TO: State Water Resources Control Board (SWB)

CC: California Department of Fish and Wildlife (CDFW): Sacramento, Redding, and Yreka offices

FROM: Theodora Johnson, Scott Valley Agriculture Water Alliance - www.scottvalleyagwa.org

DATE: May 12, 2022

RE: RE-ADOPTION OF DROUGHT EMERGENCY REGULATION FOR SCOTT RIVER AND SHASTA RIVER WATERSHEDS

To Whom It May Concern:

The Scott Valley Agriculture Water Alliance (AgWA) appreciates the opportunity to comment in advance of the release of draft drought emergency regulations for Scott River and Shasta River watersheds. Scott Valley AgWA is a unified voice communicating on behalf of local family farmers and ranchers, spreading accurate information about Scott Valley's ag producers, the Scott River, and its fish. Our growing membership of 27 Scott Valley ranches includes hay farms, cow/calf operations (most of them producing both hay and cattle), and Scott Valley's two organic dairies.

General comments:

The current regulations, which became effective Aug 30, 2021, are being considered for re-adoption, with possible changes as indicated by SWB and CDFW staff in a public online meeting May 4, 2022. The current regulations are unsustainable for Scott Valley agriculture, and some of the proposed changes for the next iteration make matters worse. If left in place for the duration of the drought, these regulations will result in loss of many of our farms and ranches and therefore loss of open spaces and important wildlife habitat. The economic hardship will extend beyond our farming and ranching families to every part of our community, from businesses to schools.

Meanwhile, the fact that Scott Valley's coho population is on a positive trend[1] was not acknowledged by SWB or CDFW at the May 4 meeting. The existing and proposed regulations seem to ignore the decades of locally-driven efforts that have helped coho, Chinook, and steelhead in the Scott River watershed—efforts such as Scott River Water Trust's leasing of surface water from irrigators for instream use; installment of fish screens on every diversion; and many more habitat improvement projects.

The agencies' approach in Scott Valley is in stark contrast to other watersheds during this extreme drought. For example, on the central coast, the Russian River Coho Voluntary Drought Initiative appears to be truly voluntary, without the immediate threat of 100% water curtailments; offers benefits such as limiting landowner liability under CESA and ESA; implements targeted (versus one-size-fits-all) flow conservation strategies; offers "financial and technical assistance" to participants; encourages groundwater recharge; and monitors and evaluates success of the measures taken. Again, threats of 100% ag groundwater use curtailments are not being made in this case. Such an approach was never offered to Scott Valley landowners, despite direction from Gov. Newsom's emergency order to do so

[1] See Appendix II, "Why the State Water Board's 2021-2022 flow regulation is not needed for coho salmon in the Scott River"

("To ensure critical instream flows for species protection in the Klamath River" the agencies "shall…work with water users and other parties on voluntary measures…")

Landowners have not been offered just compensation for their private property losses.

Water rights are what make our properties valuable as ag land. Multiple AgWA members have indicated they intend to sell and subdivide their land, if they don't have enough water to keep farming or ranching.

Specific comments on proposed regulations:

1. **Existing language requires Local Cooperative Solutions (LCS) to include "a net reduction of water use of 30 percent throughout the irrigation season…as compared to the prior irrigation season" and "a monthly reduction of 30 percent in the July 1 through October 31 time period, as compared to the prior year or to 2020" (emphasis added).**
    a. This implies an additional 30% reduction, or a 60 percent reduction, for the upcoming (2023) irrigation season. Producers who cut back as much as possible this year will be punished even more for their efforts next year. One-hundred percent of AgWA members have indicated that their businesses cannot sustain such a reduction. These potential cuts, paired with historically high input costs, will not be possible for producers to withstand.
        i. Most producers in Scott Valley use operating loans from year to year, have mortgages or ranch loan payments, and/or have payment plans on watering systems or equipment they have bought. Operating loans can, in some cases, allow for short years where full payment is not made. But if cows are sold and/or hay fields are fallowed to comply with the drought regulations, the operator begins a downward trend. With input costs at record highs and high interest rates, the producer will inevitably be forced to sell. Property that no longer has water will sell for pennies on the dollar. Residential neighborhoods, which use less water than agriculture, will likely replace our open spaces.
        ii. Alfalfa growers: A 60% reduction in water use is highly likely to result in some degree of plant death. Young stands, which are most valuable to producers but have shallower roots, are especially vulnerable to drought. Replanting a stand of alfalfa, which usually is in place for 5-7 years, is an expensive endeavor, and would be a big gamble if access to irrigation water is uncertain.
        iii. Cow/calf producers: A 60% reduction in irrigation water equates to roughly a 60% reduction in pasture, where a cow spends about 7 months of the year. Deficit irrigation not only reduces pasture yields, but the nutritional quality of the forage as well (UC Cooperative Extension, 1993). Meanwhile, the reduction in local hay supply and the regionwide hay shortage will add significantly to the cost of feeding livestock (about 5 months over the winter). This could force ranchers to sell productive cows. This is a great loss, as demonstrated in Appendix I.

