

Review of 2021 non-treaty Columbia River fisheries and impacts on wild upriver summer steelhead

Background

Wild upriver summer Columbia River steelhead (those destined for areas upstream of Bonneville Dam) are protected under the Endangered Species Act (ESA). Steelhead are subjected to various sources of mortality in both the ocean and freshwater habitats, such as ocean conditions, hydro-system impacts, degraded freshwater habitat, hatchery production and/or practices, harvest, and predation. Co-managers within the Columbia River Basin, including ODFW/WDFW are fully engaged in addressing all of these factors. Fishery impact limits within the basin are limited to levels that are consistent with achieving broad-sense recovery of ESA listed stocks. The states of Oregon, Washington, and Idaho and the Columbia River tribes have a consistent track record at remaining within the federally approved harvest constraints (e.g., ESA impacts) that guide annual fishery management. This write-up provides context on the OR/WA non-treaty harvest component.

There are no recreational or commercial non-tribal fisheries that directly harvest **wild** steelhead as a target species in the Columbia River since these fish cannot legally be retained. However, some impact does occur as a result of incidental handle and release mortality. Fisheries that incidentally impact wild summer steelhead occur through much of the mainstem Columbia and Snake rivers, and in many tributaries. There are several management components in the aggregate upriver summer steelhead run.

Upriver Skamania Stock (steelhead passing Bonneville Dam April 1 to June 30)

- Primarily hatchery origin upstream of Bonneville Dam
- Returns primarily to Columbia River tributaries between Bonneville Dam and the Klickitat River (inclusive)

Upriver A/B Index (steelhead passing Bonneville Dam July 1 to October 31)

A-Index

- For management purposes, defined as steelhead < 78 cm FL (<~31-inches)
- Hatchery and wild; includes ESA-listed fish ($\leq 2\%$ non-treaty impact limit on wild fish during fall management period, and $\leq 2\%$ during remainder of year)
- Present in rivers throughout the Columbia River Basin upstream of The Dalles Dam
- Bonneville Dam average 50% passage date is around mid-August; the natural-origin component tends to be earlier timed relative to the aggregate return with the average 50% date around August 1 (Table 1)
- Majority typically spend one year in the ocean before returning to freshwater, so fish that migrated out in 2020 generally return in 2021

B-Index

- For management purposes, defined as steelhead ≥ 78 cm FL ($\geq \sim 31$ -inches)
- Hatchery and wild; includes ESA-listed fish ($\leq 2\%$ non-treaty impact limit on wild fish during fall management period, and $\leq 2\%$ during remainder of year)
- Later timed than A-Index, Bonneville Dam 50% passage date around mid-September; the natural-origin component tends to be earlier timed relative to the aggregate return (Table 1)
- Wild component primarily return to the Clearwater Basin in Idaho; however, B-Index-sized fish can return to tributaries throughout the Columbia River Basin
- Dworshak Hatchery (Clearwater River) produces nearly 90% of the total hatchery returns
- Majority typically spend two years in the ocean before returning to freshwater

Table 1. Average passage timing by date for aggregate and natural-origin A-/B-Index steelhead at Bonneville Dam, 2016-2020.

Date	A-Index average passage %		B-Index average passage %	
	Total	Wild	Total	Wild
1-Jul	0%	0%	0%	0%
15-Jul	10%	16%	1%	5%
1-Aug	35%	49%	3%	14%
15-Aug	55%	71%	4%	20%
1-Sep	76%	88%	14%	36%
15-Sep	89%	95%	42%	63%
1-Oct	97%	98%	81%	90%
15-Oct	99%	99%	96%	97%
31-Oct	100%	100%	100%	100%

Under the *U.S. v. Oregon* Management Agreement (MA), the states of OR/WA are authorized to conduct fall-season fisheries occurring downstream of Hwy. 395 near Pasco, WA within an overall allowed impact of $\leq 2\%$ each for both wild A-Index and B-Index summer steelhead; B-Index impacts are typically the most constraining for fall fisheries. Additional recreational fisheries occur in the Snake River which incidentally impact wild Snake River summer steelhead but have separate ESA impact coverage with Idaho; recreational fisheries in the upper Columbia River incidentally impact Upper Columbia River summer steelhead and have separate ESA impact coverage. Treaty fisheries also have a separate impact rate within the MA. Recreational fishers are only allowed to retain fin-clipped (i.e., hatchery origin) fish. Harvest of hatchery steelhead to help reduce the proportion of hatchery fish on spawning grounds is an important recovery strategy for ESA-listed mid-Columbia steelhead. Non-treaty commercial fishers are prohibited from retaining any steelhead.

