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April 24, 2009

Mr. Phil Anderson  
Interim 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 2009 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 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 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 National Marine Fisheries Service under the Endangered Species Act, in the respective parties' regulation summaries, in status report documents (as required by the Puget Sound Salmon Management Plan), and other state/tribal understandings.

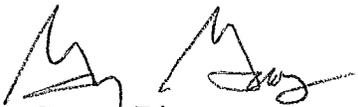
The fishing arrangements contained in this document are based on pre-season expectations of stock abundance and, in some instances, may be modified on the basis of information obtained in-season and by agreement between the parties. If any changes to the assumptions used to develop these fishing arrangements 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 treaty and non-treaty commercial and non-treaty recreational 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 run summary tables appended to the agreed upon fisheries document provide our assessment of impacts on key natural coho and Chinook salmon populations.

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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 2009-2010 management year are also included and are a part of this fisheries agreement.

Sincerely,



Gary Graves, Director  
Fishery Services  
Northwest Indian Fisheries Commission



Pat Pattillo  
Salmon Policy Coordinator  
Department of Fish and Wildlife

Enclosure

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

# **2009-10 Co-Managers'**

# **List of Agreed Fisheries**

**(May 1, 2009 – April 30, 2010)**

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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 #2309 & #0921)**

Treaty Troll Quota	39,000 Chinook; 60,000 coho
Non-treaty TAC	41,000 Chinook; 210,000 coho
NT Troll TAC	20,500 Chinook; Mark Selective Fishery impacts associated with a landed catch of 33,600 coho
Recreational TAC	20,500 Chinook and Mark Selective Fishery impacts associated with a landed catch of 176,400 coho.

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

5/1-6/30	Chinook directed fishery with sub quota of 19,000 Chinook. May 1 through the earlier of June 30 or a 19,000 Chinook quota. All salmon except coho. If the Chinook quota for the May-June fishery is not fully utilized, the excess fish cannot be transferred into the later all-salmon season. 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 20,000 Chinook or quota of 60,000 coho. Chum release 8/1-9/30. July 1 through the earlier of September 15, or a 20,000 pre-season Chinook quota, or a 60,000 coho quota. All salmon.

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

5/1-6/30	All salmon except coho with 13,735 Chinook quota; Open May 1-5 and May 8-12, then Saturday through Tuesday with a landing and possession limit of 75 Chinook per vessel north of Leadbetter Point or 75 Chinook per vessel south of Leadbetter Point for each open period. 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. State regulations require that all fishers landing fish into Oregon from any fishery between Leadbetter Point, WA and Cape Falcon, OR must notify Oregon Department of Fish and Wildlife within one hour of delivery or prior to transport away from the port.
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<p>July 1 thru earliest of Sept. 15 or pre-season Chinook sub-quota of 6,765 or Mark Selective Fishery quota of 33,600 coho.</p>	<p>Open July 1-7, then open Saturday through Tuesday thereafter. Landing and possession limit of 40 Chinook and 200 marked coho per vessel per open period north of Leadbetter Point or 40 Chinook and 200 marked coho south of Leadbetter Point. 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. 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. State regulations require that all fishers landing fish into Oregon from any fishery between Leadbetter Point, WA and Cape Falcon, OR must notify Oregon Department of Fish and Wildlife within one hour of delivery or prior to transport away from the port.</p>
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### 1.3 Non-Treaty Recreational

#### Area 1: Leadbetter Point to Cape Falcon (Oregon)

<p>6/28-9/30 (88,200 Mark Selective Fishery coho sub quota)</p>	<p>Open seven 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: 5,400; 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.</p>
<p><b>Buoy 10</b></p>	
<p>8/1-8/31</p>	<p>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 sockeye, chum, and unmarked coho. Barbed hooks allowed.</p>
<p>9/1-9/30</p>	<p>Open 7 days/week; 3 coho only per day. Coho minimum size 16 inches; retained coho must have a healed adipose fin clip. Barbed hooks allowed.</p>
<p>10/1-12/31</p>	<p>Open 7 days/week; 6 coho only per day, 2 adults (minimum size 12 inches); retained coho must have a healed adipose fin clip. Barbed hooks allowed.</p>

1/1/2010-3/31/2010	Open 7 days/week; 6 fish per day, 2 adults (minimum size 12 inches); retained Chinook must have a healed adipose fin clip; release sockeye, chum, unmarked coho and unmarked Chinook. Barbed hooks allowed.
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**

6/28-9/20 (65,270 Mark Selective Fishery coho sub quota)	Open Sun-Thur through July 23, seven days per week thereafter; ; 2 fish per day, only one of which may be a Chinook; plus one additional pink salmon; retained coho must have a healed adipose fin clip; Chinook minimum size limit 24 inches and coho minimum size 16 inches; Chinook guideline: 11,850. In-season management may be used to sustain season length and keep harvest within the overall Chinook recreational TAC for north of Cape Falcon. Grays Harbor control zone closed beginning August 1.
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**Area 2-1 (east of a line from Leadbetter Point to Cape Shoalwater): Willapa Bay**

6/28-7/31	Open concurrent with Area 2, when Area 2 is open for salmon. Area 2 rules apply.
8/1-8/15	6 fish limit, 2 adults, 12" min size limit; barbed hooks allowed
8/16-1/31/2010	6 fish limit, 3 adults; no more than 2 adult Chinook; 12" min size limit; barbed hooks allowed.

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

West of Buoy 13 line 7/1- 7/31	Closed.
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 9/16-11/30	2 fish per day, only 1 wild adult coho, release Chinook and chum. Minimum size 12".

**Westport Boat Basin and Ocean Shores Boat Basin**

8/16-1/31/2010	6 fish limit, 4 adults; 12" min size limit; barbed hooks allowed; night closure and anti-snagging rule.
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**Area 3: Cape Alava to Queets River**

6/27-9/20 (4,480 Mark Selective Fishery coho sub quota)	Open Tues-Sat through July 17, seven days per week thereafter; 2 fish per day, only one of which may be a Chinook plus two additional pink salmon; retained coho must have a healed adipose fin clip; Chinook minimum size limit 24 inches, coho minimum size 16 inches; Chinook guideline: 950. 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 9/26-10/11	(100 coho sub quota; 100 Chinook sub quota) 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**

6/27-9/20 (18,350 Mark Selective Fishery coho sub quota)	Open Tuesday through Saturday through July 17, seven days per week thereafter; 2 fish per day, only one of which may be a Chinook plus two additional pink salmon. Chum non-retention during August and September. Retained coho must have a healed adipose fin clip; Chinook minimum size limit 24 inches and coho minimum size 16 inches; Chinook guideline: 2,200; 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-season management may be used to sustain season length and keep harvest within the overall Chinook recreational TAC for north of Cape Falcon.
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**Area 4A: Makah Bay Treaty Evaluation Marine Set Net Fishery**

Chinook	Trty	Open 8/16 through 9/19 inside an area bounded by a line running from Strawberry Rock Point (48° 19' 07"N, 124° 40' 00"W) to the group of rocks (48° 19' 46"N, 124° 40' 35"W) which are located off Hobuck Beach and a line to the mouth of Hobuck Creek (48° 19' 54"N, 124° 39' 37"W), to be implemented per agreement by the Makah Tribe and WDFW.
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**Part II. PUGET SOUND including STRAIT OF JUAN de FUCA and SAN JUAN ISLANDS fisheries**

**2.1 Strait of Juan de Fuca Pre-terminal Areas**

**Areas 5, 6, 6C Treaty Troll (Ntrty net closed)**

NOTE: For Area 4B: 5/1-10/31 see Ocean Troll. For 11/1-12/31 and 1/1-4/15 see below

5/1-6/17	Closed
6/18 - 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 through April 15, or when catch reaches the harvest guideline of 8500 Chinook, whichever comes first. 1,000-foot closures around stream mouths. A lower number was modeled in Chinook FRAM #2309 as per co-manager agreement; however, the fishery will be managed for the harvest guideline of 8500 Chinook.
4/16-4/30	Closed

**Areas 4B, 5, & 6C Treaty Net (Ntrty net closed)**

Chinook	Open for setnet gear only, 6/21 through 8/15; 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/Pink	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 and pink 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 and pink 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 (in-season adjustments based on cumulative catch) from the end of Fraser Panel control, through 10/10; 1,000 ft. closure around stream mouths. The gillnet catch number listed in FRAM #0921 will be used as management guideline and should not be greatly exceeded.
Chum	Open for gillnets, starting at 6 days per week (days may be added if effort is low), 10/11 through 11/14; 1,000-foot closure around stream mouths.

**Area 5 Recreational**

5/1-6/30	Closed
7/1-8/15	2 fish limit, plus 2 additional pink salmon (Chinook 22" min size); unmarked Chinook, unmarked coho, and chum release. South of the Kydaka Pt./Shipwreck Pt. line – closed to salmon angling.
8/16-9/18	2 fish limit, plus 2 additional pink salmon; Chinook, unmarked coho, and chum release. South of the Kydaka Pt./Shipwreck Pt. line – closed to salmon angling.
9/19-9/30	2 fish limit; Chinook and chum release. South of the Kydaka Pt./Shipwreck Pt. line – closed to salmon angling.
10/1-10/15	2 fish limit, 1 Chinook (Chinook 22" min size).
10/16-2/12	Closed
2/13-4/10	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, plus 2 additional pink salmon, (Chinook 22" min size); unmarked coho, chum, and Chinook release, 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, plus 2 additional pink salmon; Chinook, unmarked coho, and chum release. 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 - 2/12	Closed
2/13 - 4/10	1 fish limit (Chinook 22" min size). 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
Pink	All	Closed
Coho	Trty	Open 9/21 through 11/24; additional openings possible based on in-season information; Chinook and chum release and gillnets may fish daytime only, gillnets must be attended to by fisher, through 10/10; 1,500 ft closure around each river mouth.
	Ntrty	Open Wk 39 (wb 9/20) through Wk 43 (wb 10/18) for skiff gillnet gear; 7AM – 7PM, 5 days each week (M-F); Chinook and chum release by cutting ensnaring meshes; 1,500 ft. (1/4 nautical mile) closure around each river mouth. Additional openings possible in wb 10/25 based on in-season information.
Chum	All	Closed

### Dungeness River Treaty (Ntrty net closed)

Chinook	Trty	Closed
Pink	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	Open 9/13 through 11/7; days per week to be determined in-season.
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.
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**Elwha River Recreational**

(mouth to Aldwell Lake Dam)	3/1 – 9/30	Closed to all fishing.
	10/1 – 2/28/2009	Trout and other game fish open.
	10/1 – 11/15	6 fish limit, coho only; no more than 4 adults; 12" min. size

**Hoko River Recreational**

(mouth to cement bridge (mile 7.0) on Hoko/Ozette Hwy.)	All year	Closed to salmon.
	6/1 – 3/15/2009	Trout and other game fish.. (Fly fishing only 9/1 – 10/31)

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
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Sockeye	Trty	<p>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 and pink 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&amp;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. If, during the season, the Fraser Panel schedules a fishery that is projected to result in a total Chinook by-catch exceeding 6,300 fish, the Tribes will, effective with that scheduled fishery, prohibit all retention of Chinook salmon by all fishers; unless a projection for the remainder of the 2009 sockeye and pink salmon fishery will not result in a total by-catch of more than 6,700 Chinook. July and August – C&amp;S fishery. Further policy discussion may occur among the affected parties prior to the season.</p>
	Ntrty	<p>Schedule to be determined. Modeled for Wks 31 (wb 7/26) – 37 (wb 8/16), 1,3,3,2,0,4,4. 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 for the season. 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 3,677 total Chinook (120% of pre-season estimate).</p>
Pink	Trty	<p>Purse seine and gill net: schedule dependent upon Fraser Panel. See Chinook by-catch in-season actions description in sockeye section above.</p>

	Ntrty	Schedule to be determined, modeled as described above. 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 chum, unmarked Chinook, and unmarked coho NR. See Chinook by-catch in-season actions description in sockeye section above.
Coho	Trty	Closed
	Ntrty	Reef net: 7 days/wk beginning at end of Fraser Mgmt through chum mgmt wk 46 (wb 11/8); 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 Treaty 10/10-11, 10/14-15, with an in-season conference on Thursday 10/15 to determine further fishing schedules.
	Ntrty	PS and GN open week 42 (wb 10/11) Monday – Tuesday and Friday- Saturday, then 7 days/week wks 43 (wb 10/18) – 46 (wb 11/8). Dependent upon update of run status from CDFO, and in-season conference on Thursday 10/15 to determine further fishing schedules. Purse seine brailing required, Chinook and coho NR; GN Chinook and coho NR, live box, and limited soak time restrictions in wk 42. Reef nets open from end of Fraser Panel management through wk 46 (wb 11/8), 7 days per week. All vessel operators must complete best fishing practices certification prior to fishing.
Subsistence	Trty	2/1-4/15 subsistence troll fishery

### Area 7 Recreational

5/1-6/30	Closed
7/1-7/31	2 fish limit, 1 Chinook (Chinook 22" min size) plus 2 additional pink salmon; 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) plus 2 additional pink salmon; release unmarked coho, 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. Single point barbless hooks only.
10/1-10/31	2 fish limit, 1 Chinook; Samish Bay closed to salmon angling 10/1-10/15. Unmarked coho release.
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/Pink	Trty	<p>Areas 7B, 7C, &amp; 7D: August 2 through September 4 (Wks 31-36), open weekly 4 PM Sunday to 4 PM Friday (except Purse seines closed on 8/19 and 8/26); 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 4:00 PM Sunday – 4:00 PM Wednesday south to a line from Oyster Creek to Fish Point on Samish Island; fishing pattern: 5,5,5,5,5. 6 1/2" mesh in 7B, off reservation areas and 7C except when open for sockeye in 7 and 7A.</p> <p>Areas 7B (5" min mesh) and 7D on reservation: July 26 through September 5 (Wks 31-36) open Sunday 4 PM through Saturday 4 PM, fishing pattern: 6, 6, 6, 6, 6.</p>
	Ntrty	<p>Areas 7B &amp; 7C: Wks 33 (wb 8/9)- 36 (wb 8/30); GN pattern beginning wk 33: 1,3,3,3 (GN will not be scheduled for Sundays Wks 34-36) PS pattern beginning wk 33: 1,1,1,1, brailing required; PS coho NR.</p>

Coho	Trty	<p>Area Closure during September coho fisheries. For both Treaty and non-Treaty gillnet fisheries operating in Area 7B during September as follows: 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. Treaty and Non-Treaty purse seines fishing in this area must release coho.</p> <p>The waters of Indian Slough remain open south of a line from a tower located on March Point (48°28'23"N, 122° 32'57"W) to the Spire on the eastern shore of Padilla Bay at Bayview (48°29'05"N, 122° 28'32"W) for treaty fishers.</p>
		<p>Areas 7B: September 6 through October 24 (Wks 37-43), open Sunday 4 PM – Saturday 4 PM. 6,6,6,6,6,6.</p>
		<p>Areas 7B and 7D on reservation: September 6 through October 24 (Wks 37-43), open Sunday 4 PM – Saturday 4 PM. 6,6,6,6,6,6.</p>
		<p>7A on reservation fishery: September 20 through October 17 (Wks 39-42). Open weekly 4 PM Sunday through 4 PM Wednesday.</p>
	Ntrty	<p>Area 7B: Wks 37 (wb 9/6)-Wk 43 (wb 10/18); GN fishing pattern: 3,3,7,7,7,7,7 (24 hrs for all days); PS fishing pattern: 1,3,7,7,7,7,7.</p>
Chum	Trty	<p>Areas 7B &amp; 7D: October 25 – December 19 (Wks 44-51); open 3 days/wk. 3,3,3,3,3,3,2</p>
	Ntrty	<p>Area 7B: Wks 44 (wb 10/25)-Wk 49 (wb 11/29); PS/GN; 7,5,5,5,5,5. Whatcom Creek Zone (east of line from Post Point to flashing red light at west entrance of Squalicum Harbor) open 7 days per week.</p>

**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/Pink	April 1 – May 31	April and May limited ceremonial and subsistence Chinook harvest as required. Harvest will not exceed 80 total (expected 8 NOR) Chinook. The fishery will occur in the north fork between the railroad trestle just down river from the Highway 9 bridge and the mouth of Racehorse Creek (RM 36.6 to 45.2) and the Nooksack River between Slater Road bridge and the river mouth (between RM 0.0 and 3.5).
	8/2-9/5 (wks 32-36)	Open 4 PM Sunday and close 4 PM Saturday, except wk 32 open Sunday 4 PM to Wednesday 4 PM. Fishing pattern: 6,6,6,6,6. The river is divided into five zones during this period. These zones open on subsequent weeks, proceeding upriver, to protect migrating spring Chinook.
Coho	9/6 – 10/31 (wks 37-44)	Off reservation open weekly Sunday 4 PM through Friday 4 PM, and Saturday 4 PM through Sunday 7 AM. On reservation open Sunday 4 PM through Saturday 4 PM; 6 days/wk.
Chum	11/22-23	Subsistence harvest
	11/1 – 12/19 (Wks 45-51);	Commercial. Open 3 days/wk. 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), release pink salmon; 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, 12" min size, release pink salmon, unmarked Chinook and unmarked coho. All species-night closure and anti-snagging rule 8/1-11/30.
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(from yellow marker at the FFA high school barn in Deming to confluence of North and South forks)	10/16 – 12/31	2 fish limit, 12" min size, release pink salmon, Chinook and unmarked coho. All species-night closure and anti-snagging rule 10/1-11/30.
(from confluence of North and South forks to Maple Creek on North Fork)	10/1 – 10/31	2 fish limit, 12" min size, release pink salmon, Chinook and unmarked coho. All species-night closure and anti-snagging rule 8/1-11/30.

**Nooksack River Recreational, South Fork**

(from mouth to Skookum Creek)	10/16 – 12/31	2 fish limit, 12" min size, release pink salmon, Chinook and unmarked coho. All species-selective gear rules 6/1–2/28, and night closure 8/1-10/31. The water from Saxon Road Bridge to Skookum Creek closed to all fishing from 7/1 – 10/16.
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**Samish River Recreational**

(from mouth to Thomas Rd. Bridge)	7/1 – 12/31	2 fish limit, 12" min size. Release unmarked coho. All species-night closure and anti-snagging rule 8/1-12/31.
(from Thomas Rd. Bridge to I-5 Bridge)	10/1 – 12/31	2 fish limit, 12" min size. Release unmarked coho. All species-night closure and anti-snagging rule 8/1-12/31.

**Dakota Creek Recreational**

(mouth to Giles Road Bridge)	10/1 – 12/31	2 fish limit, 12" min size.
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**Whatcom Creek Recreational**

(mouth to yellow markers below foot bridge below Dupont St. in Bellingham)	8/1 – 12/31	6 fish/2 adult limit, 12" min size. All Species – night closure and anti-snagging rule 8/1-12/31.
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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.

Chinook	Area 8 - Trty	<p><u>Swinomish fishing pattern:</u> wk 19 (wb 5/3) and wk 20 (wb 5/10) 1,1; wk 28 (wb 7/5) thru 32 (wb 8/2) 2,2,2,2,2.</p> <p><u>Upper Skagit fishing pattern:</u> wk 19 (wb 5/3) thru wk 21 (wb 5/17) 1,1,1; wk 28 (wb 7/5) thru wk 32 (wb 8/2) 1.167, 1.167, 1.167, 1.167, 1.167.</p>
Pink	Trty	<p><u>Swinomish fishing pattern:</u> wk 34(wb 8/16) thru 37(wb 9/6);1,6,6,6. Schedule after ISU dependent on ISU.</p> <p><u>Upper Skagit fishing pattern:</u> wks 35(wb 8/23) thru 38(wb 9/13); 1.167,1.167,1.167,1.167Schedule after ISU dependent on ISU.</p>
	Ntrty	Wk 34 (w/b 8/16) – 35 (w/b 8/23); PS NR for CK, CO, SO, and CH; PS fishing pattern 2, 2; GN fish daylight hours; GN fishing pattern 2, 2.
Sockeye	Area 8 – Trty	<p><u>Swinomish:</u> no preseason harvestable, if harvestable take at Baker Trap. If harvestable exceeds C&amp;S needs, discuss with co-managers.</p> <p><u>Upper Skagit:</u> no preseason harvestable, if harvestable take at Baker Trap. If harvestable exceeds C&amp;S needs, discuss with co-managers.</p>
	Ntrty	Closed
Coho	Trty	Terminal Treaty HR target 12.5%. If ISU changes abundance status, HR may be modified following co-manager discussions.
	Area 8 - Trty	<p><u>Swinomish fishing pattern:</u> wks 39 (wb 9/20) thru wk 40 (wb 9/27); 2,1.</p> <p><u>Upper Skagit fishing pattern:</u> wks 39 (wb 9/20) thru wk 42 (wb 10/11); 1,2,2,1.167.</p>
	Ntrty	Closed
Chum Test	Area 8	1 boat at Jetty 1 day/wk 44 (wb 10/25) & 45 (wb 11/1) and 1 boat in Bay 1 day/wk 44 (wb 10/25) & 45 (wb 11/1).
Chum	Area 8 - Trty	<p><u>Swinomish fishing pattern:</u> wk 45 (wb 11/1) and wk 46 (wb 11/8); 1,1. Fishery dependent on ISU and harvestable fish.</p> <p><u>Upper Skagit fishing pattern:</u> wk46 (wb 11/8) and wk 47 (wb 11/15); 1,1. Fishery dependent on ISU and harvestable fish.</p>
	Ntrty	Closed. May open pending co-manager agreement on ISU that indicates harvestable runsize.

**Skagit River Treaty Net (Ntrty net closed)**

Chinook	Areas 78C and 78D	<p>Ceremonial and Subsistence – 565 fish total Swinomish, Sauk-Suiattle, and Upper Skagit Tribes.</p> <p><u>Swinomish fishing pattern:</u> wk 19 (wb 5/3) and wk 20 (wb 5/10) 1,1; wk 28 (wb 7/5) thru 32 (wb 8/2) 2,2,2,2,2.</p> <p><u>Sauk-Suiattle fishing pattern:</u> wk 19 (wb 5/3) and wk 20 (wb 5/10) 1,1; wk 28 (wb 7/5) thru 31 (wb 7/26) 2,2,1,1.</p> <p><u>Upper Skagit fishing pattern:</u> wk 19 (wb 5/3) thru wk 21 (wb 5/17) 1,1,1; wk 28 (wb 7/5) thru wk 32 (wb 8/2) 1.167,1.167,1.167,1.167,1.167.</p>
Sockeye	Areas 78C and 78D	No preseason harvestable, if harvestable take at Baker Trap. If harvestable exceeds C&S needs, discuss with co-managers.
Pink	<u>Area 78C</u>	<p><u>Swinomish fishing pattern:</u> wks 34 (wb 8/16) thru 37 (wb 9/6); 1,6,6,6. Schedule after ISU dependent on ISU.</p> <p><u>Sauk-Suiattle fishing pattern:</u> wks 34 (wb 8/16) thru 37 (wb 9/6); 1,4,4,4. Schedule after ISU dependent on ISU.</p> <p><u>Upper Skagit fishing pattern:</u> wks 35 (wb 8/23) thru 38 (wb 9/13); 1.167,1.167,1.167,1.167. Schedule after ISU dependent on ISU.</p>
	<u>Area 78D</u>	<u>Upper Skagit fishing pattern:</u> wks 35 (wb 8/23) thru 38 (wb 9/13); 1.167,1.167,1.167,1.167. Schedule after ISU dependent on ISU.
Coho		Terminal Treaty HR target 12.5%. If ISU changes abundance status, HR may be modified following co-manager discussions.
	Area 78C:	<p><u>Swinomish fishing pattern:</u> wk 39 (wb 9/20) thru wk 40 (wb 9/27); 2,1.</p> <p><u>Sauk-Suiattle fishing pattern:</u> wk 39 (wb 9/20) thru wk 40 (wb 9/27); 2,1.</p> <p><u>Upper Skagit fishing pattern:</u> wk 39 (wb 9/20) thru wk 42 (wb 10/11); 1,2,2,1.167.</p>
	Area 78D	<u>Upper Skagit fishing pattern:</u> wk 39 (wb 9/20) thru wk 42 (wb 10/11); 1,2,2,1.167.
Chum	Area 78C	<p><u>Swinomish fishing pattern:</u> wk 44 (wb 10/25) and wk 45 (wb 11/1); 1,1; fishery dependent on ISU.</p> <p><u>Sauk-Suiattle fishing pattern:</u> wk 44 (wb 10/25) and wk 45 (wb 11/1); 1,1; fishery dependent on ISU.</p> <p><u>Upper Skagit fishing pattern:</u> wk 45 (wb 11/1) and wk 46 (wb 11/15); 1,1; fishery dependent on ISU.</p>
	78D	<u>Upper Skagit fishing pattern:</u> wk 44 (wb 10/25) and wk 45 (wb 11/1); 1,1; fishery dependent on ISU.