            The drought (both natural and artificially imposed) is being accompanied by record-high—and increasing--input prices for cow/calf producers (see Appendix

I). If these increasing inputs are not met with increasing prices for calves sold, many ranchers will be hard-pressed to stay in business. Add to that the water unavailability (both natural and artificially imposed), which adds to scarcity (and thus price) of pasture and hay, and Scott Valley may no longer have cattle ranching families, many of which have been here for 5-6 generations and are part of Scott Valley's historic culture.

iv. Organic dairies: Both of our small, family-owned and operated organic dairies indicated they could not withstand a 60% reduction in water use. One dairy explained that a 60% reduction would result in laying off all employees and reducing the dairy herd. The milk company that buys their milk could drop their business if they downsize too much. All of this combined would put their 3rd-generation dairy out of business.

b. Many AgWA members have indicated they cannot sustain the current 30% reduction in water use for long. They have also indicated that they do not consider their LCS to be "voluntary," but rather the only thing that can keep their operations scraping by this year. The effects of the 30% reduction on our industries is as follows:

   i. Alfalfa producers use the minimum amount of water to get maximum production. If excess water is applied, production goes down. If underwatered, production goes down. As shown in the graph below, the yield rate is almost directly related to irrigation rates, up to 20 inches of application. This equates to roughly a 30% reduction in income for Scott Valley's alfalfa growers. Grains can be planted on a rotational basis, but cannot permanently replace alfalfa here in the intermountain region, where elevation, climate, and the short growing season (typically 90 to 160 days) make alfalfa the most important crop. Grain depletes the soil of nitrogen, whereas alfalfa, a legume, fixes nitrogen in the soil (Orloff 1997). Our short growing season and large fluctuations in temperature also make other crops, such as row crops and orchards, infeasible. There is good demand for alfalfa hay in our region, and it is easily stored in barns for relatively long periods of time.

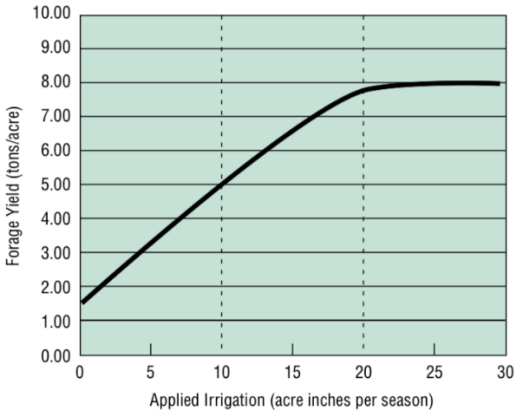

Figure 4.1. Typical yield response of alfalfa to applied irrigation in the Intermountain Region.

ii. Cow/calf producers – The 30% reduction will likely have results similar to the 60% reduction (see above), but will be a slower decline.
iii. Organic dairy – One of our dairies indicated that they don't currently use surface water, and that the current regulations have forced them to stop irrigating entirely one day a week. They are also irrigating less acres for organic hay production and grazing land. As a result, they will be purchasing more organic hay this season than in the past, an expensive option, and will have less grazable land for their organic dairy cattle to be turned out onto. The loss of irrigated grazable land threatens their business, because their cattle must graze at least 30% of their overall feed to meet organic certifications. There is a possibility that from the consequences of this unprecedented 30% water reduction, they will have to downsize their organic dairy herd.

c. The 30% reduction will not lead to better salmon spawning production without adequate fall rains
i. UC Davis Scott Valley Hydrologic Model shows in the Scott Valley GSP that even a zero irrigation scenario during a drought year results in only small increase in flows and reconnection, but not the 30 cfs flow target desired by CDFW.
ii. In 2013's drought, Scott River flows in November met the 60 cfs minimum flow target in the current instream flow requirements, but the tributaries were not connected due to too little precipitation and cold temperatures. As a result, the coho spawning run of over 2,700 adults became stuck in the mainstem Scott River instead of their natal tributaries. Mainstem habitat could not support the over 160,000 juveniles produced, which ended up being rescued and relocated as best as possible to the upper reaches of the tributaries.
iii. Despite fears of CDFW that the 2020 coho brood year was doomed due to low flows and late rains, the adults were able to reach their natal spawning sites high up in the watershed. Their progeny are showing up in the 2022 coho juvenile outmigration at much higher than average numbers, indicating successful rearing habitat conditions despite no curtailment during the 2021 summer months.
iv. CDFW annual data since 2007 reveal the significantly increasing numbers of the coho salmon's 3 brood years, despite many years of drought (see Appendix II for data on coho populations in the Scott River watershed). As shown above, even the minimum flow target of 60 cfs in November won't help the run when the tribs are not flowing due to lack of precipitation or freezing weather. Multiple factors have combined for this success, including concerted efforts by many landowners and water users in Scott Valley.

2. **DWR data shows that roughly half of Scott Valley's irrigated acreage is surface-water irrigated, which means that this acreage will not qualify for LCS.[2] These lands, primarily pasture, will therefore be 100-percent curtailed when flows dip below the mandated levels this summer.**
a. Recent information shared by SWB staff on the LCS signups indicated about 15,000 acres will likely be covered by the 30% option. However, we know there are at least

[2] SWB does offer an LCS for surface diversions, but in practicality these are very difficult to get approved, due to the difficulty in assuring that no other diverters on the stream are affected.

30,000 irrigated acres in Scott Valley. What does this mean for the other half? 100% curtailment. The possibility that half of our productive land could be fallowed this year and perhaps next year removes any doubt that the current regulations cannot be sustained.

b. This 100% curtailment further exacerbates the feed shortage faced by livestock producers in Scott Valley. Although many diversions go dry in drought years, artificially turning off those diversions earlier than they naturally would dry up could make a tough drought year an unbearable drought year for livestock operations. While haying equipment can be turned off, livestock keeps eating, every day, year-round. Loss of pasture due to drought is a long-term loss that's hard to recover from. Much pasture is mixed grass/legume (clover), which takes years to get established.

c. When ditches are allowed to go dry, much more water is needed to "seal" the ditch and deliver water to the desired location. Leaving a ditch dry causes it to become more "leaky" due to damage from rodents and cracking.

d. This blanket curtailment unnecessarily removes the win/win benefit of the locally-derived Scott River Water Trust, a tool that has had documented success at increasing coho by paying farmers and ranchers to forgo their surface diversions in targeted areas, leaving water in-stream where coho spawning is known to have occurred. The curtailment, on the other hand, is a "blanket" application that ignores the timing and location needs of coho and applies punitive curtailments across the board. With curtailments in place, Water Trust payments cannot be made, since farmers can't receive payment for water that they were not going to get.

