

Management Strategies for Columbia River Recreational and Commercial Fisheries: 2013 and Beyond

Recommendation of the Columbia River Fishery Management Workgroup to the Fish and Wildlife Commissions of Oregon and Washington

November 21, 2012

Background

Columbia River recreational and commercial fisheries are a vital part of the social and economic fabric of Oregon and Washington, providing valuable jobs and economic vitality to rural and urban communities. Optimizing the economic value of both these fisheries within a conservation-based framework that assists recovery of Columbia and Snake River fish species currently listed under the federal Endangered Species Act (ESA) is a management priority.

Thirteen species of salmon and steelhead are currently listed under the ESA in the Columbia River basin. Limits on the allowable incidental-take of these species (ESA-impacts) significantly constrain access by recreational, commercial and tribal fisheries to hatchery stocks and healthy wild fish runs. There have been a series of adjustments made to commercial and recreational fisheries, including development of additional selective fisheries, to meet conservation responsibilities and provide harvest opportunities. However, perennial conflicts occur between recreational and commercial fishers over how best to manage non-tribal fisheries under these constraints. Conflicts also exist over the use of gill nets in non-tribal mainstem commercial fisheries. These conflicts divide stakeholders and communities and detract from a unified effort to recover fish runs. In this context, further development of fishery strategies is needed to meet the needs of the recreational and commercial fisheries.

As mentioned above, a current strategy for managing non-tribal fisheries consistent with efforts to recover ESA-listed salmon and steelhead and conserve white sturgeon is to make them more selective, i.e. deploy gears and techniques and use time and area closures to minimize the catch and/or allow the safe release of imperiled wild fish. Although this strategy is presently used for some fisheries, there are opportunities to expand its use. This strategy also lessens the degree in which limits on the allowable incidental-take of ESA-listed fish species constrain access by fisheries to hatchery stocks and healthy wild fish runs.

What follows is a description of the key elements of an alternative management framework for non-tribal Columbia River recreational and commercial fisheries. The framework is intended to enhance the economies of Oregon and Washington as a whole, ensure the long-term viability of recreational and commercial fisheries and those communities that rely on them, and contribute to fish conservation and recovery. The elements of the framework constitute a comprehensive and cohesive package and are comprised of progressive actions necessary to achieve the desired outcomes. Consequently, the framework should be considered in its entirety when implementing fisheries in the near- and long-terms.

Guiding Principles

1. Promote the recovery of ESA-listed species and the conservation of wild stocks of salmon, steelhead, and sturgeon in the Columbia River.
2. Continue leadership on fish recovery actions, including improved fish survival through the federal Columbia River hydropower system, improved habitat conditions in the tributaries and estuary, hatchery reform, reduced predation by fish, birds, and marine mammals, and harvest management that meet conservation responsibilities.
3. Continue to meet terms of *U.S. v. Oregon* management agreements with Columbia River Treaty Tribes.
4. In a manner that is consistent with conservation and does not impair the resource, seek to enhance the overall economic well-being and stability of Columbia River fisheries in Oregon and Washington.
5. For steelhead, salmon and sturgeon, prioritize recreational fisheries in the mainstem and commercial fisheries in off-channel areas of the lower Columbia River. Toward this end:
 - a) Assign mainstem recreational fisheries a sufficient share of ESA-impacts and harvestable surplus to enhance current fishing opportunity and economic benefit.
 - b) Assign commercial fisheries a sufficient share of the ESA-impacts and harvestable surplus to effectively harvest fish in off-channel areas and harvest surplus fish with selective techniques in the mainstem Columbia River.
6. Phase out the use of non-selective gill nets in non-tribal commercial fisheries in the mainstem Columbia River. Transition gill net use to off-channel areas.
7. Enhance the economic benefits of off-channel commercial fisheries, in a manner consistent with conservation and wild stock recovery objectives. Enhancements should include:
 - a. Providing additional hatchery fish for release in off-channel areas by shifting currently available production, and where possible providing new production for release in off-channel areas, emphasizing complementary conservation benefits in tributaries.
 - b. Expanding existing seasons and boundaries in off-channel areas and/or establishing new off-channel areas, allowing increased harvest in areas where the likelihood of impacting ESA-listed stocks is lower than the mainstem.
8. Develop and implement selective-fishing gear and techniques for commercial mainstem fisheries to optimize conservation and economic benefits consistent with mainstem recreational objectives. Provide incentives to commercial fishers to expand the development and implementation of these gear and techniques.
9. Maintain consistent and concurrent policies between Oregon and Washington related to management of non-tribal Columbia River fisheries, to ensure orderly fisheries as well as the sharing of investments and benefits.

10. To maximize economic return, develop a program that seeks to implement Marine Stewardship Council or other certification of commercial salmon and sturgeon fisheries in the Columbia River as sustainably managed fisheries.

Approach

The approach to developing and implementing an alternative management framework for non-tribal Columbia River recreational and commercial fisheries described below incorporates concepts in Oregon Governor Kitzhaber's proposal (as described in letters to the Oregon Fish and Wildlife Commission dated August 9 and August 14, 2012 and in a document released on September 20, 2012 in response to questions by various stakeholders). It also incorporates additional details developed by Oregon and Washington staff and refined through the deliberative process conducted by the Columbia River Fishery Management Workgroup (Workgroup). These Workgroup recommendations are designed to inform policy decisions and rule-making by the respective Fish and Wildlife Commissions in Oregon and Washington. Appendix A summarizes the approach in tabular form.

To avoid significant economic harm to the commercial fishery, the approach to phasing out the use of non-selective gill nets in mainstem Columbia River non-tribal commercial fisheries would include a transition period. The intent is to complete the transition by the end of 2016, although the period may be extended by one year if circumstances warrant it. During this period, the use of gill nets would be allowed in the mainstem as evaluation of alternative gear continues, strategies to further access harvestable surplus in the mainstem are developed, and additional hatchery fish are released in off-channel areas. To help lessen economic impacts on commercial fisheries during the transition, only a partial shift toward a higher mainstem priority for recreational fisheries would occur. The transition period would span the time needed for returns on new investments in off-channel areas, for evaluation and implementation of alternative selective fishing methods, and for evaluation of economic objectives for commercial fisheries under the alternative management framework. This period would also provide opportunities to secure political support and additional resources (i.e., money, infrastructure, and fish) and adopt statutes necessary for the long-term implementation of this management framework.

1. Transition period (2013-2016)

- a. A fixed framework would be used to assign shares of ESA-impacts and harvestable surplus to each of the Columbia River non-tribal fisheries, except as specified below. Within this framework, shares would be assigned to each non-tribal fishery as follows:
 - 1) Spring Chinook: Assign 70% of the ESA-impact for upriver spring Chinook stocks to mainstem recreational fisheries (current share is 60% under "base case"). Assign the balance (30%¹) to off-channel and mainstem commercial fisheries.

¹ Current allocation of the ESA-impacts is 60% to mainstem recreational fisheries and 35% to commercial fisheries. The remaining 5% of the impact is unallocated (set aside) because of current policy differences between the Oregon and Washington Fish and Wildlife Commissions. Because this 5% set-aside does not represent a policy choice for additional conservation by either Commission, policy options in this management framework would allocate 100% of the ESA impact available to non-tribal fisheries.

- 2) Summer Chinook: Through 2014, assign 60% of the harvestable surplus available for use downstream from Priest Rapids Dam to mainstem recreational fisheries (current share is 50%). Assign the balance (40%) to mainstem commercial fisheries. Beginning 2015² and for the remainder of the transition period, increase the recreational fisheries share of the harvestable surplus to 70% and assign commercial fisheries the balance (30%).
- 3) Sockeye: Assign 70% of the ESA-impact for Snake River sockeye to mainstem recreational fisheries (current share is 50%). Assign the balance (30%) to mainstem commercial fisheries for incidental harvest of sockeye in Chinook-directed fisheries. If NOAA Fisheries increases the allowable ESA-impact for Snake River sockeye, provide opportunities for increased commercial harvest using selective gear if developed and practical.
- 4) Tule Fall Chinook: Assign no more than 70% of the ESA-impact for lower Columbia River tule fall Chinook to mainstem recreational fisheries to meet management objectives (Appendix B³; current share is approximately 50%). Assign the balance (not less than 30%) to off-channel commercial fisheries, mainstem commercial fisheries that target Upriver Bright fall Chinook, and, if selective gear is developed during the transition period, mainstem commercial fisheries that harvest Washington Lower River Hatchery Chinook to help reduce strays, consistent with the Washington Commission Hatchery and Fishery Reform Policy. Modeling results (Appendix C) indicate that on average about 65% of the ESA-impact for tule Chinook may be needed to meet reasonable recreational fisheries objectives and that the remainder (35%) may be sufficient to avoid significant overall economic loss for commercial fisheries during the transition and provide mainstem alternative gear fisheries to remove hatchery Chinook and coho.
- 5) Upriver Bright Fall Chinook: Assign no more than 70% of the ESA-impact for Snake River Wild fall Chinook to mainstem recreational fisheries to meet management objectives (current share is approximately 50%). Assign the balance (not less than 30%) to off-channel and mainstem commercial fisheries. Establish reasonable recreational fisheries objectives that reflect a modest increase in the priority for mainstem recreational fisheries (Appendix B³). As per 1c (below), provide additional mainstem commercial harvest when recreational fishery objectives are expected to be met. The focus of mainstem commercial fisheries would be to harvest Upriver Bright fall Chinook in the area upstream of the Lewis River where the incidental take of lower river tule fall Chinook is reduced and in the area downstream from the Lewis River as alternative selective gear is developed. At the large run sizes that have recently occurred, it is anticipated that over half of the lower river

² 2015 is when adult Select Area Bright fall Chinook will begin returning from 2013 off-channel enhancements.

³ Recreational fisheries objectives would be: Buoy 10 season August 1-Labor Day; Tongue Point to Warrior Rock season August 1-September 7 as non-mark selective and September 8-14 as mark selective and Warrior Rock to Bonneville Dam season August 1-October 31 when the season is assumed to be essentially complete.

harvestable surplus of Upriver Bright fall Chinook (Appendix C) would be allocated to mainstem commercial fisheries under this scenario.

- 6) Coho: Assign commercial fisheries a sufficient share of the ESA-impact for Lower Columbia Natural coho to implement off-channel coho and fall Chinook fisheries and mainstem fall Chinook fisheries. Assign the balance to in-river mainstem recreational fisheries (currently in-river mainstem recreational fisheries are assigned a sufficient share of the allowable incidental-take of ESA-listed coho to meet fishery objectives). If these fisheries are expected to be unable to use all of the ESA-impact for Lower Columbia Natural coho, assign the remainder to mainstem commercial coho fisheries. As selective techniques and alternative gear are developed, additional commercial mainstem coho fisheries would be provided with an emphasis on harvesting hatchery coho in October when wild coho are less abundant.
 - 7) Chum: Continue practice of no target chum fisheries. Assign commercial fisheries a sufficient share of the ESA-impact for chum to implement off-channel and mainstem fisheries targeting other salmon species (retention in recreational fisheries is currently prohibited).
 - 8) White Sturgeon: Allocate 90% of the harvestable surplus for use in non-tribal fisheries and hold 10% in reserve as an additional conservation buffer above the maximum harvest rate allowed in Oregon's white sturgeon conservation plan⁴. Assign 80% of the white sturgeon available for harvest to the recreational fishery (current share is 80%). Assign the balance (20%) to off-channel and mainstem commercial fisheries.
- b. Alternative selective gear would be used for the non-tribal mainstem commercial fisheries referenced above (Section 1a). If alternative selective gear is not available and practical, based on administrative, biological or economic factors, the use of gill nets in these fisheries would be allowed during the transition period. For fall fisheries, pilot commercial fisheries with alternative selective gear would be initiated in 2013, if appropriate authority is acquired, with a target of full implementation no later than 2016. The development and implementation of alternative selective gear such as purse seines and beach seines would provide area-specific opportunity to target fishery harvests on abundant hatchery stocks, reduce the number of hatchery-origin fish in natural spawning areas, limit mortalities of non-target species and stocks, and provide commercial fishing opportunities. To facilitate the timely development of and transition to alternative gear and techniques, Oregon and Washington would develop incentives for those commercial fishers who choose to use these gear and techniques.
 - c. Under the following conditions, opportunities for additional mainstem commercial fishing would be provided during the transition period using alternative selective gear, or gill nets if alternative selective gear is not available and practical. This approach would be expected to provide substantive additional mainstem

⁴ As per 1g below, the Commissions would initiate rule making to consider non-retention regulations for recreational and commercial fisheries for sturgeon if the forecasted decline in the abundance of legal-sized sturgeon for 2012 holds true.

commercial fishing opportunities during the interim for Upriver Bright fall Chinook.