River Test	Chinook	(Blakes) Wk 19 (wb 5/3) thru wk 35 (wb 8/23); 1 boat, 6 hours/wk.
	Pink	(Blakes & Spudhouse) wk 32 (w/b 8/2) thru wk 33 (wb 8/9); 2 boats, 12 hours/wk.
	Coho	(Blakes & Spudhouse) wk 34 (wb 8/16)- wk 45 (wb 11/1); 2 boats, 12 hours/wk; River Area 2 (78D) wk 35 (wb 8/23) thru wk 44 (wb 10/25); 2 setnets, 24 hours/wk.
	Chum	One boat at Blakes 1 day/wk 44 (wb 10/25) and wk 45 (wb 11/1).

**Swinomish Channel Treaty Net (Ntrty net closed)**

Coho	No separate openings. Area opens during Area 8 openings.
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**Area 8-1 Recreational**

5/1-7/31	Closed
8/1-9/30	2 fish limit, plus two additional pink, Chinook release.
10/1- 10/31	Closed, except Oak Harbor open, 2 coho only limit.
11/1 – 4/30	2 fish limit, Chinook 22" min size, release unmarked Chinook.

**Baker River/Lake Recreational**

(mouth to Hwy 20 Bridge)	July	Dependent on ISU. Potential fishery starting date to be determined. 2 fish limit, sockeye only, 12" min. size.
From Hwy 20 Bridge upstream to Dam	July	Dependent on ISU. Potential fishery starting date to be determined. 2 fish limit, sockeye only, 12" min. size.
Baker Lake	July - August	Dependent on ISU. Potential fishery starting date to be determined. 2 fish limit, sockeye only, 12" 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 Gilligan Creek)	7/9 – 8/9	Open weekly Thursday noon – Sunday midnight. 2 fish limit, only 1 adult, Chinook only.
(mouth to Memorial Hwy. Bridge (Hwy 536 at Mt. Vernon))	8/16 – 12/31	2 fish limit, plus 2 additional pink 12" min size, release chum and Chinook.

(From Memorial Hwy Bridge to Gilligan Creek)	8/16 – 12/31	2 fish limit, plus 2 additional pink, 12" min size, release chum and Chinook.
(From Gilligan Creek to Dalles Bridge at Concrete)	8/16 – 12/31	2 fish limit, plus 2 additional pink, 12" min size, release chum and Chinook. All Species – night closure and anti-snagging rule 7/1 - 11/30.
(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. All species – night closure and anti-snagging rule. Co-managers will consult on harvest guidelines and fishery may close early.
	July	Dependent on ISU. Potential fishery starting date to be determined. 2 fish limit, sockeye only, 12" min. size.
	9/16 – 12/31	2 fish limit, plus 2 additional pink, 12" min size, release chum and Chinook. All species – night closure and anti-snagging rule 7/1 through 11/30.
	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

**Note:** A Snohomish Chinook mark-recapture study will be conducted in the Snohomish River during the summer and fall of 2009 for the purpose of improving spawning escapement estimation methods. This study is being implemented as part of the Sentinel Stocks Program of the renewed Pacific Salmon Treaty. The project is expected to capture up to 500 Snohomish River hatchery and wild Chinook and project planners anticipate a maximum mortality associated with handling of 50 hatchery and wild Chinook. This maximum mortality assumption has been incorporated in the FRAM analysis of fishery impacts for the 2009 seasons although the impact is not defined as a test fishery and is not considered fishery related.

### Area 8A Net

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

Pink	Trty	Wks 33 (wb 8/9) – 36 (wb 8/30); up to 5 days per week. Closed north of the line from Camano Head northeast to Tulalip Shores Point.
	Ntrty	Wk 34 (w/b 8/16) – 35 (w/b 8/23); PS NR for CK, CO, SO, and CH; PS fishing pattern 2, 2; GN fish daylight hours; GN fishing pattern 2, 2.
Coho	Trty	Wks 37 (wb 9/6) - Wk 42 (wb 10/11) up to 5 days per week. Update fishery through week 40. Manage for CCMP breakpoints and rates.
	Ntrty PS	Wks 40-41 (wb 9/27 – wb 10/4): PS limited participation (2 boats per day): Chinook NR, fishing pattern: 1,1. PS limited to area north of a line from the Clinton ferry dock to the Mukilteo ferry dock during Wk 40. Wk 42 (wb 10/11): PS full fleet; Chinook NR, fishing pattern: 1.
	Ntrty GN	Wks 41 - 42 (wb 10/4 – wb 10/11) GN fishing pattern: 1,2; GN fish night hours Wk 41.
Chum	Trty	Wks 43 (wb 10/18) - Wk 48 (wb 11/22); Manage for Stillaguamish and Snohomish harvest rates and minimum escapement goals; Regional management plan to be developed by co-managers by July 15, 2009 including in-season update based on Treaty fisheries during MW 43-45.
	Ntrty	Closed. May open pending co-manager agreement on ISU indicating increased runsize.

**Area 8D Net**

Chinook	Trty	BS, RH, GN gear outside Tulalip Bay may be open during the following periods: 5/3 – 6/4      12:01 AM Sun – 11:59 PM Sat 6/5 – 8/29      12:01 PM Mon – 11:59 PM Thu 8/30 – 9/19      12:01 AM Mon – 11:59 PM Fri  Setnets inside Tulalip Bay may be open during the following periods: 5/3 – 9/19      12:01 AM Sun – 11:59 PM Sat  Openings will be approx. 3 days/week for each gear.
	Ntrty	Closed (see recreational SAF)
Coho	Trty	Wk 39 (wb 9/20) – Wk 45 (wb 11/1); open to target Tulalip hatchery coho.

	Ntrty	Wk 39 (wb 9/20)-Wk 45 (wb 11/1); PS Chinook NR; PS fishing pattern: 1,1,1,1,1,2,1; GN fish at night on Sundays Wks 39-41; daylight all other openings; GN fishing pattern: 3,3,3,2,2,2,2. Closed east of the line from Mission Point to Hermosa Point.
Chum	Trty	Wk 46 (wb 11/8) - Wk 52 (wb 12/20); 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 46 (wb 11/8)-Wk 48 (wb 11/22); PS fishing pattern: 2,1,2; GN fishing pattern: 2,2,2 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 as necessary to ensure egg take requirements are met.

**Stillaguamish River Treaty Net (Ntrty net closed)**

Chinook	C&S 20 Chinook.
Pink	Open 8/12 to 9/22, 5 days/wk
Coho	Open Wk 39 (wb 9/20) - Wk 43 (wb 10/18); max 5 days per week.
Chum	Wks 44 (wb 10/25)-Wk 52 (wb 12/20); 5 days per week.

**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, plus 2 additional pink salmon, Chinook release.
10/1 - 10/31	Closed north of a line due east from Randall Point, daily limit 2, 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 6/5-9/27:	6/5 – 6/19 and 6/21 – 9/7	Open 12:01 AM Friday – 11:59 AM Monday 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 plus 2 additional pink salmon (Chinook 22" min. size).
	9/12 – 9/27	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 plus 2 additional pink salmon (Chinook 22" min. size).

**Snohomish River Recreational**

(mouth to confluence of Skykomish and Snoqualmie rivers, including all channels)	8/16 – 12/31	2 fish limit, plus 2 additional pink salmon, 12" min. size, release Chinook. All species – night closure and anti-snagging rule 8/1 – 11/30.
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**Snoqualmie River Recreational**

(mouth to Snoqualmie Falls, including all channels)	9/1 – 12/31	2 fish limit, 12" min size, release Chinook and pink salmon. All species- selective gear rules 6/1-11/30, except motors allowed; night closure 9/1-11/30. Closed waters – within Puget Power tunnels at falls, and within 50' of any point on Puget Power's lower Plant building #2 (north bank).
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**Skykomish River Recreational**

(From mouth to Lewis St. Bridge in Monroe)	8/16 – 12/31	2 fish limit, plus 2 additional pink salmon. 12" min size, release Chinook. Fishing from any floating device prohibited 11/1-2/28 from the boat ramp below Lewis Street Bridge at Monroe to 2500' downstream. All species - night closure and anti-snagging rule 8/1-11/30.
(From Lewis St. Bridge in Monroe to Wallace River)	6/1 – 7/31	2 fish limit, 12" min size, marked Chinook only. All species - night closure and anti-snagging rule 6/1-11/30. Managed for hatchery broodstock. Evaluation by co-managers by June 30 about possibility of earlier fishery closure.
	9/1 – 12/31	2 fish limit, plus 2 additional pink salmon, 12" min size, release Chinook. All species - night closure and anti-snagging rule through 11/30.

(From Wallace River to the forks)	9/1 – 12/31	2 fish limit, plus 2 additional pink salmon, 12" min size, release Chinook. All species – night closure and anti-snagging rule 8/1–11/30. Closed waters – from 1500' upstream to 1000' downstream of Reiter Ponds outlet 6/1 to 8:00 a.m. 8/1 and within this 2,500' section, fishing from any floating device within this area prohibited 8:00 AM 8/1-2/28.
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**Wallace River Recreational**

Mouth to 200' upstream of water intake of salmon hatchery	9/1 – 11/30	2 fish limit for coho only, 12" min size. Fishing from any floating device prohibited 11/1-2/28.
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**Stillaguamish River Recreational**

(river and all sloughs downstream of Marine Drive)	9/1 – 12/31	2 fish limit, plus 2 additional pink salmon, 12" min size, release Chinook. All species-night closure and anti-snagging rule 8/1-11/30.
(Marine Drive upstream to forks)	9/1 - 12/31	2 fish limit, plus 2 additional pink salmon, 12" min size, release Chinook. All Species-night closure 8/1-11/30 and selective gear rules except motors allowed 6/1-11/30. Closed waters – from water control structure/barrier dam (downstream of I-5) 200' downstream.

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

**2.7 Admiralty Inlet Area**

<b>Area 9 Net</b>		
Chinook	Trty	Ceremonial and Subsistence – Up to 700 Chinook as agreed upon by those Tribes with U&A in Area 9, (PS and Hook & Line, release all chum 8/1 – 9/30).
Chum	Research	Wk 43(wb 10/18) –Wk 47(wb 11/15) research fishery to develop stock composition/timing information. Research catch quota of 1,200 chum. Details of research program based on agreement developed in 2005.
Chum	Trty	A limited area and effort Tribal chum fishery may occur in the vicinity of Apple Cove Point and North of the Hood Canal Bridge with a maximum catch of 30,000 chum. Chinook, steelhead, and coho NR in purse seine gear. Fishery pending agreement by all affected Tribes and the State. Fishery will be structured so as not to exceed modeled Chinook and coho impacts.

	Ntrty	Closed
<b>Area 9 Recreational</b>		
5/1-7/15		Closed
7/16-8/31		2 fish limit; plus 2 additional pink salmon, Chinook 22" min size, release unmarked Chinook, and chum. Closed south and west of a line from Foulweather Bluff to Olele Point.
9/1-9/30		2 fish limit, plus 2 additional pink salmon, 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
<b>Edmonds Pier Recreational</b>		
Year-Round		2 fish limit, 1 Chinook (22" min size), plus 2 additional pink salmon 7/1 – 9/30, 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
Pink	Trty	Wks 31(wb 7/26) – 36(wb 8/30), Maximum of 4 days/wk, 1 PS, limited GN participation, observers required on vessels; retention of Chinook by fishers prohibited, release chum North of a line from President Point due East to landfall, all waters within 1000 feet of shoreline closed; Chinook encounters limited to 400. Agreed sampling protocol to be determined.
	Ntrty	Wks 35 (wb 8/23) – 36 (wb 8/30); PS limited participation (2 boats/day); fishing pattern 2,1; Brailing and live boxes required; NR for CK, CO, SO, and CH; GN limited participation (2 boats/day); fishing pattern 2,1; Live boxes and limited soak times required; NR for CK, CO, SO, and CH; observers required on vessels.
Coho	Test	Gillnet: Wks 37 (wb 9/6)-Wk 39 (wb 9/20); 3 boats, 3 sites; fishing pattern: 2,2,2
	Trty	Fishery based on ISU beginning Wk 37(wb 9/6). 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 10/4)-Wk 46 (wb 11/8); 1 site, fishing pattern: 1,1,1,1,1,1.
	Trty	Treaty allocation based on intertribal sharing agreement; Wks 41 (wb 10/4) – Wk 48 (wb 11/22) fishing pattern – ISU dependent; Fishing schedule for Area 10 shall be set consistent with the MST agreement (1983).
	Ntrty	Wks 43 (wb 10/18) - 48 (wb 11/22); 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 10A Treaty Net That portion of Elliott Bay east of the line from Pier 91 to the light at Duwamish Head to the 1000 foot radius around both the Duwamish River (80B) East and West waterways.**

Chinook	Test	Gillnet: Wks 29 (wb 7/12) – Wk 31 (wb 7/26); 7/15, 7/22, 7/29 (Wednesday); 5 fishing sites (one boat per site). 8 PM to 8 AM.
	Trty	Gillnet: Reference terminal management plan. Wk 32 (wb 8/2) – Wk 34 (8/16) one 12 hour opening per week (Wednesday). Criteria: Wk 32 to open, 3 nights of test fishing (combined total) must catch at least 100 fish. Wk 33 to open, the wk 32 Treaty Commercial fishery (bay + river) must catch at least 1000 fish. Wk 34 to open (will be discussed by co-managers after wk 33 completed fishery).
Pink	Trty	<b>[Closed to all commercial fishing.]</b>
Coho		Gillnet: Wk 37 (wb 9/7)-Wk 45 (wb 11/1) fishing pattern: 5 days per week (Sun – Fri)
Chum		Gillnet Wk 46 (wb 11/8)-Wk 47 (wb 11/15); fishing pattern: 5 days per week (Sun – Fri). Wk 48 (wb 11/22) fishing pattern: (Sun – Wed).

**Duwamish/Green River (Area 80B) Treaty Net (Ntrty net closed)**

Chinook	Wk 32 – 34	Gillnet: Reference terminal management plan. Wk 32 (wb 8/2) – Wk 34 (8/16) one 12 hour opening per week (Wednesday). Criteria: Wk 32 to open, 3 nights of test fishing (combined total) must catch 100 fish. Wk 33 to open, the wk 32 Treaty Commercial fishery (bay + river) must catch 100 fish. Wk 34 to open (will be discussed by co-managers after wk 33 opening).
Pink	Wk 35 only	<b>[Gillnet: Wk 35 (wb 8/23) that portion of 80B north of Spokane Street Bridge (includes both waterways) fishing pattern: Sunday – Friday other restrictions to be determined.]</b>
Coho	Wk 37 – Wk 45	Closed until Chinook clear or coho predominate. Clearance fishery on lower river (up to 16 <sup>th</sup> Avenue Bridge) begins 9/10; (6 sites); If Chinook clearance is met or coho predominate, fishery will open Sept 13; starting Sept. 20, 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	Wks 46 (wb 11/8)-Wk 48 (wb 11/22)	Gillnet Wk 46 (wb 11/8)-Wk 47 (wb 11/15); fishing pattern: 5 days per week (Sun – Fri). Wk 48 (wb 11/22) fishing pattern: (Sun – Wed).

**Area 10E Treaty Net (Ntrty net closed; see below for recreational SAF)**

Chinook	Wks 30 (wb 7/19)-Wk 38 (wb 9/13); fishing pattern: 7 days/wk. Possible extension for Sinclair Inlet
Coho	On-Reservation only; Wks 38 (wb 9/13)-Wk 43 (wb 10/18); setnet/beach seine; 7 days/wk.
Chum	Wks 43 (wb 10/18)-Wk 50 (wb 12/6); schedule dependent upon ISU.

**Lake Washington System (includes lake, 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 (7/5).	
Chinook	<b>[Reference Terminal Management Plan; no fishery anticipated. 10C closed, 10F (Upper and Lower Ship Canal) and 10G to be determined pending NOAA Fisheries Agreement and ISU (lock counts).]</b>	
Coho	The coho fisheries in the four following areas are dependent upon the ISU <b>[on Sept. 15]</b> (if lock counts project run size < 10,000 coho entering the lake, then no coho fishery):	
	Lower ship canal (below Ballard Locks)	<b>[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 (9/13).]</b>
	Upper ship canal (above Ballard Locks):	Fishing pattern 5 days/wk (Sun – Fri).
	North end Lake Washington (North of Hwy. 520 bridge):	Starting Wk 41 (wb 9/27): 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.
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**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, plus 2 additional pink salmon, Chinook release.
7/16-8/31	2 fish limit, plus 2 additional pink salmon, Chinook 22" min size, release unmarked Chinook and release chum after 8/1.

9/1-9/30	2 fish limit, plus 2 additional pink salmon, 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 except for indicated openings identified in "Elliott Bay Recreational" section below. Elliott Bay fishing piers open; see below.
	Special gear restrictions in Duwamish Waterways area when open.

#### 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), plus 2 additional pink salmon 7/1 – 9/30, release chum 8/1-9/15.
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#### Elliott Bay Recreational SAF

5/1 – 6/30	Same as Area 10
7/1 – 7/2	Closed
7/3-8/24	Open E of Pier 91/Duwamish Head line, weekly 12:01 AM. Friday through 11:59 PM. Monday, 7/3–8/24. 2 fish limit, plus 2 additional pink salmon, release chum 8/1-8/24. Special gear restrictions in Duwamish Waterways area when open.
8/25-8/31	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, plus 2 additional pink salmon, (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**

(1 <sup>st</sup> Avenue Bridge to old highway 99/Tukwila Intl. Boulevard)	8/22 – 8/31	Daily limit 6. No more than 3 adult coho and chum in total may be retained. Release Chinook. Bait prohibited. Only 1 single-point hook may be used. Hook must measure less than ½" from point to shank. Night closure.
	9/1 – 12/31	Daily limit 6. No more than 3 adult coho and chum in total, 12" min size, release Chinook. All species-night closure and anti-snagging rule Sept. 1-Nov. 30. Fishing from any floating device prohibited 11/1-2/15.
(Old highway 99/Tukwila Intl. Boulevard to I-405)	9/1 – 12/31	Daily limit 6. No more than 3 adult coho and chum in total may be retained, 12" min size, only 1 Chinook. All species-night closure and anti-snagging rule Sept. 1-Nov. 30. Fishing from any floating device prohibited 11/1-2/15.
(I-405 to the S. 277 <sup>th</sup> Bridge in Auburn)	9/1 – 9/30	Daily limit 6. No more than 3 adult coho and chum in total may be retained. Release Chinook. Bait prohibited. Only 1 single-point hook may be used. Hook must measure less than ½" from point to shank. Night closure.
	10/1 – 12/31	Daily limit 6. No more than 3 adult coho and chum in total, 12" min size, release Chinook. All species-night closure and anti-snagging rule 10/1-11/30. Fishing from any floating device prohibited 11/1-2/15.
(S. 277 <sup>th</sup> Bridge to Auburn-Black Diamond Rd Bridge)	9/16 – 10/15	Daily limit 6. No more than 3 adult coho and chum in total may be retained. Release Chinook. Bait prohibited. Only 1 single-point hook may be used. Hook must measure less than ½" from point to shank. Night closure.
	10/16 – 12/31	Daily limit 6. No more than 3 adult coho and chum in total, 12" min size, release Chinook. All species-night closure and anti-snagging rule 10/16-11/30. Fishing from any floating device prohibited 11/1-2/28.
(from Auburn-Black Diamond Rd Bridge to Tacoma Headworks Dam)	11/1 – 12/31	Daily limit 6. No more than 3 adult coho and chum in total, 12" min size, chum only. All species-night closure and anti-snagging rule 8/1-11/30. Closed waters- within 150' of the Palmer Ponds outlet rack and within 150' of the mouth of Keta (Crisp) Creek.

The 2009/2010 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. 277 <sup>th</sup> Bridge in Auburn: Feb. 15
	S. 277 <sup>th</sup> Bridge to Tacoma Headworks Dam: Feb. 28

**Soos Creek Recreational**

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

**3.2 Area 11 Subregion**

**Area 11 Net**

Chinook	All	Closed
Coho	Trty:	Commercial fishery open beginning Wks 37 (wb 9/6)- Wk 41 (wb 10/4); 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 10/11)-Wk 49 (wb 11/29); gillnets 7 nights/wk, could close at anytime. Beach seine daylight hours only, 7 days/wk.
	Ntrty	Wks 43 (wb 10/18) - 48 (wb 11/22); 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 9/6)-Wk 42 (wb 10/11); 3 nights/wk
Chum	Commercial fishery open Wks 46 (wb 11/8)- Wk 53 (wb 12/27) 3 nights/wk.

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

Chinook		
	Commercial fishery	Wk 35 (Open 8/23 6 AM to 6 PM 12 Hr opening)
Coho	Commercial fishery Wks 36 (wb 8/30)-Wk 42 (wb 10/11) fishing pattern: 1,2,2,2,3,3,3.	
Chum	Test fishery Wks 43 (wb 10/18)-Wk 46 (wb 11/8) 1 day/wk, drift net only.	
Winter Chum	Commercial fishery Wks 46 (wb 11/8) – Wk 53 (wb 12/27) total days yet to be determined in steelhead management plan.	

**White River Treaty Net**

Sp. Chinook	Ceremonial and subsistence fisheries.	
Coho/Chum	Ceremonial and subsistence fisheries.	

**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), plus 2 additional pink salmon, 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), plus 2 additional pink salmon 7/1 – 9/30.

**Puyallup River Recreational:**

(from 11th St. Bridge to Freeman Road (82 <sup>nd</sup> Ave E))	8/16 – 12/31	Closed August 23. 6 fish/4 adult limit, only 2 adults may be any combination of Chinook, coho and chum, 12" min size, release unmarked adult Chinook. All species – single point barbless hooks required 8/1-11/30.
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(from Freeman Road (82 <sup>nd</sup> Ave E) to Carbon River)	8/16 – 12/31	6 fish/4 adult limit, only 2 adults may be any combination of Chinook, coho and chum, 12" min size, release unmarked adult Chinook. All species – single point barbless hooks required 8/1-11/30.
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**Carbon River Recreational**

(mouth to Voight Creek)	9/1 – 11/30	6 fish/4 adult limit, no more than 2 adult Chinook; 12" min size, release unmarked adult Chinook, and release chum. All species night closure, anti-snagging rule, and single point barbless hooks 8/1-11/30.
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All other SOUTH SOUND AREA 11 REGION freshwater recreational Closed to salmon angling

**3.3 Area 13 Subregion**

**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

**Sequalitchew (Area 13) Treaty Net (Ntrty net closed)**

Chinook and Chum	Closed
Coho	Wks 39-42; Beach seines; 4 days a week. Release Chinook.