3. **CDFW's proposed "Inefficient livestock watering" prohibition extension through March 31**

a. The current regulation prohibits ditches that allow "seepage losses" (§ 875.3 (a)) (i.e., earthen ditches). Earthen ditches constitute virtually 100% of the ditches in Scott Valley.

b. Current regs cover two time periods:

i. During curtailments, current regs require: "Limited diversions for minimal stockwatering, through means that do not result in seepage losses, may be authorized to continue after receipt of a curtailment order as specified in this section. Such diversions may include, but are not limited to, pipes, wells, or lined ditches." (emphasis added)

ii. For the period of September through January, current regs require: "…from September through January, inefficient surface water diversions in the Scott River and Shasta River watersheds for livestock watering, which result in excessive water diversion for a small amount of water delivered for beneficial use, are not reasonable … inefficient surface water diversions for livestock watering are those that divert, as measured at the point of diversion, more than ten times the amount of water needed to support the number of livestock and reasonable water quantities set forth in Article 5, section 697…" (emphasis added).

c. CDFW proposes extending the current prohibition on "inefficient livestock watering" from Sept 1 - Jan 31 to Sept 1 - March 31. Currently, the rule "applies to everyone who diverts surface water for livestock during September through January… You cannot

divert more than 10 times the estimated amount that livestock drink," reads a SWB letter from Oct 21, 2021 explaining the regulation.

i. The March 31 extension appears arbitrary when we don't know what next winter will be like. This is a prohibition on a water right that's in the 3 decrees and very well-established.

ii. The March 31 extension makes an already-problematic policy worse. Leaving ditches empty has many negative repercussions:

1. Livestock water running through ditches in the winter months, even at very low levels, helps keep the ground saturated so that less water is needed when delivering irrigation water in the irrigation season. When ditches are allowed to go dry, much more water is needed to "seal" the ditch and deliver water to the desired location. Leaving a ditch dry causes it to become more "leaky" due to damage from rodents and cracking.

    a. According to a local rancher who also repairs and maintains ditches (such as Scott Valley Irrigation (SVID)) using heavy equipment, the longer a ditch is dry, the more damage occurs. Rodents move in, weeds grow in the bottom, and trees die—a major problem because when those roots rot out, it's as bad as a leaking pipe. It's a multiple-year problem, because different varieties of trees will die at different times over several years. Fixing these leaks is an ordeal. It's fixed via compaction or digging out roots, pushing trees over, and refilling with material. Applying plastic can be a temporary fix, but it also gives rodents a spot to live, which results in a network of tunnels that leak. When SVID gets turned off every year, the squirrels move into it, and they tunnel completely through the ditch out the bank. Water will even pop out 100 feet away. Ultimately, this "Swiss cheese" effect makes it so water deliveries aren't made, or are greatly delayed.

    The hardest ditches to fix are the ones that have been off the longest. Water in the ditch keeps weeds from growing in the bottom, keeps animals from living in the bank. When the major ditches in this valley are turned off for over 6 months, it costs the irrigation district tens of thousands of dollars more than normal maintenance to get them functional again.

2. Groundwater recharge is an important hydrologic side-benefit of stockwater ditches, as confirmed by Dr. Laura Foglia and the seepage inputs to the UCD Integrated Hydrologic Model (personal communication). This prohibition could also threaten ongoing aquifer recharge research and future projects. These recharge projects are locally supported, have the potential to improve instream flows in the

Scott River in late summer/fall, and should have the support of CDFW and SWB.

3. Providing adequate, clean water is a crucial part of animal husbandry, and is made more difficult by this prohibition. The current levels (15 gallons per cow/horse per day, 1.5 gal per sheep, and 2.5 gal per goat/hog) are not adequate – especially during extreme hot or cold weather - and should be verified by licensed veterinarians.
    a. In years gone by, many ranchers used natural streams to water their livestock. Now, with the growing prevalence of livestock-exclusion fences on streams, other water sources must be provided. While many producers have stock tanks, some still rely on ditches in certain fields, especially during winter.
        i. At the south end of Scott Valley alone, almost 20 producers rely on winter stockwater from ditches, accounting for about 4,000 cows, sheep and horses. At least another 2,000 head of cattle from mid-valley relies on winter stockwater. (This list is not comprehensive; more producers rely on winter stockwater).
    b. These ditches help distribute water between pastures and prevent overcrowding of livestock in concentrated areas. Overcrowding causes disease problems and negative effects on pasture.
    c. The amount of water "allowed" per head in the regs is not adequate, especially during cold months of freezing and snowfall. One producer, whose sole source of income is cattle ranching, reports that the .013 cfs that SWB allowed for his 600 cattle was not enough to reach beyond 100 yards once it was piped to his earthen ditch system. This left several fields with no water source. The producer would have to violate a contract to allow cattle to water on the creek in order to use one 160-acre field.
    d. 600 head cannot all go to water in the small, 15-acre field where this water reached. Water becomes muddy, full of feces, or iced. Animal health and cruelty becomes an issue, as does death loss.
    e. The alternative—piping ditches from diversions—is expensive. Some ranches have 6+ miles of ditch that would need to be piped. The price of pipe has tripled this year (8-inch pipe is now $10/foot; 2-inch pipe went from .89/foot in 2020 to 2.34/foot in 2022), and concrete (for lining ditches) has jumped from $125/yard to $145/yard. Other expenses for piping are digging trenches. In the case of lining ditches, most of the expense is in the preparation of the ditch for concrete: removing trees; shaping and compacting the ditch; and finally, pouring concrete.