- 1) If mainstem recreational fisheries are predicted to be unable to fully use their shares of ESA-impacts or harvestable surplus.
 - 2) If reasonable goals for mainstem recreational fisheries are predicted to be met.
- d. Several actions would take place during the transition period to enhance harvest levels and opportunities for commercial fisheries in off-channel sites (see Appendix D for details). The proposed increases in artificial production would use locations, species, stocks, and control mechanisms (i.e., weirs, mark-selective fisheries) in a manner that maintains the ability to meet conservation and recovery objectives for wild stocks. Increasing artificial production would provide the opportunity to offset the loss of commercial fishing opportunities in the mainstem Columbia River for Washington and Oregon commercial fishers. Successful implementation of these programs would require a concerted, coordinated, and sustained effort by the states and stakeholders to secure the necessary funding.

1) Enhanced hatchery production at existing off-channel sites:

- a) *Spring Chinook*: The number of juvenile spring Chinook acclimated for release at off-channel sites would be enhanced by approximately 1,000,000 fish annually, including a 250,000 increase by Oregon that began in 2010 (current releases are approximately 1,550,000⁵). The increase in 2010 was a result of Commission direction in 2008 and adults from those releases began returning in 2012. Oregon would acclimate an additional 500,000 juvenile spring Chinook annually for release beginning in 2013. Washington would provide 250,000 juvenile spring Chinook for acclimation in 2013, and pursue funding to produce and acclimate these fish long-term.
- b) *Coho*: The number of juvenile coho acclimated for release at off-channel sites would be enhanced by approximately 920,000 fish annually, including a 120,000 increase by Oregon that began in 2010 (current releases are approximately 4,170,000). Oregon would acclimate an additional 600,000 juvenile coho annually for release beginning in 2013. Washington would acclimate an additional 200,000 juvenile coho annually beginning in 2013.
- c) *Select Area Bright Fall Chinook*: To offset reductions in mainstem commercial harvest of summer Chinook, Oregon would rear an additional 500,000 juvenile Select Area Bright fall Chinook annually for release at off-channel sites (current releases are approximately 1,450,000). These releases would begin in 2013.

2) Expanding existing off-channel sites: Oregon would seek funding to evaluate the feasibility of providing more commercial fishing opportunity and more

⁵ Including 350,000 in Deep River which will be discontinued beginning with the 2013 release because of very poor adult returns and budget shortfalls.

commercially fishable area at existing off-channel sites. During the transition period, the proportion of overall impacts allocated to off-channel areas may be increased from current levels to complete evaluations and initiate expansions. In the long-term, the proportion of overall impacts allocated to off-channel areas would be expected to be approximately double (20%) what it is now (10%) in order to accommodate expanded and new sites.

- 3) New off-channel sites: Oregon and Washington would seek funding to evaluate the feasibility of establishing new off-channel sites consistent with the expected long-term allocation of impacts described above.
- e. Oregon and Washington would begin development in 2013 of a program to buyback non-tribal gill net permits for the Columbia River and implement as soon as the appropriate authority and financing is secured. Efforts would be made to also develop, evaluate, and implement other tools to reduce the number of gillnet permits in a manner consistent with the principles of this plan.
- f. Reporting requirements for lost and derelict commercial fishing nets would be consistent between Oregon and Washington, and would align with the current policy in Washington.
- g. The Commissions would initiate rule making to consider non-retention regulations for recreational and commercial fisheries for sturgeon if the forecasted decline in the abundance of legal-sized sturgeon for 2012 holds true.
- h. The Commissions would consider additional measures to enhance management and reduce ecological risks from fisheries (e.g., barbless hooks, guide log books) (Appendix E).
- i. Using the model results in Appendix C, the ex-vessel value for commercial fisheries (mainstem plus off-channel) during the transition period would increase by about \$198,000 (5%) in 2013 and to about \$1.1 million (30%) in 2016. For recreational fisheries, the number of angler trips would be anticipated to increase by approximately 13%.

2. Long Term (2017 and Beyond)

- a. A fixed framework would be used to assign shares of ESA-impacts and harvestable surplus to each of the Columbia River non-tribal fisheries, except as specified below. The shares assigned to off-channel commercial fisheries would be secured by holding them harmless from pre-season buffers. This would assist fish recovery by reducing the opportunity for hatchery fish to stray into lower Columbia River tributaries and will maximize the economic value of the harvest. Within this framework, shares would be assigned to each non-tribal fishery as follows:
 - 1) Spring Chinook: Assign 80% of the ESA-impact to mainstem recreational fisheries to meet management objectives and the balance (20%) to commercial fisheries.
 - 2) Summer Chinook: Assign the harvestable surplus, in excess of that needed for off-channel commercial fisheries targeting late-returning spring Chinook and early-returning Select Area Bright fall Chinook (~2%), to recreational fisheries.

- 3) Sockeye: Assign approximately 80% of the ESA-impact for Snake River sockeye to mainstem recreational fisheries to meet management objectives and the balance (approximately 20%) to mainstem commercial fisheries for incidental harvest of sockeye in Chinook-directed fisheries. If NOAA Fisheries increases the allowable take of ESA-listed Snake River sockeye, provide for increased commercial harvest using selective gear if developed and practical.
- 4) Tule Fall Chinook: Assign no more than 80% of the ESA-impact for lower Columbia River tule fall Chinook to mainstem recreational fisheries to meet management objectives (Appendix B⁶). Assign the balance (not less than 20%) to off-channel commercial fisheries, mainstem commercial fisheries that target Upriver Bright fall Chinook, and mainstem commercial fisheries that harvest Washington Lower River Hatchery Chinook with selective gear to help reduce strays, consistent with the Washington Commission Hatchery and Fishery Reform Policy. Modeling results (Appendix C) indicate that on average about 65% of the ESA-impact for tule Chinook may be needed to meet reasonable recreational fisheries objectives and that the remainder (35%) may be sufficient to accommodate the conservation objective of removing Lower River Hatchery Chinook and hatchery coho from the mainstem and to provide reasonable access to upriver bright fall Chinook.
- 5) Upriver Bright Fall Chinook: Assign no more than 80% of the ESA-impact for Snake River Wild fall Chinook to mainstem recreational fisheries to meet management objectives (Appendix B⁷). Assign the balance (not less than 20%) to off-channel and mainstem commercial fisheries. The focus of mainstem commercial fisheries would be to target Upriver Bright fall Chinook in the area upstream of the Lewis River where the incidental take of lower river tule Chinook is reduced⁷ and to harvest Upriver Bright fall Chinook in the area downstream from the Lewis River in selective fisheries that target Washington Lower River Hatchery Chinook and coho. At the large run sizes that have recently occurred, it is anticipated that over half of the lower river harvestable surplus of Upriver Bright fall Chinook (Appendix C) would be allocated to mainstem commercial fisheries under this scenario.
- 6) Coho: Assign commercial fisheries a sufficient share of the ESA-impact for Lower Columbia Natural coho to implement off-channel coho and fall Chinook fisheries and mainstem fall Chinook fisheries. Assign the balance to in-river mainstem recreational fisheries. If these fisheries are unable to use

⁶ Recreational fisheries objectives would be: Buoy 10 season August 1-Labor Day; Tongue Point to Warrior Rock season August 1-September 7 as non-mark selective and September 8-14 as mark selective and Warrior Rock to Bonneville Dam season August 1-October 31 when the season is assumed to be essentially complete.

⁷ As per 2b below, the presumptive (expected) path forward regarding targeted commercial harvest of Upriver Bright fall Chinook upstream of the Lewis River would be to access available Chinook with alternative gear and techniques. Because access to Upriver Bright fall Chinook would be critically important to ensuring the long-term economic viability of commercial fishers, adaptive management would be used to ensure alternative gear and techniques are effective and that commercial fishers continue to have profitable mainstem access to these economically important salmon stocks.

all of the ESA-impact for Lower Columbia Natural coho, assign the remainder to mainstem commercial coho fisheries. As per 2b (below), it is expected that substantive new selective mainstem commercial fisheries will be available for hatchery coho, particularly in October.

- 7) Chum: Continue practice of no target chum fisheries. Assign commercial fisheries a sufficient share of the ESA-impact for chum to implement off-channel and mainstem fisheries targeting other salmon species (retention in recreational fisheries is currently prohibited).
 - 8) White Sturgeon: Allocate 90% of the harvestable surplus for use in non-tribal fisheries and hold 10% in reserve as an additional conservation buffer above the maximum harvest rate allowed in Oregon's white sturgeon conservation plan. Assign 80% of the white sturgeon available for harvest to the recreational fishery. Assign the balance (20%) to off-channel and mainstem commercial fisheries. If additional conservation was adopted during the transition period (as per 1.g.), then reassess conservation need prior to shifting back to this harvest sharing framework.
- b. Non-tribal mainstem commercial fisheries would be restricted to the use of selective gear and fishing techniques. With respect to Upriver Bright fall Chinook, the presumptive (expected) path forward regarding targeted commercial harvest upstream of the Lewis River would be to access these Chinook with alternative gear and techniques. Because access to Upriver Bright fall Chinook would be critically important to ensuring the long-term economic viability of commercial fishers, adaptive management would be used to ensure these gears are effective and that commercial fishers continue to have profitable mainstem access to these economically important salmon stocks. Oregon and Washington would continue to provide commercial fishers incentives developed during the transition period to facilitate and encourage their participation in and innovation of these fisheries.
 - c. As during the transition period, opportunities for additional mainstem commercial fishing may be provided as described below. This approach is expected to provide substantive mainstem commercial opportunities in the long-term for Upriver Bright fall Chinook, lower river hatchery fall Chinook and hatchery coho.
 - 1) If mainstem recreational fisheries are predicted to be unable to fully use their shares of ESA-impacts or harvestable surplus.
 - 2) If reasonable goals for mainstem recreational fisheries are predicted to be met.
 - 3) As needed to remove lower river hatchery tule Chinook and coho consistent with conservation objectives.
 - d. Efforts to enhance economic benefits for off-channel commercial fisheries (see Appendix D for details) would continue, based on available funding, by:
 - 1) Making major capital improvements at existing off-channel sites in Oregon, which would enable the rearing or acclimation of an additional 1,250,000 juvenile spring Chinook, 750,000 juvenile Select Area Bright fall Chinook, and 1,920,000 juvenile coho annually (these numbers include the additional production put in place during the transition period).

- 2) Putting in place the infra-structure and fish rearing and acclimation operations necessary to establish new off-channel sites in Oregon and/or Washington, as identified by evaluations completed during the transition period.
- e. Planned enhancements of salmon and steelhead production upstream from Bonneville Dam may have implications to harvest management contemplated in this plan. For production enhancements that come on-line and/or produce adult salmon on or after 2017, Oregon and Washington staff would collaboratively evaluate the implications of the increased mainstem production on these harvest strategies, including *U.S. v. Oregon* agreements, and would make additional recommendations to the Commissions as needed.
- f. Using the model results in Appendix C, the ex-vessel value for commercial fisheries (mainstem plus off-channel) would increase by \$550,000 (15%) in 2017 and to about \$840,000 (23%) in 2021, assuming all investments to off-channel areas are made and convert to assumed levels of additional harvest by the fleet, and the commercial fishery is able to access their mainstem allocation with selective gear. For recreational fisheries, the number of angler trips would be anticipated to increase by approximately 22%.
- g. Overall conservation benefits associated with implementation of this approach would be positive (Appendix F). Increased conservation would include reduced risk from hatchery strays, slightly increased escapement of some wild populations, increased harvest rate on hatchery salmon, and a reduced non-tribal harvest rate of white sturgeon. However, there would also be a modest increase in the risk of hatchery strays in some lower Columbia River tributaries (primarily coho), potential increase in overall wild steelhead handle and mortality, and a very small increase (<1%) in the total number of hatchery smolts utilizing the Columbia River estuary.