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

Chinook	8/1-9/19, 7 days/wk, open in sections.
Coho	9/13-10/24, 7 days/wk, in-season monitoring to meet hatchery escapement need.
Chum	10/25-12/5, 7 days/wk

**Chambers Bay (Area 13C) Treaty Net<sup>1</sup> (Ntrty net closed)**

Chinook	Wks 31 (wb 7/26)-Wk 41 (wb 10/4); 4 days/wk. Beach seines Sunday noon to Tuesday noon. Set nets Wednesday noon to Friday noon.
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Coho	Wks 42 (wb 10/11)-Wk 44 (wb 10/25); 2 days/wk. Beach seines Sunday noon to Monday noon. Set nets Monday noon to Tuesday noon.
Chum	Wks 45 (wb 11/1)-Wk 48 (wb 11/22); 4 days/wk. Beach seines Sunday noon to Tuesday noon. Set nets Wednesday noon to Friday noon.
<b>Area 13D Treaty Net (Ntrty net closed)</b>	
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.
<b>Peale Pass (13D-3)</b>	7 days/wk
<b>Pickering Pass (13D-2)</b>	7 days/wk
<b>Dana Pass (13D-1)</b>	7 days/wk
<b>Southern Case (13D-4)</b>	7 days/wk
Chum	Open approximately 10/22; 2-3 days per week; managed weekly by updates (~10/11).
<b>Area 13E Net</b>	Closed to all fishing
<b>Budd Inlet (Area 13F) Treaty Net (Ntrty net closed)</b>	
Chinook	7/15-9/9 or earlier date dependent on in-season management needs; 7 days/wk
Coho	Closed
Chum	Open approximately 11/1, 2-3 days per week, managed by weekly in-season updates
<b>Eld Inlet (Area 13G) Treaty Net (Ntrty net closed)</b>	
Chinook	7/15-9/9; opening dependent upon in-season data, outer portion only
Coho	Closed
Chum	Open approximately 11/1, 2-3 days per week, managed by weekly escapement updates
<b>Totten Inlet (Area 13H) Treaty Net (Ntrty net closed)</b>	
Chinook	7/30-9/9; schedule dependent on in-season data
Coho	Closed
Chum	Open approximately 10/8, 2-3 days per week; managed by weekly escapement updates

<b>Little Skookum Inlet (Area 13I) Treaty Net (Ntrty net closed)</b>	
Chinook	7/30-9/10; schedule dependent upon in-season data
Coho	Closed
Chum	Open approximately 12/1, 2-3 days per week; managed by weekly escapement updates
<b>Hammersley Inlet (Area 13J) Treaty Net (Ntrty net closed)</b>	
Chinook	7/30-9/9 or earlier date dependent on in-season management needs
Coho	Closed
Chum	Open approximately, 9/17-12/25, 2-3 days/wk; managed by weekly escapement updates
<b>Northern Case Inlet (Area 13K) Treaty Net (Ntrty net closed)</b>	
Chinook	7/15-9/9
Coho	9/10-12/31 or earlier date dependent on in-season management needs
Chum	Open approximately 9/17-12/25; 2-3 days/wk; managed by weekly escapement updates
<b>Nisqually River (Area 83D) Treaty Net (Ntrty net closed)</b>	
Chinook/Pink	Wks 28 (wb 7/5)-Wk 37 (wb 9/6); 3 days/wk; The Nisqually Indian Tribe will manage the Nisqually River Chinook run to attain a 1,200 natural spawning escapement goal. This will be achieved by running an in-season update and adjusting the fishing schedule accordingly.
Coho	Wks 41 (wb 10/4)-Wk 47 (wb 11/15); 3-4 days/wk
Chum	Proposed schedule: Wks 48 (wb 11/22)-Wk 5 (wb 1/24/2010); 3,4 days/wk; per annual Nisqually River chum/steelhead management plan.
<b>McAllister Creek (Area 83F) Treaty Net (Ntrty net closed)</b>	
Chinook/Pink	Wks 27 (wb 6/28)-Wk 40 (wb 9/27); 3 days/wk
Coho	Wks 41 (wb 10/4)-Wk 48 (wb 11/22); 3-4 days/wk
Chum	Proposed schedule: Wks 49 (wb 11/29)-Wk 5 (wb 1/24/2010); 4 days/wk per annual Nisqually River chum/steelhead management plan.
<b>Area 13 Recreational</b>	
5/1-6/30	2 fish limit (Chinook 22" min. size), release unmarked Chinook, Minter Creek mouth closed through 9/30.

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).
1/1-1/31	1 fish limit, (Chinook 22" min size).
2/1-2/28	Closed
3/1-4/30	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.
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#### **Chambers Creek Estuary Recreational**

(downstream of markers 400' below Boise-Cascade Dam to Burlington Northern Railroad Bridge)	7/1 – 11/15	6 fish/2 adult limit, 12" min size, release unmarked coho.
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#### **Deschutes River Recreational**

Capitol Lake (from outlet to 400' below lowest Tumwater Falls (Deschutes River) fish ladder).	7/1 – 10/15	6 fish/2 adult limit, 12" min size, release coho. All species night closure and anti-snagging rules 8/1 – 11/30.
(from Old Hwy 99 Bridge on Capitol Blvd in Tumwater to Henderson Blvd Bridge)	7/1 – 10/15	6 fish/2 adults limit, 12" min size, release coho.
(upstream of Henderson Blvd Bridge)	7/1 – 10/15	6 fish/2 adults limit, 12" min size, release coho, selective gear rules.

#### **Kennedy Creek Recreational**

(mouth to northbound Hwy. 101 Bridge)	10/1 – 11/30	6 fish/2 adults limit, 12" min size, release unmarked coho, barbless hooks required. Night closure and anti-snagging rule 10/1-12/31.
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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).
1/1-1/31	1 fish limit, (Chinook 22" min size).
2/1-2/28	Closed
3/1-4/30	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.
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#### **Chambers Creek Estuary Recreational**

(downstream of markers 400' below Boise-Cascade Dam to Burlington Northern Railroad Bridge)	7/1 – 11/15	6 fish/2 adult limit, 12" min size, release unmarked coho.
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#### **Deschutes River Recreational**

Capitol Lake (from outlet to 400' below lowest Tumwater Falls (Deschutes River) fish ladder).	7/1 – 10/15	6 fish/2 adult limit, 12" min size, release coho. All species night closure and anti-snagging rules 8/1 – 11/30.
(from Old Hwy 99 Bridge on Capitol Blvd in Tumwater to Henderson Blvd Bridge)	7/1 – 10/15	6 fish/2 adults limit, 12" min size, release coho.
(upstream of Henderson Blvd Bridge)	7/1 – 10/15	6 fish/2 adults limit, 12" min size, release coho, selective gear rules.

#### **Kennedy Creek Recreational**

(mouth to northbound Hwy. 101 Bridge)	10/1 – 11/30	6 fish/2 adults limit, 12" min size, release unmarked coho, barbless hooks required. Night closure and anti-snagging rule 10/1-12/31.
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**McAllister Creek Recreational**

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(mouth to Olympia-Steilacoom Rd Bridge)	7/1 – 11/30	6 fish/2 adult limit, 12" min size. All species – night closure and anti-snagging rule 8/1-11/30.
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**McLane Creek Recreational**

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(from a line 50' north of and parallel to the Mud Bay Rd. Bridge to a line 100' upstream of and parallel to the south bridge on Hwy.101)	Same as Area 13	Same as Area 13
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**Minter Creek Recreational**

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(mouth to 50' downstream of hatchery rack)	11/1 – 12/31	4 fish limit, 12" min size, chum only.
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**Nisqually River Recreational**

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(mouth to the military tank crossing bridge, one mile upstream of the mouth of Muck Creek)	7/1 – 1/31	6 fish/3 adult limit, only 2 adults may be any combination of pink, coho, and chum. 12" min. size, release unmarked adult Chinook. All species – night closure and anti-snagging rule 8/1-11/30.
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All other SOUTH SOUND AREA 13 REGION freshwater recreational closed to salmon angling.

## 4.0 Hood Canal Region

### 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 7/19-8/29; 5 days/wk; release chum 8/1-8/29. Open wb 7/19 – 8/24 for gillnets 5 days/wk; restricted to 7" min mesh starting 8/1. Area 12H: Open wb 7/19 through 9/26; hook and line gear continuous; beach seines daylight hours Tues and Thur each week; possible in-season modifications; Chum release.
	Ntrty	Closed
Pink	All	Same as Chinook openings.
Coho	Trty:	Area 12: Open 9/25 through 10/17 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 10/24 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 9/21. Both gear types open 7 days/wk.
		Area 12C: Open 10/1 through wb 10/25 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 5 days/wk when open.
	Ntrty:	Closed
		Area 12D (west of Madrona Pt. - local name): Open for gillnets no earlier than 10/1. Weekly schedules identical to Area 12C.

Chum

WDFW and the Tribes will develop a new forecast based on reconciled Tribal catch data by July 31, 2009. In-season management methodology approaches will be developed and agreed to for the Hood Canal Chum fishery in 2009. Review to be completed and implemented by August 31, 2009.

Trty:	Area 12: Open 10/18 through 11/20; 7 d/wk
	Area 12B: Open 10/25 through 11/20; 7d/wk
	Area 12C: Open 11/1 through 11/27; 7d/wk.
	Area 12D: Closed.
	Area 12H: Hook and line gear open from 10/18 through 12/5; beach seines open Tuesday and Thursday of each week. Then Monday and Wednesday for the week beginning 11/15; possible in-season adjustments. Starting 11/1, hatchery escapement control measures will go into effect.
Ntrty:	Areas 12-12B: Open Wks 43 (wb 10/18) through wk 47 (wb 11/15), PS Chinook NRPS fishing pattern: 1,2,1,2,1; GN fishing pattern: 2,2,2,2,2, daylight hours
	Area 12C: Open Wks 46 (wb 11/8) through wk 48 (wb 11/22) If needed to attain NT share. PS Chinook NR; PS fishing pattern: 1,1,1; GN fishing pattern: 2,2,2
	Area 12H: BS (Hoodsport Hatchery Zone) fishery in wks 46 – 48 pending discussions with the Co-Managers.
	Area 12D Closed

NOTE: The above schedules for the chum management period are preliminary and are subject to revision, on the basis of final forecast of abundance, as well as review and application of inseason abundance assessment methods.

**Port Gamble (Area 9A)**

Chinook	All	Closed
Coho	Trty:	Open wb 8/23 through wb 10/25, gillnet only.

	Ntrty:	Open Wks 35 (wb 8/23) - 44 (wb 10/25) GN and skiff GN, both gears limited to 100 fathoms length and 60 meshes in depth; 3 days wk 35, then 7 days/wk; Chinook NR; Chum NR through 9/30; release fish not to be retained 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 11/1 through 12/5.
	Ntrty:	Closed

**Quilcene / Dabob (Area 12A)**

Coho	Trty:	Open north of Pt. Whitney, wb 8/23 through wb 10/11; 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 start 8/21, open continuously. Gillnets closed before 9/1 and limited to 1 day/wk - 9/1 through 9/30. Gillnets will close if 12A Summer Chum escapement projected <1,500. Additional gillnet days may be added after 9/15, if 12A Summer Chum escapement projected >2,500 and Coho harvest needs require it. Beach seine advance notification required prior to fishing.
	Ntrty:	Skiff GN open wks 36 (wb 8/30) – 40 (wb 9/27); GN fishing pattern 1,1,1,1,1 daylight hours; net must be attended at all times; Chinook NR; chum NR through 10/7; release fish not to be retained by cutting ensnaring meshes. Gillnets will close if 12A summer chum escapement projected <1,500. Potential additional gillnet time may be added after 9/15 if 12A summer chum escapement projected >2,500, per Summer Chum Salmon Conservation Initiative (SCSCI). Beach seine open wks 35 (wb 8/23) – 40 (wb 9/27); Limited participation (2 permits/day); CK and CH NR; fishing pattern 2,2,2,2,2,2; Fishery will be managed consistent with SCSCI.
Chum	Trty:	Open to set and drift gillnets wb 10/18 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 monitor hatchery rack escapement levels and entry level rates to determine when there are surpluses of hatchery Chinook, Coho and Chum present in Purdy Creek. For Chinook, the Skokomish Tribe will also conduct spawning ground surveys (in addition to those surveys conducted by WDFW) to evaluate the movement of natural Chinook escapement in the Skokomish River. The hatchery escapement and spawning ground survey data will be used to trigger fisheries in Purdy Creek directed at surplus hatchery fish returning to George Adams Hatchery facility. Methodology to determine numbers of fish needed to trigger this fishery will be distributed to the WDFW by June 30, 2009.]

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

Chinook	Open 8/01 through 9/19; no more than 4 days/wk; closed to gillnets below SR 106.
Coho	Open 9/20 through 10/31; 5 days/wk, Open 11/1 – 11/14; six days per week. Closed to gillnets below SR 106 through 9/30.
Chum	Open 11/15 through 12/5; 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 10/11. 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.
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**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.
10/16-12/31	4 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

**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

**Hoodspout Hatchery Zone Recreational**

Same as Area 12 except:

7/1-12/31	4 fish limit, no minimum size, only 2 Chinook greater than 24";, chum release 7/1-10/15; night closure.
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**Dewatto River Recreational**

(mouth to Dewatto-Holly Rd. Bridge)	9/16 – 10/31	2 fish limit, 12" min size, coho only. Selective Gear Rules, night Closure.
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**Dosewallips River Recreational**

(mouth to Hwy. 101 Bridge)	11/1 – 12/15	2 fish limit, 12" min size, chum only
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**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
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**Quilcene River Recreational**

(from Rodgers St. to Hwy 101 Bridge)	8/16 – 10/31	4 fish, 12" min size, coho only. Only 1 single point barbless hook may be used. Only fish hooked inside the mouth may be retained.
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**Skokomish River Recreational**

(mouth to Hwy. 101 Bridge)	8/1 – 9/30	1 fish limit, 12" min size, release chum. All Species-night closure, anti-snagging rule, and single point barbless hooks required through 11/30. Terminal gear (hooks, weights, lures or baits) and line must not be within 25' of Tribal gillnets.
	10/1 – 10/15	6 fish/4 adult, 12" min size, release Chinook and chum. All Species-night closure, anti-snagging rule, and single point barbless hooks required through 11/30. Terminal gear (hooks, weights, lures or baits) and line must not be within 25' of Tribal gillnets.

	10/16 – 12/15	6 fish/4 adult, 12" min size, release Chinook. All Species-night closure, anti-snagging rule, and single point barbless hooks required through 11/30. Terminal gear (hooks, weights, lures or baits) and line must not be within 25' of Tribal gillnets.
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**Tahuya River Recreational**

(mouth to marker 1 mile above N. Shore Rd. Bridge)	9/16 – 10/31	2 fish limit, 12" min size, coho only. Selective Gear rules, night closure.
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All other HOOD CANAL REGION freshwater recreational closed to salmon angling.

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

Fishery Regulation Assessment Model Run Number: 0921 04/23/09  
 Run Description: PFMC Final NT 210 T 60 07:06 PM  
 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
<b>CANADIAN (B.C.) FISHERIES:</b>		
WCVI Troll	4,372	Incidental
Area 20 Net	0	Incidental
Georgia St. Sport	7,399	Selective fishery
Georgia St. Troll	0	Assumes no Gulf troll fishery
<b>SOUTH OF CAPE FALCON:</b>	154,097	Sport TAC 128,000 selective,
<b>NORTH OF CAPE FALCON OCEAN:</b>		
Treaty Ocean Troll	63,725	TAC 60,000 coho
NT Ocean Troll	44,121	Troll TAC 33,600 selective
NT Ocean Sport	203,691	Sport TAC 176,400 coho, selective
NT North-of-Falc. total:	247,812	
4B Add-on	0	4B Add-on fishery of 0
Canadian License catch	50	(For Areas 4 and 4B) Landed catch only
Buoy 10	131,810	Sport 115,000 selective
<b>PUGET SOUND SPORT &amp; TROLL:</b>		
Treaty Strait Troll	851	Source data for treaty troll are from 2003-2008.
Puget Sound Sport:		
Area 5	28,590	5/1-6/30 clsd; 7/1-8/15, bag 2 + 2 pk, co & ch MSF, cm NR; 8/16-9/18, bag-2 + 2 pk, co MSF ch NR, cm NR; 9/19-9/30, bag-2, ch NR, cm NR; 10/1-10/15, bag-2, one ch; 10/16-10/31 clsd; 11/1-11/30 clsd; 12/1-2/12 clsd; 2/13-4/10, 1 bag; 4/11-4/30 clsd; Kydaka closure 7/1-9/30
Area 6	1,078	5/1-6/30 clsd; 7/1-8/15 bag 2+2 pk, co & ch MSF expt ch NR East of Ediz, cm NR; 8/16-9/30, bag 2+2 pk, co MSF, ch & cm NR; 10/1-10/31 2/1 bag; 11/1-11/30 closed; 12/1-2/12 clsd; 2/13-4/10, 1 bag; 4/11-4/30 clsd; 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	536	5/1-6/30 clsd; 7/1-7/31, 2/1 bag + 2 pk, 8/1-9/30, 2/1 bag + 2 pk, co MSF, cm NR; 10/1-10/31, 2/1 bag, co MSF; 11/1-11/30 clsd; 12/1-4/30 2 bag, ch MSF; B'Bay, 8/16-10/31, 4/2 bag, pk NR; S. Rosario & E. JDF clsd 7/1-9/30; B Bay - clsd 4/1 thru 8/15; Samish - clsd 7/1-10/15
Area 8-1	960	5/1-7/31 clsd; 8/1-9/30, bag 2 + 2 pk, ch NR; 10/1-10/31 clsd; 11/1-4/30, 2 bag, ch MSF; Oak Harbor 10/1-10/31
Area 8-2	4,687	5/1-7/31 clsd; 8/1-9/30, bag 2 + 2 pk, ch NR; 10/1-10/31 2 bag, ch nr, clsd n. of Randell Pt; 11/1-4/30, 2 bag, ch MSF; Tul. Term Area, 6/5-9/7 Fri-noon Mon except clsd 6/20, 9/12-9/27 Sat & Sun, bag 2 + 2 pk
Area 9	12,778	5/1-7/15 clsd; 7/16-8/31, bag 2 + 2 pk, ch MSF, cm NR; 9/1-9/30, bag 2 + 2 pk, ch & cm NR; 10/1-10/31, 2 bag, ch NR; 11/1-11/30, 2 bag ch MSF; 12/1-1/15 closed; 1/16-4/15, 2 bag, ch MSF; 4/16-4/30 clsd; Hd Cnl clsd during sum MSF. Edmds YR, 2/1 bag, cm NR 8/1-9/30, + 2 pk 7/1-9/30
Area 10	8,363	5/1-5/31, closed; 6/1-6/30 C&R; 7/1-7/15, bag 2 + 2 pk, ch NR; 7/16-8/31, bag 2 + 2 pk, ch MSF, cm NR 8/1-8/31; 9/1-9/30, bag 2 + 2 pk, ch NR, cm NR till 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, inner E Bay 7/3-8/24 Fri-Mon bag 2 + 2 pk, cm NR; Sinc TAF, 7/1-9/30, bag 2 + 2 pk, ch MSF, cm NR 8/1-9/15; Piers Yr-round, 2/1 bag, cm NR 8/1-9/15, + 2 pk 7/1-9/30,
Area 11	4,636	5/1-5/30 clsd; 6/1-6/30 2 bag, ch MSF; 7/1-9/30, bag 2 + 2 pk, ch MSF; 10/1-10/31, 2 bag; 11/1-12/31, 2/1 bag; 1/1-1/31 clsd; 2/1-4/30, 2 bag, ch MSF. Commencement Bay closure: 6/1-7/31. Piers Yr-Round: Dash Pt, Pt Def., Les Davis, Des Moines, & Redondo, 2/1 bag, + 2 pk 7/1-9/30
Area 13	942	5/1-6/30, 2 bag, ch MSF; 7/1-9/30, 2 bag, ch & co MSF; 10/1-10/31, 2 bag, co MSF; 11/1-12/31, 2/1 bag; 1/1-1/31, bag - 1; 2/1-2/28 clsd; 3/1-4/30 bag 1; Minter closed 4/16-9/30; Budd closures 7/16-10/31; Fox Island Yr-Round: 2/1 bag, coho MSF 7/1-10/31
Area 12	2,923	Entire Area: 5/1-6/30 clsd; So. Ayock 7/1-10/15, 4 bag/2 ch, cmNR; No. Ayock 7/1-8/31 clsd; 9/1-10/15, 4 co only; Entire Area: 10/16-12/31 bag 4/1; Jan clsd; 2/1 - 4/30, 2 bag ck MSF; Hoodspout: 7/1-12/31, bag-4/2, cm NR 7/1-10/15; Quilcene: 8/16-8/31, 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	663	1,224	510	561	2,958
SJI 6/7/7A Net NTrty	3	75	359	1,106	1,543
Trty	12	192	294	7,808	8,305

2009 Total Mortality (Fraser Panel and other)

JDF Sockeye/Pink: Trty (GN): wb 7/26 - wb 8/16  
 JDF Coho: Trty (GN): wb 9/6 - wb 10/4, 6-6-6-6  
 JDF Chum: Trty (GN): wb 10/11 - wb 11/1, 6-6-6-6  
 SJI Coho: Ntry RN - Open 7 d/wk from end of Fraser Panel control thru chum (wb 11/08), MSF co&ch thru 9/30 (ch 300 cap), cm NR though 9/30  
 SJI Sockeye/Pink: Ntry (GN/PS/RN) Schedule TBD by Fraser Panel, modeled as wb 8/02 - wb 8/16 1-2-1, PS & RN co & ck NR  
 Trty (GN/PS): wk 31 (wb 7/26) - wk37 (wb 9/6)  
 SJI Chum: Ntry (GN/PS) weeks 41-46 1-3-5-5-5-5, PS co & ck NR  
 Trty (GN/PS): wk 41 (wb 10/4) - wk 47 (wb 11/15)

Comment: Sept landed GN catch for NonTreaty 6/7/7A Net modeled as NonRetention mortality to allow RN landed to be modeled as MSF.

