Yurok Tribe

United States House of Representatives

Subcommittee on Water, Oceans, and Wildlife

Hearing on Drought

Testimony

May 25th, 2021

I. Introduction to the Yurok Tribe and Impacts of Drought

The Yurok Tribe is the largest federally recognized tribe in California. Since time immemorial, the Yurok people have lived along the Lower Klamath River and Pacific Coast near the northernmost corner of California. We are prayer people, salmon people and world renewal people. Today, a large majority of our citizens reside on and near the Yurok Reservation. Comprised of approximately 10 percent of our ancestral territory, the reservation straddles the lower 45 miles of the Klamath River a mile on either side. The Yurok tribal government is led by nine democratically elected Tribal Council Members. With a workforce of more than 600 individuals, one of the largest employers in Del Norte and Humboldt Counties, the Tribal government administers approximately 40 programs and departments dedicated to serving the Yurok population and restoring the environment within the Tribe's homeland. Most notably, the Tribe is responsible for managing one of the largest and most sophisticated fisheries departments on the West Coast, which is emblematic of how important salmon are to the Tribe. The Tribe's government is sustained by grants, earnings from a dozen environmentally sustainable small businesses and revenue from California's Cap and Trade Program.

For uncountable generations, the Yurok lifeway has revolved around the Klamath River

and its once prolific fish runs. Our traditional culture is inextricably linked to the river, as is the physical, emotional, and spiritual health of our people. In good years, the river sustains our nutritional needs in the form of many fish species, including salmon, Pacific lamprey, steelhead, and sturgeon. We obtain much of our medicine as well as many food sources from the forests and prairies surrounding the Klamath. The streams that flow through the reservation supply our villages with clean drinking water. We obtain materials to make our ceremonial regalia from the seashore, the river and the forest. Our ceremonies are conducted everywhere from the high mountaintops to the coast. All of these life-supporting natural resources as well as our sacred sites are presently at risk because of the unprecedented chronic drought.

The record-breaking drought this year threatens these essential components of our culture as well as the physical safety of our citizens and our property. On May 13, 2021, the Yurok Tribal Council issued an emergency declaration to mobilize Tribal personnel and resources toward addressing the many different threats posed by the drought. In the next few months, hundreds of homes will be without drinking water because the streams that feed our municipal systems are expected to run dry. We are also facing an extremely elevated forest fire risk due to the drought and a 100-year-long ban on cultural burning, which has led to a massive buildup of exceedingly flammable fuels. The potential for a calamitous fire is most acute on the eastern half of our reservation.

Last year, the Yurok Reservation was surrounded by destructive forest fires and experienced the worst air quality on record. For a full two weeks, the reservation and surrounding area were covered in shroud of smoke so dense that it was impossible to ascertain whether it was day or night[1]. Many of our elders, living in Humboldt, Del Norte and Trinity

[1] Students from the Mad River Montessori Elementary School prepared watercolor paintings and letters expressing their feelings around the forest fires. The paintings and letters were submitted to the hearing record.

Counties, reported difficulty breathing as a result of the abhorrent conditions. We anticipate this will happen again this year.

The lack of water has produced other problems too. Fish disease rates are skyrocketing because Klamath River flows are so low. Our highly regarded biologists predict that the pathogen, *Ceratonova shasta (C. Stasta)*, will kill the majority of our baby salmon and we will lose an entire year class of fish. This will have a devastating impact on the Klamath salmon stocks for many years to come. It will also harm the numerous species that depend on salmon for all or part of their lifecycles, such as endangered Southern Oregon orca whales (which are starving for lack of food because Klamath salmon stock abundance is so low), black bears, and bald eagles. Adding insult to injury, the 2021 adult salmon forecast once again provides far too few fish to meet the subsistence and ceremonial needs of the tribe. As a conservation measure, the Tribe cancelled its 2021 commercial fishery for a fifth year. The swiftly declining fish stocks have made it extremely difficult for many Yurok citizens to pay bills and put food on the table.