3. Adaptive Management

The commissions would track implementation and results of the fishery management actions and artificial production programs in the lower Columbia River during the transition period, with an initial review at the end of 2014 and a comprehensive review at the end of the transition period (e.g., 2016). Management of non-tribal fisheries would be adaptive and adjustments may be made to sharing agreements and mainstem fisheries if commercial or recreational fisheries are not achieving expectations outlined in the principles of this plan. If these expectations are not achieved, efforts would be made to determine why and to identify actions necessary to correct course. Correcting course, however, does not mean dismantling the foundations of this alternative management framework or removing its key elements described above. These elements constitute a cohesive package and actions necessary to achieve the desired outcomes. In this context, and with recognition of the prioritization of recreational fisheries in the mainstem of the Columbia River, reconsideration of the sharing agreements and mainstem fisheries may take place under the following circumstances:

- a. Significantly lower than expected returns of harvestable fish to off-channel sites.
- b. Insufficient space within off-channel sites to accommodate the commercial fleet.

- c. Significantly lower than expected commercial catches in the mainstem Columbia River using selective gears.
- d. Biological, fiscal and/or legal circumstances that delay or preclude implementation of alternative gear, buyback of commercial fishing permits, and/or additional off-channel hatchery investments.
- e. Significantly lower than expected economic benefits to commercial and recreational fishers.
- f. Conflicts with terms of *U.S. v. Oregon* management agreements with Columbia River Tribes.
- g. Failure to meet conservation objectives, e.g. reducing the proportion of hatchery fish on spawning grounds.

4. Enhanced Fishery Management

Because the alternative management framework would significantly change the current management of fisheries and because run-size forecasts play a vital role in shaping fisheries, two enhancements would be put in place during the transition period.

- a. **Increase Management Certainty.** Implement outreach programs to increase understanding of recreational fishing rules, improved enforcement programs, and enhanced fishery monitoring to improve the accounting of catch and fishing related mortality, increase management certainty, and ensure conservation effectiveness.
- b. **Improve Management Tools.** Explore and develop alternative approaches to improve pre-season forecasts of run size and timing, in-season updates of run-size estimates, and in-season estimates of the harvest impacts by fishery. Dedicate additional resources and expertise to this task.

Appendix A.

Tabular Summary of the Presumptive Management Framework for Non-Tribal Mainstem Columbia River Recreational and Commercial Fisheries

Overall Management Objectives

- 1) Meet terms of *U.S. v. Oregon* management agreements with Columbia River tribes.
- 2) Promote conservation and recovery of wild stocks.
- 3) Maximize recreational fishing opportunities for hatchery stocks in the mainstem Columbia River in a manner consistent with policies and agreements regarding the sharing of those stocks throughout the Columbia River basin.
- 4) Implement selective commercial fisheries in the mainstem of the Columbia River to remove excess hatchery-origin fish in a manner consistent with policies and agreements regarding the sharing of those stocks throughout the Columbia River basin.
- 5) Implement commercial fisheries in off-channel areas to provide revenue to the commercial fishery and supply markets.

Spring Chinook Fishery

Sharing Metric: Incidental-take of ESA-listed upriver spring Chinook

Fishing Year	Recreational Fishery		Commercial Fishery		
	Impact Share	Location	Share	Location	Gear
Existing Policy	~60-65%	Mainstem Columbia River and Snake River	~35-40%	Mainstem Columbia River below Bonneville Dam and off-channel areas	Tangle Net/ Gill Net
2013-2016	70%	Mainstem Columbia River and Snake River	30%	Mainstem Columbia below Bonneville Dam	Tangle Net
				Off-Channel Areas	Tangle Net/ Gill Net
2017+	80%	Mainstem Columbia River and Snake River	20% ¹	Off-channel and mainstem areas of the Columbia River	Tangle Net/ Gill Net ² / Beach Seine/ Purse Seine/Other Alternative Gear

¹ Not subject to pre-update buffer/ ² Gill nets confined to off-channel areas

Summer Chinook Fishery

Sharing Metric: Harvestable share of summer Chinook available downstream from Priest Rapids Dam

Fishery-Specific Objective: Meet terms of agreements with the United Tribes of the Colville Reservation.

Fishing Year	Recreational Fishery		Commercial Fishery ¹		
	Share	Location	Share	Location	Gear
Existing Policy	50%	Mainstem Columbia River below Priest Rapids Dam	50%	Mainstem Columbia River below Bonneville Dam	Gill Net
2013-2014	60%	Mainstem Columbia River below Priest Rapids Dam	40%	Mainstem Columbia River below Bonneville Dam	Gill Net
2015-2016	70%	Mainstem Columbia River below Priest Rapids Dam	30%	Mainstem Columbia River below Bonneville Dam	Gill Net
2017+	~98% ²	Mainstem Columbia River below Priest Rapids Dam	0%	Mainstem Columbia River below Bonneville Dam	Beach Seine/ Purse Seine/ Other Alternative Gear

¹To offset reductions in mainstem commercial harvest of summer Chinook, Oregon would enhance the fisheries for Select Area Bright Fall Chinook.² Recreational fisheries would be assigned the harvestable surplus in excess of that needed for off-channel commercial fisheries targeting late-returning spring Chinook and early-returning Select Area Bright fall Chinook (~2%).

Tule Fall Chinook Fishery

Sharing Metric: Incidental-take of ESA-listed tule fall Chinook

Fishing Year	Recreational Fishery		Commercial Fishery		
	Share	Location	Share	Location	Gear
Existing Policy	~50%	Mainstem Columbia below Bonneville Dam	~50%	Mainstem Columbia River below Bonneville Dam and off-channel areas	Gill Net
2013-2015	≤70%	Mainstem Columbia below Bonneville Dam	≥30%	Mainstem Columbia River below Bonneville Dam and off-channel areas	Gill Net/ Pilot Beach Seine/ Pilot Purse Seine
2016	≤70%	Mainstem Columbia below Bonneville Dam	≥30%	Mainstem Columbia River below Bonneville Dam	Beach Seine/ Purse Seine
				Off-channel areas	Gill Net
2017+	≤80%	Mainstem Columbia below Bonneville Dam	≥20%	Mainstem Columbia River below Bonneville Dam	Beach Seine/ Purse Seine/ Other Alternative Gear
				Off-channel areas	Gill Net

Upriver Bright Chinook Fishery

Sharing Metric: Incidental-take of ESA-listed Snake River wild fall Chinook

Fishery-Specific Objective: Implement mainstem commercial fisheries in zones 4 and 5 upstream of the Lewis River to remove excess hatchery-origin bright Chinook and harvest surplus wild bright Chinook

Fishing Year	Recreational Fishery		Commercial Fishery		
	Share	Location	Share	Location	Gear
Existing Policy	~50%	Mainstem Columbia below Bonneville Dam	~50%	Mainstem Columbia River below Bonneville Dam	Gill Net
2013-2016	Necessary to meet recreational objectives, but not more than 70% ¹	Mainstem Columbia below Bonneville Dam	Dependant on recreational fisheries need, but not less than 30%	Mainstem Columbia River below Bonneville Dam	Gill Net ² / Beach Seine ³ / Purse Seine ³
2017+	Necessary to meet recreational objectives, but not more than 80%	Mainstem Columbia below Bonneville Dam	Dependant on recreational fisheries need, but not less than 20%	Mainstem Columbia River below Bonneville Dam	Beach Seine/ Purse Seine/ Other Alternative Gear
				Above Lewis River	Alternative Gear ⁴

¹ It is expected that recreational fishery objectives (Buoy 10 season August 1-Labor Day; Tongue Point to Warrior Rock season August 1-September 7 as non-mark selective and September 8-14 as mark selective and Warrior Rock to Bonneville Dam season August 1-October 31 when the season is assumed to be essentially complete) would be met in most years at less than a 50% share of Snake River Wild fall Chinook impacts (see Appendix B, Table B.3). However, the recreational fishery share would likely need to be increased to meet objectives in years when Upriver Bright fall Chinook returns are significantly less than recent years./ ² The mainstem gill net fishery would be restricted to the area above the Lewis River in 2016./ ³ Beach seine and purse seine fisheries would be pilots in 2013, 2014 and 2015./ ⁴ The presumptive (expected) path forward regarding targeted commercial harvest of Upriver Bright fall Chinook upstream of the Lewis River would be to access available Chinook with alternative gear and techniques. Because access to Upriver Bright fall Chinook is critically important to ensuring the long-term economic viability of commercial fishers, adaptive management would be used to ensure alternative gear and techniques are effective and that commercial fishers continue to have profitable mainstem access to these economically important salmon stocks.

Coho Fishery

Sharing Metric: Incidental-take of ESA-listed coho

Fishing Year	Recreational Fishery		Commercial Fishery		
	Share	Location	Share	Location	Gear
Existing Policy	-	Mainstem Columbia below Bonneville Dam	-	Mainstem Columbia River below Bonneville Dam and off-channel areas	Gill Net
2013-2016	1	Mainstem Columbia below Bonneville Dam	1	Mainstem Columbia River below Bonneville Dam and off-channel areas	Gill Net/ Tangle Net ² / Beach Seine ² / Purse Seine ²
2017+	3	Mainstem Columbia below Bonneville Dam	3	Mainstem Columbia River below Bonneville Dam and off-channel areas	Tangle Net/ Beach Seine/ Purse Seine/ Other Alternative Gear

¹ Maintain current sharing except provide sufficient additional impacts to the commercial fishery to implement the pilot alternative gear fisheries./ ² Tangle net, beach seine and purse seine fisheries would be pilots in 2013, 2014 and 2015./ ³ Assign commercial fisheries a sufficient share of the ESA-impact for Lower Columbia Natural coho to implement off-channel coho fisheries, fall Chinook fisheries as described above, and alternative gear fisheries to reduce the number of hatchery-origin coho in natural spawning areas. Assign the balance to mainstem recreational fisheries. If these recreational fisheries are unable to use all of the ESA-impact for Lower Columbia Natural coho, assign the remainder to mainstem commercial coho fisheries.

Sturgeon Fishery

Sharing Metric: Allowable harvest of sturgeon below Bonneville Dam.

Fishery-Specific Objectives: Promote conservation and recovery of sturgeon¹.

Fishing Year	Recreational Fishery		Commercial Fishery		
	Share	Location	Share	Location	Gear
Existing Policy	80%	Mainstem Columbia below Bonneville Dam	20%	Mainstem Columbia River below Bonneville Dam and off-channel areas	Large Mesh Net
2013-2016	80%	Mainstem Columbia below Bonneville Dam	20%	Mainstem Columbia River below Bonneville Dam and off-channel areas	Large Mesh Net
2017+	80%	Mainstem Columbia below Bonneville Dam	20%	Mainstem Columbia River below Bonneville Dam and off-channel areas	Large Mesh Net in off channel areas/ Alternative Gear in mainstem

¹ The Commissions would initiate rule making to consider non-retention regulations for recreational and commercial fisheries for sturgeon if the forecasted decline in the abundance of legal-sized sturgeon for 2012 holds true.

Appendix B

Defining Management Objectives for Recreational Fisheries Downstream from Bonneville Dam
Analysis of Management Guidelines and Available Recreational Fishing Days Under the Current Management Policy and the Alternative Management Framework Being Considered by the Columbia River Fishery Management Workgroup.