TABLE 2A: COHO FISHERY IMPACT SUMMARY HIGHLIGHTS

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

FRAM Run Number: 0921  
Run Description: PPMC Final NT 210 T 60

04/23/09  
07:06 PM

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

FISHERY	ALL STOCKS MORTALITY			SKAGIT				STILLY	SNOHOM	STILLAGUAMISH/SNOHOMISH		
	Marked	UnMarked	Total	Wild	Marked	UnMarked	Total	Wild	Wild	Marked	UnMarked	Total
Projected Spawning Escapement				22,419	6,458	23,243	29,701	8,971	49,482	22,628	65,538	88,166
Spawning Escapement Breakpoint				25,000				10,000	50,000			
Projected Exploitation Rate (all fisheries)				33.2%				33.2%	26.4%			
Exploitation Rate Ceiling				35%				35%	40%			
Exploitation in Southern U.S. Fisheries				31%				32%	25%			
CANADIAN	43,875	199,971	243,846	610	607	629	1,236	132	670	1,346	926	2,272
ALASKA	59,655	91,526	151,181	0	0	0	0	0	0	0	0	0
S. of Falcon Troll	5,131	6,435	11,566	3	1	3	4	0	5	2	7	9
S. of Falcon Sport	122,293	20,238	142,531	20	27	21	48	9	46	124	64	188
NORTH OF CAPE FALCON OCEAN:												
Treaty Troll	36,062	27,663	63,725	1,432	399	1,483	1,882	379	1,901	1,100	2,620	3,720
NT Troll N. Leadbtr	15,357	3,588	18,945	113	94	118	212	36	181	292	251	543
NT Troll S. Leadbtr	21,609	3,566	25,175	20	16	21	37	7	36	54	49	103
Sport: Area 1	92,906	7,547	100,453	13	18	14	32	4	19	53	27	80
Buoy 10	121,307	10,503	131,810	2	2	2	4	0	1	2	1	3
Area 2	68,608	6,989	75,597	71	98	73	171	22	108	296	149	445
Area 3	4,797	658	5,455	13	19	14	33	7	34	93	47	140
Area 4 *	19,183	3,001	22,184	234	317	242	559	51	255	713	352	1,065
PUGET SOUND:												
Treaty Troll	417	434	851	26	7	27	34	20	101	56	139	195
Sport: Areas 5	20,777	7,814	28,591	591	457	612	1,069	192	963	1,344	1,329	2,673
Area 6	793	285	1,078	32	27	33	60	7	34	67	47	114
Area 7	400	136	536	15	14	15	29	2	10	21	13	34
Area 8-1,2	1,546	4,101	5,647	613	161	636	797	409	2,423	688	3,100	3,788
Area 9	6,558	6,221	12,779	595	160	616	776	204	1,022	567	1,410	1,977
Area 12	1,164	1,759	2,923	4	1	4	5	0	0	0	0	0
Area 10	5,291	3,072	8,363	132	37	137	174	18	89	51	123	174
Area 11	2,835	1,800	4,635	21	6	21	27	9	43	25	59	84
Area 13	754	189	943	11	4	11	15	0	1	2	2	4
Freshwater Sport	n/a	n/a	n/a	1,058	n/a	n/a	1,503	797	2,219	296	3,161	3,457
Pre-terminal net:												
6/7/7A NTrty	828	715	1,543	43	11	45	56	2	10	6	13	19
6/7/7A Trty	4,772	3,534	8,306	173	43	179	222	5	22	12	31	43
4B/5/6C NTrty	0	0	0	0	0	0	0	0	0	0	0	0
4B/5/6C Trty	1,427	1,531	2,958	111	30	115	145	36	182	104	251	
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	1	3	4	3	1	3	4	0	0	0	0	0
Skagit Bay (8) Trty	149	465	614	435	139	453	592	1	5	3	6	9
Area 8A NTrty	134	64	198	6	2	6	8	7	37	38	55	93
Area 8A Trty	3,359	4,722	8,081	433	116	448	564	487	2,709	2,821	4,033	6,854
Hood Canal NTrty	4,109	2,849	6,958	5	1	6	7	3	14	7	19	26
Hood Canal Trty	12,919	9,889	22,808	7	2	7	9	4	21	12	29	41
South Pgt Snd NTrty	486	298	784	6	2	6	8	2	11	6	15	21
South Pgt Snd Trty	33,343	9,739	43,082	62	17	64	81	23	115	63	158	221
B'ham Bay(7B) NTrty	2,023	1,005	3,028	37	10	10	10	1	6	3	8	11
B'ham Bay(7B) Trty	5,338	2,651	7,989	97	25	100	125	3	16	9	22	31
Local Extreme Terminal Net:												
Nontreaty	Refer to TAMMs for individual stocks			0	0	0	0	9	43	88	77	165
Treaty				3,348	639	3,432	4,071	1,575	4,358	8,887	8,579	17,466
Test				744	269	783	1,052	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 analysis of the data has yet to be done.

RECAPITULATION OF IMPACTS ACCOUNTING:	WILD	TOTAL	WILD	WILD	TOTAL
Nontreaty Total Wild Impacts:	3,661	5,648	1,798	7,610	15,216
Treaty Total Wild Impacts:	6,124	7,725	2,533	9,430	28,935
Amt NT above (or below) T:	(2,463)	(2,077)	(735)	(1,820)	(13,719)
Nontreaty Wild Impacts w/o SOF:	3,638	5,596	1,789	7,559	15,019
Treaty Wild Impacts w/o SOF:	6,124	7,725	2,533	9,430	28,935
Amt NT above (or below) T w/o SOF:	(2,486)	(2,129)	(744)	(1,871)	(13,916)

**TABLE 2B: COHO FISHERY IMPACT SUMMARY HIGHLIGHTS**

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

04/23/09

FRAM Run Number:

0921

07:06 PM

Run Description:

PFMC Final NT 210 T 60

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				JUAN DE FUCA TRIBUTARIES			
	Wild	Marked	UnMarked	Total	Wild	Marked	UnMarked	Total
Projected Spawning Escapement	25,805	7,804	27,984	35,788	18,099	2,393	18,726	21,119
Spawning Escapement Breakpoint	14,350			35,788	11,000			21,119
Projected Exploitation Rate (all fisheries)	47.2%				12%			
Exploitation Rate Ceiling	65%				40%			
Exploitation in Southern U.S. Fisheries	45%				10%			
<b>CANADIAN</b>	1,023	2,735	1,164	3,899	313	235	330	565
<b>ALASKA</b>	1	1	1	2	35	10	37	47
S. of Falcon Troll	18	14	20	34	9	2	10	12
S. of Falcon Sport	41	170	46	216	25	38	27	65
<b>NORTH OF CAPE FALCON OCEAN:</b>								
Treaty Troll	2,052	1,834	2,342	4,176	719	211	761	972
NT Troll N. Leadbitr	200	477	227	704	61	54	63	117
NT Troll S. Leadbitr	32	78	37	115	16	15	19	34
Sport: Area 1	26	113	30	143	12	17	13	30
Buoy 10	14	51	16	67	0	0	0	0
Area 2	133	566	152	718	46	66	49	115
Area 3	62	253	70	323	7	10	8	18
Area 4 *	377	1,609	430	2,039	41	58	43	101
<b>PUGET SOUND:</b>								
Treaty Troll	51	41	58	99	27	7	28	35
Sport: Areas 5	1,515	3,143	1,722	4,865	728	456	771	1,227
Area 6	83	172	94	266	25	23	28	51
Area 7	6	16	7	23	0	0	0	0
Area 8	85	74	96	170	0	0	0	0
Area 9	2,021	1,501	2,295	3,796	25	7	27	34
Area 12	1,510	1,070	1,713	2,783	0	0	0	0
Area 10	743	556	836	1,392	8	2	9	11
Area 11	116	93	132	225	0	0	0	0
Area 13	5	12	5	17	0	0	0	0
Freshwater Sport	1,085	3,275	1,715	4,990	0	706	140	846
<b>Pre-terminal net:</b>								
6/7/7A NTrty	16	11	18	29	13	3	13	16
6/7/7A Trty	70	40	77	117	78	21	83	104
4B/5/6C NTrty	0	0	0	0	0	0	0	0
4B/5/6C Trty	284	225	322	547	173	48	183	231
6B/9 NTrty	0	0	0	0	0	0	0	0
6B/9 Trty	0	0	0	0	0	0	0	0
<b>Terminal net:</b>								
Skagit Bay (8) NTrty	0	0	0	0	0	0	0	0
Skagit Bay (8) Trty	2	2	2	4	0	0	0	0
Area 8A NTrty	1	0	1	1	0	0	0	0
Area 8A Trty	43	29	49	78	2	1	2	3
Hood Canal NTrty	1,453	447	1,541	1,988	18	6	20	26
Hood Canal Trty	6,191	1,484	6,552	8,036	25	7	27	34
South Pgt Snd NTrty	85	61	96	157	1	0	1	1
South Pgt Snd Trty	872	643	987	1,630	13	3	13	16
B'ham Bay(7B) NTrty	2	1	3	4	0	0	0	0
B'ham Bay(7B) Trty	6	3	7	10	0	0	0	0
<b>Local Extreme Terminal Net:</b>								
Nontreaty	769	3,393	1,138	4,531	0	781	103	884
Treaty	2,033	13,397	4,285	17,682	16	1068	203	1,271
Test	n/a			n/a	n/a			n/a
<b>Total</b>	<b>23026</b>			<b>65876</b>	<b>2436</b>			<b>6866</b>

\* 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:	10,398	29,596	1,035
Treaty Total Wild Impacts:	11,604	32,379	1,053
Amt NT above (or below) T:	(1,206)	(2,783)	(18)
<b>Nontreaty Wild Impacts w/o SOF:</b>	<b>10,339</b>	<b>29,346</b>	<b>1,001</b>
<b>Treaty Wild Impacts w/o SOF:</b>	<b>11,604</b>	<b>32,379</b>	<b>1,053</b>
<b>Amt NT above (or below) T w/o SOF:</b>	<b>(1,265)</b>	<b>(3,033)</b>	<b>(52)</b>

**TABLE 2C: COHO FISHERY IMPACT SUMMARY HIGHLIGHTS**

Estimated fishery impacts from regulations described by the following FRAM run:  
FRAM Run Number: 0921  
Run Description: PFMC Final NT 210 T 60

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

FISHERY	QUIL FALL		HOH		QUILLAYUTE FALL H&W		QUEETS				GRAYS HARBOR				
	Wild	Marked	Wild	Marked	UnMarked	Total	Wild	Suppl.	Hatchery	Marked	UnMarked	Total	Wild	Marked	Total
Projected Ocean Escapement	17,820	7,867	216	421	160	591	25,488	0	8,879	7,186	27,181	34,367	53,807	46,913	106,892
Spawning Escapement Objective	6,300	2,000	0	12	8	20	5,800	0	4	2	8	10	37	34	75
Projected Marine Exploitation Rate	7%	17%	28	38	27	65	15%	0	33	27	88	125	87	77	174
Projected Exploitation Rate (all fisheries)	47%	58%	47	397	57	454	38%	0	519	499	320	819	240	1,044	1,310
Exploitation in Southern U.S. marine Fisheries	6%	14%					13%								
<b>CANADIAN</b>	128	770	216	421	160	591	546	0	621	565	584	1,169	725	1,528	2,335
<b>ALASKA</b>	7	123	0	12	8	20	8	0	4	2	8	10	37	34	75
S. of Falcon Trawl	22	44	28	38	27	65	82	0	33	27	88	125	87	77	174
S. of Falcon Sport	46	47	47	397	57	454	300	0	519	499	320	819	240	1,044	1,310
<b>NORTH OF CAPE FALCON OCEAN:</b>															
Treaty Trawl	575	770	770	1,021	713	1,734	1,924	0	721	602	1,944	2,546	2,291	2,070	4,623
NT Trawl N. Leadbtr	136	123	0	640	168	808	377	0	368	343	401	744	210	561	795
NT Trawl S. Leadbtr	48	44	44	252	59	311	176	0	188	176	188	364	141	384	541
Coastal terminal area "djp-lns"	114	42	42	200	143	343	1,437	0	482	390	1,527	1,917	469	406	929
Sport:	36	22	22	305	44	349	180	0	322	310	203	513	148	658	823
Area 1	8	5	5	58	10	69	23	0	31	30	25	55	54	209	269
Bucy 10	81	117	117	784	113	897	557	0	950	913	584	1,507	475	2,069	2,599
Area 2	14	25	25	119	17	136	84	0	136	130	80	220	26	113	142
Area 3	47	55	55	400	58	458	177	0	304	292	189	481	78	337	421
<b>PUGET SOUND CATCHES:</b>															
Treaty Trawl	1	19	19	2	1	3	1	0	0	0	1	1	8	7	16
Sport:	98	73	2	363	121	484	121	0	125	117	129	246	137	286	439
Area 5	0	2	2	2	0	2	2	0	1	1	2	3	1	1	2
Area 6	1	8	8	10	2	12	8	0	2	1	7	8	0	0	0
Areas 7-13	0	0	0	0	0	0	16	0	5	4	17	21	3	2	5
Nontreaty Net	14	13	13	25	18	43	69	0	25	20	74	94	53	48	106
Treaty Net	6689	3172	3172	19486	19486	19486	4710	0	4142	8852	8852	8852	10754	20862	20862
LOCAL TERMINAL	985	546	546	2813	2813	2813	1338	0	466	1804	1804	1804	1591	5849	5849
Nontreaty Net	958	4408	4408	4408	4408	4408	958	0	4408	4408	4408	4408	958	4408	4408
Treaty Net	10754	20862	20862	20862	20862	20862	10754	0	20862	20862	20862	20862	10754	20862	20862
Sport	1591	5849	5849	5849	5849	5849	1591	0	5849	5849	5849	5849	1591	5849	5849

\* 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:

0921

04/23/09

07:06 PM

PFMC Description:

PFMC Final NT 210 T 60

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

FISHERY	SOUTH PUGET SOUND				NOOKSACK-SAMISH			
	Wild	Marked	UnMarked	Total	Wild	Marked	UnMarked	Total
Projected Spawning Escapement	27,504	47,306	33,154	80,460	2,688	8,089	3,967	12,056
Spawning Escapement Objective	n/a			80,460	n/a			
Projected Exploitation Rate (all fisheries)	49%				62%			
Exploitation in Southern U.S. Fisheries	48%				60%			
<b>CANADIAN</b>	651	6,569	839	7,408	163	1,564	228	1,792
ALASKA	0	0	0	0	0	0	0	0
S. of Falcon Troll	10	31	14	45	0	2	2	4
S. of Falcon Sport	31	481	40	521	3	56	5	61
<b>NORTH OF CAPE FALCON OCEAN:</b>								
Treaty Troll	2,007	6,295	2590	8,885	309	941	438	1,379
NT Troll N. Leadbtr	197	1,800	254	2,054	20	183	28	211
NT Troll S. Leadbtr	37	329	47	376	2	21	3	24
Sport: Area 1	24	358	31	389	2	30	3	33
Buoy 10	1	14	1	15	0	2	0	2
Area 2	110	1,681	142	1,823	13	194	18	212
Area 3	24	365	31	396	4	57	5	62
Area 4 *	319	4,847	412	5,259	48	706	68	774
<b>PUGET SOUND:</b>								
Treaty Troll	39	120	51	171	1	3	1	4
Sport: Areas 5	1,231	9,422	1587	11,009	90	730	128	858
Area 6	40	413	51	464	4	36	6	42
Area 7	5	55	6	61	7	76	10	86
Area 8	0	493	207	700	44	130	63	193
Area 9	1,411	4,248	1817	6,065	9	26	13	39
Area 12	0	0	0	0	30	93	43	136
Area 10	1,494	4,597	1415	6,012	3	9	4	13
Area 11	1,210	2,705	1935	4,640	0	0	0	0
Area 13	143	736	170	906	0	0	0	0
Freshwater Sport	2,958	9,505	3726	13,231	630	608	666	1,274
<b>Pre-terminal net:</b>								
6/7/7A NTrty	26	74	33	107	64	179	90	269
6/7/7A Trty	93	242	117	359	356	978	502	1,480
4B/5/6C NTrty	0	0	0	0	0	0	0	0
4B/5/6C Trty	199	616	257	873	13	39	18	57
6B/9 NTrty	0	0	0	0	0	0	0	0
6B/9 Trty	0	0	0	0	0	0	0	0
<b>Terminal net:</b>								
Skagit Bay (8) NTrty	0	0	0	0	0	0	0	0
Skagit Bay (8) Trty	0	1	0	1	1	3	2	5
Area 8A Ntrty	2	5	2	7	0	0	0	0
Area 8A Trty	131	384	169	553	1	4	2	6
Hood Canal NTrty	85	245	111	356	2	4	3	7
Hood Canal Trty	128	368	164	532	2	6	3	9
South Pgt Snd NTrty	135	412	174	586	1	4	2	6
South Pgt Snd Trty	6,951	32,564	8454	41,018	12	34	17	51
B'ham Bay(7B) NTrty	10	27	12	39	602	1,948	889	2,837
B'ham Bay(7B) Trty	26	73	33	106	1,587	5,140	2,345	7,485
<b>Local Extreme Terminal Net:</b>								
Nontreaty	n/a			n/a	n/a			n/a
Treaty	6,542	38124	11561	49,685	385	932	462	1,394
Test	112				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:	9,503	55,061	1,578	7,143
Treaty Total Wild Impacts:	16,116	102,183	2,667	11,870
Amt NT above (or below) T:	(6,613)	(47,122)	(1,089)	(4,727)
Nontreaty Wild Impacts w/o SOF:	9,462	54,495	1,575	7,078
Treaty Wild Impacts w/o SOF:	16,116	102,183	2,667	11,870
Amt NT above (or below) T w/o SOF:	(6,654)	(47,688)	(1,092)	(4,792)

**TABLE 4: SUMMARY OF COHO EXPLOITATION RATES BY FISHERY AGGREGATE**

Predicted Exploitation Rates for Total Fishery-Related Mortality

FRAM Run Number:

0921

04/23/09

Run Description:

PFMC Final NT 210 T 60

07:06 P

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

STOCK->	Skagit Wild	Stilly Wild	Snohom Wild	HdCnl Wild V1	JDF Tribs Wild V2	South Sound Wild	Nooksack Wild	Quillayute Fall/Wild	Hoh Wild	Queets Wild	Grys Hbr Wild
Predicted Spawning Escapement Ocean Escapement *	22,419 n/a	8,971 n/a	49,482 n/a	25,805 n/a	18,099 n/a	27,504 n/a	2,688 n/a	n/a 17,820	n/a 7,867	n/a 25,488	n/a 53,807
<b>RUN RECONSTRUCTION:</b>											
Ocean/Pre-term. Marine Catch V1	4,898	1,551	8,156	10,484	2,361	9,302	1,185	1,272	1,567	4,569	4,712
Nonlocal Mixed-terminal Catch	653	37	188	1,011	59	382	19	114	42	1,437	469
Local Mixed Terminal Marine Catch	438	494	2,746	7,644	0	7,086	2,189	n/a	n/a	n/a	n/a
Extreme Terminal & FW V2 NTRTY	1,058	806	2,262	1,854	0	2,958	630	n/a	n/a	n/a	n/a
Extreme Terminal & FW V2 TRTY	3,348	1,575	4,358	2,033	16	6,542	385	n/a	n/a	n/a	n/a
Extr. Term. TEST V2	744	0	0	0	0	112	-	n/a	n/a	n/a	n/a
Escapement V2	22,419	8,971	49,482	25,805	18,099	27,504	2,688	17,820	7,867	25,488	53,807
TOTAL ABUNDANCE V3	33,558	13,434	67,192	48,831	20,535	53,886	7,096	19,092	9,434	30,057	58,519
TOTAL PREDICTED EXPL. RATE V4	33.2%	33.2%	26.4%	47.2%	11.9%	49%	62%	7%	17%	15%	8%
Canada	1.8%	1.0%	1.0%	2.1%	1.5%	1.2%	2.3%	0.7%	2.3%	1.8%	1.2%
Alaska	0.0%	0.0%	0.0%	0.0%	0.2%	0.0%	0.0%	0.0%	0.0%	0.0%	0.1%
Subtotal Southern U.S. EXPL. RATE V5	31%	32%	25%	45%	10%	47.8%	59.8%	6.0%	14%	13%	7%
S. Of Falcon Ocean	0.1%	0.1%	0.1%	0.1%	0.2%	0.1%	0.0%	0.4%	0.8%	1.3%	0.6%
NOF Ocean Troll:	NTrty 0.4%	0.3%	0.3%	0.5%	0.4%	0.4%	0.3%	1.0%	1.8%	1.8%	0.6%
	Trty 4.3%	2.8%	2.8%	4.2%	3.5%	3.7%	4.4%	3.0%	8.2%	6.1%	3.9%
Ntrty NOF Ocean & Buoy10 Spt	1.0%	0.6%	0.6%	1.3%	0.5%	0.9%	0.9%	1.0%	2.4%	3.4%	1.3%
Pgt Snd 5,6C Troll	Trty 0.1%	0.1%	0.2%	0.1%	0.1%	0.1%	0.0%	0.6%	All Puget Sound Combined:		0.3%
								1.2%	0.7%		
Pgt Snd 5,6 Sport	1.9%	1.5%	1.5%	3.3%	3.7%	2.4%	1.3%				
Pgt Snd 7 Sport	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.1%				
Pgt Snd 8 Sport	1.8%	3.0%	3.6%	0.2%	0.0%	0.0%	0.6%				
Pgt Snd 9 Sport	1.8%	1.5%	1.5%	4.1%	0.1%	2.6%	0.1%				
Pgt Snd 10,11,13	0.5%	0.2%	0.2%	1.8%	0.0%	5.3%	0.0%				
Pgt Snd 12 Sport	0.0%	0.0%	0.0%	3.1%	0.0%	0.0%	0.4%				
Pgt Snd Extr. Term. & FW Sport	3.2%	5.9%	3.3%	2.2%	0.0%	5.5%	8.9%				
PS Preterminal Net**:	Ntrty 0.1%	0.0%	0.0%	0.0%	0.1%	0.0%	0.9%				
	Trty 0.8%	0.3%	0.3%	0.7%	1.2%	0.5%	5.2%				
Nonlocal Term. Net:	Ntrty 0.2%	0.0%	0.0%	0.2%	0.1%	0.2%	0.0%				
	Trty 1.8%	0.2%	0.2%	1.9%	0.2%	0.5%	0.2%				
Local Terminal Net:	Ntrty 0.0%	0.1%	0.1%	3.0%	-	0.3%	8.5%				
	Trty 1.3%	3.6%	4.0%	12.7%	-	12.9%	22.4%				
Extreme Term. Net	Ntrty 0.0%	0.1%	0.1%	1.6%	0.0%	0.0%	0.0%				
	Trty 10.0%	11.7%	6.5%	4.2%	0.1%	12.1%	5.4%				
	TEST 2.2%	0.0%	0.0%	0.0%	0.0%	0.2%	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:

V1 From TAMM Tables 2; excludes freshwater sport

V2 Puget Sound Stocks From TAMM (includes freshwater sport); Coastal stocks escapement = "run entering river" from FRAM

V3 "Total Fishery-related Mortality Plus Escapement" (does not include natural mortality) or

For Coastal Stocks: Pre-River Mortality Plus Run Entering River (does not include natural escapement)

V4 This is NOT AEQ Exploitation Rate because natural mortality is not included! See Table 2 for all-fishery ERs for coastal stocks.

