



THE OSPREY

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Managing Columbia River Wild Steelhead for Extinction, Part III

2017 a Historic Low for Wild B-Runs

by Pete Soverel and David Moskowitz
— The Conservation Angler —

Pete Soverel is a long-time member of the Steelhead Committee, and President and founder of The Conservation Angler. Co-author Dave Moskowitz is The Conservation Angler's Executive Director.

The Conservation Angler is a non-profit organization that partners anglers with scientists to support wild Pacific salmon and steelhead conservation. You can learn more about The Conservation Angler at: www.theconservationangler.com

A Note from the Authors:

In Part I of this series, we describe a harvest management regime that considers wild steelhead stocks as aggregates passing a dam with little if any regard to stock structure, the impacts of direct harvest in commercial fisheries and indirect mortality from encounters in the sport fishery. In Part II, we delve into the impact to wild steelhead, particularly the wild B-run fish, that occurs when fisheries are

authorized to impact an ESA-listed wild run and the fishery is practically complete before the pre-season forecast is updated. We also touch on the unaccounted for loss of wild fish between the first dam encountered and then again after passing eight of them.

Inaccurate abundance forecasts contribute to the failure to protect wild B-Run steelhead populations.

Finally we argue that the concept of river-specific management (first proposed by Dr. Willis Rich in the 1930s and re-imagined by Bill Bakke in 2017) must replace the current regime in which management is aimed to achieve hatchery broodstock goals while free-flowing natal rivers are

without natural escapement and egg-deposition goals. Part III details the depths of the record-low 2017-2018 wild B-run steelhead return (and the third lowest total return of wild steelhead past Bonneville in the period 1984 thru 2017). We also detail a series of conservation measures necessary to conserve wild steelhead in the Columbia and Snake River region during a new age of scarcity and warming waters. We expect to examine steelhead hatcheries in a coming series in The Osprey Journal. Thank you for reading.

Washington and Oregon fishery managers released the 2018 forecasts for summer and fall salmon and steelhead returns in mid-March 2018. Based on this pre-season forecast, wild steelhead numbers are anticipated to nudge up – indicating that 2017 will be the new historic low point for wild B-run steelhead in the Columbia and

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FROM THE PERCH — A SPECIAL MESSAGE

Big News for The Osprey and Its Loyal Supporters

by Pete Soverel, Steelhead Committee

I'm pleased to inform our loyal readership of wild fish advocates that there are dramatic changes for *The Osprey* commencing with the September 2018 issue. Since its inception in 1986, *The Osprey* has been produced and published by the Steelhead Committee of Fly Fishers International (formerly the Federation of Fly Fishers). Several prominent conservation organizations — The Conservation Angler, Steelhead Society of British Columbia, World Salmon Forum, Wild Steelhead Coalition, Skeena Wild, Wild Steelhead Coalition — have joined in partnership with Fly Fishers International to expand the content, reach and impact of *The Osprey* on Pacific salmon and steelhead conservation. In addition to expanded content, the new *Osprey* will be printed on higher quality paper. It will remain black and white.

The partners have formed an editorial committee that will mold the content of *The Osprey* and assist the editor in securing authors. A number of prominent biologists have agreed to serve as scientific advisors — Jack Stanford, Rick Williams, Jim Lichatowich, Bill Bakke and Bill McMillan. We know where the bodies are buried and we are going to be digging them up.

The editorial committee has selected three priority issues — hatchery-wild fish interactions; steelhead persistence & climate change and; steelhead management regimes (harvest models, preserving/expanding angling opportunity, recovery following dam removal). Each of these issues will be explored in each of the next six to nine issues of *The Osprey*. Other articles in areas of interest will fill out each issue.

I have been involved with *The Osprey* since its inception as a contributor, chairman of the Steelhead Committee for 10 years, and member of the editorial board for the past 30 years. I am very excited about *The Osprey's* future and its role as the authoritative source for steelhead conservation. We don't have much time to save steelhead from extinction. For example, last year only 350 wild, B-run steelhead made it back to Idaho's 15,000 miles of habitat.

We appreciate sincerely your many years of support for *The Osprey* and hope you will continue in the future. The expanded publication needs your financial support. Please consider a gift to *The Osprey: The International Journal of Steelhead Conservation*. You will find our contribution form on page 19.



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THE OSPREY



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The Osprey welcomes letters to the editor. Submissions are also welcome but queries in advance are preferred.

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Fly Fishers International (FFI) supports conservation of all fish in all waters. FFI has a long standing commitment to solving fisheries problems at the grass roots. By charter and inclination, FFI is organized from the bottom up; each of its 360+ clubs, all over North America and the world, is a unique and self-directed group. The grass roots focus reflects the reality that most fisheries solutions must come at that local level.



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Endangered Southern Resident Orcas Reshape Debate over Salmon Restoration

by Joseph Bogaard

— Save Our Wild Salmon —

This issue's guest columnist is Joseph Bogaard, Executive Director of Save Our Wild Salmon Coalition, which has been advocating for wild Columbia and Snake river wild salmon and steelhead for decades. Learn more about their work at: www.wildsalmon.org

Southern Resident Killer Whales have been plying the coastal waters of the Pacific Northwest for a very long time. Genetic research tells us this salmon-eating community of whales diverged from the other local population of orcas — the mammal-eating Transients — a few hundred thousand years ago. Until recently, a diet focused almost exclusively on Chinook salmon appears to have been a very successful strategy. Abundant, large, and fatty, Chinook have been swimming through these same waters for at least as long.

But all that's changed in the last few decades. Habitat destruction driven by short-term thinking and an underappreciation of the value and benefits of intact, functional, resilient ecosystems has caused our region's most iconic native fish to plummet toward extinction. Across the west coast, two-dozen salmon and steelhead populations are listed under the Endangered Species Act, with thirteen in the Columbia River Basin alone.

And the Southern Resident orcas that rely on them are suffering as a result. Today, these beloved whales are at a 30-year population low, and just 76 individual whales remain today. Without big changes in Northwest natural resource policies, many experts fear we will lose this unique and beloved community of whales forever.

Research in just the last five years has both shed new light on their natural history and provided insight into a number of the specific challenges they

face. Fecal sample analyses, for example, has determined that the Southern Residents rely on Chinook salmon for roughly 80 percent of their diet. Satellite tracking data confirms that in a typical year they spend about half of their time in the Salish Sea, hunting for salmon bound mainly for the Fraser River in British Columbia, but other lesser rivers as well. From fall to spring, these whales are often found cruising the West Coast, searching for salmon there. They show a particular

Southern resident orcas rely on Chinook for 80 percent of their diet, and reproductive success is tied to Chinook abundance.

affinity for the Washington coast and mouth of the Columbia River on the Oregon-Washington border, not only in winter and spring, but also opportunistically at other times of the year depending on what fish are present.

Orca reproductive success is strongly tied to Chinook abundance. Hormone analyses by the University of Washington's renowned conservation biologist Sam Wasser has found that these whales are often highly "nutritionally stressed" (aka starving) and that more than 60 percent of their pre-term calves spontaneously abort. They have not produced a calf since 2015.

Faced with an already-endangered population suffering new losses, NOAA in 2015 identified the Southern Residents as among eight endangered species nationally most likely to go

extinction without significant immediate action.

The National Oceanic and Atmospheric Administration (NOAA), however, has long been part of the problem. In its 2008 orca recovery plan, NOAA acknowledges orcas' historic reliance on Columbia Basin Chinook and describes its population declines as "[p]erhaps the single greatest change in food availability for resident killer whales since the late 1800s..." Despite publicly acknowledging this fact a decade ago, NOAA has approved inadequate, illegal salmon plans for the Columbia and Snake rivers dating back to the 1990s. Their claim: hatchery production today makes up for the depressed wild Chinook numbers and no big policy changes — such as lower Snake River dam removal — are needed.

Unfortunately for NOAA, the law, the science and the real world all tell a very different story. Leveraging the string of recent deaths (eight individual whales have died in just the last two years) and accumulating information, orca and salmon advocates have joined forces of behalf of both these iconic and imperiled species to press Northwest policymakers to act. At a time of tremendous urgency when every individual whale matters, there are some signs of hope. Many elected officials now acknowledge the crisis, and signs of leadership are starting to emerge.

In March, Washington's Democratic Governor Jay Inslee established a new Emergency Orca Task Force. This new body, made up of diverse experts and stakeholders from across the state, convened for the first time on May 1 2018 in Olympia. They are tasked with identifying and recommending no later than this fall legislative and other actions that the state can and should



B-Run Steelhead Continued from page 1

Snake Basins.

The 2018 forecast calls for 48,200 wild steelhead to pass Bonneville Dam. This exceeds the 32,625 wild steelhead that passed Bonneville in 2017; however there is little cause for celebration as the 2018 forecast is not even 50% of the current ten-year average of 101,300 wild steelhead.

principle drivers of harvest management and regulation in the Columbia and Snake Rivers. Managers try to estimate wild abundance for a species with a wonderfully complex life history, a broad and diverse historic spawning region, and a spawning timing that makes them difficult to track and observe while in the act of reproducing.

The inability to accurately forecast their abundance (See Table 2, below)

assessments of Idaho's steelhead populations. All of Idaho's populations are considered to have a high risk of extinction within 100 years (probability >25%) based on the estimated abundances and productivities."

Despite the continuing conservation concerns about wild steelhead they will not receive the benefit of any rules reducing the encounter rates in the sport or tribal fishery. One would think that the low steelhead forecast and a conservation-limited Chinook fishery would translate into some "savings" for wild salmon and steelhead produced by lower bag limits and fewer encounters – but you would be wrong. One year after an historic low, fishery managers have not proposed any conservation measures like the time and area closures they relied on to protect the historic low wild B-run in 2017.