Spring Chinook

In 2008, the Fish and Wildlife Commissions in Oregon and Washington adopted the current fisheries management policy for Columbia River spring Chinook in the area downstream from Bonneville Dam. This policy defines the objective for recreational spring Chinook fisheries downstream of Bonneville Dam as:

- Before the run-size update: A high likelihood that the fishery will remain open for at least 45 days in March and April.
- After the run-size update: If impacts remain, harvest opportunity through May.

This objective was based on a “base-case” sharing formula for upriver spring Chinook ESA-impacts. Under the base case, recreational fisheries downstream from Priest Rapids and Lower Granite dams are allocated 60% of the available impact, commercial fisheries are allocated 35% of the available impact and 5% is held in reserve. These percentages reflect the differences between Oregon and Washington in their allocation policies. In addition, the recreational fisheries’ share is further divided between fisheries downstream and upstream from Bonneville Dam. Currently, the fishery downstream from Bonneville Dam is allocated 75% of the ESA-impact available for recreational fishing.

Spring Chinook fisheries are not only managed based on the ESA-impact for upriver stocks, but also for “catch-balancing” under the 2008-2017 *U.S. v. Oregon* Management Agreement. The management guideline is defined under the Agreement based on the ESA-impact allowed for tribal fisheries after the forecasted run size is reduced by a 30% conservation buffer. Under the base case, the management guideline defined under the catch-balance provisions of the Agreement is less than what it would be under the policies adopted by Oregon’s and Washington’s Fish and Wildlife Commissions.

The management guideline and corresponding number of fishing days for the recreational fishery downstream from Bonneville Dam was modeled for a base-case run size of 225,000 upriver spring Chinook and 65,000 Willamette spring Chinook. Under the current policy, the base case is defined as a forecasted run-size for upriver spring Chinook ranging from 55,000 to 271,000 and for Willamette spring Chinook greater than 50,000. The management guideline and number of fishing days were modeled under the current management policy and under the alternative management framework being considered by the Columbia River Fishery Management Workgroup. Under the alternative management framework, the percentage of the available ESA-impact for upriver spring Chinook allocated to recreational fisheries downstream from Priest Rapids and Lower Granite dams would increase to 70% during the transition period (2013-2016) and 80% in the long term (2017 and beyond). Results of the modeling are summarized in Table B.1.

Table B.1. Comparisons of key characteristics of the spring Chinook recreational fishery downstream from Bonneville Dam, under the current management policy and under the alternative management framework being considered by the Columbia River Fishery Management Workgroup. Analyses assume forecasted run sizes of 225,000 for upriver spring Chinook and 65,000 for Willamette spring Chinook, a mark rate of 75%, and that the run-size forecast would be updated on May 10.

Management period	Time frame	Management guideline before May 10 (number landed + release mortality)	Catch of upriver spring Chinook before May 10 (number landed + release mortality)	Number of consecutive fishing days (beginning March 1)
Before the run-size update	Current	9,324	9,447	42
	Transition	10,387	10,600	44
	Long term	11,170	11,189	45
		Management guideline after May 10 (number landed + release mortality)	Estimated catch of upriver spring Chinook after May 10 (number landed + release mortality)	Number of consecutive fishing days (beginning May 10)
After the run-size update (May 10)	Current	3,950	3,450	37
	Transition	4,492	3,450	37
	Long term	6,219	3,450	37

Before the run-size update

The management guideline and number of fishing days for the recreational fishery downstream from Bonneville Dam under the policy proposed for the transition period is two more than under the current policy. The impact shares assigned to the recreational fishery downstream from Bonneville Dam translate into a 65% share of the overall management guideline for upriver spring Chinook under the current policy and a 72% share during the transition period.

The differences between the management guideline and number of fishing days for the recreational fishery downstream from Bonneville Dam under the current policy and the policy proposed for the long term are greater than during the transition period. The share of the overall management guideline for upriver spring Chinook in the long term would be 78% (vs. 65% under the current policy). Under the base case, this additional share translates to 3 more days of fishing.

After the run-size update

Although the management guideline for the recreational fishery downstream from Bonneville Dam is substantially different under the current policy and the policies proposed for the transition period and the long-term, the number of fishing days is the same. This is because, under the base case, the recreational fishery would be open from the date the run-size is updated (May 10) through the remainder of the season (June 15). Under this scenario, the recreational fishery downstream from Bonneville Dam would use 87% of its management guideline under the current policy, 77% during the transition period, and 55% in the long term. However, the fishery may have the capacity to increase catch rates in the May-June period in a given year if river conditions are good for fishing and/or effort increases. If catch rates improve, there would be expected differences in the number of fishing days between current, transition, and long-term periods.

Summary

Given the fixed impact sharing approach in the alternative management framework for the transition period and the long term, the current objective for the recreational fishery downstream from Bonneville Dam in March and April (a high likelihood that the fishery will remain open for at least 45 days) may not be relevant because the number of days of fishing is driven by the run-size forecast and its buffer, catch rate and mark rate.

Summer Chinook

In 2008, the Fish and Wildlife Commissions in Oregon and Washington adopted the current fisheries management policy for Columbia River summer Chinook as follows:

- Manage the upper Columbia summer Chinook populations for natural and hatchery aggregate escapement goals.
- Allocate non-Treaty harvest of summer Chinook downstream from Priest Rapids Dam equally (50% each) between recreational and commercial fisheries.
- Structure fisheries consistent with the fishery framework in the 2008-2017 *U.S. v. Oregon* Management Agreement.
- Structure fisheries consistent with the management agreement between the Washington Department of Fish and Wildlife and the Colville Tribe for salmonids originating above Priest Rapids Dam.

Currently, recreational fishers downstream from Priest Rapids Dam can only retain adipose fin-clipped summer Chinook.

The management guideline and corresponding number of fishing days for the recreational fishery downstream from Bonneville Dam was modeled for a run size of 75,000 summer Chinook (71,300 at the river mouth). As with spring Chinook, the management guideline and number of fishing days were modeled under the current management policy and under the alternative management framework being considered by the Columbia River Fishery Management Workgroup. Under the alternative management framework, the percentage of harvestable surplus of summer Chinook allocated to recreational fisheries downstream from Priest Rapids Dam would increase to 60% during the first two years of the transition period (2013-2014) and 70% in the last two years (2015-16). In the long term (2017 and beyond) the recreational fisheries share is the harvestable surplus in excess of that needed for off-channel commercial fisheries targeting late-returning spring Chinook and early-returning Select Area Bright fall Chinook (~2%). Results of the modeling are summarized in Table B.2.

Summary

In the analysis described above, increasing the recreational fisheries share of the harvestable surplus would increase the number of fishing days by 50% during the first two years of the transition period and would double it during the last two years. In the long term, increasing the recreational fisheries share of the harvestable surplus would increase the number of consecutive fishing days by about 350%. Additional harvest opportunity may be provided in future years if, as in past years, the Colville Tribe allocates some of its share of the harvestable surplus for use in non-Treaty fisheries downstream from Priest Rapids Dam and when the Colville Tribal Hatchery comes fully on-line and its production returns as adults to the Columbia River. As with spring Chinook, it may not be necessary to define a management objective for the recreational

fishery downstream from Bonneville Dam because under the fixed harvest sharing approach in the alternative management framework the number of recreational fishing days in the transition period and the long term is driven by the run-size forecast, catch rate and mark rate.

Table B.2. Comparisons of key characteristics of the upper-Columbia summer Chinook recreational fishery downstream from Bonneville Dam, under the current management policy and under the alternative management framework being considered by the Columbia River Fishery Management Workgroup. Analyses assume a forecasted run size of 75,000 summer Chinook (71,300 at the river mouth), a mark rate of 66%, an allocation of 600 summer Chinook to recreational fisheries in the Columbia River between Bonneville and Priest Rapids dams, and no contribution from the Colville Tribes.

Time frame	Management guideline (number landed + release mortality)	Catch of upper-Columbia summer Chinook (number landed + release mortality)	Number of consecutive fishing days (beginning June 16)
Current	2,231	2,239	13
Transition (13-14)	2,797	2,805	18
Transition (15-16)	3,363	3,385	26
Long term	5,061	4,063	46

Fall Chinook

The current fisheries management policy for managing fall Chinook (and coho) is:

- Optimize the non-treaty harvest of Chinook and coho and provide recreational and commercial fisheries a balanced opportunity.
- Consider fair and reasonable catch opportunity, stability and duration of fisheries, as well as sharing of the conservation responsibility when developing recreational and commercial fishing options.

Correspondingly, the current management approach is to:

- Calculate the allowable in-river ESA-impact for each ESA-listed stock encountered by the fisheries.
- Work with fisheries stakeholders and the public in the “North of Falcon” process to develop an annual “Non-Indian Columbia River Fall Fishery Chinook Allocation Agreement” that describes expected season structures for each fishery.
- Calculate catch expectations for each fishery and the shares of allowable impacts necessary to meet those expectations, based on the proposed season structures.

The management scenario used to model fall recreational fisheries was based on recent 5-year actual average run sizes (2007-2011) and observed recreational harvest adjusted to meet recreational season objectives. Average run sizes resulted in an allowable ESA-impact level of 38% (including ocean fisheries) for lower river hatchery (LRH) tule fall Chinook and 15% for Snake River wild (Bright) fall Chinook. At the recent in-river LRH share of 20%, 7.6% LRH impacts would be available for implementing in-river fisheries. As with spring and summer Chinook, the management guideline and number of fishing days were modeled under the current management policy and under the alternative management framework being considered by the Columbia River Fishery Management Workgroup. Under the alternative management framework, the percentage of the ESA-impact for tule fall Chinook allocated to recreational fisheries downstream from Bonneville Dam would increase up to 70%

during the transition period (2013-2016) and up to 80% in the long term (2017 and beyond) if necessary to meet recreational fishery objectives. The recreational objectives were defined as:

Buoy 10: The recreational fishing objective for Buoy 10 is defined as a season beginning August 1 and continuing through Labor Day (34 days; assuming Labor Day is September 3).

Warrior Rock to Bonneville Dam: Although the fishery is open through December 31, very little, if any fishing for Chinook occurs after October. Therefore the recreational fishing objective for the area from Warrior Rock upstream to Bonneville Dam is defined as a season beginning August 1 and continuing through October 31 when the season is assumed to be essentially complete (92 days).

Between Tongue Point and Warrior Rock: The recreational fishing objective for the area from Tongue Point upstream to Warrior Rock is defined as a season beginning August 1 and continuing through September 7 as non-mark selective with an additional week of mark selective fishing during September 8-14 (45 days).

Recreational opportunity was based on the fishery objectives above, but actual allocation would be driven by weighing the recreational fishery season objectives with conservation objectives and upriver bright harvest objectives. The percentage of ESA-impacts for Bright fall Chinook allocated to recreational fisheries downstream from Bonneville Dam would vary depending on the number of days the recreational fishery was open before reaching its objective or tule fall Chinook impact limit. Results of the modeling are summarized in Table B.3.

Summary

To reach season objectives, the recreational fishery would require an additional 6% share of the LRH impacts beyond the recent 5-year average of 59% (65% total) during the transition period. The modeled recreational fishery did not require an increased share of the LRH impacts even at higher run sizes when the total allowable ESA limit would increase to 41%. Therefore the share of the LRH impact required to achieve recreational season objectives in both the transition and long-term is not expected to exceed 65%. Season objectives for the fall Chinook recreational fisheries are needed to ensure an appropriate balance between mainstem recreational fishing and mainstem commercial fishing using selective gear. There are two objectives for the mainstem commercial fisheries. One objective is to target Lower River Hatchery tule Chinook to help reduce strays. In Washington, this would be consistent with the Washington Commission Hatchery and Fishery Reform Policy. This objective is on par with objectives for mainstem recreational fisheries. Another objective is to harvest Upriver Bright fall Chinook in the area upstream of the Lewis River where the incidental take of lower river tule fall Chinook is reduced and in the area downstream from the Lewis River as alternative selective gear is developed. This objective would be pursued only when recreational fisheries objectives are expected to be met.

