockfish Conservation Area, Cape Flattery and Columbia Control Zones closed. Grays Harbor Control Zone closed in August and September. Trip limits, gear restrictions, and guidelines may be implemented or adjusted in-season. Vessels must land their fish within 24 hours of any closure of this fishery. Under state law, vessels must report their catch on a state fish receiving ticket. Vessels fishing, or in possession of salmon while fishing north of Leadbetter Point must land and deliver their fish within the area and north of Leadbetter Point. Vessels fishing, or in possession of salmon while fishing south of Leadbetter Point must land and deliver their fish within the area and south of Leadbetter Point, except that Oregon permitted vessels may also land their fish in Garibaldi.

1.3 Non-Treaty Recreational

Area 1: Leadbetter Point to Cape Falcon (Oregon)

6/9-6/22 (8,000 Coastwide Mark Selective Fishery Chinook guideline)	Open 7 days per week; 2 fish per day; all salmon except Coho. All retained Chinook must have a healed adipose fin clip; Chinook minimum size limit 24 inches. In-season management may be used to sustain season length and keep harvest within the overall Chinook recreational TAC for north of Cape Falcon.
6/23-9/30 (34,860 Mark Selective Fishery Coho sub quota)	Open 7 days per week; 2 fish per day, only one of which may be a Chinook; retained Coho must have a healed adipose fin clip; Chinook minimum size limit 24 inches and Coho minimum size 16”; Chinook guideline: 11,100; closed in Columbia Control Zone. In-season management may be used to sustain season length and keep harvest within the overall Chinook recreational TAC for north of Cape Falcon.

Buoy 10

8/1-9/3	Open 7 days/week; 2 fish per day, only one of which may be a Chinook; Chinook minimum size 24 inches and Coho minimum size 16 inches; retained Coho must have a healed adipose fin clip. Release all salmon other than Chinook and hatchery Coho. Barbed hooks allowed.
9/4-9/30	Open 7 days/week; 2 fish per day. Release all salmon other than hatchery Coho. Coho minimum size 16 inches retained Coho must have a healed adipose fin clip. Barbed hooks allowed.
10/1-12/31	Open 7 days/week; 6 fish per day, 2 adults (minimum size 12 inches); retained Coho must have a healed adipose fin clip. Release all salmon other than Chinook and hatchery Coho.

	Barbed hooks allowed.
1/1/2013-3/31/2013	Open 7 days/week; 6 hatchery Chinook per day, 2 adults (minimum size 12 inches); retained Chinook must have a healed adipose fin clip; release sockeye, Chum, Coho and unmarked Chinook.
North Jetty	Open 7 days per week when Area 1 or Buoy 10 area is open. When Buoy 10 area and Area 1 are open concurrently, the daily limit and minimum size restrictions follow the most liberal regulations of those areas. Barbed hooks allowed.

Area 2: Queets River to Leadbetter Point

6/9-6/23 (8,000 Coastwide Mark Selective Fishery Chinook guideline)	Open 7 days per week; 2 fish per day; all salmon except Coho. All retained Chinook must have a healed adipose fin clip; Chinook minimum size limit 24 inches. In-season management may be used to sustain season length and keep harvest within the overall Chinook recreational TAC for north of Cape Falcon.
6/24-9/23 (25,800 Mark Selective Fishery Coho sub quota)	Open Sun-Thur; 2 fish per day, only one of which may be a Chinook; retained Coho must have a healed adipose fin clip; Chinook minimum size limit 24 inches and Coho minimum size 16 inches; Chinook guideline: 25,600. In-season management may be used to sustain season length and keep harvest within the overall Chinook recreational TAC for north of Cape Falcon.

Area 2-1 (east of a line from Leadbetter Point to Cape Shoalwater): Willapa Bay

6/18-7/31	Open concurrent with Area 2, when Area 2 is open for salmon. Area 2 rules apply.
8/1-1/31	6 fish limit, 3 adults, 12” min size limit. Release wild Chinook and Chum.

Area 2-2 (east of line between tips of exposed jetties): Grays Harbor

West of Buoy 13 line 6/9-9/23	Open concurrent with Area 2, when Area 2 is open for salmon. Area 2 rules apply.
East of Buoy 13 line, when open	All salmon required to be released may not be totally removed from the water, except anglers fishing from boats 30’ or longer as listed on either their State or Coast Guard regulation are exempt. Single-point barbless hooks required.
East of Buoy 13 line 7/1-9/15	Closed for salmon through 9/15.
East of Buoy 13 line 9/16-10/7	3 fish limit, 3 adults, only 1 may be a Chinook and only 2 may be wild Coho. 12” min size limit. Release Chum.
East of Buoy 13 line 10/8-11/30	3 fish limit, 3 adults, only 2 may be wild Coho 12” min size limit. Release Chinook and Chum.

Westport Boat Basin and Ocean Shores Boat Basin		
8/16-1/31	6 fish limit, 4 adults; 12” min size limit. Release wild Chinook.	
Areas 3-4: U.S./Canada border to Queets River		
6/16-6/30 (8,000 Coastwide Mark Selective Fishery Chinook guideline)	Open 7 days per week; 2 fish per day; all salmon except Coho. All retained Chinook must have a healed adipose fin clip; Chinook minimum size limit 24 inches. Closed waters: east of a true north-south line running through Sail Rock. In-season management may be used to sustain season length and keep harvest within the overall Chinook recreational TAC for north of Cape Falcon.	
Area 3: Cape Alava to Queets River		
7/1-9/23 (1,760 Mark Selective Fishery Coho sub quota)	Open 7 days per week; 2 fish per day; retained Coho must have a healed adipose fin clip; Chinook minimum size limit 24 inches, Coho minimum size 16 inches; Chinook guideline: 2,050. In-season management may be used to sustain season length and keep harvest within the overall Chinook recreational TAC for north of Cape Falcon.	
La Push Late Season Area 9/29-10/14	(50 Coho sub quota; 50 Chinook sub quota, included above) Fishery restricted to the area north of 47°50’00” N latitude and south of 48°00’00” N latitude. Open 7 days/wk. Other regulations as described above.	
Area 4: U.S./Canada border to Cape Alava and east to Sekiu River		
7/1-9/23 (7,250 Mark Selective Fishery Coho sub quota)	Open 7 days per week; 2 fish per day; retained Coho must have a healed adipose fin clip. Chum non-retention during August and September. Chinook minimum size limit 24 inches and Coho minimum size 16 inches; Chinook guideline: 4,700; Chinook non-retention east of Bonilla-Tatoosh line beginning August 1. Closed waters: east of a true north-south line running through Sail Rock in July; **Closed to salmon angling** July 1-Sept. 30 inside the area bounded by a line from Kydaka Point to Shipwreck Point. In-season management may be used to sustain season length and keep harvest within the overall Chinook recreational TAC for north of Cape Falcon.	
Area 4A: Makah Bay Treaty Evaluation Marine Set Net Fishery		
Chinook	Trty	Open 8/15 through 9/15 inside an area bounded by a line running from Strawberry Rock Point (48º 19’ 07”N, 124º 40’ 00”W) to the group of rocks (48º 19’ 46”N, 124º 40’ 35”W) which are located off Hobuck Beach and a line to the mouth of Hobuck Creek (48º 19’ 54”N, 124º 39’ 37”W), to be implemented per agreement by the Makah Tribe and WDFW.

Part II. PUGET SOUND including STRAIT of JUAN de FUCA and SAN JUAN ISLANDS fisheries (All fisheries modeled in FRAM #1512 (Chinook) & #1229 (Coho))

2.1 Strait of Juan de Fuca Pre-terminal Areas

Areas 5, 6, 6C Treaty Troll (Ntrty net closed)	
NOTE: Area 4B: 5/1-10/31 see Ocean Troll. For 11/1-12/31 & 1/1-4/15 see below.	
5/1-6/16	Closed
6/17 - 9/30	Open for salmon, Chum release; Freshwater Bay, south of Angeles Pt./Observatory Pt. line closed; Pt. Angeles Hbr. W. of line from tip of Ediz Hook to ITT Rayonier Dock closed; Hoko Bay closed, inside the area bounded by a line from Kydaka Point to Shipwreck Point; 1,000 foot closure around stream mouths; Area 6 closed east of line true north from Green Point.
10/1-10/31	Closed
11/1-4/15	In Areas 4B, 5, 6, 6C the treaty troll fishery will be open from November 1, 2012 through April 15, 2013, or when catch reaches the harvest guideline of 8,500 Chinook, whichever comes first. 1,000-foot closures around stream mouths. Hoko Bay closed inside the area bounded by a line from Kydaka Point to Shipwreck Point, for the month of November.
4/16-4/30	Closed
Areas 4B, 5, & 6C Treaty Net (Ntrty net closed)	
Chinook	Open for setnet gear only, 6/17 through 8/11; 7 days a week; Hoko Bay closed, inside the area bounded by a line from Kydaka Point to Shipwreck Point and Freshwater Bay, south of Angeles Pt./Observatory Pt. line closed. 1,000-ft. closure around stream mouths.
Sockeye	Start to be determined by Fraser River Panel. The Co-managers have identified the following management actions to control by-catch of Chinook. Estimated by-catches are best estimates and are not quotas or ceilings. The priority for this fishery is to harvest the full Treaty share of sockeye salmon, while managing the fishery so as to not greatly exceed the projected incidental harvest of Chinook salmon. All Chinook by-catch in this fishery will be promptly reported by each Tribe to the NWIFC TOCAS database and reported to the U.S. section of the Fraser Panel at least weekly, including take home and ceremonial and subsistence (C&S). If in-season the Chinook by-catch in this fishery exceeds 1,300, the Tribes will consider management actions to limit the Chinook by-catch, such as time or area restrictions, while continuing the priority objective of harvesting sockeye salmon. If in-season the fishery is projected to result in a total Chinook by-catch exceeding 3,300 Chinook, the Tribes

	will, effective with that scheduled fishery opening, prohibit any commercial sales of Chinook salmon, and any Chinook salmon landed must be delivered to the fishers' respective Tribe.
Coho	Open for gillnets starting at 6 days per week with in-season adjustments based on cumulative catch. Fishery will target Coho from the end of Fraser Panel control, through 10/6; 1,000 ft. closure around stream mouths. The gillnet catch number modeled will be used as management guideline and should not be greatly exceeded. Hoko Bay closed, inside the area bounded by a line from Kydaka Point to Shipwreck Point.
Chum	Open for gillnets, starting at 6 days per week (day may be added if effort is low), 10/7 through 11/10; 1,000-foot closure around stream mouths. Hoko Bay closed, inside the area bounded by a line from Kydaka Point to Shipwreck Point.
Area 5 Recreational	
5/1-6/30	Closed
7/1-8/15	2 fish limit, (Chinook 22" min size); release unmarked Chinook, unmarked Coho, and Chum. South of the Kydaka Pt./Shipwreck Pt. line – closed to salmon angling.
8/16-9/14	2 fish limit; release Chinook, unmarked Coho, and Chum. South of the Kydaka Pt./Shipwreck Pt. line – closed to salmon angling.
9/15-9/30	2 fish limit; release Chinook and Chum. South of the Kydaka Pt./Shipwreck Pt. line – closed to salmon angling.
10/1-10/31	2 fish limit, 1 Chinook (Chinook 22" min size). South of the Kydaka Pt./Shipwreck Pt. line – closed to salmon angling.
11/1-11/30	Closed
12/1-2/15	Closed
2/16-4/10	1 fish limit (Chinook 22" min size).
4/11-4/30	Closed
Area 6 Recreational	
5/1-6/30	Closed
7/1-8/15	2 fish limit, (Chinook 22" min size); release unmarked Coho, Chum and Chinook, except W. of true N/S line through "2" buoy near tip of Ediz Hook retention of marked Chinook allowed. South of Angeles Pt./Observatory Pt. line – closed to angling. Pt. Angeles Hbr. W. of line from tip of Ediz Hook to ITT Rayonier Dock – closed to salmon angling. Dungeness Bay closed to salmon angling.
8/16-9/30	2 fish limit; release Chinook, unmarked Coho, and Chum. South of Angeles Pt./Observatory Point line - closed to angling. Pt. Angeles Hbr. W. of a line from the tip of Ediz Hook to ITT Rayonier Dock – closed to salmon angling. Dungeness Bay

	closed to salmon angling.
10/1-10/31	2 fish limit, 1 Chinook (Chinook 22” min size). South of Angeles Pt./Observatory Point line – closed to angling. Pt. Angeles Hbr. W. of a line from the tip of Ediz Hook to ITT Rayonier Dock – closed to salmon angling. Sequim Bay south of a line from the south end of Gibson Spit to the west end of Travis Spit - closed to salmon angling. Discovery Bay south of a line from the Gardiner Boat Ramp to Beckett Point - closed to salmon angling. (see: Dungeness Bay Recreational below.)
11/1 - 11/30	Closed
12/1 - 4/10	2 fish limit (Chinook 22” min size). Release unmarked Chinook. Dungeness Bay closed to salmon angling.
4/11 - 4/30	Closed

2.2 Strait of Juan de Fuca Terminal Areas

Area 6D Dungeness Bay Net

Chinook	All	Closed
Coho	Trty	Open 9/21 through 10/28 with additional openings possible based on in-season catch composition data; 9/21 through 10/10, seven days per week, fishing 7 am to 7 pm only, nets must be attended by fisher, Chinook and Chum release; 10/11 through 10/28, seven days per week, 24 hours per day; 1,500 ft closure around mouth of Dungeness River.
	Ntrty	Open Wk 38 (wb 9/16) through Wk 42 (wb10/14) for skiff gillnet gear; 7AM – 7PM, 2 days first week starting 9/21 per SCSCI, 4 days T-F wk 39 (wb 9/23); 5 days M-F wks 40-42; Chinook and Chum NR, release by cutting ensnaring meshes; 1,500 ft. (1/4 nautical mile) closure around each river mouth. Additional openings possible in wk 43 (wb 10/21) based on in-season information.
Chum	All	Closed

Dungeness River Treaty (Ntrty net closed)

Chinook	Trty	Closed
Coho	Trty	Commercial fishing up to 3 days/wk, to be determined in-season, for Coho only, may occur no earlier than 10/16 and will be restricted to areas below the Dungeness hatchery intake using species selective (non-gillnet) gear. Subsistence fishing using selective gear may open after 10/15.
Chum	Trty	Closed

Elwha River Treaty (Ntrty net closed)		
Chinook	Trty	Closed except Ceremonial Harvest of 5 fish in July.
Coho	Trty	Closed
Chum	Trty	Closed
Dungeness Bay Recreational		
5/1-9/30	Closed to salmon angling.	
10/1-10/31	2 fish limit, Coho only.	
11/1-4/30	Closed to salmon angling.	
Dungeness River Recreational		
(mouth to hatchery intake pipe at RM 11.3)	10/16 - 12/31	4 fish limit, Coho only; 12” min size.
Elwha River Recreational		
Closed to all fishing.		
Hoko River Recreational		
(mouth to cement bridge (mile 7.0) on Hoko/Ozette Hwy.)	All year Closed to salmon.	
All other STRAIT OF JUAN DE FUCA REGION freshwater recreational closed to salmon angling**.**		

2.3 San Juan Islands/Point Roberts Area

Areas 6, 7, & 7A Net		
Chinook	All	Closed

Sockeye	Trty	Schedule to be determined. The Co-managers have identified the following management actions to track and control by-catch of Chinook. Estimated by-catches are best estimates and are not quotas. The priority for this fishery is to harvest the full treaty share of sockeye salmon, while managing the fishery so as to not greatly exceed the projected incidental harvest of Chinook salmon. All Chinook by-catch in this fishery will be promptly reported by each Tribe to the NWIFC TOCAS database and reported to the U.S. Section of the Fraser Panel at least weekly, including take home and ceremonial and subsistence (C&S). Prior to achieving a by-catch of 4,200 Chinook there will be no restrictions on the retention or sale of Chinook salmon. If, during the season, the Fraser Panel schedules a fishery that is projected to result in a total Chinook by-catch exceeding 4,200 fish, the Tribes will, effective with that scheduled fishery, prohibit any commercial sales of Chinook salmon, and any Chinook salmon landed must be delivered to the fisher's respective Tribe. July and August – C&S fishery. Further policy discussion may occur among the affected parties prior to the season.
	Ntrty	Schedule to be determined. The Co-managers have identified the following management actions to track and control by-catch. Modeled by-catches are best estimates and are not quotas. All vessel operators must complete best fishing practices certification prior to fishing. Purse seine brailing and use of recovery box required with Chinook, Coho, and Chum NR. Reef net unmarked Coho, Chum, and unmarked Chinook NR. Reef net fishers may retain marked Chinook, with a cap of 300 for all gears through 9/30. Estimates of by-catch will be shared at least weekly in the U.S. Section of the Fraser River Panel. Purse seine and gillnet fisheries will be managed to ensure that the non-treaty impact does not exceed 1,350 total Chinook (120% of pre-season estimate).
Coho	Trty	Closed
	Ntrty	Reef net: 7 days/wk beginning at end of Fraser Mgmt through Chum mgmt wk 45 (wb 11/4); Chinook NR after 9/30; unmarked-Coho release through 9/30, then Coho non-selective. Chum retention prohibited until after 9/30. All vessel operators must complete best fishing practices certification prior to fishing.
Chum	Trty	Starting 10/10 through 11/14; fishing pattern: Oct 10, 12, 13, 16. Dependent upon update of run status from CDFO. A conference call will be held on Oct 16 at 1:00 pm to determine fishing schedule for Oct. 18 and beyond.

	Ntrty	PS and GN open wk 41 (wb 10/7) through wk 45 (wb 11/4), first wk schedule; open 10/11, 10/14, 10/15 and 10/17. Dependent upon update of run status from CDFO. Co-managers agree to discuss future openings on Tuesday 10/16. PS: brailing required, Chinook and Coho NR; GN: Chinook and Coho NR, live box required and limited soak time restrictions in wk 41 (10/7-10/13). Reef nets open from end of Fraser Panel management through wk 45 (wb 11/4), 7 days per week. Release requirements for reef nets stated for Coho management period apply. All vessel operators must complete best fishing practices certification prior to fishing.
Subsistence	Trty	12/1 – 4/30 subsistence troll fishery (Chinook 22" min size) by permit only. Bellingham Bay closed 4/1 – 4/30.

Area 7 Recreational

5/1-6/30	Closed
7/1-7/31	2 fish limit, 1 Chinook (Chinook 22" min size); Waters of Area 7 in Rosario Strait and the eastern portion of the Strait of Juan de Fuca southerly of a line running true south from the westernmost point on Fidalgo Head to Burrows Island, then westerly and southerly along the shore of Burrows Island to the Burrows Island Lighthouse, then westerly to Bird Rocks, then westerly from Bird Rocks to the southernmost point on Decatur Island, then southerly across Lopez Pass to Lopez Island and following the shore of Lopez Island southerly and westerly to Iceberg Point, then from Iceberg Point to Cattle Point, then south southwest to the Salmon Bank Buoy, and then true south from the Salmon Bank Buoy to the Area 7 boundary, closed to salmon angling. Bellingham and Samish Bay closed to salmon angling.
8/1-9/30	2 fish limit, 1 Chinook (Chinook 22" min size); release unmarked Coho and Chum; Waters of Area 7 in Rosario Strait and the eastern portion of the Strait of Juan de Fuca southerly of a line running true south from the westernmost point on Fidalgo Head to Burrows Island, then westerly and southerly along the shore of Burrows Island to the Burrows Island Lighthouse, then westerly to Bird Rocks, then westerly from Bird Rocks to the southernmost point on Decatur Island, then southerly across Lopez Pass to Lopez Island and following the shore of Lopez Island southerly and westerly to Iceberg Point, then from Iceberg Point to Cattle Point, then south southwest to the Salmon Bank Buoy, and then true south from the Salmon Bank Buoy to the Area 7 boundary, closed to salmon angling. Bellingham Bay closed to salmon angling 8/1-8/15; Samish Bay closed to salmon angling. Lummi Bay closure area: east of a line from Gooseberry Point to Sandy Point 9/4 – 9/30.
10/1-10/31	2 fish limit, 1 Chinook; Samish Bay closed to salmon angling 10/1-10/15.
11/1-11/30	Closed

12/1-4/30	2 fish limit, (Chinook 22” min size), release unmarked Chinook Bellingham Bay closed to salmon angling 4/1 – 4/30.

2.4 Nooksack/Samish Terminal Region

Bellingham Bay (Areas 7B, 7C, 7D; 7A On-Reservation) Net

Chinook	Trty	Areas 7B, & 7D: August 1 through September 7, open weekly 4 PM Sunday to 4 PM Friday; except opens 12:01 AM August 1. Fishing pattern 3,5,5,5,5,5. Area 7C: August 1 through September 14, open weekly 4 PM Sunday to 4 PM Friday; fishing pattern 5,5,5,5,5,5,5. Samish Bay is closed southeasterly of a line from Oyster Creek to the fisheries marker on Samish Island, except that hand pull gill nets may fish from 4 PM Sunday – 4 PM Wednesday south to a line from Oyster Creek to Fish Point on Samish Island; fishing pattern: 3,3,3,3,3,3,3. 6 ½” mesh in 7C and off-reservation areas of 7Bexcept when open for sockeye in 7 and 7A.
	Ntrty	Areas 7B & 7C: Wks 33 (wb 8/12) - 36 (wb 9/2); PS Coho NR. GN fishing pattern: 3, 4, 4, 5; PS fishing pattern: 1,1,1,1. See Hales Pass closure below beginning 9/1.
Coho	Trty	Area 7A on reservation fishery: September 16 through October 10. Open weekly 4 PM Sunday – 4 PM Wednesday. Fishing pattern 3,3,3,3.
		Areas 7B and 7D: September 9 through October 20, open Sunday 4 PM – Saturday 4 PM. Fishing Pattern:6,6,6,6,6,6.
		7C: On October 6 conduct a Chinook clearance test. If Chinook have cleared, and there is a harvestable surplus of Coho, then open a Coho fishery Sunday 4PM – Wednesday 4PM (October 7 – October 24); fishing pattern 3,3,3.

	Ntrty	Area 7B: Wks 37 (wb 9/9) - 43 (wb 10/21); GN fishing pattern: 5,5,7,7,7,7,7 (24 hrs for all days); PS fishing pattern: 3,3,7,7,7,7,7. Hales Pass closed for all NT GN openings from Sept. 1 - 21, in the waters of Area 7B west of a line from Point Francis (48°41'42"N, 122°36'40"W), to the red and green buoy southeast of Point Francis (48°40'22"N, 122°35'30"W), then to the northernmost tip of Eliza Island (48°39'37"N, 122°35'45"W), then along the eastern shore of the island to a point intersecting a line drawn through Eliza Rock Light (48°38'35"N, 122°34'40"W) and Fish Point (48°34'35"N, 122°29'45"W) and then southeastward along that line to Fish Point. NT purse seine fisheries fishing in this area must release Coho Sept. 1-21.
Chum	Trty	Areas 7B & 7D: Oct. 21 – Dec.12; open weekly 4 PM Sunday – 4 PM Wednesday; 3,3,3,3,3,3,3,3.
	Ntrty	Area 7B: Wks 44 (wb 10/28)- 48 (wb11/25); PS/GN; 5,5,5,5,5. Whatcom Creek Zone (east of line from Post Point to flashing red light at west entrance of Squalicum Harbor) open 7 days per week.

Nooksack River Treaty Net (Ntrty net closed)

[Note: Nooksack River Tribal commercial fishery openings will be 00:01 a.m. (Lummi openings at 4:00 p.m. and will close at 4:00 p.m, (concurrent with Lummi), on a weekly basis, with the exception of the off-reservation Coho fishery, which will open and close at the hours listed below.]		
Chinook	April 1 – June 15	April to mid-June limited ceremonial and subsistence fishery will be managed for **[a total catch of 159 Chinook, with]** an estimated impact of 17 NOR Chinook. The fishery will occur in the north fork between the railroad trestle just down river from the Highway 9 bridge and the Mosquito Lake Road Bridge (RM 36.6 to 40.8), the Nooksack River between Nugents Corner and the railroad trestle just down river from the Highway 9 Bridge (RM 30.8 and 36.6) and the Nooksack River between Slater Road Bridge and the river mouth (between RM 0.0 and 3.5). A Southern U.S. management objective is in effect for Early Nooksack Chinook during this third year of the 4 year Puget Sound Chinook Harvest Management Plan.

	8/1-9/15	Open weekly 4 PM Sunday to 4 PM Saturday, except open 12:01 AM Wednesday August 1 to 4 PM Saturday August 4. Fishing pattern: 4,6,6,6,6,6. The river is divided into five zones during this period. These zones open in subsequent weeks, proceeding upriver, to protect migrating spring Chinook. Zone 1 is from Marine Drive Bridge to Slater Bridge. Zone 2 is from Slater Br. To Hannegan Br. In Lynden. Zone 3 is from Hannegan Br. to Nugents Corner Br. Zone 4 is from Nugents Corner Br. to the confluence of the north and south forks. Zone 5 is upriver of the confluence of the north and south forks.
Coho	9/16 – 10/20	Open weekly 4 PM Sunday through 4 PM Saturday. Fishing Pattern:6,6,6,6,6. The area extending from the confluence of the North and South Forks downstream to a marker behind the Nooksack Tribal Works Building will not be open during the early portion of the Coho management period, remaining closed prior to Sept. 11.
Chum	11/1-2	Subsistence harvest
	10/21-12/12	Commercial. Open weekly 4 PM Sunday through 4 PM Wednesday. Fishing Pattern: 3,3,3,3,3,3,3,3.
Bellingham Bay Terminal Area Recreational		
5/1-8/15	Closed to salmon angling.	
8/16-10/31	4 fish limit, 2 Chinook (Chinook 22" min size); Samish Bay closed to salmon angling thru 10/15.	
11/1-3/31	Same as Area 7.	
4/1-4/30	Closed to salmon angling.	
Nooksack River Recreational; mainstem and North Fork		
(from Lummi Indian Reservation boundary to yellow marker at the FFA high school barn in Deming)	9/1 – 12/31	2 fish limit, plus 2 additional Coho; 12” min size. Release unmarked Chinook thru 9/30.
(from yellow marker at the FFA high school barn in Deming to confluence of North and South forks)	10/1 – 12/31	2 fish limit, plus 2 additional Coho; 12” min size.

(from confluence of North and South forks to Maple Creek on North Fork)	10/1 – 11/30	2 fish limit, plus 2 additional Coho; 12” min size.
Nooksack River Recreational, South Fork		
(from mouth to Skookum Creek	10/1 – 12/31	2 fish limit, plus 2 additional Coho; 12” min size. Release Chum.
Samish River Recreational		
(from mouth to I-5 Bridge)	8/1-11/30	2 fish limit, 12” min size. Release unmarked Coho.
Dakota Creek Recreational		
(mouth to Giles Road Bridge)	10/1 – 12/31	2 fish limit, 12” min size. Release unmarked Chinook.
Whatcom Creek Recreational		
(mouth to yellow markers below foot bridge below Dupont St. in Bellingham)	8/1 – 12/31	6 fish limit, 2 adults; 12” min size.
All other NOOKSACK/SAMISH TERMINAL REGION freshwater recreational: Closed to salmon angling.		

2.5 Skagit Terminal Region

Skagit Bay (Area 8) Net		
Note: Fishing schedules for Skagit Bay and Skagit River are pre-season projections. Schedules may be changed in-season as necessary to meet management objectives.		
Spring Chinook	Area 8 – Trty	Swinomish Tribe fishing pattern: wk 19 (wb 5/6) thru wk 21 (wb 5/20);1,1,1; Upper Skagit Tribe fishing pattern: wk 20 (wb 5/13) thru wk 22 (wb 5/27);1,1,1.
Sockeye	Area 8 – Trty	Swinomish Tribe fishing pattern: Wk 25 (wb 6/17) thru wk 28 (wb 7/8);7,7,7,7; Upper Skagit Tribe fishing pattern: Wk 27 (wb 7/1) thru wk 28 (wb 7/8);1.167,1.
	Ntrty	Closed
Coho	Trty	Terminal Treaty HR target 12.5% as a response to “Low” abundance. If ISU changes abundance status, HR target may be modified following co-manager discussions.

	Area 8 – Trty	Swinomish Tribe fishing pattern: Wks 38 (wb 9/16) thru wk 41 (wb 10/7);1,2,2.5,1; Upper Skagit Tribe fishing pattern: wks 41 (wb 10/7) thru wk 43 (wb 10/21);1,1.167,1.167.
	Ntrty	Closed
Chum Test	Area 8	1 boat at Jetty 1 day/wk 44 (wb 10/28) & 45 (wb 11/4) and 1 boat in Bay 1 day/wk 44 (wb 10/28) & 45 (wb 11/4).
Chum	Area 8 – Trty	Swinomish Tribe fishing pattern: No preseason harvestable. Placeholder modeled schedule wk 46 (wb 11/11) 1. Fishery dependent on ISU and harvestable fish. Upper Skagit Tribe fishing pattern: No preseason harvestable.
	Ntrty	Closed. May open pending co-manager agreement on ISU that indicates harvestable runsize.
Skagit River Treaty Net (Ntrty net closed)		
Chinook	Ceremonial and Subsistence – 232 (12 spring and 220 summer/fall) fish total Swinomish, Sauk-Suiattle, and Upper Skagit Tribes.	
Spring Chinook	Area 78C	Swinomish and Sauk-Suiattle Tribes fishing pattern: wk 19 (wb 5/6) thru wk 21 (wb 5/20);1,1,1; Upper Skagit Tribe fishing pattern: wk 20 (wb 5/13) thru wk 22 (wb 5/27);1,1,1.
	Area 78D	Upper Skagit Tribe fishing pattern: wk 20 (wb 5/13) thru wk 22 (wb 5/27);1,1,1.
Sockeye	Area 78C	Swinomish and Sauk-Suiattle Tribes fishing pattern: wk 25 (wb 6/17) thru wk 28 (wb 7/8);2,5,5,5; Upper Skagit Tribe fishing pattern: wk 27 (wb 7/1) thru wk 28 (wb 7/8);1.167,1.
	Area 78D	Swinomish Tribe fishing pattern: Wk 29 (wb 7/15):1. Fishery will be managed so as not to exceed the Swinomish sockeye share based on preseason forecast until such time as an in-season update becomes available; Upper Skagit Tribe fishing pattern: wk 27 (wb 7/1) thru wk 28 (wb 7/8);1.167,1.
Coho	Terminal Treaty HR target 12.5% as a response to “Low” abundance. If ISU changes abundance status, HR target may be modified following co-manager discussions.	
	Area 78C:	Swinomish and Sauk-Suiattle Tribes fishing pattern: wks 38 (wb 9/16) thru wk 41 (wb 10/7);1,2,2.5,1; Upper Skagit Tribe fishing pattern: wks 41 (wb 10/7) thru wk 43 (wb 10/21);1,1.167,1.167.

	Area 78D	Upper Skagit Tribe fishing pattern: wks 41 (wb 10/7) thru wk 43 (wb 10/21);1,1.167,1.167.
Chum	Area 78C	Swinomish and Sauk-Suiattle Tribes fishing pattern: No preseason harvestable. Placeholder modeled schedule wk 46 (wb 11/11);1. Fishery dependent on ISU and harvestable fish. Upper Skagit Tribe fishing pattern: No preseason harvestable.
	Area 78D	Upper Skagit Tribe fishing pattern: No preseason harvestable.
River Test	Chinook	Area 78C - Blakes wk 19 (wb 5/6) thru wk 35 (wb 8/26);1 boat, 6 hours/wk.
	Sockeye	Area 78C – Blakes wk 24 (wb 6/10) thru wk 29 (wb 7/15); 1 boat, 12 hours/wk; Area 78D-3 wk 23 (wb 6/3) thru wk 30 (wb 7/22);1 boat, 4 hrs/wk.
	Coho	Area 78C - Blakes Drift wk 34 (wb 8/19) thru wk 45 (wb 11/4), 12 hours/wk; Area 78C – Spudhouse Drift wk 34(wb 8/19) thru wk 44 (wb 10/28);1 boat, 12 hours/wk; Area 78D-3 wk 35 (wb 8/26) thru wk 44 (wb 10/28);1 boat, 4 hours/wk.
	Chum	Area 78C - Blakes Drift wk 44 (wb 10/28) and wk 45 (wb 11/4);1 boat, 12 hours/wk.

Swinomish Channel Treaty Net (Ntrty net closed)

Coho	No separate openings. Area opens during Area 8 openings.

Area 8-1 Recreational

5/1-7/31	Closed
8/1-9/30	2 fish limit, release Chinook.
10/1- 10/31	2 fish limit, release Chinook.
11/1 – 4/30	2 fish limit (Chinook 22” min size). Release unmarked Chinook.

Baker River/Lake Recreational

(mouth to Hwy 20 Bridge)	Closed.	
From Hwy 20 Bridge upstream to Dam	Closed.	
Baker Lake	7/1-9/4	3 fish limit, sockeye only, 18” min. size.

Cascade River Recreational

(mouth to Rockport-Cascade Road Bridge)	6/1 – 7/15	4 fish limit, only 2 may be adults, marked Chinook only, 12” min. size. Co-managers will consult on harvest guidelines and fishery may close early.
	9/16 – 11/30	4 fish limit, Coho only, 12” min size.

Skagit River Recreational

(mouth to Memorial Hwy. Bridge (Hwy 536 at Mt. Vernon))	9/1 – 12/31	2 fish limit, 12” min size, release Chum and Chinook.
(From Memorial Hwy Bridge to Gilligan Creek)	6/16-7/15	3 fish limit, sockeye only (12” min size).
	9/1 – 12/31	2 fish limit, 12” min size, release Chum and Chinook.
(From Gilligan Creek to Dalles Bridge at Concrete)	9/16 – 12/31	2 fish limit, 12” min size, release Chum and Chinook.
(From Dalles Bridge at Concrete to Cascade River)	6/1-7/15	4 marked Chinook, only 2 may be adults, 12” min size, open only from Highway 530 bridge at Rockport to Cascade River.
	9/16 – 12/31	2 fish limit, 12” min size, release Chum and Chinook.
	6/1- 8/31	Closed waters – between a line projected across the thread of the river 200’ above the east bank of the Baker River and a line projected across the thread of the river 200’ below the west bank of the Baker River.

All other SKAGIT TERMINAL REGION freshwater recreational closed to salmon angling.

2.6 Stillaguamish/Snohomish Terminal Region

Area 8A Net

Chinook	Trty	Closed (Ceremonial set-aside of up to 100 Chinook, July-September period).
	Ntrty	Closed

Coho	Trty	(9/9 – 10/20) 5 days per week. Update fishery through 10/6. Manage for Comprehensive Coho Management Plan breakpoints and rates. Stillaguamish Tribe – Open north of a line drawn from Kayak Point due west to Camano Island. Max catch of 500 Coho or 5 Chinook, whichever is reached first.
	Test	Wb 9/9 – wb 10/7: 1 day per week; 2 GN landings per week.
	Ntrty PS	Wks 38 (wb 9/16) – 39 (wb 9/23): PS limited participation (2 boats per day): Chinook and Chum NR; fishing pattern: 1,1. Closed south of a line from the Clinton ferry dock to the Mukilteo ferry dock.
	Ntrty GN	Wks 38 (wb 9/16) – 39 (wb 9/23): Wk 38 limited participation (2 boats only) Wk 39 (wb 9/23) GN fishing pattern: 1-2; GN fish night hours. Closed south of a line from the Clinton ferry dock to the Mukilteo ferry dock.
Chum	Trty	Evaluation Fishery, wb 10/14 -wb 10/28: Port Susan closed; Max 5,200 Chum. Dependant on evaluation fishery, wb 11/4 – wb 11/18, manage for Stillaguamish and Snohomish harvest rates and minimum escapement goals.
	Test	Wb 10/14 –wb 10/28 1 day per week; 2 GN landings per week.
	Ntrty	Closed. May open pending co-manager agreement on ISU indicating increased run size.
Area 8D Net		
Chinook	Trty	BS, RH, GN gear outside Tulalip Bay may be open during the following periods: 4/29 – 6/2 12:01 AM Sun – 11:59 PM Sat 6/3 – 8/25 12:01 PM Mon – 11:59 PM Thu 8/26 – 9/15 12:01 AM Mon – 11:59 PM Fri Setnets inside Tulalip Bay may be open during the following periods: 4/29 – 9/15 12:01 AM Sun – 11:59 PM Sat
	Ntrty	Closed (see recreational SAF)
Coho	Trty	Wb 9/16 –wb 10/28; BS, RH, GN gear outside Tulalip Bay open Sun, Mon, Thu, Fri; open to target Tulalip hatchery Coho.

	Ntrty	Wks 38 (wb 9/16)- 44 (wb 10/28); PS Chinook NR; PS fishing pattern: 1,1,1,1,1,2,1; GN fish each night Sunday through Thursday night(5,5,5,5,5,5,5); also open daylight hours Tuesdays and Wednesdays (2,2,2,2,2,2,2). Closed east of the line from Mission Point to Hermosa Point.
Chum	Trty	Wb 11/4 - wb 12/9; open to target Tulalip hatchery Chum. Managed to allow for hatchery egg take needs based on Tulalip hatchery escapement updates and projections. All Area 8D fisheries will close concurrently as agreed to by Tulalip and WDFW to ensure egg take requirements are met.
	Ntrty	Wks 45 (wb 11/4) - 47 (wb 11/18); PS fishing pattern: 2,1,1; GN fishing pattern:3,3,3 daylight hours. Closed east of the line from Mission Point to Hermosa Point. Managed to allow for hatchery egg take needs based on Tulalip hatchery escapement updates and projections. All Area 8D fisheries will close concurrently as agreed to by co-managers to ensure egg take requirements are met.

Stillaguamish River Treaty Net (Ntrty net closed)

Chinook	Wb 7/1 – wb 9/2. C&S fishery; maximum catch of 30 Chinook; Open from mouth of Hatt Slough (RM 0) to Danielson Hole (RM 14).
Coho	Open wb 9/9 - wb 10/21; Up to 5 days per week; Open from mouth of Hatt Slough (RM 0) to Danielson Hole (RM 14).
Chum	C&S fishery; wb 10/28- wb 12/2; Up to 3 days per week; max catch of 300 Chum; Open from mouth of Hatt Slough (RM 0) to Danielson Hole (RM 14).

Snohomish River Treaty Net (Ntrty net closed)

Chinook, Pink, Coho, Chum	Closed
Coho Test	Closed

Area 8-2 Recreational

5/1-7/31	Closed
8/1-9/30	2 fish limit, release Chinook.
10/1 – 10/31	2 fish limit, release Chinook.
11/1 – 4/30	2 fish limit (Chinook 22" min size). Release unmarked Chinook.

Tulalip Special Area Recreational Fishery

Same as Area 8-2 Recreational, except during the period 6/4-9/26:	5/18-9/3	Open 12:01 AM Friday – 11:59 AM Monday each week. Closed June 9. Open within Tulalip Special Area boundaries only. Closed to all angling east of the line from Mission Point to Hermosa Point. 2 fish limit salmon (Chinook 22" min. size).
	9/8-9/23	Open Saturday and Sunday each week. Open within Tulalip Special Area boundaries only. Closed to all angling east of the line from Mission Point to Hermosa Point. 2 fish limit salmon (Chinook 22" min. size).
Snohomish River Recreational		
(mouth to confluence of Skykomish and Snoqualmie rivers, including all channels)	9/1 – 12/31	3 fish limit, 12" min. size. Release Pink and Chinook.
Snoqualmie River Recreational		
(mouth to Snoqualmie Falls, including all channels)	9/1 – 12/31	3 fish limit, 12" min size. Release Pink and Chinook.
Skykomish River Recreational		
(From mouth to Lewis St. Bridge in Monroe)	9/1 – 12/31	3 fish limit. 12" min size. Release Pink and Chinook.
(From mouth to Wallace River)	TBD	2 fish limit, 12" min size, marked Chinook only. Chinook fishery dependent on agreed ISU of Chinook abundance sufficient to meet the hatchery escapement goal.
From Lewis St Bridge in Monroe to Wallace River.	9/1 – 12/31	3 fish limit, 12" min size. Release Pink and Chinook.
(From Wallace River to the forks)	9/1 – 12/31	3 fish limit, 12" min size. Release Pink and Chinook.
Wallace River Recreational		
Mouth to 200' upstream of water intake of salmon hatchery	9/16 – 11/30	3 fish limit, 12" min size. Release Pink and Chinook.

Stillaguamish River Recreational

(river and all sloughs downstream of Marine Drive	9/1 – 12/31	2 Coho only limit, 12” min size.
(Marine Drive upstream to forks)	9/1 - 12/31	2 Coho only limit, 12” min size

All other STILLAGUAMISH/SNOHOMISH TERMINAL REGION freshwater recreational closed to salmon angling.

2.7 Admiralty Inlet Area

Area 9 Net

Chinook	Trty	Ceremonial and Subsistence – Up to 500 Chinook as agreed upon by those Tribes with U&A in Area 9, (PS and Hook & Line, release all Chum 6/1 – 9/30).
Chum	Research	Wks 43 (wb 10/21) – 48 (wb 11/25) research fishery to develop stock composition/timing information (200 samples/site/wk). Research catch quota of 2,400 Chum. Sampling details described in 2012 A9 Chum research plan. Fishery to be implemented by NWIFC in conjunction with Tribes and WDFW staff.
Chum	Trty	No commercial fishery, unless prior agreement by all affected Tribes and WDFW.
	Ntrty	Closed

Area 9 Recreational

5/1-6/30	Closed
7/1-7/15	2 fish limit. Release Chinook.
7/16-8/31	2 fish limit (Chinook 22” min size). Release unmarked Chinook and Chum. Closed south and west of a line from Foulweather Bluff to Olele Point, except angling allowed from shore between Hood Canal Bridge and the northern boundary of Salsbury Point Park, daily limit 2 Coho only.
9/1-9/30	2 fish limit, release Chinook and Chum.
10/1-10/31	2 fish limit, release Chinook
11/1-11/30	2 fish limit, release unmarked Chinook (Chinook 22” min size).
12/1-1/15	Closed
1/16-4/15	2 fish limit, Chinook 22” min size, release unmarked Chinook.
4/16 – 4/30	Closed

Edmonds Pier Recreational

Year-Round	2 fish limit, 1 Chinook (22" min size), release Chum 8/1-9/30.

3.0 South Sound Region

3.1 Area 10 Sub region

Area 10 Net

Chinook	Closed	
Sockeye	Trty	Fishery dependent upon ISU (Ballard lock counts)
	Ntrty	Closed
Coho	Test	Gillnet: Wks 37 (wb 9/9, not earlier than 9/8) - Wk 39 (wb 9/23);3 boats, 3 sites; fishing pattern: 2,2,2.
	Trty	Fishery based on ISU beginning Wk 37(wb 9/9). Treaty allocation based on intertribal sharing agreement. Fishing schedule for Area 10 shall be set consistent with the MST agreement (1983).
	Ntrty	Closed
Chum	Test	Purse Seine: Wks 41 (wb 10/7) - Wk 46 (wb 11/11); 1 site, fishing pattern: 1,1,1,1,1,1.
	Trty	Treaty allocation based on intertribal sharing agreement; Wks 41 (wb 10/7) – Wk 48 (wb 11/25) fishing pattern – ISU dependent; Fishing schedule for Area 10 shall be set consistent with the MST agreement (1983).
	Ntrty	Wks 42 (wb 10/14) - 47 (wb 11/18); PS Chinook and Coho NR; PS fishing pattern: 1,2,1,2,1,1; GN fishing pattern: 2,2,2,2,2,2. ISU Dependent. Area east of a line from Four Mile Rock south to Alki Point will be closed.

Area 10A Treaty Net (Ntrty net closed): That portion of Elliott Bay east of the line from Pier 91 to the light at Duwamish Head.

Chinook	Test	Wks 29 (wb 7/15) – Wk 31 (wb 7/29); 7/18 or 7/25, 8/1 (Wednesday); 5 fishing sites (one boat per site).8 PM to 8 AM. The structure/correlation of this fishery is under review and may be modified or temporarily discontinued based on co-manager agreement.
	Trty	Closed
Coho	Trty	Gillnet: Wk 37 (wb 9/9)-Wk 44 (wb 10/28); fishing pattern: 5 days per week (Sun – Fri)
Chum	Trty	Gillnet Wk 45 (wb 11/4)-Wk 48 (wb 11/25); fishing pattern: up to 5 days per week (Sun – Fri).

Duwamish/Green River (Area 80B) Treaty Net (Ntrty net closed)		
Chinook	Trty	Closed
Coho	Trty	Wk 37 (wb 9/9) – Wk 44 (wb 10/28) Closed until Chinook clear or Coho predominate. Clearance fishery on lower river (up to 16th Avenue Bridge) begins 9/13; (6 sites); If Chinook clearance is met or Coho predominate, fishery will open Sept 16; starting Sept. 23, fishery will open up to Boeing St. Bridge. Starting Oct 1 fishery will open up to Hwy 99 Bridge fishing pattern: Sun – Fri (5 days per week).
Chum	Trty	Gillnet Wk 45 (wb 11/4)-Wk 48 (wb 11/25); fishing pattern: 5 days per week (Sun – Fri).
Area 10E Treaty Net (Ntrty net closed; see below for recreational SAF)		
Chinook	Trty	Wks 29 (wb 7/15)-Wk 37 (wb 9/9); fishing pattern: 7days/wk. Possible extension for Sinclair Inlet
Coho	Trty	On-Reservation only; Wks 37 (wb 9/9)-Wk 42 (wb 10/14); gillnet/setnet/beach seine; 5-7 days/wk.
Chum	Trty	Wks 42 (wb 10/14)-Wk 49 (wb 12/2); schedule dependent upon ISU.
Lake Washington System (includes Lake, Lake Union, Ship Canal, & Lake Sammamish)		
Areas 10F, 10G, 10C, 10D Treaty Net (Ntrty net closed)		
Sockeye	Dependent upon ISU (lock counts). Potential fishery beginning Wk 28 (7/8).	
Chinook	Dependent on ISU and co-manager agreement.	
Coho	The Coho fisheries in the four following areas are dependent upon the ISU (if lock counts project run size <10,000 Coho entering the lake, then no Coho fishery):	
	Lower ship canal (below Ballard Locks)	Closed until Chinook clearance as seen in lock counts; anticipated pattern 5-7 days/wk dependent on in-season information, with a potential start date for fisheries beginning Wk 38 (9/16).
	Upper ship canal (above Ballard Locks):	Fishing pattern 5 days/wk (Sun – Fri) with a potential start date for fisheries beginning Wk 38 (9/16).
	North end Lake Washington (North of Hwy. 520 bridge):	Starting Wk 40 (wb 9/30): fishing pattern 5 days/wk (Sun – Fri).

Lake Sammamish Treaty Net

Chinook and Coho	Fisheries will be based on ISU from the Ballard Lock counts.

Area 10 Recreational

5/1-5/31	Closed
6/1-6/30	Catch-and-release in waters N of Meadow Pt./Pt. Monroe line.
7/1-7/15	2 fish limit, release Chinook.
7/16-8/31	2 fish limit (Chinook 22” min size). Release unmarked Chinook and release Chum beginning 8/1.
9/1-9/30	2 fish limit, release Chinook and release Chum through 9/15.
10/1-1/31	2 fish limit, release unmarked Chinook (Chinook 22" min size).
2/1-4/30	Closed
Shilshole Bay (East of Meadow Point/West Point line) closed 7/1-8/31.	
Outer Elliott Bay (E of West Pt./Alki Pt line to Pier 91/Duwamish Head line) Closed to salmon angling 7/1-8/31.	
Inner Elliott Bay (E of Pier 91/Duwamish Head line) closed to salmon angling 7/1-8/31.	

