

Ashbrook, Charmane E (DFW)

From: Nicholas Chambers <nchambers@tu.org>
Sent: Thursday, November 12, 2015 4:59 PM
To: Ashbrook, Charmane E (DFW)
Subject: FW: Comments for Olympic Peninsula Proposed Rule Changes
Attachments: TU comments on North Olympic Peninsula steelhead rule proposals_11-2015.pdf;
Steelhead Angler Survey.pdf

Categories: Sport Rules

From: Nicholas Chambers
Sent: Thursday, November 12, 2015 4:56 PM
To: 'james.scott@dfw.wa.gov'; 'charmane.ashbrook@dfw.gov'
Cc: 'craig.burley@dfw.wa.gov'; 'commission@dfw.wa.gov'
Subject: Comments for Olympic Peninsula Proposed Rule Changes

All,
Please accept the attached comments on the proposed Olympic Peninsula steelhead rule changes on the behalf of Trout Unlimited, these comments have also been submitted through the online comment process. Also attached for your review is an independently conducted survey of steelhead angler opinion that demonstrates the current views of steelhead anglers in the Pacific Northwest.

Thank you,

Nick Chambers

Wild Steelhead Initiative Organizer
Seattle, WA
nchambers@tu.org
(541) 908-1329

Jim Scott
Senior Policy Advisor
Washington Department of Fish and Wildlife
600 Capitol Way N.
Olympia, WA 98501

Sent via email to: Jim.Scott@dfw.wa.gov

Re: Comments on WDFW proposals for Olympic Peninsula winter steelhead sportfishing regulations

Dear Jim:

Trout Unlimited is the largest cold-water fisheries conservation organization in the United States, with approximately 5,000 members in Washington, many of whom are avid steelhead anglers. Our mission is to protect, restore and sustain native and wild salmon and trout and the watersheds they inhabit, and to support sustainable fisheries. Accordingly, we have a vested interest in obtaining fisheries management on Washington's North Olympic Peninsula (NOP) rivers that protects and restores wild populations of steelhead to ensure opportunity for this and future generations of anglers, while also honoring the treaty fishing rights of area tribes.

Steelhead are the state fish of Washington and an integral part of the Northwest cultural and economic fabric. Perhaps nowhere is this truer than on the west-side of the NOP where several rainforest rivers (Quillayute, Hoh, Queets) and their wild winter steelhead populations provide a diverse angling opportunity from January-April that is one of -- if not *the* -- best remaining wild steelhead fishery in the Lower 48. As a result, the region is an annual destination for thousands of resident and non-resident anglers.

For the past 25-30 years there has been a steady downward trend in NOP wild steelhead populations and as a result, Hoh and Queets River winter steelhead have failed to meet escapement 40-50% of the time over the past fifteen years (Figure 1). At the same time, particularly in the last decade after the wild steelhead fisheries were closed in north Puget Sound rivers, sport fishing pressure on the NOP has intensified, and it is likely to increase in the future with the growing population. Accordingly, we need to improve management to reverse the downward trajectory of wild steelhead and the fisheries that depend on them. Accomplishing this will require increasing the diversity, productivity, distribution and abundance of NOP wild steelhead, all of which are absolutely critical to sustaining sport and tribal fisheries in an uncertain future.

Every three years citizens are allowed to submit fishing rule proposals to the Washington Department of Fish and Wildlife (the Department) for consideration. This year, as part of the rule-making process, the Department established a North Coast Steelhead Advisory Group (NCSAG) to gather information about how to best manage the NOP winter steelhead sport

fishery. We commend the Department for establishing the NCSAG, which produced a suite of important rule proposals. TU believes that we as anglers need to do our part to ensure a healthy future for the NOP wild steelhead and the world-class fishery opportunity they provide. Below you will find our comments on the rule proposals put forth by the NCSAG.

General considerations for proposed NOP rule changes

1. Rule proposal #48: Require catch-and-release (CnR) of wild steelhead and rainbow trout

We support CnR of wild steelhead and rainbow trout, and so do the vast majority of anglers that fish the NOP – at least based on creel surveys. According to the 2013-2014 creel and punch-card data, anglers released over 95% of the wild steelhead they caught, largely because CnR of wild steelhead is now almost a universally accepted norm among anglers. The rule would help the NOP keep pace with management of other high quality steelhead fisheries in the lower-48, such as the Smith River (CA), N. Umpqua (OR), Deschutes (OR), Grand Ronde (OR, WA, ID), and Clearwater (ID), and those in Canada, including the Dean, Thompson, and Skeena systems.

There is a reason most great steelhead fisheries are CnR. There are simply too many anglers and not enough fish to be killed on a sustainable basis. CnR allows anglers to do what they love the most, which is fish, while also improving chances that more steelhead survive the fishery. The NOP wild steelhead populations are in long-term decline (Figure 1). Thus, releasing wild steelhead is important because it will put more fish on the spawning grounds, which maximizes diversity and improves chances that stream habitat is fully utilized to its potential. In this regard, it bears emphasis that the contribution of individual wild steelhead to the next generation is highly variable; just a few individuals may be responsible for most of the offspring in a given year. Anglers have no way to determine whether a wild fish they catch is one of those prolific individuals. Similarly, anglers cannot discern whether a pre-spawn adult is or will become a repeat spawner. Because repeat spawners contribute greatly to persistence of the population, they should not be killed. Only a catch-and-release rule for wild fish will ensure that these exceptionally important individual fish are not removed from the population.

Releasing rainbow trout is important because they can help sustain steelhead populations during times of depletion (Kendall et al. 2015), provide mates for female steelhead (McMillan et al. 2007), and contribute to genetic diversity (Christie et al. 2011). On the NOP, resident rainbow and steelhead are part of one *O. mykiss* population, and should be managed as such.

2. Rule proposal #47: Implement restrictive gear rules on NOP rivers during winter steelhead season

The current proposal put forth by the NCSAG would, 1) require barbless hooks and allow only one hook with up to 3 points, and 2) limit use of bait to those times and river segments where an angler can expect to catch a hatchery steelhead (October 1-February 15, the result of the rule is a bait ban from February 15- April 31).

We support prohibiting barbed hooks. They create larger wounds than barbless hooks and are more difficult to remove, which increases handling of the fish. Extended and poor handling reduces the chances of a fish surviving to spawn, which is important considering the large numbers of fish caught by anglers each year.

We support prohibiting bait for several reasons. First, bait is the most effective method for catching steelhead. A review by Hooton (2001) found bait produced 2.4 times as many steelhead per hour compared to lures. Similarly, creel surveys on the Thompson River in British Columbia found that bait was twice as effective as lures and 7-8 times as effective as flies (Renn and Bison 2003). In that survey, bait anglers caught 758 steelhead, while lure fishermen captured 134 fish, and fly anglers caught 92 fish. Creel surveys on the Trinity River (CA) (Garrison 2001) found that CPUE was highest in the section of river where 78 percent of all anglers used bait. Partly as a result of the effectiveness, Department creel surveys for 2013/2014 found that anglers caught more fish than the entire escapement in the Sol Duc and close to it in the Bogachiel and Hoh Rivers -- and that did not include fish that were hooked but not landed. Prohibiting bait will keep angler encounters to appropriate levels while allowing for more angler time on the water. In other words, banning bait is both good for wild steelhead and good for anglers who value time on the water over harvest, which is the large majority of anglers.

Second, bait generally, but not always, has higher mortality rates for steelhead than gear or fly (Hooton 2001). For example, in a study on the Keogh River, steelhead caught with artificial lures were hooked deeply and bleeding profusely 4 percent of the time, compared to 11 percent with bait (Hooton 1987). Similarly, Bruesewitz (1995) examined hooking location for steelhead in several Washington streams in three consecutive years and found that single-hook-and-bait combinations resulted in 2.3 times higher incidence of hooking in critical locations, such as the back of the throat, esophagus and gill arches, than did single hooks and artificial lures. Lastly, the effects are likely worse on post-spawn fish. Hooton (2001) reported data from the Department that found bait-caught kelts were critically hooked 33 percent of the time, suggesting bait may have more profound effects on post-spawn steelhead that resume feeding as they migrate back to the ocean. Thus, prohibiting bait will reduce angler-caused mortality of adult steelhead, particularly for kelts, which is important because the percent of repeat spawners appears to have declined based on data from the Queets River (Figure 3).