Of the wild summer steelhead impacts accrued in non-treaty Columbia River fisheries covered by the MA (e.g., not including those occurring in the Snake River basin and upper Columbia), the majority have typically occurred in recreational fisheries from Bonneville Dam upstream to the Hwy 395 Bridge in Pasco, WA. Prior to recent fishery restrictions, a large portion of the annual

angling effort focused on hatchery summer steelhead, particularly in the area upstream of McNary Dam (Figure 1). In the area between Bonneville and McNary dams, substantial angling effort focused on hatchery summer steelhead occurs in and around certain tributary mouths. Recreational fisheries for hatchery summer steelhead downstream of Bonneville Dam are comprised of boat and bank anglers, with the proportion of catch varying annually depending on effort and water conditions. Many bank anglers downstream of Bonneville Dam target hatchery steelhead during the late-spring and summer months. Boat anglers in the area between Tongue Point and Bonneville Dam primarily target salmon during the summer and fall, but some fishers do target hatchery steelhead through mid-August, primarily near cool water tributaries. Incidental catches of steelhead in the Buoy 10 salmon fishery are very low.

Steelhead impacts in non-treaty commercial fisheries result from fish caught incidentally (and released) while targeting other species; harvest of steelhead has not been allowed in non-treaty commercial fisheries since 1975. Wild summer steelhead impacts in non-treaty commercial fisheries accrue in various seasons which vary annually. The majority of wild steelhead impacts during the fall season occur in Chinook-directed fisheries due to their larger scale and timing. Using 9-inch mesh nets in August targets Chinook which tend to be larger earlier in the season while reducing steelhead handle. Late fall Chinook fishing occurs after mid-September using 8-inch minimum mesh gear since average Chinook size decreases later in the run and steelhead are less abundant. Coho-directed fisheries occur later in the fall (late September/October) after most summer steelhead have passed Bonneville Dam. Mainstem summer-season non-treaty commercial gillnet fisheries also impact wild summer steelhead, but this fishery hasn't occurred since 2016.

Annual wild A-Index and wild B-Index mortalities in non-treaty fisheries during 1999-2020 are presented in Figures 1 and 2 [Source: Annual Joint Staff Reports; Spring tables 11a-b, Fall tables 19a-b]. Total wild mortalities have declined in recent years due to management actions enacted in response to the recent declines in run sizes. Additionally, total handle of wild steelhead is lower at low run sizes than at higher run sizes.