Table 1. 2018 Forecast and 2017 Actual Runs of wild A-run and B-run Steelhead to Bonneville Dam

Wild Steelhead component	2018 Forecast	2017 Forecast	2017 Actual	10-year Average of wild steelhead to Bonneville Dam	2018 run Percent +/- Of 10 yr avg.
A-run	48,200	33,000	27,909	101,300 wild A-run	48%
B-run	3,400	1,100	751	10,384 wild B-run	33%

Wild B-run steelhead crossing Bonneville Dam are predicted to total 3,400 fish, a forecast three times the 2017 forecast of 1,100 wild B-run fish, though it is only 33% of the current

nor make mid-season run updates in the midst of authorized and on-going commercial and sport fishing seasons that are based on the pre-season forecasts, is contributing to the failure to

In 1962, nearly 43,200 wild B-run steelhead were counted as they crossed a small, long gone dam just three miles upstream from the Clearwater River's confluence with the Snake River in Lewiston. Yet the 2017-2018 run will total fewer than 500 fish to the Clearwater and its undammed tributaries, a decline from the early 1960s of 99%.

Table 2: Pre-season Forecasts of wild B-run steelhead to Bonneville Dam with Actual Returns as percent of forecast

Year	Pre-season Forecast	Actual Return	Actual as % of the Forecast
2017	1,100	751	68%
2016	7,500	3,469	46%
2015	11,700	5,842	50%
2014	6,500	13,341	205%
2013	7,900	1,886	24%
2012	13,400	6,813	51%

ten-year average for wild B-runs (10,384 fish in the 2007-2016 period).

The challenge of predicting the annual return of wild steelhead to the Columbia and Snake Basin is daunting, yet it is the annual abundance of wild steelhead – particularly wild B-run steelhead – that remains one of the

protect and rebuild wild steelhead populations in the Columbia and Snake River, and indeed, driving these fish to extinction.

The fishery managers know this is the case, as clearly stated by Idaho in 2017: "Abundance and productivity data are of primary importance in ESA

Fishery managers have been counting fish at Bonneville Dam since the 1940s, and their official count of wild B-run fish over Bonneville Dam in 2017 is 751 from July through November. As of early February, 362 of those fish crossed Lower Granite Dam. Past research demonstrates that approximately 95% of the total run over Lower Granite Dam is normally complete by December 31, meaning that Idaho can expect a total 2017-18 wild B-run steelhead run over Lower Granite of likely fewer than 500 wild fish. The majority of that group of wild B-run steelhead will migrate up the Clearwater (about two-thirds) while about one-third of the wild B-run fish that cross Lower Granite will migrate to the Salmon River. As a result, we can fairly reliably estimate that the total 2017-2018 Clearwater River wild B-run steelhead will be in the neighborhood of fewer than 300 fish, and possibly 200 wild B-run steelhead to the Salmon River.

Pause for a moment to reflect on

Continued from previous page

those numbers.

These few prized wild B-run steelhead have been joined by a modest number of A-run wild steelhead (steelhead smaller than 30 inches) and a modest number of hatchery fish that returned in numbers large enough to calm the nerves of hatchery managers who were initially worried that the steelhead return would not meet hatchery broodstock needs. Despite easing the hatchery manager's concerns, there do not appear to be any goals for wild steelhead escapement nor wild egg deposition objectives for the individual rivers to which the wild steelhead will return. Idaho has shown concern about this issue in the past, though there is little evidence they are working to achieve them:

"Comparative escapement and resultant juvenile production data for Idaho streams should be presented to Columbia River Compact agencies to inform them of the inadequacy of Snake River and Columbia River group-B escapement objectives. There is a critical need to modify Columbia River Compact group-B wild steelhead escapement objectives. The escapement objective of 13,300 at Bonneville Dam and 10,000 at Lower Granite Dam results in extremely low seeding levels for Idaho's group-B steelhead production streams."

The gauntlet wild fish face is worsened by the sport fisheries Washington, Oregon and Idaho permitted and then opened further to a three-hatchery fish daily limit once it became clear that the hatchery fish would return in large enough numbers that hatchery managers would meet their egg-take goals. However sport fishing effort results in higher encounters with wild fish even though they are outnumbered by their hatchery cousins.

Data in Oregon and Idaho shows that steelhead anglers hoping to catch only hatchery keepers will typically encounter twice as many wild fish as hatchery fish, even though there are fewer wild fish in the rivers. Wild steelhead are simply more aggressive and better biters than the hatchery product.

What happens when an angler hooks those wild fish? Approximately 5 to 10

percent will not survive being caught and released. And when many wild fish will be caught, even though there are fewer of them, you can assume that a percentage of the wild B-run steelhead will not survive the encounter. This means that even fewer wild B-run steelhead will survive to spawn in the Clearwater and Salmon Rivers in 2018. And while some angling encounters may not be lethal, research shows that some of the wild steelhead caught in this fishery may be less successful in their efforts to spawn, further reducing the overall wild fish productivity.

The Conservation Angler believes that Washington, Oregon and Idaho's winter and spring steelhead fisheries should have been curtailed. There is good reason for concern.

The 2017-2018 B-run index (hatchery and wild B-runs) will be 50% lower than the four lowest previous index counts in the 1984-2017 period (1994, 1995, 1999 and 2013). The 2017-2018 wild B-run return over Lower Granite Dam will very likely be less than 50% of the previous low count (914 wild B-run steelhead in 1999-2000) in the 1984-2017 periods. The return of wild B-run steelhead to Bonneville Dam will be 41% of the previous low (1,847 wild B-run fish) in 1995. These comparisons are drawn from data in the February 20, 2018 Joint Staff Report: Stock Status and Fisheries for Spring Chinook, Summer Chinook, Sockeye, Steelhead and Other Species (ODFW and WDFW). The bottom line numbers show that likely fewer than 500 wild B-run steelhead will return past Lower Granite Dam for the 2017-18 run-year, and anglers will likely reduce the number of wild steelhead on the spawning grounds since the three states allowed continued fishing on steelhead all the way through April 31.

Adding urgency to the concern over the low steelhead return is a mid-2017 NOAA finding that ocean survival will remain very poor for at least two more years.

Faced with these numbers, state managers raised several issues as rational for not taking action. Since each point raises further concerns, The Conservation Angler addressed individually.

1. Angler Effort: State managers stated there was "anecdotal" evidence of

low angler effort. Even if true, that does not necessarily equate to low encounter rates. Avid and skilled steelhead anglers are likely to fish even with low abundance because they know how to catch steelhead and they know where to find them. The best anglers will still pursue steelhead while the low counts will only deter the casual angler. It would be helpful if there is a formula to calculate angler effort based on steelhead run-size.

2. Encounter Rate: The encounter rate for wild steelhead is likely higher than the encounter rate for the more abundant hatchery fish, which means that anglers encountering steelhead will likely encounter more wild steelhead than hatchery steelhead, though the ratio of hatchery-to wild steelhead is skewed the other way.

3. Habitat Partitioning: State managers noted evidence that wild and hatchery steelhead are quite partitioned within the available habitat. While this is possible given the attraction of hatchery fish to hatchery facilities, it is not uniform across all rivers. Indeed, in NOAA's 2015 Five Year Review of ESA-listed salmon and steelhead populations, the number of hatchery fish spawning with wild steelhead in Idaho is among the major risk factors wild Snake River steelhead face in multiple sub-basins. Why did fishery managers note this issue as a positive factor when partitioning among wild and hatchery steelhead was described as a major risk factor by NOAA?

4. Status of the 2017-2018 run: State managers still expected wild and hatchery steelhead to cross over Lower Granite Dam before the run year ends in June. However, according to the Fish Passage Center (FPC), ninety-five percent of the wild B-run steelhead pass Lower Granite Dam by year-end (December 31, 2017). Given the reported visual count to date, the remaining five percent yet to pass into the rivers above Lower Granite Dam will not measurably increase the final year-end count - even reaching 500 wild B-run steelhead for the 2017-2018 run year would be a pleasant surprise.

5. Size, Fitness, Fecundity: Finally, state managers believe that many of the wild A-run steelhead passing Lower Granite Dam were actually wild B-run steelhead that failed to grow



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beyond the 78 cm length that would visually identify them as wild B-run fish. This was attributed to poor ocean conditions and disruptions to the marine food web. If this is true, it is actually an even more critical uncertainty and risk factor facing the 2017-2018 wild B-run fish. The smaller “B-minus” B-run steelhead will likely exhibit less fitness and be unable to select and spawn in the best B-run spawning areas where the depth, current and cobble size provide conditions that contribute to wild B-run life history diversity. Lastly and significantly, the smaller fish will have fewer eggs so even if they spawn successfully, there will be significantly less egg deposition per redd than if this year’s wild B-run steelhead were products of better marine conditions (a wish) and returned in greater abundance (a fact). This egg deposition deficit will be magnified by the loss of even a few wild B-run steelhead in Idaho’s 2018 steelhead fishery.

An additional point TCA raised is equity. Snake River basin anglers are at the end of the line. There is a litany of fishery encounters that reduce the number of steelhead that pass into the Snake River. TCA has consistently called for angling closures and restrictions in all three states in the Columbia basin during the 2017 - 2018 fishing seasons to protect wild steelhead.

Proposed Measures to Conserve Wild Steelhead Throughout the Columbia and Snake Basins

First and foremost, federal, state, and tribal management agencies must prioritize and manage for wild escapement – not hatchery needs or harvest goals. Current management does not value wild fish.

Second, the frequently unreliable forecast methodology insures excess mortality for wild stocks. For example, the average forecast for Snake B-run wild steelhead exceeds actual by an average of 50%. This egregiously optimistic forecast guarantees excess mortality for wild stocks, especially in the absence of meaningful in-season adjustments to fisheries plans.

Third, agencies must develop temporal structure for all wild stocks and

then use those models to moderate in-season fisheries as is done in Bristol Bay. These models can easily be constructed with the abundance of passage data at the various Columbia/Snake dams. Such an approach last year would have quickly identified the dire condition of wild Snake B-run steelhead and forced conservation measures to protect them.