V5 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: 0921  
 Run Description: PFMC Final NT 210 T 60  
 Includes landed catch plus all fishery-related mortality

04/23/09  
 07:06 PM

**PUGET SOUND COHO RUN SIZES:**

Stock	Hat + Wild Run Entering Area 4B Net \1	Hat + Wild Terminal Area Abundance \2	Hat + Wild Escape-ment	Wild Run Entering Area 4B Net	Wild Run Entering USJDF-PS	Wild Escape-ment
Skagit		37,526	29,701	27,232	31,027	22,419
Stillag.-Snohomish		120,602	88,166			
	Stilly: Snohom:			10,157	12,787	8,971
Hood Canal		75,599	35,788	52,240	63,936	49,482
South Puget Sound		192,904	80,460	36,230	44,852	25,805
Nooksack-Samish		25,436	12,056	39,985	50,475	27,504
Strait Tributaries		24,037	21,119	5,582	6,532	2,688
				18,336	19,251	18,099

\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: 476,104

**OTHER WA-CA RUNSIZES:** all Truns values

Terminal Area	Ocean Escapement		
	All w/ dip Ins	Local Wild	Local Hatchery
Quillayute	65,059	19,885	45,173
Hoh	8,925	7,867	0
Queets	34,981	25,488	8,879
Quinault	37,123	14,636	21,208
Grays Harbor	107,315	53,807	53,085
Willapa Bay	72,694	29,644	41,732

Stock/Area	Ocean Escapement
Quillayute Summer Hatchery	11,081
Quillayute Summer Natural	2,065
Columbia Early (after B10)	353,960
Columbia Late (after B10)	220,520
Total	574,480
Oregon N. Coast Natural	29,263
Oregon N. Mid Coast Nat.	59,449
Oregon S. Mid Coast Nat.	100,759
Total	189,471

**TABLE C: COLUMBIA RIVER COHO FISHERY IMPACT SUMMARY**

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

FRAM Run Number:

0921

Run Description:

PFMC Final NT 210 T 60

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)	238,573	115,387	353,960	152,761	67,759	220,520	391,334	183,146	574,480
Marine Exploitation Rate	55.9%	17.3%	48.0%	47.9%	15.9%	41.0%	53.1%	16.8%	45.5%
Marine ER to Col R before B10 (PFMC Pre Rpts)	36.7%	11.4%	31.5%	42.9%	14.3%	36.7%	38.8%	12.5%	33.3%
PFMC Ocean Fisheries Exploitation Rate	36.0%	11.2%	30.9%	41.9%	13.7%	35.8%	38.0%	12.1%	32.6%
Exploitation in Southern U.S. marine Fisheries	55.5%	17.2%	47.6%	47.5%	15.8%	40.6%	52.7%	16.7%	45.2%
<b>TOTAL ER</b>	<b>71.0%</b>	<b>20.3%</b>	<b>60.6%</b>	<b>52.3%</b>	<b>22.4%</b>	<b>45.8%</b>	<b>64.4%</b>	<b>21.0%</b>	<b>55.4%</b>
CANADIAN	2450	146	2596	1172	133	1305	3,622	279	3,901
ALASKA	1	0	1	0	0	0	1	0	1
S. of Falcon Troll	3858	1348	5206	702	280	982	4,560	1,628	6,188
S. of Falcon Sport	87341	5029	92370	25472	1607	27079	112,813	6,636	119,449
<b>NORTH OF CAPE FALCON OCEAN:</b>									
Treaty Troll	8747	2817	11564	8032	2815	10847	16,779	5,632	22,411
NT Troll N. Leadbitr	5258	544	5802	3746	417	4163	9,004	961	9,965
NT Troll S. Leadbitr	9009	924	9933	9982	1087	11069	18,991	2,011	21,002
Sport: Area 1	47940	2937	50877	40315	2629	42944	88,255	5,566	93,821
Buoy 10	104427	8239	112666	14669	1328	15997	119,096	9,567	128,663
Area 2	28509	1726	30235	28390	1826	30216	56,899	3,552	60,451
Area 3	1462	87	1549	1577	102	1679	3,039	189	3,228
Area 4 *	2645	163	2808	4542	293	4835	7,187	456	7,643
<b>PUGET SOUND CATCHES:</b>									
Treaty Troll	7	2	9	137	40	177	144	42	186
Sport: Areas 5-13	985	78	1063	1222	143	1365	2,207	221	2,428
Nontreaty Net	0	0	0	0	0	0	0	0	0
Treaty Net	68	20	88	49	15	64	117	35	152
<b>COASTAL CATCHES:</b>									
Bay Sport	72	26	98	132	53	185	204	79	283
Nontreaty Net	123	47	170	214	86	300	337	133	470
Treaty Net	0	0	0	0	0	0	0	0	0
<b>LOWER COLUMBIA:</b>									
Mainstem Nontreaty Net	9913	3573	13485	12607	5202	17810	22520	8775	31295
SAFE	70144	495	70638	0	0	0	70144	495	70638
Sport	1612	53	1665	285	10	294	1897	63	1960
<b>Total Abundance</b>	<b>541,475</b>	<b>139,520</b>	<b>680,995</b>	<b>293,114</b>	<b>80,613</b>	<b>373,727</b>	<b>834,589</b>	<b>220,133</b>	<b>#####</b>

**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:

0921

Run Description:

PFMC Final NT 210 T.60

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

FISHERY	Oregon Nat	WA Early Nat	WA Late Nat	Total
Ocean Escapement (after B10)	5,083	7,770	14,489	27,342
Marine Exploitation Rate	16.4%	16.5%	15.9%	16.2%
Marine ER to Col R before B10 (PFMC Pre Rpts)	11.3%	11.3%	14.3%	12.884%
PFMC Ocean Fisheries ER	11.1%	11.2%	13.7%	12.49%
PFMC InRivers Ers (incl B10)	8.1%	8.1%	8.1%	8.11%
<b>PFMC TOTAL ER</b>	<b>19.22%</b>	<b>19.27%</b>	<b>21.82%</b>	<b>20.61%</b>
ER in So. U.S. Marine Fisheries	16.4%	16.4%	15.8%	16.1%
<b>TOTAL ER ALL FISHERIES (not ESA guidance)</b>	<b>19.4%</b>	<b>19.4%</b>	<b>22.4%</b>	<b>21.0%</b>
CANADIAN	3	4	29	36
ALASKA	0	0	0	0
S. of Falcon Troll	54	83	59	196
S. of Falcon Sport	207	318	343	868
<b>NORTH OF CAPE FALCON OCEAN:</b>				
Treaty Troll	133	204	602	939
NT Troll N. Leadbtr	26	40	90	156
NT Troll S. Leadbtr	40	62	232	334
Sport: Area 1	129	198	562	889
Buoy 10	314	480	284	1,078
Area 2	74	114	390	578
Area 3	4	6	22	32
Area 4 *	8	13	63	84
<b>PUGET SOUND CATCHES:</b>				
Treaty Troll	0	0	9	9
Sport: Areas 5-13	4	5	31	40
Nontreaty Net	0	0	0	0
Treaty Net	1	1	3	5
<b>COASTAL CATCHES:</b>				
Bay Sport	1	2	11	14
Nontreaty Net	2	3	18	23
Treaty Net	0	0	0	0
<b>LOWER COLUMBIA:</b>				
Mainstem Nontreaty Net	156	238	1112	1507
SAFE	22	33	0	55
Sport	2	4	2	8

**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: 0921

Run Description: PFMC Final NT 210 T 60

Fishery	Area	OR Coastal Natural		Rogue/Klam. H Unmrkd	
		Total Mort	Exp. Rt.	Total Mort	Exp. Rt.
Alaska	all	0	0.0%	0	0.0%
BC	all	593	0.3%	23	0.1%
Puget Sound/Straits		165	0.1%	0	0.0%
North of Falcon:					
Troll:	Treaty	1482	0.7%	0	0.0%
	Nontreaty	869	0.4%	1	0.0%
Sport:		1841	0.9%	11	0.1%
Buoy 10		507	0.2%	0	0.0%
South of Falcon:					
Troll:	Tillmk	383	0.2%	0	0.0%
	Newprt	1157	0.5%	8	0.0%
	Coos B	2626	1.2%	92	0.5%
	Brookngs	1	0.0%	0	0.0%
	CaKMZ	0	0.0%	0	0.0%
	Ft Bragg	0	0.0%	0	0.0%
	So. Calif	0	0.0%	0	0.0%
Sport:	Tillmk	2071	1.0%	8	0.0%
	Newprt	2921	1.4%	9	0.1%
	Coos B	5277	2.5%	79	0.4%
	Brookngs	1228	0.6%	218	1.2%
	CaKMZ	56	0.0%	43	0.2%
	Ft Bragg	0	0.0%	0	0.0%
	So. Calif	0	0.0%	0	0.0%
Freshwater		6388	3.0%	44	0.2%
AK to CA total		27565	13.0%	536	3.0%
Escapement		184888		17270	

**TABLE T: THOMPSON AND UPPER FRASER COHO FISHERY IMPACT SUMMARY**

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

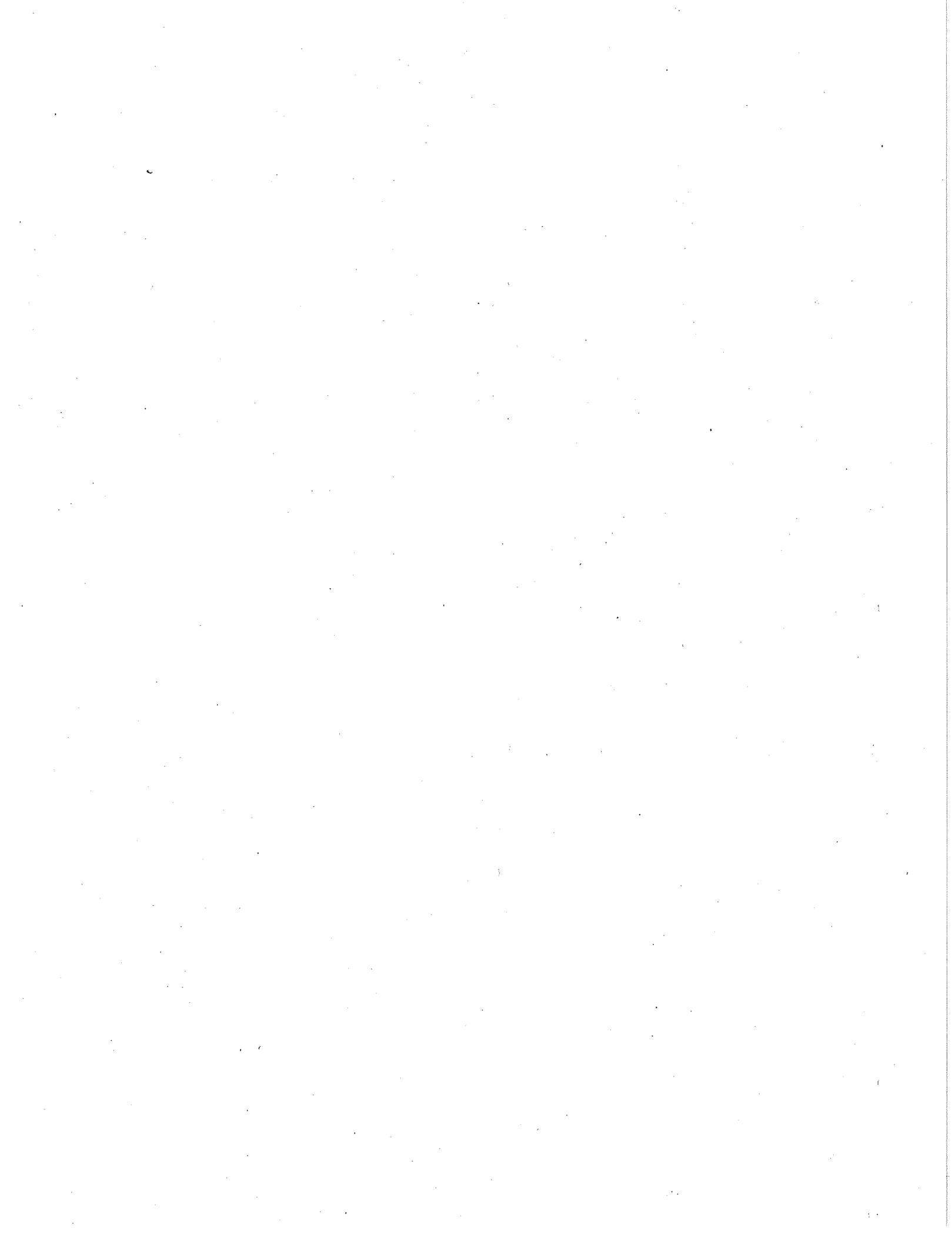
FRAM Run Number: 0921

Run Description: PPMC Final NT 210 T 60

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

FISHERY	Upper Fraser	
	Wild	
Projected Escapement	13,614	
Projected Pre-Terminal Exploitation Rate	13.2%	
<b>Exploitation in U.S. Fisheries</b>	<b>9.8%</b>	
	Mortality	Expl. Rate
CANADIAN (marine)	522	3.3%
ALASKA	13	0.1%
SOUTH OF FALCON & COL R	14	0.1%
NORTH OF CAPE FALCON OCEAN:		
Treaty Troll Area 2	6	0.0%
Treaty Troll Area 3	4	0.0%
Treaty Troll Area 4	732	4.7%
NT Troll Area 1	2	0.0%
NT Troll Area 2	11	0.1%
NT Troll Area 3	20	0.1%
NT Troll Area 4	24	0.2%
NT Sport Buoy 10 & Area 1	10	0.1%
NT Sport Area 2	38	0.2%
NT Sport Area 3	8	0.1%
NT Sport Area 4*	103	0.7%
PUGET SOUND:		
JDF Troll and Net	23	0.1%
SJI 6/7/7A NT Net	59	0.4%
SJI 6/7/7A T Net	55	0.4%
Sport: Area 5	271	1.7%
Area 6	7	0.0%
Area 7	28	0.2%
Area 8-13	16	0.1%
Puget Sound Terminal net	110	0.7%
WA Extreme Terminal Net & FW Sport	0	0.0%
<b>Total:</b>	<b>2076</b>	<b>13.2%</b>

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



Run Description 2009 Final Chinook  
 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.

Fishery	Fishery-related Mortality	Fishery Description and/or Comments:
<b>CANADIAN (B.C.) FISHERIES:</b>		
WCVI Troll/Sport	119,815	2009 PSC fishing levels reduced for new Agreement
Area 20 Net	0	2006 pre-season
Georgia St./JDF	0	Incidental mortality
Georgia St./JDF	36,000	2007 post season
<b>SOUTH OF CAPE FALCON:</b> March PFMC		
<b>NORTH OF CAPE FALCON OCEAN:</b>		
Treaty Ocean T1	47,215	TAC 39,000 chinook
NT Ocean Troll	26,912	TAC 20,500 chinook
NT Ocean Sport	22,839	TAC 20,500 chinook
NT NOF Impact	49,751	
4B Add-on		Included with Area 4
Canadian Licen:	0	(For Areas 4 and 4B)
Buoy 10	>>>>	see In-River models

# Final PFMC Chinook

## NT 41K, T 39K

<b>PUGET SOUND SPORT &amp; TROLL:</b>		
Treaty Strait&W	9,191	7000 for winter troll; 500 JDF summer troll
<b>Puget Sound Sport (landed + non-retention mortality):</b>		
Area 5	7,427	Area 5 5/1-6/30 clsd; 7/1-8/15, bag 2 + 2 pk, co & ch MSF, cm NR; 8/16-9/18, bag-2 + 2 pk, co MSF ch NR, cm NR; 9/19-9/30, bag-2, ch NR, cm NR; 10/1-10/15, bag-2, one ch; 10/16-10/31 clsd; 11/1-11/30 clsd; 12/1-2/12 clsd; 2/13-4/10, 1 bag; 4/11-4/30 clsd; Kydaka closure 7/1-9/30
Area 6	1,972	Area 6 5/1-6/30 clsd; 7/1-8/15 bag 2+2 pk, co & ch MSF expt ch NR East of Ediz, cm NR; 8/16-9/30, bag 2+2 pk, co MSF, ch & cm NR; 10/1-10/31 2/1 bag; 11/1-11/30 closed; 12/1-2/12 clsd; 2/13-4/10, 1 bag; 4/11-4/30 clsd; 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	7,330	Area 7 5/1-6/30 clsd; 7/1-7/31, 2/1 bag + 2 pk, 8/1-9/30, 2/1 bag + 2 pk, co MSF, cm NR; 10/1-10/31, 2/1 bag co MSF; 11/1-11/30 clsd; 12/1-4/30 2 bag, ch MSF; B'Bay, 8/16-10/31, 4/2 bag, pk NR; S. Rosario & E. JDF clsd 7/1-9/30; B Bay - clsd 4/1 thru 8/15; Samish - clsd 7/1-10/15
Areas 8-1,2 8D	6,517	Area 8-1 5/1-7/31 clsd; 8/1-9/30, bag 2 + 2 pk, ch NR; 10/1-10/31 clsd; 11/1-4/30, 2 bag, ch MSF; Oak Harbor 10/1-10/31 Area 8-2 5/1-7/31 clsd; 8/1-9/30, bag 2 + 2 pk, ch NR; 10/1-10/31 2 bag, ch nr, clsd n. of Randell Pt; 11/1-4/30, 2 bag, ch MSF; Tul. Term Area, 6/5-9/7 Fri-noon Mon except clsd 6/20, 9/12-9/27 Sat & Sun, bag 2 + 2 pk
Area 9	22,108	Area 9 5/1-7/15 clsd; 7/16-8/31, bag 2 + 2 pk, ch MSF; cm NR; 9/1-9/30, bag 2 + 2 pk, ch & cm NR; 10/1-10/31, 2 bag, ch NR; 11/1-11/30, 2 bag ch MSF; 12/1-1/15 closed; 1/16-4/15, 2 bag, ch MSF; 4/16-4/30 clsd; Hd Cnl clsd during sum MSF. Edmds YR, 2/1 bag, cm NR 8/1-9/30, + 2 pk 7/1-9/30
Ar 10, 10A, 10E	13,413	Area 10 5/1-5/31, closed; 6/1-6/30 C&R; 7/1-7/15, bag 2 + 2 pk, ch NR; 7/16-8/31, bag 2 + 2 pk, ch MSF, cm NR 8/1-8/31; 9/1-9/30, bag 2 + 2 pk, ch NR, cm NR till 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, inner E' Bay 7/3-8/24 Fri-Mon bag 2 + 2 pk, cm NR; Sinc TAF, 7/1-9/30, bag 2 + 2 pk, ch MSF, cm NR 8/1-9/15; Piers Yr-round, 2/1 bag, cm NR 8/1-9/15, + 2 pk 7/1-9/30
Area 11	12,659	Area 11 5/1-5/30 clsd; 6/1-6/30 2 bag, ch MSF; 7/1-9/30, bag 2 + 2 pk, ch MSF; 10/1-10/31, 2 bag; 11/1-12/31, 2/1 bag; 1/1-1/31 clsd; 2/1-4/30, 2 bag, ch MSF. Commencement Bay closure: 6/1-7/31. Piers Yr-Round: Dash Pt, Pt Def., Les Davis, Des Moines, & Redondo, 2/1 bag, + 2 pk 7/1-9/30
Area 13	2,013	Area 13 5/1-6/30, 2 bag, ch MSF; 7/1-9/30, 2 bag, ch & co MSF; 10/1-10/31, 2 bag, co MSF; 11/1-12/31, 2/1 bag; 1/1-1/31, bag - 1; 2/1-2/28 clsd; 3/1-4/30 bag 1; Minter closed 4/16-9/30; Budd closures 7/16-10/31; Fox Island Yr-Round: 2/1 bag, coho MSF 7/1-10/31
Area 12	1,392	Area 12 Entire Area: 5/1-6/30 clsd; So. Ayock 7/1-10/15, 4 bag/2 ch, cmNR; No. Ayock 7/1-8/31 clsd; 9/1-10/15, 4 co only; Entire Area: 10/16-12/31 bag 4/1; Jan clsd; 2/1 - 4/30, 2 bag ck MSF; Hoodspout: 7/1-12/31, bag-4/2, cm NR 7/1-10/15; Quilcene: 8/16-8/31, bag - 4 coho only

PUGET SOUND JUL-SEP	Oct-Apr	TOTAL
JDF Net (4B/5/6)	0	0
Treaty	1,751	1,751
SJI Net (7/7A) I	3,365	49
Treaty	4,717	31
B6/9Net NT		
Treaty	714	0
		714

2009 Total Mortality (Fraser Panel and other)

JDF Sockeye/Pink:	Trty (GN): wb 8/2 - wb 8/16
JDF Coho:	Trty (GN): wb 9/6 - wb 10/4, 5-5-5-5-5
JDF Chum:	Trty (GN): wb 10/11 - wb 11/1, 6-6-6-6
SJI Coho:	Ntry RN - Open 7 d/wk from end of Fraser Panel control thru chum (wb 11/08), MSF co&ch thru 9/30 (ch 300 cap), cm NR though 9/30
SJI Sockeye/Pink:	Ntry (GN/PS/RN) Schedule TBD by Fraser Panel, modeled as wb 8/03 - wb 8/17 1-2-1, PS & RN co & ck NR
	Trty (GN/PS): wk 31 (wb 7/26) - wk37 (wb 9/6)
SJI Chum:	Ntry (GN/PS) weeks 41-46 1-3-5-5-5-5, PS co & ck NR
	Trty (GN/PS): wk 41 (wb 10/4) - wk 47 (wb 11/15)

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

Stock	Model Prediction			Management Criteria		
	Total ER	SUS ER	SUS Preterm. ER	Natural Escapement	RER or CERC	Low Abundance Threshold (nat. esc.)
<b>Spring/Early:</b>						
Nooksack (n)	20.3%	6.55%	2.3%	315	6.6% SUS; (base reg.)	2000
Skagit (n)	33.5%	21.1%	10.1%	1204	38% Total	576
White	19.8%	18.5%	4.7%	1390	20% Total	200
Dungeness	41.6%	4.3%	4.1%	786	10% SUS	500
<b>Summer/Fall:</b>						
Skagit	48.6%	25.5%	4.9%	17549	50% Total; 17% SUS (pink year)	4800
Stillaguamish (n)	22.7%	11.92%	8.3%	875	25% Total; 15% SUS	650
Snohomish (n)	26.4%	14.0%	11.5%	6667	21% Total; 15% SUS	2800
Lake Wa. (Cedar R.) (n)	40.5%	19.6%	10.7%	1128	15% Preterm SUS	200
Green	57.4%	36.5%	10.7%	5813	15% Preterm SUS	1800
Puyallup	49.8%	28.9%	10.7%	1153	50% Total	500
Nisqually	75.8%	58.8%	19.5%	1741	Under development	500
Western Strait-Hoko	24.6%	4.8%	4.8%	1015	10% SUS	500
Elwha	41.2%	4.2%	4.1%	1864	10% SUS	1000
Mid-Hood Canal tribs. (n)	26.8%	12.0%	11.69%	114	11.9% preterminal SUS (base reg)	400
Skokomish	58.1%	43.3%	11.9%	1217	15% Preterm SUS, >1200 esc.	800 natural

SRFJ = 0.473 (0.70 ceiling)  
 Lower Col Nat Tule ER = 0.380 (0.38 ceiling)

FRAM Description: 2009 Final Chinook  
 FRAM Run Number: 2309

April 17, 2009

**Summer Mark-Selective Chinook Sport Fishery  
Strait of Juan de Fuca, Areas 5 & 6  
2009**

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 2009 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 2009, 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.

The Fishery Intent

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. The 2009 fishery sampling program transitions from an intensively sampled pilot study to decreased sampling effort and greater reliance on Voluntary Trip Reports. Prior to the 2010 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.

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 and sampling program described in Attachment A, employing shore-based surveys and sampling techniques, as well as an intensive voluntary trip report program similar to the approach demonstrated during the 2008 season, 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.

For the Area 5 mark-selective Chinook fishery, post-season catch and effort estimates will be produced and shared between the co-managers by August 31, 2009 (per Attachment A), immediately following the 1.5

month mark-selective Chinook fishery. In addition, WDFW will provide the co-managers with in-season catch and effort data prior to July 31, 2009, to facilitate co-manager discussions at the end of July regarding performance of the 2009 Area 5 mark-selective Chinook fishery.

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 December 31, 2009.

to be considered for the 2010 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 2010 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 2009**

### **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, 2009). In addition, following the Chinook selective fishery period, we will continue to sample the coho selective fishery in Areas 5 and 6 through September 30, 2009.

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 2008), 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

In Area 5, we will implement creel surveys using 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), in order to produce total-Area estimates of catch and effort 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 2009 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 2009 creel survey design, as recommended by NWIFC, we will improve upon the reduced design employed in 2008 (WDFW 2008b) by ensuring that two access sites are sampled on at least two separate randomly selected days in each stratum (weekend and weekday), and we will lengthen the defined time strata for estimation from a weekly basis to a two-week basis; 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

For the Area 6 mark-selective Chinook fishery, as in 2008, 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.

Similar to our approach used in summer 2008, we will implement an “enhanced” Voluntary Trip Report (VTR) program, in which an additional WDFW technician will be hired to work exclusively on distributing and collecting VTRs from the angling public. The enhanced VTR program in 2008 was successful in substantially increasing the VTR sample size relative to the VTR sample size from the 2003 through 2007 seasons in Areas 5 and 6. Furthermore, in Area 5, the sample size of Chinook encounters from 2008 VTRs was approximately three-fold higher than the sample size from the 2008 test fishery, and proportions of each mark/size category (LM, LU, SM, and SU) of Chinook encounters were relatively similar (WDFW 2008b). 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 2009) 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).

