

12. Columbia River Spring Chinook Historical Briefing

**TABLE OF CONTENTS**

Decision Page/"Green sheet" .....	<i>i-ii</i>
Policy C-3617 .....	1-2
Policy C-3617-Attachement 1.....	3-10
Table A1_2009 Modifications .....	11
2010 Pre-Season Forecasts.....	12-13

## **“GREEN SHEET”**

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**Meeting dates:** January 8-9, 2010, Commission Meeting

**Agenda item #:** Columbia River Spring Chinook Policy

**Staff Contact:** Cindy LeFleur, Columbia River Policy Coordinator,  
Intergovernmental Resource Management Program

**Presenter(s):** Cindy LeFleur, Columbia River Policy Coordinator,  
Intergovernmental Resource Management Program  
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### **Background:**

Columbia River spring Chinook return to tributaries throughout the basin and include hatchery and wild fish. Upriver spring Chinook return to areas above Bonneville Dam and include two components that are listed under the Endangered Species Act (ESA); Snake River spring/summer Chinook and Upper Columbia spring Chinook. The parties to *United States v Oregon* developed a conservation-based fish management plan beginning in 1978 to protect, rebuild, and enhance upper Columbia River fish runs, and since then have developed multi-year management plans incorporating the same principles. The ESA-listed stocks are protected by the *United States v Oregon* management agreement and ESA limits.

The parties to *United States v Oregon* recently completed a new plan covering harvest and production of upriver stocks. This Agreement, titled “2008-2017 *United States vs Oregon* Management Agreement for upriver Chinook, sockeye, steelhead, coho, and white sturgeon” provides specific fishery management constraints for upriver spring Chinook. The Agreement defines treaty Indian and non-Indian fishery allocation of available ESA impacts in the Columbia River, based on forecasted run size and the sliding scale harvest rate schedule defined in the Agreement. The Agreement also includes provisions for equitable catch between non-treaty and treaty Indian fisheries.

### Fishery Management 2010-2012

An amendment to the Agreement was filed in December to adjust spring Chinook fishery management to meet the intent of the spring Chinook catch balancing provision of the Agreement. The amendment includes additional management constraints for non-treaty fisheries. Beginning in 2010, non-treaty fisheries in the Columbia and lower Snake rivers will be managed for a total harvest, including hatchery fish that does not exceed the treaty Indian allowable total harvest of spring Chinook. The non-treaty fisheries will be managed for at least a 30 percent run size buffer prior to the run update to ensure that non-treaty fisheries do not harvest more fish than what is allocated to the treaty Indian fishery. The states may choose to manage for more than 30 percent. In most years, managing for a minimum of 30 percent of the run size will be more conservative than managing for ESA impact limits. The result will be a closer balance of total upriver spring Chinook catch and mortality in treaty Indian and non-treaty fisheries, and there will likely be ESA impacts that remain un-used by the non-treaty fisheries. The early season run size buffer will also provide more assurance of distributing sport harvest of hatchery fish throughout the basin.

### Current Policy

The current policy (C-3617, Attachment 1), provides guiding principles that highlight conservation as the highest priority and fisheries management objectives that are designed to

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provide broad geographic opportunity while considering the needs of the fishing constituents. The policy includes allocation of ESA impacts to sport and commercial fisheries based on a matrix with allocation changing as run sizes change. The policy delegates authority to the Director, through the Columbia River Compact (Compact), to set seasons for sport and commercial fisheries in the Columbia River. The Director will consult with the Commission if it becomes necessary to deviate from the policy to achieve concurrent regulations with Oregon.

### Fishery Management Objectives

Shown below are several of the fishery objectives in the policy with comments regarding the new management guidelines:

1. Limit the wild winter steelhead impact to less than 2 percent. This objective is achieved by monitoring spring Chinook to steelhead abundance ratios before a commercial fishing period is set.
2. In-season management flexibility to utilize impact allocation to meet the objectives of both fisheries. This objective may be more useful with the catch balance provision because early season fisheries will likely be more conservative.
3. Economic value of early portions of the fishery. This can be achieved but may be more limited in some years depending on the run-size. Opportunities for early fisheries through at least the month of March for both sport and commercial can be achieved in most years.
4. Broad geographic opportunity. This will be more easily achieved for fisheries above Bonneville Dam because of the minimum 30 percent run size buffer and the catch balancing provision. Fisheries in the lower Columbia River should have increased opportunity with the apparent upswing in the Willamette River spring Chinook returns.
5. Sport fishing in April with high probability of 45 days in March and April. This objective is more likely when both lower river and upriver spring Chinook stocks are strong. This objective may be harder to achieve in some years, but is dependent on many circumstances, including location of fishery below Bonneville Dam, size of the Willamette spring Chinook return, water conditions such as flow, temperature and turbidity, and actual catch rates in the fishery.

### Catch Balance and the Current Policy C-3617

The current policy allocates ESA impacts to sport and commercial fisheries based on run sizes. Included in each cell of the matrix is a buffer for each fishery – the buffer also changes within the cells of the matrix. The rationale for the buffers is to account for uncertainty in run size forecast and fishery performance and is applied prior to the run size update. In years of high abundance (2010) a larger buffer is applied to the commercial fishery and a smaller buffer is applied to the sport fishery. The policy allocates the ESA impacts and the buffer as a means to achieve the Commission’s fishery objectives outlined above.