In short, the current methods used to develop annual fishery plans are bankrupt and are leading inevitably to extinction of wild stocks, even if they meet ESA limits. As agencies move to implement the long over-due changes outlined above, they must take a number of short-term conservation measures to prevent near-term extinctions in the Columbian and Snake basin fisheries:

I. Conservation Measures for 2018 Columbia and Snake Basin Fisheries

1. Identify Cold Water Refugia areas (119 areas have been identified, 13 are high priorities).
2. Create 13 Sanctuaries where fishing is prohibited to protect migrating steelhead.
3. Require that wild fish must be released and remain in the water when landed for all shore fisheries.
4. Barbless hooks in all fisheries to facilitate safe fish release and minimize hook injuries.
5. Anglers to rack rods after limiting (rescind “party boat rule”) to reduce encounter rates.
6. Suspend multi-species bag limits to reduce encounter rates.
7. Protect established spawning areas during spawning seasons in all areas to reduce encounter rate and increase productivity of wild fish escaping to spawn in natal streams.
8. Eliminate the use of bait in all fisheries where wild salmon or steelhead are required to be released to reduce C&R mortality and reduce the overall encounter rate.
9. Establish statistically valid and real-time observer programs for sport fishing so that estimates of encounter rate and mortality rates can be confidently used in models.
10. Require use of recovery boxes in sport fleet boats to reduce release mortality for fish requiring release.
11. Manage sport fishing seasons so

that real-time catch data can be used to open or close fishing to allow passage of wild fish through fisheries and to reach spawning grounds.

12. Eliminate the use of side-planers anywhere angling is allowed from floating devices to reduce encounter rates and instill the hunting concepts of “fair chase” into angling.

II. Conservation Measures for 2018 Columbia and Snake Basin Commercial and Treaty Fisheries

The following conservation measures for use by the non-treaty and treaty commercial fisheries will conserve wild salmon and steelhead, including closures, if wild fish escapement is at risk of not being met in upstream tributaries.

1. Develop temporal structure for all Columbia/Snake wild stocks to be used to construct fisheries that will facilitate recovery of the ESA-listed stocks and prevent disruption of healthy, non-listed stocks.
2. All commercial fisheries will occur only on alternating days so catch data is analyzed.
3. All fishing shall be during daylight hours
4. Fishing only permitted with a statistically valid observer, monitoring and creel program
5. No fishing permitted in any area that is used as thermal refugia by steelhead or salmon
6. Soak time for drift gill nets shall be limited to 20 minutes
7. Use of most selective gear and recovery boxes will be required.

III. Tribal, State and Federal Coordination Needed for Wild B-Run Steelhead Conservation

In addition, TCA also recommends development of a multi-party management program to recover wild B-run steelhead. Closing the fisheries that encounter wild B-run steelhead will not, by themselves, recover the wild B-run steelhead in the Snake River. Oregon must join with Washington and Idaho and the Treaty Tribes to consider and adopt an interstate recovery plan that addresses biological recovery actions for B-run steelhead.

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IV. Proposed Wild B-run Steelhead Conservation and Recovery Agreement

1. Closure of all Columbia and Snake River thermal refuges to all fisheries. Wild steelhead spend days and weeks in some thermal refugia and should be afforded shelter from angling.
2. Establish an inter-state recovery agreement for B-run steelhead approved by NOAA. That agreement must be based on the best available biological information with the objective to recover the threatened species and establish river-specific spawner escapement criteria and egg deposition criteria for each natal stream.
3. These criteria are to be verified with parr abundance objectives (full seeding) by natal stream.
4. The states and NOAA will provide an annual report for the public on meeting wild spawner escapement, egg deposition and parr abundance criteria by natal stream.
5. Habitat restoration and protection is to be focused on spawning and rearing habitat for B-run steelhead.
6. Fishway maintenance closures must be coordinated to contribute to the migration of wild B-run steelhead. These fish over-winter in the Columbia and Snake rivers before migrating to their natal rivers to reproduce. Fishway work should not block migration of steelhead responding to the cue of increasing water temperatures.
7. All three states must commit to evaluate the effects of fishing on wild steelhead survival.

A thorough investigation of encounter rates should be conducted to determine risk to wild B-run steelhead in sport fisheries for hatchery steelhead. ODFW has identified encounter rates for wild steelhead to be 2-5 times greater for wild fish in a river compared to hatchery fish (ODFW Deschutes and Alsea rivers data). A coordinated evaluation of encounter rates, mortality of fish released based on water temperature, impacts on survival, and their effect on achieving wild spawner criteria are all poorly understood. With the wild population so low, the precautionary principle demands that the risk be shifted away

from the wild populations. Better relevant information could be used to lift any angling and fish-handling limits or to open fisheries that have been closed due to perceived high encounter and mortality rates.

It is inconceivable that fisheries requiring release of wild steelhead are not contributing to the reduced survival of wild B-run steelhead. Idaho relies on studies examining mortality in summer and fall resident trout fisheries to extrapolate impacts to steelhead caught and released in fall, winter and spring weather, when anglers are more likely to harm a wild steelhead in freezing air temperatures than in mild summer-fall trout fishery weather.

Applicable findings are primarily found in the Atlantic salmon scientific literature. Catch and release fisheries cause direct mortality as well as depressed reproductive success due to fall back, delayed migration, and reduced length of migration after release. Additional studies have shown that warmer water temperatures increase detrimental effects of catch and release and that larger fish have been found to have particularly reduced reproductive success after catch and release.

8. Failure to mark hatchery steelhead is compromising efforts to monitor steelhead abundance, diversity and escapement estimates. All hatchery-produced steelhead must be marked before release. Fishery researchers from Idaho have said it best: "Finally, the issue of non-adipose-clipped hatchery fish in window counts of 'wild steelhead' needs resolution. Hatchery-origin fish composed 46% of the unmarked catch in the Lower Granite Dam adult trap. Window counts at the dam included these fish with wild steelhead, greatly inflating wild steelhead escapement estimates. Obviously, even given that resolution of genetic stock identification is sufficient, the methodology of developing wild steelhead escapement estimates must be refined in order to produce statistically valid and accurate counts."

9. Estimating mortality in commercial net fisheries must be more rigorously evaluated. Oregon and Washington increased their rate of on-board monitoring of commercial gillnet fisheries

in 2017, yet their joint effort to have the standard mortality rates changed based on a single season of observations and data-collection is unwarranted. The Coastal Conservation Association has detailed the rationale why this rushed effort to approve a new, lower standard is improper, not scientifically valid and must be categorically denied by the US v. Oregon Technical Advisory Committee (TAC).

The Columbia River is managed for a mixed-stock (different species with different population abundance) non-selective (meaning fishers cannot avoid fish they may not or cannot harvest or release safely) fishery that relies on flawed forecasting, poor in-season monitoring and enforcement, no accounting for environmental conditions and, ultimately, with no assurance that wild fish actually reach their home rivers to spawn. This all quite clear based on NOAA's Fishery Science Center's latest review published in late 2015, before factoring in recent poor returns: "Four out of the five MPGs [Major Population Groups] are not meeting the specific objectives in the draft Recovery Plan based on the updated status information available for this review, and the status of many individual populations remains uncertain..... A great deal of uncertainty still remains regarding the relative proportion of hatchery fish in natural spawning areas near major hatchery release sites within individual populations. Overall, the information analyzed for this status review does not indicate a change in biological risk status."

All wild steelhead, both A-run and B-run fish, are precious and unique jewels and need every possible opportunity to spawn successfully. The ongoing and existing Columbia and Snake River sport and commercial fishery will cause mortalities to the wild steelhead returns now and into the future without significant changes.

It is past time to stop fishing for steelhead late in the season and in staging and spawning areas when runs are well below historic and even recent abundance levels - until real changes are made in our harvest, hatchery, water withdrawal and hydropower practices in the Columbia and Snake rivers.





The Thompson River's Last Stand as Wild Steelhead Numbers Plummet

By Robert Hooton

— Nanaimo, British Columbia —

Robert Hooton retired as supervisor of the Fish and Wildlife Section for the British Columbia Ministry of Environment's Vancouver Island regional office in 2008.

Recent months have seen a virtual tidal wave of information trading back and forth over the status of one of British Columbia's treasures, Thompson River steelhead. Never in almost six decades of association with steelhead in this province have I seen anywhere near the level of concern over a steelhead stock. That is a very good thing and one can only hope the eleventh hour pressure now developing will make a difference to the future of these magnificent fish. That said, let's examine the guts of the issue.

First stop — it isn't just those Thompson fish. From a pure science perspective they are but one of a group known as the Interior Fraser Steelhead (IFS). The distant and long forgotten Chilcotin stock is among them as are much smaller and even more forgotten stocks from the Nahatlatch, Stein, Bridge and Seton rivers. All the attention is focused on the Thompson, mostly because it is within a day's drive of Vancouver and it is, or was, the largest stock among all the IFS. The Chilcotin once enjoyed an equal reputation but one would be hard pressed to find a half dozen anglers of the modern era who know anything of that. Shed a tear.

Keeping in mind that most of what follows with respect to Thompson steelhead applies equally to those other IFS stocks, let's look more carefully at where we stand.

The downward trend in abundance of Thompson fish is well understood. The forces contributing to that trend have all been acknowledged but I'll offer their relative influence is nowhere near appreciated. The ocean is always the great unknown. All we can say with

certainty is it hasn't been a happy place for salmon and steelhead in recent years. Blame "the blob", northern extension of the range of voracious predators such as mackerel and pompano, competition for food from maturing hatchery salmon originating from the far western Pacific and commercial fisheries that intercept steelhead after they spin off from their annual cycle through the Gulf of Alaska and head for the Fraser River approaches. All are factors, to be sure. Some con-

*The downward trend
in the abundance of
Thompson River fish is
well understood.*

tend the ocean is less important than water starved juvenile rearing habitat in Thompson tributaries. To those I say, the highly productive steelhead rearing habitat of the Chilcotin is anything but short on water and that stock is even worse off than is the Thompson.