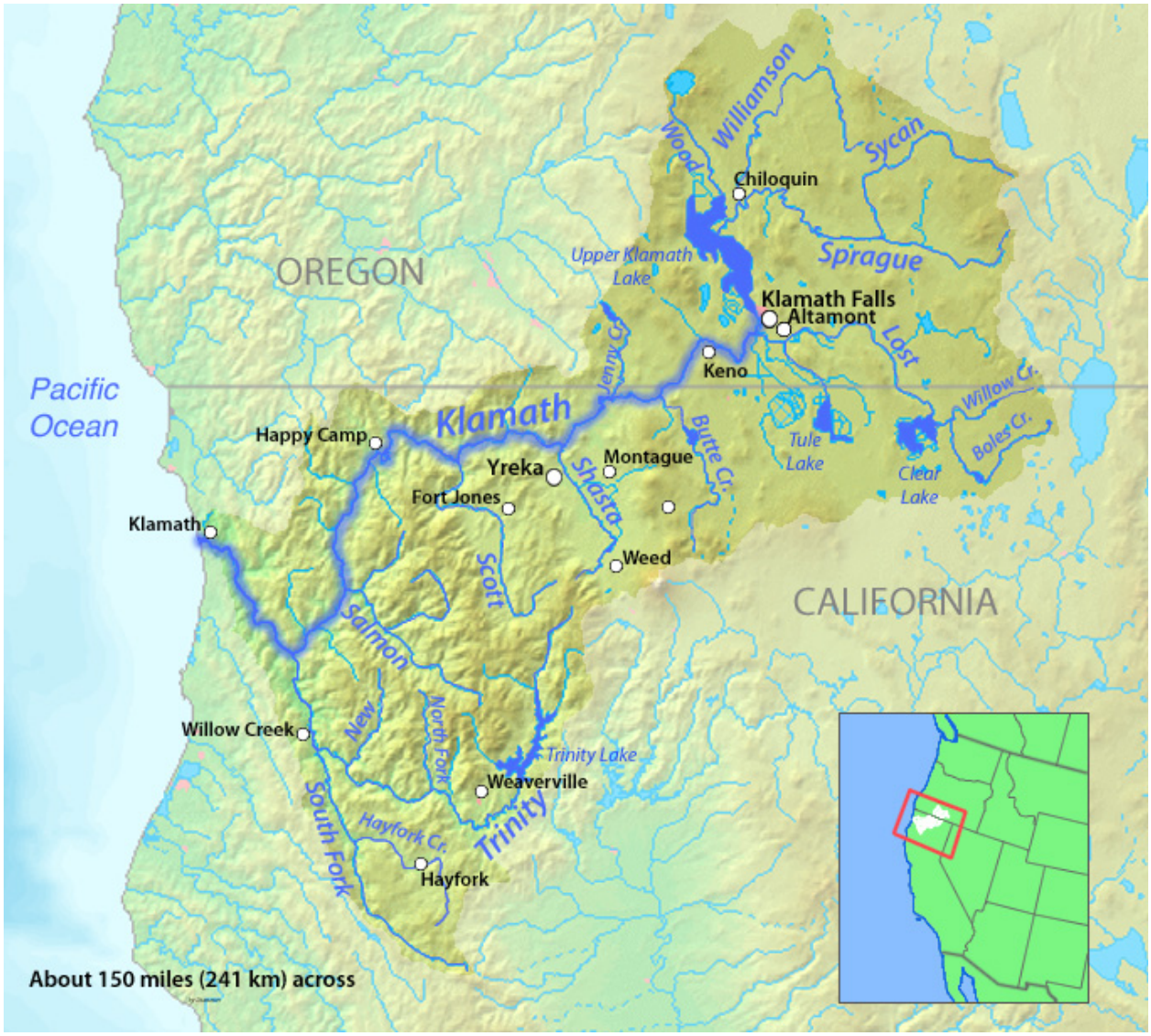
Ranging from widespread drinking water outages to unprecedented wildfire danger and fish kills, the Yurok Tribe is working on solutions to address these concurrent drought-related challenges, while continuing to confront the many different aspects of the COVID-19 crisis. As a largely grant-funded organization, the Tribal government has very limited resources to contend with real-time emergencies, like the drought. We need additional financial resources to help us respond to drought. In addition, we need the state and federal comanagers of the Klamath Basin to acknowledge that salmon are on a trail toward extinction and drought exasperates this unthinkable outcome. Instream flows along with habitat improvements are needed to ensure their survival. In the Klamath water demands exceeds water supply. Long-term solutions need to prioritize the longevity of fish populations and ecosystems, while providing for sustainable

levels of agriculture within the basin; demand needs to be aligned with supply, rather than repeatedly providing minimal amounts of water to fish.

The following includes more information on the impact of the drought on our most sacred resource the Klamath River and its fishery, and recommendations to protect it and us during this perilous time.

II. The Yurok Fishery

In the creation of the Yurok Reservation in 1855, the Yurok people reserved, and the federal government promised, to maintain the Tribe's fishing way of life on the lower 45 miles of the Klamath River. The Yurok people lived abundantly in aboriginal times benefiting from the River's plentiful resources including salmon runs, which historically were the 3rd largest along the West Coast. Yurok people have continued our fishing way of life through modern times, exercising our fishing rights as we've done for longer than can be remembered. While we exercise our fishing right on the Yurok reservation, our fishery is impacted by water management actions from above and around Upper Klamath Lake, and the Scott, Shasta and Trinity Rivers.



A map of the Klamath Basin, including tributaries. The Yurok Reservation includes a mile on either side of the Klamath River from below the confluence of the Trinity River to the mouth of the Klamath.