Lastly, bait is particularly lethal for trout and juvenile fish. Muoneke and Childress (1994) found that baited hooks penetrated critical areas of the fish roughly five times as often as artificial lures (i.e., 50 percent with bait versus 10 percent with artificials). They also found that bait-related mortality was a significant issue for resident rainbow trout. Wydoski (1977) looked at several species and found an average of 25 percent mortality for bait fishing and 5 percent for artificial lures or flies. Mongillo (1984) reported 30 percent mortality for rainbow trout caught on bait compared to only 5 to 10 percent for those caught on artificial lure or fly. Taylor and White (1992) examined several studies of trout and found an average mortality of 44 percent with bait and 5 percent with artificial lures. Pauley and Thomas (1993) reported a mortality of 40 to 58 percent for cutthroat caught with bait and 10 to 24 percent with lure. Trotter (1995) also examined several studies on trout, including some of those already mentioned, and arrived at an overall mean mortality of 31 percent for baited hooks, 5 percent for lures, and 4 percent for flies.

Thousands of anglers congregate on the NOP every year, many of them using bait. Creel surveys in the Trinity River during the winter steelhead season found that anglers caught and released three times as many juveniles as they did adults (Garrison 2002). Almost 5,000 adult steelhead were caught and released in the Quillayute during the 2013/2014 season. I don't think anyone can argue convincingly that more trout and juvenile steelhead would not survive to breed or become smolts if bait is prohibited.

The rule proposed by the NCSAG would prohibit bait from February 15-April 31. The problem is that early-timed wild steelhead are also present during the hatchery steelhead season and early-timed steelhead are severely depleted compared to historic levels (Bahls 2004, Figure 2). Rebuilding the early-timed component of the run is critical to recovery and the increased diversity they provide will be important to persisting through future climate change (Wade et al. 2013, Kendall et al. 2015). Further, because they do enter early, they are in the fishery for a longer period of time. As a result, early-timed steelhead are more likely to be caught multiple times by anglers (Hooton and Lirette 1986), leading to greater chances of mortality. Therefore, we request selective gear regulations be implemented across the entire winter steelhead season (January 1 – April 31).

3. Rule proposal #46: Implement “no fishing from boat” rule in upper Hoh River from the National Park line downstream to Morgan’s Crossing (WDFW boat launch)

We support the experimental rule of “no fishing from floating device” rule in the upper Hoh River. The same rule exists in other world-class steelhead fisheries, such as the Deschutes River in Oregon and the Skeena and Dean Rivers in British Columbia. The rule was enacted in those places to improve sharing of the resource and to reduce effectiveness. The rule makes sense here

because the vast majority of steelhead on the NOP are caught by anglers in boats (Figure 4 and 5) and the advent of rafts – both large and small – and improved fishing techniques means that there are very few places where steelhead cannot be caught by anglers. While anglers could not fish from a boat in this reach of the Hoh under the proposed rule, they could still use boats for transportation. Restrictions on boat fishing are likely to become increasingly necessary if angling pressure continues to mount and steelhead runs continue to decline. The short reach in the Upper Hoh provides an opportunity to experiment with the rule and see how anglers respond.

Conclusion

TU believes that the evidence supporting a need for implementing more conservative sport fishing regulations on the NOP is overwhelming. We appreciate that it is a major undertaking and that some rules are controversial among a sub-set of anglers, but that fact does not diminish their necessity. Significant changes in the health and abundance of wild steelhead; large public investments in steelhead habitat protection and restoration; the surging popularity of steelhead fishing; the swelling ranks of steelhead guides on the NOP; growing support for catch-and-release of wild steelhead among sport anglers of all stripes; and new scientific information emerging regarding what wild steelhead need to thrive are all facts necessitating a robust set of conservation-minded sport fishing regulations.

It bears emphasis that the proposed rules we are supporting are good for both wild steelhead and anglers. Reducing angler impacts, both lethal and sub-lethal, is obviously good for the fish, but what may not be as obvious is that it is good for fishing. The fishing benefits are of two types. First, the reduction of angler impacts will allow for more time on the water and decrease the likelihood that fishing seasons will need to be shortened or eliminated for conservation reasons. Puget Sound rivers provide a stark example of the potential for that to happen. Second, they will spread out opportunity among the angling public – leveling the playing field in other words.

We want to emphasize to the Department and Commission that there is strong support for more conservation-oriented regulations among steelhead anglers. We are attaching a report summarizing a public opinion survey commissioned by TU and conducted in May of almost 650 active steelhead anglers. The results show clearly that a significant majority of anglers favor regulations that protect wild steelhead and their opportunity to fish, even if the regulations limit the types of gear they can use and their opportunity to harvest.

Western Washington is blessed to still have rivers including the Hoh, Sol Duc, Calawah, Bogachiel and Queets River that have sizeable wild steelhead populations that can and should support angling opportunity. The wild steelhead of the NOP and the fisheries they support are world-class and should be managed carefully and with the long-view in mind. TU believes that

implementing the NCSAG sport fishing regulations, with the modifications we have proposed above, are essential elements of such a management approach.

Thank you for your consideration.

Sincerely,

A handwritten signature in blue ink, appearing to read "Rosendo Guerrero".

Rosendo Guerrero

Chair, Washington Council of Trout Unlimited

A handwritten signature in black ink, appearing to read "John McMillan".

