

**Joint-State Columbia River Fishery Policy Review Committee**  
**Effects of Harvest Reform Allocation Changes on Angling Opportunity and Angler Trips**  
**in the Lower Columbia River Recreational Fishery**  
*November 18, 2019*

**Background**

One of the objectives of the Harvest Reform Policy was to further prioritize recreational fisheries in the mainstem Columbia River by assigning these fisheries “a sufficient share of ESA impacts and harvestable surplus to enhance current fishing opportunity and economic benefit”.<sup>1</sup> In estimating potential effects of allocation shifts on recreational angler trips during the development of the original policy in late 2012, agency staffs had to make assumptions about the effects of increased ESA impacts, angler catch and effort patterns, and other variables affecting how allowable impacts convert to angler trips. These assumptions, as well as the process used, are described in detail in Appendix C of the document “Management Strategies for Columbia River Recreational and Commercial Fisheries: 2013 and Beyond” (hereafter 2012 Workgroup Document). Modeled outputs derived from these assumptions were used to assess the expected effects of allocation changes on angler trips. Importantly, this approach could not incorporate issues such as in-season run size changes and variances in fishing conditions, etc., which can have a substantial effect on the fisheries independent from allocation policies. The effort was targeted at assessing what might be expected under varying future policy choices. During the review of the Transition Period results, ODFW evaluated the effects of the allocation changes on the recreational fishery, using observed fishery data for 2013-2018, following the Policy’s phased shifts in allocations from the commercial to recreational fisheries (Table 1). That analysis was meant to assess what actually occurred in those seasons, as well an assessment of what might have occurred had a different policy been in place, not to evaluate the effects of different policy choices looking forward.

**Table 1. Summary of ESA impact and harvest sharing as defined in Harvest Reform rules/policy. Shares percentages are listed as recreational/commercial.**

Species/Stock	Transition Period				Long-term
	2013	2014	2015	2016	2017+
Spring Chinook	65/35	70/30			80/20 <sup>a</sup>
Summer Chinook (<Priest Rapids)	60/40		70/30		80/20 <sup>b</sup>
Sockeye <sup>c</sup>	70/30				80/20
LCR Fall Chinook <sup>d</sup>	≤70/≥30				≤70/≥30 <sup>e</sup>
SRW Fall Chinook <sup>f</sup>	≤70/≥30				≤70/≥30 <sup>e</sup>
LCN Coho <sup>g</sup>	Priority to Select Area and mainstem Chinook commercial fisheries				Priority to Select Area, mainstem Chinook, and hatchery Coho commercial fisheries
Chum	No retention. Share sufficient to implement Select Area and mainstem commercial fisheries targeting other species.				
White Sturgeon	80/20 (when retention allowed)				

<sup>a</sup> Oregon policy allows post-run update mainstem commercial fishery using tangle nets if impacts remain available, above what is needed for Select Areas; Washington policy (through 2018) requires any spring mainstem commercial fishery to use alternative gears other than tangle net.

<sup>b</sup> By policy, any mainstem commercial summer Chinook fishery must use alternative gears. WA policy through 2018.

<sup>c</sup> Commercial share for incidental harvest in Chinook-directed fisheries.

<sup>d</sup> Lower Columbia River natural-origin tule fall Chinook (LCR).

<sup>e</sup> Oregon policy allocation is ≤70/≥30 (with no more than 2% of 30% applied to alternative gear types) and Washington policy allocation is ≤75/≥25 through 2018, and ≤80/≥20 thereafter. Washington policy is only reflected through 2018.

<sup>f</sup> Snake River Wild fall Chinook (SRW).

<sup>g</sup> Lower Columbia River natural-origin Coho (LCN).