Because the *United States v. Oregon* catch balance provision is expected to be more constraining to non-treaty fishery harvest than the ESA impact limit, the ESA allocation matrix must be converted into total catch sharing based on the preseason forecast and then applied to the buffered run size. This method enables the sport/commercial allocation intent of the Commission’s policy to be implemented within the bounds of the *United States v. Oregon* catch balance provision, including sport/commercial allocation in the earlier part of the season prior to the run size update.

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### **Policy issue(s) you are bringing to the Commission for consideration:**

Department staff is not recommending any changes to the current five year policy. The current policy can be applied to the allowable harvest of upriver spring Chinook associated with ESA impact limits as well as the catch balance provisions of *United States v Oregon*. The catch

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balance provisions can be incorporated into the current policy and achieve the objectives of the Commission.

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**Public involvement process used and what you learned:**

Department staff met with the Columbia River Recreational and Commercial Advisory Groups on October 13 and 15, and November 18 and 19 respectively. Public meetings were held November 5, in Vancouver, Washington, and November 10, in Astoria, Oregon. Department staff will meet with the Advisory Groups in January or February to design seasons for 2010.

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**Action requested:**

None. Briefing only.

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**Draft motion language:**

N/A

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**Justification for Commission action:**

N/A

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**Communications Plan:**

A Washington/Oregon department of fish and wildlife joint staff report will be distributed in January 2010 that will detail spring Chinook stock status, review of fisheries and recommendations for future fisheries. A Compact meeting will be held mid-February to set Columbia River spring Chinook fisheries.

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*Form revised 10/16/2008 - sdy*

**FISH AND WILDLIFE COMMISSION  
POLICY DECISION**

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**POLICY TITLE: Mainstem Columbia River  
Spring Chinook Management and  
Allocation for Non-Indian Fisheries, 2009-2013**

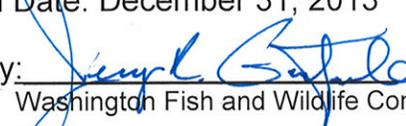
**POLICY NUMBER: C-3617**

Supersedes: C-3617, 2008

Effective Date: January 1, 2009

Termination Date: December 31, 2013

See Also: Attachment 1, and C-3618

Approved by:   
Washington Fish and Wildlife Commission

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**Discussion:** *This policy is similar to Policy C-3617 for 2008, with changes associated with discussion of the Columbia River Fish Working Group (CRFWG). Attachment #1 from Policy C-3617 for 2008 is replaced with recommendations from the CRFWG as amended by the Washington Fish and Wildlife Commission decision of January 16, 2009.*

**Policy:**

Guiding Principles

- The Department serves as the trustee of this public resource and as such is responsible and accountable for sustainable fisheries.
- Conservation and recovery are the highest priorities and will take precedence in managing the resource.
- The Department will comply with the provisions of the *U.S. v Oregon* Management Agreement for upriver spring Chinook.
- Tradeoffs between current harvest benefits and long-term stock well-being will be resolved in favor of the long-term stock well-being.
- The Department must be consistent with prescribed recovery measures in National Marine Fisheries Service Biological Opinions, and safeguard the health and viability of all salmon stocks as a precondition for harvest.
- Manage harvest to meet hatchery goals.
- The Department must meet conservation requirements for wild spring Chinook and wild winter steelhead, including populations listed under the federal Endangered Species Act.
- The Department will manage harvest consistent with the applicable recovery management objectives.

Selective Fishery and Enforcement Guidelines

- All fishers will comply with selective fisheries rules and standards.
- The Department will continue to make improvements in the selectivity of recreational and commercial fishery gear through research and feasibility studies.
- The Department will develop and implement a strategy for public communications and outreach on compliance issues.
- The Department will continue to pursue strategies to enhance enforcement efforts and successful prosecution through the use of observer programs, increased enforcement presence, and cooperative work with local prosecutors.
- The Commission expects recreational and commercial fishing sectors to demonstrate responsibility for continuous learning and skills development for selective harvest practices.

### Columbia River Fish Working Group (CRFWG)

- The Commission supports the CRFWG Phase I process to develop short-term recommendations regarding sport/commercial allocation of spring and summer Chinook.
- The Commission supports the CRFWG Phase II process to develop long-term fishery management plans and strategies to assist in recovery of Columbia River salmon and steelhead resources.

### Fisheries Management Objectives

- The Department will manage the mainstem Columbia River spring Chinook fisheries to limit the wild winter steelhead impact to less than 2%.
- The Department will exercise in-season management flexibility to utilize the non-Indian upriver spring Chinook impact allocation to meet the objectives of both fisheries, i.e., upriver impact sharing adjustments in response to in-season information pertaining to catch and run size.
- The Department will recognize the economic benefits of recreational and commercial fisheries in the Columbia River and associated value of the early portions of the fisheries.
- The Department will provide for sport fisheries throughout the Columbia River downstream of McNary Dam, sport/tribal fisheries in the Snake River and upper Columbia River, and commercial and sport fisheries in select areas, as well as in the mainstem below Bonneville Dam.
- The Department will ensure broad geographic distribution of the sport fishing opportunity in the main-stem Columbia River.
- Harvestable Lower Columbia River spring Chinook should provide opportunity to areas below the Willamette River.
- Extend sport fishing opportunity as far into April as possible downstream of Bonneville Dam, with a high probability of an uninterrupted 45-day season March-April.