f. Installing a new well is also expensive. A moratorium is currently in place for new ag wells. Should that be lifted, the waiting list for getting a well drilled is 19-22 months, and the cost right now is roughly $100/ft. Then there's the issue of getting power to it: solar power is the easiest to install, but it's unreliable in the winter. It would likely take ~$45,000 to run 3-phase power to a pump. The cost of running wire and conduit to the pump has more than doubled since 2020.
g. Turning on existing ag pumps for stockwater is problematic due to the unnecessarily large amount of pressure, and the fact that pumps and pipes can freeze and break.
h. Pipes diverting water from streams (to utilize riparian rights) often get plugged, which is extra problematic when the pipe is underground.
i. Even if replacing earthen ditches were a) a wise course of action and b) affordable, the installation of pipe or lined ditches would take several years to accomplish. Livestock producers are left with few options in the meantime.

d. **Current regulations being considered for re-adoption also include a rule that, during a curtailment, "allows you continue to divert a <u>minimum amount</u> of surface water or groundwater for livestock" (emphasis added).**
    i. Again, the minimum amount has proven itself to be inadequate, especially when ditches have been allowed to go dry and extra water is needed to reseal ditches.
    ii. Similarly to winter stockwater, summer stockwater needs can vary drastically. Heatwaves cannot always be predicted, and keeping flows at the bare minimum for livestock survival is bound to end in the suffering and possible death of livestock during unexpected temperature spikes.
    iii. The minimum livestock watering levels ignore the needs of wildlife using the ditches, some of them protected species (such as Greater Sandhill Cranes and Western Pond Turtle). Wildlife relies on well-distributed stockwater, especially in drought years.

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APPENDIX I

Cow/calf Business in Scott Valley

Scott Valley Agriculture Water Alliance
May 12, 2022

Intro: An understanding of the average cow/calf operation in Scott Valley is necessary to understand how the current and proposed regulations will affect the business.

Basics of cow/calf business: The business is often handed down generation-to-generation, because it's not an easy one to get into. Up-front costs are high, and returns on those inputs are slow. A cow that is raised on the ranch will not raise a marketable calf until about year 3, and generally will not make a profit until her 3rd calf, when she's 5 years old. She'll have roughly 10 years of productivity. If you are forced to sell a cow before then, you've lost your profitability.

There's more value to that cow than just the calves she produces; your herd genetics are something you work on for decades, and cows pass down generational learning to their young about how to utilize ranges/pastures/site-specific feeds, and how to adapt to things like climate and management practices of individual producers.

Some number crunching: These figures are for what we have invested in our herds before prices jumped in 2021-2022. A heifer you raise will be 2 years old before having a calf, and almost another year will pass before you can market that calf. Thus, you have three years in feed before you get a check from that cow. Before costs jumped in 2021-2022, feeding a cow in Scott Valley usually cost ~$30/month for 7 months of pasture. Then for winter months, most cows eat 3 to 3.5 tons of hay per month for 5 months (at ~$200/ton). That's $810/cow in feed.

Then the yearly expense of vaccines/wormer was about $40. Keeping a bull to breed cows cost about $40/cow per year. Not calculated here is the price of fuel for hauling cows or hay, or the cost of your time.

Thus, to have cared for a cow for one year, it's upwards of $900 per year. Calf prices have been averaging around $900-1,100 per calf in recent years. That cow accrues $1800 in expenses over two years before a calf is sold. Thus, that cow runs at a loss until her third calf. The cow is at least 5 years old by the time she makes a profit. She'll be productive usually for about the age of 12 (10 years of productivity). You lose profitability if you're forced to sell her sooner than that.

Perfect storm: The drought (both natural and artificially imposed) is being accompanied by record-high—and increasing--input prices. For example, hay is now $300/ton versus $200/ton in 2021. This is due to drastic increases in costs such as fertilizer (which has tripled in the last year from $420/ton to $1240/ton), fuel (which has more than doubled), equipment (parts for equipment are up 30-100% over two years ago) and electricity costs that have made similar increases. Some Scott Valley mother cows have already gone down the road this past year, and many more may be going soon.

Looking ahead: Rebuilding our herd size after selling productive mother cows will be extremely difficult. Due to the dwindling national herd inventory, which is the smallest it's been since 2016 and doesn't show signs of rebuilding yet, buying a cow could be extremely expensive.

If the increasing inputs are not met with increasing prices for calves sold, many ranchers will be hard-pressed to stay in business. Add to that the water unavailability (both natural and artificially imposed), which adds to scarcity (and thus price) of pasture and hay, and Scott Valley may no longer have cattle ranching families.