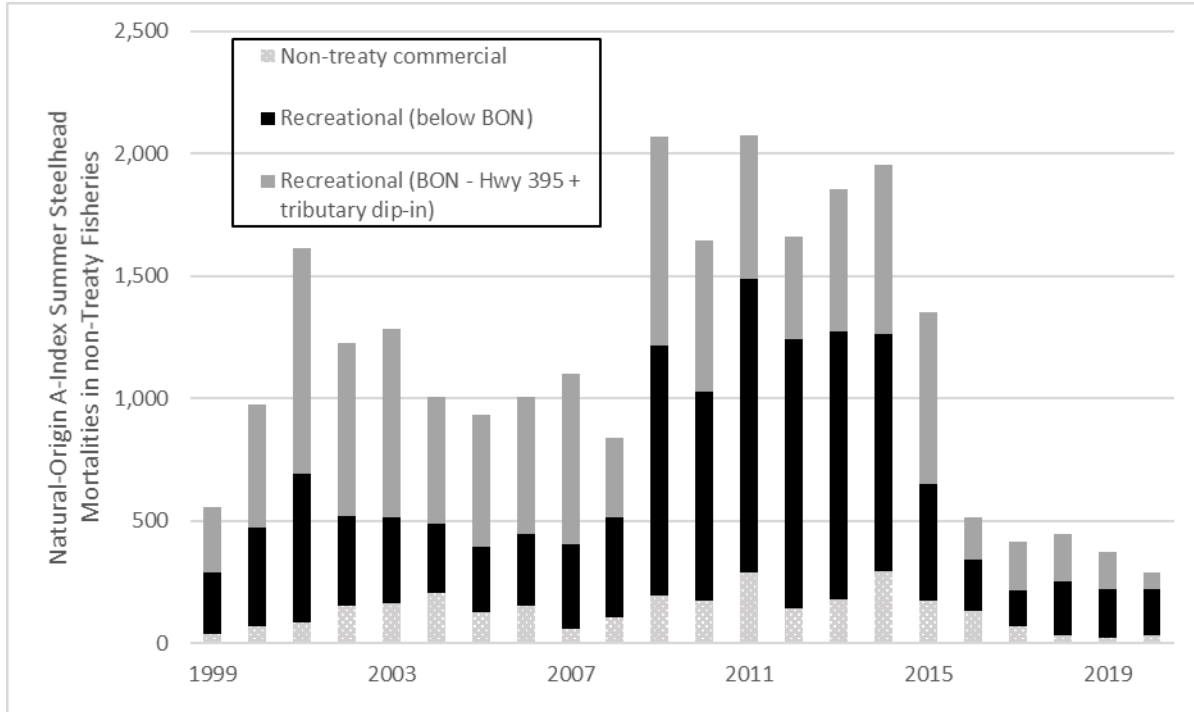


Figure 1. Number of wild A-Index steelhead mortalities in non-Treaty fisheries downstream of Highway 395 (Pasco, WA), 1999-2020.

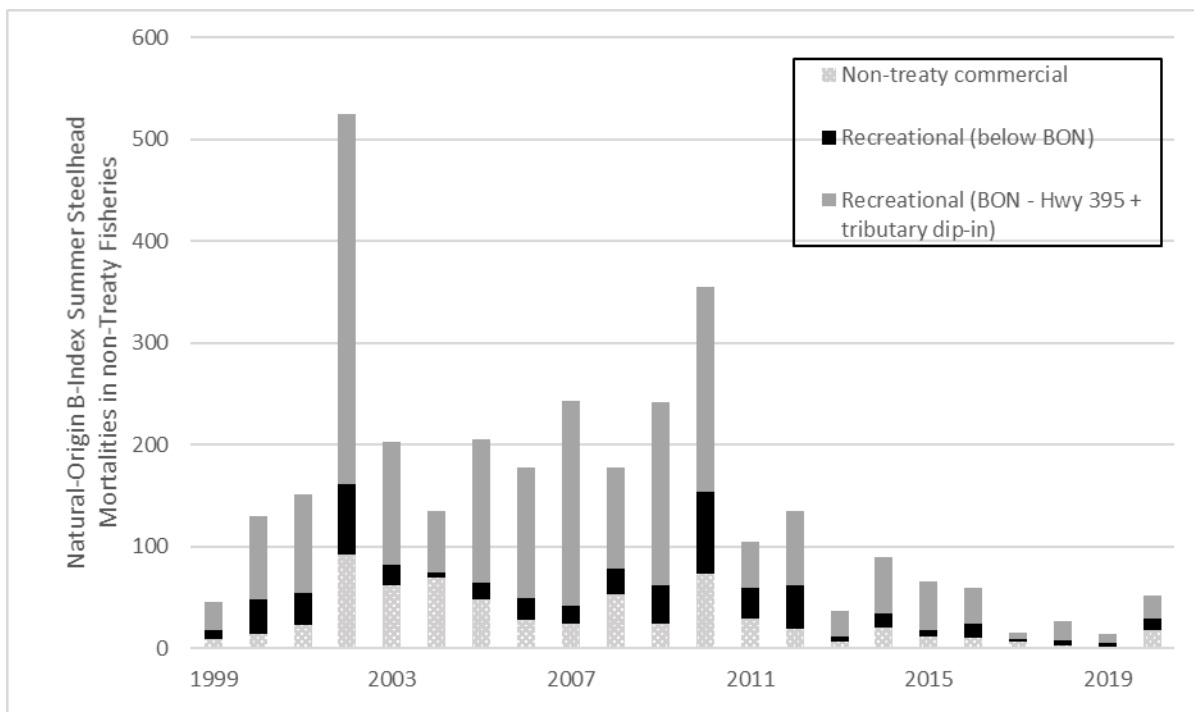


Figure 2. Number of wild B-Index steelhead mortalities in non-Treaty fisheries downstream of Highway 395 (Pasco, WA), 1999-2020. Note: y-axis scale differs from Figure 1.