John McMillan

Science Director, Wild Steelhead Initiative

Cc: Washington Fish and Wildlife Commissioners

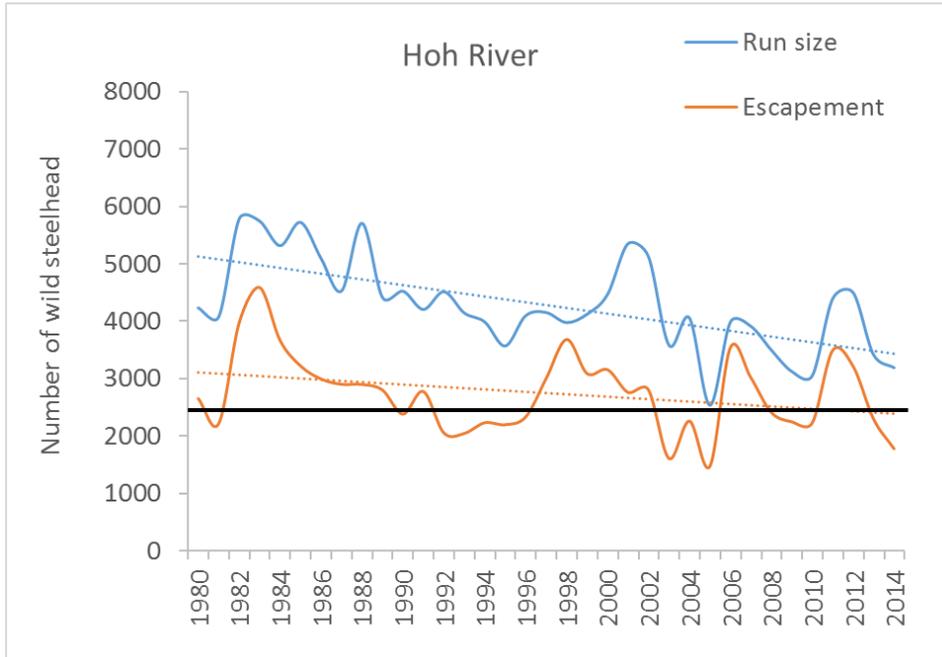
References

- Bahls, P. 2004. A Tale of Two Rivers: Assessing the current status of wild steelhead in the John Day and Sol Duc Rivers. *Osprey* 49:4-7.
- Bruesewitz, S.L. 1995. Hook placement in steelhead. Technical Report to Washington Department of Fish and Wildlife, Anadromous Fish Division, Fish Management Program. Technical report -- no. AF95-01, 12 p.
- Christie, M. R., M. L. Marine, and M. S. Blouin. 2011. Who are the missing parents? Grandparentage analysis identifies multiple sources of gene flow into a wild population. *Molecular Ecology* 20:1263-1276.
- Garrison, P.S. 2001. 1999-2000 Annual Report on recreational angler use and catch in the Trinity River, California. November 1999-March 2000. Prepared for California Department of Fish and Game, Steelhead Research and Monitoring Program, Project # 2c3. Weaverville Remote Office, Weaverville, CA.
- Hooton, R.B., and M.G. Lirette. 1986. Telemetric studies of winter steelhead, Gold River, 1982-1983. British Columbia Risheries Management Report, ISSN 0705-5390.
- Hooton, R.B. 2001. Facts and issues associated with restricting terminal gear types in the management of sustainable steelhead sport fisheries in BC. Report prepared for Ministry of Environment, Lands and Parks, Nanaimo, British Columbia.
- Kendall, N.W., McMillan, J.R., Sloat, M.R., Buehrens, T.W., Quinn, T.P., Pess, G.R., Kuzishchin, K.V., McClure, M.M., and R.W. Zabel. 2014. Anadromy and residency in steelhead and rainbow trout *Oncorhynchus mykiss*: a review of the processes and patterns. *Canadian Journal of Fisheries and Aquatic Sciences*. Published on the web 05 November 2014, accessed at: <http://www.nrcresearchpress.com/doi/abs/10.1139/cjfas-2014-0192#.VLYvCivF-Sp>.
- McMillan, J. R., S. L. Katz, and G. R. Pess. 2007. Observational evidence of spatial and temporal structure in a sympatric anadromous (winter steelhead) and resident *Oncorhynchus mykiss* mating system on the Olympic Peninsula, Washington State. *Transactions of the American Fisheries Society* 136:736-748.
- Mongillo, P. E. 1984. A summary of salmonid hooking mortality. Washington Department of Game, Fish Management Division. Olympia, Washington.
- Muoneke, M. I., and W. M. Childress. 1994. Hooking mortality: a review for recreational fisheries. *Reviews in Fisheries Science* 2(22): 123-156.
- Pauley, Gilbert B. and G. L. Thomas. 1993. Mortality of anadromous coastal cutthroat

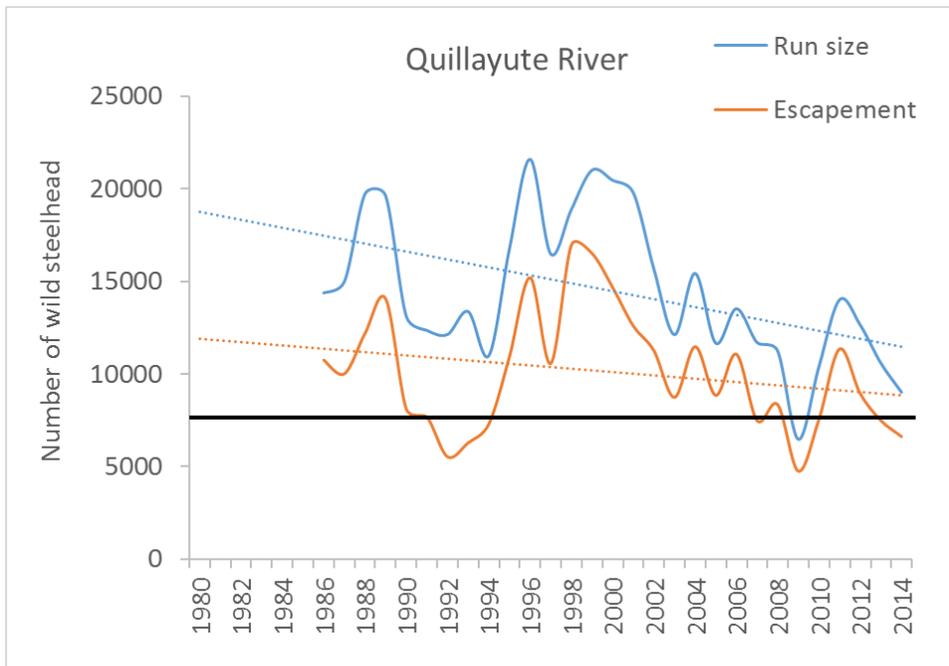
- trout caught with artificial lures and natural bait. *North American Journal of Fisheries Management* 13:337-345.
- Renn, J., and R. Bison. 2003. The 2002 Thompson River steelhead creel survey. Technical Report prepared for British Columbia Ministry of Water, Land and Air Protection, Southern Interior Region, 1259 Dalhousie Drive, Kamloops, BC, V2C5Z5.
- Taylor, M. J. and K. R. White. 1992. A meta-analysis of hooking mortality of nonanadromous trout. *North American Journal of Fisheries Management* 12: 760-767.
- Trotter, Patrick. 1995. Hooking mortality of trout. *Fly Fisherman* 26(3): 16-27.
- Wade, A.A., Beechie, T.J., Fleishman, E., Mantua, N.J., Wu, H., Kimball, J.S., Stoms, D.M., and J.A. Stanford. 2013. Steelhead vulnerability to climate change in the Pacific Northwest. *Journal of Applied Ecology* 50:1093-1104.
- Wydoski, R. S. 1977. Relation of hooking mortality and sublethal hooking stress to quality fishery management, p. 43-87 in R. A. Barnhart and T. D. Roelofs (ed.) *Catch and Release Fishing as a Management Tool*. Humboldt State University, Arcata, California.

Figure 1. Period of record during which run size and escapement of wild winter steelhead have declined in the (a.) Hoh River, (b.) Quillayute River, and (c.) Queets River. The Quillayute run size increased from 1980-1984 (not shown in graph), but has declined since 1985. The dashed lines indicate the average trend. Solid black line represents the escapement goal for each river.

a.



b.



c.

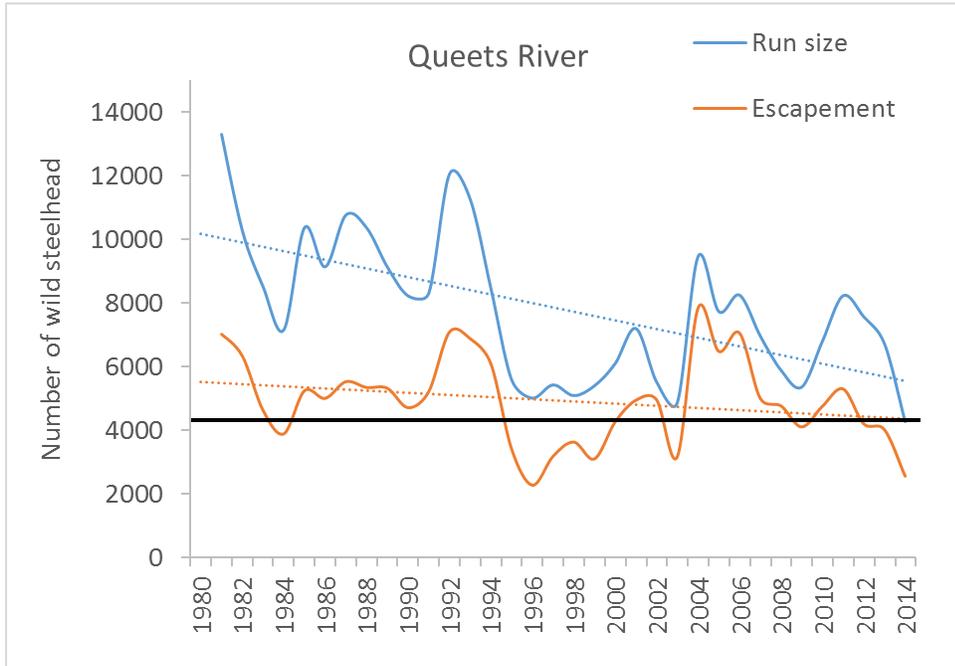
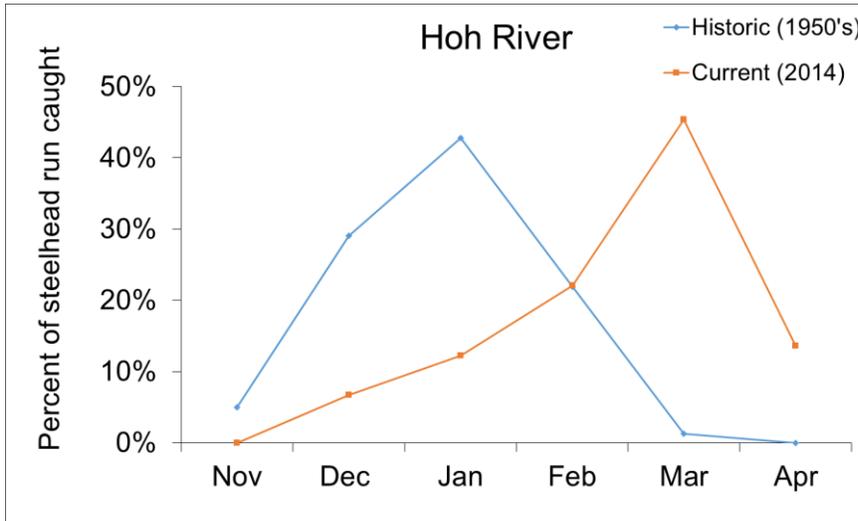


Figure 2. Percent of the cumulative tribal catch during the 1950's (blue line) and percent of sport angler catch in WDFW creel surveys in 2014 (orange line). The fishery in the 1950's generally ran from November-March, so catch data was scarce or non-existent for April, while the current fishery tends to start in early-January and run through April.

a.



b.