APPENDIX II

WHY THE STATE WATER BOARD'S 2021-2022 FLOW REGULATION IS NOT NEEDED FOR COHO SALMON IN THE SCOTT RIVER

Scott Valley Agriculture Water Alliance
April 13, 2022

Background

On August 17th, 2021 the California **State Water Resources Control Board (Water Board)** adopted water rights regulations potentially halting all agriculture irrigation in the Scott Valley when new minimum flow requirements for the Scott River are not met. These new emergency curtailment regulations remain in place until August 30, 2022. They call for above-average flows in the Scott during summer months, and are purportedly designed to address a perceived "crisis" for coho salmon (*Oncorhynchus kisutch*), a species that is listed as "threatened" in the region under the Endangered Species Acts (both federal and state). However, well-documented life cycle needs, coupled with the significant increase in the Scott River's coho returns in the last two decades, demonstrate that the mainstem flows demanded by the Water Board are not needed for coho survival.

Ill-conceived Perception of "Crisis" in 2021

In May of 2021, the California Dept. of Fish and Wildlife (CDFW) wrote in a letter to the Water Board that "surface and groundwater" use was contributing to critically low flows and threatening the survival of coho salmon in the Scott River (CDFW 2021). Unfortunately, these premises were not entirely based on fact. Misconceptions surrounding coho were furthered by a July 1, 2021 petition to the State Water Board by the Karuk Tribe. This petition, perhaps unintentionally, exaggerated the coho salmon's situation in the Scott River. "Today the Karuk Tribe filed a formal petition…demanding that [the Water Board] use its emergency powers to curtail water use in the Scott River to prevent the extinction of the [Coho]" (emphasis added).

Claims of "extinction," however, are countered by CDFW's own data. Adult coho returns have been increasing over the past two decades, and even more so in the past 10 years (Knechtle and Giudice 2021). Further, CDFW's annual salmon reports clearly show that coho do not occupy the mainstem of the river during July through early October, months in which the Water Board regulations call for mainstem flows that have not been reached in 9 out of the past 11 years (USGS 2021). By July, as the year-plus juveniles have typically migrated out of the Scott and into the Klamath River The young-of-the-year are typically inhabiting the cooler tributaries for summer rearing, as many surveys have shown (Yokel 2006). No coho adults are present in the Scott River system during the summer either; they only come up to spawn from November to February (Knechtle and Giudice 2021).

The misunderstandings about the coho's life history water needs in the Scott River system have been repeatedly stated as justification for the new regulations. The Aug. 17, 2021 press release after the Water Board's approval of the regulations claimed that dry conditions "are endangering coho fry, or baby coho emerging from gravel, and juvenile coho that rely on seasonal flows to reach a suitable summer rearing habitat." The state continued to claim in 2022 that their concern for the Scott River is about "protecting fish species, such as coho salmon, from extinction" (Souza 2022).

Where Do Coho Go in the Scott River?

Like all salmon, coho are cold-water fish that spend part of their life cycle in freshwater and part in the ocean (see Attachment A, "Coho Salmon Facts," NOAA-Fisheries). Unlike Chinook salmon, whose young usually return to the ocean after less than 9 months instream, coho must seek freshwater habitat where the juveniles can survive for up to 18 months after emerging from their eggs. For the Scott River, this habitat need means the adults prefer to spawn in the westside perennial tributaries to Scott Valley, where it's not too steep and colder water and densely forested instream cover is available for the juveniles to safely rear through the summer. Surveys have shown that most coho spawn and rear in these creeks: Shackleford/Mill, Patterson (upper), French/Miners, Sugar, South Fork and East Fork (Yokel 2006). Few coho juveniles are found rearing during the summer in the mainstem Scott River, unless low flow during spawning season (November to February) traps the adults in the mainstem. This happens when fall rains are insufficient and certain stretches remain dry (specifically, two stretches: the severely disturbed mining tailings reach of the river, which is a 5-mile stretch at the south end of valley; and the alluvial fan tributary connections, a natural phenomenon) (Magranet 2014). In "wet" water years, coho may be found in other tributaries, but those tributaries' ephemeral flow nature does not bode well for juvenile survival.

History of Coho in the Scott

Coho salmon (*Oncorhynchus kisutch*) are native to the Klamath River and its tributaries like the Scott River. However, it was not readily identified as a separate species from the Chinook salmon (*O. tshawytscha*, previously referred to as "king salmon") by most early observers, so historic data were hard to come by for these "silver salmon" until species identification became consistent (Snyder 1931). By the 1960s, state fisheries biologists were estimating salmon populations for each major river system, with the Scott River's relative annual estimates at: Coho – 800-2,000; Chinook – 10,000; Steelhead – 20,000-40,000 (CDFG 1966).

In the 1980s, few spoke about "silver salmon" in the Scott River. CDFW was not monitoring their numbers, unlike Chinook salmon, which was monitored due to its commercial importance. During cooperative work with the French Creek Watershed Advisory Group to reduce excessive sediment in French Creek in the early 1990s, habitat evaluation monitoring measured the numbers of juvenile salmonids in selected stream reaches. The Advisory Group started finding young coho in summer rearing habitat in 1992, along with more numerous steelhead. But coho numbers were relatively few. By 1995, researchers started noticing one strong coho brood year and two weaker ones, as coho have 3-year life cycles and populations can be tracked that way. Data continued to show this pattern through 2005, with each brood year's juvenile numbers increasing (CDFG 2006).