For as long as I can remember as a member of the government agency responsible for steelhead management (in fresh water at least), the commercial fishing industry was held to be the single greatest factor controlling the abundance of Thompson steelhead. I'll agree the case in support of that was strong at one time. Whereas the commercial fishery doesn't get a pass today, it has been eclipsed by the First Nations fisheries prosecuted within the Fraser River. Call it the elephant in the room. Here's the reality.

The First Nations population of British Columbia is roughly 4% (5% if Inuit and Metis are included) of the provincial total but, by far, the youngest and fastest growing segment of that total. Coincidentally, we have

governments pushing harder than ever to build voting capital by being seen as atoning for the injustices of our forefathers. Pile on the United Nations Declaration on the Rights of Indigenous Peoples to add momentum to what was already growing exponentially. Almost everyone on the streets of Vancouver hears about indigenous rights on a daily basis. Almost no one has ever heard of steelhead.

In the political arena the force majeure is reconciliation. For coastal First Nations, fish are clearly becoming currency in that respect. In the court of public opinion one dares not suggest this is not a good thing. My point is the supply of fish is diminishing and the demand increasing. The two lines crossed years ago with respect to Fraser River bound steelhead, regardless of who has the legal or political nod to catch them. Today is not about allocation, it's about sustainability and conservation.

Ah, but we have all the conservation oriented process and law to save endangered species like Thompson and Chilcotin steelhead. Enter the Committee on the Status of Endangered Wildlife in Canada (COSEWIC). These highly respected scientists performed an emergency assessment of the status of those steelhead and recommended to Canada's Minister of Environment and Climate Change an endangered listing. Subsequent steps are described ad nauseam in a couple of blog pieces I've prepared so I won't confuse things by trying to summarize them again here (www.steelheadvoices.com). Suffice to say due process is highly unlikely to secure the endangered species listing that would obligate the federal government to introduce the sorts of protection measures that could save what remains of IFS. Even if the endangered listing was brought forward according

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to the timetable one can tease out of the plethora of background material on such matters, we would endure at least another two or three seasons of the status quo.

The Department of Fisheries and Oceans (DFO) would have us believe they are doing everything possible to protect IFS. They are pursuing new computer models that assess the “exposure” of IFS to commercial fishing nets along their migration path from Johnstone Strait through the lower Fraser River. What that means is they are reviewing past data on where and when catches of IFS occurred and calculating the time over which they would be present in the conventional commercial seine and gill net fishing areas. Then they are talking about “rolling 3 or 4 week closure windows” to protect 80% of the run from harvest “with a high degree of certainty”. No one I know who is familiar with the IFS migration routes and timing is the least bit comfortable with such desk driven exercises. First, IFS are present for 10 or more weeks, not 3 or 4. Second, protecting 80% of the run is a bit of a different story when there are only 200 fish present as opposed to several thousand that occupied those same migration corridors and times not long ago. Third, what does a high degree of certainty mean? Fourth, what about those in-river First Nations fisheries? Fifth, the provincial government voice representing steelhead in these private discussions is the Ministry of Agriculture, not the steelhead management agency known as the Ministry of Forests, Lands, Natural Resource Operations and Rural Development or FLNRORD (does that sound like emasculation of any steelhead management capability?). Those Agriculture people are co-conspirators with DFO in the issue that drives the commercial fishery and, by extension, the First Nations fisheries. That issue is the certification of the Fraser River chum fisheries as sustainable under the Marine Stewardship Council (MSC) guidelines and process. Add on the fact those Agriculture people are also responsible for licensing the shore based fish processors, as well as marketing British Columbia seafood products, and there is just a bit of a conflict

of interest within the provincial government itself.

Anyone not familiar with the green washing marketing tool that MSC certification is all about might want to consider a quote from an excellent review article published in *Biological Conservation* 161 (2013) 10-17.

“During its 15 years, the MSC, which has an annual budget of close to US\$20 million, has attached its logo to more than 170 fisheries. These certifications have not occurred without protest. Despite high costs and difficult procedures, conservation organizations and other groups have filed and paid for 19 formal objections to MSC fisheries certifications. Only one objection has been upheld such that the fishery was not certified. ... An analysis of the formal objections indicates that the MSC’s principles for sustainable fishing are too lenient and discretionary, and allow for overly generous interpretation by third-party certifiers and adjudicators, which means that the MSC label may be misleading both consumers and conservation funders”.

I don’t use the term co-conspirators without reason. The chum fisheries, both commercial and First Nations, dominate what remains of the BC’s salmon fisheries. DFO and the provincial Agriculture people would have a lot less to manage and market without them. DFO performs token enforcement patrols in both tidal and non-tidal waters to police commercial vessel license requirements that specify recovery boxes and circulating pumps must be operational at all times when fishing and all non-target species, which generally includes sockeye, Chinook and wild coho salmon, and steelhead, must be resuscitated and released unharmed. They brag that these are selective fishing methods that have been in place since 2002. Look at the above figure for evidence of how that’s been working for Thompson steelhead. A recent presentation by a top official in DFO’s enforcement division revealed the enforcement effort in 2017 was the lowest in the past four years. Our man also stated plainly that the enforcement patrols in the Johnstone Strait area were intended to satisfy all comers that the commercial fisheries were “clean” and thus the MSC conditions for certification upheld. Predictably,

no significant transgressions were detected so the MSC beat goes on.

The last point I’ll make around the chum fishery is it is focused on enhanced stocks that return to lower Fraser tributaries at the worst possible time in terms of the overlap with IFS run timing. The chum fishery is all about roe, the value of which is enormous in offshore markets. The carcasses are little more than pet food and prawn bait. Any reference to FNs targeting chums for “Food, Social and Ceremonial” purposes acknowledged under Canada’s Constitution is smoke and mirrors. The First Nations fisheries impacting IFS are now formally referred to by DFO as “Economic Opportunity” fisheries. What makes matters even worse is DFO is quick to impose restrictions and even closures on harvesting the two species long known as the only significant food target of the FNs — Chinook and sockeye. Foregone opportunity on those traditional species whose run timing precedes steelhead pushes the FN fisheries later into the year so they can capitalize on dollars from chum roe, rather than protein from sockeye and chinook, while wreaking havoc on what little remains of IFS.

More on process. DFO now prepares massive documents titled Interim Fisheries Management Plans (IFMPs). These are circulated in draft form to “stakeholders” that they consider to represent the full spectrum of fisheries interests. The 2018 document of interest to IFS is 587 pages. I submit there are damned few of us volunteers out here with the time and dollars to process that material and attend all the meetings in far away places to ask penetrating questions. Nonetheless that IFMP and the so called consultation around it is all the federal government needs to have its way. Steelhead have never and will never be given their due in any IFMP. The abundance trend for IFS shouts volumes in that regard. And, if that isn’t depressing enough, consider that any conditions around First Nations fisheries are negotiated independent of IFMP processes. Instead, the First Nations along the IFS migration corridor — upwards of 40 of them between Vancouver and the Thompson steelhead spawning destinations — deal separately with DFO in

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forums where there has never been a steelhead management voice present. An agency with a sad history of addressing steelhead concerns partnered with a large number of independent First Nations who do not hold steelhead and steelhead angling in high regard does not breed optimism.

What can we do? Cancelling the MSC certification would be entirely beneficial but the best sources I can tap into on that subject tell me the armour around the MSC certification process is all but bullet proof. That paper referenced above is evidence enough of that. The alternative is to go after the major buyers of fish from MSC certified fisheries in BC. That holds promise. The other avenue of hope is legal action to force the federal government to live by its own rules regarding endangered species status, and protective measures that status commands. People are angry over DFO's intransigence and the province's complicity. Canada has never been big on the courtroom over the boardroom but this one deserves a different approach.

The other seemingly obvious conservation measure is to get the First Nation's chum seeking nets out of the migration corridor when IFS are present. What could be simpler? The large majority of those enhanced chums originate from lower Fraser tributaries where they could be harvested without collateral damage. However, that would require sharing agreements between First Nations that have a long history of conflict over salmon and little concern for steelhead.

The 2018 IFS return will be the test. There can be no doubt the worst ever, most black and white conservation crisis ever known among British Columbia's revered steelhead stocks will never reverse itself in the absence of major changes in how all three governments manage fisheries. All the platitudes about conservation, sustainability, the precautionary principle, biodiversity, etc. will be tested as never before. As go Thompson steelhead, so go wild steelhead in the next and the next and the next once great rivers.



On the Edge: Wild Clearwater River B-Run Steelhead

By Linwood Laughy

— Moscow, Idaho —

Author Linwood Laughy is an Idaho-based wild salmon and steelhead advocate.

In the mid-1950s, I often watched Clearwater River B-run steelhead leap from pool to pool ascending the fish ladder on the north end of the Washington Water Power Dam three miles upstream from the river's mouth. According to the Idaho Department of Fish and Game (IDFG), in the 1950s and early '60s, 40,000 wild B-run steelhead crossed that dam each year. Now 2018, 98% of the once famous Clearwater B-run steelhead are gone.

**Now, in 2018, 98%
of the once famous
Clearwater River B-
Run steelhead are gone**

The destruction of this magnificent steelhead run began officially on March 14, 1947, as noted in the U.S. Army Corps of Engineers' *Special Report on Selection of Sites, Lower Snake River, Oregon, Washington and Idaho*.

"The problem of passing migratory fish over dams on lower Snake River was discussed with representatives of the U.S. Fish and Wildlife Service, State of Washington Department of Fisheries, Fish Commission of Oregon, Oregon State Game Commission, and the State of Idaho Department of Fish and Game. *The consensus of opinion of these agencies was that any series of dams on lower Snake River would be hazardous and might entirely eliminate the runs of migratory fish in that stream.* [Emphasis added.] In view of

the experience at Bonneville Dam, this office does not concur with this unfounded opinion."