## Analytical Methods

As identified in the Harvest Reform Policy, the primary measures of “fishing opportunity and economic benefit” for the recreational fishery are open fishing days during the season and angler trips, respectively. Therefore, ODFW’s analysis focused on the effect of Harvest Reform allocation changes on these metrics. Since angler trips in the “Zone 6” recreational fishery above Bonneville Dam have only been estimated since a creel program was implemented in 2017, the analysis was limited to the recreational fishery below Bonneville Dam, as effort data for this fishery were available for the entire Policy implementation period. The lower river fishery also constitutes the vast majority of the angling effort in areas of the Columbia affected by the Policy. Because the number of angler trips made in a given year in the lower Columbia River recreational fishery is highly correlated with salmon run size, simply comparing total angler trips between years would not accurately determine the effect of Harvest Reform allocation changes on angling effort, due to the confounding effects of run size.<sup>2</sup> To control for the effects of run size and other non-Policy factors (e.g. river conditions) on the number of angler trips made in a particular year, ODFW developed an analytical approach that compared each lower river recreational fishery (by season) in 2013 through 2018, as they actually occurred with enhanced (post-Reform) allocations, with the same fisheries modeled at lower pre-Reform allocations (using 2010-2012 average allocation shares). By comparing the fisheries at pre- and post-Reform allocations within the same year, variables such as run size, river conditions, and

catch rates would also be the same. Thus, any differences in fishery outcomes (open fishing days and angler trips) should be due to the allocation difference. Modeling efforts in 2012 did not attempt to account for these other variables. Because some upriver recreational fisheries, such as the Snake River spring and fall Chinook fisheries, do not have models that can be used to conduct a year-specific pre- vs. post-Reform allocation assessment, this was another reason why the current analysis was restricted to the lower river fisheries.

For the spring Chinook fishery, key in-season decision points (regarding potential closure or extension of the pre-run update fishery) typically occur in early April, and at run updates in May for the post-update fishery. These are the points at which a difference in allocation can potentially affect decisions on the season structure and fishing opportunity. For the summer Chinook fishery, decision points occur at the run update in late June or early July, and again later in July at subsequent run updates. Because in-season management decisions are made frequently and have substantial effects on fishery performance, we used a “what you knew when” approach to identify the decision points managers would have faced during the season, and the likely decisions and fishery responses that would have been made, under different allocations. This approach allows for an analysis that incorporates year specific circumstances, beyond allocation shifts, that affect the actual season performance. We used year-specific Columbia River fishery management models for the spring and summer Chinook recreational fisheries to evaluate the potential effects of the allocation changes. These are fundamentally the same models used in the 2012 analyses; however, instead of projecting fishery results through the end of the season (as was done in 2012), modeling results were examined at the in-season decision points to assess whether the season structure would have been affected by the allocation change.

A slightly different approach was used for the fall Chinook fishery since a run update is usually not available until after the season objective dates for the Buoy 10 (Labor Day) and Tongue Point to Lewis River mainstem (~September 14) recreational fisheries. These fisheries are generally prosecuted as planned pre-season, then adjusted in-season, if necessary depending on the balance of available ESA impacts, often using mark-selective fishery (MSF) days for Chinook (which utilize fewer ESA impacts than non-MSF days) to reach their respective season objective dates, and this occurred in 2013-2016. Because analysis of the 2013-2016 fisheries indicated that angler effort decreased when the fisheries transitioned from non-MSF regulations for Chinook to MSF regulations, we used this information to estimate what angler effort on a non-MSF day would have been if the day was fished under MSF regulations due to a lower recreational allocation. The difference in the number of MSF days and angler trips for the fall Chinook fishery at pre- and post-Reform allocations determined if, and to what degree, the allocation change affected the structure and performance of the fishery with respect to achieving the season date objectives directed by Policy. This approach differs from the approach used in 2012 modeling. Up to that point in time, the agencies' had not implemented MSF fall Chinook fisheries in the lower Columbia; for the 2012 effort, models assumed closure of the recreational fishery when impacts were approached, not a shift to MSF regulations. A closed/open assessment creates a larger estimated change in angler trips due to effects of allocation changes when compared to an MSF/non-MSF assessment.

## **Results**

The analysis indicated that gains in fishing days and angler trips due to Harvest Reform allocation increases did not occur in every season and year, and when gains did occur, they were not

proportional to the increase in allocation (Table 2). Figures 1-3 illustrate the estimated change in angler trips and the change in allocation in fisheries below Bonneville Dam, for spring Chinook, summer Chinook, and fall Chinook during 2013-2018.