Process for developing 2021 actions to protect steelhead

Pre-season forecasts of 2021 summer steelhead abundance were published in early March and indicated low returns of upriver wild summer steelhead were expected (Table 2). The forecast for the aggregate upriver summer steelhead return to Bonneville Dam was 101,400 fish, with a total A- and B-Index return of 96,800 fish. The low predicted return continues the series of poor annual returns which began in 2017 (Figure 3). Wild A-Index summer steelhead were predicted to total 27,500 fish. Wild B-Index summer steelhead were predicted to be particularly low, with a forecast of only 1,000 fish.

Discussions with the public regarding the need for actions to protect upriver steelhead began as part of the annual [North of Falcon \(NOF\)](#) process in March. The NOF steelhead discussions focused on the need for action and shared contributions in achieving the goals of keeping wild summer steelhead impact rates well below the allowable levels, and secondarily to assist in efforts to achieve hatchery broodstock needs. However, no specific hatchery shortages were anticipated during the pre-season process.

Two virtual NOF public meetings were held by WDFW and ODFW to discuss summer and fall Columbia River fisheries planning. WDFW also developed an online video/presentation specific to the mid-Columbia and Eastern Washington regions to gather additional public input. Recordings of these meetings are available on the WDFW website.

Table 2. Summary of 2020 upriver summer steelhead forecasts and actual returns and 2021 preseason forecasts.

TAC 2021 Forecast of Upriver Summer Steelhead at Bonneville Dam			
	2020 Forecast	2020 Return	2021 Forecast
Skamania	4,400	4,101	4,600
<i>Hatchery</i>	2,600	2,047	2500
<i>Wild</i>	1,800	2,054	2100
A-Index	85,900	75,392	89,200
<i>Hatchery</i>	52,600	47,260	61,700
<i>Wild</i>	33,300	28,132	27,500
B-Index	9,600	32,199	7,600
<i>Hatchery</i>	8,200	26,921	6,600
<i>Wild</i>	1,400	5,278	1,000
A/B-Index	95,500	107,591	96,800
<i>Hatchery</i>	60,800	74,181	68,300
<i>Wild</i>	34,700	33,410	28,500
All Summer steelhead	99,900	111,692	101,400
<i>Hatchery</i>	63,400	76,228	70,800
<i>Wild</i>	36,500	35,464	30,600