### Delegation of Authority

The Washington Fish and Wildlife Commission delegates the authority to the Director, through the Columbia River Compact process, to set seasons for sport and commercial fisheries in the Columbia River consistent with Policy C-3617, and to adopt permanent and emergency regulations to implement these fisheries. The Director shall work with the Oregon Department of Fish and Wildlife to achieve implementation of this Commission action in a manner that results in concurrent regulations between the two states. The Director shall consult with the Commission if it becomes necessary to deviate from the Commission's Policy to achieve concurrent regulations with Oregon.

### Allocation of Upriver Spring Chinook Impacts and Fishery Management Plan

The Commission adopts the recommendations of the CRFWG, and except the commercial buffer is reduced by 10% (e.g., 50% to 40%), and except there would be up to 10% flexibility in the recreational buffer in order to meet management objectives.

## **Columbia River Sport and Commercial Spring Chinook Fisheries: Objectives and Strategies for Near- and Long-Term Management**

Working Draft – Final  
11-25-08

### **1. Background:**

- a. Specific state statutes and policies inform the management of spring Chinook fisheries.
  - i. It is the policy of the State of Oregon (506.109: “Food fish management policy”) that food fish shall be managed to provide the optimum economic, commercial, recreational, and aesthetic benefits for present and future generations of the citizens of this state. Toward that end, the policy defines as a goal “To permit an optimum and equitable utilization of available food fish.” It is also the policy of the state (496.012: “Wildlife policy”) that wildlife shall be managed to prevent serious depletion of any indigenous species and to provide the optimum recreational and aesthetic benefits for present and future generations of the citizens of this state.
  - ii. Washington wildlife, fish, and shellfish are the property of the state. The commission, director, and the department shall preserve, protect, perpetuate, and manage the wildlife and food fish, game fish, and shellfish in state waters and offshore waters. The department shall conserve the wildlife and food fish, game fish and shellfish resources in a manner that does not impair the resource. In a manner consistent with this goal, the department shall seek to maintain the economic well-being and stability of the fishing industry in the state. The department shall promote orderly fisheries and shall enhance and improve recreational and commercial fishing in this state (RCW 77.04.012).
- b. Recreational, commercial and tribal fisheries in the Columbia River are significantly constrained by conservation limits associated with the survival and recovery of wild fish listed under the Endangered Species Act (ESA). These limits are set by National Marine Fisheries Service (NMFS) to ensure fisheries do not jeopardize survival and contribute to recovery.
- c. Treaty Indian and non-Indian fishery allocation of available ESA impacts in the Columbia River are determined each year based on forecasted run size according to a sliding scale defined in the “2008-2017 *United States v. Oregon* Management Agreement.”
- d. In general, the available impact for non-tribal sport and commercial Columbia River fisheries is approximately 2% but may range from 0.5% to 2.7%. Fisheries are managed conservatively within these strict limits.
- e. State management of these fisheries, including technical methodology is reviewed and approved by NMFS to ensure consistency with ESA, and by other co-managers to ensure consistency with *U.S. v Oregon* agreements.
- f. This proposal represents the consensus recommendation of subcommittees from the Oregon and Washington Fish and Wildlife Commissions on the near-term and long-term management of the Columbia River spring Chinook fishery.

## 2. **Problems:**

- a. The primary constraint on sport and commercial mainstem spring Chinook fisheries is low numbers and survival of wild and hatchery fish caused by life-cycle mortalities including, but not limited to, the Columbia River hydropower system, habitat degradation, predation and hatchery practices. Reduced hatchery returns constrain fisheries directly; reduced ESA-listed fish returns constrain fisheries by severely limiting access to hatchery fish because of incidental impacts on ESA-listed fish.
- b. Pre-season forecasts of run size are uncertain and run timing is variable, making it difficult to confidently structure fisheries during March and April.
- c. Allocation of the approximate 2% listed-fish impact between sport and commercial fisheries is highly contentious and affects the structure of the fishery. Allocating ESA impacts without commonly endorsed fishery management objectives perpetuates controversy, and pits legitimate fishery interests against each other. This is because an allocation-based focus is a “zero-sum” debate; when one side gains, the other loses.
- d. Complexity of the fisheries and regulatory constraints complicate efforts to explain how management effectively meets fisheries objectives and conservation responsibilities.

## 3. **Objectives and Priorities:**

### a. **Near Term (2009-2013)**

#### i. Mainstem sport fisheries:

##### (a) Downstream from Bonneville Dam:

- 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.

##### (b) Upstream from Bonneville Dam: A high likelihood that the fisheries in the mainstem Columbia and Snake rivers will not be subject to emergency closures.

#### ii. Select Area commercial fishery: Harvest levels at least similar to those in recent years.

#### iii. Mainstem commercial fishery:

- Before the run-size update: Harvest opportunity in March and April.
- After the run-size update: If impacts remain, maximum harvest opportunity in May given available impacts and consistent with other fishery management objectives.

### b. **Long Term (2014-2018)**

#### i. Mainstem sport fisheries: Certainty in when, where, and how long fisheries are open.

#### ii. Select Area commercial fishery: Relatively stable harvest of approximately 12,000 or more spring Chinook per year in Select Areas (represents

approximately the total Select Area and mainstem spring Chinook commercial fishery in the recent past).