Table 2. Gains in fishing days and angler trips for the lower Columbia River recreational fishery due to allocation increases from the Harvest Reform Policy, 2013-2018.

Season	Gains Due To Reform	2013	2014	2015	2016	2017	2018
Spring Chinook	Recreational Allocation	60% <sup>1</sup>	70%	70%	70%	80%	80%
	Fishing Days	0	5	2	1	0	5
	Angler Trips	0	10,788	10,321	6,497	0	4,046
	% Increase in Trips	0.0%	8.0%	7.3%	5.4%	0.0%	4.7%
Summer Chinook	Recreational Allocation	60%	60%	70%	70%	80%	80%
	Fishing Days	0	0	0	0	25	0
	CHR Angler Trips	0	0	0	0	5,594	0
	% Increase in Trips	0.0%	0.0%	0.0%	0.0%	36.8%	0.0%
Fall Chinook (Buoy 10 & Mainstem Below Lewis)	Recreational Allocation	70%	70%	70%	70%	70%	70%
	Non-MSF Days	8	12	7	0	0	0
	Angler Trips	7,030	3,280	11,309	0	0	0
	% Increase in Trips	3.5%	1.3%	5.0%	0.0%	0.0%	0.0%
<b>All Seasons Total</b>	<b>Fishing Days</b>	<b>8</b>	<b>17</b>	<b>9</b>	<b>1</b>	<b>25</b>	<b>5</b>
	<b>Angler Trips</b>	<b>7,030</b>	<b>14,069</b>	<b>21,630</b>	<b>6,497</b>	<b>5,594</b>	<b>4,046</b>
	<b>% Increase in Trips</b>	<b>2.1%</b>	<b>3.4%</b>	<b>5.5%</b>	<b>1.7%</b>	<b>2.0%</b>	<b>1.7%</b>

<sup>1</sup> Although there was no change in the recreational allocation share due to a legal stay, the upriver spring Chinook catch balance guideline available to the recreational fishery increased by ~200 fish due to a 5% decrease in the commercial share of ESA impacts.