Area 10 Piers Recreational

Seacrest Pier, Pier 86, Waterman Pier, Bremerton Boardwalk, Illahee State Park Pier	Year-Round	2 fish limit, 1 Chinook (22" min size), release Chum 8/1-9/15.

Elliott Bay Recreational SAF

5/1 – 6/30	Same as Area 10
7/1 – 8/31	Closed
9/1-4/30	Same as Area 10.

Sinclair Inlet Recreational SAF

5/1-6/30	Same regulations as Area 10.
7/1-9/30	Open S of Manette Bridge, S of line drawn true W from Battle Point, and W of line drawn true S from Point White; 2 fish limit (Chinook 22" min size), release unmarked Chinook, release Chum 8/1-9/15.
10/1-4/30	Same regulations as Area 10.

Green River Recreational

(1st Ave South Bridge to Old Hwy.99/ Tukwila Intl. Blvd.)	9/1 – 12/31	Daily limit 6. No more than 3 adults may be retained, 12" min size, release Chinook.
(Old highway 99/Tukwila Intl. Boulevard to I-405)	9/1 – 12/31	Daily limit 6. No more than 3 adults may be retained, 12" min size, release Chinook.
(I-405 to the S. 277th Bridge in Auburn)	10/1 – 12/31	Daily limit 6. No more than 3 adults may be retained, 12" min size, release Chinook.
(S. 277th Bridge to Auburn Black Diamond Rd Bridge)	10/16 – 12/31	Daily limit 6. No more than 3 adults may be retained, 12" min size, release Chinook.
(from Auburn-Black Diamond Rd Bridge to mouth of Cristy Creek at Flaming Geyser Park])	9/16-10/31	Closed to all fishing.
(from Auburn-Black Diamond Rd Bridge to Tacoma Headworks Dam)	11/1 – 12/31	Daily limit 6. No more than 3 adults may be retained, 12" min size, release Chinook Closed waters- within 150' of the Palmer Ponds outlet rack and within 150' of the mouth of Keta (Crisp) Creek.

The 2012/2013 WDFW sport pamphlet will reflect the following season end dates for trout and other game fish fall/winter season. These end dates are subject to change based on State-Tribal agreement:

Mouth to S. 277th Bridge in Auburn: Jan. 15

S. 277th Bridge to Tacoma Headworks Dam: Jan. 31

Soos Creek Recreational

Closed

Lake Washington Recreational

East of the Montlake Bridge	July-August	Dependent upon ISU (lock counts). Potential fishery, starting date to be determined. 2 fish limit, sockeye only, 12" min. size. Chinook retention dependent on ISU and co-manager agreement.
North of Hwy 520 Bridge	9/16 – 10/31	4 fish limit, Coho only; 12" min size

Lake Sammamish Recreational

8/16 – 11/30	4 fish limit, only 2 Chinook, 12” min size, release sockeye. Closed: waters within 100 yards of the mouth of Issaquah Creek are closed to salmon fishing.

All other SOUTH SOUND AREA 10 REGION freshwater: Closed to salmon angling.

3.2 Area 11 Sub region

Area 11 Net

Chinook	All	Closed
Coho	Trty:	Commercial fishery open beginning Wks 37 (wb 9/9) - Wk 41 (wb 10/7); ISU dependent; gillnets 7 days/wk, could close any time. Beach seine daylight hours only, 7 days/wk.
	Ntrty:	Closed
Chum	Trty:	Commercial fishery open Wks 42 (wb 10/14)-Wk 49 (wb 12/2); gillnets 7 nights/wk, could close at anytime. Beach seine daylight hours only, 7 days/wk. Some unresolved issues remain. Additional Medicine Creek Treaty Tribal discussions will occur prior to the fisheries to resolve these remaining issues.
	Ntrty	Wks 42 (wb 10/14) - 47 (wb 11/18); PS Chinook and Coho NR; PS fishing pattern:1,2,1,2,1,1; GN fishing pattern: 2,2,2,2,2,2. ISU dependent.

Area 11A Net Treaty Net (Ntrty net closed)

Chinook	Closed
Coho	Commercial fishery open Wks 37 (wb 9/9) - Wk 42 (wb 10/14); 3 nights/wk
Chum	Commercial fishery open Wks 46 (wb 11/11) – Wk 53 (wb 12/30) 3 nights/wk.

Puyallup River (Area 81B) Treaty Net (Ntrty net closed)

Chinook	Spring Chinook	Ceremonial and Subsistence 5/1 – 6/30
	Summer - Fall	Commercial fishery 8/26, fishing pattern: 12 hours.
Coho	Commercial fishery Wks 36 (wb 9/2)-Wk 42 (wb 10/14) fishing pattern: 1,2,2,3,3,3,3.	
Chum	Test fishery Wks 43 (wb 10/21)-Wk 46 (wb 11/11) 1 day/wk, drift net only.	

Winter Chum	Commercial fishery Wks 46 (wb 11/11) – Wk 2 (wb 1/6); In-season monitoring to meet hatchery escapement needs. Total fishing days yet to be determined in steelhead management plan.	
White River Treaty Net		
Sp. Chinook	Ceremonial and subsistence fisheries.	
Coho/Chum	Fishing pattern 7 days/wk.	
Area 11 Recreational		
5/1-5/31	Closed	
6/1-6/30	2 fish limit (Chinook 22” min. size), release unmarked Chinook; Commencement Bay (E. of Cliff House Restaurant/Sperry Ocean Dock line) closed to salmon angling.	
7/1-9/30	2 fish limit (Chinook 22” min. size), release unmarked Chinook; Single-point barbless hooks only. Commencement Bay (E. of Cliff House Restaurant/Sperry Ocean Dock line) closed to salmon angling through 7/31.	
10/1-10/31	2 fish limit, (Chinook 22" min size).	
11/1-12/31	2 fish limit, 1 Chinook (Chinook 22" min size).	
1/1-1/31	Closed	
2/1-4/30	2 fish limit (Chinook 22” min size), release unmarked Chinook.	
Dash Point Dock, Point Defiance Boathouse Dock, Les Davis Pier, Des Moines Pier and Redondo Pier	Year-Round	2 fish limit, 1 Chinook (22" min size).
Puyallup River Recreational		
(from Freeman Road (82nd Ave E) to Carbon River)	8/1 – 12/31	6 fish limit, 2 adults, 12” min size, release unmarked adult Chinook.
(from 11th St. Bridge to Freeman Road (82nd Ave E))	8/16 – 12/31	Closed August 26 and September 2,3,9,10 and 11. 6 fish limit, 2 adults; 12” min size. Release unmarked adult Chinook.
Carbon River Recreational		
(mouth to Voight Creek)	9/1 – 11/30	6 fish limit, 4 adults; no more than 2 adult Chinook may be retained; 12” min size, release Chum and

		unmarked adult Chinook.

All other SOUTH SOUND AREA 11 REGION freshwater recreational Closed to salmon angling

3.3 Area 13 Sub region

Fox Island/Ketron Island (Area 13)

Chinook	Treaty:	8/1-9/15, 7 days/wk
	Ntrty:	Closed
Coho	Treaty:	9/15-10/20, 7 days/wk
	Ntrty:	Closed
Chum	Treaty:	Closed unless opened by Medicine Creek Treaty Tribes' agreement
	Ntrty:	Closed

Area 13 Treaty Net (Ntrty net closed)

Chinook	Closed
Coho	Closed
Chum	Closed

Carr Inlet (Area 13A) Treaty Net [1](Ntrty net closed) [1] **Based on Medicine Creek Treaty Tribal proposal annual regulations. Individual Tribal regulations may deviate from this schedule.**

Chinook	8/1 - 9/22, 7 days/wk, opens in sections.
Coho	9/16 -10/27, 7 days/wk, in-season monitoring to meet hatchery escapement need.
Chum	10/28 -12/8, 7 days/wk.

Chambers Bay (Area 13C) Treaty Net[1] (Ntrty net closed)

Chinook	Wb 7/29 - wb 10/13; Weekly schedule to be determined before 7/15 by agreement of the Medicine Creek Treaty Tribes.
Coho	Wb 10/14 - wb 11/3; Weekly schedule to be determined before 7/15 by agreement of the Medicine Creek Treaty Tribes.
Chum	11/4 – 12/1; Weekly schedule to be determined before 7/15 by agreement of the Medicine Creek Treaty Tribes.

Area 13D Treaty Net (Ntrty net closed)

Chinook	7/15 - 9/9 or earlier date dependent on in-season management needs; 7 days/wk
Coho	9/10 -12/31 or earlier date dependent on in-season management needs.
Dana Pass (13D-1)	7 days/wk

Pickering Pass (13D-2)	7 days/wk
Peale Pass (13D-3)	7 days/wk
Southern Case (13D-4)	7 days/wk
Chum	Open approximately 10/21; 2-3 days per week; managed weekly by updates (~10/11).
Area 13E Net	Closed to all fishing
Budd Inlet (Area 13F) Treaty Net (Ntrty net closed)	
Chinook	7/15-9/9 or earlier date dependent on in-season management needs; 7 days/wk
Coho	Closed
Chum	Open approximately 11/4, 2-3 days per week, managed by weekly in-season updates
Eld Inlet (Area 13G) Treaty Net (Ntrty net closed)	
Chinook	7/15-9/9; opening dependent upon in-season data, outer portion only.
Coho	Closed
Chum	Open approximately 11/4, 2-3 days per week, managed by weekly escapement updates
Totten Inlet (Area 13H) Treaty Net (Ntrty net closed)	
Chinook	8/1-9/9; schedule dependent on in-season data
Coho	Closed
Chum	Open approximately 10/7, 2-3 days per week; managed by weekly escapement updates
Little Skookum Inlet (Area 13I) Treaty Net (Ntrty net closed)	
Chinook	8/1-9/9; schedule dependent upon in-season data
Coho	Closed
Chum	Open approximately 12/1, 2-3 days per week; managed by weekly escapement updates
Hammersley Inlet (Area 13J) Treaty Net (Ntrty net closed)	
Chinook	8/1-9/9 or earlier date dependent on in-season management needs
Coho	Closed
Chum	Open approximately, 9/16 – 12/25, 2-3 days/wk; managed by weekly escapement updates
Northern Case Inlet (Area 13K) Treaty Net (Ntrty net closed)	

Chinook	7/15-9/9
Coho	9/10-10/31 or earlier date dependent on in-season management needs
Chum	Open approximately 9/16-12/25; 2-3 days/wk; managed by weekly escapement updates
Nisqually River (Area 83D) Treaty Net (Ntrty net closed)	
Chinook	GN 2 days/wk Wk 31 (wb 7/29) through Wk 35 (wb 8/26). Tangle Net (TN) 2 days/wk Wk 37 (wb 9/9) through wk 39 (wb 9/23). Release all unmarked Chinook. Beach Seine (BS) all freshwater immersion beaches from Luhr Beach to East Bank of Red Salmon Slough, McAllister Creek, Red Salmon Slough, and the Nisqually River 3 days/wk Wk 36 (wb 9/2) through wk 39 (wb 9/23). Release all unmarked Chinook. Gear Test by Nisqually Fisheries Staff Wk 31 (wb 7/29) through Wk 39 (wb 9/23). Total encounter not to exceed 50 Chinook. Release all fish encountered. Fishery schedule subject to change in season as per "Modification to 2012 PFMC List of Agreed Fisheries (LOAF)".
Coho	TN 2 days/wk Wk 40 (wb 9/30). Release all unmarked Chinook. BS all freshwater immersion beaches from Luhr Beach to East Bank of Red Salmon Slough, McAllister Creek, Red Salmon Slough, and the Nisqually River 3 days/wk Wk 40 (wb 9/30). GN 3 days/wk Wk 41 (wb 10/7) through wk 47 (wb 11/18).
Chum	Proposed schedule: GN 3-4 days/wk Wk 48 (wb 11/25) - Wk 5 (wb 1/27/2013) per annual Nisqually River Chum/steelhead management plan.
McAllister Creek (Area 83F) Treaty Net (Ntrty net closed)	
Chinook	Wks 27 (wb 7/1)-Wk 40 (wb 9/30); 3 days/wk
Coho	Wks 41 (wb 10/7)-Wk 48 (wb 11/25); 3-4 days/wk
Chum	Proposed schedule: Wk 49 (wb 12/2) - Wk 5 (wb 1/27/2013); 4 days/wk per annual Nisqually River Chum/steelhead management plan.

Area 13 Recreational

5/1-6/30	2 fish limit (Chinook 22" min. size), Release unmarked Chinook, Minter Creek mouth closed.
7/1-9/30	2 fish limit (Chinook 22" min. size), Release unmarked Chinook and unmarked Coho. Minter Creek mouth closed through 9/30; Lower Budd Inlet closure zone 7/16-10/31.
10/1-10/31	2 fish limit, release unmarked Coho (Chinook 22" min size). Lower Budd Inlet closure zone 7/16-10/31.
11/1-12/31	2 fish limit, 1 Chinook (Chinook 22" min size).

1/1-4/30	1 fish limit, (Chinook 22” min size). Minter Creek mouth closure begins 4/16.	
Fox Island Pier Recreational		
Year-Round	2 fish limit, 1 Chinook (22" min size); 7/1-10/31 release unmarked Coho.	
Chambers Creek Estuary Recreational		
(downstream of markers 400’ below Boise-Cascade Dam to Burlington Northern Railroad Bridge)	7/1 – 11/15	6 fish limit, 2 adults; 12” min size, release unmarked Coho.
Deschutes River Recreational		
Capitol Lake (from outlet to 400’ below lowest Tumwater Falls (Deschutes River) fish ladder).	7/1 – 10/15	Closed
(from Old Hwy 99 Bridge on Capitol Blvd in Tumwater to Henderson Blvd Bridge)	7/1 – 10/15	6 fish limit, 2 adults, 12” min size, release Coho.
(upstream of Henderson Blvd Bridge)	7/1 – 10/15	6 fish limit, 2 adults, 12” min size, release Coho.
Kennedy Creek Recreational		
(mouth to northbound Hwy. 101 Bridge)	10/1 – 11/30	6 fish limit, 2 adults, 12” min size, release unmarked Coho.
McAllister Creek Recreational		
(mouth to Olympia-Steilacoom Rd Bridge)	7/1 – 11/30	6 fish limit, 2 adults, 12” min size.
McLane Creek Recreational		
(from a line 50’ north of and	Same as Area 13	Same as Area 13

parallel to the Mud Bay Rd. Bridge to a line 100' upstream of and parallel to the south bridge on Hwy.101)		
Minter Creek Recreational		
(mouth to 50' downstream of hatchery rack)	11/1 – 12/31	4 fish limit, 12" min size, Chum only.
Nisqually River Recreational		
(mouth to the military tank crossing bridge, one mile upstream of the mouth of Muck Creek)	7/1 –10/31	6 fish limit, 3 adults, only 2 adults may be any combination of Coho, and Chum; 12" min. size; release unmarked Chinook.
	11/1-1/31	6 fish limit, 2 adults, 12" min. size; release unmarked Chinook.

All other SOUTH SOUND AREA 13 REGION freshwater recreational closed to salmon angling.

4.0 Hood Canal Region (All fisheries modeled in FRAM #1512 (Chinook) & #1229 (Coho))

Hood Canal Mainstem (Areas 12, 12B, 12C, 12D)

Treaty: 1,000 feet closure around streams that are closed to net fishing. Beach seines and hook and line gear release Chum through 9/30 (through 10/10 if within 500' of western shore of Areas 12B and 12C).

Nontreaty: See WAC 220-47-307 for Nontreaty exclusion zones.

Chinook	Trty	Areas 12, 12B and 12D: Closed
		Area 12C: Beach seines open wb 7/15-8/31; 5 days/wk; release Chum 8/1-8/31. Open wb 7/15 – 8/24 for gillnets 5 days/wk; restricted to 7" min mesh starting 8/1.
		Area 12H: Open wb 7/15 through 9/20; hook and line gear continuous; beach seines daylight hours Tues and Thur each week; possible in-season modifications; Chum release.
	Ntrty	Closed
Coho	Trty	Area 12: Open 9/25 through 10/13 for gillnets. Beach seines for Coho only (release all Chinook and Chum through 9/30) may start no earlier than 9/16. Both gear types open 7 days/wk.
		Area 12B: Open 10/1 through 10/20 for gillnets; 500 foot closure along western shore through 10/10; beach seines for Coho only (release all Chinook and Chum through 9/30) may start no earlier than 9/16. Both gear types open 7 days/wk.
		Area 12C: Open 10/1 through 10/20 for gillnets; with 500 foot beach closure from Ayock Pt. to approx. 2,000 feet south of Lilliwaup (at the large house, north of Octopus Hole) through 10/10; beach seines for Coho (release all Chum through 9/30) may start no earlier than 9/21. Both gear types may fish 7 days/wk when open.
		Area 12D (west of Madrona Pt. - local name): Open for gillnets no earlier than 10/1. Weekly schedules identical to Area 12C.
	Ntrty	Closed

Chum	The Co-Managers have reached agreement on a co-management process to assess and agree on in-season abundance estimation methods, and to define a process for addressing chronic over-harvest of catch shares ("2012 Co-Management Agreement for Hood Canal Chum Salmon Fisheries" (attached)). Products of this process may necessitate modification of Tribal or Non-Indian fishing schedules by agreement.	
	Trty	Area 12: Open 10/14 through 11/20; 7 d/wk
		Area 12B: Open 10/21 through 11/20; 7d/wk; except north of an East-West line from Zelatched Point to Seal Rock open through 11/27.
		Area 12C: Open 10/21 through 11/27; 7d/wk.
		Area 12D: Closed.
		Area 12H: Hook and line gear open from 10/16 through 11/29; beach seines open Tuesday and Thursday of each week. Then Monday and Wednesday for the week beginning 11/11; possible in-season adjustments to 3 days/wk. Starting 11/1, hatchery escapement control measures will go into effect.
	Ntrty	Area 12, 12B. Fisheries scheduled wks 42 (wb 10/14) - 47 (wb 11/18): PS Chinook NR; PS fishing pattern: 1,2,1,2,1,1; GN fishing pattern: 2,2,2,2,2,1 daylight hours.
		Area 12C Fisheries scheduled wks 45 (wb 11/4) - 47 (wb 11/18): PS Chinook NR; PS fishing pattern: 2,1,1; GN fishing pattern: 2,2,2 daylight hours.
		Area 12H: BS (Hoodsport Hatchery Zone) fishery in wks 46 – 48 pending discussions with the Co-Managers.
		Area 12D Closed
Port Gamble (Area 9A)		
Chinook	All	Closed
Coho	Trty	Open wb 8/19 through wb 11/3; 7 days/wk; gillnet only.
	Ntrty	Open Wks 35 (wb 8/19) - 44 (wb 10/21) skiff GN limited to 100 fathoms length and 60 meshes in depth; 7 days/wk; Chinook NR; Chum NR through 9/30; release NR fish by cutting ensnaring meshes. The beach area of the Port Gamble Indian Reservation, between Pt. Julia and the boundary marker at the south end of the reservation - closed to all fishing.

Chum	Trty	Open 11/4 through 12/1; 7 days/wk; gillnet only.
	Ntrty	Closed

Quilcene / Dabob (Area 12A)

Coho	Trty	Open 8/21 through 10/13; Chum and Chinook release from hook and line and beach seine gear through 9/30; beach seines 5 days/wk, daylight hours. Hook and line fisheries for Coho only, open continuously. Gillnets closed until Summer Chum escapement exceeds 1500. Beach seine advance notification required prior to fishing.
	Ntrty	Beach seine open wks 34 (wb 8/19) – 39 (wb 9/23); Limited participation (4 permits/day); Chinook and Chum NR; fishing pattern 4,5,5,5,5,5; Fishery will be managed consistent with SCSCI. GN closed unless Treaty GN opening.
Chum	Trty	Open to set and drift gillnets wb 10/14 through 11/20, South of an E-W line through Pt. Whitney.
	Ntrty	Closed

Skokomish River (Area 82G) Treaty (Ntrty net closed)

The Skokomish Tribe will develop an evaluation fishery from the mouth of the Skokomish River to the HWY 106 Bridge, to assess Summer Chum incidence during the Tribal Chinook fishery. The study design will be reviewed by the co-managers before implementation. Impacts to Chinook will be absorbed in the Tribal Chinook fishery by adjustment of days fished above the HWY 106 Bridge.

Note: Hook and line gear and beach seines release Chum through 10/15.

Chinook	Open 8/01 through 9/15; no more than 4 days/wk; closed to gillnets below SR 106.
Coho	Open 9/16 through 9/29: 4 days/wk; 9/30-11/10: 7 days/wk. Closed to gillnets below SR 106 through 9/30.
Chum	Open 11/11 through 12/1; 7 days/wk.

Big Quilcene River (Area 82F) Treaty (Ntrty net closed)

Coho	Openings to be determined in-season, for Coho only, from 9/1 through 10/15. Closed below Rogers St. From Rogers St. to U.S. Hwy 101, hook and line gear only, release all other salmon. The hatchery area, from U.S. Hwy 101 to the Quilcene Hatchery rack, may be opened for short periods to take surplus Coho. Hand held gear only (dipnets, hand lines, etc.).
Chum	Closed

Misc. Hood Canal Rivers (Dosewallips, Duckabush, Hamma Hamma, Tahuya, Dewatto, Union)		
All species	Closed to commercial harvest.	
Area 12 Recreational		
5/1-6/30	Closed	
7/1-8/31	North of Ayock Pt. – Closed to salmon angling except see Quilcene/Dabob Bay Recreational below.	
9/1-10/15	North of Ayock Pt. (including Quilcene/Dabob Bay) – 4 fish limit, Coho only.	
7/1-10/15	South of Ayock Pt. - 4 fish limit, 2 Chinook (Chinook 22" min size); release Chum and unmarked Chinook.	
10/16-12/31	4 fish limit, 2 Chinook(Chinook 22" min size). Release unmarked Chinook	
1/1-1/31	Closed	
2/1-4/30	2 fish limit (Chinook 22" min size), release unmarked Chinook	
Quilcene/Dabob Bay Recreational		
5/1-8/15	Same as Area 12	
8/16-8/31	4 fish limit, Coho only.	
9/1-4/30	Same as Area 12	
Hoodsport Hatchery Zone Recreational		
Same as Area 12 except:		
7/1-12/31	4 fish limit, no minimum size, only 2 Chinook greater than 24”; Release unmarked Chinook and Chum release 7/1-10/15.	
Dewatto River Recreational		
(mouth to Dewatto-Holly Rd. Bridge)	10/1 – 10/31	2 fish limit, 12” min size, Coho only.
Dosewallips River Recreational		
(mouth to Hwy. 101 Bridge)	11/1 – 12/15	2 fish limit, 12” min size, Chum only.
Duckabush River Recreational		
(mouth to Mason Co. PUD #1 overhead electrical distribution line)	11/1 – 12/15	2 fish limit, 12” min size, Chum only.
Quilcene River Recreational		
(from Rodgers St.	8/16 –	4 fish, 12” min size, Coho only.

to Hwy 101 Bridge)	10/31	
Skokomish River Recreational		
(mouth to Hwy. 101 Bridge)	8/10 – 9/5	2 fish limit, 12” min size, release Chum and unmarked Chinook. Terminal gear (hooks, weights, lures or baits) and line must not be within 25’ of Tribal gillnets. Closed upstream of Highway 106 bridge Monday through Thursday weekly, except Labor Day.
	9/16 – 9/30	2 fish limit, 12” min size, release Chum and Chinook. Terminal gear (hooks, weights, lures or baits) and line must not be within 25’ of Tribal gillnets. Closed upstream of Highway 106 bridge.
	10/1 – 12/15	6 fish limit, 4 adults, 12” min size, release Chinook and release Chum through 10/15. Terminal gear (hooks, weights, lures or baits) and line must not be within 25’ of Tribal gillnets.
Tahuya River Recreational		
(mouth to marker 1 mile above N. Shore Rd. Bridge)	10/1 – 10/31	2 fish limit, 12” min size, Coho only.
All other HOOD CANAL REGION freshwater recreational closed to salmon angling.		

TABLE 1: DESCRIPTION OF FISHERY REGULATIONS AND SUMMARY OF COHO CATCH TARGETS

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04/17/12
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Fishery Regulation Assessment Model Run Number: 1229
Run Description: PFMC April 4th NT 83K T47.5K FINAL
Impacts expressed as total fishery-related mortality, including landed catch, non-retention mortality, and other fishery-related mortality; except where noted.

Fishery	Catch + Mortality	Comments
CANADIAN (B.C.) FISHERIES:		
WCVI Troll	908	Incidental
Area 20 Net	61	Incidental
Georgia St. Sport	5,343	Selective fishery
Georgia St. Troll	0	Assumes no Gulf troll fishery
SOUTH OF CAPE FALCON:	37,654	Sport TAC 8,000 selective and 10,000 non-selective
NORTH OF CAPE FALCON OCEAN:		
Treaty Ocean Troll	51,087	TAC 47,500
NT Ocean Troll	26,568	Troll TAC 13,280 selective
NT Ocean Sport	88,993	Sport TAC 69,720 coho, selective
NT North-of-Falc. total:	115,561	
4B Add-on	0	4B Add-on fishery of 0
Canadian License catch	50	(For Areas 4 and 4B) Landed catch only
Buoy 10	10,332	Sport 8,300 selective
PUGET SOUND SPORT & TROLL:		
Treaty Strait Troll	525	Source data for treaty troll are from 2006-2011.
Puget Sound Sport: Area 5	45,906	5/1-6/30 clsd; 7/1-8/15, bag 2, co & ch MSF, cm NR; 8/16-9/14, bag-2, co MSF, ch NR, cm NR; 9/15-9/30 , bag-2, ch NR, cm NR; 10/1-10/31 bag 2, 1 ch; 11/01-2/15 clsd; 2/16-4/10, 1 bag; 4/11-4/30 clsd; Kydaka closure 7/1-9/30
Area 6	1,759	5/1-6/30 clsd; 7/1-8/15 bag 2, co & ch MSF expt ch NR East of Ediz, cm NR; 8/16-9/30, bag 2, co MSF, ch & cm NR; 10/1-10/31 bag-2, 1 ch; 11/1-11/30 clsd; 12/1-4/10, 2 bag, ch MSF; Dungeness Bay, 10/1-10/31, 2 bag, coho only; FW Bay closure 7/1-10/31, PA Har clsd 7/1-10/31, Dung Bay clsd 11/1-9/30, Sequim & Disco Bays clsd 10/1-10/31
Area 7	790	5/1-6/30 clsd; 7/1-7/31, bag-2, 1ch; 8/1-9/30, bag-2, 1ch, co MSF, cm NR; 10/1-10/31, bag-2,1 ch; 11/1-11/30 clsd; 12/1-4/30 bag-2, ch MSF; B'Bay, 8/16-10/31, 4/2 bag; S. Rosario & E. JDF clsd 7/1-9/30; B Bay - clsd 4/1 thru 8/15; Samish Bay - clsd 7/1-10/15
Area 8-1	751	5/1-7/31 clsd; 8/1-10/31, bag-2, ch NR; 11/1-4/30, bag-2, ch MSF;
Area 8-2	3,877	5/1-7/31 clsd; 8/1-10/31, bag-2, ch NR; 11/1-4/30, 2 bag, ch MSF; Tul. Term Area, ???-9/3 Fri- noon Mon, 9/8-9/23 Sat & Sun, bag-2, clsd 6/9, 2 pole option
Area 9	10,619	5/1-6/30 clsd; 7/1-7/15, bag-2, ch NR; 7/16-8/31, bag-2, ch MSF, cm NR; 9/1-9/30, bag-2, ch & cm NR; 10/1-10/31, bag-2, ch NR; 11/1-11/30, bag-2, ch MSF; 12/1-1/15 closed; 1/16-4/15, bag-2, ch MSF; 4/16-4/30 clsd; Hd Cnl clsd during sum MSF; Edmds YR, bag 2, 1 ch, cm NR 8/1-9/30
Area 10	6,632	5/1-5/31, closed; 6/1-6/30 C&R; 7/1-7/15, bag-2, ch NR; 7/16-8/31, bag-2, ch MSF, cm NR 8/1-8/31; 9/1-9/30, bag-2, ch NR, cm NR through 9/15; 10/1-1/31, bag-2, ch MSF; 2/1-4/30 closed; Inner Bay Clsd: 7/1-8/31; Shilshole clsd 7/1-8/31; Agate Fly Only 1/1-3/31; Outer E' Bay: 7/1-8/31 clsd; Sinc TAF, 7/1-9/30, bag-2, ch MSF, cm NR 8/1-9/15; Piers Yr-round, bag-2, 1 ch, cm NR 8/1-9/15,
Area 11	2,507	5/1-5/31 clsd; 6/1-6/30 bag-2, ch MSF; 7/1-9/30, bag-2, ch MSF; 10/1-10/31, bag-2; 11/1-12/31, bag-2, 1 ch; 1/1-1/31 clsd; 2/1-4/30, bag-2, ch MSF. Commencement Bay closure: 6/1-7/31. Piers Yr-Round: Dash Pt, Pt Def., Les Davis, Des Moines, & Redondo, bag-2, 1 ch
Area 13	604	5/1-6/30, bag-2, ch MSF; 7/1-9/30, bag-2, ch & co MSF; 10/1-10/31, bag-2, co MSF; 11/1-12/31, bag-2, 1 ch; 1/1-4/30 bag-1; Minter closed 4/16-9/30; Budd closures 7/16-10/31; Fox Island Yr-Round: bag-2, 1 ch, coho MSF 7/1-10/31
Area 12	1,392	Entire Area: 5/1-6/30 clsd; So. Ayock 7/1-10/15, bag-4, 2 ch, cm NR, ch MSF; No. Ayock 7/1-8/31 clsd; 9/1-10/15, bag-4 coho only; Entire Area: 10/16-12/31, bag -4, 2 ch, ch MSF; 1/1-1/31 closed; 2/1-4/30 bag-2, ch MSF; Hoodsport: 7/1-12/31, bag -4, 2 ch, ch MSF, cm NR through 10/15; Quilcene: 8/16-9/30, bag-4 coho only

PUGET SOUND NET:	JUL	AUG	SEP	OCT-DEC	TOTAL
JDF 4B/5/6C Net NTrty	0	0	0	0	0
Trty	235	714	571	1,306	2,826
SJI 6/7/7A Net NTrty	13	47	16	933	1,009
Trty	138	678	31	5,100	5,947

2012 Total Mortality (Fraser Panel and other)

JDF Chinook:	Trty (GN): wb 6/17 -- wb 8/5 Set Gillnet Only
JDF Sockeye/Pink:	Trty (GN): wb 7/29 - wb 9/16 Schedule TBD by Fraser Panel
JDF Coho:	Trty (GN): wb 9/23- wb 9/30
JDF Chum:	Trty (GN): wb 10/07 - wb 11/04
SJI Coho:	Ntry RN - Open 7 d/wk from end of Fraser Panel control thru chum (wb 11/04), MSF co&ch thru 9/30 (ch 300 cap), cm NR though 9/30, ch NI
SJI Sockeye/Pink:	Ntrty (GN/PS/RN) Schedule TBD by Fraser Panel, modeled as weeks 30-34, 1-2-2-2-1, PS co, cm & ch NR, RN MSF co&ch (ch 300 cap). Trty (GN/PS) Schedule TBD by Fraser Panel, modeled as: wk 30 (wb 7/22) - wk 35 (wb 8/26).
SJI Chum:	Ntry (GN/PS/RN): Opens wk 41 (wb 10/7); 10/11, 10/14, 10/15, 10/17, with co-mgr mtg 10/16 to determine remaining schedule. RN: 7 days/wl Trty (GN/PS): starting 10/10 through 11/14; fishing 10/10, 10/12, 10/13, 10/16 with conf call on 10/16 to determine remaining schedule.

5/1/12

April PFMC Coho
NT 83K, T 47.5K

TABLE 2A: COHO FISHERY IMPACT SUMMARY HIGHLIGHTS

Estimated fishery impacts from regulations described by the following FRAM run: 04/17/12

FRAM Run Number: 1229 01:11 PM

Run Description: PFMC April 4th NT 83K T47.5K FINAL

Impacts are expressed as total fishery-related mortality, incl. landed catch, non-retention mort., and other fishery-related mort. Trty/NonTrty splits are NOT based on CWT recovery data.

FISHERY	ALL STOCKS MORTALITY Marked	UnMarked	Total	SKAGIT Wild	Marked	UnMarked	Total	STILLY Wild	SNOHOM Wild	STILLAGUAMISH/SNOHOMISH Marked	UnMarked	Total
Projected Spawning Escapement				33,388	7,004	34,960	41,965	33,893	78,201	22,884	114,288	137,172
Spawning Low/Normal Esc. Breakpoint				25,000				10,000	50,000			
Projected Exploitation Rate (all fisheries)				31.2%				28.8%	28.4%			
Exploitation Rate Ceiling				35%				50%	40%			
Exploitation in Southern U.S. Fisheries				31%				29%	28%			
CANADIAN	26,773	59,406	86,179	297	429	311	740	145	336	887	490	1,377
ALASKA	97,123	1,882,600	1,979,723	1	0	1	1	0	0	0	0	0
S. of Falcon Troll	2,320	6,428	8,748	10	3	11	14	10	24	9	34	43
S. of Falcon Sport	10,597	18,310	28,907	12	8	14	22	14	32	36	47	83
NORTH OF CAPE FALCON OCEAN:												
Treaty Troll	21,999	29,088	51,087	1,688	397	1,763	2,160	1,083	2,489	965	3,639	4,604
NT Troll N. Leadbltr	8,738	5,759	14,497	147	83	154	237	163	375	276	548	824
NT Troll S. Leadbltr	8,318	3,756	12,074	46	23	48	71	45	105	83	153	236
Sport: Area 1	36,353	6,780	43,133	23	26	25	51	17	40	75	58	133
Buoy 10	8,670	1,661	10,331	1	1	1	2	0	0	0	0	0
Area 2	26,990	7,093	34,083	88	94	91	185	68	155	278	227	505
Area 3	1,887	462	2,349	15	17	15	32	17	38	69	56	125
Area 4 *	7,566	1,862	9,428	165	180	172	352	90	206	346	301	647
PUGET SOUND:												
Treaty Troll	187	338	525	17	4	18	22	50	114	44	167	211
Sport: Areas 5	29,217	16,689	45,906	1,407	766	1,471	2,237	1,136	2,610	1,937	3,815	5,752
Area 6	1,342	417	1,759	51	49	53	102	27	63	111	92	203
Area 7	441	349	790	27	15	28	43	11	25	15	37	52
Area 8-1,2	811	3,817	4,628	475	106	497	603	826	2,264	375	3,157	3,532
Area 9	4,835	5,784	10,619	633	145	661	806	533	1,225	457	1,790	2,247
Area 12	491	901	1,392	2	1	3	4	0	0	0	0	0
Area 10	4,165	2,467	6,632	163	38	170	208	55	126	49	184	233
Area 11	1,620	888	2,508	19	4	20	24	21	49	19	71	90
Area 13	492	112	604	4	2	4	6	1	1	1	2	3
Freshwater Sport	n/a	n/a	n/a	1,734	n/a	n/a	2,458	1,023	4,866	326	6,031	6,357
Pre-terminal net:												
6/7/7A NTrty	596	413	1,009	19	4	19	23	1	3	1	5	6
6/7/7A Trty	3,414	2,532	5,946	134	30	140	170	15	35	13	52	65
4B/5/6C NTrty	0	0	0	0	0	0	0	0	0	0	0	0
4B/5/6C Trty	1,206	1,619	2,825	118	27	124	151	82	190	70	277	347
6B/9 NTrty	0	0	0	0	0	0	0	0	0	0	0	0
6B/9 Trty	0	0	0	0	0	0	0	0	0	0	0	0
Terminal net:												
Skagit Bay (8) NTrty	0	0	0	0	0	0	0	0	0	0	0	0
Skagit Bay (8) Trty	53	192	245	177	49	186	235	1	2	1	3	4
Area 8A Ntrty	512	302	814	31	7	33	40	70	182	126	257	383
Area 8A Trty	4,231	8,425	12,656	796	181	832	1,013	2,012	5,158	3,497	7,295	10,792
Hood Canal NTrty	4,076	5,609	9,685	10	2	11	13	10	22	7	33	40
Hood Canal Trty	20,414	21,308	41,722	19	4	20	24	23	53	18	78	96
South Pgt Snd NTrty	479	255	734	3	1	3	4	3	6	2	9	11
South Pgt Snd Trty	35,008	6,772	41,780	48	11	52	63	44	100	37	147	184
B'ham Bay(7B) Ntrty	8,089	3,442	11,531	78	17		17	7	15	5	23	28
B'ham Bay(7B) Trty	21,060	9,335	30,395	321	71	336	407	28	65	23	95	118
Local Extreme Terminal Net:												
Nontreaty	Refer to TAMMs for individual stocks			0	0	0	0	109	249	355	362	717
Treaty	"			5,453	901	5,629	6,530	5,979	9,822	13,874	15,976	29,850
Test				903	280	965	1,245	n/a	n/a			

* Area 4 Sport numbers include 4B add-on, if any, and a number of fish caught on Canadian licenses in areas 4 and 4B.

FRAM assumes that there are no changes in the relative exploitation rates of model stocks estimated from the base period (1986-91). The possibility exists that with the changes to the structure of a fishery the relative exploitation rates of the stock may change as well, though an anlysis of the data has yet to be done.

RECAPITULATION OF IMPACTS ACCOUNTING:	WILD	TOTAL	WILD	WILD	TOTAL
Nontreaty Total Wild Impacts:	5,163	7,554	4,257	12,681	22,250
Treaty Total Wild Impacts:	8,771	10,775	9,317	18,028	46,271
Amt NT above (or below) T:	(3,608)	(3,221)	(5,060)	(5,347)	(24,021)
Nontreaty Wild Impacts w/o SOF:	5,141	7,518	4,233	12,625	22,124
Treaty Wild Impacts w/o SOF:	8,771	10,775	9,317	18,028	46,271
Amt NT above (or below) T w/o SOF:	(3,630)	(3,257)	(5,084)	(5,403)	(24,147)

TABLE 2B: COHO FISHERY IMPACT SUMMARY HIGHLIGHTS

Estimated fishery impacts from regulations described by the following FRAM run:

FRAM Run Number: 1229

Run Description: PFMC April 4th NT 83K T47.5K FINAL

04/17/12
01:11 PM

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Impacts are expressed as total fishery-related mortality, incl. landed catch, non-retention mort., and other fishery-related mort. Trty/NonTrty splits are NOT based on CWT recovery data.

FISHERY	HOOD CANAL Wild	Marked	UnMarked	Total	JUAN DE FUCA TRIBUTARIES Wild	Marked	UnMarked	Total
Projected Spawning Escapement	37,146	9,677	39,262	48,939	11,042	8,732	13,050	21,782
Spawning Low/Normal Esc. Breakpoint	14,350			48,939	11,000			21,783
Projected Exploitation Rate (all fisheries)	49.52%				12.85%			
Exploitation Rate Ceiling	65%				40%			
Exploitation in Southern U.S. Fisheries	49%				11.97%			
CANADIAN	429	1,880	481	2,361	46	305	59	364
ALASKA	19	14	21	35	66	80	80	160
S. of Falcon Troll	28	19	30	49	9	8	8	16
S. of Falcon Sport	14	41	16	57	30	51	37	88
NORTH OF CAPE FALCON OCEAN:								
Treaty Troll	2,545	1,831	2,851	4,682	359	437	439	876
NT Troll N. Leadbttr	387	486	435	921	30	100	36	136
NT Troll S. Leadbttr	63	102	71	173	16	45	19	64
Sport: Area 1	50	171	56	227	9	54	11	65
Buoy 10	5	14	6	20	0	0	0	0
Area 2	173	545	193	738	25	135	31	166
Area 3	43	146	49	195	4	22	5	27
Area 4 *	268	920	300	1,220	12	71	15	86
PUGET SOUND:								
Treaty Troll	30	21	33	54	3	3	4	7
Sport: Areas 5	3,794	5,169	4,231	9,400	747	1,504	915	2,419
Area 6	136	299	149	448	18	89	22	111
Area 7	10	19	11	30	0	0	0	0
Area 8	48	34	53	87	0	0	0	0
Area 9	2,092	1,315	2,335	3,650	12	14	14	28
Area 12	797	445	879	1,324	0	0	0	0
Area 10	863	546	958	1,504	3	3	4	7
Area 11	99	65	111	176	0	0	0	0
Area 13	8	12	9	21	0	0	0	0
Freshwater Sport	596	2,374	1,009	3,383	0	312	39	351
Pre-terminal net:								
6/7/7A NTrty	10	6	11	17	3	4	4	8
6/7/7A Trty	82	48	90	138	20	23	25	48
4B/5/6C NTrty	0	0	0	0	0	0	0	0
4B/5/6C Trty	374	209	411	620	165	188	201	389
6B/9 NTrty	0	0	0	0	0	0	0	0
6B/9 Trty	0	0	0	0	0	0	0	0
Terminal net:								
Skagit Bay (8) NTrty	0	0	0	0	0	0	0	0
Skagit Bay (8) Trty	1	1	1	2	0	0	0	0
Area 8A Ntrty	4	2	4	6	0	0	0	0
Area 8A Trty	87	50	97	147	1	1	1	2
Hood Canal NTrty	4,188	986	4,355	5,341	13	15	16	31
Hood Canal Trty	14,529	3,163	15,145	18,308	21	25	27	52
South Pgt Snd NTrty	69	30	74	104	0	1	1	2
South Pgt Snd Trty	966	546	1,066	1,612	7	8	9	17
B'ham Bay(7B) Ntrty	5	2	5	7	0	0	0	0
B'ham Bay(7B) Trty	18	10	20	30	0	0	0	0
Local Extreme Terminal Net:								
Nontreaty	647	2,805	1,078	3,883	0	1495	183	1,678
Treaty	2,962	20,119	6,999	27,118	9	2194	276	2,470
Test	n/a			n/a	n/a			n/a
Total	36439			88088	1628			9668

* Area 4 Sport numbers include 4B add-on, if any, and a number of fish caught on Canadian licenses in areas 4 and 4B.

RECAPITULATION OF IMPACTS ACCOU	WILD	TOTAL	WILD	TOTAL
Nontreaty Total Wild Impacts:	14,397	32,981	931	5,283
Treaty Total Wild Impacts:	21,594	52,711	585	3,861
Amt NT above (or below) T:	(7,197)	(19,730)	346	1,422
Nontreaty Wild Impacts w/o SOF:	14,355	32,875	892	5,179
Treaty Wild Impacts w/o SOF:	21,594	52,711	585	3,861
Amt NT above (or below) T w/o SOF:	(7,239)	(19,836)	307	1,318

TABLE 2C: COHO FISHERY IMPACT SUMMARY HIGHLIGHTS

Estimated fishery impacts from regulations described by the following FRAM run:

FRAM Run Number: 1229

Run Description: PFMC April 4th NT 83K T47.5K FINAL

04/17/12
01:11 PM

Impacts are expressed as total fishery-related mortality, incl. landed catch, non-retention mort., and other fishery-related mort. Trty/NonTrty splits are NOT based on CWT recovery data.

FISHERY	QUIL FALL Wild	HOH Wild	QUILLAYUTE FALL H&W Marked	QUILLAYUTE FALL H&W UnMarked	QUILLAYUTE FALL H&W Total	QUEETS Wild	QUEETS Suppl.	QUEETS Hatchery	QUEETS Marked	QUEETS UnMarked	QUEETS Total	GRAYS HARBOR Wild	GRAYS HARBOR Marked	GRAYS HARBOR UnMarked	GRAYS HARBOR Total
Projected Ocean Escapement	31,214	12,240	12,004	34,204	46,208	29,422	0	17,387	14,927	31,882	46,809	136,919	38,875	138,574	177,449
Spawning Escapement Objective	6,300	2,000				5,800						35,400			
Projected Marine Exploitation Rate	6%	14%				14%						7%			
Projected Exploitation Rate (all fisheries)	51%	47%				62%						50%			
Exploitation in Southern U.S. marine Fisheries	6%	12%				13%						6%			
CANADIAN	62	125	82	69	151	270	0	748	727	295	1,022	656	519	663	1,182
ALASKA	24	55	9	26	35	63	0	41	37	69	106	649	189	657	846
S. of Falcon Troll	51	31	21	56	77	111	0	74	64	119	183	119	34	120	154
S. of Falcon Sport	29	35	47	31	78	163	0	248	234	176	410	378	189	383	572
NORTH OF CAPE FALCON OCEAN:															
Treaty Troll	849	962	342	931	1,273	1,749	0	1,121	980	1,890	2,870	4,403	1,294	4,456	5,750
NT Troll N. Leadbttr	324	173	251	355	606	762	0	859	798	823	1,621	569	397	577	974
NT Troll S. Leadbttr	87	80	93	96	189	259	0	388	367	280	647	416	305	421	726
Coastal terminal area "dip-ins"	194	119	77	213	290	3,081	0	1,408	1,210	3,279	4,489	2,080	588	2,105	2,693
Sport: Area 1	76	43	147	83	230	277	0	780	758	299	1,057	460	658	465	1,123
Buoy 10	3	2	5	3	8	6	0	15	14	7	21	31	40	32	72
Area 2	125	169	243	137	380	653	0	1,742	1,689	706	2,395	1,566	2,159	1,585	3,744
Area 3	17	23	34	19	53	56	0	148	143	61	204	48	67	48	115
Area 4 *	37	36	71	40	111	98	0	279	272	106	378	86	124	87	211
PUGET SOUND CATCHES:															
Treaty Troll	0	0	0	0	0	1	0	1	0	1	1	2	0	2	2
Sport: Areas 5	253	170	205	278	483	223	0	342	325	241	566	552	311	559	870
Area 6	0	4	1	0	1	2	0	2	2	2	4	2	1	2	3
Areas 7-13	2	6	4	2	6	3	0	1	1	3	4	0	0	0	0
Nontreaty Net	0	0	0	0	0	30	0	11	10	32	42	3	1	3	4
Treaty Net	28	29	11	31	42	113	0	55	47	120	167	90	26	91	117
LOCAL TERMINAL															
Nontreaty Net	–	–	–	–	–	–	–	–	–	–	–	14710	——>>	——>>	18096
Treaty Net	13531	3819	——>>	——>>	20031	13686	0	10077	——>>	——>>	23764	32508	——>>	——>>	41664
Sport	1359	794	——>>	——>>	2758	1545	0	913	——>>	——>>	2457	15432	——>>	——>>	20699

* Area 4 Sport numbers include 4B add-on, if any, and a number of fish caught on Canadian licenses in areas 4 and 4B.

TABLE 2D: COHO FISHERY IMPACT SUMMARY HIGHLIGHTS

Estimated fishery impacts from regulations described by the following FRAM run:

FRAM Run Number: 1229

Run Description: PFMC April 4th NT 83K T47.5K FINAL

04/17/12
01:11 PM

Impacts are expressed as total fishery-related mortality, incl. landed catch, non-retention mort., and other fishery-related mort. Trty/NonTrty splits are NOT based on CWT recovery data.