- iii. Mainstem commercial fishery: Harvest opportunity in March and April and, if impacts remain, after the run-size update.

#### 4. **Managing Uncertainty in Run Size Forecasts and Fisheries Performance**

##### a. **In general:**

- i. To account for uncertainties in the information used to plan and implement fisheries, a management buffer in fishery structure will be established and applied to fisheries occurring prior to the run size update (primarily in March and April).
- ii. Fisheries managers will use the in-season run size update provided by the *U.S. v. Oregon* Technical Advisory Committee (TAC).
- iii. The buffer is intended to be sufficient to cover potential run-size forecasting error and ensure compliance with ESA requirements and *U.S. v. Oregon* allocation provisions.

- b. **Near Term:** The buffer will be approximately 35% of the allowable impacts and will be allocated as described below in Table 1. The share of the buffer allocated to the sport and commercial fisheries will vary as a function of the proportion of impacts assigned to each fishery. When the sport fishery share is  $> 65\%$ , each fishery's contribution to the buffer will be approximately 35% of its assigned impacts. When the sport fishery share is  $\leq 65\%$ , the sport fishery's contribution to the buffer will be approximately 25% of its assigned impacts, and the commercial fishery's share will be approximately 50% of its assigned impacts.

To minimize the likelihood of emergency closures of the sport fishery downstream from Bonneville Dam prior to the run-size update, up to 5% of the impacts assigned for use by the sport fishery, but held in reserve as the buffer, may be used to achieve the scheduled season.

- c. **Long Term:** The buffer may be less than that used in the near term as improvements are made to run size forecasting ability.

#### 5. **Solutions:**

##### a. **Near Term:**

- i. Sharing the available impacts among the sport and commercial fisheries: Total available impacts, as determined by the *U.S. v. Oregon* harvest schedule, will be shared as described in Table 1. The share assigned to each fishery will vary as a function of the run size of upper Columbia River and Willamette spring Chinook. The sharing formula represents the high priority placed on providing a high likelihood that the sport fishery downstream from Bonneville Dam will remain open for at least 45 days in March and April.

- ii. Sharing the impacts assigned to the mainstem sport fisheries: Seventy-five percent (75%) of the impacts allocated to the sport fisheries for use prior to the run-size update will be assigned to the sport fishery downstream from Bonneville Dam. Twenty-five percent (25%) will be assigned and reserved for the sport fishery upstream from Bonneville Dam. Providing a full sport fishery upstream from Bonneville Dam will be the highest sport fishery priority after the run-size update, however, if under certain forecasted run sizes, less than 25% of the impacts available are needed to achieve this objective, the “surplus” can be used to provide additional sport or commercial fishing opportunity downstream from Bonneville Dam.

**Table 1.** Percent of total available impacts, as determined by the *U.S. v. Oregon* harvest schedule, assigned to sport and commercial fisheries at different run sizes for upper Columbia and Willamette spring Chinook. The base case represents range of run sizes that most frequently have occurred in the recent past.

Run Size of Upriver Columbia Spring Chinook	Run Size of Willamette Spring Chinook	
	Low (<50,000)	High (>50,000)
<b>Very Low (&lt;33,000)</b>	Share = 85/15%	Share = 75/25%
	Buffer = 35% of sport fishery impact + 35% of commercial fishery impact	Buffer = 35% of sport fishery impact + 35% of commercial fishery impact
<b>Low (33,000 – 55,000)</b>	Share = 75/25%	Share = 70/30%
	Buffer = 35% of sport fishery impact + 35% of commercial fishery impact	Buffer = 35% of sport fishery impact + 35% of commercial fishery impact
<b>Medium-High (55,000 – 271,000)</b>	Share = 70/30%	Share = <b>65/35% (base)</b>
	Buffer = 35% of sport fishery impact + 35% of commercial fishery impact	Buffer = 25% of sport fishery impact + 50% of commercial fishery impact
<b>Very High (&gt;271,000)</b>	Share = 60/40%	Share = 55/45%
	Buffer = 25% of sport fishery impact + 50% of commercial fishery impact	Buffer = 25% of sport fishery impact + 50% of commercial fishery impact

- iii. Select Area commercial fishery: Commercial fisheries in the select areas will be allocated an impact level of 0.15% for use prior to the run size update. This will enable the fisheries to be managed similarly to recent years.
- iv. Sharing the impacts available after the run-size update (post-update): The impacts remaining after the run-size update will be allocated so that the sport/commercial share of the total available impacts is approximately equal to that defined in Table 1 for the updated run size of upper Columbia and Willamette spring Chinook. If the level of post-update impacts available to a fishery, based on Table 1, exceeds that necessary to meet its objectives, the balance will be reallocated to those fisheries that can use it.