The actual destruction of the Clearwater's B-run steelhead began in 1956. The U.S. Corps of Engineers constructed Ice Harbor Dam 1956-1961; Lower Monumental Dam, 1961-1969; Little Goose Dam, 1963-1970; Lower Granite Dam, 1965-1973. In 1973 the completion of Dworshak Dam on the Clearwater's North Fork struck another blow.

The early 1960s saw more than 100,000 wild A-run and B-run steelhead enter the Snake River each year. By the 1974-75 season that number had dropped to 12,200, with only 3,000 fish returning to Idaho rivers and streams. In 1997, the U.S. Fish and Wildlife Service listed all Snake River steelhead as threatened with extinction under the Endangered Species Act. A-run steelhead generally pass Bonneville Dam between July 1 and August 25. These are primarily one-year-in-ocean fish less than 78 centimeters (about 31 inches) in length. B-run steelhead pass Bonneville mostly after August 25 and before November 1. These fish typically spend two years in the ocean and are headed for Idaho's Clearwater and Salmon rivers.

Fast-forward 20 years. In 2017 fish managers predicted as few as 770 wild B-run steelhead would cross Lower Granite dam during the 2017-2018 season, later raising this figure to 1,100. Pinning down accurate fish numbers is complicated. Not all B-run steelhead are over 78 centimeters in length, cross Bonneville between August 25 and November 1, or spend two years in the ocean. Further, up to a third of the B-run over Lower Granite Dam are bound for the Middle Fork and South Fork of the Salmon River rather than the Clearwater. Yet slice the figures any way you wish, since the late 1950s around 98% of the Clearwater River

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wild B-run steelhead have disappeared.

Citing present ocean conditions as a major contributor to the extremely low 2017 Snake River steelhead returns, IDFG fish biologist Joe Dupont recently wrote: “If we had better spawning, rearing and *migratory conditions*, it would buffer the poor ocean conditions to the point that we could still provide harvest fisheries in Idaho, and wild fish would not be threatened of going extinct.” [Emphasis added] This may be as bold a statement as an IDFG staff member dare make with its reference to “migratory conditions.” In 1999 the Idaho legislature whisked management of ESA-listed fish species away from IDFG with the creation of the Office of Species Conservation in the Governor’s office. The State of Idaho, a defendant in the current Bi-Op case before Judge Michael H. Simon, is aligned with the federal agencies and special interest groups trying to maintain the *status quo* on the lower Snake River—fish be damned as well as dammed.

In its 2002 *Lower Snake River Juvenile Salmon Migration Feasibility Study*, the Corps of Engineers identified three action alternatives to address the issue of threatened and endangered Snake River salmon and steelhead: the maximum transport (barging) of juvenile fish around the dams, major dam passage system improvements, and dam breaching. The biological analysis concluded the third alternative, breaching, presented the highest probability of recovering endangered and threatened Snake River salmon and steelhead.

The Corps and Bonneville Power Administration have since spent billions of taxpayer and ratepayer dollars implementing the first two alternatives. These least-likely-to-succeed alternatives have failed. No Snake River threatened or endangered fish species is on its way to recovery. In November 2017 National Oceanic and Atmospheric Administration Fisheries released its new “Recovery Plan” for threatened Snake River steelhead. The plan includes an extensive list of actions continuing over the next 50 to 100 years and is projected to cost hundreds of millions of dollars. Two points

of particular note in the report: first, the plan keeps the lower Snake River dams in place, and second, astonishingly, NOAA Fisheries acknowledges that “the actions will not get us to recovery.”

Breaching the four Snake River dams offers the best chance of recovering ESA listed fish

The public is thus now asked to invest more millions of dollars in a fish recovery plan designed to fail while ignoring the one action fish scientists have consistently identified as having

and watch our once plentiful and thriving wild salmon and steelhead disappear.

By NOAA’s own admission, the federal government’s recovery plan for threatened Snake River steelhead is a sham deserving of public outrage. The special interest groups that support the *status quo* on the lower Snake River—including government agencies like the Corps of Engineers and NOAA Fisheries—deserve the public’s disdain. Politicians who do the bidding of these organizations and who willfully deceive the public with misinformation and false statements regarding Snake River steelhead and salmon must be held accountable.

Based on Jared Diamond’s award winning book *Collapse*, the only remaining hope for avoiding the extinction of Snake River wild salmon and steelhead rests with an aggressive



The four lower Snake River dams remain the primary impediment to restoring not only Clearwater River B-Run steelhead, but steelhead and Pacific salmon populations throughout the upper Columbia River Basin. Photo by Jim Yuskavitch

the greatest potential for successful recovery: dam breaching. And all this while the four lower Snake River dams continue to produce electricity we no longer need, while we subsidize the Snake River shipment of wheat to Asia,

mass movement of individuals who refuse to see these iconic species disappear. Individual anger without collective action is a sure path to species extinction.



Wild Winter Steelhead, Sea Lions and Crisis Management

By Conrad Gowell and Jennifer Fairbrother

— *Native Fish Society* —

Conrad Gowell is Fellowship Program Director and Jennifer Fairbrother is Campaign & Columbia Regional Director for the Native Fish Society.

The Native Fish Society uses the best available science to advocate for the recovery of wild native fish and good stewardship of their habitats. Learn more about the organization's work at: nativefishsociety.org

Since the Oregon Department of Fish and Wildlife (ODFW) released a press statement at Willamette Falls in 2017, there has been a sustained public outcry about the conflict between wild winter steelhead and sea lions. Dr. Shaun Clements, Senior Policy Analyst with ODFW, said in a statement, "We know what the problem is and have seen this coming for about a decade, we just couldn't take action to prevent it." Dr. Clements is referring to an effort by many groups to modify the Marine Mammal Protection Act (MMPA), which would allow the Department to lethally remove California sea lions from the area surrounding Willamette Falls. Federal legislation has been introduced in both the House and Senate (H.R. 2083 and S. 1702, respectively) to modify the MMPA for this purpose. While the act does allow for the lethal removal of problem sea lions under crisis situations, state agencies want more latitude to address predation problems throughout the Columbia. ODFW's science team released a Population Viability Analysis (PVA) in 2017 assessing the effect of sea lion associated mortality on wild winter steelhead at Willamette Falls. The report indicates: "Sea lions have a large negative effect on the viability of winter steelhead."

Sea lion presence at Willamette Falls has been increasing over the past decade. As predators of Endangered

Species Act-listed winter steelhead, spring Chinook, lamprey, sturgeon, and other fishes native and non-native to the Willamette, sea lion predation is impacting the already low populations of wild fish in the basin. ODFW has declared that, because of the increased sea-lion population, wild winter steelhead are on the verge of extinction in the Willamette. But the Department's own analysis also shows one population of wild Willamette River winter steelhead, the Calapooia, is destined for extinction regardless of what is done with sea lions.

Winter steelhead have been declining for the past 45 years, long before the sea lions showed up.

For Native Fish Society (NFS) River Stewards working on the recovery and protection of these fish, ODFW's statements and PVA only provide part of the story. Winter steelhead have been declining for at least four and a half decades, falling from over 25,000 fish in 1971-1972 run year to just 822 in the 2016-2017 run year. Of those 822 fish, only 512 were estimated to return to the four core populations included in the analysis. The shifting baseline of wild steelhead decline in the Willamette began well before these data were taken. It started with intense splash dam logging, gravel mining, and industrial development that has been occurring since the 1860s. Willamette winter steelhead and spring Chinook were listed as threatened species in 1999 due to the continued degradation of habitat below, and lack of passage over federally owned dams, the nega-

tive impacts of mitigation hatcheries, and recreational and commercial harvest concerns. In response, several management plans have been put in place in the Willamette including the Fisheries Evaluation and Management Plan (2001), the Willamette Biological Opinion (2008), and the National Marine Fisheries Services' Recovery Plan (2011). Because of recommendations made in these plans, direct harvest has been reduced, incidental harvest through commercial fisheries has decreased, and hatchery operations have been limited to non-native summer steelhead, resident rainbows, and spring Chinook production.

But even as River Stewards throughout the basin carefully followed the abysmal returns of wild winter steelhead over Willamette Falls early in the 2016-2017 run year, no action was taken by fisheries managers. This lack of action led NFS River Steward Dave Carpenter to reach out to the governor's office, district fisheries biologists, Fish and Wildlife Commissioners, and state senators and representatives, urging them to address the multitude of threats facing these fish. In many of the Willamette's tributaries, it is legal to fish for wild winter steelhead during their spawning period, and the use of bait is allowed while juveniles are rearing in freshwater. Simple actions, like shutting down the catch and release fishery can take place on an emergency basis. But there is a problem: no one has determined an escapement number, or the number of fish that need to return to the spawning grounds. This figure is absolutely necessary to take in-season action and sustain the population into the future. The research, monitoring, and evaluation has not been developed to say if and when we need to adaptively reduce our various impacts to these fish.