FISHERY	SOUTH PUGET SOUND Wild	Marked	UnMarked	Total	NOOKSACK-SAMISH Wild	Marked	UnMarked	Total
Projected Spawning Escapement	16,061	41,788	17,623	59,411	9,016	18,202	9,073	27,275
Spawning Escapement Objective	n/a			59,411	n/a			
Projected Exploitation Rate (all fisheries)	62.9%				64.5%			
Exploitation in Southern U.S. Fisheries	63%				63%			
CANADIAN	127	2,933	141	3,074	269	2,712	272	2,984
ALASKA	3	9	3	12	4	10	4	14
S. of Falcon Troll	13	45	14	59	5	11	5	16
S. of Falcon Sport	13	117	13	130	3	40	3	43
NORTH OF CAPE FALCON OCEAN:								
Treaty Troll	1,335	4,666	1486	6,152	900	2,172	906	3,078
NT Troll N. Leadbttr	147	1,198	163	1,361	55	324	55	379
NT Troll S. Leadbttr	41	333	45	378	11	66	11	77
Sport: Area 1	24	399	26	425	9	105	9	114
Buoy 10	0	3	0	3	0	2	0	2
Area 2	76	1,220	84	1,304	38	430	38	468
Area 3	14	230	15	245	11	123	11	134
Area 4 *	125	2,060	139	2,199	82	899	83	982
PUGET SOUND:								
Treaty Troll	15	51	16	67	2	4	2	6
Sport: Areas 5	1,661	11,341	1850	13,191	506	2,821	509	3,330
Area 6	37	565	41	606	15	139	15	154
Area 7	4	43	5	48	34	156	35	191
Area 8	0	181	59	240	49	114	49	163
Area 9	836	2,836	931	3,767	24	56	25	81
Area 12	0	0	0	0	19	45	19	64
Area 10	1,013	3,490	635	4,125	9	22	9	31
Area 11	578	1,524	1122	2,646	0	0	0	0
Area 13	92	477	97	574	0	0	0	0
Freshwater Sport	3,779	7,169	4314	11,483	463	477	464	941
Pre-terminal net:								
6/7/7A NTrty	5	18	6	24	78	179	78	257
6/7/7A Trty	35	104	38	142	458	1,019	461	1,480
4B/5/6C NTrty	0	0	0	0	0	0	0	0
4B/5/6C Trty	104	347	115	462	30	71	31	102
6B/9 NTrty	0	0	0	0	0	0	0	0
6B/9 Trty	0	0	0	0	0	0	0	0
Terminal net:								
Skagit Bay (8) NTrty	0	0	0	0	0	0	0	0
Skagit Bay (8) Trty	0	0	0	0	1	2	1	3
Area 8A Ntrty	6	21	7	28	0	1	0	1
Area 8A Trty	143	473	160	633	6	13	6	19
Hood Canal NTrty	76	238	85	323	7	16	7	23
Hood Canal Trty	169	542	189	731	10	22	10	32
South Pgt Snd NTrty	148	441	164	605	2	4	2	6
South Pgt Snd Trty	4,551	34,342	5437	39,779	24	54	24	78
B'ham Bay(7B) Ntrty	13	41	14	55	3,147	7,944	3,170	11,114
B'ham Bay(7B) Trty	54	176	60	236	8,124	20,450	8,183	28,633
Local Extreme Terminal Net:								
Nontreaty	n/a			n/a	n/a			n/a
Treaty	11,994	36403	13159	49,562	2,016	4795	2026	6,821
Test	24				n/a			n/a

* Area 4 Sport numbers include 4B add-on, if any, and a number of fish caught on Canadian licenses in areas 4 and 4B.

RECAPITULATION OF WILD IMPACTS ACCOUNTING:

Nontreaty Total Wild Impacts:	8,701			43,819	4,567			18,571
Treaty Total Wild Impacts:	18,400			97,764	11,571			40,252
Amt NT above (or below) T:	(9,699)			(53,945)	(7,004)			(21,681)
Nontreaty Wild Impacts w/o SOF:	8,675			43,630	4,559			18,512
Treaty Wild Impacts w/o SOF:	18,400			97,764	11,571			40,252
Amt NT above (or below) T w/o SOF:	(9,725)			(54,134)	(7,012)			(21,740)

TABLE 4: SUMMARY OF COHO EXPLOITATION RATES BY FISHERY AGGREGATE

Predicted Exploitation Rates for Total Fishery-Related Mortality

FRAM Run Number: 1229

Run Description: PFMC April 4th NT 83K T47.5K FINAL

NOTE: Landed catch plus all fishery-related mortality - Not AEQ Expl. Rate!!!

04/17/12
01:11 PM

STOCK->		Skagit Wild	Stilly Wild	Snohom Wild	HdCnl Wild \1	JDF Tribs Wild \2	South Sound Wild	Nooksack Wild	Quillayute FallWild	Hoh Wild	Queets Wild	Grys Hbr Wild
Predicted Spawning Escapement		33,388	33,893	78,201	37,146	11,042	16,061	9,016	n/a	n/a	n/a	n/a
Ocean Escapement *		n/a	n/a	n/a	n/a	n/a	n/a	n/a	31,214	12,240	29,422	136,919
RUN RECONSTRUCTION:												
Ocean/Pre-term. Marine Catch \1		5,562	4,410	10,505	12,367	1,577	6,298	2,611	1,967	1,943	4,839	10,030
Nonlocal Mixed-terminal Catch		1,306	116	263	1,150	42	461	50	194	119	3,081	2,080
Local Mixed Terminal Marine Catch		177	2,082	5,340	18,717	0	4,699	11,271	n/a	n/a	n/a	n/a
Extreme Terminal & FW \2 NTRTY		1,734	1,132	5,115	1,243	0	3,779	463	n/a	n/a	n/a	n/a
Extreme Terminal & FW \2 TRTY		5,453	5,979	9,822	2,962	9	11,994	2,016	n/a	n/a	n/a	n/a
Extr. Term. TEST \2		903	0	0	0	0	24	-	n/a	n/a	n/a	n/a
Escapement \2		33,388	33,893	78,201	37,146	11,042	16,061	9,016	31,214	12,240	29,422	136,919
TOTAL ABUNDANCE \3		48,523	47,612	109,246	73,585	12,670	43,316	25,427	33,181	14,183	34,261	146,949
TOTAL PREDICTED EXPL. RATE \4		31.2%	28.8%	28.4%	49.520%	12.8%	63%	65%	6%	14%	14%	7%
Canada		0.6%	0.3%	0.3%	0.6%	0.4%	0.3%	1.1%	0.2%	0.9%	0.8%	0.4%
Alaska		0.0%	0.0%	0.0%	0.0%	0.5%	0.0%	0.0%	0.1%	0.4%	0.2%	0.4%
Subtotal Southern U.S. EXPL. RATE \5		31%	29%	28%	49%	11.965%	62.6%	63.5%	5.7%	12%	13%	6%
S. Of Falcon Ocean		0.0%	0.1%	0.1%	0.1%	0.3%	0.1%	0.0%	0.2%	0.5%	0.8%	0.3%
NOF Ocean Troll:	NTrty	0.4%	0.4%	0.4%	0.6%	0.4%	0.4%	0.3%	1.2%	1.8%	3.0%	0.7%
	Trty	3.5%	2.3%	2.3%	3.5%	2.8%	3.1%	3.5%	2.6%	6.8%	5.1%	3.0%
Ntrty NOF Ocean & Buoy10 Spt		0.6%	0.4%	0.4%	0.7%	0.4%	0.6%	0.6%	0.8%	1.9%	3.2%	1.5%
Pgt Snd 5,6C Troll	Trty	0.0%	0.1%	0.1%	0.0%	0.0%	0.0%	0.0%	All Puget Sound Combined:			
Pgt Snd 5,6 Sport		3.0%	2.4%	2.4%	5.3%	6.0%	3.9%	2.0%	0.9%	1.5%	1.1%	0.4%
Pgt Snd 7 Sport		0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.1%				
Pgt Snd 8 Sport		1.0%	1.7%	2.1%	0.1%	0.0%	0.0%	0.2%				
Pgt Snd 9 Sport		1.3%	1.1%	1.1%	2.8%	0.1%	1.9%	0.1%				
Pgt Snd 10,11,13		0.4%	0.2%	0.2%	1.3%	0.0%	3.9%	0.0%				
Pgt Snd 12 Sport		0.0%	0.0%	0.0%	1.1%	0.0%	0.0%	0.1%				
Pgt Snd Extr. Term. & FW Sport		3.6%	2.1%	4.5%	0.8%	0.0%	8.7%	1.8%				
PS Preterminal Net**:	Ntrty	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.3%				
	Trty	0.5%	0.2%	0.2%	0.6%	1.5%	0.3%	1.9%				
Nonlocal Term. Net:	Ntrty	0.3%	0.0%	0.0%	0.1%	0.1%	0.2%	0.0%				
	Trty	2.4%	0.2%	0.2%	1.5%	0.2%	0.8%	0.2%				
Local Terminal Net:	Ntrty	0.0%	0.1%	0.2%	5.7%	–	0.3%	12.4%				
	Trty	0.4%	4.2%	4.7%	19.7%	–	10.5%	32.0%				
Extreme Term. Net	Ntrty	0.0%	0.2%	0.2%	0.9%	0.0%	0.0%	0.0%				
	Trty	11.2%	12.6%	9.0%	4.0%	0.1%	27.7%	7.9%				
	TEST	1.9%	0.0%	0.0%	0.0%	0.0%	0.1%	0.0%				

* Model-predicted Escapement for Washington Coastal stock aggregates represents run entering the rivers or "Ocean Escapement," and does not represent all exploitation for coastal stocks!

** Puget Sound Area 6B/9 Net is apportioned using agreed Run Reconstruction apportionment rather than FRAM CWT-based projections of stock impacts

tnotes:

\1 From TAMM Tables 2; excludes freshwater sport

\2 Puget Sound Stocks From TAMM (includes freshwater sport); Coastal stocks escapement = "run entering river" from FRAM

\3 "Total Fishery-related Mortality Plus Escapement" (does not include natural mortality) or for Coastal Stocks: Pre-River Mortality Plus Run Entering River

\4 For coastal stocks the presented ER is for pre-terminal fisheries only. See Table 2 for all-fishery ERs for coastal stocks.

\5 Sum of exploitation rates for Southern U.S. only: SoF, OCean 1-4, Col. R., coastal harbors, Puget Sound

TABLE 7: COHO RUN SIZES FOR SALMON TECHNICAL TEAM REFERENCE

FRAM Run Number: 1229

Run Description: PFMC April 4th NT 83K T47.5K FINAL

Includes landed catch plus all fishery-related mortality

04/17/12
01:11 PM

PUGET SOUND COHO RUN SIZES:

Stock	Hat +Wld Run Entering Area 4B Net \1	Hat + Wld Terminal Area Abundance \2	Hat + Wld Escape-ment	Wild Run Entering Area 4B Net	Wild Run Entering USJDF-PS	Wild Escape-ment
Skagit		54,010	43,163	40,262	46,030	33,388
Stillag.-Snohomish		189,502	137,172			
Stilly:				37,641	45,960	33,893
Snohom:				83,539	105,446	78,201
Hood Canal		108,345	48,939	59,333	69,561	37,146
South Puget Sound		166,065	59,411	31,822	41,398	16,061
Nooksack-Samish		75,963	27,275	22,502	24,040	9,016
Strait Tributaries		26,184	21,783	11,223	12,064	11,042

\1 Note: 4B Run sizes differ from exact Status Report frame of reference because Area 6B/9 impacts are accounted for as per FRAM CWT-based stock impacts.

2\ RR_Term compatible

PS Runsize: 620,069

OTHER WA-CA RUNSIZES: all Truns values

Terminal Area	Ocean Escapement All w/ dip Ins	Local Wild	Local Hatchery
Quillayute	55,261	36,518	18,743
Hoh	13,476	12,240	0
Queets	48,491	29,422	17,387
Quinault	57,079	24,275	29,044
Grays Harbor	177,747	136,919	40,530
Willapa Bay	146,345	73,921	69,794

Stock/Area	Ocean Escapement
Quillayute Summer Hatchery	3,750
Quillayute Summer Natural	5,304
Columbia Early (after B10)	176,313
Columbia Late (after B10)	55,302
Total	231,615
Oregon N. Coast Natural	40,906
Oregon N. Mid Coast Nat.	83,118
Oregon S. Mid Coast Nat.	140,856
Total	264,880

TABLE C: COLUMBIA RIVER COHO FISHERY IMPACT SUMMARY

Estimated fishery impacts from regulations described by the following FRAM run:

FRAM Run Number: 1229

Run Description: PFMC April 4th NT 83K T47.5K FINAL

Impacts are expressed as total fishery-related mortality, incl. landed catch, non-retention mort., and other fishery-related mort.

FISHERY	Columbia Early			Columbia Late			Combined		
	Marked	UnMarked	Total	Marked	UnMarked	Total	Marked	UnMarked	Total
Ocean Escapement (after B10)	94,770	81,543	176,313	44,505	10,797	55,302	139,275	92,340	231,615
Marine Exploitation Rate	32.4%	10.9%	23.9%	40.0%	14.2%	36.3%	35.0%	11.3%	27.3%
Marine ER to Col R before B10 (PFMC Pre Rpts)	27.3%	9.6%	20.3%	38.8%	13.8%	35.2%	31.3%	10.1%	24.4%
PFMC Ocean Fisheries Exploitation Rate	26.7%	9.4%	19.9%	37.6%	13.2%	34.1%	30.5%	9.9%	23.8%
Exploitation in Southern U.S. marine Fisheries	32.1%	10.9%	23.7%	39.7%	14.1%	36.0%	34.7%	11.3%	27.1%
TOTAL ER	69.5%	13.0%	47.2%	43.3%	18.1%	39.6%	60.5%	13.6%	45.1%
CANADIAN	395	34	429	264	9	273	659	43	702
ALASKA	1	1	2	0	0	0	1	1	2
S. of Falcon Troll	1252	837	2089	346	61	407	1,598	898	2,496
S. of Falcon Sport	6033	1598	7631	1748	135	1883	7,781	1,733	9,514
NORTH OF CAPE FALCON OCEAN:									
Treaty Troll	1980	1482	3462	1669	341	2010	3,649	1,823	5,472
NT Troll N. Leadbttr	1351	409	1760	1050	90	1140	2,401	499	2,900
NT Troll S. Leadbttr	2439	685	3124	2780	222	3002	5,219	907	6,126
Sport: Area 1	16275	2374	18649	12988	508	13496	29,263	2,882	32,145
Buoy 10	7050	1232	8282	901	47	948	7,951	1,279	9,230
Area 2	7495	1131	8626	6451	271	6722	13,946	1,402	15,348
Area 3	293	45	338	313	12	325	606	57	663
Area 4 *	333	51	384	588	22	610	921	73	994
PUGET SOUND CATCHES:									
Treaty Troll	2	1	3	37	6	43	39	7	46
Sport: Areas 5-13	399	73	472	448	31	479	847	104	951
Nontreaty Net	0	0	0	0	0	0	0	0	0
Treaty Net	7	6	13	5	1	6	12	7	19
COASTAL CATCHES:									
Bay Sport	8	6	14	13	3	16	21	9	30
Nontreaty Net	68	57	125	106	24	130	174	81	255
Treaty Net	0	0	0	0	0	0	0	0	0
LOWER COLUMBIA:									
Mainstem Nontreaty Net	1700	1382	3083	1923	459	2383	3624	1842	5465
SAFE	49391	406	49797	0	0	0	49391	406	49797
Sport	1000	83	1083	500	30	530	1500	113	1613
Total Abundance	140,151	91,565	231,716	74,212	12,580	86,792	214,363	104,145	318,508

TABLE C-Nat: COLUMBIA RIVER COHO FISHERY IMPACT SUMMARY FOR LOWER COL NATURAL COHO

Estimated fishery impacts from regulations described by the following FRAM run:

FRAM Run Number: 1229

Run Description: PFMC April 4th NT 83K T47.5K FINAL

Impacts are expressed as total fishery-related mortality, incl. landed catch, non-retention mort., and other fishery-related mort.

FISHERY	Sandy Early Wild Oregon Nat	Clackamas Early Wild WA Early Nat	Clackamas Late Wild WA Late Nat	Total
Ocean Escapement (after B10)	9,772	5,937	10,583	26,292
Marine Exploitation Rate	10.8%	10.8%	14.2%	12.2%
Marine ER to Col R before B10 (PFMC Pre Rpts)	9.6%	9.6%	13.8%	**11.3%**
PFMC Ocean Fisheries ER	9.4%	9.5%	13.2%	11.00%
PFMC InRivers Ers (incl B10)	3.2%	3.2%	4.3%	3.66%
PFMC TOTAL ER	**12.68%**	**12.69%**	**17.47%**	**14.65%**
ER in So. U.S. Marine Fisheries	10.8%	10.8%	14.1%	12.2%
TOTAL ER ALL FISHERIES	**12.9%**	**12.9%**	**18.1%**	**15.0%**
CANADIAN	1	0	8	9
ALASKA	0	0	0	0
S. of Falcon Troll	97	60	60	217
S. of Falcon Sport	179	108	132	419
NORTH OF CAPE FALCON OCEAN:				
Treaty Troll	191	116	335	642
NT Troll N. Leadbttr	53	33	87	173
NT Troll S. Leadbttr	83	50	217	350
Sport: Area 1	286	174	498	958
Buoy 10	130	79	46	255
Area 2	133	81	265	479
Area 3	6	4	12	22
Area 4 *	7	4	22	33
PUGET SOUND CATCHES:				
Treaty Troll	0	0	6	6
Sport: Areas 5-13	9	6	31	46
Nontreaty Net	0	0	0	0
Treaty Net	1	0	1	2
COASTAL CATCHES:				
Bay Sport	1	0	3	4
Nontreaty Net	8	5	24	37
Treaty Net	0	0	0	0
LOWER COLUMBIA:				
Mainstem Nontreaty Net	165	100	450	716
SAFE	49	30	0	78
Sport	10	6	29	45

Table OR. Total mortality and exploitation rates for OCN and Rogue/Klamath

Estimated fishery impacts from regulations described by the following FRAM run:
FRAM Run Number: 1229
Run Description: PFMC April 4th NT 83K T47.5K FINAL

		OR Coastal Natural			Rogue/Klam. H Unmrkd	
Fishery	Area	Total Mort	Exp. Rt.		Total Mort	Exp. Rt.
Alaska	all	0	0.0%		0	0.0%
BC	all	296	0.1%		6	0.0%
Puget Sound/Straits		290	0.1%		0	0.0%
North of Falcon:						
Troll:	Treaty	1546	0.5%		0	0.0%
	Nontreaty	1446	0.5%		1	0.0%
Sport:		2738	0.9%		7	0.1%
Buoy 10		160	0.1%		0	0.0%
South of Falcon:						
Troll:	Tillmk	178	0.1%		0	0.0%
	Newprt	969	0.3%		4	0.0%
	Coos B	1116	0.4%		12	0.1%
	Brookngs	63	0.0%		5	0.0%
	CaKMZ	193	0.1%		35	0.3%
	Ft Bragg	941	0.3%		106	0.8%
	So. Calif	798	0.3%		29	0.2%
Sport:	Tillmk	2273	0.8%		4	0.0%
	Newprt	4527	1.5%		3	0.0%
	Coos B	3772	1.3%		16	0.1%
	Brookngs	614	0.2%		66	0.5%
	CaKMZ	1074	0.4%		235	1.8%
	Ft Bragg	944	0.3%		135	1.0%
	So. Calif	801	0.3%		86	0.6%
Freshwater		18996	6.5%		32	0.2%
AK to CA total		43735	15.0%		782	5.8%
Escapement		248359			12594	

TABLE T: THOMPSON AND UPPER FRASER COHO FISHERY IMPACT SUMMARY

Estimated fishery impacts from regulations described by the following FRAM run:

FRAM Run Number: 1229

Run Description: PFMC April 4th NT 83K T47.5K FINAL

Impacts are expressed as total fishery-related mortality, incl. landed catch, non-retention mort., and other fishery-related mortality.

==========

FISHERY	Interior Fraser Wild	
Projected Escapement	24,538	
Projected Pre-Terminal Exploitation Rate	12.3%	
Exploitation in U.S. Fisheries	**9.944%**	
	Mortality	Expl. Rate
CANADIAN (marine)	585	2.1%
ALASKA	62	0.2%
SOUTH OF FALCON & COL R	20	0.1%
NORTH OF CAPE FALCON OCEAN:		
Treaty Troll Area 2	12	0.0%
Treaty Troll Area 3	14	0.1%
Treaty Troll Area 4	1033	3.7%
NT Troll Area 1	7	0.0%
NT Troll Area 2	36	0.1%
NT Troll Area 3	42	0.2%
NT Troll Area 4	14	0.1%
NT Sport Buoy 10 & Area 1	23	0.1%
NT Sport Area 2	63	0.2%
NT Sport Area 3	6	0.0%
NT Sport Area 4*	83	0.3%
PUGET SOUND:		
JDF Troll and Net	25	0.1%
SJI 6/7/7A NT Net	1	0.0%
SJI 6/7/7A T Net	16	0.1%
Sport: Area 5	808	2.9%
Area 6	16	0.1%
Area 7	86	0.3%
Area 8-13	21	0.1%
Puget Sound Terminal net	453	1.6%
WA Extreme Terminal Net & FW Sport	2	0.0%
Total:	3428	12.3%

* Area 4 Sport numbers include 4B add-on, if any, and a number of fish caught on Canadian licenses in areas 4 and 4B.

TABLE 1: DESCRIPTION OF FISHERY REGULATIONS AND SUMMARY OF CHINOOK CATCH ======== ======== TABLE 1

Run Number: **1512** Version: 2.09 05/01/12

Run Description: 2012 Final PFMC 02:30 PM

Impacts are expressed as total fishery-related mortality, which includes landed catch, non-retention mortality, and other fishery-related mortality; not to be used for allocation computations.

MX 5/1/12

Fishery	Fishery-related Mortality	Fishery Description and/or Comments:
CANADIAN (B.C.) FISHERIES:		
WCVI Troll/Sport	147,858	2012 TAC per PSC Abundance Index
Area 20 Net	0	2011 post season
Georgia St./JDF T	0	Incidental mortality
Georgia St./JDF S	41,248	Preliminary 2011 post season
SOUTH OF CAPE FALCON:		March PFMC Preseason Report
NORTH OF CAPE FALCON OCEAN:		
Treaty Ocean Tro	61,937	TAC 55,000 chinook
NT Ocean Troll	58,255	TAC 47,500 chinook
NT Ocean Sport	58,431	TAC 51,500 chinook (no MSF = 47,500)
NT NOF Impacts:	116,686	
4B Add-on		Included with Area 4
Canadian License	0	(For Areas 4 and 4B)
Buoy 10	>>>>	see In-River models
PUGET SOUND SPORT & TROLL:		
Treaty Strait&Win	11,036	8500 for winter troll; 800 JDF summer troll

April PFMC Chinook

NT 99K, T 55K

Puget Sound Sport (landed + non-retention mortality):

Area 5	9,025	Area 5	5/1-6/30 clsd; 7/1-8/15, bag 2, co & ch MSF, cm NR; 8/16-9/14, bag-2, co MSF, ch NR, cm NR; 9/15-9/30 , bag-2, ch NR, cm NR; 10/1-10/31 bag 2, 1 ch; 11/01-2/15 clsd; 2/16-4/10, 1 bag; 4/11-4/30 clsd; Kydaka closure 7/1-9/30
Area 6	3,940	Area 6	5/1-6/30 clsd; 7/1-8/15 bag 2, co & ch MSF expt ch NR East of Ediz, cm NR; 8/16-9/30, bag 2, co MSF, ch & cm NR; 10/1-10/31 bag-2, 1 ch; 11/1-11/30 clsd; 12/1-4/10, 2 bag, ch MSF; Dungeness Bay, 10/1-10/31, 2 bag, coho only; FW Bay closure 7/1-10/31, PA Har clsd 7/1-10/31, Dung Bay clsd 11/1-9/30, Sequim & Disco Bays clsd 10/1-10/31
Area 7	9,216	Area 7	5/1-6/30 clsd; 7/1-7/31, bag-2, 1ch; 8/1-9/30, bag-2, 1ch, co MSF, cm NR; 10/1-10/31, bag-2,1 ch; 11/1-11/30 clsd; 12/1-4/30 bag-2, ch MSF; B'Bay, 8/16-10/31, 4- bag, 2 ch; S. Rosario & E. JDF clsd 7/1-9/30; B Bay - clsd 4/1 thru 8/15; Samish Bay - clsd 7/1-10/15
Areas 8-1,2 8D	7,598	Area 8-1	5/1-7/31 clsd; 8/1-10/31, bag-2, ch NR; 11/1-4/30, bag-2, ch MSF;
		Area 8-2	5/1-7/31 clsd; 8/1-10/31, bag-2, ch NR; 11/1-4/30, 2 bag, ch MSF; Tul. Term Area, 5/18-9/3 Fri- noon Mon, 9/8-9/23 Sat & Sun, bag-2, clsd 6/16, 2 pole option
Area 9	12,100	Area 9	5/1-6/30 clsd; 7/1-7/15, bag-2, ch NR; 7/16-8/31, bag-2, ch MSF, cm NR; 9/1-9/30, bag-2, ch & cm NR; 10/1-10/31, bag-2, ch NR; 11/1-11/30, bag-2, ch MSF; 12/1-1/15 closed; 1/16-4/15, bag-2, ch MSF; 4/16-4/30 clsd; Hd Cnl clsd during sum MSF; Edmds YR, bag 2, 1 ch, cm NR 8/1-9/30
Ar 10, 10A, 10E	11,184	Area 10	5/1-5/31, closed; 6/1-6/30 C&R; 7/1-7/15, bag-2, ch NR; 7/16-8/31, bag-2, ch MSF, cm NR 8/1-8/31; 9/1-9/30, bag-2, ch NR, cm NR through 9/15; 10/1-1/31, bag-2, ch MSF; 2/1-4/30 closed; Inner Bay Clsd: 7/1-8/31; Shilshole clsd 7/1-8/31; Agate Fly Only 1/1-3/31; Outer E' Bay: 7/1-8/31 clsd; Sinc TAF, 7/1-9/30, bag-2, ch MSF, cm NR 8/1-9/15; Piers Yr-round, bag-2, 1 ch, cm NR 8/1-9/15,
Area 11	14,276	Area 11	5/1-5/31 clsd; 6/1-6/30 bag-2, ch MSF; 7/1-9/30, bag-2, ch MSF; 10/1-10/31, bag-2; 11/1-12/31, bag-2, 1 ch; 1/1-1/31 clsd; 2/1-4/30, bag-2, ch MSF. Commencement Bay closure: 6/1-7/31, Piers Yr-Round: Dash Pt, Pt Def., Les Davis, Des Moines, & Redondo, bag-2, 1 ch
Area 13	2,637	Area 13	5/1-6/30, bag-2, ch MSF; 7/1-9/30, bag-2, ch & co MSF; 10/1-10/31, bag-2, co MSF; 11/1-12/31, bag-2, 1 ch; 1/1-4/30 bag-1; Minter closed 4/16-9/30; Budd closures 7/16-10/31; Fox Island Yr-Round: bag-2, 1 ch, coho MSF 7/1-10/31
Area 12	3,229	Area 12	Entire Area: 5/1-6/30 clsd; So. Ayock 7/1-10/15, bag-4, 2 ch, cm NR, ch MSF; No. Ayock 7/1-8/31 clsd; 9/1-10/15, bag-4 coho only; Entire Area: 10/16-12/31, bag -4, 2 ch, ch MSF; 2/1-4/30 bag-2, ch MSF; Hoodsport: 7/1-12/31, bag -4, 2 ch, ch MSF, cm NR through 10/15; Quilcene: 8/16-9/30, bag-4 coho only

PUGET SOUND I	JUL-SEP	Oct-Apr	TOTAL
JDF Net (4B/5/6C	0	0	0
Treaty	628	62	700
SJI Net (7/7A) NT	1,423	48	1,472
Treaty	4,717	30	4,747
B6/9Net NT			
Treaty	760	0	760

2012 Total Mortality (Fraser Panel and other)

JDF Chinook:	Trty (GN): wb 6/17 – wb 8/5 Set Gillnet Only
JDF Sockeye/Pink:	Trty (GN): wb 7/29 - wb 9/16 Schedule TBD by Fraser Panel
JDF Coho:	Trty (GN): wb 9/23- wb 9/30
JDF Chum:	Trty (GN): wb 10/07 - wb 11/04
SJI Coho:	Ntry RN - Open 7 d/wk from end of Fraser Panel control thru chum (wb 11/04), MSF co&ch thru 9/30 (ch 300 cap), cm NR though 9/30, ch N
SJI Sockeye/Pink:	Ntrty (GN/PS/RN) Schedule TBD by Fraser Panel, modeled as weeks 30-34, 1-2-2-2-1, PS co, cm & ch NR, RN MSF co&ch (ch 300 cap). Trty (GN/PS) Schedule TBD by Fraser Panel, modeled as: wk 30 (wb 7/22) - wk 35 (wb 8/26).
SJI Chum:	Ntry (GN/PS/RN): Opens wk 41 (wb 10/7); 10/11, 10/14, 10/15, 10/17, with co-mgr mtg 10/16 to determine remaining schedule. RN: 7 days/\ Trty (GN/PS): starting 10/10 through 11/14; fishing 10/10, 10/12, 10/13, 10/16 with conf call on 10/16 to determine remaining schedule.

Table 2. Exploitation rates and natural escapements of selected Puget Sound chinook stocks (MSF c

	Model Prediction				Management Criteria	
Stock	Total ER	SUS ER	SUS Preterm. ER	Natural Escapement	RER or CERC	Low Abundance Threshold (nat. esc.)
Spring/Early:						
Nooksack (n)	35.1%	7.0%	3.0%	309	7%/9% SUS a)	2000
				236	North Fork	1000
				73	South Fork	1000
Skagit (n)	33.1%	18.8%	8.3%	942	38% Total; 18% SUS	576
				468	Upper Sauk	130
				276	Upper Cascade	170
				197	Suiattle	170
White	19.2%	18.2%	3.6%	2141	20% Total; 15% SUS	200
Dungeness	63.9%	3.4%	3.3%	656	10% SUS; 6%SUS	500
Summer/Fall:						
Skagit	40.4%	14.3%	4.9%	8398	50% Total: 17%/15% SUS (odc	4800
				5796	Upper Skagit	2200
				288	Sauk	400
				1168	Lower Skagit	900
Stillaguamish (n	23.4%	13.5%	8.2%	338	25% Total; 15% SUS	700
				296	North Fork Summers	500
				43	South Fork Falls	200
Snohomish (n)	16.4%	9.1%	7.5%	2301	21% Total; 15% SUS	2800
				1453	Skykomish	1745
				848	Snoqualmie	521
Lake Wa. (Cedar	34.1%	17.8%	9.6%	994.4	20% SUS; 10%Preterm SUS	200
Green	31.0%	14.6%	9.6%	1911	15% Preterm SUS; 12% Preter	1800
Puyallup	48.5%	32.2%	9.6%	2206	50% Total; 12% Preterm SUS	500
Nisqually	55.3%	41.2%	20.7%	1072	56% Total	
Western Strait-H	21.6%	2.8%	2.8%	2118	10% SUS; 6% SUS	500
Elwha	63.2%	3.4%	3.3%	1887	10% SUS; 6% SUS	1000
Mid-Hood Canal	25.9%	12.2%	12.0%	196	15% Preterm SUS; 12% Preter	400
Skokomish	47.9%	34.3%	12.6%	1889	50% Total, 12% Preterm SUS	800 nat/1300 tot

a: Expected SUS rate will not exceed 7% in 4 out of 5 years

SRFI = .51 (0.70 ceiling)
Lower Col Nat Tule ER = 0.409 (0.41 ceiling)

FRAM Version: 2.09
FRAM Description: 2012 Final PFMC
FRAM Run Number 1512

Chin1512.xls 5/1/2012 2:30 PM

5/1/12

Management Plan for the 2012 Pilot Mark-Selective Chinook Sport Fishery
Ocean Management Areas 1 - 4
April 2012

The Washington Coastal Treaty Tribes (Quinault Indian Nation, Hoh Tribe, Quileute Tribe and Makah Tribe; hereinafter, the "Tribes") and the Washington Department of Fish and Wildlife (WDFW) have reached agreement to implement a pilot mark-selective sport fishery in the Pacific Ocean Areas 1 - 4, as proposed by WDFW for the 2011 season. The fishery will be implemented consistent with management objectives defined by the Co-managers (hereinafter, this term means the aforementioned tribes and WDFW) and established principles concerning the allocation of harvestable salmon and the exercise of treaty rights (U.S. v. Washington, 384 F.Supp.312 (1974) and Hoh v. Baldrige, 522 F.Supp.683 (1981)). The Co-managers will seek to minimize or eliminate any unintended effects of this fishery on individual treaty fisheries, including dislocation and/or disruption. Therefore, treaty fisheries will not be modified in order to accommodate this mark-selective fishery.

This Agreement is effective when signed by all parties hereto and will remain in effect until March 31, 2013. This Agreement does not establish a precedent for future agreement between the Co-managers. Nothing in this Agreement shall be construed to alter, amend, repeal, interpret or otherwise modify tribal sovereignty, any treaty right, or other rights of the Tribes, or preempt, modify or limit the exercise of any such right.

For 2012, the parties to this Agreement further agree that:

- Mark-selective fishing for chinook salmon in Areas 1 – 4 will be limited to the period from June 9 to June 30;

- WDFW will estimate the total number of marked/unmarked and legal/sublegal-size chinook encountered and landed by conducting a monitoring and sampling program (Attachment A , made a part hereof for all purposes), and will regulate the Areas 1-4 mark-selective fishery to ensure that the total number of legal-sized marked and unmarked chinook landed does not exceed the pre-season estimate of 8,000 landed catch (FRAM 1512) ;

- Consistent with federal procedures for in-season management of Pacific Fishery Management Council fisheries, the quota for the nonselective sport fishery for chinook in Area 1-4 will be adjusted by the difference between actual and pre-season estimates of landed catches plus mortalities estimated from released encounters of the mark-selective chinook fishery, to ensure the overall sport catch allocation and impact levels do not exceed pre-season estimates identified in FRAM 1512 for coastal chinook stocks of concern.

The Pilot Fishery Intent

This pilot fishery is being conducted as a mark-selective fishery by WDFW to provide season stability and increased harvest opportunity for hatchery chinook, relative to opportunity

provided by non-selective fishery alternatives. In addition, the 2012 monitoring and sampling program for the Areas 1-4 mark-selective fishery is designed to demonstrate the capability to provide data necessary for estimation of impacts on stocks affected by the fishery.

Goals and Objectives

The Co-managers have agreed to this sampling and monitoring program with the intention that data will be collected to enable stock specific estimates of fishery impacts for chinook mark selective fisheries. This sampling and monitoring program defines coded-wire tag (CWT), genetic (DNA) and other biological sampling levels and objectives for the 2012 fisheries.

Data Needs for Evaluating the Fishery

WDFW will carry out the monitoring and sampling program described in Attachment A, employing on the water as well as shore-based surveys and sampling techniques, with the intention of collecting data that will form the basis of post-season analyses and evaluation of performance. The ocean sampling program will sample both the non-selective and mark selective portions of the ocean sport fishery utilizing methods that will enable comparison of the estimates for these fisheries.These monitoring and sampling programs are designed to provide data to estimate, with acceptable levels of accuracy and precision, the following parameters:

- the mark rate in the fishery - marked and unmarked encounters will be estimated for legal and sublegal chinook;
- the number of fish retained - marked and unmarked fish;
- the number of unmarked fish released – legal and sublegal;
- the number of marked fish released – legal and sublegal;
- the number of release mortalities - mark/unmarked and legal/sublegal size category;
- marked and unmarked mortalities of double-index tagged (DIT) and other CWT stocks.

Post-Season Report

WDFW will complete a draft post-season report with preliminary results of monitoring and sampling programs for the Areas 1-4 mark-selective fishery by February 15, 2013. WDFW and the Tribes will jointly review and finalize the draft post-season report by March 15, 2013. The final report will include recommendations for improving the effectiveness of chinook mark-selective fishery monitoring and sampling programs for achieving the intended objectives.

The final post-season report will include the estimates described above together with the supporting information collected from the monitoring and sampling program. The report will include estimates of marked and unmarked mortalities of double index-tagged (DIT) and other CWT stocks as described in the section below. The post-season report will include a statistical comparison of independent on-water and shore-based estimates by management area of the mark rate, the number of unmarked and marked fish released, and the number of legal and sub-legal size fish encountered. After the distribution of the final post-season report, WDFW and the Tribes, including NOAA representatives if available, will meet to discuss the performance of the mark-selective fishery and the sampling program.

A post-season WDFW Enforcement report of monitoring activities related to compliance with the Areas 1-4 mark-selective fisheries will be provided to the Tribes prior to the first North of Falcon meeting in March, 2013.

Data Needs for Post-Season Estimation of Stock-Specific Unmarked Fish Mortalities

Methods for estimating unmarked mortalities of double-index tagged CWT stocks within Area 1-4 mark-selective chinook fishery will be determined jointly by the parties to this Agreement, considering recommendations of the Selective Fisheries Evaluation Committee of the Pacific Salmon Commission. WDFW will be responsible for making available the necessary fishery information and data that allows these estimates to be generated.

In the postseason report (see previous section), WDFW will provide estimates of unmarked mortalities, by DIT group (by stock and age).

Further Considerations

The Co-managers agree that the enhanced Volunteer Trip Report (VTR) sampling approach is acceptable in management Areas 3 and 4, given the low intensity of the mark-selective fishery for chinook in 2012. However, WDFW will conduct on-water sampling using charter boat ride-alongs in both areas during the 2012 mark-selective fishery if opportunities to apply this sampling approach are available.

Attachment A

2012 OCEAN SAMPLING PROGRAM OPERATING PLAN
As modified for the Areas 1-4 Chinook Mark Selective Fishery

The Washington Department of Fish and Wildlife's Ocean Sampling Program (OSP) documents ocean fishery impacts on the salmon and marine fish resources. The program is responsible for monitoring the non-treaty commercial salmon troll fisheries and all sport fisheries in the ocean.

The OSP has historically had three main functions: to estimate catch and effort in quota fisheries and recommend closures when quotas are projected to be met, to estimate catch and effort in non-quota sport fisheries, and to collect biodata such as tags, scales, and length frequency samples from the ocean fisheries. The current structure of the dockside sampling program has consistently produced estimates of catch and effort with coefficients of variation (CVs) under 5 percent on commonly observed species. In 2012, the OSP intends to continue dockside sampling at the same rate as in the past several years, but will also employ the following sampling strategies:

1. **Voluntary angler trip reports:** Sport anglers, including WDFW staff, will be approached and requested to complete a trip report while fishing in mark selective fisheries. Sport fishing volunteers will record the date, area fished, number of anglers aboard the vessel, and for each hookup: species hooked, result of hookup (fish kept, released, or dropped off), mark status, and size (legal vs. sublegal). This method will be employed in all ports.
2. **Charter boat ride-alongs:** WDFW observers will ride along aboard charter boats, collecting the following data for each encounter on the boat: date, area fished, species hooked, result of hookup (fish kept, released, or dropped off), mark status, and size (legal vs. sublegal). Any seabirds hooked or marine mammals encountered will also be documented. This method will be employed in Ilwaco and Westport and possibly in La Push and Neah Bay during the mark selective sport fisheries if the opportunity to apply this method exists.
3. **Non-selective fisheries:** Ratios of marked to unmarked coho and chinook from non-selective fisheries could be applied to concurrent selective fisheries, when appropriate.

PROGRAM GOALS:

The goals of the Ocean Sampling Program for the Chinook mark-selective fishery are:

1) To provide in-season estimates of total landed catch by species used to keep the fishery within the assigned catch quota.
2) To estimate total catch by species, mark/unmarked and legal/sublegal status.
3) To estimate stock contribution of Chinook by fishery, area, and time period.
4) To estimate age distribution of chinook.
5) To estimate encounters for coho and Chinook by mark/unmarked and legal/sublegal status.
6) To estimate the true drop-off rate for comparison to the assumed rate.

7) To estimate a recall error rate for the release of sublegal and unmarked salmon by comparing on-water and VTR data to dockside reports for the sport fishery.

For Chinook salmon, encountered and retained fish will be estimated for marked and legal-sized, marked and sub-legal-sized, unmarked and legal-sized, and unmarked and sub-legal sized categories. Note that encounters here are the number of fish brought to the boat which were either retained or released by the angler. The drop off rate is the ratio of the number of encountered fish that escape to the number of fish that are landed.

The specific objectives of the OSP monitoring program will be met through the following data collection and methods are as follows:

- Objectives 1 and 2 will be achieved through dockside sampling. Samplers will collect catch and effort data sufficient to generate in-season and post-season estimates of total catch by species, marked/unmarked and legal/sublegal size categories and effort for all sport fisheries with CVs of 5% or less on commonly observed species. In-season catch estimates will be produced for all quota fisheries on a weekly (or more frequent) basis; post-season final catch estimates will be produced for these fisheries as well as all non-quota sport fisheries. Time strata will be statistical week periods for all salmon fisheries, statistical month periods for non-quota fisheries.
- Objective 3 will be achieved through collection of CWTs and DNA samples in the dockside sampling program. Dockside samplers will examine, using electronic detection devices, a minimum of 20 percent of the landed catch from the Areas 1-4 chinook mark-selective sport fisheries for the presence of CWTs and collect any CWTs encountered. Samplers will collect genetic tissue samples from chinook with accompanying scale samples to achieve 200 samples per stratum with one stratum defined as a statistical month per fishery, area, and gear as possible. Genetic tissue would also be sampled from fish encountered in auxiliary sampling programs (see below).
- Objective 4 will be achieved through dockside collection of scales of Chinook salmon with a minimum of 110 scale samples per stratum, with one stratum defined as a period of one statistical month per fishery, area, and gear.
- Objective 5 will be achieved through one or more different auxiliary sampling programs;
    - On-board observers will observe and record the number encountered by mark/unmarked and legal/sublegal size category for each species.
    - On-board observers would observe and record the number retained and released by mark/unmarked and legal/sublegal size category for each species
    - Voluntary trip reports would provide the number retained and number released by marked/unmarked and legal/sublegal size category
    - Dockside samplers would provide observe the number landed by mark/unmarked and legal/sublegal size category and through fisher interviews would record the number released by species, legal/sublegal size (Chinook only) and marked/unmarked status if the fisher could recall these items.
- Objective 6 will be achieved through one of the auxiliary sampling programs. Onboard observers or anglers with voluntary trip reports would record the number of total fish on the hook that escape or drop off.

- Objective 7 is a product of the post-season statistical comparison of auxiliary method results.

Specifics of the dockside and on-water components of the program are described below.

DOCKSIDE SAMPLING

SAMPLING OBJECTIVES:

The specific objectives of the OSP dockside monitoring are as follows:

1) Collect catch and effect data sufficient to generate in-season and post-season estimates of total catch, release fish, and effort for all sport fisheries with CVs of 5% or less on commonly observed species. In-season catch estimates will be produced for all quota fisheries on a weekly (or more frequently) basis: post-season final catch estimates will be statistical week periods for all salmon fisheries, statistical month periods for non-quota fisheries.
2) Examine, using electronic detection devices, a minimum of 20 percent of the landed catch of chinook from the sport fisheries for the presence of CWTs and collect any CWTs encountered.
3) Collect scales from a minimum of 5% of landed chinook per stratum, with one stratum defined as a period of one month and area.
4) From the recreational fishery, collect genetic tissue samples from a total of 200 chinook per stratum with accompanying scale samples.

SAMPLING UNIT

The standard unit of sample is one boat trip.

ASSUMPTIONS

1) All boats exiting or entering the port are included in the exit/entrance count.
2) Catch and effort from sampled boats is representative of the entire port.
3) Anglers answer questions accurately and do not conceal fish.
4) Anglers recall mark/unmarked, legal/sublegal size and species of released fish accurately.

DATA TO BE COLLECTED

The following data will be collected by the OSP:

1) The dockside sampling scheme is designed to sample charter boats, and private boats for CWTs at an overall rate of no less than 20 percent. Weekend and weekday days are stratified. Data collected include number of anglers, landed catch by species, released catch by species (sport fisheries only), mark status of both landed and released salmon, and CWT status for all salmon (using electronic detection devices).
2) Scales will be collected minimum of 110 scale samples per stratum.

3) Tissue samples for genetic stock identification with accompanying scales will be collected from chinook at 200 samples per stratum (month/area).

METHODS

Dockside samplers will be placed in the four major landing ports: Neah Bay, La Push, Westport, and Ilwaco (including the port of Chinook and the Cape Disappointment launching ramp). Staff levels for the chinook mark-selective fishery will be 6 samplers in Neah Bay, 2 samplers in La Push, 6 samplers in Westport, and 5 samplers in Ilwaco collecting dockside data; staff levels will be increased in Neah Bay and Ilwaco for the higher-effort all-species fishery. Each port will be sampled a minimum of 4 to 5 days per week, with weekend and weekday days stratified. On each sample day, a total sport boat count will be obtained either by counting boats exiting the port or entering the port. A minimum of 20% of the boats returning to the port within each boat type (charter and private) will be included in the sample, which has historically provided weekly salmon catch estimates with CVs no higher than 5%. The data described above will be collected for each boat sampled.

ANALYSIS

The 1991 Washington Department of Fisheries Progress Report number 289, by Lai et. al., details the methodologies used to estimate ocean catch and effort statistics from the data collected dockside by the OSP.

Total Chinook encounters in the Area 1-4 chinook mark-selective fishery will be estimated using the bias-corrected approach developed by Conrad and McHugh (2008). Briefly, with the Conrad and McHugh (2008) method, chinook encounters are estimated by dividing the estimate of legal-marked chinook harvest by the estimated proportion of the fishable chinook population that is of legal size and marked –this constitutes our former "Method 2" approach (WDFW 2008). Given that the former "Method 2" approach yields negatively biased estimates if anglers release any of the legal-marked chinook they encounter, Conrad and McHugh estimated a "correction" factor to account for this phenomenon and incorporated it into their estimator. Applying Conrad and McHugh's (2008) approach, total chinook encounters is estimated by dividing the bias corrected estimate of legal-size, marked chinook encountered (landed & released) by the estimated proportion (from VTR or on-board observation) of the fishable chinook population that is of legal size and marked.

The chinook tissue samples collected for genetic stock identification will be archived for future analysis.

ON-WATER MONITORING AND VTR PROGAM

SAMPLING OBJECTIVES:

The specific objectives of the OSP on-water monitoring and VTR program are as follows:

1. Conduct ride–along sampling on charter vessels in Areas 1 & 2 four days per week during the chinook mark-selective fishery to collect information on chinook encounters by mark status and size class, drop-offs, and encounters of other salmon and non-salmon species. Charter boat ride-along sampling will also occur in Areas 3 and 4 if opportunity exists. The goal is to collect 100 total chinook encounters per stratum. Stratum will initially be defined as one statistical month in one area, but may be modified if fishing patterns warrant.
2. Distribute and collect VTRs in all coastal ports throughout the chinook and coho mark selective fisheries with the goal of collecting 100 total chinook encounters per stratum. Stratum will initially be defined as one statistical month in one area, but may be modified if fishing patterns warrant.
3. Provide post-season statistical comparison of data observed through on-water observation and VTRs with parameters used preseason in the Chinook FRAM models.