The analysis in Table B.3 shows the allocation of LRH impacts needed to meet recreational fishery season objectives and the corresponding recreational fishing days in each of the fisheries (Buoy 10, Tongue Point-to-Warrior Rock, and Warrior Rock to Bonneville Dam), which sets up the discussion for allocating the remaining LRH impacts for some level of mainstem commercial fishery targeting Washington Lower River Hatchery tule Chinook.

Table B.3. Comparisons of key characteristics of the mainstem fall Chinook recreational fishery under the current management policy and under the alternative management framework being considered by the Columbia River Fishery Management Workgroup. The “current” scenario set the recreational fishery’s share of the in-river ESA impact for lower river hatchery tulle equal to 59% (recent five-year pre-season average) and the “transition” and “long term” scenarios were set to meet fishery season objectives while remaining within the alternative management framework guidelines. All scenarios assumed the same stock-specific harvest rates as in 2012 pre-season model, the in-river share of available LRH impacts was 20% (recent five-year pre-season average), bright catch includes Zone 6 recreational fisheries, and that the Snake River recreational fishery used 0.5% of the Snake River wild (Bright) ESA-impact.

In-river ESA Impact Level	Time frame	Fall Chinook Stock	Management guideline (In-river ESA-Impact Level/Share) to meet Objective	Catch	Number of consecutive fishing days (beginning August 1)		
					Buoy 10	Tongue Point to Warrior Rock	Warrior Rock to Bonneville Dam
Lower river hatchery tulle fall Chinook = 7.6% Snake River wild (Bright) fall Chinook = 15%	Current	Tule	4.48% (59%)	7,900	30	37	92
		Bright	5.04% (34%)	22,300			
	Transition (≤70% of LRH Impacts)	Tule	4.96% (65%)	9,200	34	45 (includes 7 mark-selective fishing days)	92
		Bright	5.60% (37%)	24,600			
	Long term (≤80% of LRH Impacts)	Tule	4.96% (65%)	9,200	34	45 (includes 7 mark-selective fishing days)	92
		Bright	5.60% (37%)	24,600			

Appendix C

Analysis of Recreational Angler Trips and Ex-Vessel Value of Mainstem and Off-Channel Commercial Fisheries Under the Current Management Policy and the Alternative Management Framework Being Considered by the Columbia River Fishery Management Workgroup.

Mainstem Recreational and Commercial Fisheries Downstream from Bonneville Dam

Analytical Framework

Spring Chinook

The catches of upriver and all stocks of spring Chinook in the recreational fishery downstream from Bonneville Dam and in mainstem commercial fisheries were estimated for a base-case run size of 225,000 upriver spring Chinook and 65,000 Willamette hatchery spring Chinook. Under the current policy, the base case is defined as a forecasted run-size for upriver spring Chinook ranging from 55,000 to 271,000 and for Willamette hatchery spring Chinook greater than 50,000. Analyses compared catches under the current management policy and under the alternative management framework being considered by the Columbia River Fishery Management Workgroup. Under the alternative management framework, the percentage of the available ESA-impact for upriver spring Chinook allocated to recreational fisheries downstream from Priest Rapids and Lower Granite dams would increase to 70% during the transition period (2013-2016) and 80% in the long term (2017 and beyond).

Once the catches were estimated, the corresponding number of recreational fishing days and associated angler trips were calculated (Table C.1), as was the ex-vessel value of spring Chinook landed in mainstem commercial fisheries (Tables C.4 and C.5).

Summer Chinook

The catches of upper-Columbia summer Chinook in the recreational fishery downstream from Bonneville Dam and in mainstem commercial fisheries were estimated for a run size of 75,000 summer Chinook (71,300 at the river mouth). As with spring Chinook, analyses compared catches under the current management policy and under the alternative management framework being considered by the Columbia River Fishery Management Workgroup. Under the alternative management framework, the percentage of harvestable surplus of summer Chinook allocated to recreational fisheries downstream from Priest Rapids Dam would increase to 60% during the first two years of the transition period (2013-2014) and 70% in the last two years (2015-16). In the long term (2017 and beyond) the recreational fisheries share is the harvestable surplus in excess of that needed for off-channel commercial fisheries targeting late-returning spring Chinook and early-returning Select Area Bright fall Chinook (~2%). Also, as with spring Chinook, once the catches were estimated, the corresponding number of recreational fishing days and associated angler trips were calculated (Table C.2), as was the ex-vessel value of summer Chinook landed in mainstem commercial fisheries (Tables C.4 and C.5).

Fall Chinook

The catches of fall Chinook in the recreational fishery downstream from Bonneville Dam and in mainstem commercial fisheries were estimated based on recent 5-year actual average run sizes (2007-2011) and observed recreational harvest adjusted to meet recreational season objectives. Average run sizes resulted in an allowable ESA-impact level of 38% (including ocean fisheries) for lower river hatchery (LRH) tule fall Chinook and 15% for Snake River wild (Bright) fall Chinook. At the recent in-river LRH share of 20%, 7.6% LRH impacts would be available for implementing in-river fisheries. As with spring and summer Chinook, the management guideline and number of fishing days were modeled under the current management policy and under the alternative management framework being considered by the Columbia River Fishery Management Workgroup. Under the alternative management framework, the percentage of the ESA-impacts for tule fall Chinook allocated to recreational fisheries downstream from Bonneville Dam would increase up to 70% during the transition period (2013-2016) and up to 80% in the long term (2017 and beyond) if necessary to meet recreational fishery objectives. The recreational objectives were defined as:

Buoy 10: The recreational fishing objective for Buoy 10 is defined as a season beginning August 1 and continuing through Labor Day (34 days; assuming Labor Day is September 3).

Warrior Rock to Bonneville Dam: Although the fishery is open through December 31, very little, if any fishing for Chinook occurs after October. Therefore the recreational fishing objective for the area from Warrior Rock upstream to Bonneville Dam is defined as a season beginning August 1 and continuing through October 31 when the season is assumed to be essentially complete (92 days).

Between Tongue Point and Warrior Rock: The recreational fishing objective for the area from Tongue Point upstream to Warrior Rock is defined as a season beginning August 1 and continuing through September 7 as non-mark selective with an additional week of mark selective fishing during September 8-14 (45 days).

As with spring and summer Chinook, once the catches were estimated, the corresponding number of recreational fishing days and associated angler trips were calculated (Table C.3), as was the ex-vessel value of summer Chinook landed in mainstem commercial fisheries (Tables C.4 and C.5).

Economic Assumptions

- The economic analyses in Table C.5 are based on the following values:
- Spring Chinook in mainstem: Average weight = 14.1 pounds (lb); ex-vessel value = \$6.00/lb in March and April and \$4.84/lb in May and June
- Spring Chinook in off-channel: Average weight = 12.1 pounds (lb); ex-vessel value = \$5.23/lb
- Summer Chinook in mainstem: Average weight = 17.4 pounds (lb); ex-vessel value = \$3.08/lb
- Tule Fall Chinook in mainstem (late August): Average weight = 21.0 pounds (lb); ex-vessel value = \$0.54/lb
- Tule Fall Chinook in mainstem (September/October): Average weight = 15.6 pounds (lb); ex-vessel value = \$0.52/lb
- Bright Fall Chinook in mainstem (late August): Average weight = 21.0 pounds (lb); ex-vessel value = \$2.31/lb

- Bright Fall Chinook in mainstem (September/October): Average weight = 15.6 pounds (lb); ex-vessel value = \$1.67/lb
- Select Area Bright Chinook in off-channel: Average weight = 13.8 pounds (lb); ex-vessel value = \$2.28/lb
- Coho in mainstem: Average weight = 9.24 pounds (lb); ex-vessel value = \$1.32/lb
- Coho in off-channel: Average weight = 9.5 pounds (lb); ex-vessel value = \$1.38/lb

Recreational Fisheries

Spring Chinook

Analyses in Table C.1 indicate that the number of additional recreational fishing days prior to the run-size update (March and April) would increase two days (4.8%) in the transition period and 3 days (7.1%) in the long term. Correspondingly, the number of angler trips during this time frame would increase by about 10,000 (9.1%) in the transition period and about 15,000 (13.7%) in the long term.

In the period after the run-size update (May and June), analyses indicate that the recreational fishery would not be able to catch all the spring Chinook available to them under the management guideline because they run out of fishing days. This is due to the fact that catch rates during this time are generally low. Under the “current” scenario the unused catch would total about 475 spring Chinook. In the transition period and long term, these numbers would be about 830 and about 2,750, respectively. This picture would change if the recent trend in recreational fisheries of increasing catch rates held true during May and June. The upriver spring Chinook that go uncaught in the recreational fishery downstream from Bonneville Dam could be reassigned to recreational fisheries upstream of Bonneville Dam, to the commercial fishery, or to conservation.

Summer Chinook

Analyses in Table C.2 indicate that the number of additional recreational fishing days would increase six days in the first half of the transition period and 13 days (100%) in the latter half. The increase would be 33 days (350%) in the long term. Correspondingly, the number of angler trips would increase by about 9,000 (35%) during the first two years of the transition period, 20,000 (80%) in the final two years of the transition period and about 45,000 (180%) in the long term.

Fall Chinook

Recreational opportunity was based on the fishery objectives described above, but actual allocation would be driven by weighing the recreational fishery season objectives with conservation objectives and upriver Bright fall Chinook harvest objectives. The percentage of ESA-impacts for Bright fall Chinook allocated to recreational fisheries downstream from Bonneville Dam would vary depending on the number of days the recreational fishery was open before reaching its objective or tule fall Chinook impact limit.

Analyses in Table C.3 indicate that the number of additional recreational fishing days would increase 4 days for the Buoy 10 fishery (13%) and 8 days (21.6%) for the Tongue Point-to-Warrior Rock fishery in the transition period and long term. Correspondingly, the number of angler trips would increase by about 15,000 (9.4%) in the transition period and long term.

Under the ESA-impact scenario modeled (7.6% for lower river hatchery tulle fall Chinook (LRH) and 15% for Snake River wild (Bright) fall Chinook), analyses indicate that in the “current” scenario the recreational and commercial fisheries are not able to catch all the upriver Bright fall Chinook available to them because of constraints imposed by the LRH impacts and rapidly declining abundance of upriver stocks by the time the available quota is determined. The current unused catch totals about 6,000 upriver Bright fall Chinook. In the transition period this number would be about 9,500 upriver Bright fall Chinook (13,570 total Chinook) as a result of reserving one-third of the commercial LRH impacts for alternative commercial harvest.

Table C.1. Comparisons of upriver spring Chinook catch, kept catch of all spring Chinook stocks, number of fishing days, and number of angler trips for the recreational fishery downstream from Bonneville Dam, under the current management policy and under the alternative management framework being considered by the Columbia River Fishery Management Workgroup. Analyses assume forecasted runs sizes of 225,000 for upriver spring Chinook and 65,000 for Willamette spring Chinook, a mark rate of 75%, and that the run-size forecast would be updated on May 10.

Management period	Time frame	Catch of upriver stocks before May 10 (number landed + release mortality)	Kept catch of all stocks before May 10 (number landed)	Number of consecutive fishing days (beginning March 1)	Number of angler trips before May 10
Before the run-size update	Current	9,447	12,312	42	109,840
	Transition	10,600	13,763	44	119,854
	Long term	11,189	14,504	45	124,931
		Catch of upriver stocks after May 10 (number landed + release mortality)	Kept catch of all stocks after May 10 (number landed)	Number of consecutive fishing days (beginning May 10)	Number of angler trips after May 10
After the run-size update (May 10)	Current	3,450	3,938	37	55,522
	Transition	3,450	3,938	37	55,522
	Long term	3,450	3,938	37	55,522

Table C.2. Comparisons of upper-Columbia summer Chinook catch, kept catch, number of fishing days, and number of angler trips for the recreational fishery downstream from Bonneville Dam, under the current management policy and under the alternative management framework being considered by the Columbia River Fishery Management Workgroup. Analyses assume a forecasted run size of 75,000 summer Chinook (71,300 at the river mouth), a mark rate of 66%, an allocation of 600 summer Chinook to recreational fisheries in the Columbia River between Bonneville and Priest Rapids dams, and no contribution from the Colville Tribes.