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Winter steelhead have been declining for the past 45 years, long before sea lions showed up. While it is easy to articulate the effect of a single factor, such as sea lion predation, the solution

also subjected to some of the worst ocean conditions since the late 1990s. Poor upwelling along the Northwest Pacific Coast in the 2014-2016 years likely led to very low juvenile survival for Willamette steelhead. When winter

Scenario	North Santiam	South Santiam	Calapooia	Molalla
No Sea Lions	1.5%	4.8%	99.3%	0%
2015 Sea Lions	7.9%	15.8%	99.8%	0.1%
Average Sea Lions	27.4%	33.5%	99.9%	2.1%
2017 Sea Lions	64.4%	59.9%	99.9%	20.9%

Table 1. Percentages of quasi-extinction over a 100 year period in four populations of Willamette River winter steelhead under four different scenarios. Scenarios with sea lions assume that the predation mortality estimated during that year will continue indefinitely. The lowest predation rate was observed in 2015 and the highest predation rate was observed in 2017.

to wild steelhead recovery is more elusive. During the in-season period of this year's steelhead run, ODFW offered the following statement: "Part of the reason for this year's decline may be the horrific water conditions that existed during outmigration for many steelhead smolts during the winter and spring of 2015. As you recall we endured one of the worst droughts on record, exacerbated by a heat wave that elevated stream temperatures markedly in spring and early summer. Sea lion predation could also be a factor, given the ever-growing numbers in both the Willamette and the Columbia rivers. They feed both on upstream migrating winter steelhead adults and out-migrating juveniles below the falls, taking an estimated minimum of 15% of the Willamette bound adults in 2016. Understand that additional mortality is occurring in the river below the falls as well."

Indeed, these fish did experience a triple whammy of environmental conditions which contributed to their poor survival. A drought in 2015 caused many streams throughout the upper Willamette basin to dewater, including Courtney Creek, a high priority tributary in the Calapooia watershed. Oregon has been found ill-equipped to solve water quantity challenges, and public and private efforts to address water quality concerns have stalled.

The juvenile steelhead that survived the poor freshwater conditions were

steelhead were foraging through the North Pacific, these fish encountered "the blob", a deadly patch of warm water that developed and persisted during the summer of 2015 and into 2016, leading to poor survival of sub-adult steelhead in the ocean.

Once this cohort of fish returned to freshwater they were caught in recreational and commercial gillnet fisheries throughout the lower Columbia River, not purposely, but as bycatch—the unintended consequence of trying to keep fisheries open when small populations of ESA-listed fish are passing through. The effect of this harvest is assumed to be low, but poor data calls into question whether or not this factor is important.

It's at this point in their migration that adult wild winter steelhead would be subjected to sea lion mortality. With an increasing number of California sea lions showing up in the Willamette River, scientists estimated that 25% of the steelhead that returned to Willamette Falls in 2016 were consumed by these marine mammals. If we extrapolate the 25% predation estimate out to the 2017 return year and add that number back into the total number of fish that returned, the counts of winter steelhead at Willamette Falls would still be the lowest on record. And the trend is not improving. This year's run of wild Willamette winter steelhead looks to be the second lowest on record.

In 2017, NFS River Steward Nick Rowell provided anecdotal observations on the Clackamas River of sea lions moving up into the river to prey on spawning winter steelhead.

It is no question that sea lions moving this far into freshwater, feeding at times on spawning fish, is having a negative effect. In Washington State, sea lions drove a population of steelhead that moved through the Ballard Locks in Seattle to near extirpation. Indicators within the larger ecosystem, however, point to a larger collapse of prey species, with lamprey, forage fish and other food sources for sea lions such as sardines, sand lance, anchovies, and herring also struggling in the poor ocean conditions.

So where do we draw the line in our efforts to control predators?

In one study, avian predators in central California wiped out 100% of endangered steelhead and coho salmon. Do we also start selectively killing problem water oozles, blue herons, hooded mergansers, kingfishers, salmon sharks, and orca whales?

But those fish that successfully maneuver around the sea lions and anglers parked at the base of Willamette Falls still face numerous hurdles before they are able to spawn. Native fish often find that they can't reach their historical spawning habitat due to incomplete or partial fish passage at dams. For example, the Minto Fish Passage facility on the N. Fork Santiam River, which was built by the Army Corps of Engineers in 2013, has not been able to pass wild winter steelhead or spring Chinook upstream into their historical habitat because their offspring will have no way to migrate downstream through the reservoirs after they hatch. The \$27.4 million dollar facility opened in 2013, but plans to provide downstream passage at Detroit reservoir have stalled and the timeline remains uncertain to start construction on downstream passage. The earliest that juvenile wild steelhead could naturally pass through Detroit Reservoir on their way to the ocean is now 2023, the deadline for providing full fish passage in the Willamette Biological Opinion.

Another factor weighing on the population of winter steelhead is ODFW's

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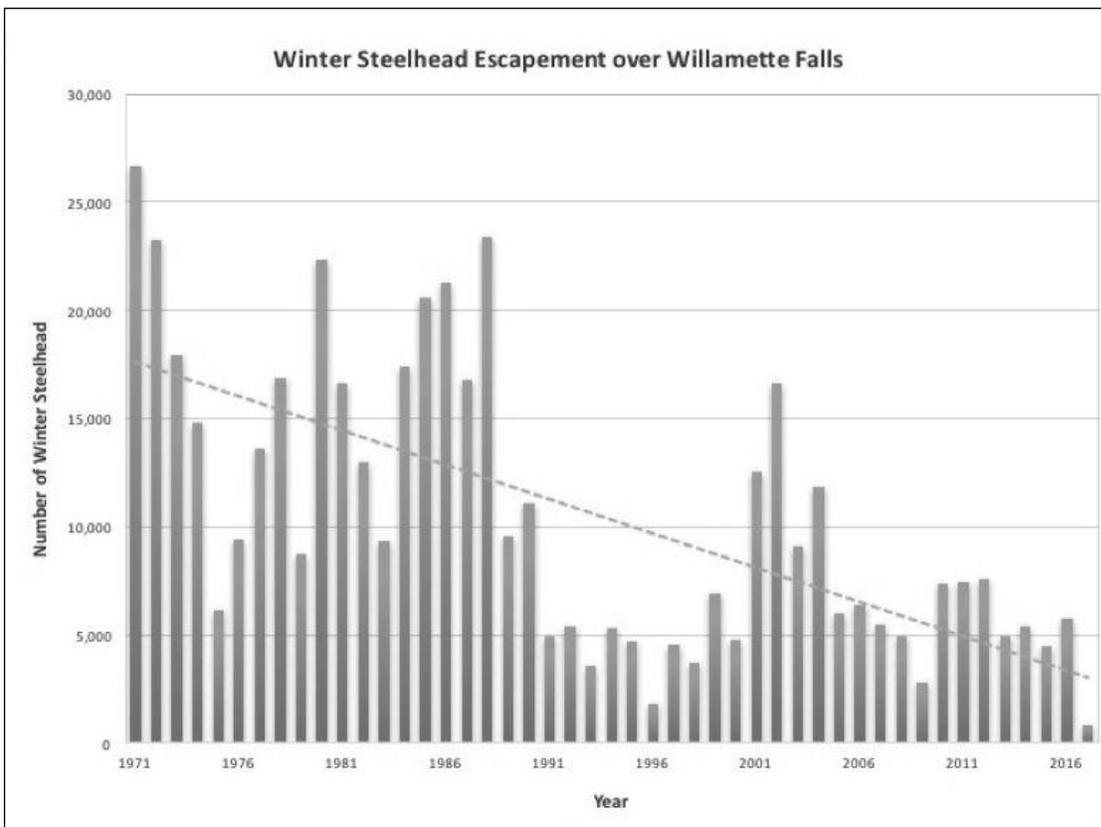
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stocking of non-native hatchery summer steelhead and hatchery rainbow trout. ODFW releases hundreds of thousands of these fish every year, which pose ecological and genetic risks to native winter steelhead. Hatchery summer steelhead smolts are planted at a much larger size than juvenile winter steelhead and often residualize, or stay in the river, instead of going to the ocean. These holdover summer steelhead then compete with native winter steelhead for food and other resources. Wild winter and hatchery summer steelhead can also spawn together, yielding unfit hybrids of the two distinct life histories. Stocked rainbow trout, like sea lions, can also directly prey upon juvenile ESA-listed winter steelhead and spring Chinook. Last year, a lawsuit was filed by two conservation groups, Willamette Riverkeeper and The Conservation Angler, alleging that hatchery summer run steelhead programs are putting ESA-listed wild winter steelhead in jeopardy.

While the effect of sea lion predation shown by ODFW researchers does contribute to the probability of one or more Willamette steelhead populations going extinct over the next century, other factors like those discussed above were not analyzed to weigh their individual contribution to the problems facing these fish. Pinniped predation may be a serious threat moving forward, but it was not the sole factor responsible for the critically low run in 2017 and again this year.

In 2021, wild winter steelhead are likely to be uplisted from threatened to endangered under the Endangered Species Act. We take very seriously Dr. Clements' statement that, "We are at a point where any more delays in the Willamette may condemn this run to extinction."

But it will take more than just amend-



ing the Marine Mammal Protection Act to save these fish. In March, NFS filed a lawsuit, in conjunction with our partners at WildEarth Guardians and Northwest Environmental Defense Center and represented by Advocates for the West, to address the failure by the U.S. Army Corps of Engineers (the Corps) to implement the management changes necessary to recover Upper Willamette River winter steelhead and spring Chinook. The Corps initiated reconsultation under the Endangered Species Act in April, the first step to addressing significant factors such as fish passage at key dams.

Native Fish Society River Stewards in the upper Willamette Basins have been calling on fisheries managers to shut down harvest on these ESA-listed fish, reform hatchery practices, restore access to historical habitat, and invest in solutions to the immediate and systemic problems of wild fish decline. Paramount to that goal is that we establish an escapement, or threshold for each population, at which we limit the array of threats we have immediate control over. We can't operate under crisis management to recover any listed species.

Ultimately, the solution to the

Willamette's wild fish crisis depends upon our collective voices creating the public will necessary to motivate state and federal resource managers to implement meaningful solutions. Our current crisis has drawn a diverse array of stakeholders to the table to form a coalition to help guide recovery efforts and engage the public in addressing the many causes of wild fish decline.

The root threats to the survival of threatened Willamette winter steelhead and spring Chinook are complex. While the effect of sea lion predation is important, it isn't the reason wild winter steelhead face extinction. Saving these fish, much less recovering them to populations that can sustain fully executable fisheries, will require resource managers to address the multiplicity of factors impacting these populations. We must move forward now on implementing solutions that don't require congressional approval if we are to ensure the persistence of this unique run of fish.