SAMPLING UNITS AND SAMPLE SIZES

For on-water chinook mark-selective fishery monitoring, the standard unit of sample is one coho or chinook encounter to the boat. A total of 100 total encounters of each species are planned per stratum for on-water monitoring, with the goal being to define a stratum as a period of one statistical month per catch record card area. This level of sampling should provide estimates within +/- 10% with a 95% confidence interval.

ASSUMPTIONS

1) The on-water sample of observed salmon encounters is representative of the fleet.
2) On-water samplers do not record the outcome of a hookup if it is not observed.
3) The presence of on-water observers does not change angler behavior.
4) On-water observers are able to correctly categorize each observed hookup.
5) Volunteers completing trip reports fish in a manner representative of the fishing fleet.
6) Volunteers are able to correctly identify salmon and mark and size status.

METHODS

One on-board observer each in Area 2 (Westport), and Area 1 (Ilwaco) will collect recreational mark selective fishery information including legal and sublegal Chinook encounter rates by mark status, drop-off encounters, and bycatch species information; ride-along sampling will also occur in Areas 3 (La Push) and 4 (Neah Bay) if opportunity exists.

Voluntary trip reports will be issued to and collected from as many recreational private boat anglers as possible in all ocean ports and to charter boat operators in Area 3 (La Push). Three staff coastwide will be dedicated specifically to VTR collection. Their time will be split between Ilwaco, Westport, La Push, and Neah Bay depending on angler effort and based on evaluation of the need to maximize sample collection.

Data collected from concurrent non-selective treaty and non-treaty ocean troll fisheries may also be utilized to supplement data needs for evaluating the fishery as appropriate.

ANALYSIS

Mark selective fishery data will be analyzed post-season and compared to the PFMC chinook Fishery Regulation Assessment Model assumptions used pre-season. Specifically, the combination of dockside data, observer data, and voluntary trip reports will be used to estimate the number of encounters, both retained and released, by species, mark and size categories. Bias corrections will be made using the methods of Conrad and McHugh (2008). In addition, the assumed drop off rate (5% of landed catch) will be evaluated and assumed rate of angler error in retaining unmarked chinook will be compared with estimates from dockside methods.

REFERENCES

Conrad, R., and P. McHugh. 2008. Assessment of Two Methods for Estimating Total Chinook Salmon Encounters in Puget Sound/Strait of Juan de Fuca Mark-Selective Chinook Fisheries. Northwest Fishery Resource Bulletin Manuscript Series No. 2. http://www.nwifc.org/publications/northwest-fishery-resource-bulletin/

Lai Han-Lin, Rick Moore, Jack Tagart. 1991. Methodologies for Estimating Catch and Effort Statistics of Ocean Sport Fishery Off the Washington Coast with Users' Guide for the Program 'OSFP.FOR'. Washington Department of Fisheries Progress Report Number 289, 35 pages.

Washington Department of Fish and Wildlife (WDFW). 2008. A Multi-year Assessment of the Marine Areas 5 and 6 Selective Chinook Fishery: 2005-2007. Final Report Draft: March 14, 2008. Washington Department of Fish and Wildlife. Olympia, Washington. 177 pp. http://wdfw.wa.gov/fish/salmon/suggested_reading.htm.

5/1/12

April 11, 2012

Summer Mark-Selective Chinook Sport Fishery
Strait of Juan de Fuca, Areas 5 & 6
2012

The Northwest Treaty Tribes and the Washington Department of Fish and Wildlife (WDFW) have reached agreement to continue mark-selective sport fishing in the Strait of Juan de Fuca (Areas 5&6) for the 2012 season. The fishery will be implemented consistent with management objectives defined by the co-managers' Puget Sound Chinook Harvest Management Plan and established principles concerning the allocation of harvestable salmon and the exercise of treaty rights. The co-managers will seek to minimize or eliminate any unintended effects of this fishery on individual treaty fisheries, including dislocation and/or disruption. Therefore, treaty fisheries will not be modified in order to accommodate this mark-selective fishery.

For 2012, while the Area 5&6 Mark-Selective Chinook Fishery is in progress:

- the mark-selective fishing will be limited to the period from July 1 to August 15;
- fishing in Areas 5 and 6 will be restricted as follows:
    1. The portion of Area 6, east and south of the Ediz Hook No.2 Buoy, including Port Angeles Harbor, shall be closed to the taking of Chinook salmon.
    2. Freshwater Bay, inshore of a line from Angeles Pt. to Observatory Pt. shall be closed to fishing through August 31.
    3. Hoko Bay, inshore of a line from Kydaka Pt. due west to Shipwreck Pt. (Area 4B) shall be closed to fishing; and,
- fishing in Area 4B will be restricted as follows:
    1. The eastern portion of Area 4B from the mouth of the Sekiu R. west to Sail Rock shall be closed to the taking of Chinook salmon.

<u>The Fishery Intent</u>
This fishery has been implemented as a mark-selective fishery to provide season stability and increased harvest opportunity for marked Chinook while reducing fishing mortality on unmarked Chinook. Prior to the 2013 season, WDFW and the tribes will jointly review and analyze results of the previous year's sampling and monitoring program to evaluate the effectiveness of this fishery program at achieving the intended objectives.

<u>Data Needs for Evaluating the Fishery</u>
Monitoring, sampling and reporting programs are being implemented by WDFW for the purpose of providing data necessary to estimate the impact of these mark-selective fisheries on un-marked Chinook and to support the evaluation of future mark-selective fisheries.

WDFW will carry out the monitoring and sampling program described in Attachment A, employing shore-based surveys and sampling techniques, as well as an intensive voluntary trip report program, with the intention of collecting data that will form the basis of post-season analyses and evaluation of performance. This monitoring and sampling program will be a part of the co-managers' preseason fishing plan document.

Preliminary catch and effort estimates for the Area 5 mark-selective Chinook fishery will be produced and shared between the co-managers by August 31, 2012 (per Attachment A). To facilitate co-manager discussions, WDFW will provide the tribes with weekly in-season catch and effort estimates with the initial estimates available the week ending Friday, July 20.

These monitoring and sampling programs are designed to provide data to estimate, with acceptable levels of accuracy and precision, the following parameters:

- the mark rate in the fishery - marked and unmarked encounters will be estimated by both shore-based programs and the intensive voluntary trip report program;
- the number of fish retained or landed - marked and unmarked fish will be estimated using a shore-based program, including CWT and scale-age sampling;
- the number of unmarked fish released - estimated by shore-based and intensive voluntary trip report programs;
- the number of unmarked fish retained - estimated by a shore-based program and compared to enforcement program estimates;
- the number of marked fish released - estimated by a shore-based program in conjunction with mark rate encounter estimates obtained from voluntary trip reports;
- the number of the chinook encounters that are of sub-legal size - estimated by shore based and voluntary trip report programs;
- the stock composition of the marked and unmarked mortalities - estimated by CWT data.

Post-Season Report

WDFW will provide a preliminary post-season report by February 1, 2013 to be considered for the 2013-14 fisheries. The post-season report will include the estimates described above together with the supporting information collected from monitoring and sampling program. In addition, the report will include estimates of marked and unmarked mortalities of double index-tagged (DIT) and other CWT stocks as described in the section below. The post-season report will include an evaluation of possible bias in parameters with independent shore-based and voluntary trip report-based estimates.

A post-season WDFW Enforcement Report of monitoring activities related to compliance with the Area 5&6 mark-selective fishery will be provided in a timely manner to be considered for planning the 2013 fisheries.

Data Needs for Post-Season Estimation of Stock-Specific Unmarked Fish Mortalities

The co-managers agree to implement this fishery with the understanding that the capability to estimate stock-specific unmarked fish mortalities is preserved. WDFW will be responsible for reporting the necessary fishery information and data to the PSMFC that allows these estimates to be generated.

In the postseason report (see previous section), WDFW will provide estimates of unmarked mortalities, by DIT group (by stock and age), in each year's Area 5&6 mark-selective fishery.

Information or assumptions needed for providing these estimates include (1) estimated recoveries of marked DIT fish from the selective fisheries; (2) the assumption that the DIT release numbers provide a reasonable estimate of the unmarked to marked fish ratio; and, (3) an assumption for the mortality rate for chinook caught and released in the fishery (sfm).

Estimates of total fishery related mortalities, including the total exploitation rate or the Southern US exploitation rate, that represents the management objective for Puget Sound chinook management units under the co-managers' Harvest Management Plan, will be made by combining the mortality estimate for the Area 5&6 mark-selective fishery with mortality estimates in other selective and non-selective fisheries. To ensure that all information necessary to make these estimates is collected, plans for sampling and monitoring of all selective fisheries will be included as a component of the co-managers' annual pre-season agreement.

Attachment A

MONITORING THE SELECTIVE CHINOOK AND COHO FISHERIES IN AREAS 5 AND 6, JULY 1 THROUGH SEPTEMBER 30 2012

Overview

The WDFW Puget Sound Sampling Program will monitor the mark-selective Chinook and coho fisheries in Areas 5 and 6 for the entire 46-day season of the mark-selective Chinook fishery (July 1 through August 15, 2012). In addition, following the Chinook selective fishery period, we will continue to sample the coho selective and non-selective fisheries in Areas 5 and 6 through September 30, 2012.

The Areas 5 and 6 monitoring plans (depicted in **Figure 5/6-1** and **Figure 5/6-2**, respectively) will enable us to estimate the critical data parameters necessary for evaluating pilot mark-selective fisheries as previously identified by the co-managers (e.g., WDFW and NWIFC 2009), including: *i)* the mark rate of the targeted Chinook population (based on data from our enhanced voluntary trip report [VTR] program and dockside sampling data), *ii)* fishery-total angling effort and Chinook salmon encounters (harvest + releases) and mortalities (by size/mark-status class) (e.g., from a combination of VTR encounter rate data, creel survey estimates in Area 5, and Catch Record Card [CRC] estimates in Area 6), *iii)* the coded-wire tag (CWT)-based stock composition of marked and unmarked Chinook mortalities (from dockside sampling data), and *iv)* fishery-total mortality of marked and unmarked double index tag (DIT) CWT stocks (once post-season CWT sample rates are estimated). In both areas, we will acquire and analyze relevant data characterizing other aspects of the pilot fishery, including descriptors of fishing success (catch [landed Chinook] per unit effort, CPUE), the length and age composition of encountered and/or landed Chinook, and the overall intensity of our sampling efforts.

Area 5 Overview

A modified (i.e., scaled back relative to the full Murthy design employed during the 2003-2007 seasons) version of the Murthy estimator method (Murthy 1957, Cochran 1977), will be used to produce total-Area estimates of catch and effort in Area 5 with accompanying estimates of variance (**Figure 5/6-1**). Our modified-Murthy approach, as detailed below, will incorporate data from intensive dockside sampling days in the summer 2012 season, combined with site size measures obtained from on-the-water surveys conducted last season (for corresponding time intervals) to produce total-Area catch and effort estimates. For the 2012 creel survey design two access sites will be sampled on each sample day; this approach will allow for all components of variance (e.g., including site-to-site variance) to be estimated. Catch and effort estimates will be available at the end of August, immediately following the 1.5 month selective Chinook fishery, unless the co-managers deem it necessary to provide timelier in-season estimates as the fishery progresses.

Area 6 Overview

We will employ a baseline-level sampling program (**Figure 5/6-2**), which will include sampling for the estimation of: *i)* mark rates (based on VTRs), *ii)* indices of Chinook encounters and angling effort (i.e., sample frame-observations, not fishery totals), and *iii)* the CWT composition of landed catch. Baseline sampling is opportunistic in nature, with overall sampling effort

allocated across space and time in a manner that maximizes the number of angler interviews obtained per sampling event. Baseline sampling data are not used to produce in-season creel survey estimates, in contrast to the Murthy estimator approach applied in Area 6 during the 2003 through 2007 seasons. Rather, in-sample catch and effort data (e.g., catch per unit effort [CPUE] and species composition data) are used in conjunction with the Catch Record Card (CRC) system to compute post-season (available approximately 1 to 1.5 years from the close of the fishery) catch estimates by species and area.

Enhanced VTR Program

We will collect mark rate and encounter rate information in Areas 5 and 6 using dockside sampling and voluntary trip reports (**Figures 5/6-1 and 5/6-2**), as detailed below. From the Areas 5 and 6 VTR data, we will calculate the proportions of Chinook that were legal-size and marked (LM), legal-size and unmarked (LU), sublegal-size and marked (SM), and sublegal-size and unmarked (SU) in each Area.

An "enhanced" Voluntary Trip Report (VTR) program will be implemented, in which an additional WDFW technician will be hired to work exclusively on distributing and collecting VTRs from the angling public. This enhanced VTR program has been very successful in recent seasons, substantially increasing the VTR sample size (e.g., WDFW 2009a and WDFW 2010) relative to the VTR sample size from the 2003 through 2007 seasons in Areas 5 and 6 (e.g., WDFW 2008). In addition, the proportion of legal size and marked Chinook encounters obtained from VTRs will be compared with dockside angler interview-based data on Chinook legal-size marked encounters (retained and released).

Total Encounter Estimates

To estimate total Chinook encounters in Areas 5 and 6, we will apply Conrad and McHugh's (2008) bias-corrected method, which incorporates an estimate of the proportion of legal-marked Chinook encountered in the fishery (we will obtain this estimate via VTR results in Areas 5 and 6 in 2012) along with the estimate of retained Chinook catch (e.g., from post-season creel survey estimates in Area 5 and Catch Record Card estimates in Area 6). The Conrad and McHugh approach applies a "correction factor" to account for bias in dockside angler interview reported Chinook releases (see further explanation below).

Dockside Sampling

Dockside sampling designs are described separately for Areas 5 and 6 below. In each Area, dockside samplers will interview anglers exiting the fishery at selected access sites. Samplers will collect data on: 1) angler effort (i.e., boats and angler counts, trip duration, etc.); 2) encounter (fish retained and/or released) composition, by species (all fish species) and mark status (unmarked vs. adipose-clipped; Chinook and coho salmon only); and 3) landed Chinook size (fork and total lengths) and age composition (i.e., scale samples are collected and subsequently read).

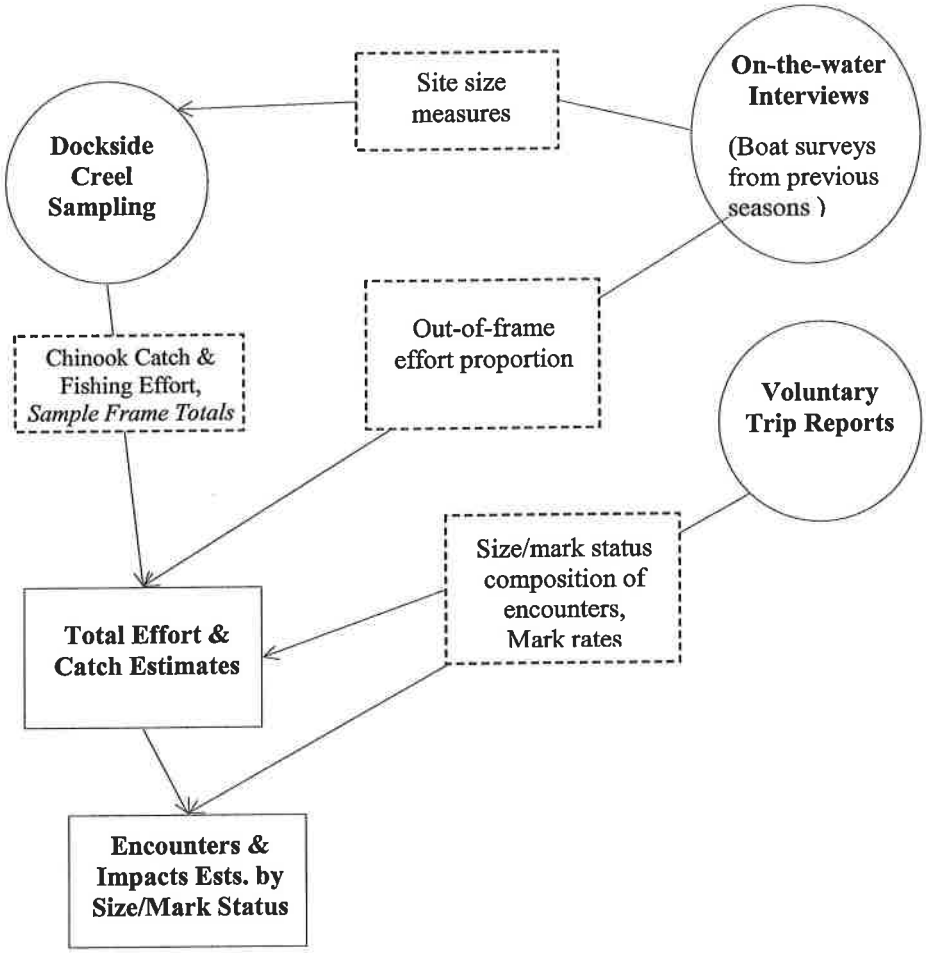

Figure 5/6-1. Conceptual diagram of the monitoring plan proposed for the **Area 5 summer** mark-selective Chinook season. Circles represent discrete sampling activities, dashed boxes represent parameters that are estimated using data from a given activity, and solid boxes depict key quantities estimated from the comprehensive plan. 'Encounters' includes both harvested and released Chinook salmon.

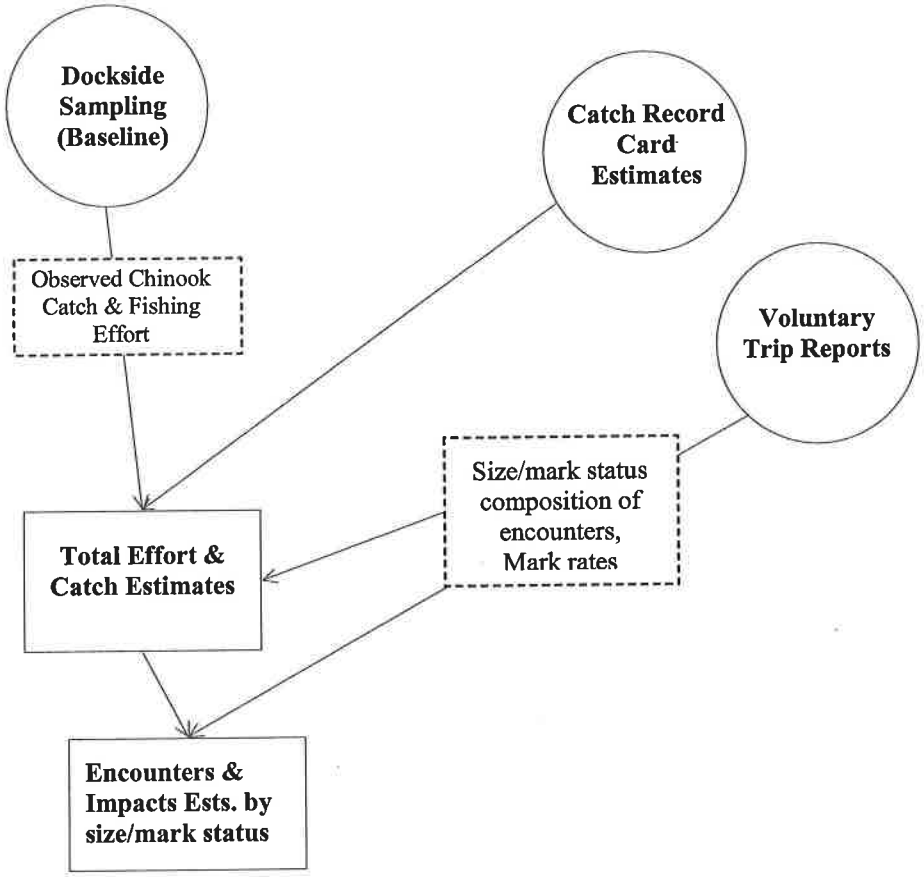

Figure 5/6-2. Conceptual diagram of the monitoring plan proposed for the **Area 6 summer** mark-selective Chinook season. Circles represent discrete sampling activities, dashed boxes represent parameters that are estimated using data from a given activity, and solid boxes depict key quantities estimated from the comprehensive plan. 'Encounters' includes both harvested and released Chinook salmon.

Area 5

Dockside Sample Design

Sampling strata will be divided into 'weekday' (Monday through Thursday) and 'weekend' (Friday, Saturday, and Sunday) days. For each two-week period of the fishery, we will randomly select n=2 sample days from the N=8 possible weekday stratum days (distributed so there is at least one weekday sampled in each of the two weeks). For the weekend stratum (Friday through Sunday), and we will select n=2 sample days out of the N=3 possible weekend days each week. In total, we will sample 12 site-days every two weeks using the reduced Murthy creel survey design.Samplers will be stationed at two ramps on each of the selected sampling days. Sites in our sample frame will be selected for sampling via our weighted-random site selection process (e.g., probability proportional to size, using site size measures from the previous 2011 season). Samplers will achieve 100% sampling coverage at the assigned ramps. All anglers and fish exiting the fishery through the sampled site will be counted. Any boats that are missed at the sampled site will be counted and recorded on the sampling forms.

In addition, we will sample multiple ramps in Area 5 on the remaining days in the weekday stratum, using baseline-level sampling to ensure that we achieve the 20% sample rate goal.

On-the-water Surveys

On-the-water surveys were conducted in Area 5 during the previous 2003-2011 seasons, to estimate the percent of effort from sites in our sample frame (versus out-of-frame sites) and the proportion of angler effort at each sampled site. These boat surveys covered the entire area to pick up effort from all launch sites. Boat occupants were asked where they intend to tie up or exit the fishery rather than where they launched. We calculated the weights (or size measures) of Area 5 sites based on the boat survey data. In summer 2012, we intend to use the most recently available boat survey data (from the previous season, for corresponding time strata) to compute the site size measures needed to estimate in-season catch and effort for the entire Area 5. If anything occurs in-season that could potentially shift proportions of effort at access sites (e.g., if access sites in Area 5 open or close), we will conduct boat surveys in Area 5 to update the site size measures.

Harvest and Effort Estimates

The harvest and effort observed at the Murthy-based sampled sites in Area 5 will be expanded to all access sites (based on estimated site size measures) to estimate total harvest for the day. Sample data will be combined and expanded to create stratum estimates of harvest and effort with variances.

To generate weekly catch and effort estimates for the Area 5 summer fishery, the four-day "weekday stratum" estimate for Monday-Thursday of each week (based on n=2 days sampled out of N=8 available weekdays per two-week period) will be added to the "weekend stratum" (Friday-Sunday) estimate for the particular week (based on n=2 days sampled out of N=3 available weekend days per week). The eight-day weekday estimates for each two-week period will be split evenly between individual weeks in the two-week block to enable weekly estimates, with variances computed using the n=2 days sampled out of N=8 available weekdays in the appropriate variance equation.

Assumptions

Harvest and effort estimates are based on the following assumptions:

- Boat surveys from previous seasons (e.g., 2011 site size measures) provide an unbiased estimate of the proportion of anglers accessing fisheries from sites in our sample site frame and sites outside the frame.
- The proportion of total effort accessing the fishery at site A represents the proportion of total catch landed at site A.
- All anglers exiting at a sampled site are interviewed and all anglers accurately report their harvest. If any boats are missed they are counted and catch and effort estimates are expanded appropriately.
- CPUE does not differ significantly between sites in our sample frame and sites outside our sample frame.

Area 6

Dockside Sample Design

For the 2012 Area 6 mark-selective Chinook fishery, we will conduct dockside angler interviews at selected boat ramps via our Baseline sampling program, to obtain observed data on angler effort (boats and angler counts, trip duration, etc.) and composition of salmon encounters (retained and/or released), by species and mark status. Baseline sampling is opportunistic in nature, with overall sampling effort allocated across space and time in a manner that maximizes the number of angler interviews obtained per sampling event. Baseline sampling data are not used to produce in-season creel survey estimates, in contrast to the Murthy estimator approach applied in Area 6 during the 2003 through 2007 seasons. Rather, in-sample catch and effort data (e.g., catch per unit effort [CPUE] and species composition data) are used in conjunction with the Catch Record Card (CRC) system to compute post-season (available approximately 1 to 1.5 years from the close of the fishery) catch estimates by species and area.

Dockside samplers will interview anglers exiting the fishery at several selected access sites in Area 6, approximately five days per week. Samplers will collect data on: 1) angler effort (i.e., boats and angler counts, trip duration, etc.); 2) encounter (fish retained and/or released) composition, by species (all fish species) and mark status (adipose fin-clipped [marked] or unclipped [unmarked]) for Chinook and coho salmon only); and 3) landed Chinook size (fork and total lengths) as well as age composition (i.e., scale samples are collected and subsequently read). Sampling size is set at 120 fish per stratum for estimation of species composition and 100 boats per stratum for the estimation of CPUE.

CWT Sampling

We will sample for coded wire tags (CWT) in the Areas 5 and 6 mark-selective Chinook fisheries as part of our dockside angler interviews. The objective is to provide stock specific estimation (by hatchery and brood year) of population parameters, such as fishery contribution and marine survival, as part of the coast-wide CWT program. The sample rate goal for CWT recovery is 20% in mark-selective Chinook fisheries. During dockside interviews samplers will inspect landed Chinook and coho salmon for the presence of coded-wire tags using wand CWT detectors, and snouts will be collected from all fish containing CWTs. For post-season analyses and reporting, CWT data will be used to estimate stock composition by hatchery and brood year. Total unmarked double index tagged (DIT) mortality estimates will be produced post-season (note: in Area 6, DIT mortality estimates cannot be produced until post-season CRC estimates are available because sample-rate estimates are needed for tag expansions).

Voluntary Trip Reports

Information on adipose mark rates and the percentage of Chinook that are legal size (22 inches [56 cm] and larger total length) versus sublegal size (less than 22 inches total length) will be obtained from Voluntary Trip Reports (VTRs) that are submitted by private-boat anglers during the mark selective Chinook fisheries in Areas 5 and 6 during 2012. We will also contact known salmon charter operators (if any are operating in these Areas) to submit VTR forms.

Anglers will be asked to record on the VTR forms the date, number of anglers, target species, CRC Area, each Chinook or coho hooked, whether the fish was kept or released, species (if they positively identified the fish), total length to the nearest 1/8th inch, and whether the fish was

adipose fin-clipped or not clipped.

An enhanced Voluntary Trip Report (VTR) program will be implemented to increase the VTR sample size relative to the sample size in the 2003-2007 seasons. The enhanced VTR program for the 2012 season will include several key elements.. First, we will assign a dedicated sampler the duty of distributing forms to every possible angling party at the start of their trip throughout the mark-selective Chinook season, to recruit participants on site. Also, the Areas 5 and 6 VTR samplers will distribute our new and improved, user-friendly VTR form that is easier for anglers to complete compared to the old VTR form. The VTR samplers will focus their attention on high-use access sites only and begin their shifts early (typically 0500 hours) in order to intercept as many anglers as possible. Additionally, samplers will provide participants with a brochure describing the intent of VTRs and their significance to fishery monitoring, and answer VTR-related questions. To increase the response rate, participants are given three options for returning completed VTRs to WDFW: hand-delivering them to samplers, placing them in on-site drop boxes, or sending them via U.S. mail (pre-paid); if they are unsuccessful (i.e., no encounters occurred [harvested or released]) on their trip, the VTR samplers will request that participants keep their forms for future trips.

From the Areas 5 and 6 VTR data, we will calculate the proportions of Chinook that were legal-size and marked, legal-size and unmarked, sublegal-size and marked, and sublegal-size and unmarked in each Area. These VTR data will be compared with dockside creel survey data, from which we can also obtain Chinook legal-size marked encounter information (retained and released).

Estimates of Total Encounters

We will estimate total Chinook encounters in the Areas 5 and 6 selective Chinook fisheries using the bias-corrected approach developed by Conrad and McHugh (2008). Briefly, with the Conrad and McHugh (2008) method, Chinook encounters are estimated by dividing the estimate of legal-marked Chinook harvest by the estimated proportion of the fishable Chinook population that is of legal size and marked. Given that our former "Method 2" approach (e.g., WDFW 2008a) yields negatively biased estimates if anglers release any of the legal-marked Chinook they encounter, Conrad and McHugh estimated a "correction" factor to account for this phenomenon and incorporated it into their estimator. Applying Conrad and McHugh's (2008) approach within the designs proposed in **Figure 5/6-1** and **Figure 5/6-2**, we would estimate total Chinook encounters by dividing the estimate of legal-marked Chinook harvest by the estimated proportion of the fishable Chinook population that is of legal size and marked (obtained via VTR's). Estimates of legal-marked Chinook harvest will be obtained via creel surveys in Area 5 and via post-season CRC estimates in Area 6.

Reporting Schedule

Preliminary catch and effort estimates for the Area 5 mark-selective Chinook fishery will be produced and shared between the co-managers by August 31, 2012. A final report will be written and distributed by February 1, 2013.

Sampling Rates and Staffing Levels

WDFW will continue to meet or exceed the 20% sampling rate goal for the selective Chinook fisheries in Areas 5 and 6. **Table 5/6-1** shows the additional staffing levels (compared to baseline levels used for non-selective fisheries) needed to implement the proposed monitoring plan for the selective Chinook fisheries in Areas 5 and 6.

Table 5/6-1: Number of Additional Staff Required for Monitoring the 2012 Summer Selective Chinook Fisheries in Areas 5 and 6.

Month	Area 5 Dockside Samplers	VTR Dockside Position	Area 6 Dockside Samplers
July	4	1	2
Aug	4	1	2
Sept	4	--	--

5/1/12

April 11, 2012

2012-2013 Area 6 Winter Period Mark-Selective Sport Fishery

The Northwest Treaty Tribes and the Washington Department of Fish and Wildlife (WDFW) have reached agreement to implement a Chinook salmon mark-selective fishery in Area 6, during the winter period from December 1, 2012 to April 10, 2013. This fishery will be implemented consistent with management objectives defined by the co-managers' Puget Sound Chinook Harvest Management Plan (April, 2010), the WDFW-Tulalip management plan for hatchery origin fish (2005 Memorandum of Understanding), and established principles concerning the allocation of harvestable salmon and the exercise of treaty rights. The co-managers will seek to minimize or eliminate any unintended effects of this fishery on individual treaty fisheries, including dislocation and/or disruption. Therefore, treaty fisheries will not be modified in order to accommodate this mark-selective fishery.

Fishery Intent

The winter period mark-selective fishery in Area 6 has been implemented to provide recreational fishing opportunity directed at hatchery Chinook salmon. Sampling and monitoring programs implemented with this fishery are intended to provide information necessary to evaluate and plan potential future Chinook mark-selective fisheries. The sampling program will provide a basis for determining if the data needed to estimate critical management and analysis parameters can be collected and if the sample sizes needed to produce these estimates with agreed levels of precision can be realistically obtained. Prior to the 2013-14 season, WDFW and the tribes will jointly review and analyze results of the sampling and monitoring program for these fisheries to evaluate the effectiveness at achieving the intended objectives.

Data Needs for Evaluating the Fishery

Monitoring, sampling and reporting programs are being implemented by WDFW for the purpose of providing data necessary to estimate the impact of these mark-selective fisheries and to support the evaluation of future mark-selective fisheries.

WDFW will carry out the monitoring, sampling and reporting program described for the Area 6 winter Chinook mark-selective fishery in Attachment A. On-water as well as shore-based surveys and sampling techniques will be employed, in addition to an intensive voluntary trip report program, with the intention of collecting data that will form the basis of post-season analyses and evaluation of performance. During the conduct of these fisheries WDFW will maintain sampling rates in areas 5-13 at levels equivalent to or greater than rates achieved in the most recent two-years. This monitoring, sampling and reporting program is part of the WDFW Puget Sound monitoring and sampling operational plan documented with the co-managers' preseason fishing plan.

These monitoring and sampling programs are designed to provide data to estimate the following parameters:

- the mark rate in the fishery - marked and unmarked encounters will be estimated by both on-water and shore-based programs;
- the number of fish retained or landed - marked and unmarked fish will be estimated using a shore-based program, including CWT and scale-age sampling;
- the number of unmarked fish released - estimated by shore-based and on-water programs;
- the number of unmarked fish retained - estimated by a shore-based program;
- the number of marked fish released - estimated by a shore-based program in conjunction with on-water mark rate encounter estimates;
- the number of the Chinook encounters that are of sub legal size - estimated by shore-based and on-water programs;

- the stock composition of the mortalities – estimated by CWT data collected in the shore-based sampling program;
- estimates of marked and unmarked mortalities of double-index tagged and other CWT stocks.

Post-Season Report

A preliminary post-season report will be written and distributed by November 30, 2013, containing a post-season analysis of all data collected in the 2012-13 Area 6 winter selective Chinook fishery.

Data Needs for Post-Season Estimation of Stock-Specific Unmarked Fish Mortalities
The co-managers agree to implement these fisheries with the understanding that the capability to estimate stock-specific unmarked fish mortalities is preserved. Methods for estimating unmarked mortalities of double-index tagged CWT stocks within this mark-selective chinook fishery will be determined jointly by co-managers, considering recommendations of the Selective Fisheries Evaluation Committee of the Pacific Salmon Commission. WDFW will be responsible for reporting the necessary fishery information and data to the Pacific States Marine Fishery Commission that allows these estimates to be generated.

In the postseason report (see previous section), WDFW will provide estimates of unmarked mortalities, by DIT group (by stock and age) and area. Unmarked DIT recoveries will be estimated based on estimated recoveries of marked DIT fish and assuming:

1. DIT release numbers provide a reasonable estimate of the unmarked to marked fish ratio; and,
2. the mortality rate for Chinook caught and released in the fishery (sfm) is known.

The assumption that the DIT release numbers provide a reasonable estimate of the unmarked to marked fish ratio will be evaluated through post-season comparisons of DIT tag groups. A design for these comparisons will be developed jointly by the co-managers following the method used in analyzing coho DIT groups.[1] All information from this fishery necessary for making these comparisons is assumed to be included in the sampling design and will be included in the post-season report.

Estimates of total fishery related mortalities, including the total exploitation rate or the southern US exploitation rate, that represent the co-managers' management objectives for Puget Sound chinook management units, are made by combining mortality estimates in mark-selective fisheries with mortality estimates in non-selective fisheries. To ensure that all information necessary to make these estimates is collected, plans for sampling and monitoring of the winter selective fishery in Area 6, as well as other mark-selective and non-selective fisheries will be included as a component of the co-managers' annual pre-season agreement.

[1] *Analysis of coho salmon double-index tag (DIT) data. 2003*

Attachment A

MONITORING THE WINTER AREA 6 SELECTIVE CHINOOK FISHERY, DECEMBER 1, 2012 THROUGH APRIL 10, 2013

Overview

The WDFW Puget Sound Sampling Program will intensively monitor the proposed mark-selective Chinook fishery in Area 6 during the period from December 1, 2012 through April 10, 2013 , using comprehensive data collection strategies consisting of dockside sampling, aerial surveys, and voluntary trip reports, as detailed below. The proposed sample design is an aerial-access site design that was effective in producing in-season estimates during the previous four seasons in Areas 7 and 9 (e.g., WDFW 2010a and 2010c).

The aerial-based design differs from our usual Murthy estimator method (Murthy 1957; Cochran 1977) primarily in terms of the approach used for assessing fishery-wide effort. The design is a "Modified Murthy" approach that will incorporate aerial survey-based total effort counts, rather than the approach in which on-the-water surveys are conducted to assess proportions of effort accessing the fishery from sampled and non-sampled sites. Due to the large geographic expanse of the marine areas of Puget Sound, and because of expected adverse conditions on the water during winter time, we determined that the usual boat-based approach for assessing proportions of effort (site size measures) would be riskier (to both the success of the study and safety of field personnel) and far more costly than the aerial-based Modified Murthy approach described below.

Sampling Objectives

We will implement the comprehensive monitoring plan depicted in **Figure 6-1** to estimate total *i*) Chinook encounters (*C*; retained and released by mark status) and *ii*) angler effort (*E*) due to pilot Area-6 winter mark-selective Chinook fishery, and to evaluate additional key selective fishery sampling objectives, including: *iii*) quantify fishery-total angling effort and Chinook salmon encounters (harvest + releases) and mortalities (by size/mark-status class) (e.g., from a combination of dockside sampling data and VTRs); *iv*) recover CWTs and assessing the impact of the selective fishery on DIT groups; *v*) estimate the age composition of and test fishery- and landed dockside-sampled Chinook; and *iv*) estimate total fishery impacts (encounters and mortality) and comparing these values to pre-season modeling (FRAM) expectations.

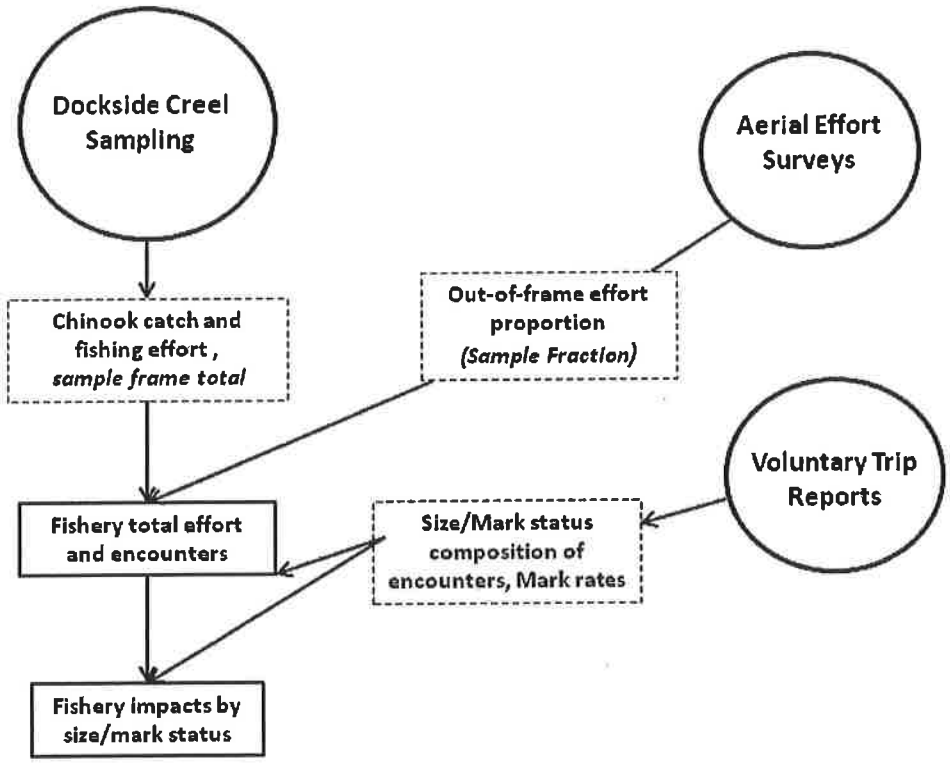

Figure 6-1. Conceptual diagram of the monitoring plan proposed for the **Area 6 winter** mark-selective Chinook season. Circles represent discrete sampling activities, dashed boxes represent parameters that are estimated using data from a given activity, and solid boxes depict key quantities estimated from the comprehensive plan. 'Encounters' includes both harvested and released Chinook salmon.

Design Overview

We will achieve our Area-6 objectives using a complemented aerial–access design (**Figure 6-1** and **6-2**), whereby:

i) Total encounters (C_{ds}, separate estimates for landed and released) and effort (E_{ds}) will be estimated for all anglers at sampled access sites (e.g., sites in our dockside sample frame; see below) using completed-trip interview data collected through a multistage sample design.

ii) A sampling fraction (*f*) for expanding sample-frame estimates of encounters and effort (C_{ds} and E_{ds}) to fishery-wide totals (C_{tot} and E_{tot}) will be estimated using data from paired aerial and dockside effort-sampling events.

Dockside sampling— Completed-trip interview data will be collected using a stratified three-stage cluster sample design. For each two-week temporal stratum throughout the fishery, the three-stage cluster sample design will be implemented as follows,

- Sample days will be selected (randomly) from weekday (Mon-Thurs, n = 2 out of 8 possible weekday days for each two week interval) and weekend (Fri-Sun, n = 2 out of 3 possible weekend days for each week) strata at the first stage.

- At the second stage, all access sites in the sample site frame (n = 4 sites) will be selected for sampling (i.e., this will be a census of the four dockside sample-frame sites; probability proportional to 1 for site selection),
- All anglers accessing the fishery at a particular site (the clusters) will be interviewed at the third stage.

As in other selective fishery surveys, we will acquire information on fishing trip duration (start and end times), the number of anglers and boats fishing, and total salmon encounters (retained and released) by species and mark status, during post-trip dockside interviews. These data, in conjunction with site size measures determined for the sites in the dockside sample frame, will allow us to estimate C_{ds} and E_{ds} for the entire dockside sample frame using the Murthy total estimator (Murthy 1957; Cochran 1977).

The sites included in the Area-6 dockside sample frame will be the four assumed highest-use access sites for Area 6 anglers; e.g., Ediz Hook and John Wayne Marina, plus Cornet Ramp and Port Townsend Ramp that are already included in the Areas 7 and 9 winter dockside sample frame. Size measures will be estimated for each site in our sample frame via complete daily effort counts recorded by samplers stationed at each of the four sampled sites on a subset of sample days (i.e., number of boats and anglers returning to the ramp from dawn to dark). From these dockside effort data, we will determine the proportion of anglers accessing the fishery at each of the four sampled sites relative to the total number of anglers summed across the four sampled sites (size measures will sum to 1 across the four sites in the sample frame). Following an adjustment to scale sample-frame estimates of catch and effort to fishery-total estimates (described below), parameter values will be expanded to stratum totals. Depending on the proportion of effort contained in the sample frame (as determined through sampling early in the fishery), the variability in size measures observed for the sample frame, and the availability of resources, all sample-frame sites for all selected sample days may be sampled during the season (i.e., a census of catch and effort for all sites in our sample frame on scheduled sample days).

Aerial surveys.—In order to obtain fishery-wide parameter values, we will collect the data necessary to expand sample-frame estimates to "never-sampled" (i.e., out of the frame) access sites and thus the total fishery. Thus, on a subset of randomly selected days where dockside sampling is scheduled (n = 5 target per month), we will also conduct an aerial survey to estimate total fishing effort for the entire CRC area (i.e., including effort originating from never-sampled sites and those that are in our dockside frame). While survey days will be randomly chosen, flight times will be scheduled in order to coincide with peak (and relatively stable) periods of angler activity. This flight will provide an instantaneous aerial effort count (i.e., number of boats, b_i) that can then be expanded to a fishery-wide total (E_i^{tot}) based on the activity profile estimated for that particular day; i.e., aerial counts will be expanded based on the proportion of anglers fishing on a given day that were active during the aerial survey, P:

$$(1) \qquad E_i^{tot} = b_i / P_i$$

where,

E_i^{tot} = the total fishing effort on day i;

b_i = the number of boats enumerated in the aerial survey on day i;

P_i = the proportion of anglers that were active during the aerial survey on day i,

and where P_i is estimated number of anglers active in the aerial survey area divided by the total number of anglers interviewed as follows,

$$P_i = \frac{a_i}{A_i},$$

where,

a_i = the number of anglers that were active in the aerial survey area on day i and;

A_i = the total number of anglers surveyed on day *i*.

Although dockside *CPUE* estimates for a particular day could be used in conjunction with this total effort estimate to estimate C_{tot} for that same day (e.g., as was used for the aerial-access design approach implemented in Volstad *et al.* 2006), we will focus aerial surveys only on obtaining an accurate estimate of season-wide sampling fraction, *f*, due to reasons discussed in WDFW 2008b. We will fly on fewer occasions (than the previously-discussed aerial-access method would require) and instead use aerial effort estimates (E_i^{tot}) in conjunction with dockside effort estimates (E_i^{ds}) to estimate a season-wide sampling fraction, *f*, for converting dockside Chinook encounters and effort estimates into fishery-wide totals (C_{tot} and E_{tot}). The ratio of total effort to sample-frame estimate, *f*, is as follows,

$$(2) \qquad f = \frac{\sum_{i=1}^{n} E_i^{ds}}{\sum_{i=1}^{n} E_i^{tot}},$$

Accordingly, for days when no aerial survey is conducted, the daily dockside estimates of catch (C_j^{tot}) and effort (E_j^{tot}) will be expanded to fishery total values by *f* as follows, respectively,

$$(3) \qquad C_j^{tot} = \frac{C_j^{ds}}{f} \text{ and } E_j^{tot} = \frac{E_j^{ds}}{f}$$

and then the usual stratum- and season-total estimation procedure will be followed. Thus, the design relies on both dockside sampling (the primary emphasis) aerial effort surveys (auxiliary information) to achieve total-fishery parameter estimation. This approach is similar to Canada-DFO's use of aerial–access sampling to estimate recreational fishery statistics in the Strait of Georgia to the north of Area 7 (this survey and its estimators has undergone rigorous theoretical review in recent years; see Dauk 2001 for details).

Assumptions

For this approach to yield unbiased estimates of catch and effort, a number of assumptions must be met. First, the usual Murthy-design assumptions apply and are,

- For sites contained in the sample, access-site size measures are accurately estimated and reflect proportional differences in catch landed across sites.
- CPUE does not differ between sampled and non-sampled sites.
- All anglers are interviewed and accurately report catch and encounters.

Second, by adding the aerial–access based sampling fraction to our calculations, we also assume the following:

- The relative proportion of effort originating from sites within and outside of our sample frame does not differ between fair weather (i.e., when flight is possible) and poor weather days (i.e., when aerial surveys cannot be done).
- All boats that are actively fishing are accurately counted (e.g., boats are neither missed nor double counted)
- Boat ingress and egress rates are equal.
- Anglers accurately report their periods of fishing activity.

- The relative proportion of effort originating from sampled and un-sampled sites does not differ between weekday and weekend days.

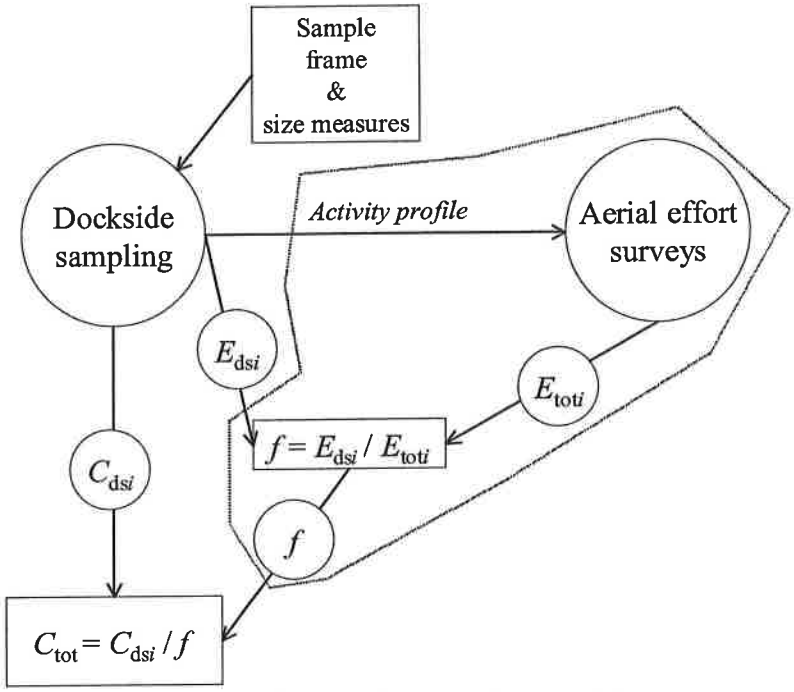

Figure 6-2. A schematic of the Area-6 sampling plan demonstrating the relationship among sampling components and estimators. Note that the dockside interview element used to expand instantaneous aerial boat counts to daily totals (i.e., the '*Activity profile*', based on trip start and end time reports) is not used in sample frame-only catch and effort estimation. Features contained in the dashed polygon are estimated for paired aerial–access sample days only; dockside sampling will occur on all scheduled sample days.