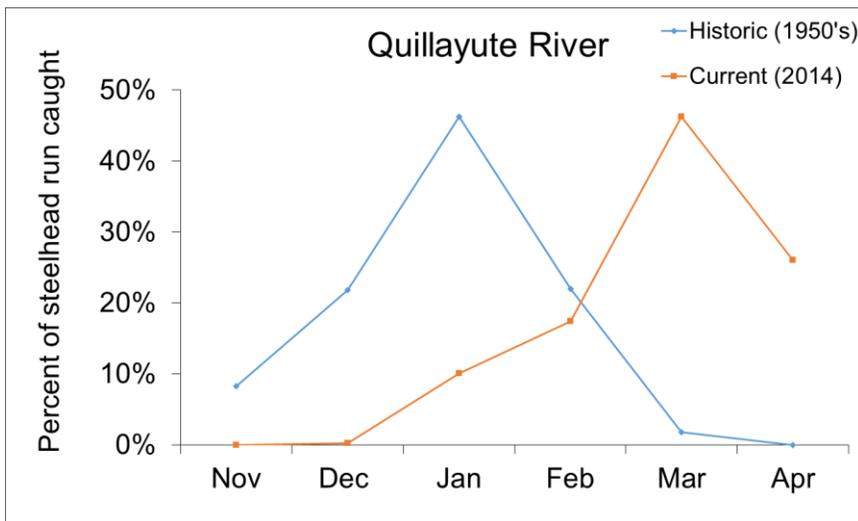


Figure 3. Proportion of the winter steelhead run (1980-2013) comprised of repeat spawners: fish that survived to spawn more than once. Trend line depicts 5-year moving average. Data provided by WDFW.

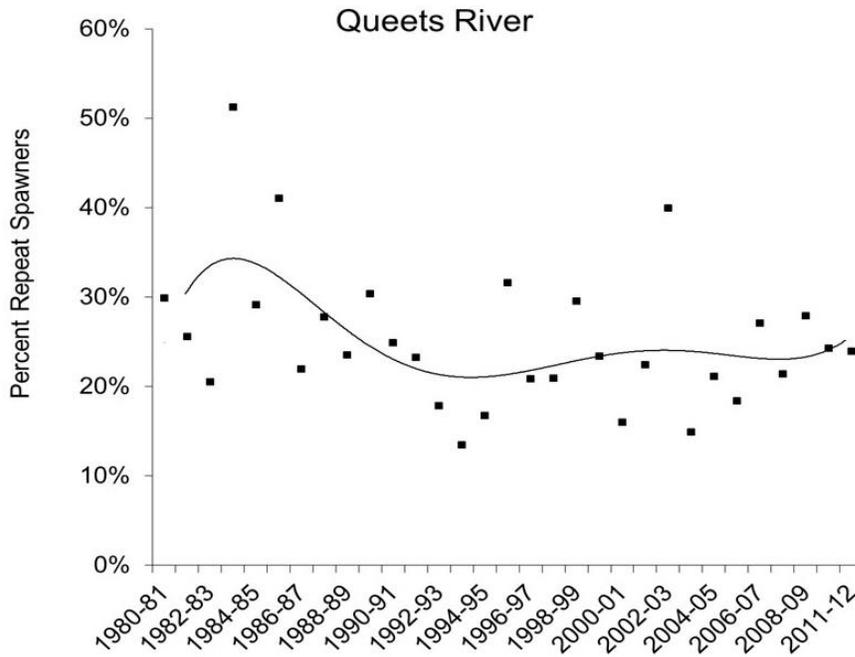


Figure 4. Number of steelhead landed per hour (Catch per unit effort) by different types of anglers in Quillayute tribes and Hoh River. Based on data collected by WDFW in 2013/2014.

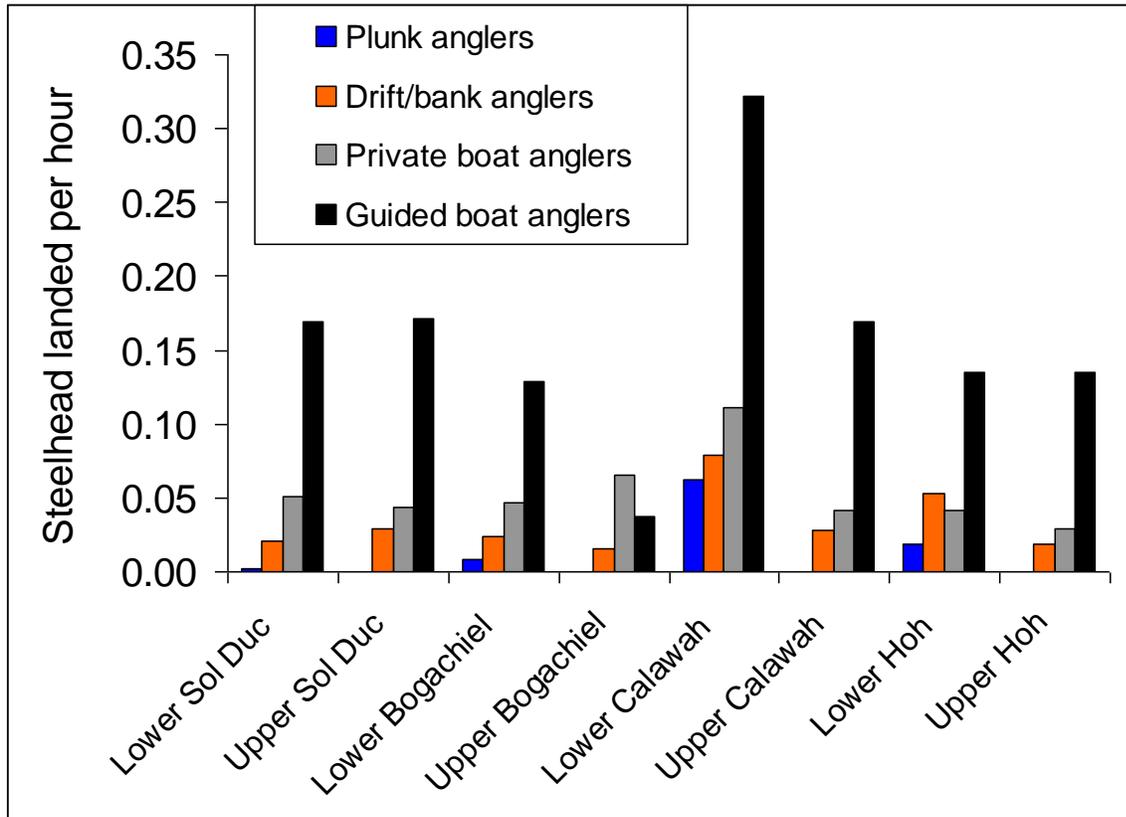
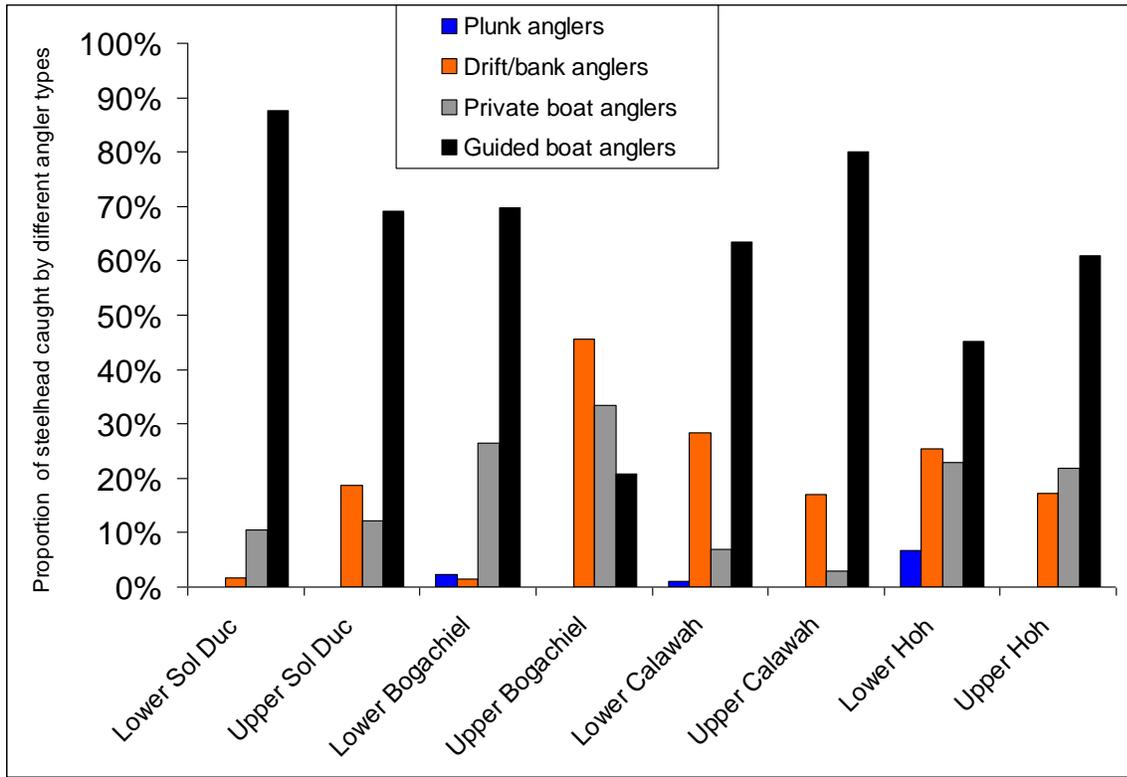