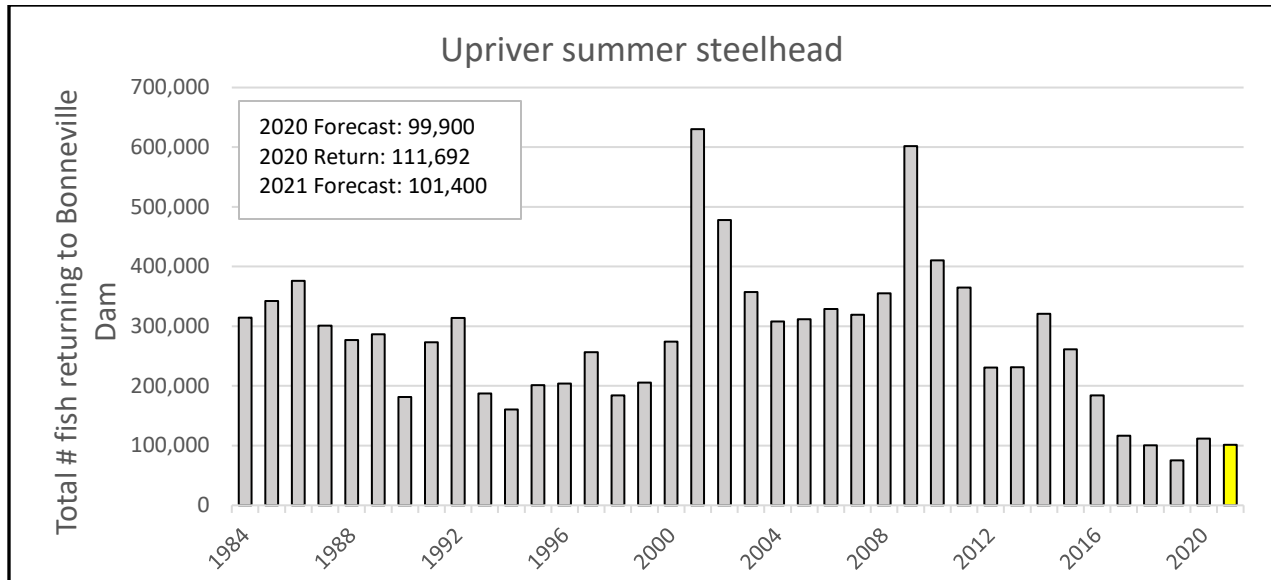


Figure 3. 1984-2020 and projected 2021 total summer steelhead returns to Bonneville Dam. Includes hatchery and wild fish from the upriver Skamania and A- and B-Index management stocks.

Steelhead conservation actions adopted for 2021 summer and fall fisheries

Working with constituents at the NOF meetings, the following steelhead conservation actions were identified and implemented for 2021 summer and fall fisheries in the mainstem Columbia River and adjacent tributaries. These actions were proactive in nature and implemented as part of the 2021 pre-season plan to address the low steelhead forecasts for 2021. Although several of these regulations have been used in recent low return years, they are a departure from regulations that would occur under normal run sizes, i.e., 2 hatchery steelhead per day from July 1 – December 31.

Recreational fisheries

- A reduced one-fish hatchery steelhead daily bag limit in the mainstem Columbia and multiple tributaries when open to steelhead retention.
- Mainstem Columbia from Buoy 10 upstream to The Dalles Dam: steelhead retention closed from August through October.
- Mainstem Columbia River from The Dalles Dam upstream to Hwy. 395 (Pasco, WA): steelhead retention closed from September 1 through March 31.
- Thermal angling sanctuaries adjacent to and in the lower reaches of Eagle Cr., Herman Cr., and the Deschutes River from July 15 through September 15.
- Steelhead angling closure July through October in Drano Lake.
- Steelhead retention prohibited in the following areas: Lower Cowlitz River (Aug), Lower Wind/White Salmon/Klickitat rivers (Jul-Oct), John Day River (Sep-Dec <Tumwater Falls), Snake River mouth to ID/WA stateline (Sept-Mar)
- Night-angling closure.
- Upper Columbia River (upstream of the Snake River) is closed to steelhead angling (impacts are covered in a separate Biological Opinion).

Mainstem Non-treaty Commercial fisheries

- No summer-season steelhead impacts accrued (no summer mainstem fishery)
- The August Zone 4/5 fishery occurs mid to late August to focus on achieving the maximum Chinook harvest per steelhead impact.
- Continued use of a 9-inch minimum mesh size in August to limit/reduce steelhead handle.
- Use of standard tributary mouth sanctuaries (as applicable to each fishery). Zone 4/5 fishery occurs upstream of the Lewis River and excludes fishing in waters near tributary mouths.
- No Zone 4/5 fishery from September 3 through mid-September to further reduce potential B-Index impacts.
- Late-September fisheries to be considered *after* in-season upriver steelhead and Chinook run-size updates are available.
- Late fall Coho-directed mainstem fishery occurs in the lower Columbia River (Zones 1-3) and after the vast majority of the upriver summer steelhead migration (96-99%). Steelhead handle in the tangle net fishery is low and live-capture regulations are utilized to maximize survival of released fish.

Few additional actions remain available to provide substantive reductions in steelhead impacts. Remaining non-treaty salmon fisheries are largely trying to avoid steelhead, therefore further restrictions will not result in much additional savings. The only area in the Columbia River currently open to hatchery steelhead retention is the area upstream of The Dalles Dam which closes September 1. As of August 23, there had been zero steelhead handled (kept or released) in this fishery.