Estimates of Total Encounters

We will estimate total Chinook encounters in the Area 6 winter selective Chinook fishery using the bias-corrected approach developed by Conrad and McHugh (2008). Briefly, with the Conrad and McHugh (2008) method, Chinook encounters are estimated by dividing the estimate of legal-marked Chinook harvest by the estimated proportion of the fishable Chinook population that is of legal size and marked. Given that our former "Method 2" approach (e.g., WDFW 2008a) yields negatively biased estimates if anglers release any of the legal-marked Chinook they encounter, Conrad and McHugh estimated a "correction" factor to account for this phenomenon and incorporated it into their estimator. Applying Conrad and McHugh's (2008) approach within the design proposed in **Figure 6-1**, we would estimate total Chinook encounters by dividing the estimate of legal-marked Chinook harvest (obtained via aerial-access creel surveys) by the estimated proportion of the fishable Chinook population that is of legal size and marked (obtained via VTR data).

CWT Sampling

We will sample for coded wire tags (CWT) in the Area 6 winter mark-selective Chinook fishery as part of our dockside angler interviews. The objective is to provide stock specific estimation (by hatchery and brood year) of population parameters, such as fishery contribution and marine survival, as part of the coast-wide CWT program. The sample rate goal for CWT recovery is 20% in mark-selective Chinook fisheries. During dockside interviews samplers will inspect landed Chinook and coho salmon for the presence of coded-wire tags using wand CWT detectors, and snouts will be collected from all fish containing CWTs. For post-season analyses and reporting, CWT data will be used to estimate stock composition by hatchery and brood year. Total unmarked double index tagged (DIT) mortality estimates will be produced post-season.

Voluntary Trip Reports

Additional information on adipose mark rates and the percentage of Chinook that are legal size (22 inches [56 cm] total length and larger) versus sublegal size (less than 22 inches) will be obtained from Voluntary Trip Reports (VTR's) submitted by private-boat anglers during the mark selective Chinook fishery in Area 6. Anglers will be asked to record on the VTR forms the date, number of anglers, target species, CRC Area, each Chinook or coho hooked, whether the fish was kept or released, species (if they positively identified the fish), total length to the nearest 1/8th inch, and whether the fish was adipose fin-clipped or not clipped.

Several measures will be taken to expand and help ensure the success of our VTR program. First, samplers will distribute our new and improved, user-friendly VTR form that is easier for anglers to complete compared to the old VTR form. Samplers will maximize the distribution of VTRs by handing out VTRs as anglers launch, and collecting the VTRs as anglers exit the fishery. Additionally, samplers will provide participants with a brochure describing the intent of VTRs and their significance to fishery monitoring, and answer VTR-related questions. To increase the response rate, participants are given three options for returning completed VTRs to WDFW: hand-delivering them to samplers, placing them in on-site drop boxes, or sending them via U.S. mail (pre-paid); if they are unsuccessful (i.e., no encounters occurred [harvested or released]) on their trip, the VTR samplers will request that participants keep their forms for future trips.

Mark rates of legal-size and sublegal-size Chinook will be estimated by calculating the season average mark rate from VTR's. The proportion of Chinook that were legal-size and marked, legal-size and unmarked, sublegal-size and marked, and sublegal-size and unmarked will also be calculated.

Reporting Schedule

A final report will be written and distributed by November 30, 2013, with a post-season analysis of all data collected in the 2012-13 Area 6 winter selective Chinook fishery.

Sampling Rates and Staffing Levels

WDFW will meet or exceed the sampling rate goal of 20% during the selective Chinook fishery time period via increased staffing levels as compared to non-selective fisheries. **Table 6W-1** shows staffing levels for the intensive monitoring of the winter selective Chinook fishery in Area 6.

Table 6W-1: Number of Additional Staff Required for Monitoring the Winter Selective Chinook Fishery in Area 6, December 1, 2012 through April 10, 2013.

Month	Area 6 Dockside Samplers
Dec	2
Jan	2
Feb	2
Mar	2
Apr(10)	2

5/1/12

April 11, 2012
2012-2013 Area 7 Winter Period Mark-Selective Sport Fishery

The Northwest Treaty Tribes and the Washington Department of Fish and Wildlife (WDFW) have reached agreement to implement a Chinook salmon mark-selective fishery in Area 7 from December 1, 2012, through April 30, 2013. This fishery will be implemented consistent with management objectives defined by the co-managers' Puget Sound Chinook Harvest Management Plan (April, 2010), the WDFW-Tulalip management plan for hatchery origin fish (2005 Memorandum of Understanding), and established principles concerning the allocation of harvestable salmon and the exercise of treaty rights. The co-managers will seek to minimize or eliminate any unintended effects of this fishery on individual treaty fisheries, including dislocation and/or disruption. Therefore, treaty fisheries will not be modified in order to accommodate this mark-selective fishery.

The co-managers further agree that:

- Total encounters of marked and unmarked, legal and sub legal-size chinook will be estimated through a monitoring and sampling program (Attachment A). If in-season estimates indicate the estimated total legal-size encounters for the fishery will significantly exceed the preseason forecasted level of 4,284 (FRAM 1512), the fishery will be modified to control impacts on stocks of concerns; and,

- All subarea closures that are part of the co-managers' 2012-2013 fisheries agreement will be in effect in Area 7 and during the time period that the agreed Chinook mark-selective fishery is being conducted.

Fishery Intent

The mark-selective fishery in Area 7 has been implemented to provide recreational fishing opportunity directed at hatchery Chinook salmon. Sampling and monitoring programs implemented with this fishery are intended to provide information necessary to evaluate and plan potential future Chinook mark-selective fisheries. The sampling program will provide a basis for determining if the data needed to estimate critical management and analysis parameters can be collected. Prior to the 2013-14 season, WDFW and the tribes will jointly review and analyze results of the sampling and monitoring program for these fisheries to evaluate the effectiveness at achieving the intended objectives.

Data Needs for Evaluating the Fishery

WDFW will carry out the monitoring, sampling and reporting program described for the Area 7 winter Chinook mark-selective fishery in Attachment A. On-water as well as shore-based surveys and sampling techniques will be employed, in addition to an intensive voluntary trip report program, with the intention of collecting data that will form the basis of post-season analyses and evaluation of performance. During the conduct of this fishery WDFW will maintain sampling rates in areas 5-13 at levels equivalent to those in the most recent two-years. This monitoring, sampling and reporting program is part of the WDFW monitoring and sampling operational plan documented with the co-managers' preseason fishing plan.

These monitoring and sampling programs are designed to provide data to estimate the following parameters:

- the mark rate in the fishery - marked and unmarked encounters will be estimated for legal and sub-legal size fish by both on-water and shore-based programs;
- the number of fish retained or landed - marked and unmarked fish will be estimated using a shore-based program, including CWT and scale-age sampling;
- the number of unmarked fish released - estimated by shore-based and on-water programs;
- the number of unmarked fish retained - estimated by a shore-based program;
- the number of marked fish released - estimated by a shore-based program in conjunction with on-water mark rate encounter estimates;
- the number of the chinook encounters that are of sub legal size - estimated by shore-based and on-water

programs;

- the stock composition of the mortalities – estimated by CWT and DNA;
- estimates of marked and unmarked mortalities of double-index tagged (DIT) and other CWT stocks.

Post Season report.

A preliminary post-season report will be written and distributed by November 30, 2013, containing a post-season analysis of all data collected in the 2012-13 Area 7 winter selective Chinook fishery.

Data Needs for Post-Season Estimation of Stock-Specific Unmarked Fish Mortalities

The co-managers agree to implement these fisheries with the understanding that the capability to estimate stock-specific unmarked fish mortalities is preserved. Methods for estimating unmarked mortalities of double-index tagged CWT stocks within this mark-selective chinook fishery will be determined jointly by co-managers, considering recommendations of the Selective Fisheries Evaluation Committee of the Pacific Salmon Commission. WDFW will be responsible for reporting the necessary fishery information and data to the Pacific States Marine Fisheries Commission that allows these estimates to be generated.

In the postseason report (see previous section), WDFW will provide estimates of unmarked mortalities, by DIT group (by stock and age) and area. Unmarked DIT recoveries will be estimated based on estimated recoveries of marked DIT fish and assuming:

1. DIT release numbers provide a reasonable estimate of the unmarked to marked fish ratio; and,
2. the mortality rate for chinook caught and released in the fishery (sfm) is known.

The assumption that the DIT release numbers provide a reasonable estimate of the unmarked to marked fish ratio will be evaluated through post-season comparisons of DIT tag groups. A design for these comparisons will be developed jointly by the co-managers following the method used in analyzing coho DIT groups.[1] All information from this fishery necessary for making these comparisons is assumed to be included in the sampling design and will be included in the post-season report.

Estimates of total fishery related mortalities, including the total exploitation rate or the Southern US exploitation rate, that represent the co-managers' management objectives for Puget Sound chinook management units, will be made by combining the mortality estimate for the Area 7 mark-selective fishery with mortality estimates in non-selective fisheries and other mark-selective fisheries. To ensure that all information necessary to make these estimates is collected, plans for sampling and monitoring of this selective fishery will be included as a component of the co-managers' pre-season agreement.

[1] *Analysis of coho salmon double-index tag (DIT) data. 2003*

Attachment A

MONITORING THE WINTER AREA 7 SELECTIVE CHINOOK FISHERY, DECEMBER 1, 2012 THROUGH APRIL 30, 2013

Overview

The WDFW Puget Sound Sampling Program will intensively monitor the proposed mark-selective Chinook fishery in Area 7 from December 1, 2012 through April 30, 2013, using comprehensive data collection strategies consisting of dockside sampling, aerial surveys, test fishing, and voluntary trip reports, as detailed below. The proposed sample design is an aerial-access site design that was effective in producing in-season estimates during the previous winter seasons in Areas 7 and 9 (e.g., WDFW 2009b and 2009c).

The aerial-based design differs from our usual Murthy estimator method (Murthy 1957; Cochran 1977) primarily in terms of the approach used for assessing fishery-wide effort. This design is particularly suited for large geographic areas such as Area 7 during the winter season. The design is a "Modified Murthy" approach that will incorporate aerial survey-based total effort counts, rather than the approach in which on-the-water surveys are conducted to assess proportions of effort accessing the fishery from sampled and non-sampled sites. Due to the large geographic expanse of Area 7, and because of expected adverse conditions on the water during winter time, we determined that the usual boat-based approach for assessing proportions of effort (site size measures) would be riskier (to both the success of the study and safety of field personnel) and far more costly than the aerial-based Modified Murthy approach described below.

Sampling Objectives

The comprehensive monitoring plan depicted in **Figure 7-1** will be implemented to estimate total *i*) Chinook encounters (*C*; retained and released by mark status) and *ii*) angler effort (*E*) due to pilot Area 7 winter mark-selective Chinook fishery, and to evaluate additional key selective fishery sampling objectives, including: *iii*) quantify the size and mark-status composition of the fishable Chinook population via test fishing; *iv*) recover CWTs and assessing the impact of the selective fishery on DIT groups; *v*) estimate the age composition of and test fishery- and landed dockside-sampled Chinook; and *iv*) estimate total fishery impacts (encounters and mortality) and comparing these values to pre-season modeling (FRAM) expectations.

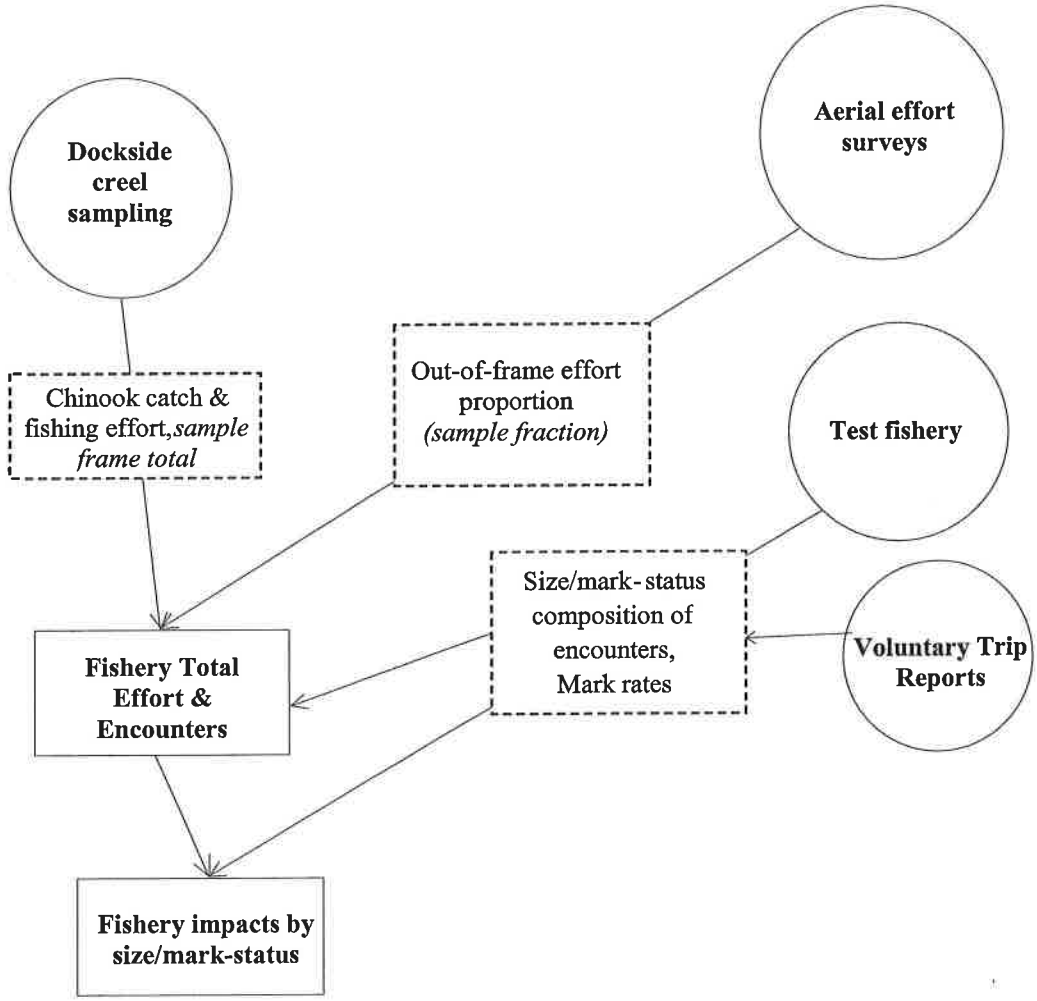

Figure 7-1. Conceptual diagram of the monitoring plan proposed for the **Area 7 winter** mark-selective Chinook fishery season. Circles represent discrete sampling activities, dashed boxes represent parameters that are estimated using data from a given activity, and solid boxes depict key quantities estimated from the comprehensive plan. 'Encounters' includes both harvested and released Chinook salmon.

Design Overview

Area 7 objectives will be achieved using a complemented aerial–access design (**Figure 7-1** and **7-2**), whereby:

i) Total encounters (C_{ds}, separate estimates for landed and released) and effort (E_{ds}) will be estimated for all anglers at sampled access sites (e.g., sites in our dockside sample frame; see below) using completed-trip interview data collected through a multistage sample design.

ii) A sampling fraction (f) for expanding sample-frame estimates of encounters and effort (C_{ds} and E_{ds}) to fishery-wide totals (C_{tot} and E_{tot}) will be estimated using data from paired aerial and dockside effort-sampling events.

Dockside sampling— Completed-trip interview data will be collected using a stratified three-stage cluster sample design. For each two-week temporal stratum throughout the fishery, the three-stage cluster sample design will be implemented as follows,

- Sample days will be selected (randomly) from weekday (Mon-Thurs, n = 2 out of 8 possible weekday days for each two week interval) and weekend (Fri-Sun, n = 2 out of 3 possible weekend days each week) strata at the first stage.
- At the second stage, all access sites in the sample site frame (n = 4 sites) will be selected for sampling (i.e., this will be a census of the four dockside sample-frame sites; probability proportional to 1 for site selection),
- All anglers accessing the fishery at a particular site (the clusters) will be interviewed at the third stage.

As in other selective fishery surveys, information on fishing trip duration (start and end times), the number of anglers and boats fishing, and total salmon encounters (retained and released) by species and mark status, will be aquired from post-trip dockside interviews. These data, in conjunction with site size measures determined for the sites in the dockside sample frame, will allow us to estimate C_{ds} and E_{ds} for the entire dockside sample frame using the Murthy total estimator (Murthy 1957; Cochran 1977).

The sites included in the Area-7 dockside sample frame will be the four assumed highest-use access sites, based on dockside interview data collected during the previous three seasons in Area 7. The sites will also represent diverse access locations throughout Area 7. Based on these criteria, the four sample-frame sites will consist of the following access locations: Washington Park Ramp, Bellingham Ramp, Cornet Ramp, and Friday Harbor Marina on San Juan Island.

Size measures will be estimated for each site in our sample frame via complete daily effort counts recorded by samplers stationed at each of the four sampled sites on a subset of sample days (i.e., number of boats and anglers returning to the ramp from dawn to dark). From these dockside effort data, we will determine the proportion of anglers accessing the fishery at each of the four sampled sites relative to the total number of anglers summed across the four sampled sites (size measures will sum to 1 across the four sites in the sample frame). Following an adjustment to scale sample-frame estimates of catch and effort to fishery-total estimates (described below), parameter values will be expanded to stratum totals. Depending on the proportion of effort contained in the sample frame (as determined through sampling early in the fishery), the variability in size measures observed for the sample frame, and the availability of resources, we may opt to staff all sample-frame sites for all selected sample days during the season (i.e., we will obtain a census of catch and effort for sites in our sample frame on scheduled sample days).

Aerial surveys.—In order to obtain fishery-wide parameter values, we will collect the data necessary to expand sample-frame estimates to "never-sampled" (i.e., out of the frame) access sites and thus the total fishery. Thus, on a subset of randomly selected days where dockside sampling is scheduled (n = 4 target per month), we will also conduct an aerial survey to estimate total fishing effort for the entire CRC area (i.e., including effort originating from never-sampled sites and those that are in our dockside frame). While survey days will be randomly chosen, flight times will be scheduled in order to coincide with peak (and relatively stable) periods of angler activity. This flight will provide an instantaneous aerial effort count (i.e., number of boats, b_i) that can then be expanded to a fishery-wide total (E_i^{tot}) based on the activity profile estimated for that particular day; i.e., aerial counts will be expanded based on the proportion of anglers fishing on a given day that were active during the aerial survey, P:

$$(1) \qquad E_i^{tot} = b_i / P_i$$

where,

E_i^{tot} = the total fishing effort on day i;

b_i = the number of boats enumerated in the aerial survey on day i;

P_i = the proportion of anglers that were active during the aerial survey on day i,

and where P_i is estimated number of anglers active in the aerial survey area divided by the total number

of anglers interviewed as follows,

$$P_i = \frac{a_i}{A_i},$$

where,

a_i = the number of anglers that were active in the aerial survey area on day *i* and;

A_i = the total number of anglers surveyed on day *i*.

Although dockside *CPUE* estimates for a particular day could be used in conjunction with this total effort estimate to estimate C_{tot} for that same day (e.g., as was used for the aerial-access design approach implemented in Volstad *et al.* 2006), we will focus aerial surveys only on obtaining an accurate estimate of season-wide sampling fraction, *f*, due to reasons discussed in WDFW 2008b. We will fly on fewer occasions (than the previously-discussed aerial-access method would require) and instead use aerial effort estimates (E_i^{tot}) in conjunction with dockside effort estimates (E_i^{ds}) to estimate a season-wide sampling fraction, f, for converting dockside Chinook encounters and effort estimates into fishery-wide totals (C_{tot} and E_{tot}). The ratio of total effort to sample-frame estimate, f, is as follows:

$$(2) \qquad f = \frac{\sum_{i=1}^{n} E_i^{ds}}{\sum_{i=1}^{n} E_i^{tot}},$$

Accordingly, for days when no aerial survey is conducted, the daily dockside estimates of catch (C_j^{tot}) and effort (E_j^{tot}) will be expanded to fishery total values by *f* as follows, respectively,

$$(3) \qquad C_j^{tot} = \frac{C_j^{ds}}{f} \text{ and } E_j^{tot} = \frac{E_j^{ds}}{f}.$$

and then the usual stratum- and season-total estimation procedure will be followed. Thus, the design relies on both dockside sampling (the primary emphasis) aerial effort surveys (auxiliary information) to achieve total-fishery parameter estimation. This approach is similar to Canada-DFO's use of aerial–access sampling to estimate recreational fishery statistics in the Strait of Georgia to the north of Area 7 (this survey and its estimators has undergone rigorous theoretical review in recent years; see Dauk 2001 for details).

Assumptions

For this approach to yield unbiased estimates of catch and effort, a number of assumptions must be met. First, the usual Murthy-design assumptions apply and are,

- For sites contained in the sample, access-site size measures are accurately estimated and reflect proportional differences in catch landed across sites.
- CPUE does not differ between sampled and non-sampled sites.
- All anglers are interviewed and accurately report catch and encounters.

Second, by adding the aerial–access based sampling fraction to our calculations, we also assume the following:

- The relative proportion of effort originating from sites within and outside of our sample frame does not differ between fair weather (i.e., when flight is possible) and poor weather days (i.e., when aerial surveys cannot be done).
- All boats that are actively fishing are accurately counted (e.g., boats are neither missed nor double counted)
- Boat ingress and egress rates are equal.
- Anglers accurately report their periods of fishing activity.
- The relative proportion of effort originating from sampled and un-sampled sites does not differ between weekday and weekend days.

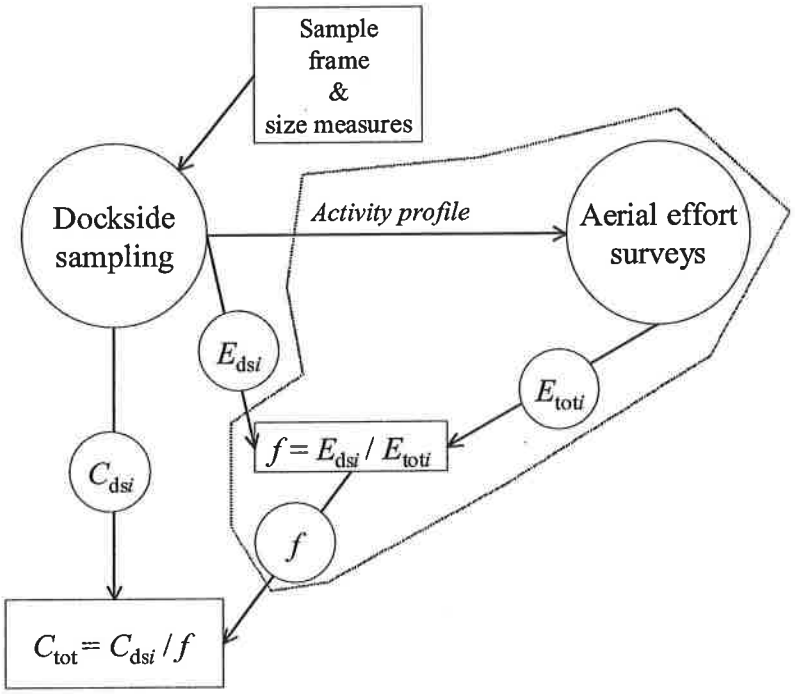

Figure 7-2. A schematic of the Area-7 sampling plan demonstrating the relationship among sampling components and estimators. Note that the dockside interview element used to expand instantaneous aerial boat counts to daily totals (i.e., the '*Activity profile*', based on trip start and end time reports) is not used in sample frame-only catch and effort estimation. Features contained in the dashed polygon are estimated for paired aerial–access sample days only; dockside sampling will occur on all scheduled sample days.

Estimates of Total Encounters

Total Chinook encounters in the Area 7 winter selective Chinook fishery will be estimated using the bias-corrected approach developed by Conrad and McHugh (2008). Briefly, with the Conrad and McHugh (2008) method, Chinook encounters are estimated by dividing the estimate of legal-marked Chinook harvest by the estimated proportion of the fishable Chinook population that is of legal size and marked. Given that our former "Method 2" approach (e.g., WDFW 2008a) yields negatively biased estimates if anglers release any of the legal-marked Chinook they encounter, Conrad and McHugh estimated a "correction" factor to account for this phenomenon and incorporated it into their estimator. Applying

Conrad and McHugh's (2008) approach within the design proposed in **Figure 7-1**, total Chinook encounters will be estimated by dividing the estimate of legal-marked Chinook harvest (obtained via aerial-access creel surveys) by the estimated proportion of the fishable Chinook population that is of legal size and marked (obtained via test fishing data).

Dockside Fishing Method Question

During dockside interviews, samplers will record the predominant (based on time) angling method employed by the boat being interviewed, for the boats that successfully encountered Chinook. Responses will be recorded on the sampling form according to the following five fishing method categories:

1. Weight & Bait (W): Mooching or slow trolling with lead and herring/anchovy.
2. Downrigger Trolling (DR): Using either hardware or bait or any combination.
3. Jigging (J): Drifting, jerking pole up and down; for example using Buzz Bombs, Point Wilson Darts, or Crippled Herring.
4. Diver Trolling (DV): For example trolling with a Deep Six or a Pink Lady, using either hardware or bait or any combination.
5. Other (O): For example fly fishing, or trolling bucktails with or without weight.

The sampling supervisor will summarize the above information for anglers encountering Chinook and instruct the test boat samplers on which method to employ in order to adequately represent the fishing methods used by the recreational fleet.

Test Fishing

WDFW will operate one test boat in Area 7 to collect encounter rate and mark rate information during the winter selective Chinook fishery. The crew will consist of two WDFW technicians fishing with one rod each. The test boat will fish approximately five days per week (weather permitting). For each hook-up, the encounter number, time sampled, species, mark status, and DNA vial number (if applicable) will be recorded. Samplers will collect scales, fork lengths, and total lengths on all Chinook brought on board. Legal-size Chinook are 22 inches (56 cm) total length and larger, while sublegal-size Chinook are less than 22 inches total length. Samplers also will use scissors to remove a 1-cm^2 piece of the dorsal fin for DNA analysis. All fish will be handled carefully and immediately released. The test boat will operate in areas where sport and test catches would be high enough to warrant test fishing. Based on the input of the WDFW and NWIFC biometricians, we will work to achieve recommended sample sizes of Chinook encounters and acceptable precision levels for the mark rate estimates.

Charter Vessels

Charter vessels will be included in our aerial-access creel estimates for the Area 7 winter mark-selective Chinook fishery. The combination of charter effort proportions (very small) and CPUE ratios (relatively high) in Area 7 suggests that pooling causes negligible (<3%) bias (McHugh 2009).

Voluntary Trip Reports from Private Vessels

Additional information on adipose mark rates and the percentage of Chinook that are legal size (22 inches and larger) versus sublegal size (less than 22 inches) will be obtained from Voluntary Trip Reports (VTR's) submitted by private-boat anglers during the mark selective Chinook fishery in Area 7.

Anglers will be asked to record on the VTR forms the date, number of anglers, target species, CRC Area, each Chinook or coho hooked, whether the fish was kept or released, species (if they positively identified the fish), total length to the nearest 1/8th inch, and whether the fish was adipose fin-clipped or not clipped.

Mark rates of legal-size and sublegal-size Chinook will be calculated using the average mark rate from

VTR's. The proportion of Chinook that were legal-size and marked, legal-size and unmarked, sublegal-size and marked, and sublegal-size and unmarked will also be calculated. VTR results will be compared with results from the test fishery in Area 7.

Several measures will be taken to help ensure the success of our VTR program. First, samplers will distribute our new and improved, user-friendly VTR form that is easier for anglers to complete compared to the old VTR form. Samplers will maximize the distribution of VTRs by handing out VTRs as anglers launch, and collecting the VTRs as anglers exit the fishery. Additionally, samplers will provide participants with a brochure describing the intent of VTRs and their significance to fishery monitoring, and answer VTR-related questions. To increase the response rate, participants are given three options for returning completed VTRs to WDFW: hand-delivering them to samplers, placing them in on-site drop boxes, or sending them via U.S. mail (pre-paid); if they are unsuccessful (i.e., no encounters occurred [harvested or released]) on their trip, the VTR samplers will request that participants keep their forms for future trips.

Reporting Schedule

A final report will be written and distributed by November 30, 2013, with a post-season analysis of all data collected in the 2012-13 Area 7 winter selective Chinook fishery.

Sampling Rates and Staffing Levels

WDFW intends to meet or exceed the 20% sample rate goal defined for all selective Chinook fisheries via increased staffing levels as compared to non-selective fisheries. **Table 7-1** shows planned staffing levels for monitoring the selective Chinook fishery in Area 7.

Table 7-1: Number of Additional Staff Required for Monitoring the Selective Chinook Fishery in Area 7, December 1, 2012 through April 30, 2013.

Month	Area 7 Dockside Samplers	Area 7 Test Boat Staff (1 Boat)
Dec	4	2
Jan	4	2
Feb	4	2
Mar	4	2
April	4	2

6/1/12

April 11, 2012

Winter Mark-Selective Sport Fishery
Areas 8.1 & 8.2
2012-2013

The Northwest Treaty Tribes and the Washington Department of Fish and Wildlife (WDFW) have reached agreement to implement mark-selective recreational fishing in Areas 8.1 and 8.2 during the period November 1, 2012, through April 30, 2013. The fishery will be implemented consistent with management objectives defined by the co-managers' Puget Sound Chinook Harvest Management Plan (April, 2010), the WDFW-Tulalip management plan for hatchery origin fish (2005 Memorandum of Understanding), and established principles concerning the allocation of harvestable salmon and the exercise of treaty rights. The co-managers will seek to minimize or eliminate any unintended effects of this fishery on individual treaty fisheries, including dislocation and/or disruption. Therefore, treaty fisheries will not be modified in order to accommodate this mark-selective fishery.

The co-managers further agree that:

- Total encounters of legal-sized chinook will be estimated through a monitoring and sampling program (Attachment A). If at any time during the fishery total legal-size encounters estimated from this program are expected to exceed the preseason forecasted level of 2,763 Chinook (FRAM 1512) by more than 10% the parties will consider modification to the fishery to control impacts;
- Mark-selective fishing will be limited to the period from November 1 through April 30; and,
- Fishing will remain closed in that portion of Area 8.2 in Tulalip Bay east of a line from Mission Point to Hermosa Point.

Fishery Intent

This fishery represents the sixth year of experience using mark-selective Chinook regulations in these marine waters during the winter recreational fishery. The purpose of the fishery is to provide recreational fishing opportunity directed at hatchery Chinook salmon.

Data Needs for Evaluating the Fishery

Sampling and monitoring programs implemented with this fishery are intended to provide information necessary to maintain current estimates of the encounter rates and stock composition of marked and unmarked Chinook salmon so that future projections of the impacts of this fishery will be as accurate as possible. The sampling program also is necessary to comply with obligations under the Pacific Salmon Treaty, including the obligation to sample for coded-wire tags (CWT). Prior to the 2013-2014 season, WDFW and the tribes will jointly review and analyze available results of the sampling and monitoring program for this fishery and make any necessary changes to the calibration of the fishery assessment model.

WDFW will carry out the monitoring and sampling program described in Attachment A, employing on-the water as well as shore-based surveys and sampling techniques, with the intention of collecting data that will form the basis of post-season analyses and evaluation of performance. During the conduct of this fishery WDFW will maintain sampling rates in areas 5-13 at levels sufficient to meet the obligation to adequately sample for CWT and other biological information. This monitoring, sampling and program will be a part of the co-managers' preseason fishing plan document.

These monitoring and sampling programs are designed to provide data to estimate the following parameters:

- the mark rate in the fishery - marked and unmarked encounters will be estimated by both on-water and shore-based programs;
- the incidence of partial adipose clips - estimated by both shore-based and on-water programs.

- the number of fish retained or landed - marked and unmarked fish will be estimated using a shore-based program, including CWT and scale-age sampling;
- the number of unmarked fish released - estimated by shore-based and on-water programs;
- the number of unmarked fish retained - estimated by a shore-based program and compared to enforcement program estimates;
- the number of marked fish released - estimated by a shore-based program in conjunction with on-water mark rate encounter estimates;
- the number of the chinook encounters that are of sub legal size – estimated by shore-based and on-water programs;
- the stock composition of the mortalities – estimated by CWT and DNA;
- estimates of marked and unmarked mortalities of double-index tagged (DIT) and other CWT stocks.

Reports

A preliminary post-season report will be written and distributed by November 30, 2013, with a post-season analysis of all data collected in the 2012-13 Areas 8-1 and 8-2 winter selective Chinook fishery.

Data Needs for Post-Season Estimation of Stock-Specific Unmarked Fish Mortalities

The co-managers agree to implement this fishery with the understanding that the capability to estimate stock-specific unmarked fish mortalities is preserved. Methods for estimating unmarked mortalities of DIT CWT stocks in each catch reporting area within the Area 8.1 & 8.2 mark-selective Chinook fishery will conform to the recommendations of the Selective Fisheries Evaluation Committee of the Pacific Salmon Commission unless the co-managers agree to use alternative methods. WDFW will be responsible for reporting the necessary fishery information and data to the Pacific States Marine Fisheries Commission that allows these estimates to be generated.

In the postseason report (see previous section), WDFW will provide estimates of unmarked mortalities, by DIT group (by stock and age), in each year's Area 8.1 & 8.2 mark-selective fishery. Unmarked DIT recoveries will be estimated based on estimated recoveries of marked DIT fish and assuming:

1. DIT release numbers provide a reasonable estimate of the unmarked to marked fish ratio (it is assumed that the marked to unmarked ratio in this fishery is not affected by other selective fisheries); and,
2. the mortality rate for Chinook caught and released in the fishery (sfm) is known.

The assumption that the DIT release numbers provide a reasonable estimate of the unmarked to marked fish ratio will be evaluated through post-season comparisons of DIT tag groups. A design for these comparisons will be developed jointly by the co-managers following the method used in analyzing coho DIT groups.[1] All information from this fishery necessary for making these comparisons will be included in the post-season report.

Estimates of total fishery related mortalities, including the total exploitation rate or the Southern US exploitation rate, that represent the co-managers' management objectives for Puget Sound chinook management units, will be made by combining the mortality estimate for the Area 8.1 & 8.2 mark-selective fishery with mortality estimates in non-selective and other mark-selective fisheries. To ensure that all information necessary to make these estimates is collected, plans for sampling and monitoring of this selective fishery, as well as other mark-selective fisheries, will be included as a component of the co-managers' annual pre-season agreement.

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[1] *Analysis of coho salmon double-index tag (DIT) data.* 2003

Attachment A

MONITORING THE AREAS 8-1 AND 8-2 WINTER SELECTIVE CHINOOK FISHERY, NOVEMBER 1, 2012 THROUGH APRIL 30, 2013

The WDFW Puget Sound Sampling Program will monitor the mark-selective Chinook fishery in Areas 8-1 and 8-2 from November 1, 2012 through April 30, 2013 via comprehensive data collection strategies consisting of dockside creel surveys, on-the-water surveys, and voluntary trip reports, as shown in **Figure 8-1** and detailed below.

The monitoring plan shown in **Figure 8-1** will enable us to estimate the critical data parameters necessary for evaluating pilot mark-selective fisheries as previously identified by the co-managers (e.g., WDFW and NWIFC 2009), including: *i)* the mark rate of the targeted Chinook population (based on VTR and dockside angler interview data), *ii)* fishery-total angling effort and Chinook salmon encounters (harvest + releases) and mortalities (by size/mark-status class) (e.g., from a combination of dockside sampling data and VTRs), *iii)* the coded-wire tag (CWT)-based stock composition of marked and unmarked Chinook mortalities (from dockside sampling data), and *iv)* fishery-total mortality of marked and unmarked double index tag (DIT) CWT stocks (once post-season CWT sample rates are estimated). In addition, we will acquire and analyze relevant data characterizing other aspects of the pilot fishery, including descriptors of fishing success (catch [landed Chinook] per unit effort, CPUE), the length and age composition of encountered and/or landed Chinook, and the overall intensity of our sampling efforts.

Dockside Sampling

We will implement creel surveys during the winter mark-selective Chinook fishery in Areas 8-1 and 8-2 using a modified (scaled back) version of the Murthy estimator method (Murthy 1957, Cochran 1977), in order to produce total-Area estimates of catch and effort with accompanying estimates of variance. Our modified-Murthy approach, as detailed below, will incorporate data from intensive dockside sampling days, combined with site size measures obtained from on-the-water surveys, to produce total-Area catch and effort estimates with variances.

Dockside Sample Design

Sampling strata will be divided into 'weekday' (Monday through Thursday) and 'weekend' (Friday, Saturday, and Sunday) days. For each two-week period of the fishery, we will randomly select n=2 sample days from the N=8 possible weekday stratum days (distributed so there is at least one weekday sampled in each of the two weeks). For the weekend stratum (Friday through Sunday), and we will select n=2 sample days out of the N=3 possible weekend days each week. In total, we will sample 12 site-days every two weeks using the reduced Murthy creel survey design.

Samplers will be stationed at two ramps on each of the selected sampling days. Sites in our sample frame will be selected for sampling via our weighted-random site selection process (e.g., probability proportional to size, using the most current boat survey data). At the beginning of the season, sites will be selected based on the site size measures determined last year for the equivalent period in the fishery. Thereafter, we will determine the weights of Areas 8-1 and 8-2 sites based on the most recently available in-season boat survey data to enable the weighted random site selection process.

Samplers will achieve 100% sampling coverage at the assigned ramps, with shifts lasting approximately from dawn until dusk (will be adjusted as needed according to changing day lengths throughout the season), in order to intercept all boats. All anglers and fish exiting the fishery through the sampled site will be counted. Any boats that are missed at the sampled site will be counted and recorded on the sampling forms.

In addition, we will sample multiple ramps in Areas 8-1 and 8-2 on the remaining days in the weekday stratum, using baseline-level sampling to ensure that we achieve the 20% sample rate goal.

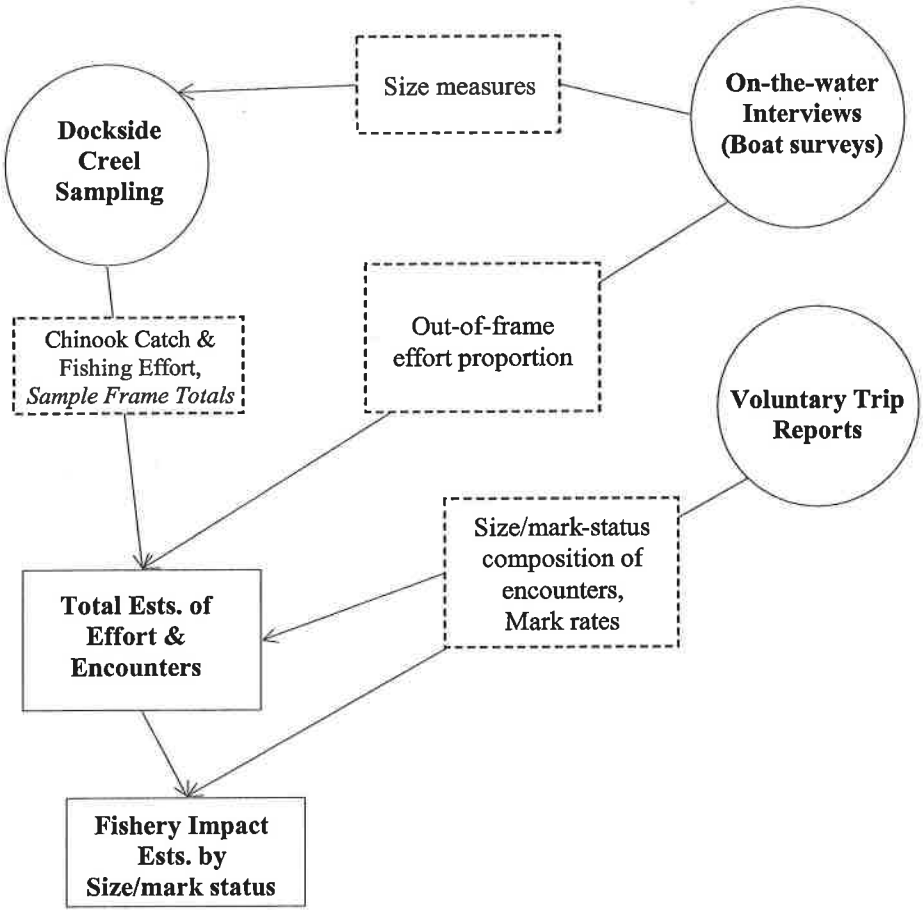

Figure 8-1. Conceptual diagram of the monitoring plan proposed for the **Areas 8-1 and 8-2 winter** mark-selective Chinook season. Circles represent discrete sampling activities, dashed boxes represent parameters that are estimated using data from a given activity, and solid boxes depict key quantities estimated from the comprehensive plan. 'Encounters' includes both harvested and released Chinook salmon.

On-the-water Surveys

On-the-water surveys (boat surveys) will be employed to estimate the percent of effort from sites in our sample frame versus sites outside of the frame (e.g., never-sampled sites). Boat surveys will cover the entire area to pick up effort from all launch sites. We will ask boat occupants where they will tie up or exit the fishery rather than where they launched. We will calculate the size measures of Areas 8-1 and 8-2 sites based on the most recently available boat survey data.

We will conduct boat surveys in Areas 8-1 and 8-2 to update site size measures throughout the season. In addition, on-the-water surveys will be conducted whenever anything changes in the fishery that could affect effort patterns (e.g., if launch sites open or close or if adjacent catch areas open or close).

Harvest and Effort Estimates

The harvest and effort observed at the Murthy-based sampled sites in Areas 8-1 and 8-2 will be expanded to all access sites (based on estimated site size measures) to estimate total harvest for the day. Sample data will be combined and expanded to create stratum estimates of harvest and effort with variances.

To generate weekly catch and effort estimates for Areas 8-1 and 8-2, the four-day "weekday stratum" estimate for Monday-Thursday of each week (based on n=2 days sampled out of N=8 available weekdays per two-week period) will be added to the "weekend stratum" (Friday-Sunday) estimate for the particular week (based on n=2 days sampled out of N=3 available weekend days per week). The eight-day weekday estimates for each two-week period will be split evenly between individual weeks in the two-week block to enable weekly estimates, with variances computed using the n=2 days sampled out of N=8 available weekdays in the appropriate variance equation.

Assumptions

Harvest and effort estimates are based on the following assumptions:

- Boat surveys provide an unbiased estimate of the proportion of anglers accessing fisheries from sites in our sample site frame and sites outside the frame.
- The proportion of total effort accessing the fishery at site A represents the proportion of total catch landed at site A.
- All anglers exiting at a sampled site are interviewed and all anglers accurately report their harvest. If any boats are missed they are counted and catch and effort estimates are expanded appropriately.
- CPUE does not differ significantly between sites in our sample frame and sites outside our sample frame.

Estimates of Total Encounters

We will estimate total Chinook encounters in the Areas 8-1 and 8-2 winter selective Chinook fishery using the bias-corrected approach developed by Conrad and McHugh (2008). Briefly, with the Conrad and McHugh (2008) method, Chinook encounters are estimated by dividing the estimate of legal-marked Chinook harvest by the estimated proportion of the fishable Chinook population that is of legal size and marked. Given that our former "Method 2" approach (e.g., WDFW 2008a) yields negatively biased estimates if anglers release any of the legal-marked Chinook they encounter, Conrad and McHugh estimated a "correction" factor to account for this phenomenon and incorporated it into their estimator. Applying Conrad and McHugh's (2008) approach within the design proposed in **Figure 8-1**, we would estimate total Chinook encounters by dividing the estimate of legal-marked Chinook harvest (obtained via creel surveys) by the estimated proportion of the fishable Chinook population that is of legal size and marked (obtained via VTRs).

CWT Sampling

We will sample for coded wire tags (CWT) in the Areas 8-1 and 8-2 winter mark-selective Chinook fishery as part of our dockside angler interviews. The objective is to provide stock specific estimation (by hatchery and brood year) of population parameters, such as fishery contribution and marine survival, as part of the coast-wide CWT program. The sample rate goal for CWT recovery is 20% in mark-selective Chinook fisheries. During dockside interviews samplers will inspect landed Chinook and coho salmon for the presence of coded-wire tags using wand CWT detectors, and snouts will be collected from all fish containing CWTs. For post-season analyses and reporting, CWT data will be used to estimate stock composition by hatchery and brood year. Total unmarked double index tagged (DIT) mortality estimates will be produced post-season.

Voluntary Trip Reports

Information on adipose mark rates and the percentage of Chinook that are legal size (22 inches [56 cm]

total length and larger) versus sublegal size (less than 22 inches) will be obtained from Voluntary Trip Reports (VTR's) submitted by private-boat anglers during the mark selective Chinook fishery in Areas 8-1 and 8-2. Anglers will be asked to record on the VTR forms the date, number of anglers, target species, CRC Area, each Chinook or coho hooked, whether the fish was kept or released, species (if they positively identified the fish), total length to the nearest 1/8th inch, and whether the fish was adipose fin-clipped or not clipped.

Several measures will be taken to expand and ensure the success of our VTR program in Areas 8-1 and 8-2. First, samplers will distribute our new and improved, user-friendly VTR form that is easier for anglers to complete compared to the old VTR form. Samplers will maximize the distribution of VTRs by handing out VTRs as anglers launch, and collecting the VTRs as anglers exit the fishery. Additionally, samplers will provide participants with a brochure describing the intent of VTRs and their significance to fishery monitoring, and answer VTR-related questions. To increase the response rate, participants are given three options for returning completed VTRs to WDFW: hand-delivering them to samplers, placing them in on-site drop boxes, or sending them via U.S. mail (pre-paid); if they are unsuccessful (i.e., no encounters occurred [harvested or released]) on their trip, the VTR samplers will request that participants keep their forms for future trips.

We will estimate the mark rates of legal-size and sublegal-size Chinook via calculating the season average mark rate from VTR's. We will calculate the proportion of Chinook that were legal-size and marked, legal-size and unmarked, sublegal-size and marked, and sublegal-size and unmarked.

Reporting Schedule

A final report will be written and distributed by November 30, 2013, with a post-season analysis of all data collected in the 2012-13 Areas 8-1 and 8-2 winter selective Chinook fishery.

Sampling Rates and Staffing Levels

Similar to the previous four years of the pilot study in Areas 8-1 and 8-2, WDFW will continue to meet or exceed sampling rates for Chinook (sample rate goal of 20%) during the Areas 8-1 and 8-2 winter fishery time period. We will maintain increased staffing levels as compared to non-selective fisheries. **Table 8-1** shows staffing levels needed to implement the 2012-13 monitoring plan for the winter selective Chinook fishery in Areas 8-1 and 8-2.

Table 8-1: Number of Additional Staff Required for Monitoring the Winter Selective Chinook Fishery in Areas 8-1 and 8-2, November 1, 2012 through April 30, 2013.