Time frame	Catch (number landed + release mortality)	Kept catch (number landed)	Number of consecutive fishing days (beginning June 16)	Number of angler trips
Current	2,239	2,078	13	25,000
Transition (13-14)	2,805	2,604	18	33,746
Transition (15-16)	3,385	3,142	26	45,047
Long term	4,063	3,772	46	70,000

Table C.3. Comparisons of key characteristics of the mainstem fall Chinook recreational fishery under the current management policy and under the alternative management framework being considered by the Columbia River Fishery Management Workgroup. The “current” scenario set the recreational fishery’s share of the in-river ESA impact for lower river hatchery tulle equal to 59% (recent five-year pre-season average) and the “transition” and “long term” scenarios were set to meet fishery season objectives while remaining within the alternative management framework guidelines. All scenarios assumed the same stock-specific harvest rates as in 2012 pre-season model, the in-river share of available LRH impacts was 20% (recent five-year pre-season average), bright catch includes Zone 6 recreational fisheries, and that the Snake River recreational fishery used 0.5% of the Snake River wild (Bright) ESA-impact.

In-river ESA Impact Level	Time frame	Fall Chinook Stock	Management guideline (In-river ESA-Impact Level/Share) to meet Objective	Catch	Number of consecutive fishing days (beginning August 1)			Number of Angler Trips
					Buoy 10	Tongue Point to Warrior Rock	Warrior Rock to Bonneville Dam	
Lower river hatchery tulle fall Chinook = 7.6% Snake River wild (Bright) fall Chinook = 15%	Current	Tulle	4.48% (59%)	7,900	30	37	92	160,000
		Bright	5.04% (34%)	22,300				
	Transition (≤70% of LRH Impacts)	Tulle	4.96% (65%)	9,200	34	45 (includes 7 mark-selective fishing days)	92	175,000
		Bright	5.60% (37%)	24,600				
	Long term (≤80% of LRH Impacts)	Tulle	4.96% (65%)	9,200	34	45 (includes 7 mark-selective fishing days)	92	175,000
		Bright	5.60% (37%)	24,600				

Mainstem Commercial Fisheries

Spring Chinook

Our modeling analysis indicates that the mainstem commercial harvest of spring Chinook would decline by 46% in the transition period and would be negligible in the long term (Table C.4). The corresponding decline in economic value would be 48% in the transition period and near 100% in the long term (Table C.5). As with recreational fisheries, analyses indicates that the mainstem commercial fishery would not be able to catch all the spring Chinook available to them in May and June under the management guideline. However, this is because fishers most likely would have to fish with large-mesh gill nets. As such they would likely use up all their available ESA-impacts before they reach the guideline. Under the “current” scenario, the mainstem commercial fishery would be unable to land about 1,500 spring Chinook, which have an ex-vessel value of about \$100,000. During the transition period, the mainstem commercial fishery would be unable to land about 1,100 spring Chinook, which have an ex-vessel value of about \$75,000.

Summer Chinook

Our modeling analysis indicates that the mainstem commercial harvest of summer Chinook would decline by 20%-40% in the transition period. Because our analyses are based on a run-size less than 90,000, it does not include any harvest in the long term (Table C.4). The corresponding decline in economic value would be 20%-40% in the transition period and 100% in the long term (Table C.5).

Fall Chinook

Our modeling analysis indicates that the mainstem commercial harvest of fall Chinook would increase by 26%-69% in the transition period and by 69% in the long term (Table C.4). The corresponding increase in economic value would be 3.5%-25% in the transition period and 25% in the long term (Table C.5). This analysis includes mainstem commercial fishing with seine gear and assumes full harvest of fall Chinook in the area upstream from the Sandy River. As noted for recreational fisheries, under the ESA-impact scenario modeled (7.6% for lower river hatchery tule fall Chinook (LRH) and 15% for Snake River wild (Bright) fall Chinook) the analysis indicates that in the "current" scenario the recreational and commercial fisheries are not able to catch all the upriver Bright fall Chinook available to them because of constraints imposed by the LRH impacts and rapidly declining abundance of upriver stocks by the time the available quota is determined. The current unused catch totals about 6,000 upriver Bright fall Chinook. In the transition period this number would be about 9,500 upriver Bright fall Chinook (13,570 total Chinook) as a result of reserving one-third of the commercial LRH impacts for alternative commercial harvest. The calculated ex-vessel value would be about \$353,500 and assumes the mainstem commercial gillnet fishery has the ability to access these fish in the area upstream from the Sandy River (assumes no LRH impacts). The calculated ex-vessel value would be the same in the long term but assumes the same number of fish can be caught using alternative gear types. The same assumptions apply to the current Zone 4-5 gillnet fishery which is expected to have an ex-vessel value of \$773,000 during the transition period. Based on the proposed management framework, these fish (23,100) would need to be harvested with alternative gears upstream of the Lewis River.

Coho

Our modeling analysis indicates that the mainstem commercial harvest of coho would almost double in the transition period and increase by one-third in the long term, if seine and tangle-net fisheries prove feasible (Table C.4). A similar change is indicated in the economic value of the fisheries in the transition period and the long term (Table C.5).

Commercial Fisheries in Existing Off-Channel Areas

For the transition period, analyses assumed "current" production was enhanced by 1.0 million spring Chinook, 500,000 Select Area Bright fall Chinook, and 920,000 coho. For the long term, off-channel fisheries were modeled assuming enhancements totaled 1,250,000 spring Chinook, 750,000 Select Area Bright fall Chinook and 1,920,000 coho. Under the "current" scenario, off-channel fisheries were modeled assuming returns from a base production of 950,000 spring Chinook, 1.45 million Select Area Bright Chinook and 4.17 million coho. All scenarios assumed that survival of smolts to adults commercially harvested at each site was 0.5% for spring Chinook, 0.3% for Select Area Bright fall Chinook, and 1.4% for coho. Catch estimates do not include incidental harvest of non-local stocks. Results are summarized in Tables C.4 and C.5.

Our modeling analysis indicates that the total commercial harvest of spring Chinook, fall Chinook and coho would increase by 4%-32% in the transition period and by 32%-52% in the

long term, if planned expansions of production occur (Table C.4). The corresponding increase in economic value would be 6.7%-43% in the transition period and 43%-64% in the long term (Table C.5).

Summary

The changes in angler trips and ex-vessel values described below are based on the modeled analyses described above and are relative to values calculated for the “current” scenario.

With respect to mainstem recreational fisheries in the spring, summer and fall, the total number of angler trips in the transition period would increase by about 45,000 (~13%). In the long term, the number of angler trips would increase by about 75,000 (~22%).

With respect to mainstem and off-channel commercial fisheries, the annual ex-vessel value in the transition period would increase by about \$198,000 (~5%) in 2013 to about \$1.1 million (~30%) in 2016 (Table C.5). For the period 2017 through 2021, the annual ex-vessel value of commercial fisheries would increase by \$550,000 (~15%) in 2017 to about \$840,000 (~23%) in 2021.

Table C.4. Summary of modeled current mainstem commercial fishery harvest (numbers of fish) compared to expected harvest for potential alternative fisheries by year and fishery, 2013-2021

Fishery	Stock	Status	Numbers of Fish (Modeled Values)									
			Current	Transition				Long-Term				
				2013	2014	2015	2016	2017	2018	2019	2020	2021
Mainstem Gillnet	Spring Chinook	Existing	5,051	2,714	2,714	2,714	2,714	-	-	-	-	-
Mainstem Gillnet	Summer Chinook	Existing	2,831	2,264	2,264	1,698	1,698	-	-	-	-	-
Mainstem Gillnet (Zone 4-5)	Fall Chinook	Existing	37,990	23,080	23,080	23,080	23,080	-	-	-	-	-
Mainstem Gillnet (2S)	Fall Chinook	New	-	13,570	13,570	13,570	13,570	-	-	-	-	-
Mainstem Gillnet	Coho	Existing	25,881	22,099	22,099	22,099	21,375	-	-	-	-	-
Select Area Gillnet	Spring Chinook	Expanded	5,000	6,234	6,250	8,805	9,951	10,000	10,000	10,852	11,234	11,250
Select Area Gillnet	Fall Chinook	Expanded	18,528	18,528	18,528	19,173	19,953	20,028	20,028	20,351	20,741	20,778
Select Area Gillnet	Coho	Expanded	56,700	58,380	69,580	69,580	75,954	75,954	89,954	89,954	89,954	89,954
Mainstem (Gear to be Determined; Zone 4-5)	Fall Chinook	New?	-	-	-	-	-	23,080	23,080	23,080	23,080	23,080
Mainstem (Gear to be Determined; 2S)	Fall Chinook	New	-	-	-	-	-	13,570	13,570	13,570	13,570	13,570
Mainstem Seine	Lower River Hatchery Chinook	New	-	11,194	11,194	11,194	27,441	27,441	27,441	27,441	27,441	27,441
Mainstem Seine	Coho	New	-	6,010	6,010	6,010	14,374	14,374	14,374	14,374	14,374	14,374
Mainstem Tangle-net	Coho	New	-	20,160	20,160	20,160	20,160	20,160	20,160	20,160	20,160	20,160

Table C.5. Summary of modeled current mainstem commercial fishery values compared to expected values for potential alternative fisheries by year and fishery, 2013-2021

Fishery	Stock	Status	Ex-Vessel Value (Modeled)									
			Current	Transition				Long-Term				
				2013	2014	2015	2016	2017	2018	2019	2020	2021
Mainstem Gillnet	Spring Chinook	Existing	\$395,911	\$205,272	\$205,272	\$205,272	\$205,272	-	-	-	-	-
Mainstem Gillnet	Summer Chinook	Existing	\$151,719	\$121,332	\$121,332	\$90,999	\$90,999	-	-	-	-	-
Mainstem Gillnet (Zone 4-5)	Fall Chinook	Existing	\$1,272,247	\$772,926	\$772,926	\$772,926	\$772,926	-	-	-	-	-
Mainstem Gillnet (2S)	Fall Chinook	New		\$353,526	\$353,526	\$353,526	\$353,526	-	-	-	-	-
Mainstem Gillnet	Coho	Existing	\$316,682	\$270,442	\$270,442	\$270,442	\$261,582	-	-	-	-	-
Select Area Gillnet	Spring Chinook	Expanded	\$316,415	\$394,493	\$395,519	\$503,300	\$605,566	\$631,805	\$632,830	\$686,721	\$710,908	\$711,934
Select Area Gillnet	Fall Chinook	Expanded	\$436,943	\$436,943	\$436,943	\$457,237	\$481,779	\$484,139	\$484,139	\$494,286	\$506,557	\$507,737
Select Area Gillnet	Coho	Expanded	\$743,337	\$765,362	\$1,052,678	\$1,052,678	\$1,052,678	\$1,052,678	\$1,236,218	\$1,236,218	\$1,236,218	\$1,236,218
Mainstem (Gear to be Determined; Zone 4-5)	Fall Chinook	New?	-	-	-	-	-	\$772,926	\$772,926	\$772,926	\$772,926	\$772,926
Mainstem (Gear to be Determined; 2S)	Fall Chinook	New	-	-	-	-	-	\$353,526	\$353,526	\$353,526	\$353,526	\$353,526
Mainstem Seine	Lower River Hatchery Chinook	New	-	\$190,851	\$190,851	\$190,851	\$467,868	\$467,868	\$467,868	\$467,868	\$467,868	\$467,868
Mainstem Seine	Coho	New	-	\$73,562	\$73,562	\$73,562	\$175,901	\$175,901	\$175,901	\$175,901	\$175,901	\$175,901
Mainstem Tangle-net	Coho	New	-	\$246,713	\$246,713	\$246,713	\$246,713	\$246,713	\$246,713	\$246,713	\$246,713	\$246,713
Totals			\$3,633,254	\$3,831,422	\$4,119,764	\$4,217,507	\$4,714,810	\$4,185,556	\$4,370,121	\$4,434,159	\$4,470,617	\$4,472,823
Difference from Current			\$0	\$198,168	\$486,510	\$584,253	\$1,081,556	\$552,302	\$736,867	\$800,905	\$837,363	\$839,569
% Difference from Current			0%	5%	13%	16%	30%	15%	20%	22%	23%	23%

Appendix D

Enhancement of Hatchery Production for Harvest by Non-tribal Commercial Fisheries in Off-Channel Areas of the Columbia River Downstream from Bonneville Dam

Current Program

Production: Currently production targets in existing off-channel sites in the Columbia River downstream from Bonneville Dam for spring Chinook, tule fall Chinook, Select Area Bright fall Chinook and coho total 13.57 million. This total includes 250,000 spring Chinook and 120,000 coho transferred from other facilities for release in off-channel sites beginning in 2010. This total also includes 350,000 spring Chinook released at the Deep River site, which will be discontinued effective in 2013. The specific release targets for the current program by species and stock are shown in Table D.1.