Habitat Restoration Efforts

Over the past 30 years, local habitat restoration projects targeting coho have been undertaken, including many sacrifices from the agriculture, mining and forestry industries. Some of these efforts include: fish screening of all surface-water diversions; increasing riparian shade; reducing sediment discharge from mountain roads; logging practices that reduce disturbance/sediment; closure of all suction dredge mining; instream water transactions via forbearance agreements and 1707 dedications (coordinated by the Scott River Water Trust in priority coho streams); and other projects (see Siskiyou Resource Conservation District website). Since juvenile coho seem to find refuge within woody debris, efforts have also been made to add more large wood to stream habitat or mimic beaver dam habitat (see also Scott River Watershed Council). The CDFW environmental program manager in Yreka has acknowledged that "efforts to enhance over-summering habitat for coho in the Scott don't get as much credit as they deserve" (Joe Croteau, personal communication).

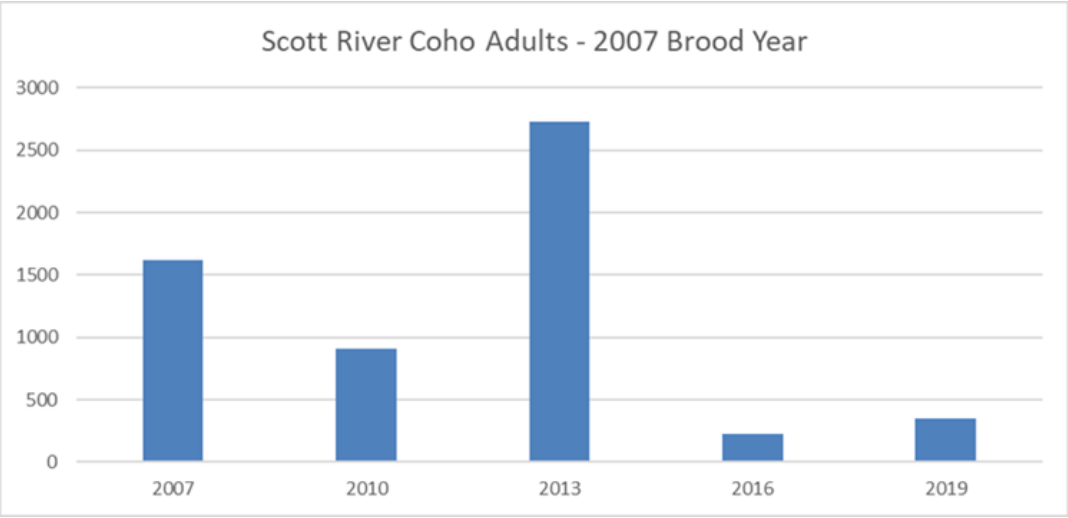
It should be noted that many external conditions beyond the Scott River watershed and drought also influence salmon populations, such as ocean conditions; predation; hatchery impacts; over-fishing; disease in the Klamath River; and floods. The major "100-year" flood events of 1955, 1964, and 1974 caused significant damage in the Scott River watershed and to its fish populations, which has also taken decades to recover from.

Coho Adult Populations Are Increasing

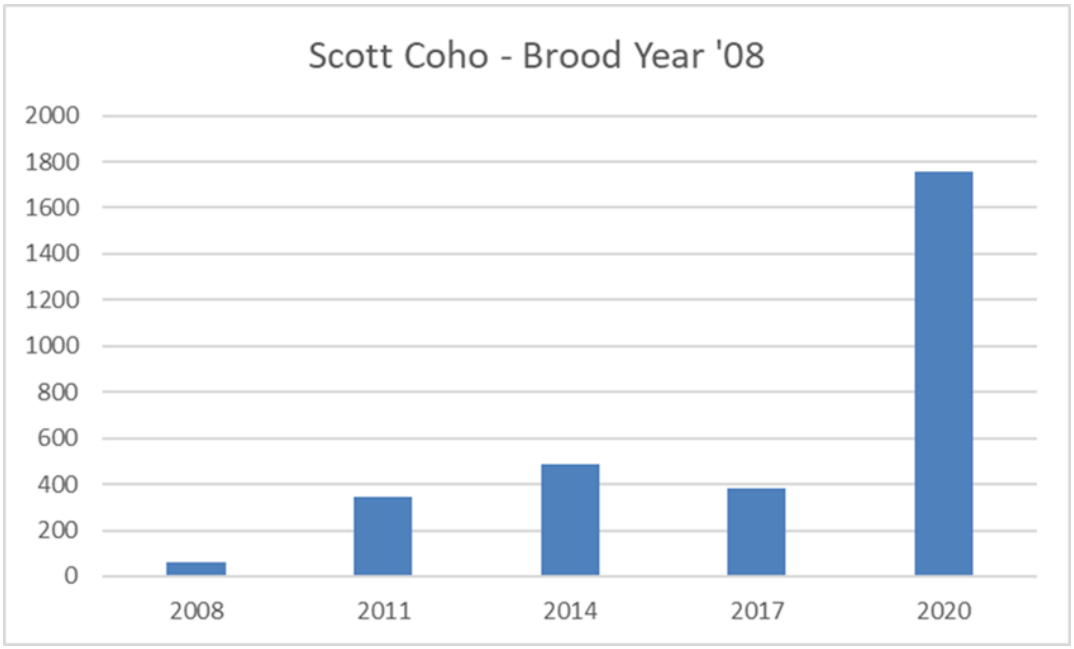
Since coho in this region became listed as "threatened" under the federal Endangered Species Act (ESA) in 1997 and the state ESA in 2005, great attention has been given toward the recovery of the species. Whether because of these recovery efforts, external circumstances, or both, coho salmon populations in the Scott River are, fortunately, not near "extinction." Instead, the 3 brood years have generally been increasing.