Month	Area 8-1 Dockside Samplers	Area 8-2 Dockside Samplers
Nov	2	2
Dec	2	2
Jan	2	2
Feb	2	2
Mar	2	2
April	2	2

5/1/12

April 11, 2012

2012 Areas 9 & 10 Summer Period Mark-Selective Sport Fishery

The Northwest Treaty Tribes and the Washington Department of Fish and Wildlife (WDFW) have reached agreement to implement Chinook salmon mark-selective fisheries in Areas 9 and 10, for the period July 16 to August 31, 2012. These fisheries will be implemented consistent with management objectives defined by the co-managers' Puget Sound Chinook Harvest Management Plan (April, 2010), the WDFW-Tulalip management plan for hatchery origin fish (2005 Memorandum of Understanding), and established principles concerning the allocation of harvestable salmon and the exercise of treaty rights. The co-managers will seek to minimize or eliminate any unintended effects of this fishery on individual treaty fisheries, including dislocation and/or disruption. Therefore, treaty fisheries will not be modified in order to accommodate this mark-selective fishery.

The co-managers further agree that:

- WDFW will manage this fishery as a season, however, if in-season estimates indicate the estimated total encounters of legal-sized Chinook will exceed the forecast level of 6,150 in Area 9, and 3,963 in Area 10 (FRAM 1512) by more than 10%, then the fishery will be modified to control impacts on stocks of concern;

- Total encounters of marked and unmarked legal and sub legal-size chinook will be estimated through a monitoring and sampling program (Attachment A).

- The two areas will be managed to run concurrently. Any modification to the season structure for the mark-selective fishery in these two areas will be made only by co-manager agreement and without increasing the total impact on stocks of concern;

- WDFW will provide the Tribes with weekly in-season catch and effort estimates with estimates of the variance. In-season estimates will be distributed electronically within the week following the week being reported;

- A conference call will be scheduled between the affected co-managers when the Area 9 and Area 10 fishery has achieved 80% of the combined predicted landed catch (6,969 landed Chinook) to review catch and discuss the remaining fishing schedule; and

- All subarea closures that are part of the co-managers' 2012-2013 fisheries agreement will be in effect in the areas and during the time periods that the agreed Chinook mark-selective fisheries are being conducted.

<u>The Fishery Intent</u>

The summer period mark-selective fisheries in Areas 9 and 10 have been implemented for the purpose of collecting information necessary to enable evaluation and planning of potential future Chinook mark-selective fisheries, and to determine whether data needed to estimate critical management and analysis parameters can be collected. The sampling program for the Area 9 & 10 mark selective fishery will provide a basis for determining if the data needed to estimate critical parameters can be collected and if the sample sizes needed to produce these estimates with agreed levels of precision can be realistically obtained. Prior to the 2013 season, WDFW and the tribes will jointly review and analyze results of the sampling and monitoring program for these fisheries to evaluate the effectiveness at achieving the intended objectives.

Data Needs for Evaluating the Fishery

Monitoring, sampling and reporting programs are being implemented by WDFW for the purpose of providing data necessary to estimate the impact of these mark-selective fisheries and to support the evaluation of future mark-selective fisheries.

WDFW will carry out the monitoring, sampling and reporting program described for the Areas 9&10 summer Chinook mark-selective fisheries in Attachment A. On-water as well as shore-based surveys and sampling techniques will be employed, with the intention of collecting data that will form the basis of post-season analyses and evaluation of performance. During the conduct of these fisheries WDFW will maintain sampling rates in areas 5-13 at levels equivalent to or greater than rates achieved in the most recent two-years. This monitoring, sampling and reporting program is part of the WDFW Puget Sound monitoring and sampling operational plan documented with the co-managers' preseason fishing plan.

These monitoring and sampling programs are designed to provide data to estimate the following parameters:

- the mark rate in the fishery - marked and unmarked encounters will be estimated for legal and sub legal fish by both on-water and shore-based programs;
- the number of fish retained or landed - marked and unmarked fish will be estimated using a shore-based program, including CWT and scale-age sampling;
- the number of unmarked fish released - estimated by shore-based and on-water programs;
- the number of unmarked fish retained - estimated by a shore-based program;
- the number of marked fish released - estimated by a shore-based program in conjunction with on-water mark rate encounter estimates;
- the number of the Chinook encounters that are of sub legal size - estimated by shore-based and on-water programs;
- the stock composition of the mortalities – estimated by CWT and DNA
- estimates of marked and unmarked mortalities of double-index tagged (DIT) and other CWT stocks.

Post-Season Report

WDFW will provide a preliminary post-season report with results of monitoring and sampling programs for the Areas 9 & 10 summer period Chinook mark-selective fishery to the Tribes no later than February 1, 2013 to be considered for planning the 2013 fisheries. The post-season report will include the estimates described above together with the supporting information collected from monitoring and sampling programs. In addition, the report will include estimates of marked and unmarked mortalities of (DIT) and other CWT stocks as described in the section below. The post-season report will include a comparison of independent on-water and shore-based estimates of mark rate, unmarked fish released and sub legal size fish encountered.

Data Needs for Post-Season Estimation of Stock-Specific Unmarked Fish Mortalities

The co-managers agree to implement these fisheries with the understanding that the capability to estimate stock-specific unmarked fish mortalities is preserved. Methods for estimating unmarked mortalities of double-index tagged CWT stocks within Area 9 & 10 mark-selective chinook fishery will be determined jointly by co-managers, considering recommendations of the Selective Fisheries Evaluation Committee of the Pacific Salmon Commission. WDFW will be responsible for reporting the necessary fishery information and data to the Pacific States Marine Fisheries Commission that allows these estimated to be generated.

In the postseason report (see previous section), WDFW will provide estimates of unmarked mortalities, by DIT group (by stock and age) and area. Unmarked DIT recoveries will be estimated based on estimated recoveries of marked DIT fish and assuming:

1. DIT release numbers provide a reasonable estimate of the unmarked to marked fish ratio; and,
2. the mortality rate for Chinook caught and released in the fishery (sfm) is known.

The assumption that the DIT release numbers provide a reasonable estimate of the unmarked to marked fish ratio will be evaluated through post-season comparisons of DIT tag groups. A design for these comparisons will be developed jointly by the co-managers following the method used in analyzing coho DIT groups.[1] All information from this fishery necessary for making these comparisons is assumed to be included in the sampling design and will be included in the post-season report.

Estimates of total fishery related mortalities, including the total exploitation rate or the southern US exploitation rate, that represent the co-managers' management objectives for Puget Sound chinook management units, are made by combining mortality estimates in mark-selective fisheries with mortality estimates in non-selective fisheries. To ensure that all information necessary to make these estimates is collected, plans for sampling and monitoring of the summer selective fishery in Areas 9 and 10, as well as other mark-selective and non-selective fisheries will be included as a component of the co-managers' annual pre-season agreement.

[1] *Analysis of coho salmon double-index tag (DIT) data. 2003*

ATTACHMENT A

MONITORING THE SELECTIVE CHINOOK FISHERIES IN AREAS 9 AND 10, JULY 16 THROUGH AUGUST 31 2012

Overview

The WDFW Puget Sound Sampling Program will intensively monitor the mark-selective Chinook fishery in Areas 9 and 10 during the summer period from July 16 through August 31, 2012. We will incorporate comprehensive data collection strategies consisting of dockside sampling, on-the-water surveys, test fishing, and voluntary trip reports from charter boats and private boats, as shown in **Figure 9/10-1** and detailed below.

The monitoring plan shown in **Figure 9/10-1** will enable us to estimate the critical data parameters necessary for evaluating pilot mark-selective fisheries as previously identified by the co-managers (e.g., WDFW and NWIFC 2009), including: *i)* the mark rate of the targeted Chinook population (based on test fishery and dockside angler interview data), *ii)* fishery-total angling effort and Chinook salmon encounters (harvest + releases) and mortalities (by size/mark-status class) (e.g., from a combination of test fishery encounter rate data, dockside sampling, and voluntary trip reports), *iii)* the coded-wire tag (CWT)-based stock composition of marked and unmarked Chinook mortalities (from dockside sampling data), and *iv)* fishery-total mortality of marked and unmarked double index tag (DIT) CWT stocks (once post-season CWT sample rates are estimated). In addition, we will acquire and analyze relevant data characterizing other aspects of the pilot fishery, including descriptors of fishing success (catch [landed Chinook] per unit effort, CPUE), the length and age composition of encountered and/or landed Chinook, and the overall intensity of our sampling efforts.

Dockside Sampling

We will implement creel surveys during the summer mark-selective Chinook fishery in Areas 9 and 10 using the Murthy estimator method (Murthy 1957, Cochran 1977) in order to produce total-Area estimates of catch and effort with accompanying estimates of variance. The Murthy estimate approach, as detailed below, will incorporate data from intensive dockside sampling days, combined with site size measures obtained from on-the-water surveys, to produce total-Area catch and effort estimates with variances.

Dockside Sample Design

Sampling strata will be divided into weekday (Monday through Thursday) and 'weekend' (Friday, Saturday, and Sunday) strata. Each week we will randomly select two days from the Monday through Thursday stratum for dockside sampling. In addition, we will sample every Friday, Saturday, and Sunday. Samplers will be stationed at two ramps on each of the selected sampling days. Sites from our sample frame will be selected for sampling via our weighted-random site selection process (e.g., probability proportional to size). Initially, site selection will be based on site size measures calculated from boat survey data obtained during the equivalent time period in summer 2011. Once the initial 2012 boat surveys are completed in Areas 9 and 10, we will calculate the updated size measures of sites in our sample frame based on the most recently available boat survey data.

Samplers will achieve 100% sampling coverage at the assigned ramps (i.e., individual samplers will cover early-, mid-, and late-shifts) from approximately from dawn until dark in order to intercept all boats. All anglers and fish exiting the fishery through the sampled sites will be counted. Any boats that are missed at the sampled sites will be counted and recorded on the sampling forms.

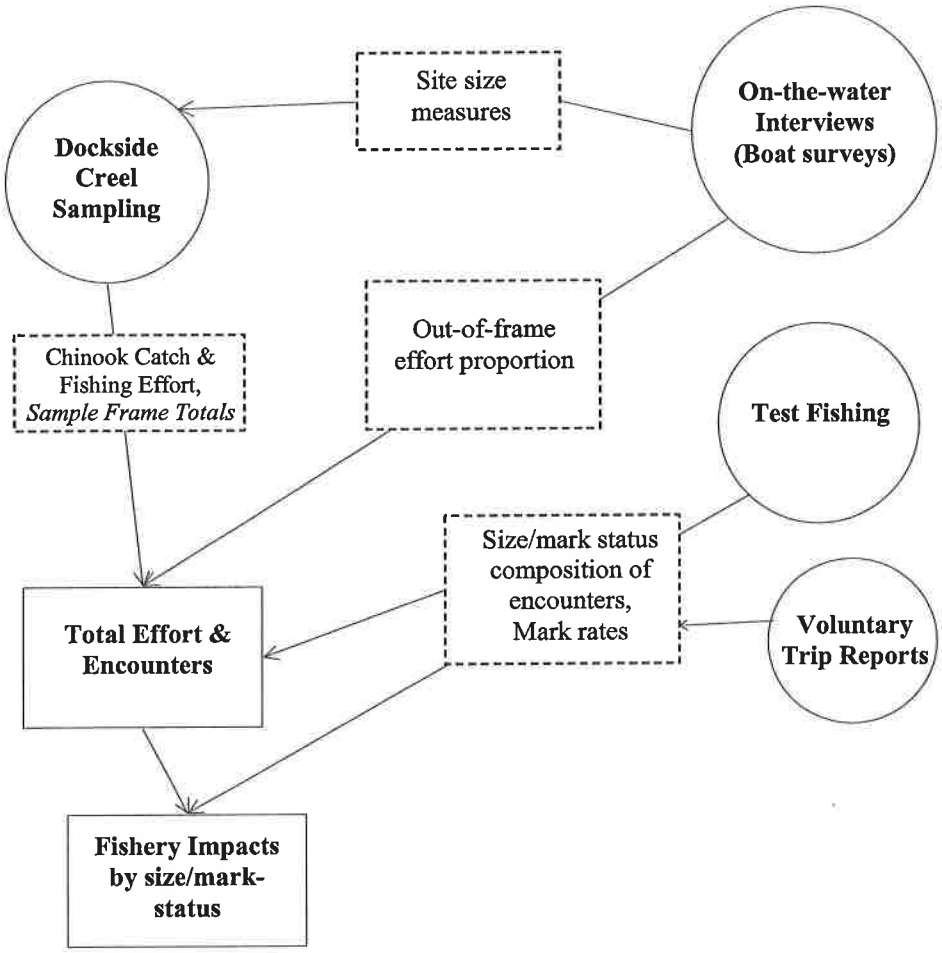

Figure 9/10-1. Conceptual diagram of the monitoring plan proposed for the **Areas 9 and 10 summer** mark-selective Chinook season. Circles represent discrete sampling activities, dashed boxes represent parameters that are estimated using data from a given activity, and solid boxes depict key quantities estimated from the comprehensive plan. 'Encounters' includes both harvested and released Chinook salmon.

The sites in our sample frame in Areas 9 and 10 will likely include the following sites:

Southern Area 9:

- Everett Ramp
- Edmonds Ramp
- Shilshole Ramp
- Mukilteo Ramp
- Kingston Ramp

Northern/Mid Area 9:

- Salsbury Ramp
- Point No Point
- Port Townsend Boat Haven
- Fort Worden Ramp

- Fort Casey

Area 10:

- Shilshole Ramp
- Armeni Ramp
- Manchester Ramp
- Everett Ramp
- Edmonds Ramp
- Kingston Ramp

On-the-water Surveys

On-the-water surveys (boat surveys) will be employed to estimate the percent of effort from sites in our sample frame versus sites outside of the frame (e.g., never-sampled sites). Boat surveys will cover the entire area to pick up effort from all launch sites. We will ask boat occupants where they will tie up or exit the fishery rather than where they launched. We will calculate the size measures of Areas 9 and 10 sites based on the most recently available boat survey data.

We will strive for a minimum sample size of one hundred boats per time period stratum (weekday and weekend strata), or as many boats as possible. In addition, boat surveys will be conducted whenever anything changes in the fishery that could affect effort patterns (e.g., if launch sites open or close or if adjacent catch areas open or close). The boat survey data will be used to expand site estimates to all sites accessing the fishery.

Harvest and Effort Estimates

The harvest and effort observed at the Murthy-based sampled sites in Areas 9 and 10 will be expanded to all access sites (based on estimated site size measures) to estimate total harvest for the day. Sample data will be combined and expanded to create stratum estimates of harvest and effort with variances.

Assumptions

Harvest and effort estimates are based on the following assumptions:

- Boat surveys provide an unbiased estimate of the proportion of anglers accessing fisheries from sites in our sample site frame and sites outside the frame.
- The proportion of total effort accessing the fishery at site A represents the proportion of total catch landed at site A.
- All anglers exiting at a sampled site are interviewed and all anglers accurately report their harvest. If any boats are missed they are counted and catch and effort estimates are expanded appropriately.
- CPUE does not differ significantly between sites in our sample frame and sites outside our sample frame.

Estimates of Total Encounters

We will estimate total Chinook encounters in the Areas 9 and 10 summer selective Chinook fishery using the bias-corrected approach developed by Conrad and McHugh (2008). Briefly, with the Conrad and McHugh (2008) method, Chinook encounters are estimated by dividing the estimate of legal-marked Chinook harvest by the estimated proportion of the fishable Chinook population that is of legal size and marked. Given that our former "Method 2" approach (e.g., WDFW 2008a) yields negatively biased estimates if anglers release any of the legal-marked Chinook they encounter, Conrad and McHugh estimated a "correction" factor to account for this phenomenon and incorporated it into their estimator. Applying Conrad and McHugh's (2008) approach within the design proposed in **Figure 9/10-1**, we would estimate total Chinook encounters by dividing the estimate of legal-marked Chinook harvest (obtained via creel surveys) by the estimated proportion of the fishable Chinook population that is of legal size and marked (obtained via test fishing data), and we would apply their recommended bias correction factor.

Dockside Fishing Method Question

During dockside interviews, samplers will record the predominant (based on time) angling method employed by the boat being interviewed, for the boats that successfully encountered Chinook. Responses will be recorded on the sampling form according to the following five fishing method categories:

1. Weight & Bait (W): Mooching or slow trolling with lead and herring/anchovy.
2. Downrigger Trolling (DR): Using either hardware or bait or any combination.
3. Jigging (J): Drifting, jerking pole up and down; for example using Buzz Bombs, Point Wilson Darts, or Crippled Herring.
4. Diver Trolling (DV): For example trolling with a Deep Six or a Pink Lady, using either hardware or bait or any combination.
5. Other (O): For example fly fishing, or trolling bucktails with or without weight.

The sampling supervisor will summarize the above information for anglers encountering Chinook and instruct the test boat samplers on which method to employ in order to adequately represent the fishing methods used by the recreational fleet.

CWT Sampling

We will sample for coded wire tags (CWT) in the Areas 9 and 10 summer mark-selective Chinook fisheries as part of our dockside angler interviews. The objective is to provide stock specific estimation (by hatchery and brood year) of population parameters, such as fishery contribution and marine survival, as part of the coast-wide CWT program. The sample rate goal for CWT recovery is 20% in mark-selective Chinook fisheries. During dockside interviews samplers will inspect landed Chinook and coho salmon for the presence of coded-wire tags using wand CWT detectors, and snouts will be collected from all fish containing CWTs. For post-season analyses and reporting, CWT data will be used to estimate stock composition by hatchery and brood year. Total unmarked double index tagged (DIT) mortality estimates will be produced post-season.

Test Fishing

WDFW will operate one test boat in each area (one in Area 9 and another in Area 10) to collect encounter rate and mark rate information during the 2012 summer selective Chinook fishery in Areas 9 and 10. The crew in each boat will consist of two WDFW technicians fishing with one rod each. The test boats will fish

approximately five days per week (weather permitting). For each hook-up, the encounter number, time sampled, species, mark status, and DNA vial number (if applicable) will be recorded. Samplers will collect scales, fork lengths, and total lengths on all Chinook brought on board. Legal-size Chinook are 22 inches total length (56 cm) and larger, while sublegal-size Chinook are less than 22 inches total length. Samplers also will use scissors to remove a 1-cm^2 piece of the dorsal fin for DNA analysis. All fish will be handled carefully and immediately released. The test boat will operate in areas where sport and test catches would be high enough to warrant test fishing. Based on the input of the WDFW and NWIFC biometricians, we will work to achieve recommended sample sizes of Chinook encounters and acceptable precision levels for the mark rate estimates.

Charter Vessels

We plan to separate charter vessels from private (non-charter) boats in generating the catch estimates for Areas 9 and 10, to reduce potential bias and improve the precision in our estimates. Charter boats will be treated separately and excluded from our Murthy estimate due to their high catch per unit of effort compared to private boats, and because charter boats do not necessarily exit the fishery via our sampled sites. We will rely on the Murthy estimator method to estimate total salmon encounters for private boats in Areas 9 and 10, while a complete census approach will be used for charter boats.

To obtain the complete census of Chinook encounters and angler trips from charter boat operators, we will call all possible charter operators that fished in Areas 9 and 10 during the summer selective Chinook fishery period. We will ask charter operators to report complete counts of salmon encounters and number of trips via Voluntary Trip Report (VTR) forms. VTR data included the date of the fishing trip, number of anglers, target species, CRC Area, each Chinook or coho hooked, whether the fish was kept or released, species (if they positively identified the fish), total length to the nearest 1/8th inch, and whether the fish was adipose fin-clipped or not clipped.

Voluntary Trip Reports from Private Vessels

Additional information on adipose mark rates and the percentage of Chinook that are legal size (22 inches [56 cm] total length and larger) versus sublegal size (less than 22 inches) will be obtained from Voluntary Trip Reports (VTR's) submitted by private-boat anglers during the Areas 9 and 10 mark selective Chinook fishery. Anglers will be asked to record on the VTR forms the date, number of anglers, target species, CRC Area, each Chinook or coho hooked, whether the fish was kept or released, species (if they positively identified the fish), total length to the nearest 1/8th inch, and whether the fish was adipose fin-clipped or not clipped.

We will take several measures to help ensure the success of our VTR program. First, samplers will distribute our new and improved, user-friendly VTR form that is easier for anglers to complete compared to the old VTR form. Samplers will maximize the distribution of VTRs by handing out VTRs as anglers launch, and collecting the VTRs as anglers exit the fishery. Additionally, samplers will provide participants with a brochure describing the intent of VTRs and their significance to fishery monitoring, and answer VTR-related questions. To increase the response rate, participants are given three options for returning completed VTRs to WDFW: hand-delivering them to samplers, placing them in on-site drop boxes, or sending them via U.S. mail (pre-paid); if they are unsuccessful (i.e., no encounters occurred [harvested or released]) on their trip, the VTR samplers will request that participants keep their forms for future trips.

We will estimate the mark rates of legal-size and sublegal-size Chinook via calculating the season average mark rate from VTR's. We will calculate the proportion of Chinook that were legal-size and marked, legal-size and unmarked, sublegal-size and marked, and sublegal-size and unmarked. We will then compare VTR results with results from the test fishery in Areas 9 and 10.

Reporting Schedule

Weekly in-season catch and effort estimates with variances will be distributed electronically, within the week following the week being reported. A final report will be written and distributed by February 1, 2013, with a post-season analysis of all data collected in the 2012 Area 9 and 10 summer selective Chinook fishery.

Sampling Rates and Staffing Levels

WDFW will meet or exceed the sampling rate goal of 20% during the selective Chinook fishery time period via increased staffing levels as compared to non-selective fisheries. **Table 9/10-1** shows staffing levels needed to implement the intensive monitoring plan for the summer selective Chinook fisheries in Areas 9 and 10.

Table 9/10-1: Number of Additional Staff Required for Monitoring the 2012 Summer Selective Chinook Fisheries in Areas 9 and 10.

Month	Area 9	Area 10	Test Fishing Boat Staff
July (7/16-7/31)	6	4	4
August	6	4	4

5/1/12

April 11, 2012

2012-2013 Area 9 Winter Period Mark-Selective Sport Fishery

The Northwest Treaty Tribes and the Washington Department of Fish and Wildlife (WDFW) have reached agreement to implement a Chinook salmon mark-selective fishery in Area 9, during the winter period from November 1 -30, 2012, and January 16 to April 15, 2013. This fishery will be implemented consistent with management objectives defined by the co-managers' Puget Sound Chinook Harvest Management Plan (April, 2010), the WDFW-Tulalip management plan for hatchery origin fish (2005 Memorandum of Understanding), and established principles concerning the allocation of harvestable salmon and the exercise of treaty rights. The co-managers will seek to minimize or eliminate any unintended effects of this fishery on individual treaty fisheries, including dislocation and/or disruption. Therefore, treaty fisheries will not be modified in order to accommodate this mark-selective fishery.

For 2012-2013, the co-managers further agree that:

- Total encounters of marked and unmarked, legal and sub-legal-sized Chinook will be estimated through a monitoring and sampling program (Attachment A). If at any time during the fishery total legal-size encounters estimated from this program are expected to exceed the preseason forecasted level of 1,615 Chinook (FRAM 1512) by more than 10%, then the fishery will be modified to control impacts on stocks of concern; and
- All subarea closures that are part of the co-managers' 2012-2013 fisheries agreement will be in effect in Area 9 and during the time period that the agreed Chinook mark-selective fishery is being conducted.

Fishery Intent

The winter period mark-selective fishery in Area 9 has been implemented to provide recreational fishing opportunity directed at hatchery Chinook salmon. Sampling and monitoring programs implemented with this fishery are intended to provide information necessary to evaluate and plan potential future chinook mark-selective fisheries. The sampling program will provide a basis for determining if the data needed to estimate critical management and analysis parameters can be collected and if the sample sizes needed to produce these estimates with agreed levels of precision can be realistically obtained. Prior to the 2013-14 season, WDFW and the tribes will jointly review and analyze results of the sampling and monitoring program for these fisheries to evaluate the effectiveness at achieving the intended objectives.

Data Needs for Evaluating the Fishery

Monitoring, sampling and reporting programs are being implemented by WDFW for the purpose of providing data necessary to estimate the impact of these mark-selective fisheries and to support the evaluation of future mark-selective fisheries.

WDFW will carry out the monitoring, sampling and reporting program described for the Area 9 winter Chinook mark-selective fishery in Attachment A. On-water as well as shore-based surveys and sampling techniques will be employed, in addition to an intensive voluntary trip report program, with the intention of collecting data that will form the basis of post-season analyses and evaluation of performance. During the conduct of these fisheries WDFW will maintain sampling rates in areas 5-13 at levels equivalent to or greater than rates achieved in the most recent two-years. This monitoring, sampling and reporting program is part of the WDFW Puget Sound monitoring and sampling operational plan documented with the co-managers' preseason fishing plan.

These monitoring and sampling programs are designed to provide data to estimate the following parameters:

- the mark rate in the fishery - marked and unmarked encounters will be estimated by both on-water and shore-based programs;
- the number of fish retained or landed - marked and unmarked fish will be estimated using a shore-based program, including CWT and scale-age sampling;
- the number of unmarked fish released - estimated by shore-based and on-water programs;
- the number of unmarked fish retained - estimated by a shore-based program;
- the number of marked fish released - estimated by a shore-based program in conjunction with on-water mark rate encounter estimates;
- the number of the chinook encounters that are of sub legal size - estimated by shore-based and on-water programs;
- the stock composition of the mortalities – estimated by CWT data collected in the shore-based sampling program;
- estimates of marked and unmarked mortalities of double-index tagged and other CWT stocks.

Post season report

A preliminary post-season report will be written and distributed by November 30, 2013, containing a post-season analysis of all data collected in the 2012-13 Area 9 winter selective Chinook fishery.

Data Needs for Post-Season Estimation of Stock-Specific Unmarked Fish Mortalities

The co-managers agree to implement these fisheries with the understanding that the capability to estimate stock-specific unmarked fish mortalities is preserved. Methods for estimating unmarked mortalities of double-index tagged CWT stocks within this mark-selective chinook fishery will be determined jointly by co-managers, considering recommendations of the Selective Fisheries Evaluation Committee of the Pacific Salmon Commission. WDFW will be responsible for reporting the necessary fishery information and data to the Pacific States Marine Fishery Commission that allows these estimates to be generated.

In the postseason report (see previous section), WDFW will provide estimates of unmarked mortalities, by DIT group (by stock and age) and area. Unmarked DIT recoveries will be estimated based on estimated recoveries of marked DIT fish and assuming:

1. DIT release numbers provide a reasonable estimate of the unmarked to marked fish ratio; and,
2. the mortality rate for chinook caught and released in the fishery (sfm) is known.

The assumption that the DIT release numbers provide a reasonable estimate of the unmarked to marked fish ratio will be evaluated through post-season comparisons of DIT tag groups. A design for these comparisons will be developed jointly by the co-managers following the method used in analyzing coho DIT groups.[1] All information from this fishery necessary for making these comparisons is assumed to be included in the sampling design and will be included in the post-season report.

Estimates of total fishery related mortalities, including the total exploitation rate or the southern US exploitation rate, that represent the co-managers' management objectives for Puget Sound chinook management units, are made by combining mortality estimates in mark-selective fisheries with mortality estimates in non-selective fisheries. To ensure that all information necessary to make these estimates is collected, plans for sampling and monitoring of the winter selective fishery in Area 9, as well as other mark-selective and non-selective fisheries will be included as a component of the co-managers' annual pre-season agreement.

[1] *Analysis of coho salmon double-index tag (DIT) data. 2003*

Attachment A

MONITORING THE WINTER AREA 9 SELECTIVE CHINOOK FISHERY, NOVEMBER 2012 AND JANUARY 16 THROUGH APRIL 15, 2013

Overview

The WDFW Puget Sound Sampling Program will intensively monitor the proposed mark-selective Chinook fishery in Area 9 during November 2012 and from January 16 through April 15, 2013, using comprehensive data collection strategies consisting of dockside sampling, aerial surveys, test fishing, and voluntary trip reports, as detailed below. The proposed sample design is an aerial-access site design that was effective in producing in-season estimates during the previous three seasons in Areas 7 and 9 (e.g., WDFW 2009a and 2009b).

The aerial-based design differs from our usual Murthy estimator method (Murthy 1957; Cochran 1977) primarily in terms of the approach used for assessing fishery-wide effort. This design is particularly suited for large geographic areas such as Area 9 during the winter season. The design is a "Modified Murthy" approach that will incorporate aerial survey-based total effort counts, rather than the approach in which on-the-water surveys are conducted to assess proportions of effort accessing the fishery from sampled and non-sampled sites. Due to the large geographic expanse of Area 9, and because of expected adverse conditions on the water during winter time, we determined that the usual boat-based approach for assessing proportions of effort (site size measures) would be riskier (to both the success of the study and safety of field personnel) and far more costly than the aerial-based Modified Murthy approach described below.

Sampling Objectives

We will implement the comprehensive monitoring plan depicted in **Figure 9-1** to estimate total *i*) Chinook encounters (*C*; retained and released by mark status) and *ii*) angler effort (*E*) due to pilot Area-9 winter mark-selective Chinook fishery, and to evaluate additional key selective fishery sampling objectives, including: *iii*) quantify the size and mark-status composition of the fishable Chinook population via test fishing; *iv*) recover CWTs and assessing the impact of the selective fishery on DIT groups; *v*) estimate the age composition of and test fishery- and landed dockside-sampled Chinook; and *iv*) estimate total fishery impacts (encounters and mortality) and comparing these values to pre-season modeling (FRAM) expectations.

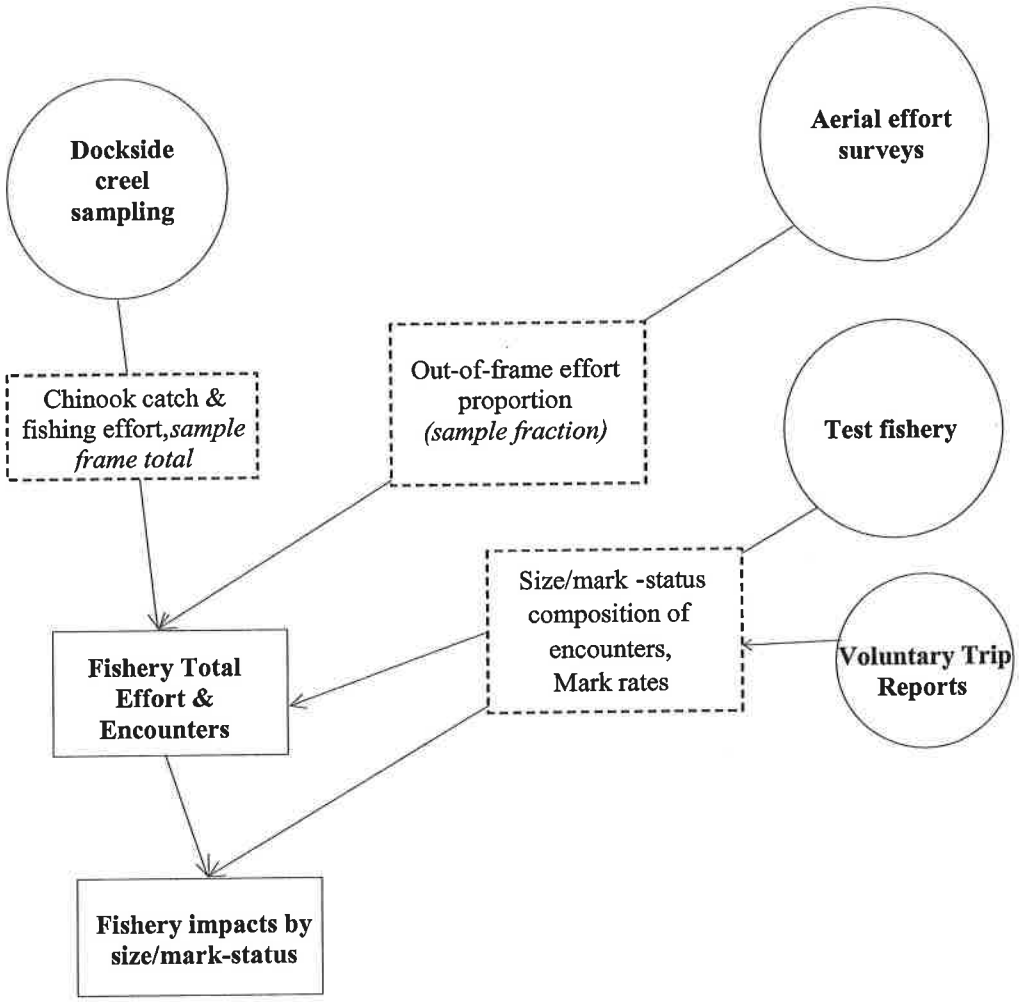

Figure 9-1. Conceptual diagram of the monitoring plan proposed for the **Area 9 winter** mark-selective Chinook fishery season. Circles represent discrete sampling activities, dashed boxes represent parameters that are estimated using data from a given activity, and solid boxes depict key quantities estimated from the comprehensive plan. 'Encounters' includes both harvested and released Chinook salmon.

Design Overview

We will achieve our Area-9 objectives using a complemented aerial–access design (**Figure 9-1** and **9-2**), whereby:

i) Total encounters (C_{ds}, separate estimates for landed and released) and effort (E_{ds}) will be estimated for all anglers at sampled access sites (e.g., sites in our dockside sample frame; see below) using completed-trip interview data collected through a multistage sample design.

ii) A sampling fraction (*f*) for expanding sample-frame estimates of encounters and effort (C_{ds} and E_{ds}) to fishery-wide totals (C_{tot} and E_{tot}) will be estimated using data from paired aerial and dockside effort-sampling events.

Dockside sampling— Completed-trip interview data will be collected using a stratified three-stage cluster sample design. For each two-week temporal stratum throughout the fishery, the three-stage cluster sample design will be implemented as follows,

- Sample days will be selected (randomly) from weekday (Mon-Thurs, n = 2 out of 8 possible weekday days for each two week interval) and weekend (Fri-Sun, n = 2 out of 3 possible weekend days for each week) strata at the first stage.

- At the second stage, all access sites in the sample site frame (n = 4 sites) will be selected for sampling (i.e., this will be a census of the four dockside sample-frame sites; probability proportional to 1 for site selection),
- All anglers accessing the fishery at a particular site (the clusters) will be interviewed at the third stage.

As in other selective fishery surveys, on fishing trip duration information (start and end times), the number of anglers and boats fishing, and total salmon encounters (retained and released) by species and mark status, will be collected during post-trip dockside interviews. These data, in conjunction with site size measures determined for the sites in the dockside sample frame, will allow estimation of C_{ds} and E_{ds} for the entire dockside sample frame using the Murthy total estimator (Murthy 1957; Cochran 1977).

The sites included in the Area-9 dockside sample frame will be the four assumed highest-use access sites (two in northern Area 9 and two in southern Area 9), based on site size measure data collected during the previous season of the Area 9 winter selective Chinook fishery. The four sample-frame sites will likely consist of Port Townsend Ramp, Kingston Ramp, Everett Ramp, and Edmonds Ramp (or Mukilteo Ramp).

Size measures will be estimated for each site in our sample frame via complete daily effort counts recorded by samplers stationed at each of the four sampled sites on a subset of sample days (i.e., number of boats and anglers returning to the ramp from dawn to dark). These dockside effort data will e used to determine the proportion of anglers accessing the fishery at each of the four sampled sites relative to the total number of anglers summed across the four sampled sites (size measures will sum to 1 across the four sites in the sample frame). Following an adjustment to scale sample-frame estimates of catch and effort to fishery-total estimates (described below), parameter values will be expanded to stratum totals. Depending on the proportion of effort contained in the sample frame (as determined through sampling early in the fishery), the variability in size measures observed for the sample frame, and the availability of resources, we may opt to staff all sample-frame sites for all selected sample days during the season (i.e., *we will obtain a census of catch and effort for sites in our sample frame on scheduled sample days*).

Aerial surveys.—In order to obtain fishery-wide parameter values, we will collect the data necessary to expand sample-frame estimates to "never-sampled" (i.e., out of the frame) access sites and thus the total fishery. Thus, on a subset of randomly selected days where dockside sampling is scheduled (n = 5 target per month), we will also conduct an aerial survey to estimate total fishing effort for the entire CRC area (i.e., including effort originating from never-sampled sites and those that are in our dockside frame). While survey days will be randomly chosen, flight times will be scheduled in order to coincide with peak (and relatively stable) periods of angler activity. This flight will provide an instantaneous aerial effort count (i.e., number of boats, b_i) that can then be expanded to a fishery-wide total (E_i^{tot}) based on the activity profile estimated for that particular day; i.e., aerial counts will be expanded based on the proportion of anglers fishing on a given day that were active during the aerial survey, P:

$$(1) \qquad E_i^{tot} = b_i / P_i$$

where,

E_i^{tot} = the total fishing effort on day i;

b_i = the number of boats enumerated in the aerial survey on day i;

P_i = the proportion of anglers that were active during the aerial survey on day i,

and where P_i is estimated number of anglers active in the aerial survey area divided by the total number of anglers interviewed as follows,

$$P_i = \frac{a_i}{A_i},$$

where,

a_i = the number of anglers that were active in the aerial survey area on day *i* and;

A_i = the total number of anglers surveyed on day *i*.

Although dockside *CPUE* estimates for a particular day could be used in conjunction with this total effort estimate to estimate C_{tot} for that same day (e.g., as was used for the aerial-access design approach implemented in Volstad *et al.* 2006), we will focus aerial surveys only on obtaining an accurate estimate of season-wide sampling fraction, *f*, due to reasons discussed in WDFW 2008b. We will fly on fewer occasions (than the previously-discussed aerial-access method would require) and instead use aerial effort estimates (E_i^{tot}) in conjunction with dockside effort estimates (E_i^{ds}) to estimate a season-wide sampling fraction, f, for converting dockside Chinook encounters and effort estimates into fishery-wide totals (C_{tot} and E_{tot}). The ratio of total effort to sample-frame estimate, f, is as follows:

$$(2) \qquad f = \frac{\sum_{i=1}^{n} E_i^{ds}}{\sum_{i=1}^{n} E_i^{tot}},$$

Accordingly, for days when no aerial survey is conducted, the daily dockside estimates of catch (C_j^{tot}) and effort (E_j^{tot}) will be expanded to fishery total values by *f* as follows, respectively,

$$(3) \qquad C_j^{tot} = \frac{C_j^{ds}}{f} \text{ and } E_j^{tot} = \frac{E_j^{ds}}{f}$$

and then the usual stratum- and season-total estimation procedure will be followed. Thus, the design relies on both dockside sampling (the primary emphasis) aerial effort surveys (auxiliary information) to achieve total-fishery parameter estimation. This approach is similar to Canada-DFO's use of aerial–access sampling to estimate recreational fishery statistics in the Strait of Georgia to the north of Area 7 (this survey and its estimators has undergone rigorous theoretical review in recent years; see Dauk 2001 for details).

Assumptions

For this approach to yield unbiased estimates of catch and effort, a number of assumptions must be met. First, the usual Murthy-design assumptions apply and are,

- For sites contained in the sample, access-site size measures are accurately estimated and reflect proportional differences in catch landed across sites.
- CPUE does not differ between sampled and non-sampled sites.
- All anglers are interviewed and accurately report catch and encounters.

Second, by adding the aerial–access based sampling fraction to our calculations, we also assume the following:

- The relative proportion of effort originating from sites within and outside of our sample frame does not differ between fair weather (i.e., when flight is possible) and poor weather days (i.e., when aerial surveys cannot be done).
- All boats that are actively fishing are accurately counted (e.g., boats are neither missed nor double counted)
- Boat ingress and egress rates are equal.
- Anglers accurately report their periods of fishing activity.
- The relative proportion of effort originating from sampled and un-sampled sites does not differ between weekday and weekend days.

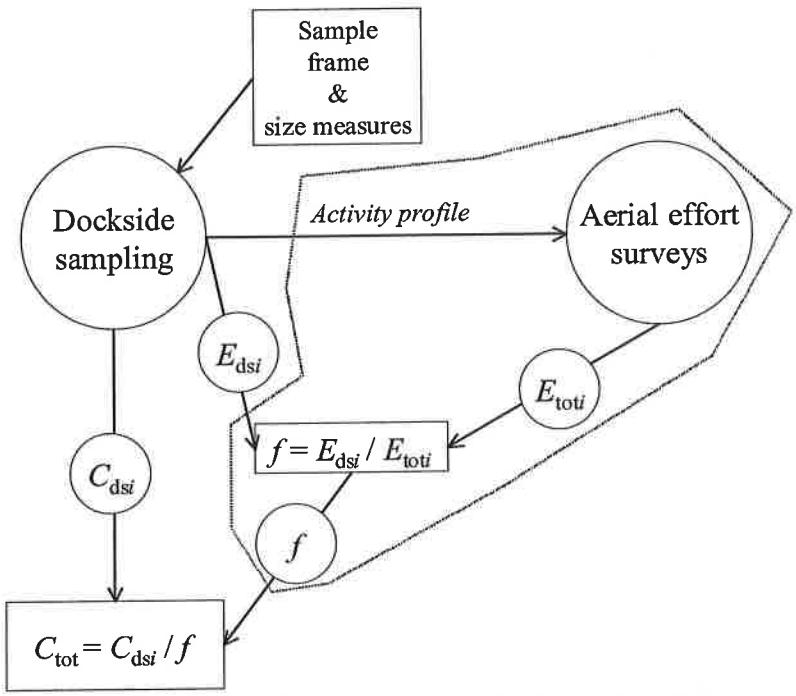

Figure 9-2. A schematic of the Area-9 sampling plan demonstrating the relationship among sampling components and estimators. Note that the dockside interview element used to expand instantaneous aerial boat counts to daily totals (i.e., the '*Activity profile*', based on trip start and end time reports) is not used in sample frame-only catch and effort estimation. Features contained in the dashed polygon are estimated for paired aerial–access sample days only; dockside sampling will occur on all scheduled sample days.

Estimates of Total Encounters

We will estimate total Chinook encounters in the Area 9 winter selective Chinook fishery using the bias-corrected approach developed by Conrad and McHugh (2008). Briefly, with the Conrad and McHugh (2008) method, Chinook encounters are estimated by dividing the estimate of legal-marked Chinook harvest by the estimated proportion of the fishable Chinook population that is of legal size and marked. Given that our former "Method 2" approach (e.g., WDFW 2008a) yields negatively biased estimates if anglers release any of the legal-marked Chinook they encounter, Conrad and McHugh estimated a "correction" factor to account for this phenomenon and incorporated it into their estimator. Applying Conrad and McHugh's (2008) approach within the design proposed in **Figure 9-1**, we would estimate total Chinook encounters by dividing the estimate of legal-marked Chinook harvest (obtained via aerial-access creel surveys) by the estimated proportion of the fishable Chinook population that is of legal size

and marked (obtained via test fishing data).

Dockside Fishing Method Question

During dockside interviews, samplers will record the predominant (based on time) angling method employed by the boat being interviewed, for the boats that successfully encountered Chinook. Responses will be recorded on the sampling form according to the following five fishing method categories:

1. Weight & Bait (W): Mooching or slow trolling with lead and herring/anchovy.
2. Downrigger Trolling (DR): Using either hardware or bait or any combination.
3. Jigging (J): Drifting, jerking pole up and down; for example using Buzz Bombs, Point Wilson Darts, or Crippled Herring.
4. Diver Trolling (DV): For example trolling with a Deep Six or a Pink Lady, using either hardware or bait or any combination.
5. Other (O): For example fly fishing, or trolling bucktails with or without weight.

The sampling supervisor will summarize the above information for anglers encountering Chinook and instruct the test boat samplers on which method to employ in order to adequately represent the fishing methods used by the recreational fleet.

Test Fishing

WDFW will operate one test boat in Area 9 to collect encounter rate and mark rate information during the winter selective Chinook fishery. The crew will consist of two WDFW technicians fishing with one rod each. The test boat will fish approximately five days per week (weather permitting). For each hook-up, the encounter number, time sampled, species, mark status, and DNA vial number (if applicable) will be recorded. Samplers will collect scales, fork lengths, and total lengths on all Chinook brought on board. Legal-size Chinook are 22 inches (56 cm) total length and larger, while sublegal-size Chinook are less than 22 inches total length. Samplers also will use scissors to remove a 1-cm^2 piece of the dorsal fin for DNA analysis. All fish will be handled carefully and immediately released. The test boat will operate in areas where sport and test catches would be high enough to warrant test fishing. Based on the input of the WDFW and NWIFC biometricians, we will work to achieve recommended sample sizes of Chinook encounters and acceptable precision levels for the mark rate estimates.

Charter Vessels

Similar to our approach applied during the winter 2011-12 season, charter vessel data will be included in Murthy estimates for the 2012-13 Area 9 winter mark-selective fishery. In a previous analysis of catch and effort data from the first two winter seasons in Area 9 (shared with NWIFC Biometrician, Bob Conrad), we determined that pooling charter and fleet data in the Murthy estimates will not significantly compromise estimate integrity in the Area 9 winter mark-selective fishery. In our analysis, the combination of charter effort proportions (very small) and CPUE ratios (relatively high) suggested that pooling will cause negligible (<3%) bias; therefore, we elected to include charter vessels in our Murthy estimate for the Area 9 winter fishery.

Voluntary Trip Reports

Information on adipose mark rates and the percentage of Chinook that are legal size (22 inches [56 cm] total length and larger) versus sublegal size (less than 22 inches) will be obtained from Voluntary Trip Reports (VTR's) submitted by private-boat anglers during the mark selective Chinook fishery in Area 9.

Anglers will be asked to record on the VTR forms the date, number of anglers, target species, CRC Area, each Chinook or coho hooked, whether the fish was kept or released, species (if they positively identified the fish), total length to the nearest 1/8th inch, and whether the fish was adipose fin-clipped or not clipped.

We will estimate the mark rates of legal-size and sublegal-size Chinook via calculating the average mark rate from VTR's. We will calculate the proportion of Chinook that were legal-size and marked, legal-size and unmarked, sublegal-size and marked, and sublegal-size and unmarked. We will then compare VTR results with results from the test fishery in Area 9.

We will take several measures to help ensure the success of our VTR program. First, samplers will distribute our new and improved, user-friendly VTR form that is easier for anglers to complete compared to the old VTR form. Samplers will maximize the distribution of VTRs by handing out VTRs as anglers launch, and collecting the VTRs as anglers exit the fishery. Additionally, samplers will provide participants with a brochure describing the intent of VTRs and their significance to fishery monitoring, and answer VTR-related questions. To increase the response rate, participants are given three options for returning completed VTRs to WDFW: hand-delivering them to samplers, placing them in on-site drop boxes, or sending them via U.S. mail (pre-paid); if they are unsuccessful (i.e., no encounters occurred [harvested or released]) on their trip, the VTR samplers will request that participants keep their forms for future trips.

Reporting Schedule

A final report will be written and distributed by November 30, 2013, with a full post-season analysis of all data collected in the 2012-13 Area 9 winter selective Chinook fishery.

Sampling Rates and Staffing Levels

WDFW intends to meet or exceed the 20% sample rate goal defined for all selective Chinook fisheries via increased staffing levels as compared to non-selective fisheries. **Table 9-1** shows staffing levels needed to implement the proposed intensive monitoring of the selective Chinook fishery in Area 9.