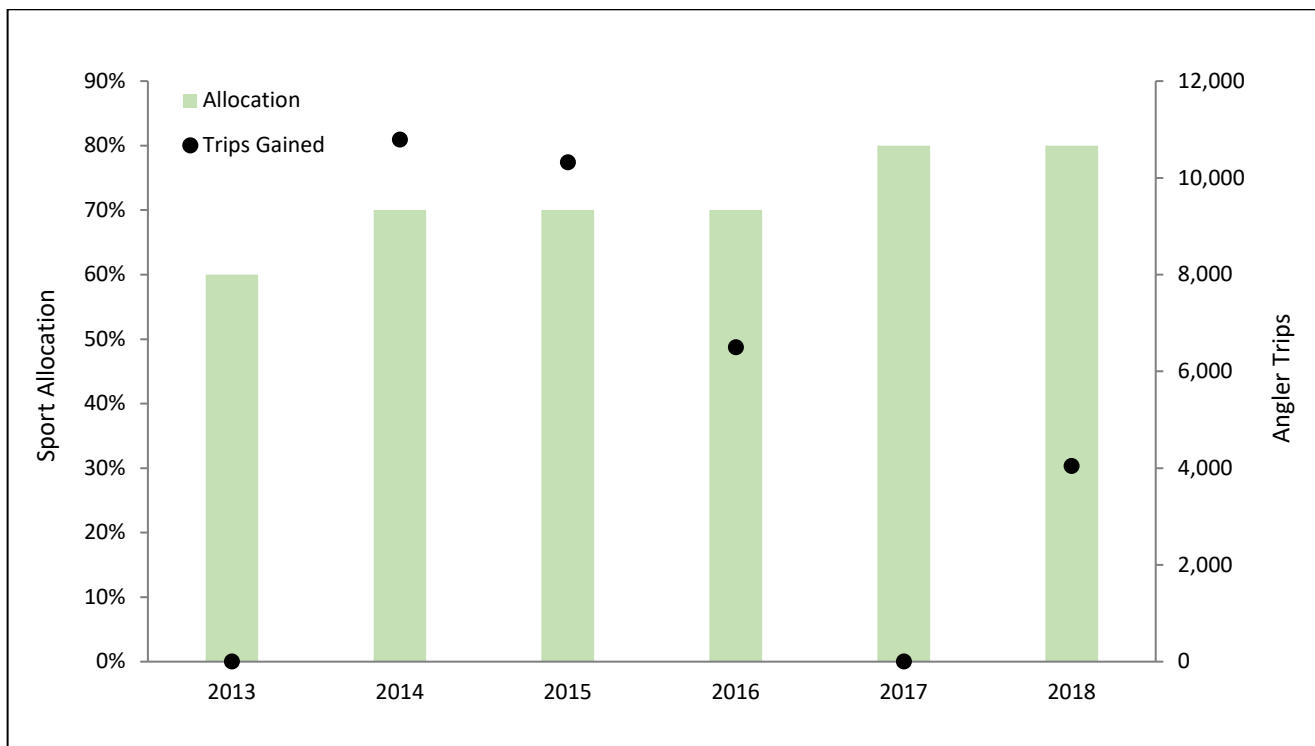
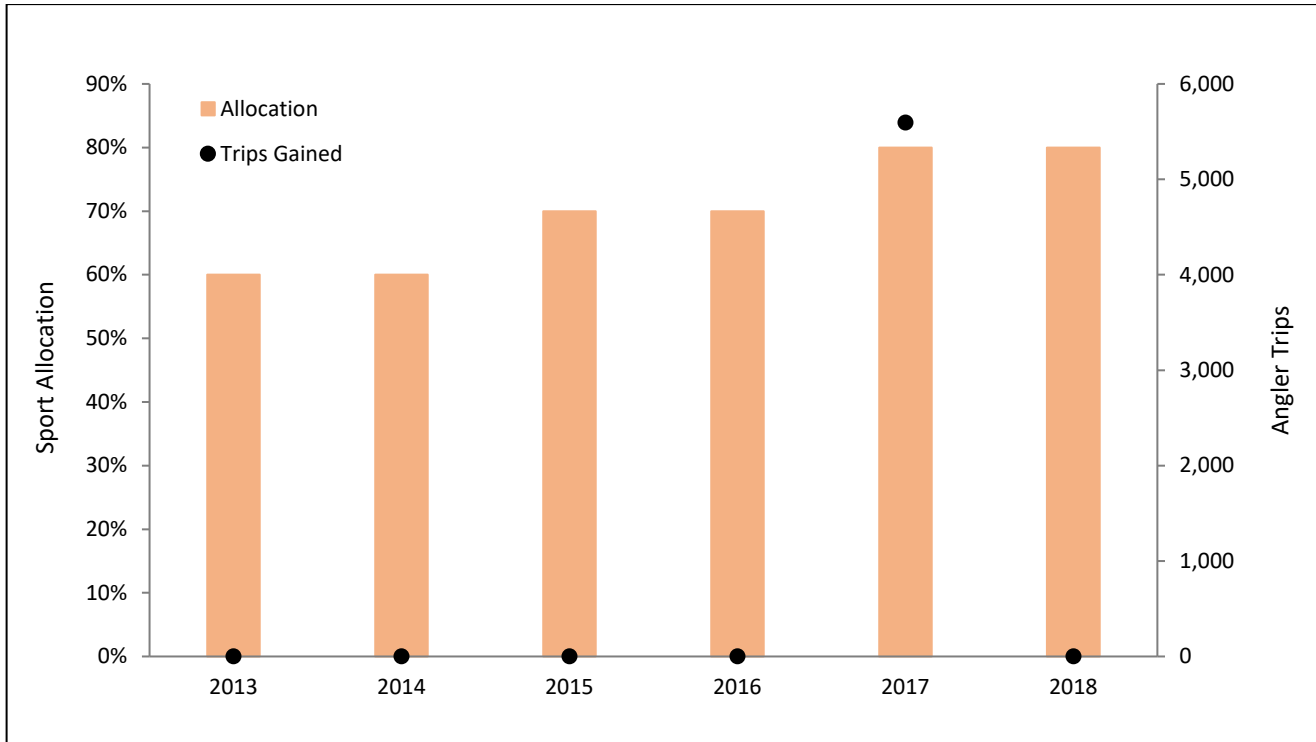