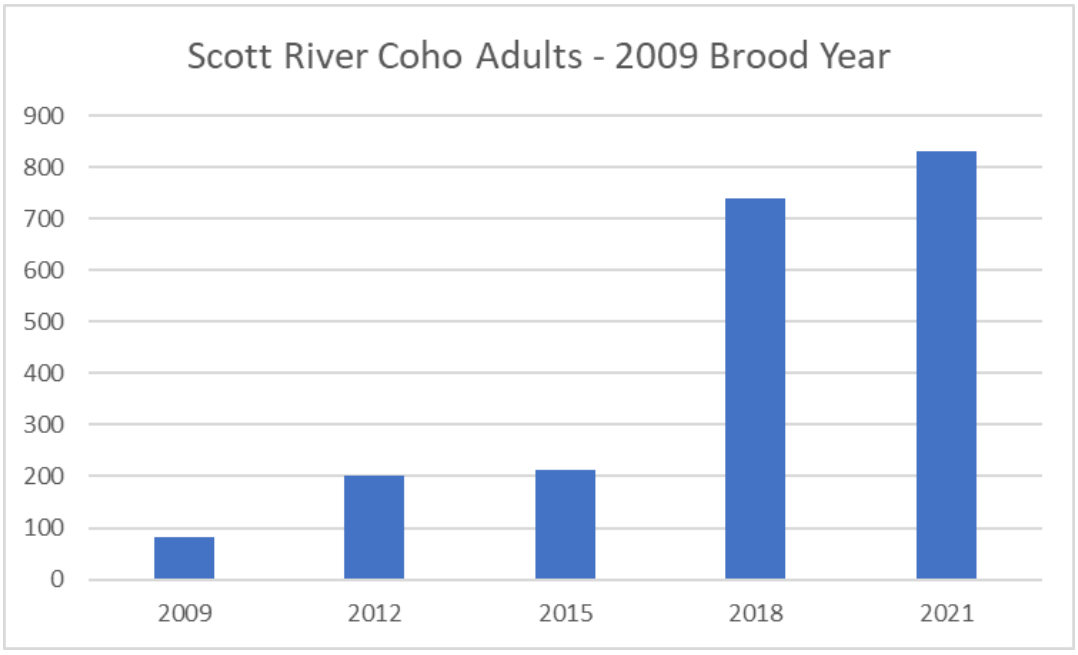
Adult coho numbers only began being monitored consistently in 2007 with the installation of a seasonal video weir by CDFW at Scott River mile 18, below the Scott Valley in the canyon. This initial adult count was the same strong brood year that researchers had initially documented as juveniles in French Creek ('95-'98-'01-'04-'07) (CDFG 2006). The data ended up showing that 1,622 adults had moved upstream of the weir in the fall of 2007. In 2010, despite good discharge in October-November (mean flows of 126 to 348 cubic feet per second (cfs)), the population went down to 927 adults, for unknown reasons. (Note: counts can be prone to yearly underestimation, due to the fact that when water in the Scott rises, the video weir is removed by CDFW employees to prevent equipment failure.)

Then a record number of 2,752 arrived in the severe drought year 2013 with mainstem flows of only 45-50 cfs – but with no fall rains, the tributaries where they prefer to spawn never connected. As a result, spawning occurred only in the mainstem and the juveniles were never able to migrate into the cooler tributaries for later rearing. A cooperative fish rescue effort was undertaken during summer 2014 to try to relocate the 160,000 juveniles into the upper streams, even though they were already stressed by low flows and the new sites were already occupied by steelhead juveniles (Magranet 2014; CDFW et al. 2015). Despite this major effort, the reduced survival of these juveniles contributed to the decreased adult return of about 250 adults in 2016. Nonetheless, this brood year is rebuilding, as shown in the graph below by the increase to 365 in 2019, demonstrating the resilience of wild coho populations in the Scott.



The ’08 and ’09 brood years were once considered “weak” but are now increasing significantly, as shown in the two graphs below. In 2020, the ’08 cohort showed “an increase of 3.5 times from returns of 2017,” up significantly from the estimated 153 counted originally in 2008 (Knechtle 2021). The ’09 cohort has expanded from an initial count of 81 adults to 830 in 2021. This impressive rebound in population has not been publicly touted by the fish advocacy community.





Juvenile Coho Outmigration Reporting Misinterpretations

After at least a year, coho juveniles move downstream to the Klamath River as “outmigrants” in the spring, with the peak timing often in May (Morrow et al. 2022). A rotary screw trap is operated by CDFW near the mouth of the Scott River to monitor juvenile salmon and steelhead outmigrants. During the

spring of 2021, a rumor was circulating that "juvenile coho are being killed in the Scott River," but this rumor proved to be ill-informed. Flows were adequate that year to sustain this outmigration, with no alarms made by CDFW in their reporting.

The source of the rumor may have been CDFW's outmigrant "raw" data, which can be easily misinterpreted when it's shared quickly via email networks. The "raw" numbers usually represent a small fraction of actual numbers, due to the inefficiency of CDFW rotary screw traps. CDFW's annual reports present their fish population estimates by species and age, and extrapolate the raw data using trap efficiency rates of 1 percent to 5 percent (Morrow et al. 2022). Given the 1 to 5 percent efficiency rate, a report of 10 coho juveniles (a "raw" number) could, for example, actually translate to 500 (at 5% efficiency) and 1,000 fish (at 1% efficiency). It should also be noted that the screw traps, like the video weir, are sometimes pulled by CDFW staff when the river flow increases, thus creating possible under-reporting of yearly totals.