Appendix Tables 1-3 estimate the performance of fisheries under the near-term management strategy described above. The Commissions will periodically review the performance of the near-term management plan with respect to achieving the fishery objectives in Section 3. The Commissions may consider modifications of the near-term plan prior to 2014 if they determine that its fishery objectives are not being met.

b. **Long Term:**

i. In general:

- (a) Continue leadership promoting improved life-cycle survival of spring Chinook, including improvements to the Columbia River hydropower system, habitat, predation management, and hatchery practices. Encourage **all** fish and fishing groups work together to promote these improvements.
- (b) Provide additional resources to ensure conservation effectiveness of spring Chinook fishery management, including enhanced monitoring, improved run size forecasting ability, and improved estimation of catch.
- (c) Amend the Willamette River Fishery Management Plan specifically to address reduced hatchery broodstock requirements based on fish health improvements.
- (d) Continue moving away from allocation-based fishery management to objective-based fishery management. This shift allows solutions that may improve **both** fisheries, rather than improving one fishery at the expense of another. This approach will require both sides to concede some ground on their stated positions in order to gain actual improvements in their fisheries. It will also require investment of additional resources in commercial fishery infrastructure and several years' patience to implement changes.
- (e) Maintain hatchery production and funding at levels that ensure viable commercial and sport fisheries. Ensure these fisheries have the capacity to harvest sufficient numbers of hatchery fish to meet hatchery reform provisions.
- (f) Ensure that funding is secured for implementation of programs necessary to meet long-term fishery management objectives.
- (g) Seek support and commitments from all fishery sectors regarding long-term fishery management plans.

ii. Mainstem sport fishery:

- (a) Stabilize fishing seasons. Provide fishing opportunity in April consistent with conservation and other management objectives.
- (b) Provide opportunity throughout the lower Columbia River.
- (c) Use sport advisory groups and surveys to consider tradeoffs and shape the fishery.
- (d) Utilize days per week and other fishery management tools to help meet objectives and priorities.
- (e) Base pre-season structure of the fishery on conservative assumptions (e.g., catch rates, effort) to minimize chance of not meeting objectives.
- (f) Continue to provide opportunities and resources to further develop selective sport fishing techniques with a goal of reducing mortality of listed fish and increasing access to hatchery fish.
- (g) Allocate some proportion of the buffer to the sport fishery

iii. Select Area commercial fishery:

- (a) Provide impacts necessary for Select Area commercial fisheries as top priority. Assume at least 10% of allowed non-tribal impacts will be required (minimum of 0.20% on average).
- (b) Increase number and priority of smolt releases in Select Areas (up to 1M smolts reprogrammed from other areas e.g. Willamette River);
- (c) Provide the infrastructure to support these additional fish (e.g., additional net pens, trucking costs, hatchery rearing space, and personnel);
- (d) Pursue opportunities to liberalize regulations of Select Area fisheries (e.g. expanding boundaries in late winter). This will require additional impacts allocated to Select Area fisheries.
- (e) Develop new select areas in Washington and Oregon with reciprocity. This will require additional impacts allocated to Select Area fisheries.
- (f) Utilize cost-effective area, timing and gear options to maximize harvest and minimize impacts, as necessary.

iv. Mainstem commercial fishery:

- (a) Incrementally reduce the impact allocated to the mainstem commercial fishery when run sizes are low and incrementally increase it as run sizes increase.
- (b) Continue to provide opportunities and resources to further develop selective commercial fishing techniques with a goal of reducing mortality of listed fish and increasing access to hatchery fish.
- (c) Define commercial fishery contribution to the buffer as follows:
  - Do not include Select Areas fisheries in the buffer.
  - Determine impacts for mainstem commercial fishery based on sliding scale preseason forecast.
  - Allocate some proportion of the buffer to the mainstem commercial fishery

Appendix  
Recommendations for CHS Fishery Management  
Working Draft - Final (11-25-08)

**Hindcasts of the relative performance of sport and commercial spring Chinook fisheries in the Columbia River prior to the run-size update under the near-term fisheries management plan**

Table 1. Allowable impacts assigned to and estimated numbers of upriver spring Chinook harvested by sport and commercial fisheries before the run-size forecast is updated (pre-update) for run sizes forecast in 1999-2008, and for a hypothetical run-size forecast with a low Willamette return. Total allowable impacts equal those allowed under the U.S. v Oregon harvest rate schedule. The share of total allowable impacts assigned to sport and commercial fisheries was determined using a matrix based on run sizes of upriver Columbia and Willamette spring Chinook. For the period before the run-size forecast is updated, sport fisheries are managed not to exceed 65-75% of their total allowable impacts and commercial fisheries are managed not to exceed 50-65% of their total allowable impacts, depending on their share of those impacts. As a result, approximately thirty-five percent of the total impacts allowed under U.S. v. Oregon are held in reserve as a “buffer” until the run-size forecast is updated to account for uncertainty. An impact level of 0.15%, is assigned to select area fisheries. Sport fisheries include areas downstream and upstream of Bonneville Dam. Harvest estimates assume the mainstem commercial fishery uses tangle-net gear.