Figure 5. Proportion of steelhead landed by different types of anglers in Quillayute tribs and Hoh River. Based on data collected by WDFW in 2013/2014.



Angler Feedback and Preferences Regarding Pacific Steelhead Management: Technical Report

Prepared for: Trout Unlimited



June 10, 2015

By: Southwick Associates



PO Box 6435
Fernandina Beach, FL 32035
Tel (904) 277-9765

Table of Contents

Background	4
Data Collection and Methods	5
Findings	6
Location and Catch Preferences	6
Management Scenarios	9
Steelhead Management Approaches.....	11
Appendix 1: Composition of the Survey Sample.....	15

List of Tables

Table 1. States where anglers fished for steelhead 6
Table 2. Perception about over-crowding 12
Table A 1. Demographic proportions for the 2015 Survey compared to the target population of
steelhead anglers (characterized using the USFWS National Survey) 15
Table A 2. Rake Weight Summary 16

List of Figures

Figure 1. Types of steelhead fishing anglers enjoy 7
Figure 2. Types of steelhead anglers prefer to catch..... 7
Figure 3. Methods most often used when targeting steelhead 8
Figure 4. Importance of catching & releasing versus harvesting a steelhead 8
Figure 5. Keep or release preference on a river with a limited population of steelhead 9
Figure 6. Findings for Scenario I 9
Figure 7. Policy preference under Scenario II 10
Figure 8. Preference for conservative versus liberal management regulations in the face of
uncertainty 11
Figure 9. Preferred approaches for managing steelhead 11
Figure 10. Agreement with keeping fish under water when practicing catch-and-release 12
Figure 11. Support for limiting number of fishing guides on popular rivers..... 13
Figure 12. Angler preference to maintain choice of methods and gear 13

Figure A 1. Outdoor recreational activities participated in during the last 2 years 16
Figure A 2. Description that best describes your neighborhood type 16
Figure A 3. Membership in an organization advocating fisheries conservation..... 16

Forward

There's no doubt steelheaders are some of the most avid anglers out there. Their passion for the sport is unrivaled and as such, their views on the sport – from application to management – are hard earned.

However, empirical information on those views, be it gear choice or the importance of wild steelhead conservation, is hard to come by.

With that in mind, Trout Unlimited set out to analyze opinions and preferences of steelheaders on the West Coast.

The result, a poll of more than 630 active steelhead anglers in California, Oregon and Washington, reveals broad support for wild steelhead conservation and for managing fisheries to sustain wild steelhead populations. Indeed, this support cuts across all preferred gear types (lures, flies and bait), across urban, suburban and rural anglers, and across the three states.

Here are a few highlights:

- When wild populations are low, a strong majority (68%) of anglers support releasing any wild fish caught versus just 24% of anglers who would keep the wild fish they caught
- In order to protect wild steelhead, significantly more anglers (55%) chose longer seasons with more restrictions on fishing gear and methods than shorter seasons with fewer gear/method restrictions (32%)
- When given a choice between protecting a catch-and-release fishery for wild steelhead and a hatchery that provides harvest opportunity but also harms wild steelhead and puts the catch-and-release fishery in jeopardy, 58% of anglers support closing the hatchery – more than twice as many than support keeping the hatchery (27%).
- A solid majority of anglers (62%) favor managing some rivers for wild steelhead and other rivers for hatchery fish

Today, wild steelhead populations are struggling throughout their native range. More than 70 percent of steelhead populations now require protection under the Endangered Species Act. But as the results of this survey show, with the support of anglers of all stripes, rural and urban, there is hope for restoration of these iconic fish and the fishing opportunity that wild steelhead, alone, provide.

--Rob Masonis, Vice President of Western Conservation, Trout Unlimited

Background

To better understand steelhead anglers' perceptions and preferences, Trout Unlimited retained Southwick Associates, a highly respected opinion research firm that specializes in natural resource issues, to conduct survey-based research. A variety of topics regarding steelhead fishing and management were explored with the respondents, ranging from their steelhead angling preferences, opinions on the management of wild steelhead, to the role of hatcheries in providing fishing opportunity. The goal was to ascertain steelhead angler viewpoints in order to inform TU's work to promote steelhead management policies that will conserve wild steelhead while providing fishing opportunity.

Data Collection and Methods

An online survey was conducted in May, 2015 to gauge fishing habits and perceptions among steelhead anglers in western states. The data solutions company (SSI®) was contracted to provide a sample of anglers drawn from residents of California, Oregon, and Washington. Anglers in the sample were directed to an online questionnaire produced and managed by Southwick Associates. The specific survey questions are included in Appendix 2.

The survey respondents were screened to include only those who reported fishing for steelhead at least once in the past two years. A total of 643 steelhead anglers completed the survey¹. A detailed summary of the respondent group is included in Table A1 of Appendix 1.

NOTE: The findings in this report summarize the results across all three states.

¹ To correct for potential response bias, the survey results were weighted based on three population characteristics (age, gender, and state of residency). The U.S. Fish and Wildlife Service's 2011 *National Survey of Fishing, Hunting, and Wildlife-Associated Recreation* served as the benchmark population (USFWS, 2011). Details of the weighting procedure are included in the appendix.

Findings

Location and Catch Preferences

Ninety percent or more of steelhead anglers fish in their home state (Table 1). Many also travel to neighboring states and beyond to pursue steelhead. Twenty three percent of Californian steelhead anglers visit Oregon and another 12% visit Washington and Alaska to fish. Steelhead anglers from Oregon also travel to Washington and California (17% and 9%, respectively). Washington steelhead anglers travel primarily to Oregon (26%) and Alaska (10%) to fish. Overall, the largest portion of anglers fish for steelhead in Washington.

Table 1. States where anglers fished for steelhead (check all that apply)

State where fishing took place	State of residency			Total
	California	Oregon	Washington	
Alaska	12%	3%	10%	9%
California	90%	9%	6%	22%
Canada	7%	2%	4%	4%
Great Lakes	9%	0%	4%	4%
Idaho	8%	5%	9%	8%
Oregon	23%	93%	26%	38%
Washington	12%	17%	94%	64%
Other	1%	0%	0%	0%
Respondents	227	166	250	643

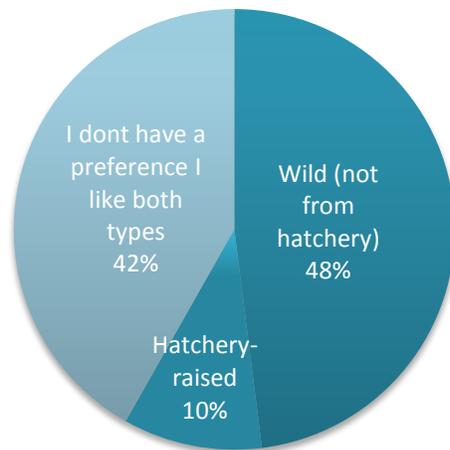
To gain insight into preferences for catch-and-release versus harvest fishing, respondents were asked to select each type of fishing they enjoy. The results suggest that catch-and-release is the most popular form of steelhead fishing. Slightly less than half of the respondents also enjoy participating in harvest fisheries (Figure 1). Nearly 1 in 5 respondents indicated they could not recall harvest regulations while fishing for steelhead.