Mining Again Threatens Mount St. Helens Area Wild Fish and Habitat

By Matt Little

— Cascade Forest Conservancy —

Matt Little is Executive Director of the Cascade Forest Conservancy, an organization that is dedicated to protecting forests, streams, wildlife and communities in the Cascade Mountains. Learn more about their work at: cascadeforest.org

Just north of Mount St. Helens lies the beautiful and pristine Green River valley, which is a treasured wild steelhead refuge and a destination for backcountry recreationists. It is also the site of a proposed gold and copper mine, and a battle that has been raging for over a decade.

The headwaters of the Green River lie in a steep and verdant valley in the remote northeastern portion of the Mount St. Helens National Volcanic Monument and contain one of the world's unique ecosystems. Following Mount St. Helens' 1980 eruption, this valley had areas that were scorched by the blast and other areas that were sheltered and where old growth forests survived the volcanic catalysm. This resulting mix of native flora and fauna at various levels of succession created a mosaic of diversity that today supports a diversity of species from wildflowers to herds of elk, and enjoyed by recreationists from bird-watchers to anglers.

The Green River flows in and out of the Monument's borders, snaking its way west through the glacial-carved landscape of Green River valley. Further downstream, it flows into the famous Toutle/Cowlitz River system. From the Cowlitz Trout Hatchery and North Toutle Hatchery down to the Columbia River, this popular stretch provides anglers with abundant opportunities to catch salmon and steelhead. What many anglers don't know, however, is that above this system flow waters so clean, clear, and productive for wild steelhead that the Washington

Department of Fish and Wildlife designated it in 2014 as one of the state's first "Wild Stock Gene Banks", to protect the integrity of the genetic stock. The Lower Columbia Fish Recovery Board also identified the Green and North Fork Toutle Rivers as "Primary" waters — their highest designation — for the recovery of fall Chinook and coho salmon, and winter steelhead, in the lower Columbia River Basin. The clean water and habitat values of the Green River, and proximity to the scenic Mount St. Helens National Volcanic Monument, also led the US Forest Service to determine that the Green River is eligible for Wild and Scenic River designation.

The valley is a treasure trove for other backcountry pursuits as well. It is a valuable wildlife corridor for the seasonal migration of a large elk herd, long recognized by the state wildlife agency for its habitat values. It also contains the Norway Pass special permit area for elk, highly coveted by hunters. Outdoor enthusiasts often start their adventures at the Green River Horse Camp to hike, bike, or ride horses along the 22-mile Goat Mountain and Green River loop trails through blast zone and old growth forests, and past beautiful alpine lakes and mountain views.

Enter Ascot Resources Ltd. This Canadian-based mining company has plans to explore for an industrial-scale mine in this valley. However, they are not the first prospectors to the area. In 1891, two German immigrant farmers were on a fishing and hunting expedition and found evidence of precious metals. This set off a mining rush in the area and led to the establishment of the Green River mining district in 1892 (later named the St. Helens mining district) to manage the numerous claims. However, these mining ventures proved to be unprofitable, and by 1926, the three companies that had

explored the Green River valley deposits (called Mount Margaret) had failed. The gold rush had ended.

The latest search for industrial-scale gold and copper started in 1969 when Duval Corporation acquired the Mount Margaret mining rights and drilled 150 core samples in the 1970s. Following the eruption of Mount St. Helens in 1980, Duval sold their claims to the Trust for Public Land. For over a decade, there was little interest in mining in the Green River valley until 1993, when Vanderbilt Gold Corp. applied for a mining permit in the area. The Bureau of Land Management (BLM) concluded that mineral concentrations in the area were too low to be profitable and denied the permit.

In 2004, Idaho General Mines, Inc. (later known as General Moly Inc.) acquired a 50% interest in the Mount Margaret deposit and applied for a hardrock mining lease. The local conservation group, Cascade Forest Conservancy (CFC), then called the Gifford Pinchot Task Force, responded by rallying support from the community. The cities of Longview, Kelso, and Castle Rock, which depended on the Green and Toutle Rivers for their drinking water supplies, all passed resolutions against the mine proposal. During the public comment period for the mining permit's Environmental Assessment, over 33,000 people expressed their concerns about the proposal. In 2008, the BLM denied the lease.

In March of 2010, the Canadian-based mining company, Ascot Resources Ltd., purchased the mining rights from General Moly Inc. In a very short time, and without an environmental assessment, the Forest Service approved Ascot's drilling plan. By August the company had drills in the ground taking core samples. CFC requested an injunction and stopped the drilling by the summer of 2011. Ascot Resources

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quickly submitted a new permit in late 2011, which this time the Forest Service and BLM approved. However, CFC prevailed in 2014 when a federal court invalidated the permits and the parties withdrew their appeals.

Not to be discouraged, Ascot started writing another application in 2015. In January of this year, the Forest Service yet again approved the permit and passed it along to BLM for their review and concurrence. It is likely the agency will concur with the decision very soon, making it final.

An industrial-sized mine in the Green River valley would be catastrophic for fish, wildlife, and recreation. These types of mines often require huge open pits to process the amount of rock and minerals necessary to be profitable. They also require massive containment ponds held back by earthen dams to hold the toxic materials and heavy metals left in the tailings sludge after mining, including copper, lead, cyanide, cadmium, mercury, and arsenic. These “ponds”, are notorious for leaking or failing over time. If one of these is built in the steep Green River valley, which is in a seismically active area in the shadow of an active volcano, the earthen dams are almost guaranteed to fail. In 2014 a tailings dam at British Columbia’s Mount Polley Mine failed, destroying whole salmon rivers with toxic sludge. Nobody wants this to happen to the Green River.

A leak containing even the smallest amount of dissolved copper can disrupt a salmonid’s olfactory senses, and at 2.3–3.0 mg/L it can be lethal. Heavy metals not only impact fish, but they build up in the living tissue of organisms as they travel up the food chain and affect just about every living creature in the ecosystem, including humans. Mercury is notorious for this and is a potent neurotoxin, greatly affecting the nervous system.

Exploratory drilling alone can have significant impacts to fish and recreation along the Green River. Ascot Resources has plans to perform test drilling at 23 drill pads that will create 63 boreholes. The drills use chemical additives during the drilling process and a bentonite-based grout afterwards that can have impacts to

groundwater and surface waters. The closest drilling sites are just 150 feet from Green River tributaries and others are approximately 400 feet from the Green River itself. Also, trees will be removed and formerly closed roads will be reconstructed, which will further impact the streams and fish.

Drilling, truck traffic, and other activities will create 24/7 noise throughout the summer into mid-fall, the same time of year that people visit this area for backcountry recreation and solitude. Bow season for elk and deer begins in September and the proposed mining site is where most backcountry trips begin, since it is the end of the road and it is where the horse camp and trails begin. The fishing experience would certainly be disrupted, as well as the direct impacts to other fish and wildlife from the project itself.

A large coalition of recreation and conservation groups have partnered with the Cascade Forest Conservancy to oppose this mine. The Clark Skamania Flyfishers (CSF), established in 1975, is one of the most vocal opponents of the mine because of potential impacts to the local fishery. In a powerful video about the mine on Cascade Forest Conservancy’s website, CSF’s Steve Jones is documented fly fishing the Green River and talking about the inevitable impacts that mining will have on the 14-16 pound steelhead he loves. Others opposed to the mine include the Cowlitz Indian Tribe, the original owners and managers of this land, and even the Portland-based rock band Modest Mouse, who currently has an ad out against the mine on their main webpage.

All these calls to action have been heard by decision makers, including leaders in Congress. Washington’s Democratic Senator Maria Cantwell is an important ally for mine opponents, especially through her role as Ranking Member on the Senate Energy and Natural Resources Committee. In a 2016 Committee hearing on the Forest Service budget, Senator Cantwell grilled the former Chief of the Forest Service, Thomas Tidwell, on his agency’s insufficient review of this mine and the impacts it will have on the valley.

Ironically, all of the 900 acres currently under consideration for

exploratory drilling were once owned by the conservation-focused Trust for Public Land (TPL), who had purchased it from Duval. In 1986, following the creation of the Mount St. Helens National Volcanic Monument, TPL donated and sold their land and the mining rights to the Forest Service. During the land transfer, TPL wrote that they expected that the mineral rights “would be removed from entry under the General Mining Laws.” Fortunately, some of these lands were also purchased using money from the Land and Water Conservation Fund (LWCF).

The Land and Water Conservation Fund Act was established by Congress in 1964 to use money generated from off shore oil and gas leases to acquire lands for conservation and recreation purposes. Since its inception, LWCF has protected over five million acres of conservation and recreation lands across the country. A mine established on these lands would be devastating not only to the Green River valley, but for public lands everywhere.

So what’s next? The Cascade Forest Conservancy and its coalition partners will continue to fight drilling in the Green River valley, including through more litigation if necessary. The coalition hopes for a permanent end to mining in this valley and is asking our leaders in Congress to lead a solution that will preserve the area’s exceptional fish populations, wildlife habitat, and backcountry recreation opportunities. The Land and Water Conservation Fund has strong bipartisan support, and any solution should also preserve the integrity of this law and the public lands it has protected.

The Green River valley is unique, and the fish, wildlife, and communities that depend on it for their livelihoods deserve our long-term support and protection. To learn more about this proposal and see a video of this beautiful landscape, go to:

cascadeforest.org/our-work/mining/

Also, please consider joining the Cascade Forest Conservancy as we work toward the long-term preservation of this treasured watershed.





Piscine Reovirus Documented in Escaped Puget Sound Farmed Atlantic Salmon

By Patrick Myers

— Wild Fish Conservancy —

Author Patrick Myers is Director of Development and Outreach for the Wild Fish Conservancy, which works to conserve wild fish through science, education and advocacy. Learn more about their work at: wildfishconservancy.org

On March 22, 2018, Governor Jay Inslee signed into law landmark legislation representing the world's largest ever legislative removal of Atlantic salmon net pens. This historic action was not only a major environmental victory for Washington state, but it set a precedent for our colleagues around the globe fighting the very same battle their own public waters.