Year	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	Average (1999-2008)	Hypothetical w/ low Willamette run size
<b>Forecasted run size</b>	24,600	134,000	364,600	333,700	145,400	360,700	254,100	88,400	78,500	269,300	225,411	300,000
<b>Total allowable impact</b>	0.500%	1.700%	2.300%	2.300%	1.900%	2.300%	2.000%	1.600%	1.500%	2.000%	2.000%	2.200%
<b>Sport/commercial fishery shares of total allowable impact</b>	75/25%	65/35%	55/45%	55/45%	65/35%	55/45%	65/35%	65/35%	65/35%	65/35%	65/35%	60/40%
<b>Pre-update sport fishery impact (65-75% of its share of total allowable, depending on run size)</b>	0.175 <sup>a</sup> %	0.829%	0.949%	0.949%	0.926%	0.949%	0.975%	0.780%	0.731%	0.975%	0.975%	0.990%
<b>Pre-update commercial fisheries impact (50-65% of its share of total allowable depending on run size)</b>	0.150%	0.298%	0.518%	0.518%	0.333%	0.518%	0.350%	0.280%	0.263%	0.350%	0.350%	0.440%
<b>Pre-update commercial fisheries impact assigned to Select Area and winter sturgeon fisheries</b>	0.150%	0.150%	0.150%	0.150%	0.150%	0.150%	0.150%	0.150%	0.150%	0.150%	0.150%	0.150%
<b>Pre-update commercial fisheries impact assigned to mainstem salmon fisheries</b>	0.000%	0.148%	0.368%	0.368%	0.183%	0.368%	0.200%	0.130%	0.113%	0.200%	0.200%	0.290%
<b>Pre-update sport fishery harvest of upriver fish (assuming 75% mark rate)</b>	325	8,329	25,944	23,745	10,101	25,666	18,581	5,171	4,305	19,693	16,483	22,275
<b>Pre-update select area fishery harvest of upriver fish</b>	37	201	547	501	218	541	381	133	118	404	338	450
<b>Pre-update mainstem commercial fishery harvest of upriver fish (assuming 75% mark rate)</b>	0	1,008	6,836	6,257	1,354	6,763	2,593	586	451	2,748	2,300	4,439

<sup>a</sup> Under this very low forecasted run size, the 0.15% impact level assigned to commercial fisheries in the select areas is more than 25% of the available impact. This means the mainstem commercial fishery would not be assigned any pre-update impacts, and the sport fishery impact = (total allowable impact) x (0.65) - (0.15).

Appendix  
Recommendations for CHS Fishery Management  
Working Draft - Final (11-25-08)

**Hindcasts of the relative performance of sport and commercial spring Chinook fisheries in the Columbia River after the run-size update under the near-term fisheries management plan**

Table 2. Allowable impacts assigned to and estimated numbers of upriver spring Chinook harvested by sport and commercial fisheries after the run-size forecast is updated (post-update) for run sizes occurring in 1999-2008, and for a hypothetical run-size forecast with a low Willamette return. These impacts equal those allowed under the U.S. v Oregon harvest rate schedule for the final run size minus the impact used before the run size update adjusted for the difference between pre- and post-update run size. Available post-update impacts are shared between the sport and commercial fisheries so that the final percent of impacts used by each fishery approximates that in the matrix for the final upriver Columbia spring Chinook run size. None of the commercial share of the post-update impacts needs to be assigned to select area fisheries because their season is over. Sport fisheries include areas downstream and upstream of Bonneville Dam. Harvest estimates assume the mainstem commercial fishery uses large-mesh gear.

Year	1999	2000	2001	2002	2003	2004 <sup>a</sup>	2005 <sup>a</sup>	2006	2007	2008 <sup>a</sup>	Average (1999-2008)	Hypothetical w/ low Willamette run size
<b>Final run size</b>	38,700	178,600	416,500	295,100	208,900	193,400	106,900	132,100	86,200	178,700	199,600	300,000
<b>Total allowable impact</b>	1.000%	1.900%	2.500%	2.200%	1.900%	1.900%	1.600%	1.700%	1.600%	1.900%	1.900%	2.200%
<b>Sport/commercial fishery shares of total allowable impact</b>	70/30%	65/35%	55/45%	55/45%	65/35%	65/35%	65/35%	65/35%	65/35%	65/35%	65/35%	60/40%
<b>Post-update allowable impact (total minus impact used before the run-size update, adjusted for difference in pre- and post-update run size)</b>	0.793%	1.055%	1.216%	0.542%	1.024%	0%	0%	0.991%	0.695%	0%	0.404%	0.770%
<b>Post-update sport fishery impact (adjusted so overall share approximates that in matrix)</b>	0.588%	0.613%	0.544%	0.137%	0.590%	0%	0%	0.583%	0.374%	0%	0.134%	0.330%
<b>Post-update commercial fisheries impact (adjusted so overall share approximates that in matrix)</b>	0.205%	0.442%	0.672%	0.405%	0.434%	0%	0%	0.408%	0.321%	0%	0.270%	0.440%
<b>Post-update sport fishery harvest of upriver fish (assuming 75% mark rate and sport fishery uses all its impacts)</b>	1,707	8,214	17,008	3,035	9,249	0	0	5,776	2,418	0	2,005	7,425
<b>Post-update mainstem commercial fishery harvest of upriver fish (assuming 75% mark rate and commercial fishery uses all its impacts)</b>	149	1,479	5,248	2,240	1,698	0	0	1,010	519	0	1,010	2,475

a: final run size and total allowable impact were less than forecasted and impacts used by the fisheries pre-update would have exceeded those allowed under the final run size. As a result, no impacts would be available for fisheries post-update.

Appendix  
Recommendations for CHS Fishery Management  
Working Draft - Final (11-25-08)

**Hindcasts of the relative performance of sport and commercial spring Chinook fisheries in the Columbia River overall under the near-term fisheries management plan**

Table 3. Summary of allowable impacts assigned to and estimated numbers of upriver spring Chinook harvested by sport and commercial fisheries for run sizes occurring in 1999-2008, and for a hypothetical run-size forecast with a low Willamette return. Assumes fisheries are able to use all the impacts assigned to them. Total allowable impacts equal those allowed under the U.S. v Oregon harvest rate schedule for the final run size. Sport fisheries include areas downstream and upstream of Bonneville Dam. Commercial fisheries include select areas.