Figure 1. Types of steelhead fishing anglers enjoy (check all that apply)



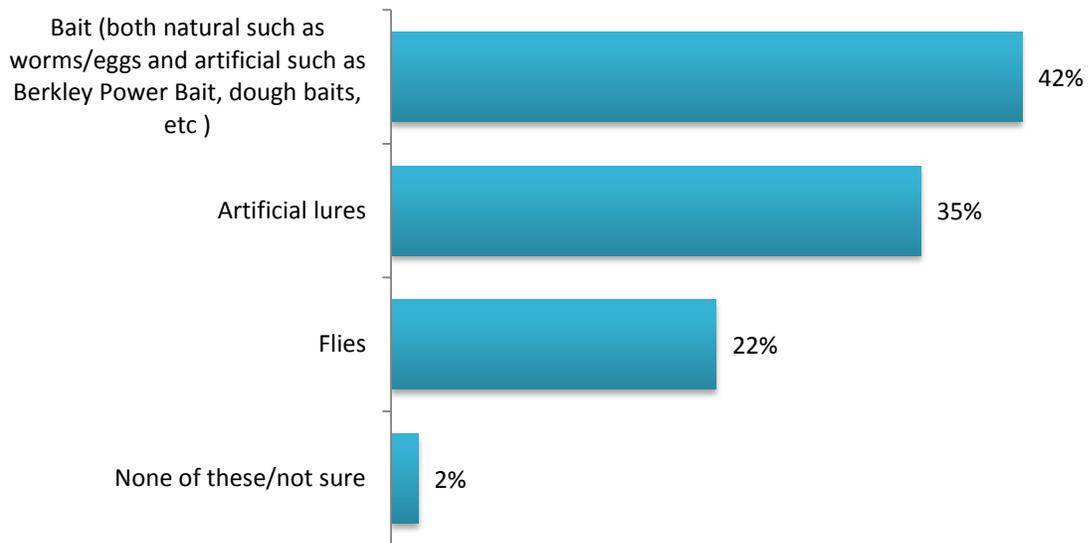
Steelhead anglers were also asked to share their preference for wild versus hatchery-raised fish. Two distinct groups of anglers emerge. The largest group (48%) of steelhead anglers prefers to catch wild fish (Figure 2). The other sizable group (42%) of steelhead anglers prefers to catch either type of fish, wild or hatchery-raised. Only a small proportion (10%) say they prefer to catch hatchery-raised.

Figure 2. Types of steelhead anglers prefer to catch



Steelhead anglers use a variety of tackle types when steelhead fishing. Bait is used most often (42%), followed by artificial lures (35%), and then flies (22%) (Figure 3).

Figure 3. Methods most often used when targeting steelhead



When fishing for steelhead, 44% of anglers say that the opportunity to catch and then release is most important to them (Figure 4). Roughly one-third of anglers say harvesting a steelhead is important to them after a catch. Almost one-quarter of steelhead anglers say they have no preference for either the opportunity to harvest or release. Thus, 68% of the respondents would not lose interest in steelhead fishing if they were not allowed to harvest steelhead.

Figure 4. Importance of catching & releasing versus harvesting a steelhead

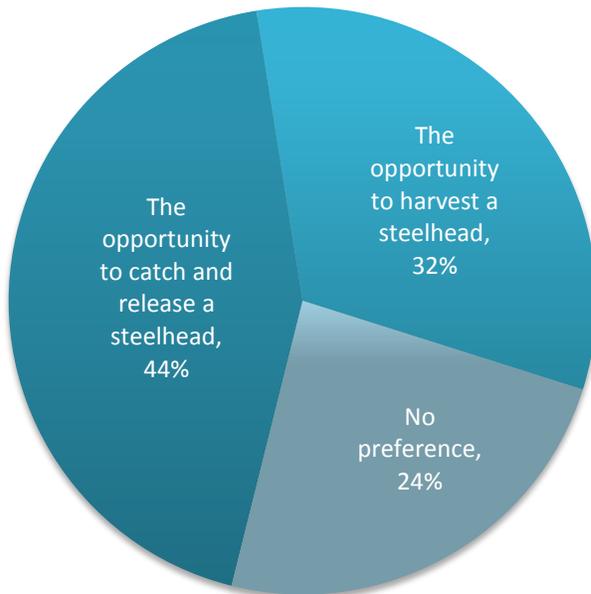
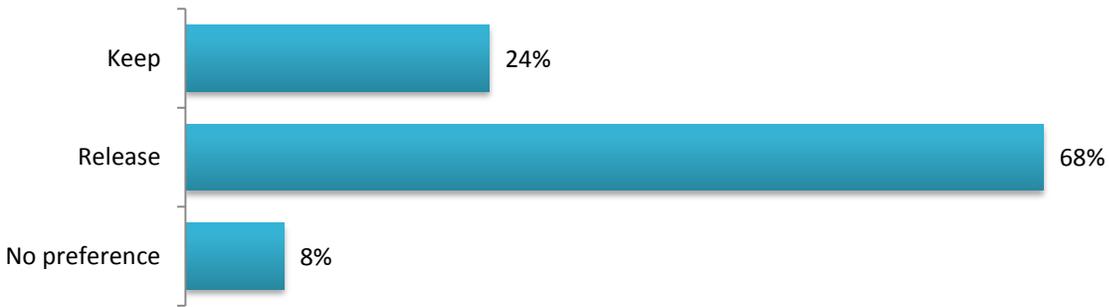


Figure 5. Keep or release preference on a river with a limited population of steelhead



If allowed to harvest wild steelhead in a river where the abundance of wild steelhead is low, 68% of anglers would release any wild steelhead caught (Figure 6). One quarter of anglers say they would keep the wild steelhead.

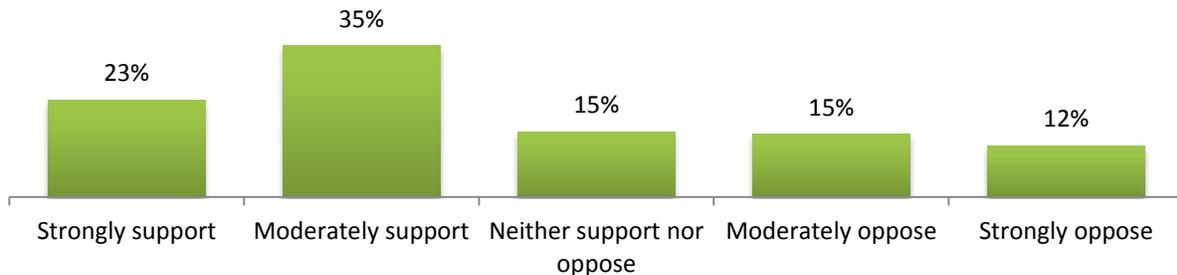
Management Scenarios

Steelhead anglers were presented the following scenarios to explore their support for different steelhead management options.

Scenario I

A hatchery is providing steelhead you can harvest. However, it is determined that the hatchery's operation is harming wild steelhead that are currently supporting a catch-and-release fishery, and continued use of the hatchery would require shortening or closing the wild steelhead fishing season. Anglers were asked if they would support or oppose the closure of the hatchery.