Yet as we continue to celebrate and countdown to 2022, when Cooke Aquaculture's final leases expire, we have discovered a new and serious threat to our wild salmon posed by this industry that cannot be ignored for another four years.

Back in February, Wild Fish Conservancy sent tissues samples taken from 19 Atlantic salmon that had escaped from a net pen near Cypress Island to an independent lab to be tested for Piscine Reovirus (PRV), a virus that may spread to and harm wild fish. The lab results showed that every single one of the 19 fish tested positive for the virus. Even more shocking were the results of the genetic sequencing, which revealed the origin of the virus to be sub-genotype 1a, or of Norwegian origin, and clustered tightly with a PRV-isolate from Iceland.

This is the first time the Icelandic PRV-isolate has been found in Pacific waters, and the finding raises a critical question — if the eggs used in Cooke Aquaculture's Atlantic salmon hatchery in Rochester, Washington come from Norwegian-born fish raised in

Iceland, has the industry been allowed to import PRV-infected eggs and consequently plant infected fish into Washington's public waters?

As a consequence of these test results, Wild Fish Conservancy drafted and sent a letter to Dr. Kenneth Warheit, supervisor of the fish-health and genetics lab at the Washington Department of Fish and Wildlife, requesting the department to test for PRV in Atlantic salmon juveniles ready to be transferred into open water net pens and in all currently

Has the salmon farming industry been allowed to import PRV-infected eggs and then plant infected fish into Washington's public waters?

operating Atlantic salmon net pens in Washington state.

WDFW responded swiftly to our concern, and agreed to test both Atlantic salmon hatcheries and Atlantic salmon net pens in Washington for PRV, and further agreed to halt the transfer of Atlantic salmon juveniles and remove infected fish from open-water net pens if the PRV virus was found.

We applaud WDFW's decision to test Atlantic salmon for PRV, and we share the agency's opinion that Atlantic salmon infected with PRV should not be grown for harvest in Washington's waters. We believe WDFW's decision to exclude PRV-infected fish from public waters is well in line with a precautionary approach, an approach that is necessary when considering the needs of wild Pacific salmon and steelhead.

We have deep concerns, however, over the agency's chosen means for testing for this virus. We understand that WDFW has dictated that a private veterinary consulting group will be conducting viral sampling and testing for PRV, and that this chosen group is currently a consultant for, and has publicly testified on behalf of, the Atlantic salmon aquaculture industry in Washington state. Due to the potential consequences of PRV testing in Atlantic salmon hatcheries and open-water net pens, we are concerned that any private entity, even an entity that had not previously exhibited a predilection for the aquaculture industry, could fall under the influence of outside interests, and could experience difficulty in testing for PRV in an impartial manner.

To bring this issue to the agency's attention, Wild Fish Conservancy drafted, and is gathering signatures on, a letter of petition requesting WDFW to conduct PRV testing internally. It is WFC's belief that state conducted viral testing is the only way to assure the public that PRV test results will be free from bias.

Wild Fish Conservancy will be circulating the petition via the Our Sound, Our Salmon campaign, a coalition of 100+ businesses and organizations as well as nearly 12,000 individuals who worked over the past year to bring about a legislative phase out of Atlantic salmon net pens in Washington state.

Dear WDFW Acting Director Joe Stohl,

We, as members of a coalition of businesses, organizations, commercial and recreational fishermen, and individuals under the name of Our Sound, Our Salmon, write to respectfully urge the

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Washington Department of Fish and Wildlife (WDFW) to reconsider the means by which farmed Atlantic salmon and ready-to-transport Atlantic salmon smolts in Washington state hatcheries are to be tested for Piscine Reovirus (PRV).

In the aftermath of the Cypress Island escape last August, PRV was found in every fish that was tested for the virus. Even more shocking were the results of the genetic sequencing, which revealed the origin of the virus to be sub-genotype 1a, or of Norwegian origin, and clustered tightly with a PRV-isolate from Iceland.

This is the first time the Icelandic PRV-isolate has been found in Pacific waters, but it raises a critical question — if the eggs used in Cooke Aquaculture's Atlantic salmon hatchery in Rochester, WA come from Norwegian-born fish raised in Iceland, has the industry been allowed to import PRV-infected eggs and consequently plant infected fish into Washington's public waters?

Recent scientific evidence has shown that PRV is amplified by net pens in the marine environment, and that the virus can spread to and potentially harm wild fish. Considering this concerning possibility, we applaud WDFW's decision to test Atlantic salmon for PRV, both in open-water net pens and at any Atlantic salmon hatchery intending to transfer fish into public waters, and we share the agency's opinion that Atlantic salmon infected with PRV should not be grown for harvest in Washington's waters. We believe WDFW's decision to exclude PRV-infected fish from public waters is well in line with a precautionary approach, an approach that is necessary when considering the needs of wild Pacific salmon and steelhead.

We have deep concerns, however, over the agency's chosen means for testing for this virus. We understand that WDFW has dictated that a private veterinary consulting group will be conducting viral sampling and testing for PRV, and that this chosen group is currently a consultant for, and has publicly testified on behalf of, the Atlantic salmon aquaculture industry in Washington state. Due to the potential consequences of PRV testing in

Atlantic salmon hatcheries and open-water net pens, we are concerned that any private entity, even an entity that had not previously exhibited a predilection for the aquaculture industry, could fall under the influence of outside interests, and could experience difficulty in testing for PRV in an impartial manner.

As is stated in WDFW's own investigative report into 2017's Cypress Island Atlantic salmon escape, the Atlantic salmon net pen industry in Washington state has misled the public on a number of occasions in the past year. As a result, public confidence in the industry's willingness to act candidly and in the best interests of Puget Sound has eroded.

A fundamental principle of good resource management is to assure the public that the outcome of consequential testing is the result of rigorous science conducted by independent investigators free from any reasonable perception of bias and/or conflict of interest. Following this principle, the signees of this letter urge WDFW to conduct PRV testing internally, using appropriately qualified staff.

As an agency, WDFW owns both the scientific means and legal authority to sample and test for PRV in operating net pens and hatcheries, and we, as a coalition, would have far more confidence in test results from a governmental agency than in results coming from the industry's consultant.

We urge WDFW to make the results of those tests available to the public as soon as is feasible, and we stress that an impartial testing process is essential to assure the public that the Atlantic salmon net pen industry is not causing additional harm to our marine environment and our cherished marine species.

Thank you for taking our concerns into consideration.

More information on PRV in Puget Sound can be found at:

<https://www.oursound-oursalmon.org/prv-1/>

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Guest Column

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take to protect and begin to recover this population on the brink of extinction.

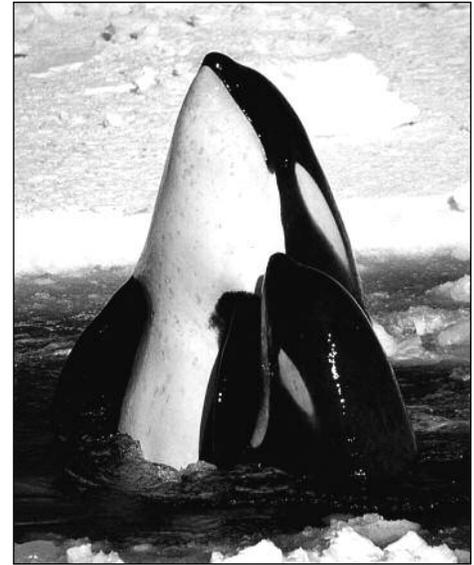
While three causes of decline are generally accepted, insufficient prey numbers is the top priority. Without more fish in the very near-term these orca don't stand a chance. Further, the other two issues to address, toxins and vessel noise, are made much worse by the shortage of prey. Lack of food, for example, leads to burning blubber stores where toxins concentrate. Burning fat mobilizes these toxins and heightens their harms to orca reproduction and immune systems and ultimately can lead to death.

The plight of orca and central need for significant increases in salmon abundance regionally has recently permeated into many natural resource venues and vehicles. Advocates have included endangered orca among the claims of Columbia-Snake River Basin biological opinion litigation for the last ten years. Orca figures prominently in discussions in NOAA's Columbia Basin Partnership — a new regional forum of stakeholders working together to identify recovery levels for salmon and steelhead. Ben Enticknap, senior scientist with Oceana, recently delivered a presentation about orca at the 2018 Lake Roosevelt Forum in Spokane, Washington. Federal agencies (BPA and Army Corps) assure us that the court-ordered environmental review of salmon recovery alternatives for the Columbia Basin will include a full and fair analysis of impacts and opportunities for the Southern Residents.

Across all these forums, orca advocates have joined forces with salmon advocates to press urgently for the removal of the four lower Snake River dams. Not only is it one of the single most beneficial actions that we can take to protect and restore endangered salmon (NOAA's own finding in 2002), it will also restore significant populations of the large, fatty spring Chinook we now know Southern Residents target in winter and early spring at the mouth of the Columbia River. The Snake River and its tributaries are highly productive habitat for springers; historically this drainage produced nearly half of the spring

Chinook in the entire basin. Restoring the lower Snake River by removing its four deadbeat dams is no silver bullet for orca survival, but according to experts, it is very difficult to see how we protect them from extinction with these dams in place.

The plight of the Southern Resident orcas is a poignant reminder of the role of Northwest salmon as a connector of people, of place and of ecosystem. Their precarious status today brings new urgency and argument for meaningful action and much-needed leadership. Already high stakes have gotten higher for the Northwest and the nation; it remains to be seen if the citizens and leaders of our region will step up to the challenge.



Orca. Photo courtesy Robert Pitman, NOAA



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