Table 9-1: Number of Additional Staff Required for Monitoring the Selective Chinook Fishery in Area 9, November 2012 and January 16 through April 15, 2013.

Month	Area 9 Dockside Samplers	Area 9 Test Boat Staff (1 Boat)
Nov	4	2
Jan (16-31)	4	2
Feb	4	2
Mar	4	2
April (1-15)	4	2

5/1/12

April 11, 2012

2012-2013 Area 10 Winter Period Mark-Selective Sport Fishery

The Northwest Treaty Tribes and the Washington Department of Fish and Wildlife (WDFW) have reached agreement to implement a Chinook salmon mark-selective fishery in Area 10, during the winter period from October 1, 2012 to January 31, 2013. This fishery will be implemented consistent with management objectives defined by the co-managers' Puget Sound Chinook Harvest Management Plan (April, 2010), the WDFW-Tulalip management plan for hatchery origin fish (2005 Memorandum of Understanding), and established principles concerning the allocation of harvestable salmon and the exercise of treaty rights. The co-managers will seek to minimize or eliminate any unintended effects of this fishery on individual treaty fisheries, including dislocation and/or disruption. Therefore, treaty fisheries will not be modified in order to accommodate this mark-selective fishery.

For 2012-2013, the co-managers further agree that:

- Total encounters of marked and unmarked legal and sub-legal sized Chinook will be estimated through a monitoring and sampling program (Attachment A). If at any time during the fishery total legal size encounters estimated from this program are expected to exceed the preseason forecasted level of 2,925 Chinook (FRAM 1512) by more than 10%, then the fishery will be modified to control impacts on stocks of concern; and
- All subarea closures that are part of the co managers' 2012-2013 fisheries agreement will be in effect in Area 10 and during the time period that the agreed Chinook mark-selective fishery is being conducted.

Fishery Intent

The winter period mark-selective fishery in Area 10 has been implemented to provide recreational fishing opportunity directed at hatchery Chinook salmon. Sampling and monitoring programs implemented with this fishery are intended to provide information necessary to evaluate and plan potential future Chinook mark-selective fisheries. The sampling program will provide a basis for determining if the data needed to estimate critical management and analysis parameters can be collected and if the sample sizes needed to produce these estimates with agreed levels of precision can be realistically obtained. Prior to the 2013-14 season, WDFW and the tribes will jointly review and analyze results of the sampling and monitoring program for these fisheries to evaluate the effectiveness at achieving the intended objectives.

Data Needs for Evaluating the Fishery

Monitoring, sampling and reporting programs are being implemented by WDFW for the purpose of providing data necessary to estimate the impact of these mark-selective fisheries and to support the evaluation of future mark-selective fisheries.

WDFW will carry out the monitoring, sampling and reporting program described for the Area 10 winter Chinook mark-selective fishery in Attachment A. On-water as well as shore-based surveys and sampling techniques will be employed, in addition to an intensive voluntary trip report program, with the intention of collecting data that will form the basis of post-season analyses and evaluation of performance. During the conduct of these fisheries WDFW will maintain sampling rates in areas 5-13 at levels equivalent to or greater than rates achieved in the most recent two-years. This monitoring, sampling and reporting program is part of the WDFW Puget Sound monitoring and sampling operational plan documented with the co-managers' preseason fishing plan.

These monitoring and sampling programs are designed to provide data to estimate the following parameters:

- the mark rate in the fishery - marked and unmarked encounters will be estimated by both on-water and shore-based programs;
- the number of fish retained or landed - marked and unmarked fish will be estimated using a shore-based program, including CWT and scale-age sampling;
- the number of unmarked fish released - estimated by shore-based and on-water programs;
- the number of unmarked fish retained - estimated by a shore-based program;
- the number of marked fish released - estimated by a shore-based program in conjunction with on-water mark rate encounter estimates;
- the number of the chinook encounters that are of sub legal size - estimated by shore-based and on-water programs;
- the stock composition of the mortalities – estimated by CWT and DNA;
- estimates of marked and unmarked mortalities of double-index tagged and other CWT stocks.

Post season report

A preliminary post-season report will be written and distributed by November 30, 2013, containing a post-season analysis of all data collected in the 2012-13Area 10 winter selective Chinook fishery.

Data Needs for Post-Season Estimation of Stock-Specific Unmarked Fish Mortalities

The co-managers agree to implement these fisheries with the understanding that the capability to estimate stock-specific unmarked fish mortalities is preserved. Methods for estimating unmarked mortalities of double-index tagged CWT stocks within this mark-selective chinook fishery will be determined jointly by co-managers, considering recommendations of the Selective Fisheries Evaluation Committee of the Pacific Salmon Commission. WDFW will be responsible for reporting the necessary fishery information and data to the Pacific States Marine Fishery Commission that allows these estimates to be generated.

In the postseason report (see previous section), WDFW will provide estimates of unmarked mortalities, by DIT group (by stock and age) and area. Unmarked DIT recoveries will be estimated based on estimated recoveries of marked DIT fish and assuming:

1. DIT release numbers provide a reasonable estimate of the unmarked to marked fish ratio; and,
2. the mortality rate for chinook caught and released in the fishery (sfm) is known.

The assumption that the DIT release numbers provide a reasonable estimate of the unmarked to marked fish ratio will be evaluated through post-season comparisons of DIT tag groups. A design for these comparisons will be developed jointly by the co-managers following the method used in analyzing coho DIT groups.[1] All information from this fishery necessary for making these comparisons is assumed to be included in the sampling design and will be included in the post-season report.

Estimates of total fishery related mortalities, including the total exploitation rate or the southern US exploitation rate, that represent the co-managers' management objectives for Puget Sound chinook management units, are made by combining mortality estimates in mark-selective fisheries with mortality estimates in non-selective fisheries. To ensure that all information necessary to make these estimates is collected, plans for sampling and monitoring of the winter selective fishery in Area 10, as well as other mark-selective and non-selective fisheries will be included as a component of the co-managers' annual pre-season agreement.

[1] *Analysis of coho salmon double-index tag (DIT) data. 2003*

Attachment A

MONITORING THE AREA 10 WINTER SELECTIVE CHINOOK FISHERY, OCTOBER 1, 2012 THROUGH JANUARY 31, 2013

Overview

The Puget Sound Sampling Program will monitor the mark-selective Chinook fishery in Area 10 during the proposed winter season from October 1, 2012 through January 31, 2013 through comprehensive data collection strategies consisting of dockside sampling, on-the-water surveys, test fishing, and voluntary trip reports from charter boats and private boats, as shown in **Figure 10-1** and detailed below.

The monitoring plan shown in **Figure 10-1** will enable us to estimate the critical data parameters necessary for evaluating pilot mark-selective fisheries as previously identified by the co-managers (e.g., WDFW and NWIFC 2009), including: *i)* the mark rate of the targeted Chinook population (based on test fishery and dockside angler interview data), *ii)* fishery-total angling effort and Chinook salmon encounters (harvest + releases) and mortalities (by size/mark-status class) (e.g., from a combination of test fishery encounter rate data, dockside sampling, and voluntary trip reports), *iii)* the coded-wire tag (CWT)-based stock composition of marked and unmarked Chinook mortalities (from dockside sampling data), and *iv)* fishery-total mortality of marked and unmarked double index tag (DIT) CWT stocks (once post-season CWT sample rates are estimated). In addition, we will acquire and analyze relevant data characterizing other aspects of the pilot fishery, including descriptors of fishing success (catch [landed Chinook] per unit effort, CPUE), the length and age composition of encountered and/or landed Chinook, and the overall intensity of our sampling efforts.

Dockside Sampling

Creel surveys will be implemented during the winter mark-selective Chinook fishery in Area 10 using the modified (i.e., scaled back relative to the full Murthy design employed during the 2007-08 and 2008-09 winter seasons) version of the Murthy estimator method (Murthy 1957, Cochran 1977), in order to produce total-Area estimates of catch and effort with accompanying estimates of variance. Our modified-Murthy approach, as detailed below, will incorporate data from intensive dockside sampling days, combined with site size measures obtained from on-the-water surveys, to produce total-Area catch and effort estimates with variances.

Dockside Sample Design

Sampling strata will be divided into 'weekday' (Monday through Thursday) and 'weekend' (Friday, Saturday, and Sunday) days. For each two-week period of the fishery, we will randomly select n=2 sample days from the N=8 possible weekday stratum days (distributed so there is at least one weekday sampled in each of the two weeks). For the weekend stratum (Friday through Sunday), and we will select n=2 sample days out of the N=3 possible weekend days each week. In total, we will sample 12 site-days every two weeks using the reduced Murthy creel survey design.

Samplers will be stationed at two ramps on each of the selected sampling days. Sites in our sample frame will be selected for sampling via our weighted-random site selection process (e.g., probability proportional to size, using the most current boat survey data). Samplers will achieve 100% sampling coverage at the assigned ramps, with shifts lasting approximately from dawn until dusk (will be adjusted as needed according to changing day lengths throughout the season), in order to intercept all boats. All anglers and fish exiting the fishery through the sampled site will be counted. Any boats that are missed at the sampled site will be counted and recorded on the sampling forms.

In addition, we will sample multiple ramps in Area 10 on the remaining days in the weekday stratum, using baseline-level sampling to ensure that we achieve the 20% sample rate goal.

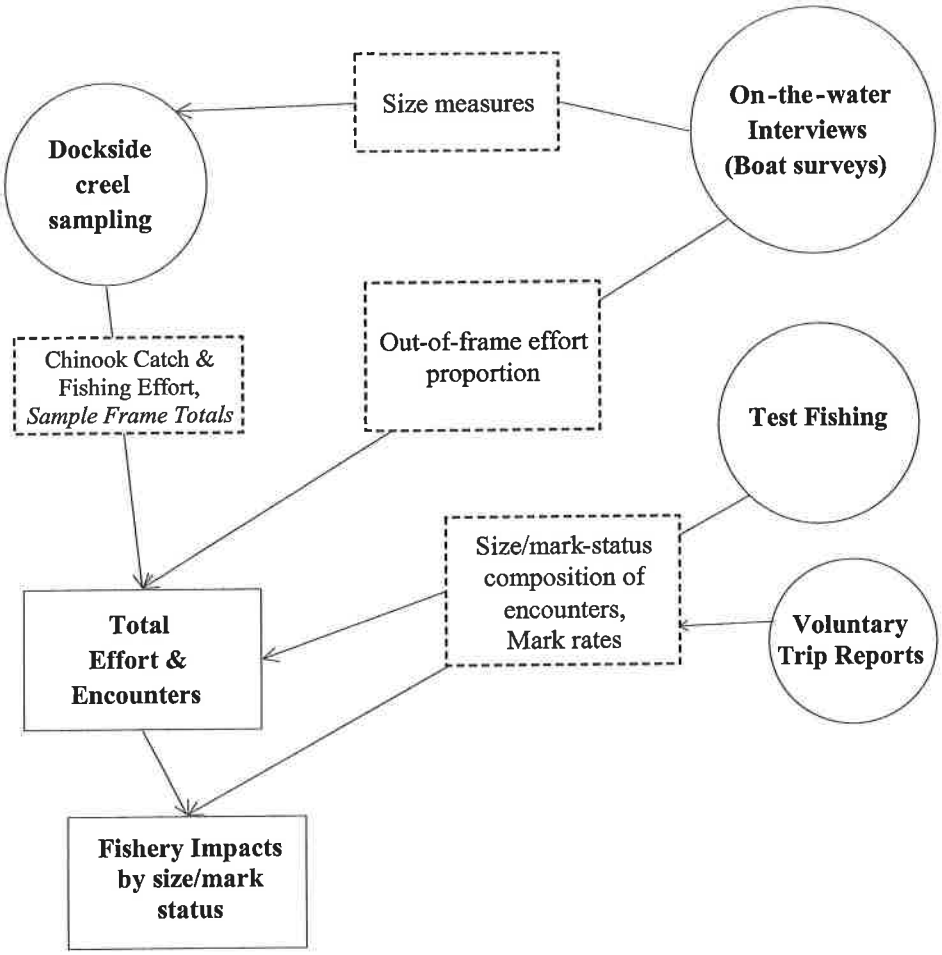

Figure 10-1. Conceptual diagram of the monitoring plan proposed for the **Area 10 winter** mark-selective Chinook season. Circles represent discrete sampling activities, dashed boxes represent parameters that are estimated using data from a given activity, and solid boxes depict key quantities estimated from the comprehensive plan. 'Encounters' includes both harvested and released Chinook salmon.

The sites in our sample frame in Area 10 will likely include the following sites:

- Shilshole Ramp
- Armeni Ramp
- Manchester Ramp
- Everett Ramp
- Edmonds Ramp
- Port Orchard Ramp
- Kingston Ramp

On-the-water Surveys

On-the-water surveys (boat surveys) will be employed to estimate the percent of effort from sites in our sample frame versus sites outside of the frame (e.g., never-sampled sites). Boat surveys will cover the entire area to pick up effort from all launch sites. We will ask boat occupants where they will tie up or exit the fishery rather than where they launched. We will calculate the size measures of Area 10 sites based

on the most recently available boat survey data.

We will conduct an apropraite number surveys in Area 10 throughout the season to update site size measures. In addition, on-the-water surveys will be conducted whenever anything changes in the fishery that could affect effort patterns (e.g., if launch sites open or close or if adjacent catch areas open or close).

We will strive for a minimum sample size of one hundred boats per time period stratum (e.g., using data lumped across one month strata, based on consultation with the WDFW biometrician), or as many samples as possible. Factors such as low angler effort and rough winter weather conditions may result in a lower sample size. The boat survey data will be used to expand site estimates to all sites accessing the fishery.

Harvest and Effort Estimates

The harvest and effort observed at the Murthy-based sampled sites in Area 10 will be expanded to all access sites (based on estimated site size measures) to estimate total harvest for the day. Sample data will be combined and expanded to create stratum estimates of harvest and effort with variances.

To generate weekly catch and effort estimates for Area 10, the four-day "weekday stratum" estimate for Monday-Thursday of each week (based on n=2 days sampled out of N=8 available weekdays per two-week period) will be added to the "weekend stratum" (Friday-Sunday) estimate for the particular week (based on n=2 days sampled out of N=3 available weekend days per week). The eight-day weekday estimates for each two-week period will be split evenly between individual weeks in the two-week block to enable weekly estimates, with variances computed using the n=2 days sampled out of N=8 available weekdays in the appropriate variance equation.

Assumptions

Harvest and effort estimates are based on the following assumptions:

- Boat surveys provide an unbiased estimate of the proportion of anglers accessing fisheries from sites in our sample site frame and sites outside the frame.
- The proportion of total effort accessing the fishery at site A represents the proportion of total catch landed at site A.
- All anglers exiting at a sampled site are interviewed and all anglers accurately report their harvest. If any boats are missed they are counted and catch and effort estimates are expanded appropriately.
- CPUE does not differ significantly between sites in our sample frame and sites outside our sample frame.

Estimates of Total Encounters

We will estimate total Chinook encounters in the Area 10 winter selective Chinook fishery using the bias-corrected approach developed by Conrad and McHugh (2008). Briefly, with the Conrad and McHugh (2008) method, Chinook encounters are estimated by dividing the estimate of legal-marked Chinook harvest by the estimated proportion of the fishable Chinook population that is of legal size and marked. Given that our former "Method 2" approach (e.g., WDFW 2008a) yields negatively biased estimates if anglers release any of the legal-marked Chinook they encounter, Conrad and McHugh estimated a "correction" factor to account for this phenomenon and incorporated it into their estimator. Applying Conrad and McHugh's (2008) approach within the design proposed in **Figure 10-1**, we would estimate total Chinook encounters by dividing the estimate of legal-marked Chinook harvest (obtained via creel surveys) by the estimated proportion of the fishable Chinook population that is of legal size and marked (obtained via test fishing data).

Dockside Fishing Method Question

During dockside interviews, samplers will record the predominant (based on time) angling method employed by the boat being interviewed, for the boats that successfully encountered Chinook. Responses will be recorded on the sampling form according to the following five fishing method categories:

1. Weight & Bait (W): Mooching or slow trolling with lead and herring/anchovy.
2. Downrigger Trolling (DR): Using either hardware or bait or any combination.
3. Jigging (J): Drifting, jerking pole up and down; for example using Buzz Bombs, Point Wilson Darts, or Crippled Herring.
4. Diver Trolling (DV): For example trolling with a Deep Six or a Pink Lady, using either hardware or bait or any combination.
5. Other (O): For example fly fishing, or trolling bucktails with or without weight.

The sampling supervisor will summarize the above information for anglers encountering Chinook and instruct the test boat samplers on which method to employ in order to adequately represent the fishing methods used by the recreational fleet.

CWT Sampling

We will sample for coded wire tags (CWT) in the Area 10 winter mark-selective Chinook fishery as part of our dockside angler interviews. The objective is to provide stock specific estimation (by hatchery and brood year) of population parameters, such as fishery contribution and marine survival, as part of the coast-wide CWT program. The sample rate goal for CWT recovery is 20% in mark-selective Chinook fisheries. During dockside interviews samplers will inspect landed Chinook and coho salmon for the presence of coded-wire tags using wand CWT detectors, and snouts will be collected from all fish containing CWTs. For post-season analyses and reporting, CWT data will be used to estimate stock composition by hatchery and brood year. Total unmarked double index tagged (DIT) mortality estimates will be produced post-season.

Test Fishing

WDFW will operate one test boat in Area 10 to collect encounter rate and mark rate information during the 2012-13 winter selective Chinook fishery. The crew will consist of two WDFW technicians fishing with one rod each. The test boat will fish approximately five days per week (weather permitting). For each hook-up, the encounter number, time sampled, species, mark status, and DNA vial number (if applicable) will be recorded. Samplers will collect scales, fork lengths, and total lengths on all Chinook brought on board. Legal-size Chinook are 22 inches total length (56 cm) and larger, while sublegal-size Chinook are less than 22 inches total length. Samplers also will use scissors to remove a 1-cm^2 piece of the dorsal fin for DNA analysis. All fish will be handled carefully and immediately released. The test boat will operate in areas where sport and test catches would be high enough to warrant test fishing. Based on the input of the WDFW and NWIFC biometricians, we will work to achieve recommended sample sizes of Chinook encounters and acceptable precision levels for the mark rate estimates.

Voluntary Trip Reports

Information on adipose mark rates and the percentage of Chinook that are legal size (22 inches [56 cm] total length and larger) versus sublegal size (less than 22 inches) will be obtained from Voluntary Trip Reports (VTRs) submitted by private-boat anglers during the mark selective Chinook fishery in Area 10. Anglers will be asked to record on the VTR forms the date, number of anglers, target species, CRC Area, each Chinook or coho hooked, whether the fish was kept or released, species (if they positively identified

the fish), total length to the nearest 1/8th inch, and whether the fish was adipose fin-clipped or not clipped.

We will take several measures to help ensure the success of our VTR program. First, samplers will distribute our new and improved, user-friendly VTR form that is easier for anglers to complete compared to the old VTR form. Samplers will maximize the distribution of VTRs by handing out VTRs as anglers launch, and collecting the VTRs as anglers exit the fishery. Additionally, samplers will provide participants with a brochure describing the intent of VTRs and their significance to fishery monitoring, and answer VTR-related questions. To increase the response rate, participants are given three options for returning completed VTRs to WDFW: hand-delivering them to samplers, placing them in on-site drop boxes, or sending them via U.S. mail (pre-paid); if they are unsuccessful (i.e., no encounters occurred [harvested or released]) on their trip, the VTR samplers will request that participants keep their forms for future trips.

From the Area 10 VTR data, we will calculate the proportion of Chinook that were legal-size and marked, legal-size and unmarked, sublegal-size and marked, and sublegal-size and unmarked. We will then compare VTR results with results from the test fishery in Area 10.

Reporting Schedule

A final report will be written and distributed by November 30, 2013, with a post-season analysis of all data collected in the 2012-13 Area 10 winter selective Chinook fishery.

Sampling Rates and Staffing Levels

WDFW will meet or exceed the sampling rate goal of 20% during the selective Chinook fishery time period via increased staffing levels as compared to non-selective fisheries. **Table 10-1** shows staffing levels needed to implement the intensive monitoring of the winter selective Chinook fishery in Area 10.

Table 10-1: Number of Additional Staff Required for Monitoring the Winter Selective Chinook Fishery in Area 10, October 1, 2012 through January 31, 2013.

Month	Area 10 Dockside Samplers	Area 10 Test Boat Staff (1 Boat)
Oct	2	2
Nov	2	2
Dec	2	2
Jan	2	2

5/1/12

April 11, 2012

2012 Areas 11 & 13 Summer Period Mark-Selective Sport Fishery

The Northwest Treaty Tribes and the Washington Department of Fish and Wildlife (WDFW) have reached agreement to implement Chinook salmon mark-selective fisheries in Areas 11 and 13, for the period beginning June 1, 2012 (May 1 for Area 13 only) and extending no later than September 30, 2012. These fisheries will be implemented consistent with management objectives defined by the co-managers' Puget Sound Chinook Harvest Management Plan (April, 2010), the WDFW-Tulalip management plan for hatchery origin fish (2005 Memorandum of Understanding), and established principles concerning the allocation of harvestable salmon and the exercise of treaty rights. The co-managers will seek to minimize or eliminate any unintended effects of this fishery on individual treaty fisheries, including dislocation and/or disruption. Therefore, treaty fisheries will not be modified in order to accommodate this mark-selective fishery.

The co-managers further agree that:

- The total number of legal-size chinook encountered by anglers fishing in the mark-selective summer period fishery in Area 11will be estimated through a monitoring and sampling program (Attachment A). If in-season estimates indicate the estimated total legal-size encounters for the fishery will exceed the preseason forecasted level of 11,840 (FRAM 1512) by more than 10%, the fishery will be modified to control impacts on stocks of concern; and,

- All subarea closures that are part of the co-managers' 2012-2013 fisheries agreement will be in effect in the areas and during the time periods that the agreed Chinook mark-selective fisheries are being conducted.

The Fishery Intent

The summer period mark-selective fisheries in Areas 11 and 13 have been implemented to provide recreational fishing opportunity directed at hatchery Chinook salmon. Sampling and monitoring programs implemented with this fishery are intended to provide information collecting information necessary to enable evaluation and planning of potential future Chinook mark-selective fisheries, and to determine whether data needed to estimate critical management and analysis parameters can be collected. The sampling program for the Areas 11 and 13 mark selective fishery will provide a basis for determining if the data needed to estimate critical parameters can be collected and if the sample sizes needed to produce these estimates with agreed levels of precision can be realistically obtained. Prior to the 2013-14 season, WDFW and the tribes will jointly review and analyze results of the sampling and monitoring program for these fisheries to evaluate the effectiveness at achieving the intended objectives.

Data Needs for Evaluating the Fishery

Monitoring, sampling and reporting programs are being implemented by WDFW for the purpose of providing data necessary to estimate the impact of these mark-selective fisheries and to support the evaluation of future mark-selective fisheries.

WDFW will carry out the monitoring, sampling and reporting program described for Areas 11 and 13 summer Chinook mark-selective fisheries in Attachment A. On-water (Area 11) as well as shore-based (Areas 11 and 13) surveys and sampling techniques will be employed, and voluntary trip report distribution and collection efforts will be intensified, with the intention of collecting data that will form the basis of post-season

analyses and evaluation of performance. During the conduct of these fisheries WDFW will maintain sampling rates in areas 5-13 at levels equivalent to or greater than rates achieved in the most recent two-years. This monitoring, sampling and reporting program is part of the WDFW Puget Sound monitoring and sampling operational plan documented with the co-managers' preseason fishing plan.

These monitoring and sampling programs are designed to provide data to estimate the following parameters:

- the mark rate in the fishery - marked and unmarked encounters will be estimated by both on-water and shore-based programs;
- the number of fish retained or landed - marked and unmarked fish will be estimated using a shore-based program, including CWT and scale-age sampling;
- the number of unmarked fish released - estimated by shore-based and on-water programs;
- the number of unmarked fish retained - estimated by a shore-based program;
- the number of marked fish released - estimated by a shore-based program in conjunction with on-water mark rate encounter estimates;
- the number of the chinook encounters that are of sub legal size - estimated by shore-based and on-water programs;
- the stock composition of the mortalities – estimated by CWT and DNA
- estimates of marked and unmarked mortalities of double-index tagged and other CWT stocks.

Post-Season Report

A preliminary post-season report will be written and distributed prior to the 2013 North of Falcon process, containing a post-season analysis of all data collected in the 2012 Areas 11 and 13 summer selective Chinook fisheries.

Data Needs for Post-Season Estimation of Stock-Specific Unmarked Fish Mortalities

The co-managers agree to implement these fisheries with the understanding that the capability to estimate stock-specific unmarked fish mortalities is preserved. Methods for estimating unmarked mortalities of double-index tagged CWT stocks within this mark-selective chinook fishery will be determined jointly by co-managers, considering recommendations of the Selective Fisheries Evaluation Committee of the Pacific Salmon Commission. WDFW will be responsible for reporting the necessary fishery information and data to the Pacific States Marine Fishery Commission that allows these estimates to be generated.

In the postseason report (see previous section), WDFW will provide estimates of unmarked mortalities, by DIT group (by stock and age) and area. Unmarked DIT recoveries will be estimated based on estimated recoveries of marked DIT fish and assuming:

1. DIT release numbers provide a reasonable estimate of the unmarked to marked fish ratio; and,
2. the mortality rate for chinook caught and released in the fishery (sfm) is known.

The assumption that the DIT release numbers provide a reasonable estimate of the unmarked to marked fish ratio will be evaluated through post-season comparisons of DIT tag groups. A design for these comparisons will be developed jointly by the co-managers following the method used in analyzing coho DIT groups.[1] All information from this fishery necessary for making these comparisons is assumed to be included in the sampling design and will be included in the post-season report.

Estimates of total fishery related mortalities, including the total exploitation rate or the southern US exploitation rate, that represent the co-managers' management objectives for Puget Sound chinook management units, are made by combining mortality estimates in mark-selective fisheries with mortality

[1] *Analysis of coho salmon double-index tag (DIT) data. 2003*

estimates in non-selective fisheries. To ensure that all information necessary to make these estimates is collected, plans for sampling and monitoring of the summer selective fishery in Areas 11 and 13, as well as other mark-selective and non-selective fisheries will be included as a component of the co-managers' annual pre-season agreement.

ATTACHMENT A

MONITORING THE AREA 11 SUMMER SELECTIVE CHINOOK FISHERY, JUNE 1 THROUGH SEPTEMBER 30, 2012

The WDFW Puget Sound Sampling Program will monitor the mark-selective Chinook fishery in Area 11 during the proposed summer season from June 1 through September 30, 2012 via comprehensive data collection strategies consisting of dockside sampling, on-the-water surveys, and our enhanced voluntary trip report (VTR) program, as shown in **Figure 11S-1** and detailed below.

The monitoring plan shown in **Figure 11S-1** will enable us to estimate the critical data parameters necessary for evaluating pilot mark-selective fisheries as previously identified by the co-managers (e.g., WDFW and NWIFC 2009), including: *i)* the mark rate of the targeted Chinook population (based on dockside angler interview data and voluntary trip reports), *ii)* fishery-total angling effort and Chinook salmon encounters (harvest + releases) and mortalities (by size/mark-status class) (e.g., from a combination of VTR-based encounter rate data and dockside sampling), *iii)* the coded-wire tag (CWT)-based stock composition of marked and unmarked Chinook mortalities (from dockside sampling data), and *iv)* fishery-total mortality of marked and unmarked double index tag (DIT) CWT stocks (once post-season CWT sample rates are estimated). In addition, we will acquire and analyze relevant data characterizing other aspects of the pilot fishery, including descriptors of fishing success (catch [landed Chinook] per unit effort, CPUE), the length and age composition of encountered and/or landed Chinook, and the overall intensity of our sampling efforts.

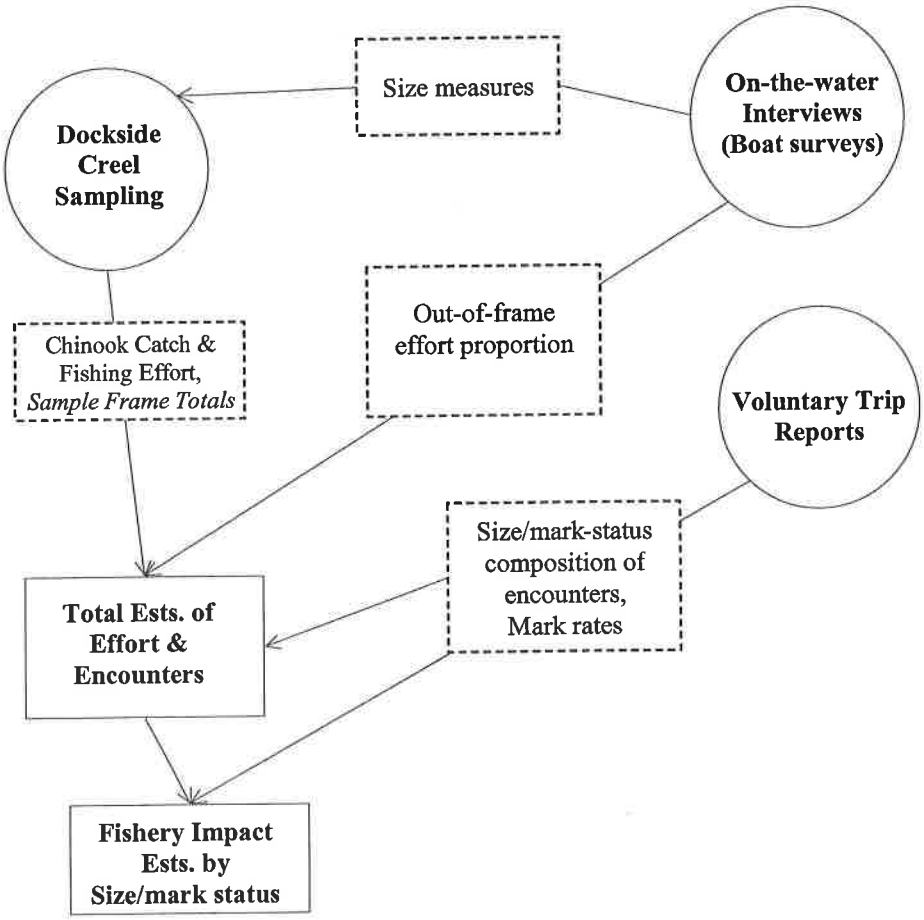

Figure 11S-1. Conceptual diagram of the monitoring plan proposed for the 2010 **Area 11 summer** mark-selective Chinook season. Circles represent discrete sampling activities, dashed boxes represent parameters that are estimated using data from a given activity, and solid boxes depict key quantities estimated from the comprehensive plan. 'Encounters' includes both harvested and released Chinook salmon.

Dockside Sampling

We will implement creel surveys during the summer mark-selective Chinook fishery in Area 11 using the same sampling design as implemented during the 2011 summer season -- a modified (i.e., scaled back relative to the full Murthy design employed during the 2007 and 2008 summer seasons) version of the Murthy estimator method (Murthy 1957, Cochran 1977), in order to produce total-Area estimates of catch and effort with accompanying estimates of variance. Our modified-Murthy approach, as detailed below, will incorporate data from intensive dockside sampling days, combined with site size measures obtained from on-the-water surveys, to produce total-Area catch and effort estimates with variances.

Dockside Sample Design

Sampling strata will be divided into 'weekday' (Monday through Thursday) and 'weekend' (Friday, Saturday, and Sunday) days. For each two-week period of the fishery, we will randomly select n=2 sample days from the N=8 possible weekday stratum days (distributed so there is at least one weekday sampled in each of the two weeks). For the weekend stratum (Friday through Sunday), and we will select n=2 sample days out of the N=3 possible weekend days each week. In total, we will sample 12 site-days every two weeks using the reduced Murthy creel survey design.

Samplers will be stationed at two ramps on each of the selected sampling days. Sites in our sample frame will be selected for sampling via our weighted-random site selection process (e.g., probability proportional to size, using the most current boat survey data). Samplers will achieve 100% sampling coverage at the assigned ramps from approximately from dawn until dark (i.e., individual samplers will cover early-, mid-, and late-shifts) in order to intercept all boats. All anglers and fish exiting the fishery through the sampled sites will be counted. Any boats that are missed at the sampled sites will be counted and recorded on the sampling forms.

The sites in our sample frame in Area 11 will likely include the following sites:

- Point Defiance Public Ramp
- Point Defiance Boathouse
- Redondo Ramp
- Gig Harbor Ramp
- Narrows Marina Ramp
- Armeni Ramp

On-the-water Surveys

On-the-water surveys (boat surveys) will be employed to estimate the percent of effort from sites in our sample frame versus sites outside of the frame (e.g., never-sampled sites). Boat surveys will cover the entire area to pick up effort from all launch sites. We will ask boat occupants where they will tie up or exit the fishery rather than where they launched. We will calculate the size measures of Area 11 sites based on the most recently available boat survey data.

We will strive for a minimum sample size of one hundred boats per time period stratum (weekday and weekend strata), or as many boats as possible. In addition, boat surveys will be conducted whenever anything changes in the fishery that could affect effort patterns (e.g., if launch sites open or close or if adjacent catch areas open or close). The boat survey data will be used to expand site estimates to all sites accessing the fishery.

Harvest and Effort Estimates

The harvest and effort observed at the Murthy-based sampled sites in Area 11 will be expanded to all access sites (based on estimated site size measures) to estimate total harvest for the day. Sample data will be combined and expanded to create stratum estimates of harvest and effort with variances.

To generate weekly catch and effort estimates for the Area 11 summer fishery, the four-day "weekday stratum" estimate for Monday-Thursday of each week (based on n=2 days sampled out of N=8 available weekdays per two-week period) will be added to the "weekend stratum" (Friday-Sunday) estimate for the particular week (based on n=2 days sampled out of N=3 available weekend days per week). The eight-day weekday estimates for each two-week period will be split evenly between individual weeks in the two-week block to enable weekly estimates, with variances computed using the n=2 days sampled out of N=8 available weekdays in the appropriate variance equation.

Assumptions

Harvest and effort estimates are based on the following assumptions:

- Boat surveys provide an unbiased estimate of the proportion of anglers accessing fisheries from sites in our sample site frame and sites outside the frame.
- The proportion of total effort accessing the fishery at site A represents the proportion of total catch landed at site A.
- All anglers exiting at a sampled site are interviewed and all anglers accurately report their harvest. If any boats are missed they are counted and catch and effort estimates are expanded appropriately.
- CPUE does not differ significantly between sites in our sample frame and sites outside our sample frame.

Estimates of Total Encounters

We will estimate total Chinook encounters in the Area 11 summer mark-selective Chinook fishery using the bias-corrected approach developed by Conrad and McHugh (2008). Briefly, with the Conrad and McHugh (2008) method, Chinook encounters are estimated by dividing the estimate of legal-marked Chinook harvest by the estimated proportion of the fishable Chinook population that is of legal size and marked. Given that our former "Method 2" approach (e.g., WDFW 2008a) yields negatively biased estimates if anglers release any of the legal-marked Chinook they encounter, Conrad and McHugh estimated a "correction" factor to account for this phenomenon and incorporated it into their estimator. Applying Conrad and McHugh's (2008) approach within the design proposed in **Figure 11S-1**, we would estimate total Chinook encounters by dividing the estimate of legal-marked Chinook harvest (obtained via creel surveys) by the estimated proportion of the fishable Chinook population that is of legal size and marked (obtained via our enhanced Voluntary Trip Report program).

CWT Sampling

We will sample for coded wire tags (CWT) in the Area 11 summer mark-selective Chinook fishery as part of our dockside angler interviews. The objective is to provide stock specific estimation (by hatchery and brood year) of population parameters, such as fishery contribution and marine survival, as part of the coast-wide CWT program. The sample rate goal for CWT recovery is 20% in mark-selective Chinook fisheries. During dockside interviews samplers will inspect landed Chinook and coho salmon for the presence of coded-wire tags using wand CWT detectors, and snouts will be collected from all fish containing CWTs. For post-season analyses and reporting, CWT data will be used to estimate stock composition by hatchery and brood year. Total unmarked double index tagged (DIT) mortality estimates will be produced post-season.

Charter Vessels

Similar to our approach applied during the 2011 season, charter vessels will be included in the Murthy estimate for the 2012 Area 11 summer mark-selective fishery.

Voluntary Trip Reports

Information on adipose mark rates and the percentage of Chinook that are legal size (22 inches [56 cm] total length and larger) versus sublegal size (less than 22 inches) will be obtained from Voluntary Trip Reports (VTR's) submitted by private-boat anglers during the mark selective Chinook fishery in Area 11. Anglers will be asked to record on the VTR forms the date, number of anglers, target species, CRC Area, each Chinook or coho hooked, whether the fish was kept or released, species (if they positively identified the fish), total length to the nearest 1/8th inch, and whether the fish was adipose fin-clipped or not clipped.

The "enhanced" Voluntary Trip Report (VTR) program will be used during 2012 in Area 11, in which an additional WDFW technician will be hired to work exclusively on distributing and collecting VTRs from the angling public. Several measures will be taken to help expand and ensure the success of our VTR program. First, samplers will distribute our new and improved, user-friendly VTR form that is easier for anglers to complete compared to the old VTR form. The VTR position and other samplers will maximize the distribution of VTRs by handing out VTRs as anglers launch, and collecting the VTRs as anglers exit the fishery. Additionally, samplers will provide participants with a brochure describing the intent of VTRs and their significance to fishery monitoring, and answer VTR-related questions. To increase the response rate, participants are given three options for returning completed VTRs to WDFW: hand-delivering them to samplers, placing them in on-site drop boxes, or sending them via U.S. mail (pre-paid); if they are unsuccessful (i.e., no encounters occurred [harvested or released]) on their trip, the VTR samplers will request that participants keep their forms for future trips.

The sample size goal is n=150 Chinook encounters per month obtained from VTRs during the four-month Area 11 Chinook mark-selective fishery. From the VTR-based Chinook encounter data collected over the season, we will calculate the proportion of Chinook that were legal-size and marked, legal-size and unmarked, sublegal-size and marked, and sublegal-size and unmarked.

Reporting Schedule

After the four-month Area 11 fishery is completed, we will distribute a report containing catch and effort estimates and total encounter estimates. This report will be distributed within one month following the end of the mark-selective Chinook fishery in Area 11. In this report we will present estimates of angler effort, catch, and releases by species and mark status, with variances, the coefficient of variation, and 95% confidence intervals for the estimates. We will also distribute a second table with the cumulative total Chinook encounters estimated for each month to date. Voluntary Trip Report results will also be included in the report, showing the cumulative total number of legal and sub-legal encounters and the mark rates over the four-month fishery.

A final report will be written and distributed by February 1, 2013, to enable reviews before the 2013 North of Falcon process, with a post-season analysis of all data collected in the 2012 Area 11 summer selective Chinook fishery.

Sampling Rates and Staffing Levels

WDFW will meet or exceed the sampling rate goal of 20% during the selective Chinook fishery time period via increased staffing levels as compared to non-selective fisheries. **Table 11S-1** shows staffing levels needed to implement the monitoring plan for the 2012 Area 11 summer selective Chinook fishery.

Table 11S-1: Number of Additional Staff Required for Monitoring the Summer Selective Chinook Fishery in Area 11, June 1 through September 30, 2012.

Month	Area 11 Dockside Samplers	Area 11 VTR Dockside Position
June	4	1
July	4	1
Aug	4	1
Sept	4	1

MONITORING THE AREA 13 SUMMER SELECTIVE CHINOOK FISHERY FROM MAY 1 THROUGH SEPTEMBER 30, 2012

Overview

The Puget Sound Sampling Program will monitor the mark-selective Chinook fishery in Area 13 during the summer season from May 1 through September 30, 2012. We will implement the monitoring plan shown in **Figure 13-1** to enable estimation of the critical data parameters necessary for evaluating pilot mark-selective fisheries as previously identified by the co-managers (e.g., WDFW and NWIFC 2009), including: *i)* the mark rate of the targeted Chinook population (based on voluntary trip report [VTR] and dockside angler interview data), *ii)* fishery-total angling effort and Chinook salmon encounters (harvest + releases) and mortalities (by size/mark-status class) (e.g., from a combination of VTR encounter rate data and dockside sampling data), *iii)* the coded-wire tag (CWT)-based stock composition of marked and unmarked Chinook mortalities (from dockside sampling data), and *iv)* fishery-total mortality of marked and unmarked double index tag (DIT) CWT stocks (once post-season CWT sample rates are estimated). In addition, we will acquire and analyze relevant data characterizing other aspects of the pilot fishery, including descriptors of fishing success (catch [landed Chinook] per unit effort, CPUE), the length and age composition of encountered and/or landed Chinook, and the overall intensity of our sampling efforts.

During the Area 13 summer mark-selective Chinook fishery we will implement a baseline-level sampling program (**Figure 13-1**), with samplers stationed at the higher-use access sites throughout Area 13. Baseline sampling is opportunistic in nature, with overall sampling effort allocated across space and time in a manner that maximizes the number of angler interviews obtained per sampling event. In-sample catch and effort data (e.g., catch per unit effort [CPUE] and species composition data) are used in conjunction with the Catch Record Card (CRC) system to compute post-season (available approximately 1 to 1.5 years from the close of the fishery) catch estimates by species and area.

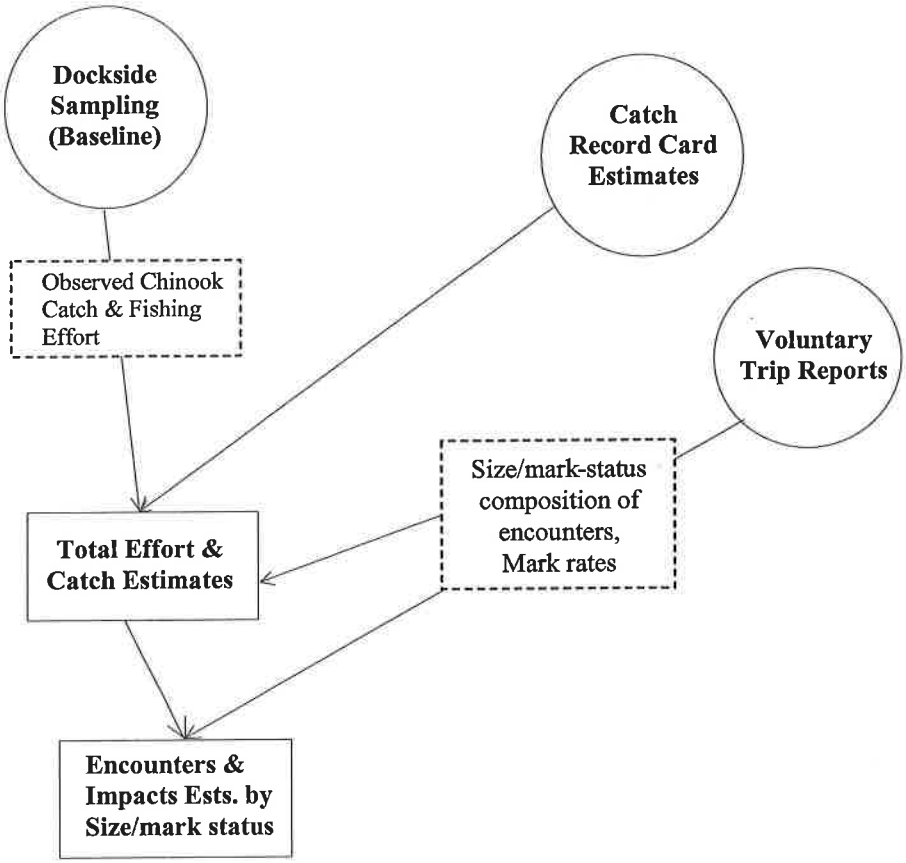

Figure 13-1. Conceptual diagram of the monitoring plan proposed for the **Area 13 summer** mark-selective Chinook season. Circles represent discrete sampling activities, dashed boxes represent parameters that are estimated using data from a given activity, and solid boxes depict key quantities estimated from the comprehensive plan. 'Encounters' includes both harvested and released Chinook salmon.

Dockside Sampling

Dockside samplers will interview anglers exiting the fishery at selected access sites in Area 13 via our baseline sampling program, approximately five days per week. Samplers will collect data on: 1) angler effort (i.e., boats and angler counts, trip duration, etc.); 2) encounter (fish retained and/or released) composition, by species (all fish species) and mark status (unmarked vs. adipose-clipped; Chinook and coho salmon only); and 3) landed Chinook size (fork and total lengths) and age composition (i.e., scale samples are collected and subsequently read).

Baseline sampling is opportunistic in nature, with overall sampling effort allocated across space and time in a manner that maximizes the number of angler interviews obtained per sampling event. In-sample catch and effort data (e.g., catch per unit effort [CPUE] and species composition data) are used in conjunction with the Catch Record Card (CRC) system to compute post-season (available approximately 1 to 1.5 years from the close of the fishery) catch estimates by species and area. Sampling size is set at 120 fish per stratum for estimation of species composition and 100 boats per stratum for the estimation of CPUE.

CWT Sampling

We will sample for coded wire tags (CWT) in the Area 13 summer mark-selective Chinook fishery as part of our dockside angler interviews. The objective is to provide stock specific estimation (by hatchery and

brood year) of population parameters, such as fishery contribution and marine survival, as part of the coast-wide CWT program. The sample rate goal for CWT recovery is 20% in mark-selective Chinook fisheries. During dockside interviews samplers will inspect landed Chinook and coho salmon for the presence of coded-wire tags using wand CWT detectors, and snouts will be collected from all fish containing CWTs. For post-season analyses and reporting, CWT data will be used to estimate stock composition by hatchery and brood year. Total unmarked double index tagged (DIT) mortality estimates will be produced post-season (note: DIT mortality estimates cannot be produced until post-season CRC estimates are available because sample-rate estimates are needed for tag expansions).

Voluntary Trip Reports

Additional information on adipose mark rates and the percentage of Chinook that are legal size (22 inches [56 cm] and larger total length) versus sublegal size (less than 22 inches total length) will be obtained from Voluntary Trip Reports (VTRs) that are submitted by private-boat anglers during the winter mark-selective Chinook fishery in Area 13. Anglers will be asked to record on the VTR forms the date, number of anglers, target species, CRC Area, each Chinook or coho hooked, whether the fish was kept or released, species (if they positively identified the fish), total length to the nearest 1/8th inch, and whether the fish was adipose fin-clipped or not clipped.

We will take several measures to help ensure the success of our VTR program. First, samplers will distribute our new and improved, user-friendly VTR form that is easier for anglers to complete compared to the old VTR form. Samplers will maximize the distribution of VTRs by handing out VTRs as anglers launch, and collecting the VTRs as anglers exit the fishery. Additionally, samplers will provide participants with a brochure describing the intent of VTRs and their significance to fishery monitoring, and answer VTR-related questions. To increase the response rate, participants are given three options for returning completed VTRs to WDFW: hand-delivering them to samplers, placing them in on-site drop boxes, or sending them via U.S. mail (pre-paid); if they are unsuccessful (i.e., no encounters occurred [harvested or released]) on their trip, the VTR samplers will request that participants keep their forms for future trips.

We will estimate the mark rates of legal-size and sublegal-size Chinook via calculating the season average mark rate from VTRs. We will calculate the proportion of Chinook that were legal-size and marked, legal-size and unmarked, sublegal-size and marked, and sublegal-size and unmarked.