Figure 6. Findings for Scenario I

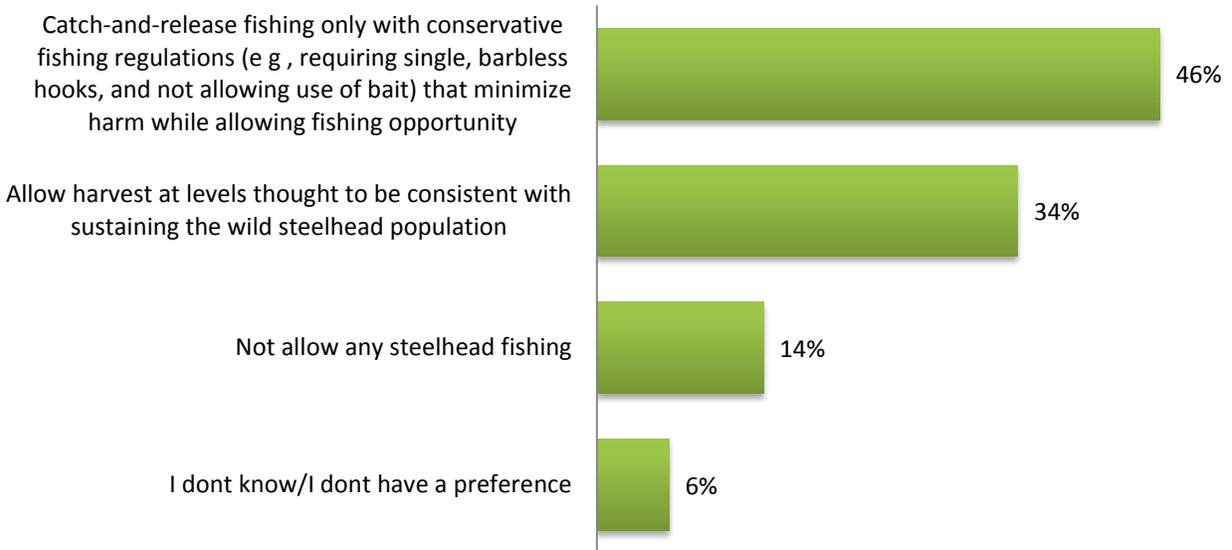


Fifty eight percent of anglers would support, either strongly or moderately, the closure rather than a shortened or closed season for wild steelhead (Figure 9). Twenty seven percent of anglers would moderately or strongly oppose the closure of the hatchery.

Scenario II

A river has wild steelhead, but the state fisheries agency does not have the data necessary to determine the size and health of the wild steelhead population. Anglers were asked to identify the policy that should be in place until the population’s health is known.

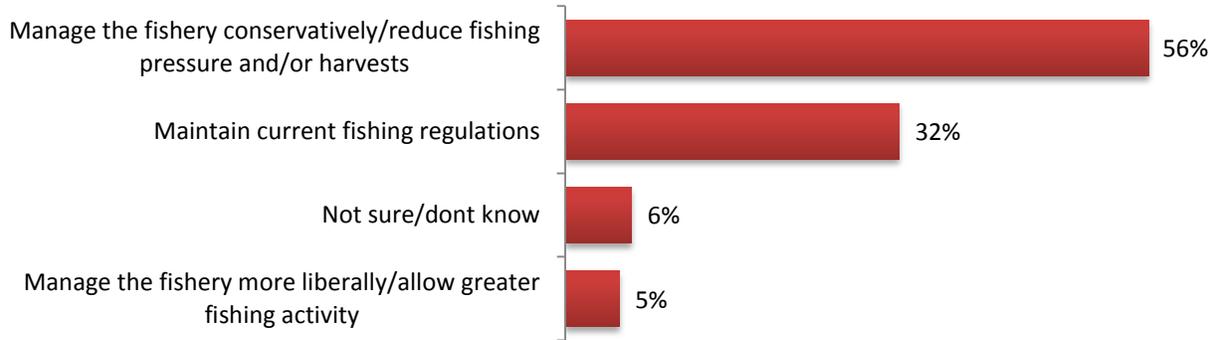
Figure 7. Policy preference under Scenario II



Most steelhead anglers (46%) favored a catch-and-release only policy that included conservative fishing regulations that would allow for the opportunity to fish but would minimize harm to wild steelhead (Figure 10). Fourteen percent favored shutting down the fishery entirely, an even more conservative position. Thirty four percent would implement a less restrictive management policy that allowed harvest at a level consistent with sustaining the wild population.

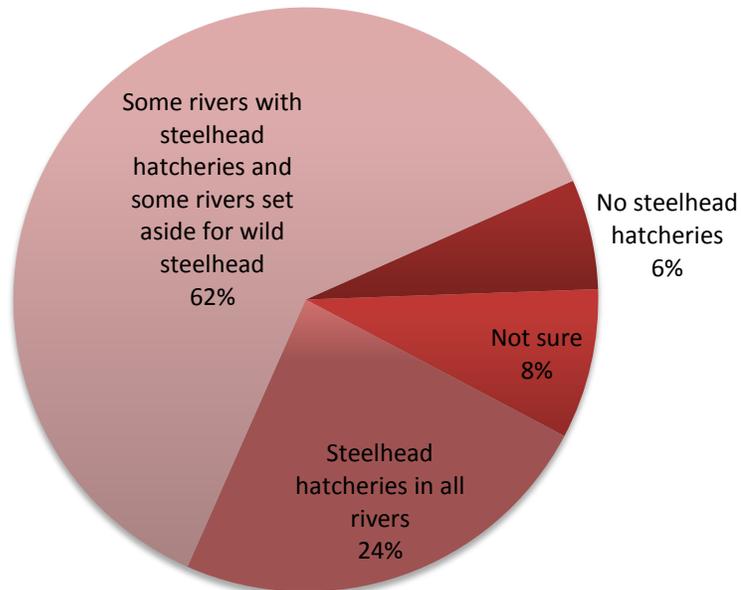
Steelhead Management Approaches

Figure 8. Preference for conservative versus liberal management regulations in the face of uncertainty



More than half of steelhead anglers (56%) would prefer that their state agency manage the fishery conservatively when the agency is unsure whether existing regulations are sufficient to protect wild steelhead (Figure 11). One third of anglers think the agency should maintain the current regulations in the face of that uncertainty.

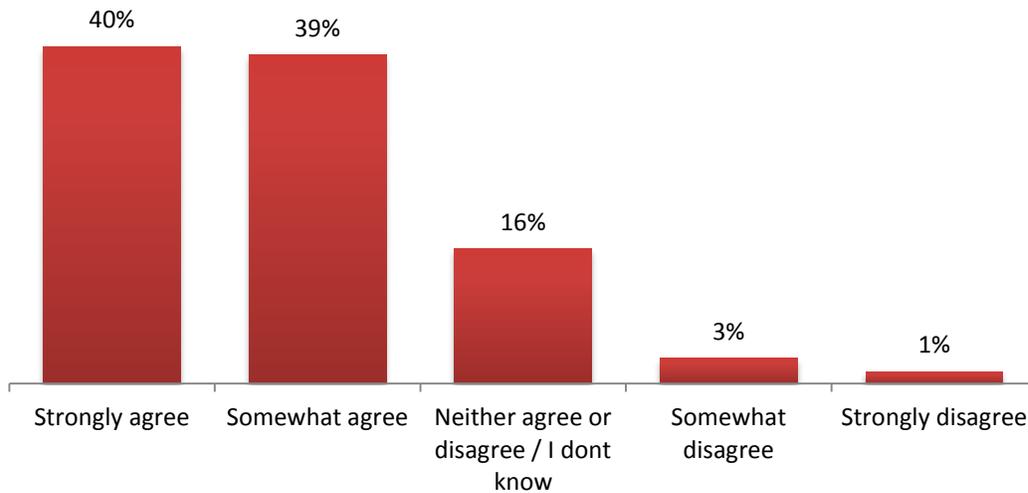
Figure 9. Preferred approaches for managing steelhead



Steelhead anglers were asked to share their thoughts on the appropriate balance of rivers managed exclusively for wild steelhead and those receiving hatchery-raised steelhead. The majority of anglers surveyed (62%) would prefer that some rivers be set aside for wild steelhead and others designated for

hatchery stocking (Figure 13). One quarter of anglers surveyed would prefer steelhead hatcheries in all rivers. Six percent of anglers would prefer no steelhead hatcheries.

Figure 10. Agreement with keeping fish under water when practicing catch-and-release



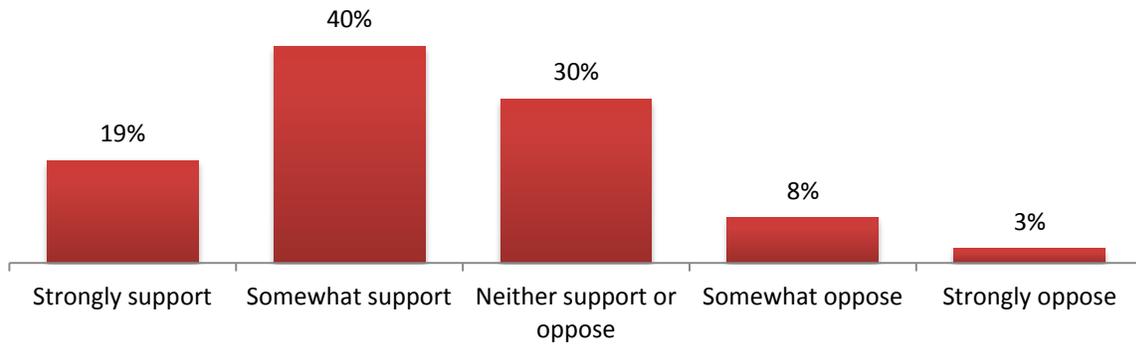
Anglers were presented with a scenario in which future scientific studies reveal that holding wild steelhead out of water causes substantial harm. They were asked whether they agree with a policy that required anglers who catch steelhead to keep wild steelhead in the water while releasing them. Seventy nine percent somewhat or strongly agree with implementation of such a requirement (Figure 14). Only four percent of anglers disagree.