Year	1999	2000	2001	2002	2003	2004 <sup>a</sup>	2005 <sup>a</sup>	2006	2007	2008 <sup>a</sup>	Average (1999-2008)	Hypothetical w/ low Willamette run size
<b>Forecasted run size</b>	24,600	134,000	364,600	333,700	145,400	360,700	254,100	88,400	78,500	269,300	225,411	300,000
<b>Final run size</b>	38,700	178,600	416,500	295,100	208,900	193,400	106,900	132,100	86,200	178,700	199,600	300,000
<b>Total allowable impact</b>	1.000%	1.900%	2.500%	2.200%	1.900%	1.900%	1.600%	1.700%	1.600%	1.900%	1.900%	2.200%
<b>Total sport fishery harvest of upriver fish (assuming 75% mark rate and sport fishery uses all its impacts)</b>	2,032	16,543	42,952	26,780	19,349	25,666	18,581	10,948	6,724	19,693	18,488	29,700
<b>Projected closing date for sport fishery downstream from Bonneville Dam pre-update (assumes open 7 days/ week)</b>	23-Mar	8-Apr	15-Apr	15-Apr	9-Apr	29-Apr	14-May	6-Apr	8-Apr	23-Apr	15-Apr	16-Apr
<b>Projected closing date for sport fishery downstream from Bonneville Dam pre-update (assumes open 3 days/ week)</b>	28-Mar	16-Apr	2 May	7 May	16-Apr	14-May	14-May	12-Apr	16-Apr	14-May	9-May	14-May
<b>Total commercial fishery harvest of upriver fish (assuming 75% mark rate and commercial fishery uses all its impacts)</b>	185	2,689	12,631	8,997	3,270	7,304	2,974	1,729	1,087	3,152	3,648	7,364
<b>Total sport fisheries impact</b>	0.700%	1.235%	1.375%	1.210%	1.235%	1.769%	2.318%	1.105%	1.040%	1.469%	1.235%	1.320%
<b>Total commercial fisheries impact</b>	0.300%	0.665%	1.125%	0.990%	0.665%	0.965%	0.832%	0.595%	0.560%	0.527%	0.665%	0.880%
<b>Final sport fisheries share of allowable impacts</b>	70%	65%	55%	55%	65%	65%	74%	65%	65%	74%	65%	60%
<b>Final commercial fisheries share of allowable impacts</b>	30%	35%	45%	45%	35%	35%	26%	35%	35%	26%	35%	40%

a: final run size and total allowable impact were less than forecasted. As a result, no fishing would have occurred post-update and total impacts used by sport and commercial fisheries would have exceeded those allowed. Sport/commercial shares of impacts used approximate that planned pre-update.

Table A1. Spring Management Period Harvest Rate Schedule

Harvest Rate Schedule for Chinook in Spring Management Period							
A	B	C	D	E	F	G	H
Total Upriver Spring and Snake River Summer Chinook Run Size <sup>6</sup>	Snake River Natural Spring/Summer Chinook Run Size <sup>1</sup>	Treaty Zone 6 Total Harvest Rate <sup>2,5</sup>	Treaty Catch Guideline	Non-Treaty Natural Harvest Rate <sup>3</sup>	Non-Treaty Mortality Guideline	Total Natural Harvest Rate <sup>4</sup>	Non-Treaty Natural Limited Harvest Rate <sup>4</sup>
<27,000	<2,700	5.0%		<0.5%		<5.5%	0.5%
27,000	2,700	5.0%	1,350	0.5%	1,350	5.5%	0.5%
33,000	3,300	5.0%	1,650	1.0%	1,650	6.0%	0.5%
44,000	4,400	6.0%	2,640	1.0%	2,640	7.0%	0.5%
55,000	5,500	7.0%	3,850	1.5%	3,850	8.5%	1.0%
82,000	8,200	7.4%	6,068	1.6%	6,068	9.0%	1.5%
109,000	10,900	8.3%	9,047	1.7%	9,047	10.0%	
141,000	14,100	9.1%	12,831	1.9%	12,831	11.0%	
217,000	21,700	10.0%	21,700	2.0%	21,700	12.0%	
271,000	27,100	10.8%	29,268	2.2%	29,268	13.0%	
326,000	32,600	11.7%	38,142	2.3%	38,142	14.0%	
380,000	38,000	12.5%	47,500	2.5%	47,500	15.0%	
434,000	43,400	13.4%	58,156	2.6%	58,156	16.0%	
488,000	48,800	14.3%	69,784	2.7%	69,784	17.0%	

Footnotes for Table A1.

1. If the Snake River natural spring/summer forecast is less than 10% of the total upriver run size, the allowable mortality rate will be based on the Snake River natural spring/summer Chinook run size. In the event the total forecast is less than 27,000 or the Snake River natural spring/summer forecast is less than 2,700, Oregon and Washington would keep their mortality rate below 0.5% and attempt to keep actual mortalities as close to zero as possible while maintaining minimal fisheries targeting other harvestable runs.

2. Treaty Fisheries include: Zone 6 Ceremonial, subsistence, and commercial fisheries from January 1-June 15. Harvest impacts in the Bonneville Pool tributary fisheries may be included if TAC analysis shows the impacts have increased from the background levels.