Table D.1. Current production targets for juvenile salmon released for harvest in off-channel areas in the Columbia River downstream from Bonneville Dam. The totals by species and stock are 1.55 million spring Chinook, 6.4 million tule fall Chinook, 1.45 million Select Area Bright fall Chinook, and 4.17 million coho.

Off-Channel Area	Release Site	Production Target	Off-Channel Area	Release Site	Production Target
Youngs Bay	Klaskanine Hatchery	600,000 Coho 2.1 million Tule Fall Chinook	Blind Slough & Knappa Slough	Net Pens	420,000 Coho 300,000 Spring Chinook
	South Fork Klaskanine Hatchery	350,000 Coho 700,000 Select Area Bright Fall Chinook		Big Creek Hatchery	3.6 million Tule Fall Chinook 535,000 Coho
	Net Pens	825,000 Coho 750,000 Select Area Bright Fall Chinook 650,000 Spring Chinook	Deep River	Net Pens	750,000 Coho 700,000 Tule Fall Chinook 350,000 Spring Chinook
Tongue Point	Net Pens	Grays River Hatchery		150,000 Late Stock Coho	

Harvest: For the years 2007 through 2011, average harvest levels from off-channel areas has been highest during the fall fisheries, driven primarily by coho (Table D.2.). Also, harvest during the spring fisheries in recent years has rivaled levels in the mainstem. However, the recent average includes 2010, in which harvest was more than twice the previous peak catch (~24,000).

Fisheries in the off-channel areas are highly selective for local, targeted stocks. In recent years, almost 90% of the harvest in the winter, spring, and summer fisheries has been local stocks. In the fall fisheries, recent harvests have been comprised of 90% local stocks for fall Chinook and about 98% for coho.

Table D.2. Average harvest levels and fishing seasons for commercial fisheries in off-channel areas in the Columbia River downstream from Bonneville Dam for 2007 through 2011.

Season and Harvest (5-year average, 2007-2011)					
	Winter (mid-Feb. – mid-March ¹)	Spring (mid-April – mid-June)	Summer (mid-June – July)	Fall (September – October ²)	Sum
Youngs Bay	477 Chinook	6,719 Chinook	1,010 Chinook	8,305 Chinook	16,511 Chinook
				26,787 Coho	26,787 Coho
Tongue Point/ South Channel		444 Chinook (2008-2011)		1,249 Chinook	1,693 Chinook
				7,990 Coho	7,990 Coho
Blind Slough/ Knappa Slough	134 Chinook	1,455 Chinook		4,411 Chinook	6,000 Chinook
				4,899 Coho	4,899 Coho
Deep River	60 Chinook	79 Chinook		858 Chinook	997 Chinook
				11,301 Coho	11,301 Coho
Totals	671 Chinook	8,697 Chinook	1,010 Chinook	14,823 Chinook	25,201 Chinook
				50,978 Coho	50,978 Coho

¹ Youngs Bay and Blind Slough winter seasons typically extend into early April
² Youngs Bay fall season starts in early August

Total Releases of Hatchery Fish in Off-Channel Sites Under the Alternative Management Framework

Total releases of hatchery fish in off-channel sites under the alternative management framework and the corresponding contribution of those fish to commercial fisheries in the off-channel areas are shown in Table D.3. The number of additional fish proposed for release during the transition period and in the long term is described by salmon stock below.

Transition Period

Spring Chinook: As stated above, proposed enhancements of hatchery production in existing off-channel areas include 250,000 spring Chinook transferred from other facilities for release in off-channel sites beginning in 2010. In addition to these fish, Oregon proposes to acclimate an additional 500,000 juvenile spring Chinook annually for release beginning in 2013 (Table D.3). Washington would provide 250,000 juvenile spring Chinook for acclimation in 2013, and pursue funding to produce and acclimate these fish long-term (Table D.3).

Coho: As stated above, proposed enhancements of hatchery production in existing off-channel areas include 120,000 coho transferred from other facilities for release in off-channel sites beginning in 2010. In addition, Oregon proposes to acclimate an additional 600,000 juvenile coho and Washington an additional 200,000 annually for release beginning in 2013 (Table D.3).

Select Area Bright Fall Chinook: To offset reductions in mainstem commercial harvest of summer Chinook, Oregon proposes to rear an additional 500,000 juvenile Select Area Bright fall Chinook annually for release at off-channel sites (Table D.3). These releases would begin in 2013.

Long Term

Spring Chinook: In addition to the 1 million additional juvenile spring Chinook proposed for release in off-channel sites during the transition period, Oregon proposes to acclimate an additional 250,000 juvenile spring Chinook annually for release beginning in 2017 (Table D.3.).

Coho: In addition to the 920,000 additional juvenile coho proposed for release in off-channel sites during the transition period, Oregon proposes to acclimate an additional 1 million juvenile coho annually for release beginning in 2017 (Table D.3.).

Select Area Bright Fall Chinook: In addition to the additional 500,000 juvenile Select Area Bright fall Chinook proposed for release annually at off-channel sites during the transition period, Oregon proposes to rear an additional 250,000 juvenile Select Area Bright fall Chinook annually for release beginning in 2017 (Table D.3.).

Table D.3. Total number of spring Chinook, coho and Select Area bright fall Chinook slated for acclimation and release in off-channel sites in the Columbia River downstream from Bonneville Dam and the contribution of those fish as kept catch to commercial fisheries. Assumed survival of smolts to adults harvested at each site was 0.5% for spring Chinook, 1.4% for coho, and 0.3% for Select Area Bright fall Chinook. Catch estimates do not include incidental harvest of non-local stocks.

Time frame	Stock	State	Release numbers	Kept catch (number landed)
Transition (2013-2016)	Spring Chinook	Oregon	1,700,000	7,810
		Washington	250,000	
	Coho	Oregon	3,870,000	66,780
		Washington	1,100,000	
	Select Area Bright Fall Chinook	Oregon	1,950,000	4,868
	Long term (2017-2021)	Spring Chinook	Oregon	1,950,000
Washington			250,000	
Coho		Oregon	4,870,000	80,780
		Washington	1,100,000	
Select Area Bright Fall Chinook		Oregon	2,200,000	6,207
Long term (2021 & beyond)		Spring Chinook	Oregon	1,950,000
	Washington		250,000	
	Coho	Oregon	4,870,000	83,580
		Washington	1,100,000	
	Select Area Bright Fall Chinook	Oregon	2,200,000	6,600

Evaluations of Opportunities to Expand Existing Off-Channel Sites and Establish New Ones

The Oregon Department of Fish and Wildlife estimated costs associated with evaluations of opportunities to expand existing off-channel sites and establish new ones (Table D.4 and Table D.5). The estimates are based on personnel costs for agency staff in Oregon and would likely differ if Oregon and Washington shared work associated with each evaluation.

Table D.4. Tasks and biennial costs associated with evaluations of opportunities to expand commercial fisheries in exiting off-channel sites in the Columbia River downstream from Bonneville Dam

Task	Approach	Needs	Effort	Cost per Unit Effort	Total Cost
Evaluate the feasibility of providing more fishing time to commercially harvest salmon at existing off-channel sites.	Use the existing fleet to collect data that will inform assessment of risk of increased impacts associated with expansion into currently closed timeframes, target-stock harvest potential, and overall stock composition.	Test fishery (full fleet)			no cost
		On-board observers	24 months	\$3,966	\$95,185
		S&S for test fishing			\$11,815
		Additional fishery samplers needed to maintain sample rates (assuming greater harvest level from increased production)	54 months	\$3,966	\$214,166
		S&S for fishery sampling			\$28,835
		TOTAL			\$350,000
Evaluate the feasibility of expanding the fishable area of existing off-channel sites	Option A. Use the existing fleet to collect data that will inform assessment of risk of increased impacts associated with expansion into currently closed areas, target-stock harvest potential, and overall stock composition.	Test fishery (full fleet)			no cost
		On-board observers	54 months	\$3,966	\$214,166
		S&S for test fishing			\$30,835
		Additional fishery samplers needed to maintain sample rates (assuming greater harvest level from increased production)	54 months	\$3,966	\$214,166
		S&S for fishery sampling			\$30,834
		TOTAL			\$490,000
	Option B. Use a test fishery with contracted fishers to collect data that will inform assessment of risk of increased impacts associated with expansion into currently closed areas, target-stock harvest potential, and overall stock composition.	Project Biologist	24 months	\$5,693	\$136,621
		Test fishery (contracted)	420 days	\$1,200	\$504,000
		On-board observers	54 months	\$3,966	\$214,166
		S&S for test fishing			\$35,524
		Additional fishery samplers needed to maintain sample rates (assuming greater harvest level from increased production)	54 months	\$3,966	\$214,166
		S&S for fishery sampling			\$35,524
		TOTAL			\$1,140,000

Table D.5. Tasks and biennial costs associated with evaluations of opportunities to establish three new off-channel commercial fisheries sites in the Columbia River downstream from Bonneville Dam

Task	Approach	Needs	Effort	Cost per Unit Effort	Total Cost
Evaluate three new off-channel sites to determine their potential to produce meaningful numbers of fish for commercial harvest (evaluations to be completed in spring 2015).	Evaluate commercial harvest opportunity in new fishing sites.	Project Leader	24 months	\$6,801	\$163,235
		Project Biologist	24months	\$5,124	\$122,970
		Determine potential new fishing sites proximate to new rearing sites			--
		Test fishery (contracted)	630 days	\$1,200	\$756,000
		On-board observers	54 months	\$3,966	\$214,166
		S&S for test fishing			\$51,982
		Sub total			\$1,308,352
	Evaluate suitability for acclimation and release at new sites.	Determine potential new rearing sites			No cost
		DEQ consultation for new net pen complexes			No cost
		Water quality technicians	8 months	\$4,512	\$36,094
		Juvenile salmonid assessment fieldworkers	72 months	\$3,966	\$285,554
		Input from Fish Propagation Programs and hatchery managers on logistical potential			No charge
		Sub total			\$321,648
		Grand total			

Appendix E

Additional Measures to Enhance Management and Reduce Ecological Risks from Fisheries

At their Oct 18, 2012 meeting, members of the Columbia River Fishery Management Workgroup (Workgroup) asked staff to review and evaluate additional management measures that might be considered to improve the effectiveness of fisheries management on the Columbia River. These short- and long-term measures were part of a larger package of recommendations provided by Workgroup's commercial fishing advisors (10/10/2012). The Washington members of the Workgroup also included some of these measures in their recommendations (10/18/12). Oregon and Washington fishery managers evaluated each of the measures and recommend the following be considered by the Workgroup for possible implementation in 2013 and beyond.