Additional in-season modifications (to date)

- Drano Lake (closed to steelhead angling): Boat angling closure within a sub-area of Drano Lake near the Little White Salmon River mouth beginning August 25.
- Wind River: WDFW anticipates the need to close the steelhead fishery currently scheduled to open September 16.
- Snake River (and WA tributaries): WDFW intends to:
 - Close steelhead angling downstream of the Idaho/Washington border including the tributaries beginning September 1.
 - Achieve concurrent regulations with Idaho following Idaho Fish and Game Commission action.
 - Impacts are covered in a separate Biological Opinion.
- ODFW is evaluating potential Snake River and tributary actions and discussing concurrency with Idaho and Washington.

Estimated impacts to wild upriver summer steelhead

Collective non-treaty winter, spring and summer season fisheries in 2021-22 are expected to accrue impact rates of 0.54% (149 mortalities) and 0.16% (<2 mortalities) for wild A- and wild B- Index steelhead, respectively. Non-treaty fall season fisheries in 2021 are expected to accrue impact rates of 0.59% (161 mortalities) and 1.03% (10 mortalities) for wild A- and wild B-Index steelhead, respectively.

Current Columbia River Temperatures

Beginning in early June, Columbia River temperatures (as measured at Bonneville Dam) began to rise above the recent 10-year average (Figure 4). Above-average water temperatures continued through mid-August but have recently dropped below average. Temperatures in June and most of July did not reach the levels observed in 2015 which was another drought year. However, several historically high ladder/forebay temperatures were observed during several days in August. Steelhead have continued to pass over Bonneville Dam, as in previous years, even with these increased water temperatures. Below is the recent Bonneville Dam scrollcase temperature and includes 2015 as a reference.

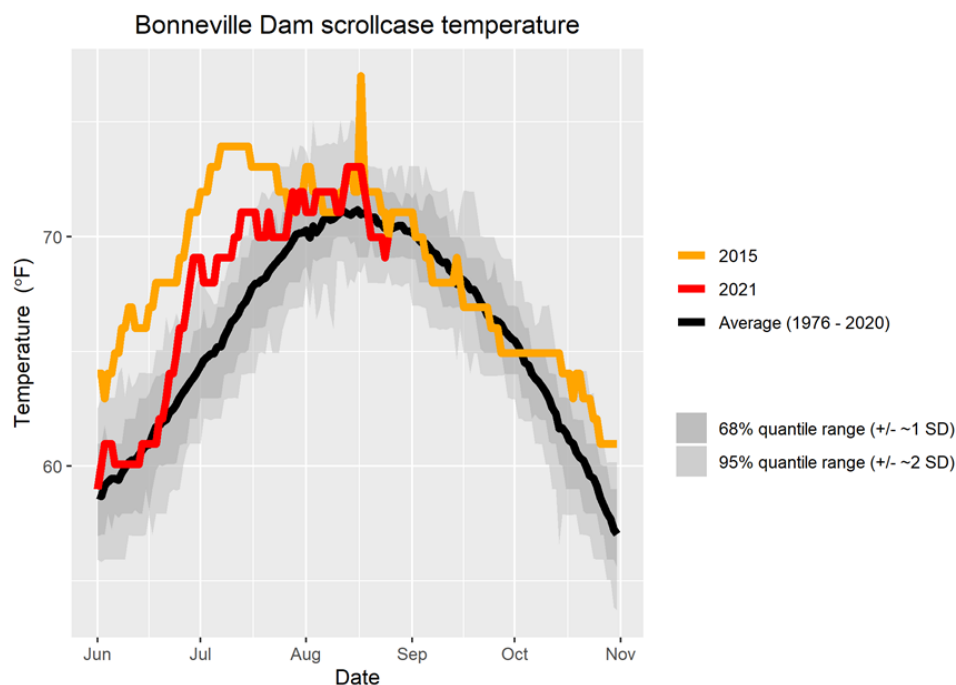


Figure 4. Water temperature June – November as measured at the Bonneville Dam scrollcase gauge. Temperature was 70°F on August 25, 2021.