3. Non-Treaty Fisheries include: Commercial and recreational fisheries in Zones 1-5 and mainstem recreational fisheries from Bonneville Dam upstream to the Hwy 395 Bridge in the Tri-Cities and commercial and recreation SAFE (Selective Areas Fisheries Evaluation) fisheries from January 1-June 15; Wanapum tribal fisheries, and Snake River mainstem recreational fisheries upstream to the Washington-Idaho border from April through June. Harvest impacts in the Bonneville Pool tributary fisheries may be included if TAC analysis shows the impacts have increased from the background levels.

4. If the Upper Columbia River natural spring Chinook forecast is less than 1,000, then the total allowable mortality for treaty and non-treaty fisheries combined would be restricted to 9% or less. Whenever Upper Columbia River natural fish restrict the total allowable mortality rate to 9% or less, then non-treaty fisheries would transfer 0.5% harvest rate to treaty fisheries. In no event would non-treaty fisheries go below 0.5% harvest rate.

5. The Treaty Tribes and the States of Oregon and Washington may agree to a fishery for the Treaty Tribes below Bonneville Dam not to exceed the harvest rates provided for in this Agreement.

6. If the total in river run is predicted to exceed 380,000, the Parties agree to consider increasing the total allowed harvest rate and to reinstate consultation with NOAA Fisheries if necessary.

**2010 Pre-Season Forecasts for Upriver Spring Chinook  
by the U.S. v. Oregon Technical Advisory Committee**

December 9, 2009

The *U.S. v. Oregon* Technical Advisory Committee (TAC) is charged with making pre-season forecasts for various Columbia River stocks. Members of the TAC include biologists from Idaho Department of Fish and Game (IDFG), Oregon Department of Fish and Wildlife (ODFW), Washington Department of Fish and Wildlife (WDFW), National Marine Fisheries Service (NMFS), U.S. Fish and Wildlife Service (USFWS), the four Columbia River Treaty Tribes (Yakama, Umatilla, Warm Springs, and Nez Perce) and the Shoshone Bannock Tribes. Each year, the TAC uses a variety of data including harvest data, dam counts, hatchery returns, and wild return data to reconstruct the upriver spring Chinook runs. These data are used to generate pre-season forecasts that are used for planning fisheries. TAC also updates the actual run size during the spring as fish pass Bonneville Dam.

It is important to remember that pre-season forecasts are only used for planning the early season fisheries before the run sizes are updated in-season. The *U.S. v. Oregon* Management Agreement requires that fisheries are to be managed based on the actual run sizes, not the pre-season forecasts. Both treaty Indian and non-treaty Chinook fisheries in the mainstem and Snake River downstream of Lower Granite are managed based on Columbia River mouth run sizes, not Bonneville Dam counts.

**Historic Forecast Methods:**

Chinook salmon return at a variety of ages. Columbia River spring Chinook are primarily yearling type fish, spending a full year rearing in fresh water before migrating to the ocean. Some male Chinook spend only one winter in the ocean before returning to freshwater at three years of age, and are known as jacks. Typically, most of each year's return is four year old fish which spend two years at sea. Fewer fish return at five years old. Relationships between the different ages of fish within a cohort have historically been fairly strong, with large jack returns resulting in large age-4 returns in the following year. TAC has used these relationships to make pre-season forecasts, generally by using linear regression models.

There is always variation between the pre-season forecasts and the actual returns. Since the late 1970's, there has been nearly the same number of over-forecasts as under-forecasts indicating little bias in the predictor models. In some years such as 2007, the forecast was close to the actual return. However, in four of the last six years the actual return has been less than the forecast by an average of 45%, which has complicated in-season management. The relationship between jacks and adult fish in the last few years has differed from historic patterns. As a result, TAC examined several modifications and alternatives to the forecast methodology.

**New Forecast Methods:**

Methods examined include non-linear relationships, ocean environmental variables, and sibling relationships. TAC met with ocean ecologists and sought input from other scientists within and outside the TAC member agencies. TAC tested all methods to evaluate model performance had they been used in the past. All of these methods performed well in some years but not in other

years. Past model performance is not a reliable indicator of how accurate the 2010 forecast will be since the 2009 jack count data is well outside of the range of the historic data sets. Uncertainty can be compounded when relationships between variables such as jacks to age-4s are changing, as was apparent in the 2007 and 2008 returns.

TAC examined more than a dozen models that produced 2010 return estimates ranging from 264,000 to 810,000 adults. Based on the hindcast performance of each model in predicting recent adult returns TAC chose seven models that ranged from 366,000 to 528,000 adults. TAC's forecast for the 2010 upriver spring Chinook return is 470,000 adults to the Columbia River mouth, which is the average of the point estimates for the seven models. This forecast includes 272,000 (73,400 wild) Snake River spring/summer Chinook adults and 57,300 (5,700 wild) Upper Columbia spring Chinook adults, with the remainder comprised of mid-Columbia fish. Other forecasts will be distributed separately as they become available.

#### **Run Size Updates:**

Accurate in-season run size updates are critical for managing fisheries to stay within the allowed harvest rates. TAC usually updates the run size when about 50% of the run has passed Bonneville Dam. TAC will continue to examine methods to update the run size as early as possible.