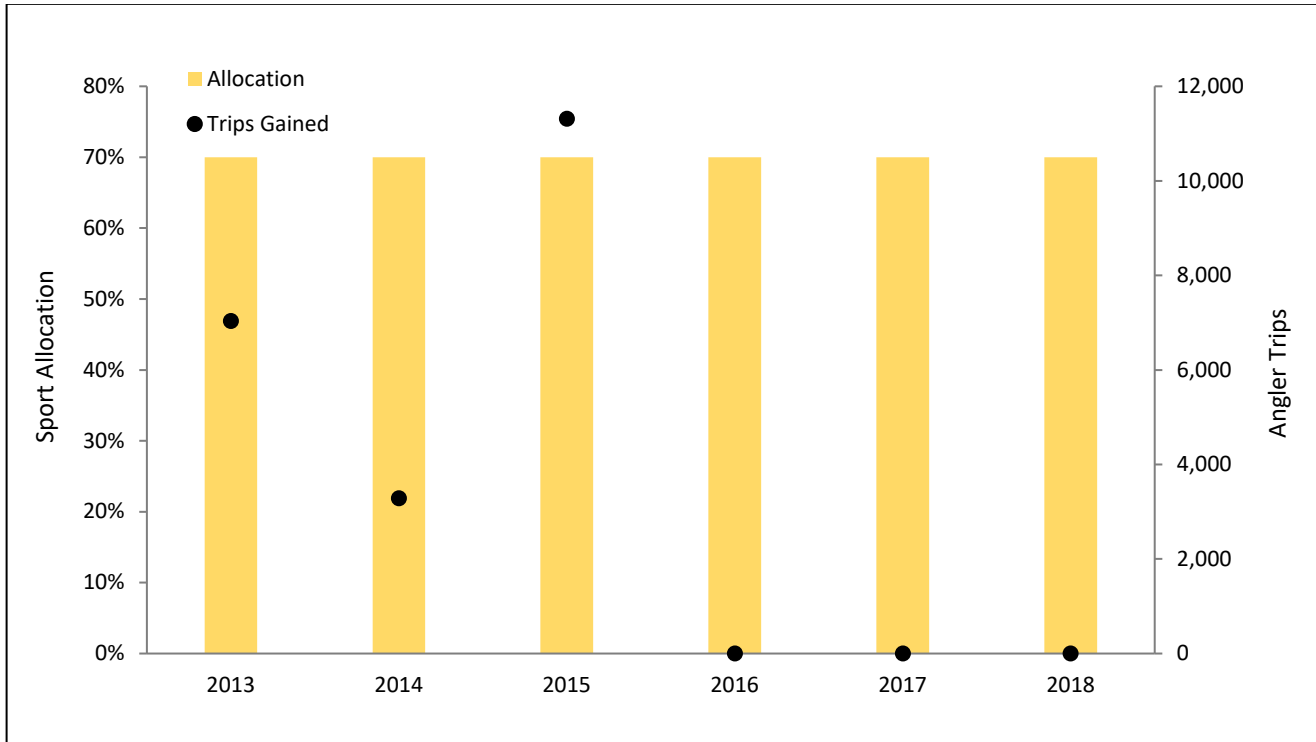