Stock status updates

Returns of summer steelhead to Bonneville Dam this year have lagged well behind expectations. The count of upriver Skamania stock summer steelhead was 1,917 total fish (42% of forecast), of which 1,119 were identified as wild (53% of forecast).

As of August 25, cumulative upriver summer A-/B-index steelhead passage since July 1 at Bonneville Dam (27,916) is the lowest on record since 1938, and the cumulative unclipped passage (13,540) is the lowest since clipped/unclipped counting began in 1994.

The *U.S. v. Oregon* Technical Advisory Committee (TAC) met on August 16 and August 23 and reviewed information for the summer steelhead run. Passage timing at this point in the run is variable, however, based on 10-year average run timing for the A-Index components, TAC maintained its August 16 estimate of 35,000 A-Index fish passing Bonneville Dam by October 31. Because B-Index steelhead typically return in September and October, there is not enough information to provide an update about the B-Index component at this time.

Summary

- Non-treaty fisheries *do not* target wild steelhead.
- Based on low run size forecasts in 2021, fishery managers developed a suite of actions during March and April (NOF process) to reduce impacts to upriver summer steelhead.
- These actions include time/area/gear considerations for commercial fisheries and steelhead retention/angling closures in the mainstem and tributary fisheries that handle upriver-bound steelhead.
- Wild steelhead impacts expected to accrue are low and well-below ESA impact limits
 - Fall season: 0.59% or 161 mortalities for A-index; 1.03% or 10 mortalities for B-index)
- Few additional actions remain available to provide substantive reductions in steelhead impacts.
- ODFW/WDFW will continue to actively manage fisheries based on the most up to date run size and impact accrual information.
- Harvest is one of many components that impact to upriver summer steelhead throughout the Columbia River basin.

Resources

Columbia Basin Partnership. A vision for Salmon and Steelhead: Goals to restore thriving Salmon and Steelhead to the Columbia River Basin. <https://www.fisheries.noaa.gov/vision-salmon-and-steelhead-goals-restore-thriving-salmon-and-steelhead-columbia-river-basin>

Joint Columbia River Management Staff: Oregon Department of Fish and Wildlife & Washington Department of Fish and Wildlife. 2021 Joint Staff Report: Stock Status and Fisheries for Spring Chinook, Summer Chinook, Sockeye, Steelhead, and other species. February 4, 2021. https://wdfw.wa.gov/sites/default/files/2021-02/2021_or_wa_spring_joint_staff_report.pdf

Joint Columbia River Management Staff: Oregon Department of Fish and Wildlife & Washington Department of Fish and Wildlife. 2021 Joint Staff Report: Stock Status and Fisheries for Fall Chinook Salmon, Coho Salmon, Chum

Salmon, Summer Steelhead, and White Sturgeon. July 19, 2021.
https://wdfw.wa.gov/sites/default/files/2021-07/2021_or_wa_fall_joint_staff_report.pdf

Joint Columbia River Management Staff: Oregon Department of Fish and Wildlife & Washington Department of Fish and Wildlife. 2021 Non-treaty Columbia River Summer/Fall Fishery Plan. May 7, 2021.
https://wdfw.wa.gov/sites/default/files/2021-05/2021_wdfw-odfw_columbia_river_fishery_plan_final.pdf

NOAA Fisheries. 2018-2027 *United States v. Oregon* Management Agreement.
<https://www.fisheries.noaa.gov/west-coast/sustainable-fisheries/2018-2027-united-states-v-oregon-management-agreement#:~:text=NOAA%20Fisheries%20signed%20the%202018-2027%20U.S.%20v%20Oregon,Endangered%20Species%20Act%20%28ESA%29%20section%207%20biological%20opinion.>

NOAA Fisheries. Recovery Plan for Snake River Spring/Summer Chinook Salmon and Snake River Basin Steelhead.
<https://www.fisheries.noaa.gov/resource/document/recovery-plan-snake-river-spring-summer-chinook-salmon-and-snake-river-basin>

Washington Department of Fish and Wildlife. 2021 North of Falcon public meeting schedule.
<https://wdfw.wa.gov/fishing/management/north-falcon/public-meetings>