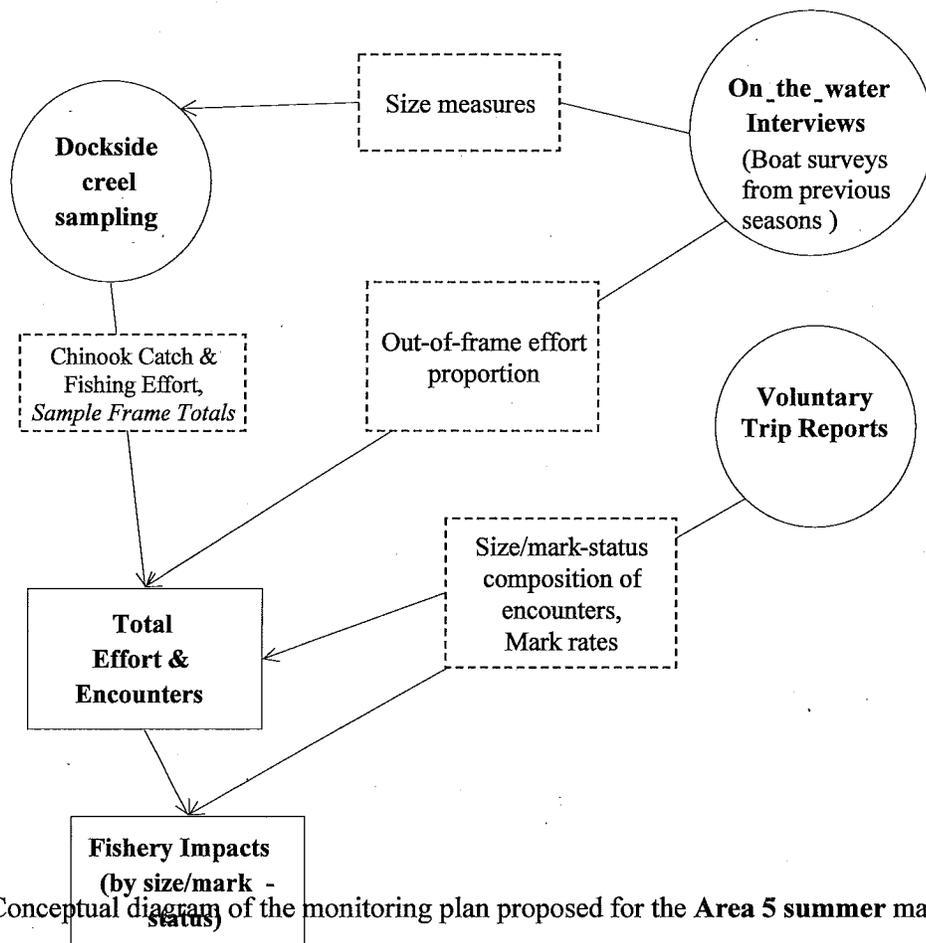
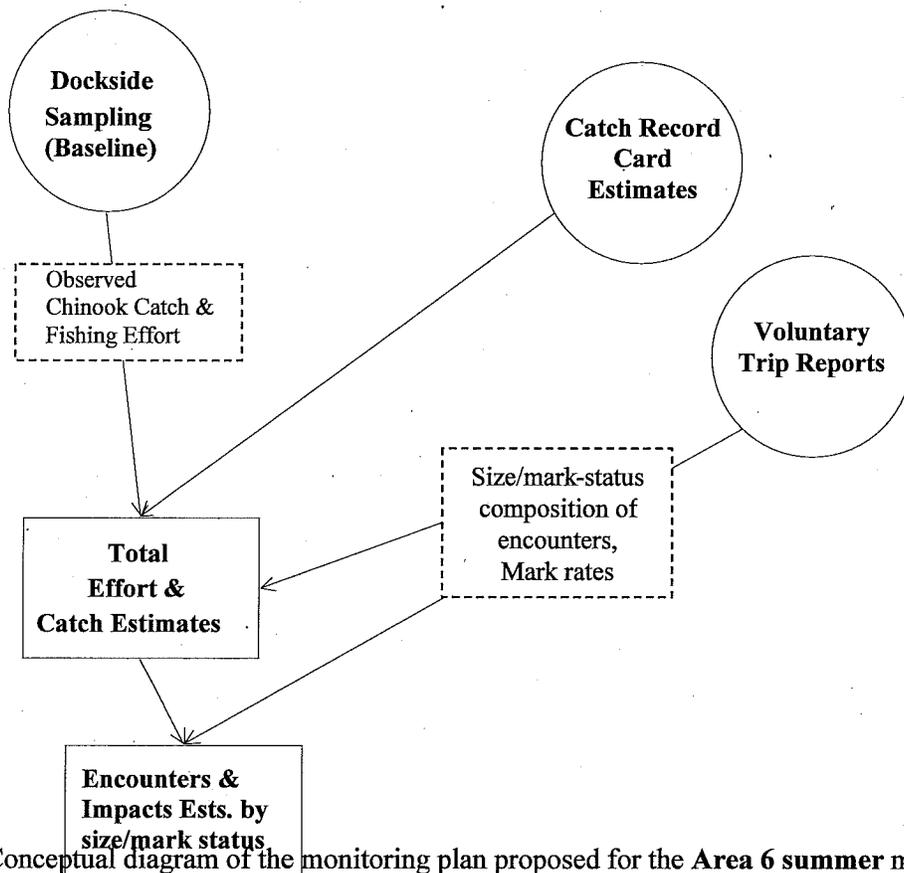


Figure 5/6-1. Conceptual diagram of the monitoring plan proposed for the Area 5 summer mark-

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.

### 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).

## **Area 5**

### **Dockside Sample Design**

Sampling strata will be divided into 'weekday' (Monday through Thursday) and 'weekend' (Friday, Saturday, and Sunday) days, and estimates will be generated for two-week intervals throughout the mark-selective Chinook fishery. For each two-week period, we will randomly select 2 sample days from the 8 possible weekday stratum days (distributed so there is at least one weekday sampled in each of the two weeks) and 4 sample days out of the 6 possible weekend (Friday through Sunday) stratum days (distributed so there are at least two weekend days sampled in each of the two weeks). 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 2008 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 in the weekday stratum, using baseline-level sampling to ensure that we achieve the 20% sample rate goal (e.g., in 2008, the sample rate was 35% when we included baseline data).

### **On-the-water Surveys**

On-the-water surveys were conducted in Area 5 during the previous 2003-2008 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 2009, 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.

### **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.

### **Assumptions**

Harvest and effort estimates are based on the following assumptions:

- Boat surveys from previous seasons (e.g., 2008 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 2009 Area 6 mark-selective Chinook fishery, as in 2008, 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**

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 mark selective Chinook fisheries in Areas 5 and 6 during 2009. 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.

Similar to our approach in summer 2008, we will implement an enhanced Voluntary Trip Report (VTR) program in an effort to increase the VTR sample size relative to the sample size in the 2003-2007 seasons. In 2008, we took several measures to help ensure the success of our enhanced VTR program, and this approach will continue in summer 2009 (WDFW 2008b). 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, similar to the 2008 season, 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 –this constitutes our former “Method 2” approach (WDFW 2008a). Given that our 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 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; test fishing data would not be available in the 2009-10 season). 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

For the Area 5 mark-selective Chinook fishery, post-season catch and effort estimates will be produced and shared between the co-managers by August 31, 2009, immediately following the 1.5 month mark-selective Chinook fishery. In addition, WDFW will provide the co-managers with in-season catch and effort data prior to July 31, 2009, to facilitate co-manager discussions at the end of July regarding performance of the 2009 Area 5 mark-selective Chinook fishery. A final report will be written and distributed by December 31, 2009.

## 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 2009 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	--	--

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April 20, 2009

## 2009 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, 2009. These fisheries will be implemented consistent with management objectives defined by the co-managers' Puget Sound Chinook Harvest Management Plan (March, 2004), 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 2009, 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 13,431 in Area 9 and 4,595 in Area 10 (FRAM 2309) 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 modifications to the season structure for the mark-selective fishery 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 schedule between the affected co-managers when the Area 9 and Area 10 fishery has achieved 80% of the combined harvest guideline (11,774 landed Chinook) to review catch and discuss the remaining fishing schedule;
- All subarea closures that are part of the co-managers' 2009-2010 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 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 accuracy and precision can be realistically obtained. Prior to the 2010 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 unmarked Chinook 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.

### Reports

WDFW will complete in-season progress reports containing catch and effort estimates and total estimated Chinook encounters that will be distributed to the co-managers electronically on a weekly basis. These weekly reports will consist of a table that presents the estimates of angler effort, catch, and releases by species and mark status, with variances, the coefficient of variation, and 95% confidence intervals for the weekly estimates by area. WDFW will also distribute a second table with the cumulative total Chinook encounters estimated for the fishery to date by area.

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 December 31, 2009 to be considered for planning the 2010 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.

A post-season WDFW Enforcement report of monitoring activities related to compliance with the Areas 9&10 summer period Chinook mark-selective fisheries will be provided to the Tribes prior to the first North of Falcon meeting in March, 2010.

#### 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.<sup>1</sup> 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 fisheries will be included as a component of the co-managers' annual pre-season agreement.

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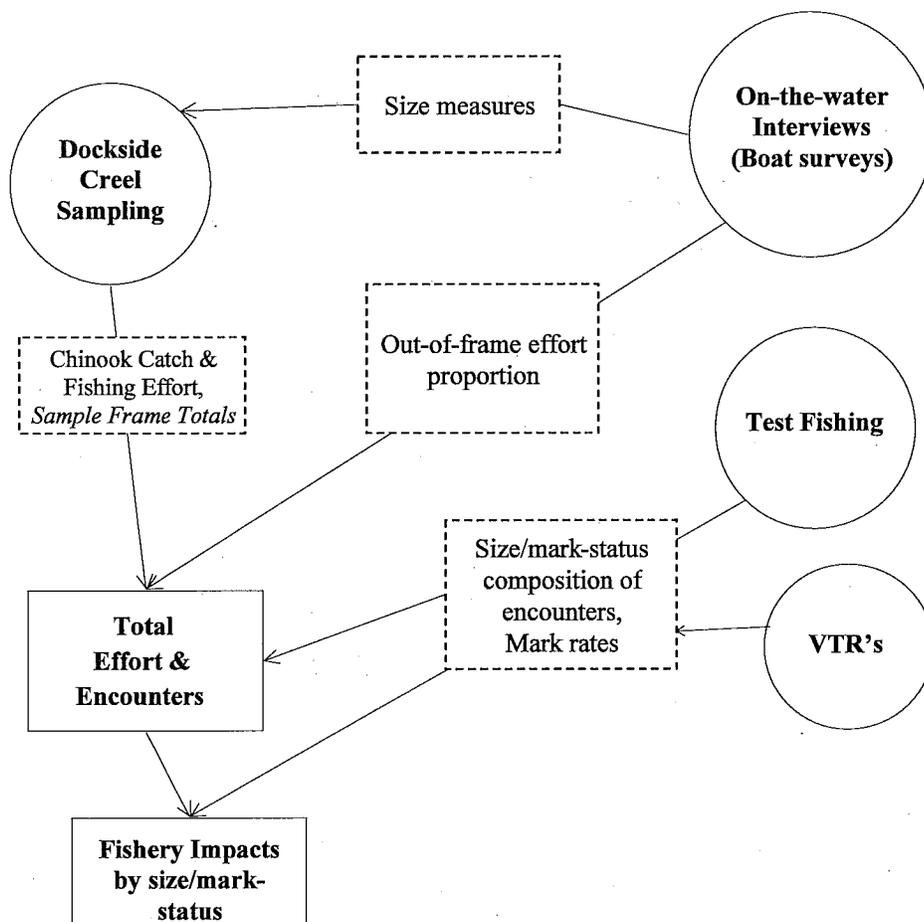
<sup>1</sup> *Analysis of coho salmon double-index tag (DIT) data. 2003*

## MONITORING THE SELECTIVE CHINOOK FISHERIES IN AREAS 9 AND 10, JULY 16 THROUGH AUGUST 31 2009

### Overview

The 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 2009. 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 2008), 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.



**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.

## 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 2008. Once the initial 2009 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.

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:

- Salisbury 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 –this constitutes our former “Method 2” approach (WDFW 2008a). Given that our 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 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 2009 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<sup>2</sup> 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.

Given the logistical and estimation challenges that arise as a result of our separate charter/fleet sampling

breakout, we explored datasets from past years and considered bias analytically in order to identify the areas/seasons where a special charter treatment is absolutely necessary, and this assessment was shared with Bob Conrad of NWIFC. Briefly, we evaluated how much CPUEs for the overall fleet versus charter boats would have to differ and/or how great the charter effort proportion (of the total effort) would have to be in order for a meaningful bias to impacts our catch estimates. For the theoretical assessment, Pete McHugh of WDFW computed the percent bias  $(\text{est'd} - \text{true}) / \text{true}$  for charter:fleet CPUE ratios and identified combinations that resulted in a bias that equaled or exceeded 3% (our default value for "negligible bias"). We then considered these results parallel to CPUE ratios and charter effort proportions that we have documented in past reports. From this evaluation, we determined that results were mixed for Areas 9 and 10 in the summer season (based on 2007 and 2008 data) –i.e., for Area 9, pooling caused negligible (<3%) bias, whereas for Area 10, we were over the bias threshold when pooling charter and private fleet data. Therefore, we determined that we should continue to separate charters from the rest of the fleet in our catch estimate methods in the 2009 season.

### **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 December 31, 2009, with a full post-season analysis of all data collected in the 2009 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 Selective Chinook Summer Fisheries in Areas 9 and 10, 2009.**

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

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**April 17, 2009**

## **2009 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, 2009 (May 1 for Area 13 only) and extending no later than September 30, 2009. These fisheries will be implemented consistent with management objectives defined by the co-managers' Puget Sound Chinook Harvest Management Plan (March, 2004), 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 11 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 exceed the preseason forecasted level of 10,359 (FRAM 2309) 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' 2009-2010 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 2010 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 unmarked Chinook 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 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 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.

### Reports

During the Area 11 summer mark-selective Chinook fishery, WDFW will distribute a monthly in-season test fishing report electronically, showing the cumulative total number of legal and sub-legal encounters and the mark rates for each month of the fishery. In addition, WDFW will distribute a report by October 31, 2009, containing 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. The report will contain cumulative total Chinook encounters estimated for each month. Test fishing 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 preliminary post-season report will be written and distributed by December 31, 2009, containing a full post-season analysis of all data collected in the 2009 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.<sup>1</sup> 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 11 and 13, 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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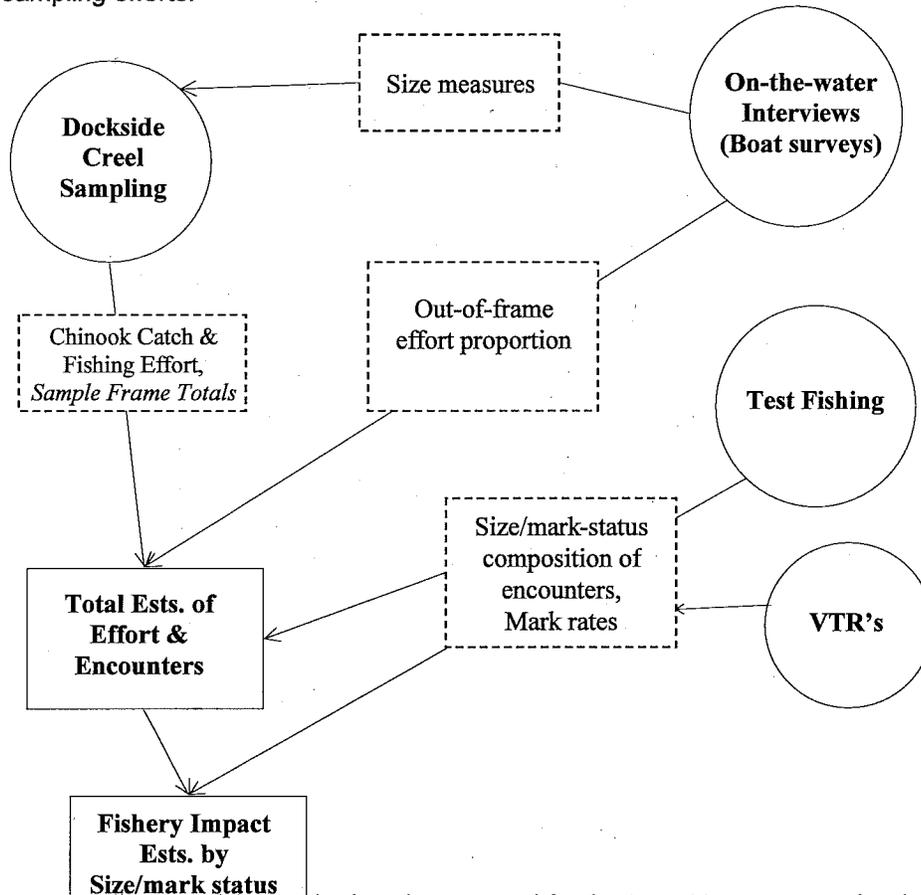
<sup>1</sup> *Analysis of coho salmon double-index tag (DIT) data. 2003*

**Attachment A**

**MONITORING THE AREA 11 SUMMER SELECTIVE CHINOOK FISHERY, JUNE 1 THROUGH SEPTEMBER 30, 2009**

The 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, 2009 via comprehensive data collection strategies consisting of dockside sampling, on-the-water surveys, test fishing, and voluntary trip reports from charter boats and private vessels, 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 2008), 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.



**Figure 11S-1.** Conceptual diagram of the monitoring plan proposed for the **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 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, and estimates will be generated for two-week intervals throughout the mark-selective Chinook fishery. For each two-week period, we will randomly select 2 sample days from the 8 possible weekday stratum days (distributed so there is at least one weekday sampled in each of the two weeks) and 4 sample days out of the 6 possible weekend (Friday through Sunday) stratum days (distributed so there are at least two weekend days sampled in each of the two weeks). 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
- 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.

## 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 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 – this constitutes our former “Method 2” approach (WDFW 2008a). Given that our 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 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 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 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.

### **Test Fishing**

WDFW will operate one test boat in Area 11 to collect encounter rate and mark rate information during the 2009-10 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<sup>2</sup> 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**

In the previous (2007 and 2008) seasons of the Area 11 summer selective Chinook fishery, we separated charter vessels from private (non-charter) boats in generating the catch and effort estimates for Area 11. We used the Murthy estimator method to estimate total salmon encounters for private boats in Area 11, while a complete census (from VTRs and follow-up phone calls) approach was used for charter boats.

Given the logistical and estimation difficulties that arise as a result of our separate charter/fleet sampling breakout, we explored datasets from past years and considered bias analytically in order to identify the areas/seasons where a special charter treatment is absolutely necessary, and this assessment was shared with Bob Conrad of NWIFC. Briefly, we evaluated how much CPUEs for the overall fleet versus charter boats would have to differ and/or how great the charter effort proportion (of the total effort) would have to be in order for a meaningful bias to impact our catch estimates. For the theoretical assessment, Pete McHugh of WDFW computed the percent bias  $(\text{est'd} - \text{true}) / \text{true}$  for charter:fleet CPUE ratios and identified combinations that resulted in a bias that equaled or exceeded 3% (our default value for "negligible bias"). We then considered these results parallel to CPUE ratios and charter effort proportions that we have documented in past reports. From this evaluation, we determined that pooling charter and fleet data in the Murthy estimates will not significantly compromise estimate integrity in the Area 11 summer selective fishery. The combination of charter effort proportions (very small) and CPUE ratios (relatively high) suggests that pooling will cause negligible (<3%) bias; therefore, we will include charter vessels in our Murthy estimate for the Area 11 summer fishery.

### **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 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.

Similar to our approach used during summer 2008 in Area 5 (WDFW 2008b), we will implement an "enhanced" Voluntary Trip Report (VTR) program in Area 11, in which an additional WDFW technician will be hired to work exclusively on distributing and collecting VTRs from the angling public. In addition, we will take several measures 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.

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 Area 11.

**Reporting Schedule**

We will distribute a monthly in-season test fishing report electronically, showing the cumulative total number of legal and sub-legal encounters and the mark rates for each month of the Area 11 fishery. In addition, after the four-month fishery is completed, we will distribute a report containing catch and effort estimates and total encounter estimates, as well as final test fishing results. This report will be distributed within one month following the end of the 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. Test fishing 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 December 31, 2009, with a full post-season analysis of all data collected in the 2009 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 2009 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, 2009.**

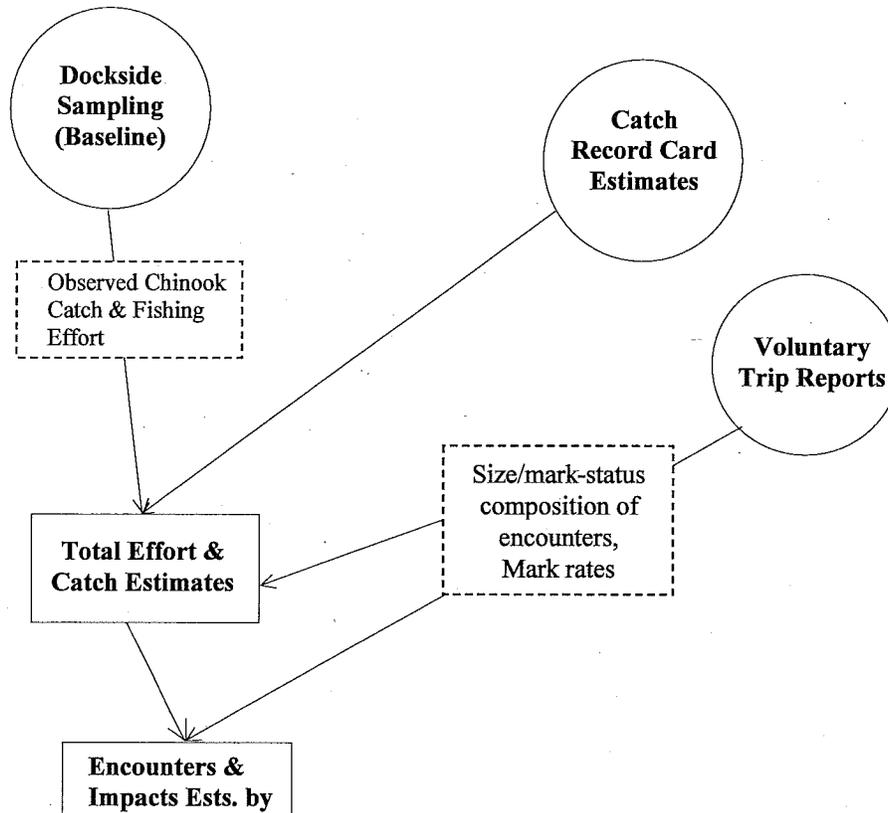
Month	Area 11 Dockside Samplers	Area 11 VTR Dockside Position	Area 11 Test Boat Staff (1 Boat)
June	4	1	2
July	4	1	2
Aug	4	1	2
Sept	4	1	2

# MONITORING THE AREA 13 SUMMER SELECTIVE CHINOOK FISHERY FROM MAY 1 THROUGH SEPTEMBER 30, 2009

## 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, 2009. 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 2008), 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 Chinook 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 – this constitutes our former “Method 2” approach (WDFW 2008a). Given that our 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 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.