Nonetheless, alarms were sent out via an email network of fish advocates about apparent low numbers. Fortunately, as of spring 2022, outmigrant monitoring weekly reports by CDFW are now clarifying that "raw catch numbers are not population estimates." CDFW now appears to be reporting population estimates only when they have sufficient trap efficiency data (CDFW 2022).

New Flow Requirements Not Targeting Coho Needs

Trying to protect coho was the purported primary intent of the Water Board's minimum flow targets adopted in 2021; however, they are a distraction from the coho's actual needs. The 2020 coho brood year was primarily located in French Creek and Shackleford Creek, where the adult spawners had flow access during the brief runoff of Nov-Dec 2020. These streams have adjudications separate from the Scott River Decree. Voluntary measures, particularly instream flow transactions via the Scott River Water Trust, have helped improve summer flows in the coho tributaries and monitoring has validated coho juvenile presence below water leases (see www.scottwatertrust.org). Coho juveniles are not rearing in the mainstem Scott in the summer months, so the July-August flow minimums of 30 cfs are not needed to sustain them there.

Mainstem flow targets for coho adult spawning migration do not reflect this species' essential need to migrate with spikes in flow, as is well documented in CDFW's annual Scott River Salmon Studies (e.g., Knechtle & Giudice 2021). A constant flow, as happened in Fall of 2013 at 50-60 cfs, does not help their spawning success when increased runoff has not triggered their inborn need to move up the tributaries to spawn (Magranet 2014). Coho are tributary spawners, not mainstem spawners if they can help it, and can spawn as late as late November to early February. Thus, they have a more flexible window than they're often given credit for. Data shows they are resilient, and fishery biologists are coming to appreciate this fact.

Scott's Coho Status Is Commendable

The Scott River has the strongest wild population of coho in the Klamath basin, according to CDFW (W. Sinnen, pers. comm.). Its average coho run size since 2007 is now 732 adults, with a peak return of 2,752 recorded in 2013 and a 2021 return of 830 fish (Knechtle & Giudice 2021; Knechtle, pers. comm.). Historic estimates from the early 1960s of the Scott River's coho population ranged from 800 to 2,000 adults, so current numbers are in the range of that "historic" era for which much nostalgia seems to remain (CDFG 1966).

Despite recent drought years and despite early predictions that coho were going "extinct", the coho salmon have shown resilience and rebounded in the Scott River. Local attention to the needs of coho salmon seems to have helped to improve its population, and these efforts will continue. This Success Story needs to be praised rather than punished.

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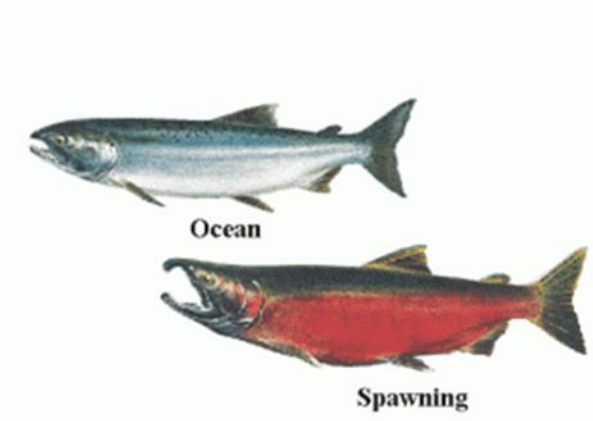
ATTACHMENT A

COHO SALMON FACTS

Appearance

- Commonly called silver salmon, coho have dark metallic blue or greenish backs with silver sides and a light belly.
- While they are in the ocean, they have small black spots on their back and on the upper lobe of the tail.



(U.S. Fish and Wildlife Service)

- The gumline in the lower jaw has lighter pigment than on Chinook salmon.
- In fresh water, spawning coho are dark with reddish-maroon coloration on the sides.
- Spawning males develop a strongly hooked snout and large teeth.
- Before juvenile coho migrate to the sea, they lose their parr marks (a pattern of vertical bars and spots useful for camouflage) and gain the dark back and light belly coloration of coho living in the ocean.

Biology

- Coho salmon are anadromous—they hatch in freshwater streams and spend a year in streams and rivers then migrate out to the saltwater environment of the ocean to feed and grow.
- Some stocks of coho salmon migrate more than 1,000 miles in the ocean, while other stocks remain in marine areas close to the streams where they were born.

- They spend about 1½ years feeding in the ocean, then return to their natal streams or rivers to spawn, generally in fall or early winter.
- Adult coho salmon usually weigh 8 to 12 pounds and are 24 to 30 inches long.
- They typically spawn between the ages of 3 and 4.
- Female coho dig out gravel nests (redds) on stream bottoms where they lay their eggs.
- The eggs incubate for 6 to 7 weeks until they hatch.
- All coho salmon die after spawning.
- The newly hatched larvae remain in the gravel until the yolk sac is absorbed.
- While in fresh water, young coho salmon feed on plankton and insects.
- While in the ocean, they switch to a diet of small fishes such as herring, sandlance, anchovies, and sardines.
- Adults are also known to eat juveniles of other salmon species, especially pink and chum salmon, as well as juvenile sablefish.
- Otters, seals, and a variety of fish and birds prey on juvenile coho. Sharks, sea lions, seals, and orcas feed on adult coho.
- After salmon spawn and die, salmon carcasses are a valuable source of energy and nutrients to the river ecosystem. Carcasses have been shown to improve newly hatched salmon growth and survival by contributing nitrogen and phosphorous compounds to streams.

Source: NOAA-Fisheries: https://www.fisheries.noaa.gov/species/coho-salmon