Table 2. Perception about over-crowding

Option	Total	State of residency		
		California	Oregon	Washington
A major problem	24%	28%	25%	23%
A minor problem	52%	52%	49%	54%
Not a problem at all	16%	14%	18%	16%
Not sure/I don't know	7%	7%	8%	7%
Respondents	643	227	166	250

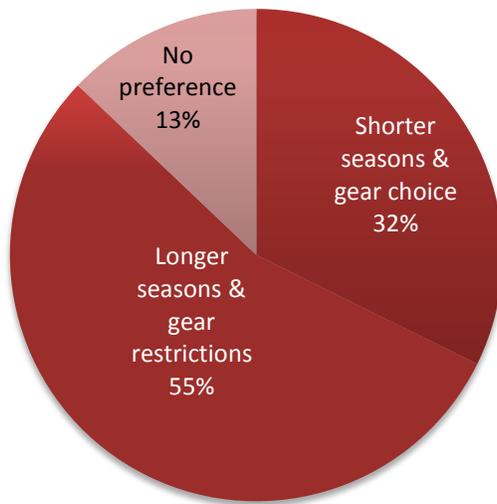
Anglers were also asked whether they consider over-crowding to be a problem on rivers in which they pursue steelhead. A large majority see overcrowding as a problem, with 24% saying it is a major problem and 52% characterizing it as a minor problem (Table 4). Only 16% said it was not a problem. The results are also presented by state of home residency, where the majority of steelhead anglers spend time fishing.

Figure 11. Support for limiting number of fishing guides on popular rivers



It can be argued that limiting the number of fishing guides allowed to operate on popular rivers will help avoid over-crowding and provide greater opportunity for non-guided anglers. Conversely, one might argue that limits on guides will reduce people’s ability to enjoy steelhead fishing and cause financial hardship for guides. Given these arguments, anglers were asked about their level of support for a policy that limited the number of fishing guides allowed on popular rivers. The majority (59%) of anglers would support such a policy (Figure 15). Thirty percent are indifferent and would neither support nor oppose such a policy. Only 11% would oppose such a policy.

Figure 12. Angler preference to maintain choice of methods and gear



Maintaining abundant, fishable populations of wild steelhead requires choices about fishing gear and methods. For example, some types of fishing gear and methods (e.g., barbed hooks, bait) increase mortality among released fish. As a result, allowing these types of gear and methods means the season must be shorter if wild populations are to remain abundant. In light of this trade-off, anglers were asked whether they would prefer shorter seasons that provide the option to use the gear and methods of their choice or longer seasons with more restrictions on gear and methods.

The majority of anglers (55%) would prefer to have longer seasons with more restrictions on gear and methods (Figure 16). One-third would prefer the option to use the gear and methods of their choice in exchange for a shorter season.

Appendix 1: Composition of the Survey Sample

The following screening questions were presented to the survey panel in an effort to identify steelhead anglers as the target audience.

- Have you fished in the past two years?
- Have you fished for steelhead at least once in the past two years?

Anglers who had fished in the past two years and pursued steelhead in particular during that time were asked to complete the remainder of the survey. A total of 643 anglers completed the Trout Unlimited survey. Demographic composition of this respondent group was evaluated and compared to the national population of anglers who also fit the angler profile defined above (Table A1).

Table A 1. Demographic proportions for the 2015 Survey compared to the target population of steelhead anglers (characterized using the USFWS National Survey)²

	2011 National Survey (%)	2015 Study Survey (%)
<u>Gender</u>		
Male	78	58
Female	22	43
<i>Subtotal</i>	<i>100</i>	<i>100</i>
<u>Age</u>		
16 to 29	25	21
30 to 44	30	30
45 to 59	25	23
60 and over	20	26
<i>Subtotal</i>	<i>100</i>	<i>100</i>
<u>Residency</u>		
Washington	62	39
Oregon	19	35
California	18	26
<i>Subtotal</i>	<i>100</i>	<i>100</i>

National level information was obtained through the National Survey of Fishing, Hunting, and Wildlife-Associated Recreation compiled by the U.S. Census and Fish & Wildlife Service in 2011. The survey respondents were mildly skewed, reflecting a larger proportion among female anglers and anglers over the age of 60. The target audience for the survey was deliberately structured to provide adequate samples from each state to allow for state-level analysis. As a result, the survey sample captures a higher proportion of anglers residing in Oregon and California and a lower portion of anglers residing in Washington, relative to the National Survey. For the collective results presented in this report, a weighting structure was implemented to more accurately reflect the national population of steelhead anglers.

² USFWS (2011). *The National Survey of Fishing, Hunting, and Wildlife-Associated Recreation*. U.S. Fish and Wildlife Service. Data provided by USFWS in 2012.

Table A 2. Rake Weight Summary

Mean	Std. Dev.	Min	Max	N
1.00	0.80	0.12	3.30	643

Respondents were asked to share additional information about themselves including neighborhood type, the outdoor activities they engage in, and whether they are a member of an organization that advocates for fisheries conservation. This type of additional information also frames the attitudes and opinions of the survey respondents.

In addition to fishing, the respondent sample is actively involved in multiple outdoor activities (Figure A1). The most popular activity among the group is hiking (72%). The largest portion of the group resides in suburban neighborhoods (Figure A2). And, the majority does not belong to a fisheries conservation organization (Figure A3).

Figure A 1. Outdoor recreational activities participated in during the last 2 years (check all that apply)

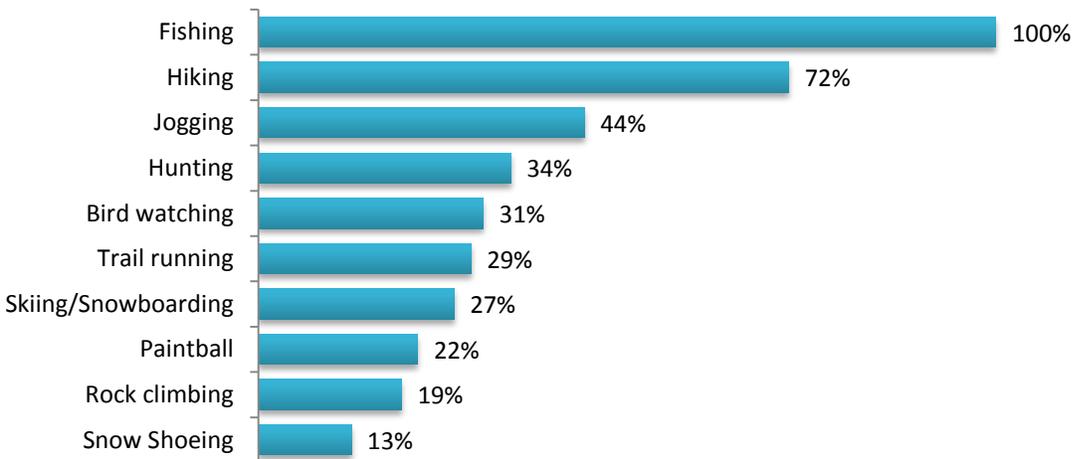


Figure A 2. Description that best describes your neighborhood type

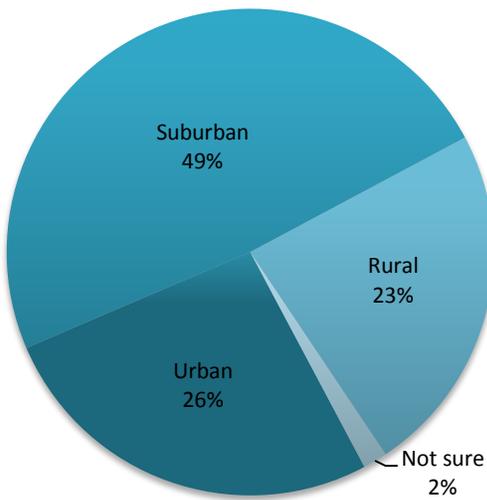


Figure A 3. Membership in an organization advocating fisheries conservation