Short Term Measures (can be implemented during transition period)

- Implement in 2013 the use of barbless hooks in all mainstem Columbia River and tributary fisheries for salmon and steelhead.
- Consider requiring the use of rubber landing nets (or their equivalent) in all mainstem Columbia River fisheries for salmon, steelhead, and sturgeon.
- Consider making it unlawful when angling from **any** vessel to totally remove from the water any salmon or steelhead required to be released unless a recovery box is present and in use on the vessel.
- Evaluate the feasibility of creating restricted recreational-fishing zones within and immediately adjacent to current or new off-channel areas. These zones would be designed to reduce the interceptions of fish intended for commercial harvest within the off-channel areas until economic benefits from commercial fisheries are verified.
- Consider a 5-fish seasonal limit for spring Chinook caught in the mainstem Columbia River from January 1 through June 15.

Measures Requiring Additional Analysis

- Initiate a comprehensive review of a recreational fishing license surcharge similar to the Washington Department of Fish and Wildlife Columbia River Salmon and Steelhead Endorsement Program. The revenue generated by this program supports needed management activities for continuation and expansion of selective fisheries in the Columbia River Basin. A similar program in Oregon could provide funding for implementation of adopted management strategies such as purchase of alternative gear and a commercial fishermen retraining program.
- Evaluate the feasibility of implementing a program in Oregon that would create a limited entry recreational fishing guide system on the Columbia River.
- Beginning in 2014, require licensed recreational fishing guides and charters to maintain and use logbooks. Logbook reporting could provide fishery managers with additional catch and harvest data on guided salmon, steelhead, sturgeon fishing trips on the Columbia River. In addition, evaluate the use of volunteer trip reports in general private boat fisheries.

Appendix F

Conservation Scenarios

Upriver Spring Chinook

Table F.1 below shows **modeled** estimates of the amount of unused upriver spring Chinook ESA impacts under four allocation scenarios for non-tribal mainstem Columbia River recreational and commercial fisheries. The first scenario (60:40) is the current policy of the Oregon Fish and Wildlife Commission. The second scenario (65:35) is the current policy of the Washington Fish and Wildlife Commission. The final two scenarios are the transition (70:30) and long-term (80:20) allocation scenarios in the proposal being considered by the Columbia River Fishery Management Workgroup. The table also shows the number of marked and unmarked fish that escape mainstem non-tribal fisheries given the unused ESA impacts. In the table below, the number of unmarked fish that escape are fish that would have been handled and released in the fisheries **and** would have subsequently died. For recreational fisheries it was assumed that 10% of the unmarked fish handled and released would have subsequently died. For mainstem commercial fisheries, it was assumed that 14.7% of the unmarked fish handled and released in March and April (using tangle-nets) would have subsequently died and that 40% handled and released in May and June (using large-mesh gillnets) would have subsequently died. In addition to the assumptions about release mortality, modeling was based on these other assumptions:

- The river-mouth run-size of upriver spring Chinook = 225,000; the river-mouth run-size of Willamette spring Chinook > 50,000.
- The mark rate of upriver spring Chinook = 75%
- ESA impacts for each scenario are allocated as follows:
 - 60:40 – Under the current policy of the Oregon Fish and Wildlife Commission, 60% of upriver spring Chinook ESA-impacts are allocated to recreational fisheries and 40% to commercial fisheries; the recreational fishery downstream from Bonneville Dam is allocated 75% of the ESA-impacts allocated to recreational fisheries; off-channel fisheries are allocated a fixed ESA impact of 0.15%.
 - 65:35 – Under the current policy of the Washington Fish and Wildlife Commission, 65% of upriver spring Chinook ESA-impacts are allocated to recreational fisheries and 35% to commercial fisheries; the recreational fishery downstream from Bonneville Dam is allocated 75% of the ESA-impacts allocated to recreational fisheries; off-channel fisheries are allocated a fixed ESA impact of 0.15%.
 - 70:30 – Under the proposal being considered by the Columbia River Fishery Management Workgroup, during the “transition period” 70% of upriver spring Chinook ESA-impacts are allocated to recreational fisheries and 30% to commercial fisheries; the recreational fishery downstream from Bonneville Dam is allocated 75% of the ESA-impacts allocated to recreational fisheries; off-channel fisheries are allocated a fixed ESA impact of 0.25% (allocation was increased from 0.15% to 0.25% to access initial returns from enhanced off-channel production).
 - 80:20 – Under the proposal being considered by the Columbia River Fishery Management Workgroup, in the “long term” 80% of upriver spring Chinook ESA-impacts are allocated to recreational fisheries and 20% to commercial fisheries; the recreational fishery downstream from Bonneville Dam is allocated 75% of the ESA-

impacts allocated to recreational fisheries; off-channel fisheries are allocated all of the ESA impacts allocated to commercial fisheries (to access full returns from enhanced off-channel production).

- Recreational fisheries use all the upriver spring Chinook available to them under the *US v Oregon* Management Guideline. Although catch rates in the recreational fishery downstream from Bonneville Dam in May and June may not be sufficiently high to harvest all the fish available, under the scenario modeled sufficient ESA impacts remained to do so.

Summary:

1. Estimates of unused ESA impacts for all four scenarios include those left-over because the *US v Oregon* Management Guideline is less than the ESA Management Guideline.
2. The ESA Management Guideline is less under the “80:20” scenario than under the “70:30” scenario and less under the “70:30” scenario than either the “65:35” or “60:40” scenarios because the commercial share of available impacts under the “70:30” and “80:20” scenarios is either primarily or wholly allocated to the off-channel fishery. Since the off-channel fishery is not mark-selective, the ratio of “marked fish kept” to “unmarked fish killed” is less than in the mainstem fishery (3.0 vs. 12.2) and the guideline is reduced proportionally.
3. Under the “60:40”, “65:35” and “70:30” scenarios the mainstem commercial fishery cannot use all its share of the *US v Oregon* Management Guideline because it runs out of ESA impacts.
4. Because the current policies of the Oregon and Washington Fish and Wildlife Commissions differ in the percentage of ESA impacts allocated to recreational and commercial non-tribal fisheries, the Oregon policy is currently used to determine the recreational fisheries share (base case = 60%) and the Washington policy is used to allocate the commercial fisheries share (base case = 35%). As a result, 5% of the ESA impacts are held in reserve. Under the current policy, the amount of unused ESA impacts in our modeling exercise would be 0.322% (0.222% unused by recreational fisheries and 0.10% held in reserve). The number of marked and unmarked fish that would escape non-tribal fisheries would be 4,703 and 163, respectively.

Summer Chinook

Table F.2 below shows **modeled** escapement of summer Chinook to Wells Dam and the percentage of that escapement that is marked and unmarked based on three different management scenarios. The first scenario (current) is based on Management Agreements and allocation policies currently in place. The second scenario (no commercial) assumes the harvest share that would have been allocated to mainstem non-tribal commercial fisheries is held in reserve as a conservation measure and is not allocated. The final scenario assumes the harvest share that would have been allocated to mainstem non-tribal commercial fisheries is instead allocated to recreational fisheries downstream from Bonneville Dam. Modeling was based on the following assumptions:

- The river-mouth run-size of summer Chinook = 75,000
- The mark rate of summer Chinook = 66%

Table F.1. Modeled estimates of the amount of unused ESA impacts for mainstem recreational and commercial upriver spring Chinook fisheries under four scenarios and the number of marked and unmarked fish that escape mainstem non-tribal fisheries, given the unused ESA impacts. The first scenario (60:40) is the current policy of the Oregon Fish and Wildlife Commission. The second scenario (65:35) is the current policy of the Washington Fish and Wildlife Commission. The final two scenarios are the transition and long-term allocation scenarios in the proposal being considered by the Columbia River Fishery Management Workgroup.

Scenario	ESA Management Guideline (% Recreational Fishery Share)	U.S. v. Oregon Management Guideline (% Recreational Fishery Share)	Number of Marked Fish Kept	Number of Unmarked Fish Killed	Percent of U.S. v. Oregon Management Guideline Used	Unused ESA Impacts	Number of Fish that Escape Mainstem Non-Tribal Fisheries, Given the Unused ESA Impacts	
							Marked fish	Unmarked fish
Recreational = 60% ^a Commercial = 40% ^a	27,765 (70.6%)	22,500 (70.6%)	19,846	950	92.4% ^b	0.266% ^c	3,977	132
Recreational = 65% ^d Commercial = 35% ^d	28,194 (75.3%)	22,500 (75.3%)	20,452	928	95.0% ^b	0.301% ^c	4,532	151
Recreational = 70% Commercial = 30%	27,644 (82.7%)	22,500 (82.7%)	20,495	924	95.2% ^b	0.303% ^c	4,543	151
Recreational = 80% Commercial = 20%	27,034 (96.7%)	22,500 (96.7%)	21,593	907	100.0%	0.323% ^c	4,841	161

^a This scenario is the "base case" under the current policy of the Oregon Fish and Wildlife Commission.
^b The mainstem commercial fishery cannot use all its share of the *US v Oregon* Management Guideline because it runs out of ESA impacts.
^c all unused ESA-impacts come from the recreational fishery
^d This scenario is the "base case" under the current policy of the Washington Fish and Wildlife Commission.

Table F.2. Escapement of summer Chinook to Wells Dam and the percentage of that escapement that is marked and unmarked based on three different management scenarios. The first scenario (current) is based on Management Agreements and allocation policies currently in place. The second scenario (no commercial) assumes the harvest share that would have been allocated to mainstem non-tribal commercial fisheries is held in reserve as a conservation measure and is not allocated. The final scenario (increased recreational) assumes the harvest share that would have been allocated to mainstem non-tribal commercial fisheries is instead allocated to recreational fisheries downstream from Bonneville Dam.

Scenario	Marked		Unmarked	
	Escapement	Percentage	Escapement	Percentage
Current	24,100	54%	20,400	46%
No Commercial	26,000	55%	21,300	45%
Increased Recreational	24,100	53%	21,300	47%

Summary:

1. About 8% more summer Chinook would reach Wells Dam with no mainstem non-tribal commercial fishing compared to current schedules. If the non-tribal commercial fishery allocation was provided to the recreational fishery downstream from Bonneville Dam, about 5% more fish would reach Wells Dam.
2. The unmarked (wild) percentage of the summer Chinook population that reaches Wells Dam would decrease by 1% with no mainstem non-tribal commercial fishing and would increase by 1% if the non-tribal commercial fishery allocation was provided to the recreational fishery downstream from Bonneville Dam.

Lower River Tule Fall Chinook

Table F.3 below represents a preliminary analysis of a commercial seine fishery in the lower Columbia River at a range of harvest levels (10,000-30,000 handle of lower river tule fall Chinook (LRH)), the corresponding effect on LRH escapement from fisheries compared to 2012 escapement, and the approximate percentage of Endangered Species Act (ESA) impacts for Lower Columbia River tule Chinook needed to prosecute the seine fishery. A 10% release mortality rate was used for the purpose of this analysis, but research is on-going to determine actual release mortality rates from seines and will be applied when available. The range of fisheries displayed in Table F.3 would reduce the LRH escapement from 18-53% and would require 7-20% of the Lower Columbia tule Chinook ESA impacts that were allotted to other in-river fisheries in 2012.

Table F.3. A preliminary analysis of a commercial seine fishery in the lower Columbia River at a range of harvest levels (10,000-30,000 handle of lower river tule fall Chinook (LRH)), the corresponding effect on LRH escapement from fisheries compared to 2012 escapement, and the approximate percentage of Endangered Species Act (ESA) impacts for Lower Columbia River tule Chinook needed to prosecute the seine fishery.

LRH Handle ¹	Number Marked ²	Percentage Reduction in Hatchery Fish Escapement Compared to 2012 Escapement ³	Percentage of Lower Columbia Tule Fall Chinook ESA-Impacts Needed ⁴
10,000	8,700	18%	7%
20,000	17,400	35%	13%
30,000	26,100	53%	20%

¹ This is the LRH portion of the catch only and does not reflect total Chinook harvest.
² Based on 2012 pre-season model with 7.8% LRH ESA-impact rate
³ Reflects percent reduction from 2012 LRH escapement level of 49,400
⁴ Percent of LRH impacts needed to prosecute seine fishery based on total LRH impacts from 2012 model