Estimates of Total Encounters

We will estimate total Chinook encounters in the Area 13 summer selective Chinook fishery using the bias-corrected approach developed by Conrad and McHugh (2008). Briefly, with the Conrad and McHugh (2008) method, Chinook encounters are estimated by dividing the estimate of legal-marked Chinook harvest by the estimated proportion of the fishable Chinook population that is of legal size and marked. Given that our former "Method 2" approach (e.g., WDFW 2008a) yields negatively biased estimates if anglers release any of the legal-marked Chinook they encounter, Conrad and McHugh estimated a "correction" factor to account for this phenomenon and incorporated it into their estimator. Applying Conrad and McHugh's (2008) approach within the design proposed in **Figure 13-1**, we would estimate total Chinook encounters by dividing the estimate of legal-marked Chinook harvest by the estimated proportion of the fishable Chinook population that is of legal size and marked (obtained via VTRs). Estimates of legal-marked Chinook harvest will be obtained via post-season CRC estimates in Area 13.

5/1/12

April 11, 2012

2013 Area 11 Winter Period Mark-Selective Sport Fishery

The Northwest Treaty Tribes and the Washington Department of Fish and Wildlife (WDFW) have reached agreement to implement a Chinook salmon mark-selective fishery in Area 11, for the winter period February 1 to April 30, 2013. This fishery will be implemented consistent with management objectives defined by the co-managers' Puget Sound Chinook Harvest Management Plan (April, 2010), the WDFW-Tulalip management plan for hatchery origin fish (2005 Memorandum of Understanding), and established principles concerning the allocation of harvestable salmon and the exercise of treaty rights. The co-managers will seek to minimize or eliminate any unintended effects of this fishery on individual treaty fisheries, including dislocation and/or disruption. Therefore, treaty fisheries will not be modified in order to accommodate this mark-selective fishery.

Fishery Intent

The winter period mark-selective fishery in Area 11 has been implemented to provide recreational fishing opportunity directed at hatchery Chinook salmon. Sampling and monitoring programs implemented with this fishery are intended to provide information necessary to evaluate and plan potential future chinook mark-selective fisheries. The sampling program will provide a basis for determining if the data needed to estimate critical management and analysis parameters can be collected and if the sample sizes needed to produce these estimates with agreed levels of precision can be realistically obtained. Prior to the 2012-13 season, WDFW and the tribes will jointly review and analyze results of the sampling and monitoring program for these fisheries to evaluate the effectiveness at achieving the intended objectives.

Data Needs for Evaluating the Fishery

Monitoring, sampling and reporting programs are being implemented by WDFW for the purpose of providing data necessary to estimate the impact of these mark-selective fisheries and to support the evaluation of future mark-selective fisheries.

WDFW will carry out the monitoring, sampling and reporting program described for the Area 11 winter Chinook mark-selective fishery in Attachment A. Shore-based surveys and sampling techniques will be employed, as well as an intensive voluntary trip report program, with the intention of collecting data that will form the basis of post-season analyses and evaluation of performance. During the conduct of these fisheries WDFW will maintain sampling rates in areas 5-13 at levels equivalent to or greater than rates achieved in the most recent two-years. This monitoring, sampling and reporting program is part of the WDFW Puget Sound monitoring and sampling operational plan documented with the co-managers' preseason fishing plan.

These monitoring and sampling programs are designed to provide data to estimate the following parameters:

- the mark rate in the fishery - marked and unmarked encounters will be estimated by shore-based and voluntary trip report programs;
- the number of fish retained or landed - marked and unmarked fish will be estimated using a shore-based program, including CWT and scale-age sampling;
- the number of unmarked fish released - estimated by shore-based and voluntary trip report programs;
- the number of unmarked fish retained - estimated by a shore-based program;
- the number of marked fish released - estimated by a shore-based program in conjunction with mark rate encounter estimates obtained from voluntary trip reports;
- the number of the chinook encounters that are of sub legal size - estimated by shore-based and voluntary trip report programs;
- the stock composition of the mortalities – estimated by CWT data collected in the shore-based sampling

program;

- estimates of marked and unmarked mortalities of double-index tagged and other CWT stocks.

Post season report

A preliminary post-season report will be written and distributed by November 30, 2013, containing a post-season analysis of all data collected in the 2013 Area 11 winter selective Chinook fishery.

Data Needs for Post-Season Estimation of Stock-Specific Unmarked Fish Mortalities

The co-managers agree to implement these fisheries with the understanding that the capability to estimate stock-specific unmarked fish mortalities is preserved. Methods for estimating unmarked mortalities of double-index tagged CWT stocks within this mark-selective chinook fishery will be determined jointly by co-managers, considering recommendations of the Selective Fisheries Evaluation Committee of the Pacific Salmon Commission. WDFW will be responsible for reporting the necessary fishery information and data to the Pacific States Marine Fishery Commission that allows these estimates to be generated.

In the postseason report (see previous section), WDFW will provide estimates of unmarked mortalities, by DIT group (by stock and age) and area. Unmarked DIT recoveries will be estimated based on estimated recoveries of marked DIT fish and assuming:

1. DIT release numbers provide a reasonable estimate of the unmarked to marked fish ratio; and,
2. the mortality rate for chinook caught and released in the fishery (sfm) is known.

The assumption that the DIT release numbers provide a reasonable estimate of the unmarked to marked fish ratio will be evaluated through post-season comparisons of DIT tag groups. A design for these comparisons will be developed jointly by the co-managers following the method used in analyzing coho DIT groups.[1] All information from this fishery necessary for making these comparisons is assumed to be included in the sampling design and will be included in the post-season report.

Estimates of total fishery related mortalities, including the total exploitation rate or the southern US exploitation rate, that represent the co-managers' management objectives for Puget Sound chinook management units, are made by combining mortality estimates in mark-selective fisheries with mortality estimates in non-selective fisheries. To ensure that all information necessary to make these estimates is collected, plans for sampling and monitoring of the winter selective fishery in Areas 11 and 13, as well as other mark-selective and non-selective fisheries will be included as a component of the co-managers' annual pre-season agreement.

[1] *Analysis of coho salmon double-index tag (DIT) data. 2003*

Attachment A

MONITORING THE AREA 11 WINTER SELECTIVE CHINOOK FISHERY, FEBRUARY 1 THROUGH APRIL 30 2013

The Puget Sound Sampling Program will monitor the mark-selective Chinook fishery in Area 11 during the proposed winter season from February 1 through April 30, 2013 through comprehensive data collection strategies consisting of dockside creel surveys, on-the-water surveys, and voluntary trip reports, as shown in **Figure 11W-1** and detailed below.

The monitoring plan shown in **Figure 11W-1** will enable us to estimate the critical data parameters necessary for evaluating pilot mark-selective fisheries as previously identified by the co-managers (e.g., WDFW and NWIFC 2009), including: *i)* the mark rate of the targeted Chinook population (based on VTR and dockside angler interview data), *ii)* fishery-total angling effort and Chinook salmon encounters (harvest + releases) and mortalities (by size/mark-status class) (e.g., from a combination of dockside sampling data and VTRs), *iii)* the coded-wire tag (CWT)-based stock composition of marked and unmarked Chinook mortalities (from dockside sampling data), and *iv)* fishery-total mortality of marked and unmarked double index tag (DIT) CWT stocks (once post-season CWT sample rates are estimated). In addition, we will acquire and analyze relevant data characterizing other aspects of the pilot fishery, including descriptors of fishing success (catch [landed Chinook] per unit effort, CPUE), the length and age composition of encountered and/or landed Chinook, and the overall intensity of our sampling efforts.

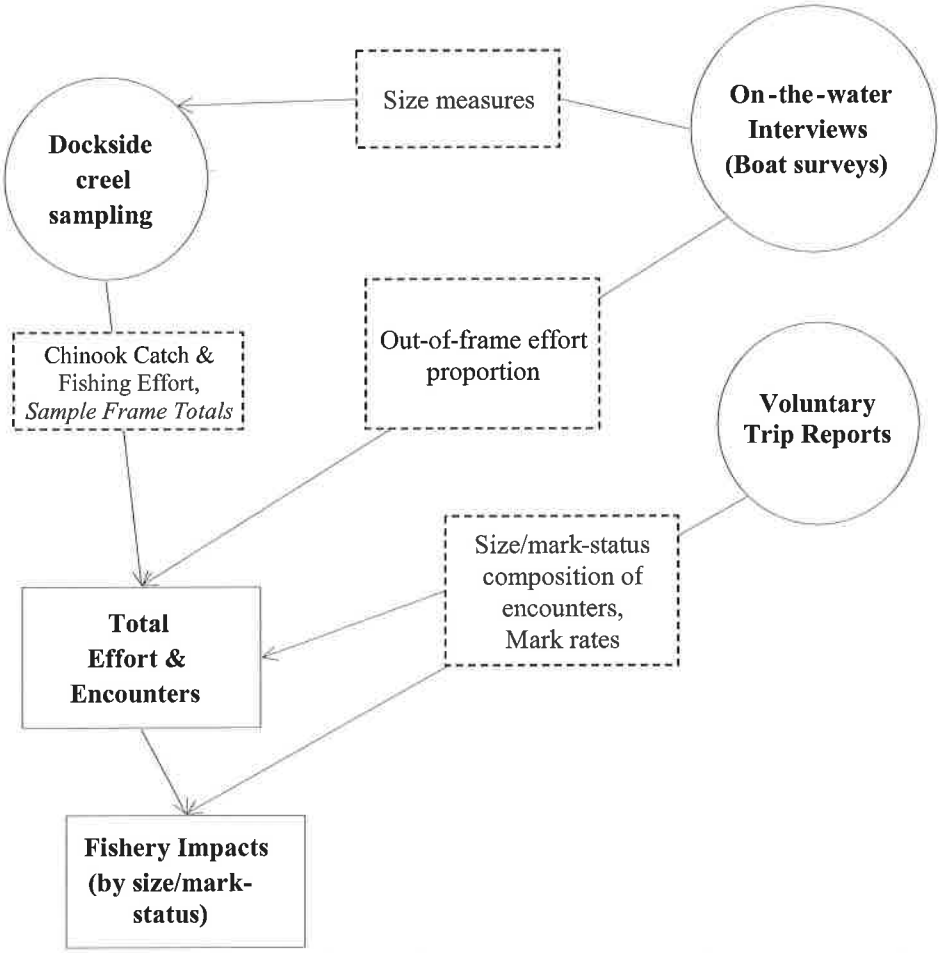

Figure 11W-1. Conceptual diagram of the monitoring plan proposed for the **Area 11 winter** mark-selective Chinook season. Circles represent discrete sampling activities, dashed boxes represent parameters that are estimated using data from a given activity, and solid boxes depict key quantities estimated from the comprehensive plan. 'Encounters' includes both harvested and released Chinook salmon.

Dockside Sampling

We will implement creel surveys during the 2011 winter mark-selective Chinook fishery in Area 11 using a modified (scaled back) version of the Murthy estimator method (Murthy 1957, Cochran 1977), in order to produce total-Area estimates of catch and effort with accompanying estimates of variance. Our modified-Murthy approach, as detailed below, will incorporate data from intensive dockside sampling days, combined with site size measures obtained from on-the-water surveys, to produce total-Area catch and effort estimates with variances.

Dockside Sample Design

Sampling strata will be divided into 'weekday' (Monday through Thursday) and 'weekend' (Friday, Saturday, and Sunday) days. For each two-week period of the fishery, we will randomly select n=2 sample days from the N=8 possible weekday stratum days (distributed so there is at least one weekday sampled in each of the two weeks). For the weekend stratum (Friday through Sunday), and we will select n=2 sample days out of the N=3 possible weekend days each week. In total, we will sample 12 site-days every two weeks using the reduced Murthy creel survey design.

Samplers will be stationed at two ramps on each of the selected sampling days. Sites in our sample frame will be selected for sampling via our weighted-random site selection process (e.g., probability proportional to size, using the most current boat survey data). Samplers will achieve 100% sampling coverage at the assigned ramps, with shifts lasting approximately from dawn until dusk (will be adjusted as needed according to changing day lengths throughout the season), in order to intercept all boats. All anglers and fish exiting the fishery through the sampled site will be counted. Any boats that are missed at the sampled site will be counted and recorded on the sampling forms.

In addition, we will sample multiple ramps in Area 11 on the remaining days in the weekday in the weekday stratum, using baseline-level sampling to ensure that we achieve the 20% sample rate goal.

The sites in our sample frame in Area 11 will likely include the following sites:

- Point Defiance Public Ramp
- Point Defiance Boathouse
- Redondo Ramp
- Gig Harbor Ramp
- Narrows
- Armeni Ramp

On-the-water Surveys

On-the-water surveys (boat surveys) will be employed to estimate the percent of effort from sites in our sample frame versus sites outside of the frame (e.g., never-sampled sites). Boat surveys will cover the entire area to pick up effort from all launch sites. We will ask boat occupants where they will tie up or exit the fishery rather than where they launched. We will calculate the size measures of Area 11 sites based on the most recently available boat survey data.

We will conduct an apropraite number surveys per month in Area 11 throughout the season to update site size measures. In addition, on-the-water surveys will be conducted whenever anything changes in the fishery that could affect effort patterns (e.g., if launch sites open or close or if adjacent catch areas open or close).

We will strive for a minimum sample size of one hundred boats per time period stratum (e.g., using data lumped across one month strata, based on consultation with the WDFW biometrician), or as many samples as possible. Factors such as low angler effort and rough winter weather conditions may result in

a lower sample size. The boat survey data will be used to expand site estimates to all sites accessing the fishery.

Harvest and Effort Estimates

The harvest and effort observed at the Murthy-based sampled sites in Area 11 will be expanded to all access sites (based on estimated site size measures) to estimate total harvest for the day. Sample data will be combined and expanded to create stratum estimates of harvest and effort with variances.

To generate weekly catch and effort estimates for Area 11, the four-day "weekday stratum" estimate for Monday-Thursday of each week (based on n=2 days sampled out of N=8 available weekdays per two-week period) will be added to the "weekend stratum" (Friday-Sunday) estimate for the particular week (based on n=2 days sampled out of N=3 available weekend days per week). The eight-day weekday estimates for each two-week period will be split evenly between individual weeks in the two-week block to enable weekly estimates, with variances computed using the n=2 days sampled out of N=8 available weekdays in the appropriate variance equation.

Assumptions

Harvest and effort estimates are based on the following assumptions:

- Boat surveys provide an unbiased estimate of the proportion of anglers accessing fisheries from sites in our sample site frame and sites outside the frame.
- The proportion of total effort accessing the fishery at site A represents the proportion of total catch landed at site A.
- All anglers exiting at a sampled site are interviewed and all anglers accurately report their harvest. If any boats are missed they are counted and catch and effort estimates are expanded appropriately.
- CPUE does not differ significantly between sites in our sample frame and sites outside our sample frame.

Estimates of Total Encounters

We will estimate total Chinook encounters in the Area 11 winter selective Chinook fishery using the bias-corrected approach developed by Conrad and McHugh (2008). Briefly, with the Conrad and McHugh (2008) method, Chinook encounters are estimated by dividing the estimate of legal-marked Chinook harvest by the estimated proportion of the fishable Chinook population that is of legal size and marked. Given that our former "Method 2" approach (e.g., WDFW 2008a) yields negatively biased estimates if anglers release any of the legal-marked Chinook they encounter, Conrad and McHugh estimated a "correction" factor to account for this phenomenon and incorporated it into their estimator. Applying Conrad and McHugh's (2008) approach within the design proposed in **Figure 11W-1**, we would estimate total Chinook encounters by dividing the estimate of legal-marked Chinook harvest (obtained via creel surveys) by the estimated proportion of the fishable Chinook population that is of legal size and marked (obtained via VTRs).

CWT Sampling

We will sample for coded wire tags (CWT) in the Area 11 winter mark-selective Chinook fishery as part of our dockside angler interviews. The objective is to provide stock specific estimation (by hatchery and brood year) of population parameters, such as fishery contribution and marine survival, as part of the coast-wide CWT program. The sample rate goal for CWT recovery is 20% in mark-selective Chinook fisheries. During dockside interviews samplers will inspect landed Chinook and coho salmon for the presence of coded-wire tags using wand CWT detectors, and snouts will be collected from all fish containing CWTs. For post-season analyses and reporting, CWT data will be used to estimate stock composition by hatchery and brood year. Total unmarked double index tagged (DIT) mortality estimates will be produced post-season.

Voluntary Trip Reports

Additional information on adipose mark rates and the percentage of Chinook that are legal size (22 inches [56 cm] total length and larger) versus sublegal size (less than 22 inches) will be obtained from Voluntary Trip Reports (VTR's) submitted by private-boat anglers during the mark selective Chinook fishery in Area 11. Anglers will be asked to record on the VTR forms the date, number of anglers, target species, CRC Area, each Chinook or coho hooked, whether the fish was kept or released, species (if they positively identified the fish), total length to the nearest 1/8th inch, and whether the fish was adipose fin-clipped or not clipped.

We will take several measures to expand and help ensure the success of our VTR program. First, samplers will distribute our new and improved, user-friendly VTR form that is easier for anglers to complete compared to the old VTR form. Samplers will maximize the distribution of VTRs by handing out VTRs as anglers launch, and collecting the VTRs as anglers exit the fishery. Additionally, samplers will provide participants with a brochure describing the intent of VTRs and their significance to fishery monitoring, and answer VTR-related questions. To increase the response rate, participants are given three options for returning completed VTRs to WDFW: hand-delivering them to samplers, placing them in on-site drop boxes, or sending them via U.S. mail (pre-paid); if they are unsuccessful (i.e., no encounters occurred [harvested or released]) on their trip, the VTR samplers will request that participants keep their forms for future trips.

We will estimate the mark rates of legal-size and sublegal-size Chinook via calculating the season average mark rate from VTR's. We will calculate the proportion of Chinook that were legal-size and marked, legal-size and unmarked, sublegal-size and marked, and sublegal-size and unmarked.

Reporting Schedule

A final report will be written and distributed by November 30, 2013, with a post-season analysis of all data collected in the 2013 Area 11 winter selective Chinook fishery.

Sampling Rates and Staffing Levels

WDFW will meet or exceed the sampling rate goal of 20% during the selective Chinook fishery time period via increased staffing levels as compared to non-selective fisheries. **Table 11W-1** shows staffing levels needed to implement the intensive monitoring of the winter selective Chinook fishery in Area 11.

Table 11W-1: Number of Additional Staff Required for Monitoring the Winter Selective Chinook Fishery in Area 11, February 1 through April 30, 2013.

Month	Area 11 Dockside Samplers
Feb	2
March	2
April	2

5/1/12

April 11, 2012

2012 Area 12 Summer Period Mark-Selective Sport Fishery

The Northwest Treaty Tribes and the Washington Department of Fish and Wildlife (WDFW) have reached agreement to implement a Chinook salmon mark-selective fishery in Area 12, for the summer period July 1 to September 30, 2012. This fishery will be implemented consistent with management objectives defined by the co-managers' Puget Sound Chinook Harvest Management Plan (April, 2010), the WDFW-Tulalip management plan for hatchery origin fish (2005 Memorandum of Understanding), and established principles concerning the allocation of harvestable salmon and the exercise of treaty rights. The co-managers will seek to minimize or eliminate any unintended effects of this fishery on individual treaty fisheries, including dislocation and/or disruption. Therefore, treaty fisheries will not be modified in order to accommodate this mark-selective fishery.

Fishery Intent

The summer period mark-selective fishery in Area 12 has been implemented to provide recreational fishing opportunity directed at hatchery Chinook salmon. Sampling and monitoring programs implemented with this fishery are intended to provide information necessary to evaluate and plan potential future Chinook mark-selective fisheries. The sampling program will provide a basis for determining if the data needed to estimate critical management and analysis parameters can be collected and if the sample sizes needed to produce these estimates with agreed levels of precision can be realistically obtained. Prior to the 2013-14 season, WDFW and the tribes will jointly review and analyze results of the sampling and monitoring program for these fisheries to evaluate the effectiveness at achieving the intended objectives.

Data Needs for Evaluating the Fishery

Monitoring, sampling and reporting programs are being implemented by WDFW for the purpose of providing data necessary to estimate the impact of these mark-selective fisheries on un-marked Chinook and to support the evaluation of future mark-selective fisheries.

WDFW will carry out the monitoring, sampling and reporting program described for Area 12 winter Chinook mark-selective fishery in Attachment A. Shore-based surveys and sampling techniques will be employed, as well as an intensive voluntary trip report program, with the intention of collecting data that will form the basis of post-season analyses and evaluation of performance. During the conduct of these fisheries WDFW will maintain sampling rates in Areas 5-13 at levels sufficient to meet the obligation to adequately sample for CWT and other biological information. This monitoring, sampling and reporting program is part of the WDFW Puget Sound monitoring and sampling operational plan documented with the co-managers' preseason fishing plan.

These monitoring and sampling programs are designed to provide data to estimate the following parameters:

- the mark rate in the fishery - marked and unmarked encounters will be estimated by shore-based and voluntary trip report programs;
- the number of fish retained or landed - marked and unmarked fish will be estimated using a shore-based program, including CWT and scale-age sampling;
- the number of unmarked fish released - estimated by shore-based and voluntary trip reporting of on-water activity;
- the number of unmarked fish retained - estimated by a shore-based program;
- the number of marked fish released - estimated by a shore-based program in conjunction with voluntary trip report program information;
- the number of the chinook encounters that are of sub legal size - estimated by shore-based and voluntary

trip report programs;

- the stock composition of the mortalities – estimated by CWT data collected in the shore-based sampling program;
- estimates of marked and unmarked mortalities of double-index tagged and other CWT stocks.

Post-Season Report

WDFW will provide a preliminary post-season report that will be written and distributed by February 1, 2013, containing a post-season analysis of all data collected in the July 1 to September 30, 2012 summer selective Chinook fishery.

Data Needs for Post-Season Estimation of Stock-Specific Unmarked Fish Mortalities

The co-managers agree to implement these fisheries with the understanding that the capability to estimate stock-specific unmarked fish mortalities is preserved. Methods for estimating unmarked mortalities of double-index tagged CWT stocks within this mark-selective chinook fishery will be determined jointly by co-managers, considering recommendations of the Selective Fisheries Evaluation Committee of the Pacific Salmon Commission. WDFW will be responsible for reporting the necessary fishery information and data to the Pacific States Marine Fishery Commission that allows these estimates to be generated.

In the post-season report (see previous section), WDFW will provide estimates of unmarked mortalities, by DIT group (by stock and age) and area. Unmarked DIT recoveries will be estimated based on estimated recoveries of marked DIT fish and assuming:

1. DIT release numbers provide a reasonable estimate of the unmarked to marked fish ratio; and,
2. the mortality rate for chinook caught and released in the fishery (sfm) is known.

The assumption that the DIT release numbers provide a reasonable estimate of the unmarked to marked fish ratio will be evaluated through post-season comparisons of DIT tag groups. A design for these comparisons will be developed jointly by the co-managers following the method used in analyzing coho DIT groups.[1] All information from this fishery necessary for making these comparisons is assumed to be included in the sampling design and will be included in the post-season report.

Estimates of total fishery related mortalities, including the total exploitation rate or the southern US exploitation rate, that represent the co-managers' management objectives for Puget Sound chinook management units, are made by combining mortality estimates in mark-selective fisheries with mortality estimates in non-selective fisheries. To ensure that all information necessary to make these estimates is collected, plans for sampling and monitoring of all mark-selective fisheries will be included as a component of the co-managers' annual pre-season agreement.

[1] *Analysis of coho salmon double-index tag (DIT) data. 2003*

Attachment A

MONITORING THE PROPOSED WINTER AREA 12 SELECTIVE CHINOOK FISHERY, JULY 1, 2012 THROUGH SEPTEMBER 30, 2012

Overview

The WDFW Puget Sound Sampling Program will monitor the mark-selective Chinook fishery in Area 12 during the winter season from July 1 through September 30, 2012. The monitoring plan shown in **Figure 12-1** will be employed to enable estimation of the critical data parameters necessary for evaluating pilot mark-selective fisheries as previously identified by the co-managers (e.g., WDFW and NWIFC 2009), including: *i)* the mark rate of the targeted Chinook population (based on voluntary trip report [VTR] and dockside angler interview data), *ii*) fishery-total angling effort and Chinook salmon encounters (harvest + releases) and mortalities (by size/mark-status class) (e.g., from a combination of VTR encounter rate data and dockside sampling data), *iii*) the coded-wire tag (CWT)-based stock composition of marked and unmarked Chinook mortalities (from dockside sampling data), and *iv*) fishery-total mortality of marked and unmarked double index tag (DIT) CWT stocks (once post-season CWT sample rates are estimated). In addition, relevant data characterizing other aspects of the pilot fishery will be aquired and analyzed, including descriptors of fishing success (catch [landed Chinook] per unit effort, CPUE), the length and age composition of encountered and/or landed Chinook, and the overall intensity of our sampling efforts.

During the Area 12 winter mark-selective Chinook fishery a baseline-level sampling program will be implemented (**Figure 12-1**), with samplers stationed at the higher-use access sites in both northern and southern Hood Canal. Baseline sampling is opportunistic in nature, with overall sampling effort allocated across space and time in a manner that maximizes the number of angler interviews obtained per sampling event. In-sample catch and effort data (e.g., catch per unit effort [CPUE] and species composition data) are used in conjunction with the Catch Record Card (CRC) system to compute post-season (available approximately 1 to 1.5 years from the close of the fishery) catch estimates by species and area.

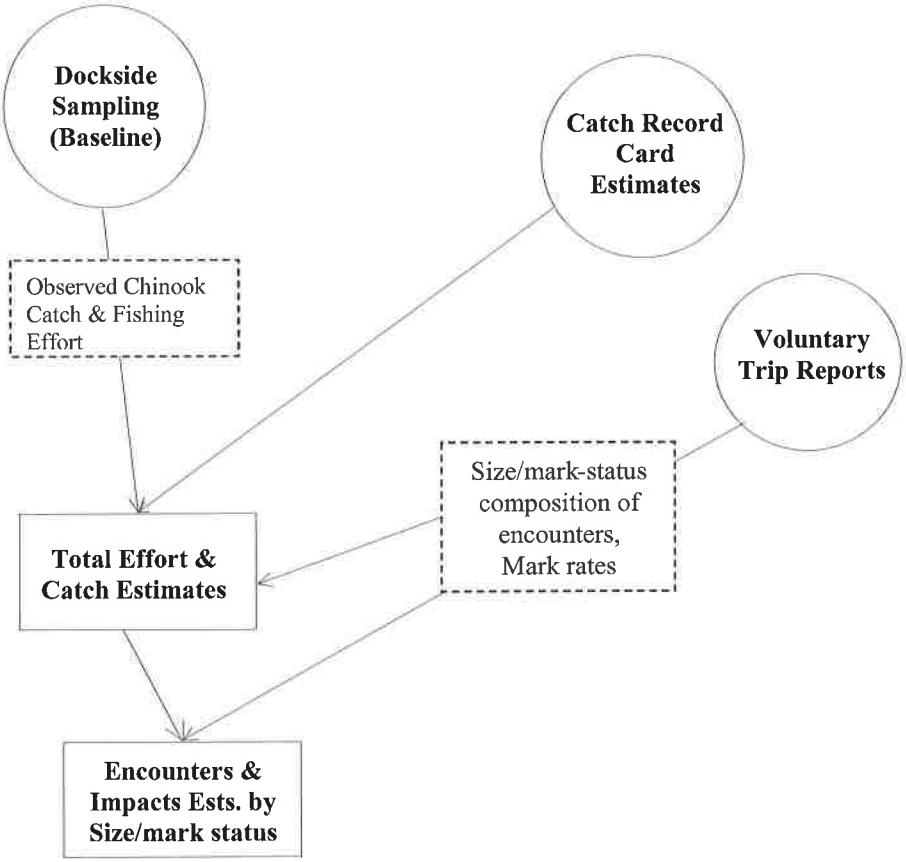

Figure 12-1. Conceptual diagram of the monitoring plan proposed for the **Area 12 winter** mark-selective Chinook season. Circles represent discrete sampling activities, dashed boxes represent parameters that are estimated using data from a given activity, and solid boxes depict key quantities estimated from the comprehensive plan. 'Encounters' includes both harvested and released Chinook salmon.

Dockside Sampling

Dockside samplers will interview anglers exiting the fishery at selected access sites in northern and southern Area 12 via our baseline sampling program, approximately five days per week. Samplers will collect data on: 1) angler effort (i.e., boats and angler counts, trip duration, etc.); 2) encounter (fish retained and/or released) composition, by species (all fish species) and mark status (unmarked vs. adipose-clipped; Chinook and coho salmon only); and 3) landed Chinook size (fork and total lengths) and age composition (i.e., scale samples are collected and subsequently read).

Baseline sampling is opportunistic in nature, with overall sampling effort allocated across space and time in a manner that maximizes the number of angler interviews obtained per sampling event. In-sample catch and effort data (e.g., catch per unit effort [CPUE] and species composition data) are used in conjunction with the Catch Record Card (CRC) system to compute post-season (available approximately 1 to 1.5 years from the close of the fishery) catch estimates by species and area. Sampling size is set at 120 fish per stratum for estimation of species composition and 100 boats per stratum for the estimation of CPUE.

CWT Sampling

Fish will be sampled for coded wire tags (CWT) in the Area 12 winter mark-selective Chinook fishery as part of our dockside angler interviews. The objective is to provide stock specific estimation (by hatchery and brood year) of population parameters, such as fishery contribution and marine survival, as part of the coast-wide CWT program. The sample rate goal for CWT recovery is 20% in mark-selective Chinook

fisheries. During dockside interviews samplers will inspect landed Chinook and coho salmon for the presence of coded-wire tags using wand CWT detectors, and snouts will be collected from all fish containing CWTs. For post-season analyses and reporting, CWT data will be used to estimate stock composition by hatchery and brood year. Total unmarked double index tagged (DIT) mortality estimates will be produced post-season (note: DIT mortality estimates cannot be produced until post-season CRC estimates are available because sample-rate estimates are needed for tag expansions).

Voluntary Trip Reports

Additional information on adipose mark rates and the percentage of Chinook that are legal size (22 inches [56 cm] and larger total length) versus sublegal size (less than 22 inches total length) will be obtained from Voluntary Trip Reports (VTRs) that are submitted by private-boat anglers during the winter mark-selective Chinook fishery in Area 12. Anglers will be asked to record on the VTR forms the date, number of anglers, target species, CRC Area, each Chinook or coho hooked, whether the fish was kept or released, species (if they positively identified the fish), total length to the nearest 1/8th inch, and whether the fish was adipose fin-clipped or not clipped.

Several measures will be taken to help ensure the success of our VTR program. First, samplers will distribute our new and improved, user-friendly VTR form that is easier for anglers to complete compared to the old VTR form. Samplers will maximize the distribution of VTRs by handing out VTRs as anglers launch, and collecting the VTRs as anglers exit the fishery. Additionally, samplers will provide participants with a brochure describing the intent of VTRs and their significance to fishery monitoring, and answer VTR-related questions. To increase the response rate, participants are given three options for returning completed VTRs to WDFW: hand-delivering them to samplers, placing them in on-site drop boxes, or sending them via U.S. mail (pre-paid); if they are unsuccessful (i.e., no encounters occurred [harvested or released]) on their trip, the VTR samplers will request that participants keep their forms for future trips.

Mark rates of legal-size and sublegal-size Chinook will be estiated by calculating the season average mark rate from VTRs. The proportion of Chinook that were legal-size and marked, legal-size and unmarked, sublegal-size and marked, and sublegal-size and unmarked will also be calculated.

Estimates of Total Encounters

We will estimate total Chinook encounters in the Area 12 winter selective Chinook fishery using the bias-corrected approach developed by Conrad and McHugh (2008). Briefly, with the Conrad and McHugh (2008) method, Chinook encounters are estimated by dividing the estimate of legal-marked Chinook harvest by the estimated proportion of the fishable Chinook population that is of legal size and marked. Given that our former "Method 2" approach (e.g., WDFW 2008a) yields negatively biased estimates if anglers release any of the legal-marked Chinook they encounter, Conrad and McHugh estimated a "correction" factor to account for this phenomenon and incorporated it into their estimator. Applying Conrad and McHugh's (2008) approach within the design proposed in **Figure 12-1**, total Chinook encounters will be estimated by dividing the estimate of legal-marked Chinook harvest by the estimated proportion of the fishable Chinook population that is of legal size and marked (obtained via VTR's). Estimates of legal-marked Chinook harvest will be obtained via post-season CRC estimates in Area 12.

Sampling Rates and Staffing Levels

WDFW will strive to meet a 20% sampling rate goal for the Area 12 winter selective Chinook fishery, although typically effort and catches are very low during the winter season in Area 12, which will impact feasibility of reaching the sample rate goal. Staffing levels will be increased, compared to sampling levels for non-selective fisheries.

Post-Season Report

WDFW will provide a preliminary post-season report that will be written and distributed by February 1, 2013 containing a post-season analysis of all data collected in the Area 12 summer selective Chinook fishery from July 1 through September 30, 2012.

5/1/12

April 11, 2012

2012-13 Area 12 Winter Period Mark-Selective Sport Fishery

The Northwest Treaty Tribes and the Washington Department of Fish and Wildlife (WDFW) have reached agreement to implement a Chinook salmon mark-selective fishery in Area 12, for the winter period October 1 to December 31, 2012 and February 1 to April 30, 2013. This fishery will be implemented consistent with management objectives defined by the co-managers' Puget Sound Chinook Harvest Management Plan (April, 2010), the WDFW-Tulalip management plan for hatchery origin fish (2005 Memorandum of Understanding), and established principles concerning the allocation of harvestable salmon and the exercise of treaty rights. The co-managers will seek to minimize or eliminate any unintended effects of this fishery on individual treaty fisheries, including dislocation and/or disruption. Therefore, treaty fisheries will not be modified in order to accommodate this mark-selective fishery.

Fishery Intent

The winter period mark-selective fishery in Area 12 has been implemented to provide recreational fishing opportunity directed at hatchery Chinook salmon. Sampling and monitoring programs implemented with this fishery are intended to provide information necessary to evaluate and plan potential future chinook mark-selective fisheries. The sampling program will provide a basis for determining if the data needed to estimate critical management and analysis parameters can be collected and if the sample sizes needed to produce these estimates with agreed levels of precision can be realistically obtained. Prior to the 2013-14 season, WDFW and the tribes will jointly review and analyze results of the sampling and monitoring program for these fisheries to evaluate the effectiveness at achieving the intended objectives.

Data Needs for Evaluating the Fishery

Monitoring, sampling and reporting programs are being implemented by WDFW for the purpose of providing data necessary to estimate the impact of these mark-selective fisheries on un-marked Chinook and to support the evaluation of future mark-selective fisheries.

WDFW will carry out the monitoring, sampling and reporting program described for Area 12 winter Chinook mark-selective fishery in Attachment A. Shore-based surveys and sampling techniques will be employed, as well as an intensive voluntary trip report program, with the intention of collecting data that will form the basis of post-season analyses and evaluation of performance. During the conduct of these fisheries WDFW will maintain sampling rates in Areas 5-13 at levels sufficient to meet the obligation to adequately sample for CWT and other biological information. This monitoring, sampling and reporting program is part of the WDFW Puget Sound monitoring and sampling operational plan documented with the co-managers' preseason fishing plan.

These monitoring and sampling programs are designed to provide data to estimate the following parameters:

- the mark rate in the fishery - marked and unmarked encounters will be estimated by shore-based and voluntary trip report programs;
- the number of fish retained or landed - marked and unmarked fish will be estimated using a shore-based program, including CWT and scale-age sampling;
- the number of unmarked fish released - estimated by shore-based and voluntary trip reporting of on-water activity;
- the number of unmarked fish retained - estimated by a shore-based program;
- the number of marked fish released - estimated by a shore-based program in conjunction with voluntary trip report program information;
- the number of the chinook encounters that are of sub legal size - estimated by shore-based and voluntary

trip report programs;

- the stock composition of the mortalities – estimated by CWT data collected in the shore-based sampling program;
- estimates of marked and unmarked mortalities of double-index tagged and other CWT stocks.

Post-Season Report

WDFW will provide a preliminary post-season report that will be written and distributed by November 30, 2013, containing a post-season analysis of all data collected in the October 1 to December 31, 2012 and February 1 to April 30, 2013 Area 12 winter selective Chinook fishery.

Data Needs for Post-Season Estimation of Stock-Specific Unmarked Fish Mortalities

The co-managers agree to implement these fisheries with the understanding that the capability to estimate stock-specific unmarked fish mortalities is preserved. Methods for estimating unmarked mortalities of double-index tagged CWT stocks within this mark-selective chinook fishery will be determined jointly by co-managers, considering recommendations of the Selective Fisheries Evaluation Committee of the Pacific Salmon Commission. WDFW will be responsible for reporting the necessary fishery information and data to the Pacific States Marine Fishery Commission that allows these estimates to be generated.

In the post-season report (see previous section), WDFW will provide estimates of unmarked mortalities, by DIT group (by stock and age) and area. Unmarked DIT recoveries will be estimated based on estimated recoveries of marked DIT fish and assuming:

1. DIT release numbers provide a reasonable estimate of the unmarked to marked fish ratio; and,
2. the mortality rate for chinook caught and released in the fishery (sfm) is known.

The assumption that the DIT release numbers provide a reasonable estimate of the unmarked to marked fish ratio will be evaluated through post-season comparisons of DIT tag groups. A design for these comparisons will be developed jointly by the co-managers following the method used in analyzing coho DIT groups.[1] All information from this fishery necessary for making these comparisons is assumed to be included in the sampling design and will be included in the post-season report.

Estimates of total fishery related mortalities, including the total exploitation rate or the southern US exploitation rate, that represent the co-managers' management objectives for Puget Sound chinook management units, are made by combining mortality estimates in mark-selective fisheries with mortality estimates in non-selective fisheries. To ensure that all information necessary to make these estimates is collected, plans for sampling and monitoring of all mark-selective fisheries will be included as a component of the co-managers' annual pre-season agreement.

[1] *Analysis of coho salmon double-index tag (DIT) data. 2003*

Attachment A

MONITORING THE PROPOSED WINTER AREA 12 SELECTIVE CHINOOK FISHERY, OCTOBER 1, 2012 THROUGH DECEMBER 31, 2012 AND FEBRUARY 1 THROUGH APRIL 30, 2013

Overview

The WDFW Puget Sound Sampling Program will monitor the mark-selective Chinook fishery in Area 12 during the winter season from October 1 through December 31, 2012 and February 1 through April 30, 2013. We will employ the monitoring plan shown in **Figure 12-1** to enable estimation of the critical data parameters necessary for evaluating pilot mark-selective fisheries as previously identified by the co-managers (e.g., WDFW and NWIFC 2009), including: *i)* the mark rate of the targeted Chinook population (based on voluntary trip report [VTR] and dockside angler interview data), *ii*) fishery-total angling effort and Chinook salmon encounters (harvest + releases) and mortalities (by size/mark-status class) (e.g., from a combination of VTR encounter rate data and dockside sampling data), *iii*) the coded-wire tag (CWT)-based stock composition of marked and unmarked Chinook mortalities (from dockside sampling data), and *iv*) fishery-total mortality of marked and unmarked double index tag (DIT) CWT stocks (once post-season CWT sample rates are estimated). In addition, we will acquire and analyze relevant data characterizing other aspects of the pilot fishery, including descriptors of fishing success (catch [landed Chinook] per unit effort, CPUE), the length and age composition of encountered and/or landed Chinook, and the overall intensity of our sampling efforts.

During the Area 12 winter mark-selective Chinook fishery a baseline-level sampling program will be implemented (**Figure 12-1**), with samplers stationed at the higher-use access sites in both northern and southern Hood Canal. Baseline sampling is opportunistic in nature, with overall sampling effort allocated across space and time in a manner that maximizes the number of angler interviews obtained per sampling event. In-sample catch and effort data (e.g., catch per unit effort [CPUE] and species composition data) are used in conjunction with the Catch Record Card (CRC) system to compute post-season (available approximately 1 to 1.5 years from the close of the fishery) catch estimates by species and area.

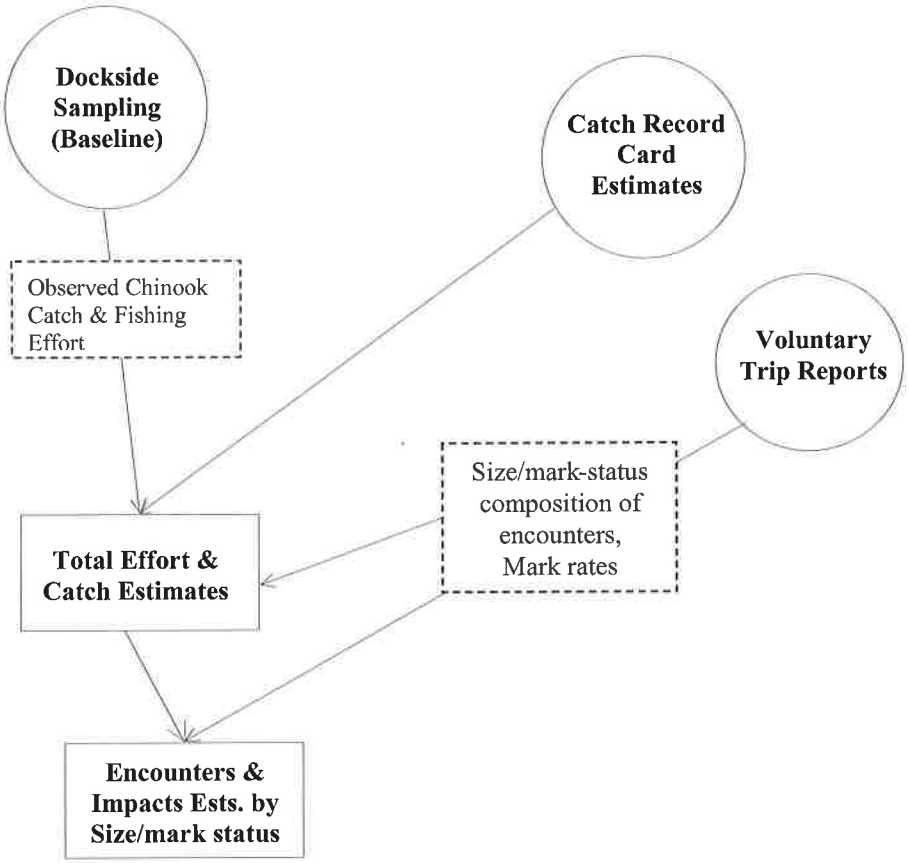

Figure 12-1. Conceptual diagram of the monitoring plan proposed for the **Area 12 winter** mark-selective Chinook season. Circles represent discrete sampling activities, dashed boxes represent parameters that are estimated using data from a given activity, and solid boxes depict key quantities estimated from the comprehensive plan. 'Encounters' includes both harvested and released Chinook salmon.

Dockside Sampling

Dockside samplers will interview anglers exiting the fishery at selected access sites in northern and southern Area 12 via our baseline sampling program, approximately five days per week. Samplers will collect data on: 1) angler effort (i.e., boats and angler counts, trip duration, etc.); 2) encounter (fish retained and/or released) composition, by species (all fish species) and mark status (unmarked vs. adipose-clipped; Chinook and coho salmon only); and 3) landed Chinook size (fork and total lengths) and age composition (i.e., scale samples are collected and subsequently read).

Baseline sampling is opportunistic in nature, with overall sampling effort allocated across space and time in a manner that maximizes the number of angler interviews obtained per sampling event. In-sample catch and effort data (e.g., catch per unit effort [CPUE] and species composition data) are used in conjunction with the Catch Record Card (CRC) system to compute post-season (available approximately 1 to 1.5 years from the close of the fishery) catch estimates by species and area. Sampling size is set at 120 fish per stratum for estimation of species composition and 100 boats per stratum for the estimation of CPUE.

CWT Sampling

We will sample for coded wire tags (CWT) in the Area 12 winter mark-selective Chinook fishery as part of our dockside angler interviews. The objective is to provide stock specific estimation (by hatchery and brood year) of population parameters, such as fishery contribution and marine survival, as part of the coast-wide CWT program. The sample rate goal for CWT recovery is 20% in mark-selective Chinook

fisheries. During dockside interviews samplers will inspect landed Chinook and coho salmon for the presence of coded-wire tags using wand CWT detectors, and snouts will be collected from all fish containing CWTs. For post-season analyses and reporting, CWT data will be used to estimate stock composition by hatchery and brood year. Total unmarked double index tagged (DIT) mortality estimates will be produced post-season (note: DIT mortality estimates cannot be produced until post-season CRC estimates are available because sample-rate estimates are needed for tag expansions).

Voluntary Trip Reports

Additional information on adipose mark rates and the percentage of Chinook that are legal size (22 inches [56 cm] and larger total length) versus sublegal size (less than 22 inches total length) will be obtained from Voluntary Trip Reports (VTRs) that are submitted by private-boat anglers during the winter mark-selective Chinook fishery in Area 12. Anglers will be asked to record on the VTR forms the date, number of anglers, target species, CRC Area, each Chinook or coho hooked, whether the fish was kept or released, species (if they positively identified the fish), total length to the nearest 1/8th inch, and whether the fish was adipose fin-clipped or not clipped.

We will take several measures to help ensure the success of our VTR program. First, samplers will distribute our new and improved, user-friendly VTR form that is easier for anglers to complete compared to the old VTR form. Samplers will maximize the distribution of VTRs by handing out VTRs as anglers launch, and collecting the VTRs as anglers exit the fishery. Additionally, samplers will provide participants with a brochure describing the intent of VTRs and their significance to fishery monitoring, and answer VTR-related questions. To increase the response rate, participants are given three options for returning completed VTRs to WDFW: hand-delivering them to samplers, placing them in on-site drop boxes, or sending them via U.S. mail (pre-paid); if they are unsuccessful (i.e., no encounters occurred [harvested or released]) on their trip, the VTR samplers will request that participants keep their forms for future trips.

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We will estimate total Chinook encounters in the Area 12 winter selective Chinook fishery using the bias-corrected approach developed by Conrad and McHugh (2008). Briefly, with the Conrad and McHugh (2008) method, Chinook encounters are estimated by dividing the estimate of legal-marked Chinook harvest by the estimated proportion of the fishable Chinook population that is of legal size and marked. Given that our former "Method 2" approach (e.g., WDFW 2008a) yields negatively biased estimates if anglers release any of the legal-marked Chinook they encounter, Conrad and McHugh estimated a "correction" factor to account for this phenomenon and incorporated it into their estimator. Applying Conrad and McHugh's (2008) approach within the design proposed in **Figure 12-1**, we would estimate total Chinook encounters by dividing the estimate of legal-marked Chinook harvest by the estimated proportion of the fishable Chinook population that is of legal size and marked (obtained via VTR's). Estimates of legal-marked Chinook harvest will be obtained via post-season CRC estimates in Area 12.

Sampling Rates and Staffing Levels

WDFW will strive to meet a 20% sampling rate goal for the Area 12 winter selective Chinook fishery, although typically effort and catches are very low during the winter season in Area 12, which will impact feasibility of reaching the sample rate goal. We will implement increased staffing levels (compared to non-selective fisheries) to boost the sample rates in Area 12.

Post-Season Report

WDFW will provide a preliminary post-season report that will be written and distributed by November 30, 2013, containing a post-season analysis of all data collected in the Area 12 winter selective Chinook fishery from October 1 through December 31, 2012 and February 1 through April 30, 2013.