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April 20, 2009

## 2009-2010 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, 2009, through April 30, 2010. This fishery will be implemented consistent with management objectives defined by the co-managers' Puget Sound Chinook Harvest Management Plan (March, 2004), 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 3,547 (FRAM 2309), the fishery will be modified to control impacts on stocks of concern; and,
- All subarea closures that are part of the co-managers' 2009-2010 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 2010 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 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 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 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.

### Reports

WDFW will distribute monthly in-season progress reports containing catch and effort estimates, total estimated Chinook encounters, and test fishing results for Area 7. These reports will be distributed electronically by the end of the month following the month to be reported, and will consist of a table that presents the estimates of angler effort, catch, and releases by species and mark status, with variances, the coefficient of variation, and 95% confidence intervals for the monthly estimates. A second table will also be provided with the cumulative total Chinook encounters estimated for each month to date (includes encounters from private and charter vessels). Test fishing results will also be included in the monthly report, showing the cumulative total number of legal and sub-legal encounters and the mark rates to date.

A preliminary post-season report will be written and distributed by October 31, 2010, containing a full post-season analysis of all data collected in the 2009-10 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.<sup>1</sup> 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

<sup>1</sup> *Analysis of coho salmon double-index tag (DIT) data. 2003*

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' pre-season agreement.

## MONITORING THE WINTER AREA 7 SELECTIVE CHINOOK FISHERY, DECEMBER 1, 2009 THROUGH APRIL 30, 2010

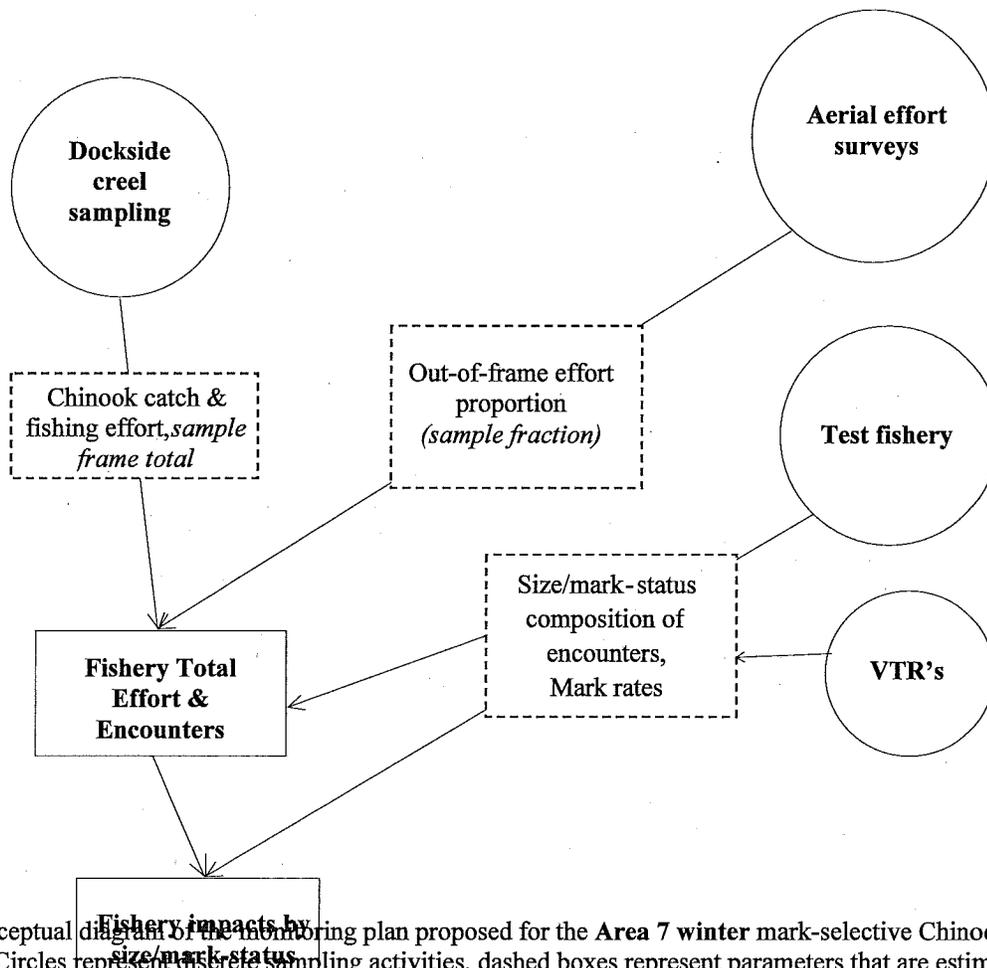
### Overview

The Puget Sound Sampling Program will intensively monitor the proposed mark-selective Chinook fishery in Area 7 from December 1, 2009 through April 30, 2010, 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 2008 and 2009 seasons in Areas 7 and 9 (WDFW 2008c, WDFW 2009).

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

We will implement the comprehensive monitoring plan depicted in **Figure 7-1** 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 *vi*) 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

We will achieve our Area 7 objectives 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,  $n = 4$  out of 6 possible weekend days for each two week interval) 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-7 dockside sample frame will be the four assumed highest-use access sites, based on dockside interview data collected during the 2008 and 2009 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 ( $n = 5$  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,  $P_i$ .

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

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 2008c. 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,

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

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,

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

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).

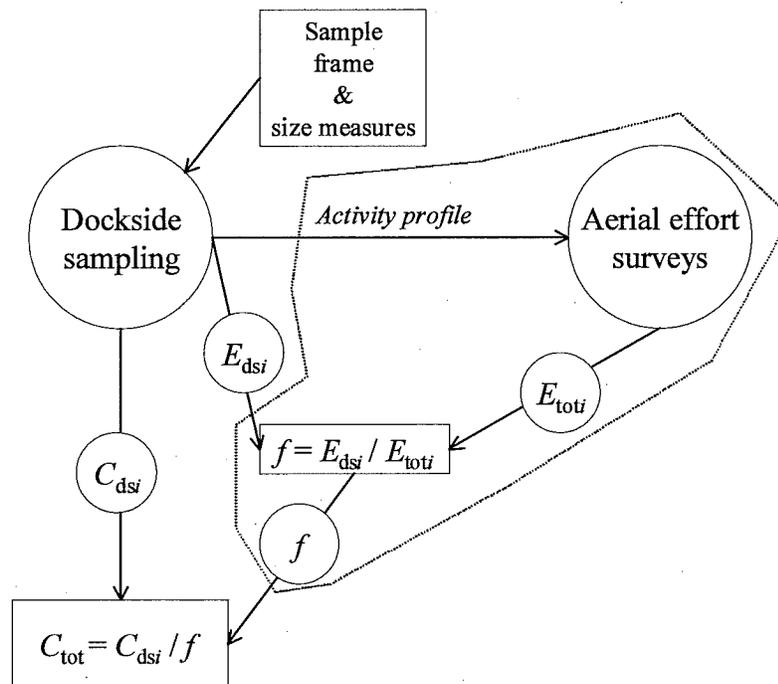
### Assumptions

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

We will estimate total Chinook encounters in the Area 7 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 – this constitutes our former “Method 2” approach (WDFW 2008a). Given that our 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 within the design proposed in **Figure 7-1**, 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 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<sup>2</sup> 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

In the previous (2008-09) seasons of the Area 7 winter selective Chinook fishery, we separated charter vessels from private (non-charter) boats in generating the catch and effort estimates for Area 7. We used the Murthy estimator method to estimate total salmon encounters for private boats, while a complete census (from VTRs and follow-up phone calls) approach was used for charter boats.

Given the logistical and estimation difficulties that arise as a result of our separate charter/fleet sampling breakout, we explored datasets from past years and considered bias analytically in order to identify the areas/seasons where a special charter treatment is absolutely necessary, and this assessment was shared with Bob Conrad of NWIFC. Briefly, we evaluated how much CPUEs for the overall fleet versus charter boats would have to differ and/or how great the charter effort proportion (of the total effort) would have to be in order for a meaningful bias to impact our catch estimates. For the theoretical assessment, Pete McHugh of WDFW computed the percent bias ( $[\text{est'd} - \text{true}] / \text{true}$ ) for charter:fleet CPUE ratios and identified combinations that resulted in a bias that equaled or exceeded 3% (our default value for "negligible bias"). We then considered these results parallel to CPUE ratios and charter effort proportions that we have documented in past reports. From this evaluation, we determined that CPUEs were virtually identical between the fleet and charter vessels, and charter boats constituted a small proportion of the catch and effort during February 2008, indicating that pooling charter and fleet data in the Murthy estimates would not significantly compromise estimate integrity in the Area 7 winter selective fishery. However, because the Area 7 mark-selective season is longer during winter 2009, and we have not yet fully analyzed charter boat data from March and April 2009, we will continue to stratify charter and private fleet data until current 2009 data are fully evaluated.

## 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.

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 7.

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

Monthly in-season progress reports will be sent out electronically, which will report the monthly catch and effort estimates, total estimated Chinook encounters, and test fishing results for Area 7, by the end of the month following the month to be reported. These monthly reports will consist of a table that presents the estimates of angler effort, catch, and releases by species and mark status, with variances, the coefficient of variation, and 95% confidence intervals for the monthly estimates. We will also distribute a second table with the cumulative total Chinook encounters estimated for each month to date (includes encounters from private and charter vessels). Test fishing results will also be included in the monthly report, showing the cumulative total number of legal and sub-legal encounters and the mark rates to date.

A final report will be written and distributed by October 31, 2010, with a full post-season analysis of all data collected in the 2010 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 staffing levels needed to implement the proposed intensive monitoring of 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, 2009 through April 30, 2010.**

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

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April 17, 2009

**Winter Mark-Selective Sport Fishery  
Areas 8.1 & 8.2  
2009-2010**

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, 2009, through April 30, 2010. The fishery will be implemented consistent with management objectives defined by the co-managers' Puget Sound Chinook Harvest Management Plan (March, 2004), 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 exceed the preseason forecasted level of 2,811 Chinook (FRAM 2309) the parties will consider modification to the fishery to ensure that the total encounters for the entire season do not exceed the preseason forecast level by more than 10%;
- 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 fifth 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 2010-2011 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

WDFW will complete in-season progress reports containing catch and effort estimates and total estimated Chinook encounters that will be distributed to the co-managers electronically on a bi-monthly basis. These bi-monthly reports will consist of a table that presents the estimates of angler effort, catch, and releases by species and mark status, with variances, the coefficient of variation, and 95% confidence intervals for the monthly estimates. WDFW will also distribute a second table with the cumulative total Chinook encounters estimated for each month to date (including encounters from private and charter vessels).

A preliminary post-season report will be written and distributed by October 31, 2010, with a full post-season analysis of all data collected in the 2009-10 Areas 8-1 and 8-2 winter selective Chinook fishery. This 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 an evaluation of possible bias in parameters based on 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 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.<sup>1</sup> 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.

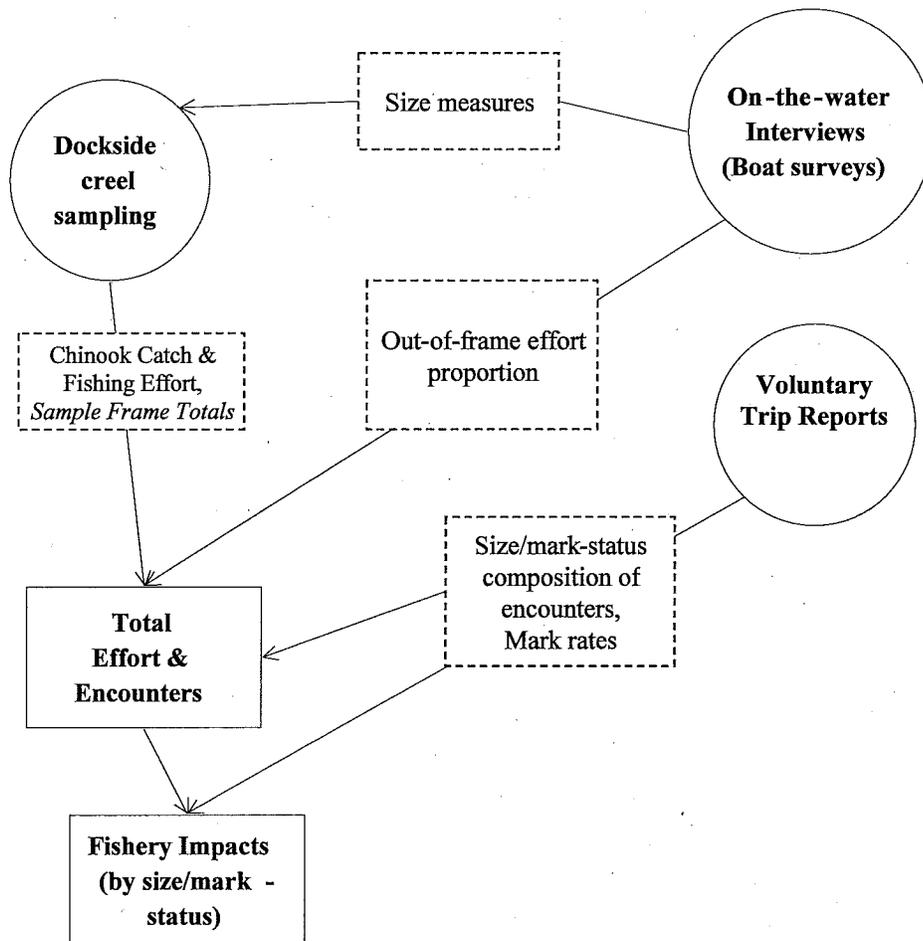
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<sup>1</sup> *Analysis of coho salmon double-index tag (DIT) data. 2003*

## MONITORING THE AREAS 8-1 AND 8-2 WINTER SELECTIVE CHINOOK FISHERY, NOVEMBER 1, 2009 THROUGH APRIL 30, 2010

The Puget Sound Sampling Program will monitor the mark-selective Chinook fishery in Areas 8-1 and 8-2 from November 1, 2009 through April 30, 2010 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 2008), 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 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.

### **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, and estimates will be generated for two-week intervals throughout the mark-selective Chinook fishery. For each two-week period, we will randomly select 2 sample days from the 8 possible weekday stratum days (distributed so there is at least one weekday sampled in each of the two weeks) and 4 sample days out of the 6 possible weekend (Friday through Sunday) stratum days (distributed so there are at least two weekend days sampled in each of the two weeks). 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 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 (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 approximately two boat surveys per month 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.

### 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 –this constitutes our former “Method 2” approach (WDFW 2008a). Given that our 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 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.

## Charter Vessels

In the previous four seasons of the Areas 8-1 and 8-2 winter selective Chinook fishery, we separated charter vessels from private (non-charter) boats in generating the catch and effort estimates for the two

areas. We used the Murthy estimator method to estimate total salmon encounters for private boats, while a complete census (from VTRs and follow-up phone calls) approach was used for charter boats.

Given the logistical and estimation challenges that arise as a result of our separate charter/fleet sampling breakout, we explored datasets from past years and considered bias analytically in order to identify the areas/seasons where a special charter treatment is absolutely necessary, and this assessment was shared with Bob Conrad of NWIFC. Briefly, we evaluated how much CPUEs for the overall fleet versus charter boats would have to differ and/or how great the charter effort proportion (of the total effort) would have to be in order for a meaningful bias to impact our catch estimates. For the theoretical assessment, Pete McHugh of WDFW computed the percent bias ( $[\text{est'd} - \text{true}] / \text{true}$ ) for charter:fleet CPUE ratios and identified combinations that resulted in a bias that equaled or exceeded 3% (our default value for "negligible bias"). We then considered these results parallel to CPUE ratios and charter effort proportions that we have documented in past reports. From this evaluation, we determined that results were mixed for Areas 8-1 and 8-2; for Area 8-1, pooling caused negligible (<3%) bias (with a consistently low charter effort proportion), whereas for Area 8-2, we were over the bias threshold when pooling the two data sources. Therefore, we determined that we should continue to separate charters from the rest of the fleet in our catch estimate method for the Area 8-2 fishery, while we will pool the charter and fleet data as part of our modified Murthy estimate in the Area 8-1 fishery.

### **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 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**

In-season progress reports will be sent out electronically on a bi-monthly basis, to report catch and effort estimates and total estimated Chinook encounters. These bi-monthly reports will consist of a table that presents the estimates of angler effort, catch, and releases by species and mark status, with variances, the coefficient of variation, and 95% confidence intervals for the monthly estimates. We will also distribute a second table with the cumulative total Chinook encounters estimated for each month to date (includes encounters from private and charter vessels).

A final report will be written and distributed by October 31, 2010, with a full post-season analysis of all

data collected in the 2009-10 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 2009-10 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, 2009 through April 30, 2010.**

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

## Literature Cited

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**April 20, 2008**

## **2009-2010 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, 2009, and January 16 to April 15, 2010. This fishery will be implemented consistent with management objectives defined by the co-managers' Puget Sound Chinook Harvest Management Plan (March, 2004), 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 2009-2010, 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 3,818 Chinook (FRAM 2309) by more than 10%, the fishery will be modified to control impacts on stocks of concern;
- All subarea closures that are part of the co-managers/ 2009-2010 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 2011 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 unmarked Chinook 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 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 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.

### Reports

WDFW will distribute monthly in-season progress reports containing catch and effort estimates, total estimated Chinook encounters for Area 9. Test fishing results will also be included in the monthly report, showing the cumulative total number of legal and sub-legal encounters and the mark rates to date. These reports will be distributed electronically by the end of the month following the month to be reported, and will consist of a table that presents the estimates of angler effort, catch, and releases by species and mark status, with variances, the coefficient of variation, and 95% confidence intervals for the monthly estimates. A second table will also be provided with the cumulative total Chinook encounters estimated for each month to date (includes encounters from private and charter vessels).

A preliminary post-season report will be written and distributed by October 31, 2010, containing a full post-season analysis of all data collected in the 2009-10 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.<sup>1</sup> 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.

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<sup>1</sup> *Analysis of coho salmon double-index tag (DIT) data. 2003*

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 fisheries will be included as a component of the co-managers' annual pre-season agreement.

## MONITORING THE WINTER AREA 9 SELECTIVE CHINOOK FISHERY, NOVEMBER 2009 AND JANUARY 16 THROUGH APRIL 15, 2010

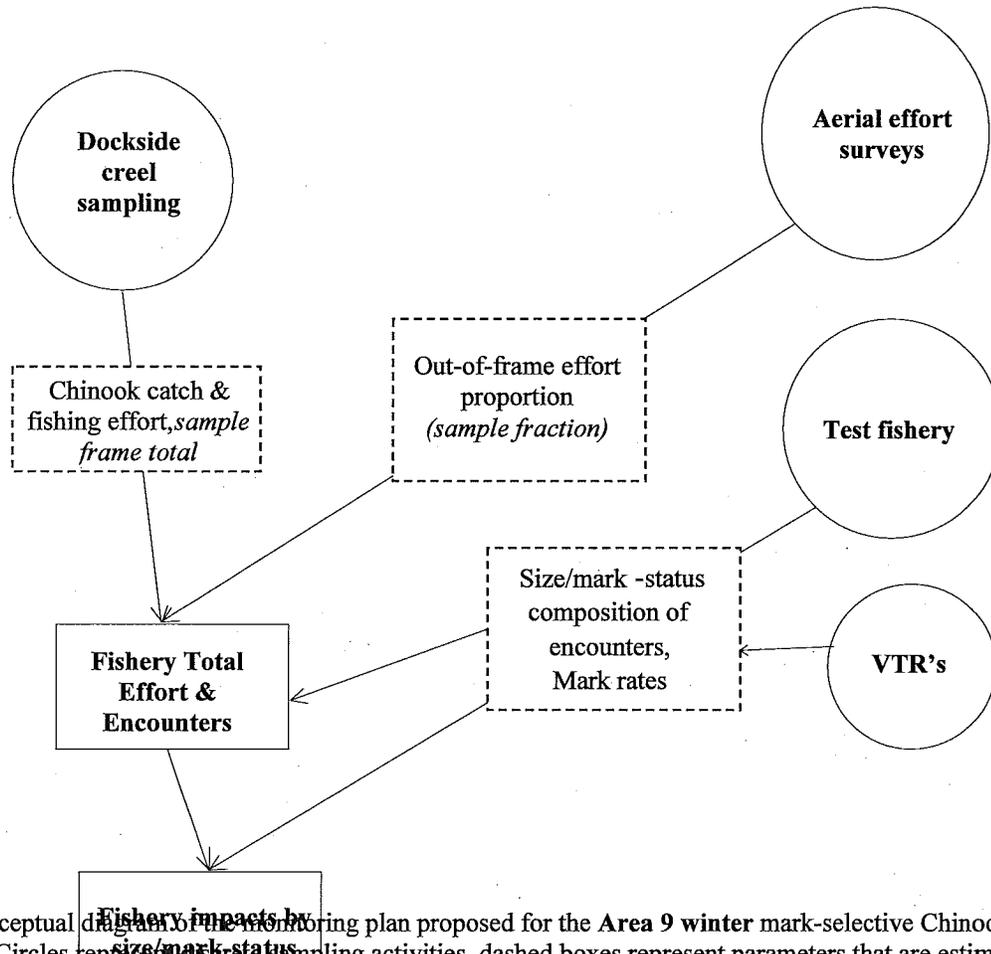
### Overview

The Puget Sound Sampling Program will intensively monitor the proposed mark-selective Chinook fishery in Area 9 during November 2009 and from January 16 through April 15, 2010, 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 2008 and 2009 seasons in Areas 7 and 9 (WDFW 2008c, WDFW 2009).

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 *vi*) estimate total fishery impacts (encounters and mortality) and comparing these values to pre-season modeling (FRAM) expectations.



**Figure 9-1.** Conceptual design of the monitoring plan proposed for the Area 9 winter mark-selective Chinook fishery season. Circles represent 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,  $n = 4$  out of 6 possible weekend days for each two week interval) 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-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). Also Fort Casey Ramp may be one of the sampled sites in northern Area 9.

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 ( $n = 5$  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,  $P_i$ .

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

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 2008c. 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,

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

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,

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

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

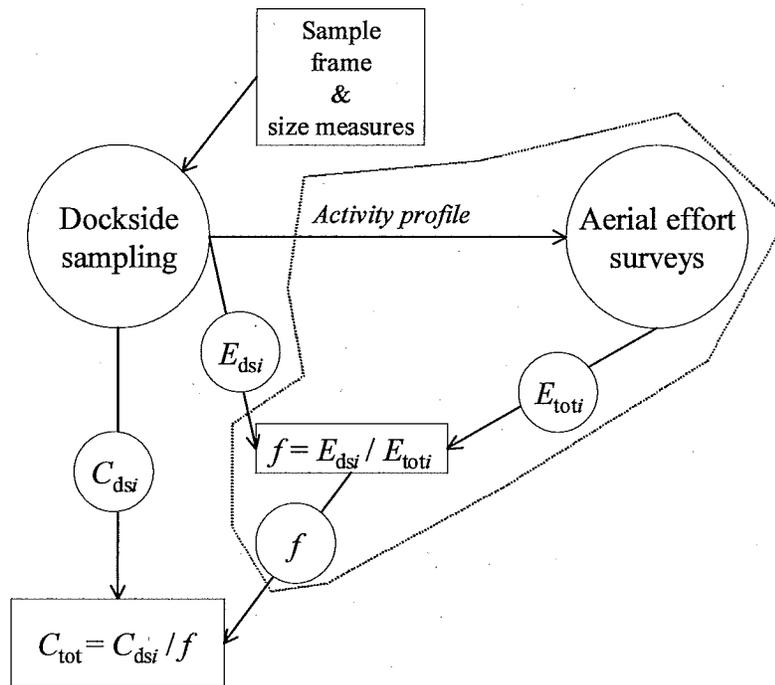
For this approach to yield unbiased estimates of catch and effort, a number of assumptions must be met. First, the usual Murthy-design assumptions apply and are,

- 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 – this constitutes our former “Method 2” approach (WDFW 2008a). Given that our 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 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): Mooring 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<sup>2</sup> 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**

In the previous (2008-09) seasons of the Area 9 winter selective Chinook fishery, we separated charter vessels from private (non-charter) boats in generating the catch and effort estimates for Area 9. We used the Murthy estimator method to estimate total salmon encounters for private boats, while a complete census (from VTRs and follow-up phone calls) approach was used for charter boats.