Figure 1. Recreational allocation and gain in angler trips in the Lower Columbia River spring Chinook fishery, 2013-2018.



**Figure 2. Recreational allocation and gain in angler trips in the Lower Columbia River summer Chinook fishery, 2013-2018.**



**Figure 3. Recreational allocation and gain in angler trips in the Lower Columbia River fall Chinook fishery, 2013-2018.**

Fishery		2013	2014	2015	2016	2017	2018
Spring Chinook	Trips Gained	0	10,788	10,321	6,497	0	4,046
	Reason For Gain/No Gain	Allocation change too small to affect season structure	Higher post-Reform allocation allowed additional fishing opportunity relative to pre-Reform allocation			Poor river conditions (pre-update fishery) and significant run downgrade (post-update fishery) affected season structure more than change in allocation	Higher post-Reform allocation allowed additional fishing opportunity relative to pre-Reform allocation
Summer Chinook	Trips Gained	0	0	0	0	5,594	0
	Reason For Gain/No Gain	Run downgrade affected season structure more than change in allocation	Run upgrade affected season structure more than change in allocation; full season achieved under either allocation		Lower than expected catch affected season structure more than change in allocation; full season achieved under either allocation	Higher post-Reform allocation allowed additional fishing opportunity relative to pre-Reform allocation	Run downgrade affected season structure more than change in allocation
Fall Chinook (Buoy 10 and Mainstem Below Lewis)	Trips Gained	7,030	3,280	11,309	0	0	0
	Reason For Gain/No Gain	Higher post-Reform allocation allowed additional fishing opportunity relative to pre-Reform allocation			Surplus LRH impacts rolled over from ocean fisheries affected season structure more than change in allocation; season objective dates met	Surplus LRH impacts rolled over from ocean fisheries and unused URB impacts from commercial fishery affected season structure more than change in allocation; season objective dates met	Run downgrade affected season structure more than change in allocation

The results of these analyses have shown that factors outside of the Policy not only affect the response to allocation changes, but often had a greater effect on the season structure than the allocation change (Table 3). The following factors have influenced how changes in allocation affected angling opportunity and angler trips in the recreational fishery, and to what degree:

- I. Allocation changes affected the season structure and number of fishing days/angler trips when:
  - Fishery catches fell between guidelines based upon pre- and post-Reform policies at key in-season decision points, allowing for a longer season at the higher allocation
  - Additional ESA impacts from higher allocations reduced the number of fall Chinook MSF days necessary (i.e. increased the number of non-MSF days allowed, which have been observed to have higher angler effort than MSF days) to reach Policy-directed season date objectives, relative to lower pre-Reform allocations
  
- II. Allocation changes did not affect the season structure and number of fishing days/angler trips when:
  - Fishery catches were low and fell below guidelines based upon pre- and post-Reform policies at in-season decision points, or catches were high and fell above both guidelines at these decision points; either situation resulted in a management decision (to extend or close the fishery, respectively) that would likely have been the same under a pre- or post-Reform allocation

- In-season run upgrades or downgrades can significantly raise or lower catch guidelines relative to the cumulative fishery catch, often causing the catch to fall below or above guidelines based upon both pre- and post-Reform allocations
  - For the lower river spring Chinook fishery, adding full fishing days at the peak time in the fishery (April) is particularly difficult because daily catch rates of upriver spring Chinook are highest at that time; this issue has been known for some time, and was accounted for during the 2012 modeling
  - Non-Policy related factors provided “extra” impacts for lower Columbia fisheries, including the recreational fishery, above what was initially available (e.g. surplus LRH tule impacts from ocean fisheries rolled over to in-river fisheries; URB impacts that could not be used in the non-treaty commercial fishery); these additional impacts helped the fall Buoy 10 and mainstem recreational fisheries meet season date objectives, and would have done so under pre-Reform allocations
- III. When gains in fishing days did occur for the recreational fishery, the magnitude of the gain in angler trips varied considerably, depending at what point in the season they occurred, as well as other factors.
- If the allocation change resulted in a gain in fishing days at a peak time in the season (e.g. April in spring or late June in summer), when daily angler effort is typically high, the gain in trips was greater.
  - In contrast, if the gain in fishing days occurred late in the season, when daily angler effort is much lower, the gain in trips was more modest.
  - The number of trips gained when additional days occurred was also affected by the level of total angler effort in that year, which is related to multiple factors such as run size, river conditions, and catch rates.

## References

- <sup>1</sup> Management Strategies for Columbia River Recreational and Commercial Fisheries: 2013 and Beyond (ODFW, 2012).
- <sup>2</sup> Summary and Analysis of Columbia River Harvest Reform Activities 2009-2017 (ODFW, 2019).