Given the logistical and estimation difficulties that arise as a result of our separate charter/fleet sampling breakout, we explored datasets from past years and considered bias analytically in order to identify the areas/seasons where a special charter treatment is absolutely necessary, and this assessment was shared with Bob Conrad of NWIFC. Briefly, we evaluated how much CPUEs for the overall fleet versus charter boats would have to differ and/or how great the charter effort proportion (of the total effort) would have to be in order for a meaningful bias to impact our catch estimates. For the theoretical assessment, Pete McHugh of WDFW computed the percent bias ( $(\text{est'd} - \text{true}) / \text{true}$ ) for charter:fleet CPUE ratios and identified combinations that resulted in a bias that equaled or exceeded 3% (our default value for "negligible bias"). We then considered these results parallel to CPUE ratios and charter effort proportions that we have documented in past reports. From this evaluation, we determined that pooling charter and fleet data in the Murthy estimates will not significantly compromise estimate integrity in the Area 9 winter selective fishery. The combination of charter effort proportions (very small) and CPUE ratios (relatively high) suggests that pooling will cause negligible (<3%) bias; therefore, we will include charter vessels in our Murthy estimate for the Area 9 winter fishery.

### **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 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

Monthly in-season progress reports will be sent out electronically, which will report the monthly catch and effort estimates, total estimated Chinook encounters, and test fishing results for Area 9, by the end of the month following the month to be reported. These monthly reports will consist of a table that presents the estimates of angler effort, catch, and releases by species and mark status, with variances, the coefficient of variation, and 95% confidence intervals for the monthly estimates. We will also distribute a second table with the cumulative total Chinook encounters estimated for each month to date (includes encounters from private and charter vessels). Test fishing results will also be included in the monthly report, showing the cumulative total number of legal and sub-legal encounters and the mark rates to date.

A final report will be written and distributed by October 31, 2010, with a full post-season analysis of all data collected in the 2010 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 2009 and January 16 through April 15, 2010.**

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

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**April 20, 2009**

## **2009-2010 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, 2009 to January 31, 2010. This fishery will be implemented consistent with management objectives defined by the co-managers' Puget Sound Chinook Harvest Management Plan (March, 2004), 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 2009-2010, 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 2,744 Chinook (FRAM 2309) by more than 10%, the fishery will be modified to control impacts on stocks of concern;
- All subarea closures that are part of the co managers' 2009-2010 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 2010 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 unmarked Chinook 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 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 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.

## Reports

WDFW will distribute monthly in-season progress reports containing catch and effort estimates, total estimated Chinook encounters for Area 10. Test fishing results will also be included in the monthly report, showing the cumulative total number of legal and sub-legal encounters and the mark rates to date. These reports will be distributed electronically by the end of the month following the month to be reported, and will consist of a table that presents the estimates of angler effort, catch, and releases by species and mark status, with variances, the coefficient of variation, and 95% confidence intervals for the monthly estimates. A second table will also be provided with the cumulative total Chinook encounters estimated for each month to date (includes encounters from private and charter vessels).

A preliminary post-season report will be written and distributed by October 31, 2010, containing a full post-season analysis of all data collected in the 2009-10 Area 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.<sup>1</sup> 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

<sup>1</sup> *Analysis of coho salmon double-index tag (DIT) data. 2003*

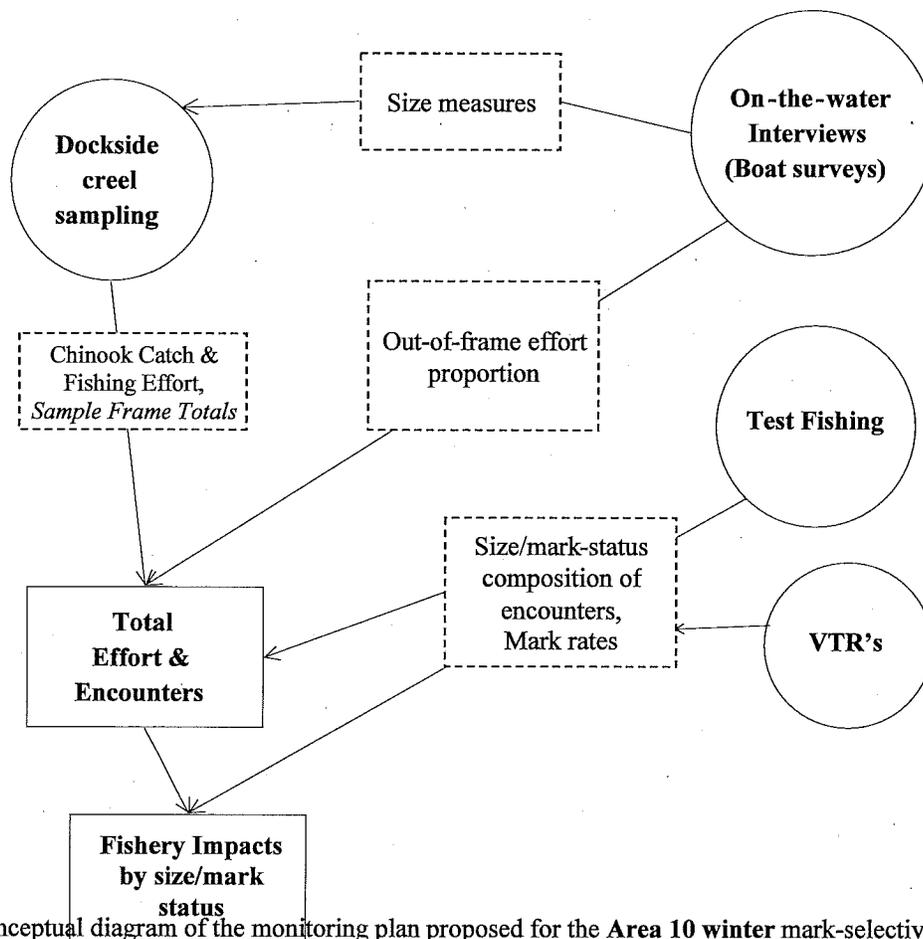
mark-selective fisheries will be included as a component of the co-managers' annual pre-season agreement.

## MONITORING THE AREA 10 WINTER SELECTIVE CHINOOK FISHERY, OCTOBER 1 2009 THROUGH JANUARY 31 2010

### Overview

The Puget Sound Sampling Program will monitor the mark-selective Chinook fishery in Area 10 during the proposed winter season from October 1 2009 through January 31 2010 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 2008), 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.



**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.

## Dockside Sampling

We will implement creel surveys during the winter mark-selective Chinook fishery in Area 10 using a 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, and estimates will be generated for two-week intervals throughout the mark-selective Chinook fishery. For each two-week period, we will randomly select 2 sample days from the 8 possible weekday stratum days (distributed so there is at least one weekday sampled in each of the two weeks) and 4 sample days out of the 6 possible weekend (Friday through Sunday) stratum days (distributed so there are at least two weekend days sampled in each of the two weeks). 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 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 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.

Boat surveys will initially be conducted during the first two weeks of the fishery (two weekend days and two weekday days). Thereafter, we will conduct a minimum of four boat surveys per month (two weekdays and two weekend days) in Area 10 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). A sufficient number of boats will be used to conduct the on-the-water surveys throughout the entirety of Area 10.

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.

#### 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 – this constitutes our former “Method 2” approach (WDFW 2008a). Given that our 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 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 2009-10 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<sup>2</sup> 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**

In the previous (2007-08 and 2008-09) seasons of the Area 10 winter selective Chinook fishery, we separated charter vessels from private (non-charter) boats in generating the catch and effort estimates for Area 10. We used the Murthy estimator method to estimate total salmon encounters for private boats in Area 10, while a complete census (from VTRs and follow-up phone calls) approach was used for charter boats.

Given the logistical and estimation difficulties that arise as a result of our separate charter/fleet sampling breakout, we explored datasets from past years and considered bias analytically in order to identify the areas/seasons where a special charter treatment is absolutely necessary, and this assessment was shared with Bob Conrad of NWIFC. Briefly, we evaluated how much CPUEs for the overall fleet versus charter boats would have to differ and/or how great the charter effort proportion (of the total effort) would have to be in order for a meaningful bias to impact our catch estimates. For the theoretical assessment, Pete McHugh of WDFW computed the percent bias ( $[\text{est'd} - \text{true}] / \text{true}$ ) for charter:fleet CPUE ratios and identified combinations that resulted in a bias that equaled or exceeded 3% (our default value for "negligible bias"). We then considered these results parallel to CPUE ratios and charter effort proportions that we have documented in past reports. From this evaluation, we determined that pooling charter and fleet data in the Murthy estimates will not significantly compromise estimate integrity in the Area 10 winter selective fishery. The combination of charter effort proportions (very small) and CPUE ratios (relatively high) suggests that pooling will cause negligible (<3%) bias; therefore, we will include charter vessels in our Murthy estimate for the Area 10 winter fishery.

## **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 (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.

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 Area 10.

### Reporting Schedule

Monthly in-season progress reports will be sent out electronically, which will report the monthly catch and effort estimates, total estimated Chinook encounters, and test fishing results for Area 10, by the end of the month following the month to be reported. These monthly reports will consist of a table that presents the estimates of angler effort, catch, and releases by species and mark status, with variances, the coefficient of variation, and 95% confidence intervals for the monthly estimates. We will also distribute a second table with the cumulative total Chinook encounters estimated for each month to date (includes encounters from private and charter vessels). Test fishing results will also be included in the monthly report, showing the cumulative total number of legal and sub-legal encounters and the mark rates to date.

A final report will be written and distributed by October 31, 2010, with a full post-season analysis of all data collected in the 2009-10 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, 2009 through January 31, 2010.**

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

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- Cochran, W.G. 1977. Sampling Techniques (third edition). John Wiley and Sons. New York.
- 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/>
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April 17, 2009

## 2009-2010 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, 2010. This fishery will be implemented consistent with management objectives defined by the co-managers' Puget Sound Chinook Harvest Management Plan (March, 2004), 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 2010 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 unmarked Chinook 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 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 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.

### Reports

WDFW will distribute monthly in-season progress reports containing catch and effort estimates, total estimated Chinook encounters, and test fishing results for Area 11. These reports will be distributed electronically by the end of the month following the month to be reported, and will consist of a table that presents the estimates of angler effort, catch, and releases by species and mark status, with variances, the coefficient of variation, and 95% confidence intervals for the monthly estimates. A second table will also be provided with the cumulative total Chinook encounters estimated for each month to date (includes encounters from private and charter vessels).

A preliminary post-season report will be written and distributed by October 31, 2010, containing a full post-season analysis of all data collected in the 2009-10 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.<sup>1</sup> 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 11, 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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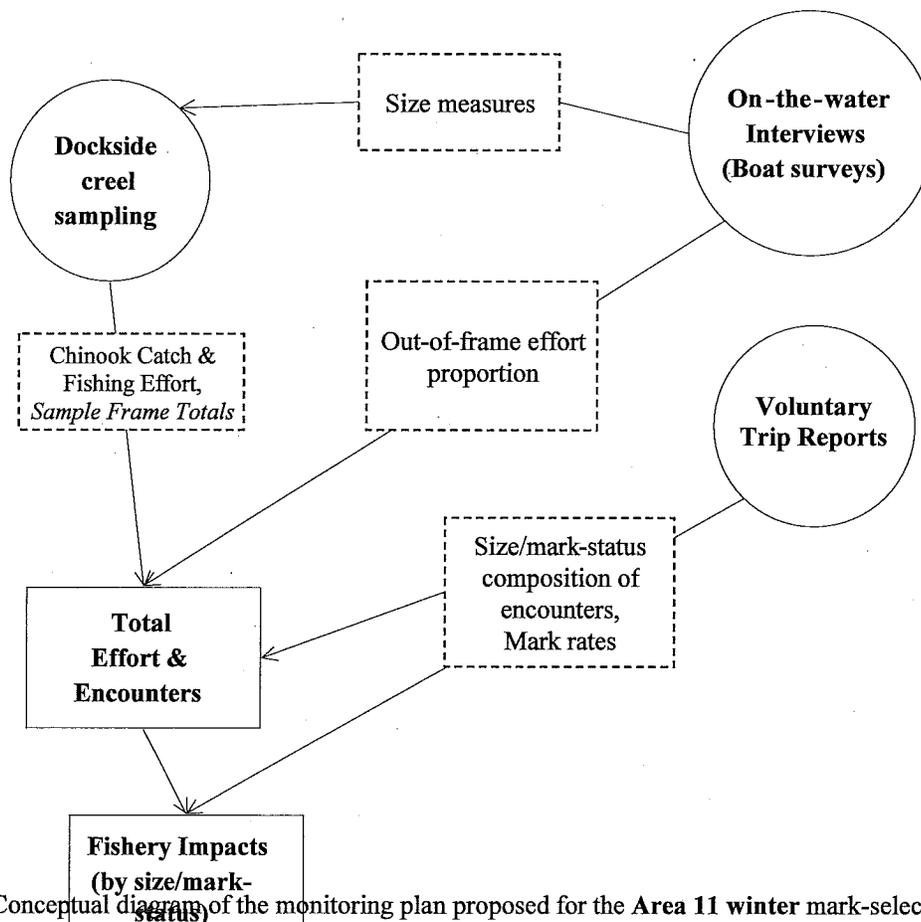
<sup>1</sup> *Analysis of coho salmon double-index tag (DIT) data. 2003*

Attachment A

# MONITORING THE AREA 11 WINTER SELECTIVE CHINOOK FISHERY, FEBRUARY 1 THROUGH APRIL 30 2010

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 2010 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 2008), 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 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, and estimates will be generated for two-week intervals throughout the mark-selective Chinook fishery. For each two-week period, we will randomly select 2 sample days from the 8 possible weekday stratum days (distributed so there is at least one weekday sampled in each of the two weeks) and 4 sample days out of the 6 possible weekend (Friday through Sunday) stratum days (distributed so there are at least two weekend days sampled in each of the two weeks). 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.

Boat surveys will initially be conducted during the first two weeks of the fishery (two weekend days and two weekday days). Thereafter, we will conduct a minimum of four boat surveys per month (two weekdays and two weekend days) in Area 11 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). A sufficient number of boats will be used to conduct the on-the-water surveys throughout the entirety of Area 11.

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.

#### 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 – this constitutes our former “Method 2” approach (WDFW 2008a). Given that our 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 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 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 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

Monthly in-season progress reports will be sent out electronically, which will report the monthly catch and effort estimates, total estimated Chinook encounters, and test fishing results for Area 11, by the end of the month following the month to be reported. These monthly reports will consist of a table that presents the estimates of angler effort, catch, and releases by species and mark status, with variances, the coefficient of variation, and 95% confidence intervals for the monthly estimates. We will also distribute a second table with the cumulative total Chinook encounters estimated for each month to date (includes encounters from private and charter vessels).

A final report will be written and distributed by October 31, 2010, with a full post-season analysis of all data collected in the 2009-10 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, 2010.**

Month	Area 11 Dockside Samplers
Feb	2
March	2
April	2

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# Northwest Indian Fisheries Commission

6730 Martin Way E. Olympia, Washington 98516-5540

Phone: (360)438-1180

FAX: (360)753-8659

To: Darin Cramer, Terry Jackson and Chris Mendoza  
From: Dave Schuett-Hames  
Date: April 30 2009  
RE: Quarterly CMER Staff Report for the NWIFC/DNR Adaptive Management Agreement

Progress on the tasks in the scope of work for January-March 2009 is as follows:

## **Eastside Type F Channel Wood Characterization Project**

- *Design.* Supported study design discussions and reviewed design proposals (Black).

## **Eastside Type F Riparian Current Condition Assessment Project**

- *Project management.* Reviewed Phase II proposals and facilitated review process. Reviewed and facilitated CMER Science Conference presentation development (Black).

## **Eastside Type F Riparian Prescription Monitoring (BTO add-on)**

- *Data review/management.* Completed input of the 2008 data (Schuett-Hames).

## **Hardwood Conversion Project**

- *Project management.* Continued to provide project management and oversight. Kept RSAG updated on project. Finalized comments on hardwood conversion case studies. Worked with contractor to finalize strategy to address comments (Roorbach).

## **Mass Wasting Prescription-Scale Effectiveness (post-mortem) Study: Stand Age Add-on**

*Scoping.* Worked on scoping a design for an add-on to the Post-Mortem project to address the apparent effect of stand age on landslide density among strata (Stewart).

## **Mass Wasting Prescription-Scale Effectiveness (post-mortem) Study: Natural Background Add-on**

*Scoping.* Worked on scoping a possible add-on to the Post-Mortem project that would partially address Policy's interest in an estimate of natural background landslide rates (Stewart)

## **Riparian Extensive Monitoring Temperature Project**

- *Project management.* Worked on site status tracking and site information database cleanup; and compiling and parsing information for landowner feedback. Reviewed and facilitated development of a CMER Science Conference presentation. Tracked project tasks and budget. Wrote CMER FY10 work plan modifications. Worked on development of alternatives for Eastside Type N component (Black).
- *Site acquisition:* Worked with contractor (Ecology) team to screen and obtain access to sites; contacted landowners for permissions (Black)

## **Riparian Extensive Monitoring Vegetation Project**

- *Study design.* Worked with contractor to access photos and assess availability and feasibility of using available photography options and available ground data. (Black).
- *Project management.* Tracked tasks and budget; provided updates and quarterly reports; wrote CMER FY10 work plan modifications (Black).

## **Road Sub-Basin Scale Effectiveness Monitoring Project**

*Project management.* Reviewed reports and worked with contractor to clarify analysis method details. Tracked project tasks and budget. Provided quarterly reports to CMER. Reviewed and facilitated CMER Science Conference presentation development (Black).

### **Type N Buffer Characteristic, Integrity and Function-Westside Project**

- *Data management.* Completed input of data into the access database (Schuett-Hames and Roorbach). Initiated data analysis.
- *Data Analysis.* Developed queries in access to conduct preliminary analysis. Prepared presentations and presented preliminary study results at the CMER Science Conference. (Schuett-Hames and Roorbach).

### **Type N Experimental Buffer-Basalt Project**

- *Data management.* Worked with project manager and DFW liaison to develop plan for 2009 field season. Assisted in development of strategy to document slash loading (Schuett-Hames and Roorbach).

### **Type N "Soft Rock" Project**

- *Scoping.* Continued participating in workgroup meetings to re-scope the project and make recommendations to CMER. Conducted GIS analysis of lithology units on CMER lands to determine feasibility of that approach. (Stewart and Schuett-Hames).

### **Wetlands Mitigation Project**

- *Design.* Worked with WetSAG to design the wetland mitigation effectiveness study. Continued writing study plan with input from members of WetSAG (Roorbach).

### **CMER/SAG Support**

- *CMER.* Participated in CMER meetings (Black, Roorbach, Schuett-Hames and Stewart).
- *CMER.* Filled the CMER staff geomorphologist position vacancy (Schuett-Hames).
- *CMER.* Participated in the CMER Science Conference (Black, Roorbach, Schuett-Hames, Stewart).
- *RSAG.* Participated in RSAG meetings, provided project updates (Black, Roorbach and Schuett-Hames).
- *UPSAG.* Participated in UPSAG meetings and provided project updates. (Black, Stewart).
- *SAGE.* Participated in SAGE meetings. Provided support for Type F riparian assessment project, Type F Instream Characterization project; communicated status and results on Extensive Riparian monitoring; and helped facilitate strategy efforts. (Black).
- *WetSAG.* Participated in WetSAG meetings and provided support for the Wetland Mitigation Project (Roorbach).

April 17, 2009

## 2010 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 February 1 to April 30, 2010. This fishery will be implemented consistent with management objectives defined by the co-managers' Puget Sound Chinook Harvest Management Plan (March, 2004), 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 2011 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 October 31, 2010, containing a full post-season analysis of all data collected in the February 1 – April 30, 2010 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.<sup>1</sup> 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.

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<sup>1</sup> *Analysis of coho salmon double-index tag (DIT) data. 2003*

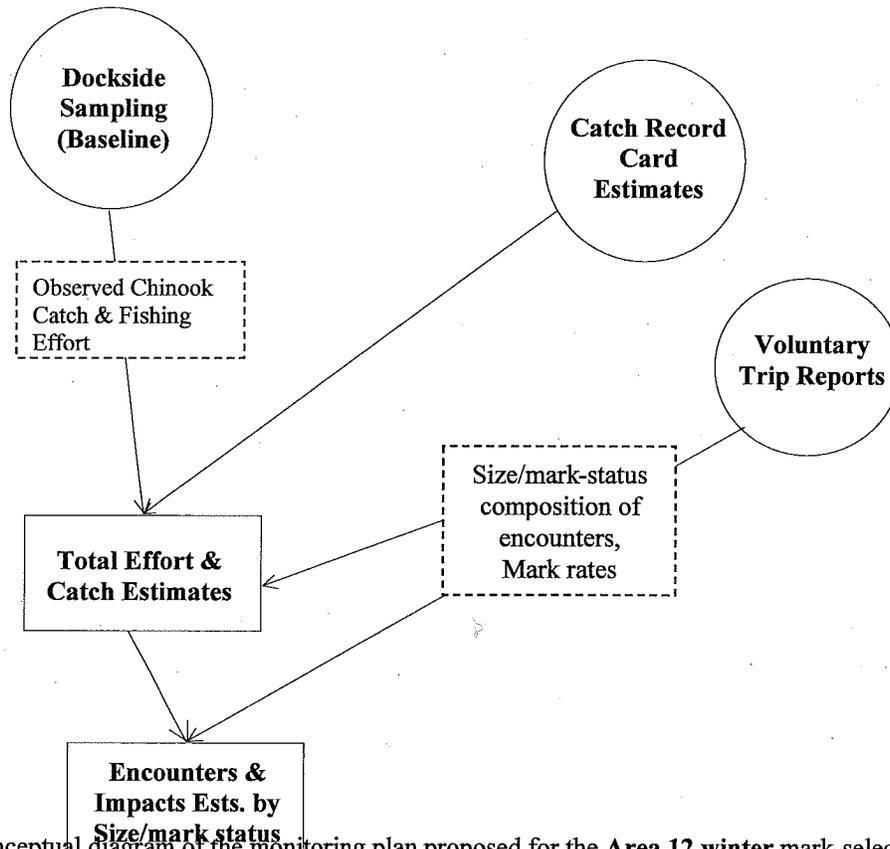
## Attachment A

# MONITORING THE AREA 12 WINTER SELECTIVE CHINOOK FISHERY FROM FEBRUARY 1 THROUGH APRIL 30, 2010

## Overview

The Puget Sound Sampling Program will monitor the mark-selective Chinook fishery in Area 12 during the winter season from February 1 through April 30, 2010. 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 2008), 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 we will implement a baseline-level sampling program (**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.

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 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 – this constitutes our former “Method 2” approach (WDFW 2008a). Given that our 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 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. A final sampling plan regarding location, number of sites, and staffing levels will be developed by the co-managers by October 31, 2009.

### **Post-Season Report**

WDFW will provide a preliminary post-season report that will be written and distributed by October 31, 2010, containing a full post-season analysis of all data collected in the Area 12 winter selective Chinook fishery from February 1 through April 30, 2010.

## Literature Cited

- Cochran, W.G. 1977. Sampling Techniques (third edition). John Wiley and Sons. New York.
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