The Yurok fishery is not less important to us than the air we breathe. The fishery, however, has been in dramatic decline for decades and we have never had the full benefit of the promise of our fishery to support our way of life. Now, Klamath River salmon populations are in a precarious condition that is exacerbated by ongoing drought. Coho salmon, spring-run Chinook, and fall-run Chinook salmon populations were already in a perilous state, largely due

to water management practices that prioritize agricultural diversions over the needs of salmon. Coho salmon have been listed under the federal Endangered Species Act (ESA) since 1997, Spring Chinook are being considered for listing under the federal ESA, and Fall Chinook have seen substantial decline during recent years.

Threatening these species even more is the recent history of fish kills and fish disease outbreaks. In 2002, Klamath Reclamation Project water diversions led to a massive outbreak of Ich fish disease that killed as many as 78,000 adult salmon on the Yurok Reservation before they could spawn. The 2002 fish kill is one of the darkest events in Yurok history. Releasing pulse flows from the Trinity River in the summer during extremely dry years has helped prevent a recurrence of that disaster. Another outbreak of ich occurred in 2014 and another fish kill was narrowly averted by cool water releases from the Trinity River.

Tragedy struck again in 2014 and 2015 when monitoring revealed that outmigrating juvenile infection rates of a different parasite—*Ceratonova shasta (C. shasta),* a fish disease that is often fatal—reached 81% and 91% respectively of fish sampled. The few salmon that survived to return as adults in 2016 and 2017 came back in near-record low numbers, shutting down commercial and Tribal fisheries, leading to another fisheries disaster. 2017 was the first year in history that the Yurok Tribal Council closed its fall subsistence fishery entirely and Yurok people did not gill net for subsistence purposes on the lower Klamath River. Just weeks after the Tribal Council voted to close the fishery for conservation purposes, it declared a suicide emergency due to a Reservation-wide epidemic of suicides by Tribal members under the age of 30. Without a fishery, the Tribe's traditional way of life is disrupted, and hope is lost.

This year's drought has caused yet another unprecedented juvenile salmon fish kill on the Klamath river within the Yurok Reservation. The Yurok Tribal Fisheries Department has

observed that over 70% of the juvenile Chinook salmon migrating through the Yurok Reservation are either dying or already dead. The Klamath River is filled with dead and dying baby salmon at this moment. Data collected by the Tribe and partner agencies shows that this fish kill is caused by the fish disease *C. shasta*. This disease is endemic to the Klamath River but is exacerbated by low flow drought conditions and lack of adequate flushing flows. The current drought conditions and lack of water available for surface flushing flows has created a worst-case scenario for juvenile salmon. It is likely most of this year's class will die. The ramifications will be felt on an ecosystem level for many years to come as these fish fail to return to the Klamath River as adults. This juvenile salmon fish kill ensures that the depressed state of salmon populations in the Klamath River will persist. Yurok People will suffer the continued loss of subsistence, cultural, religious, and commercial fishing opportunities.

The Tribe and its members rely on salmon as a healthy food source and as a means to provide for their livelihood. The annual median income on the Yurok Reservation is $11,000. Salmon provides food for Yurok families, economic opportunity, and is the fabric of the community, bringing people together to fish, connect with each other and their heritage, and anchor themselves to their fishing culture. If anything, salmon have become even more important as the community is plagued with poverty, a suicide crisis, and lack of economic opportunities.

The ongoing extreme drought conditions, and associated high disease rates facing our juvenile fish, will push our salmon populations ever-closer to extirpation from key watersheds of the Klamath Basin, if not the entire Klamath Basin.

Status of Klamath Basin Salmon Populations

i. Fall Chinook Salmon

Klamath Fall Chinook Salmon have experienced record lows of abundance since 2015. Annual average natural adult spawning escapement for Klamath fall Chinook from 2016-2020 was only 38% of the average from the previous five-year period of 2011 – 2015, and was 52% of the average from the prior entire period of record, 1978 – 2015[2]. Analysis of the entire run (natural spawning escapement, hatchery escapement, and harvest) of adult Fall Chinook to the Klamath Basin shows a similar, but worse, trajectory; inriver run from 2016-2020 was only 31% of the average from the previous five-year period of 2011 – 2015 and was 41% of the average from the prior entire period of record, 1978 - 2015[3].

The Pacific Fisheries Management Council determined in June of 2018 that Klamath Fall Chinook met the "overfished" criteria of the Magnuson Stevens Conservation Act and the Pacific Coast Salmon Fishery Management Plan, because the stock failed to meet it's conservation standard[4] for a three-year period. During three of the past five years we have managed fisheries for Klamath Fall Chinook on the de minimis portion of their harvest control rule. As can be seen in Figure 1 below, natural abundance of Klamath Fall Chinook spawning escapement has been below the Maximum Sustained Yield (MSY) level (40,700 natural spawners) for this stock during five of the past six years.

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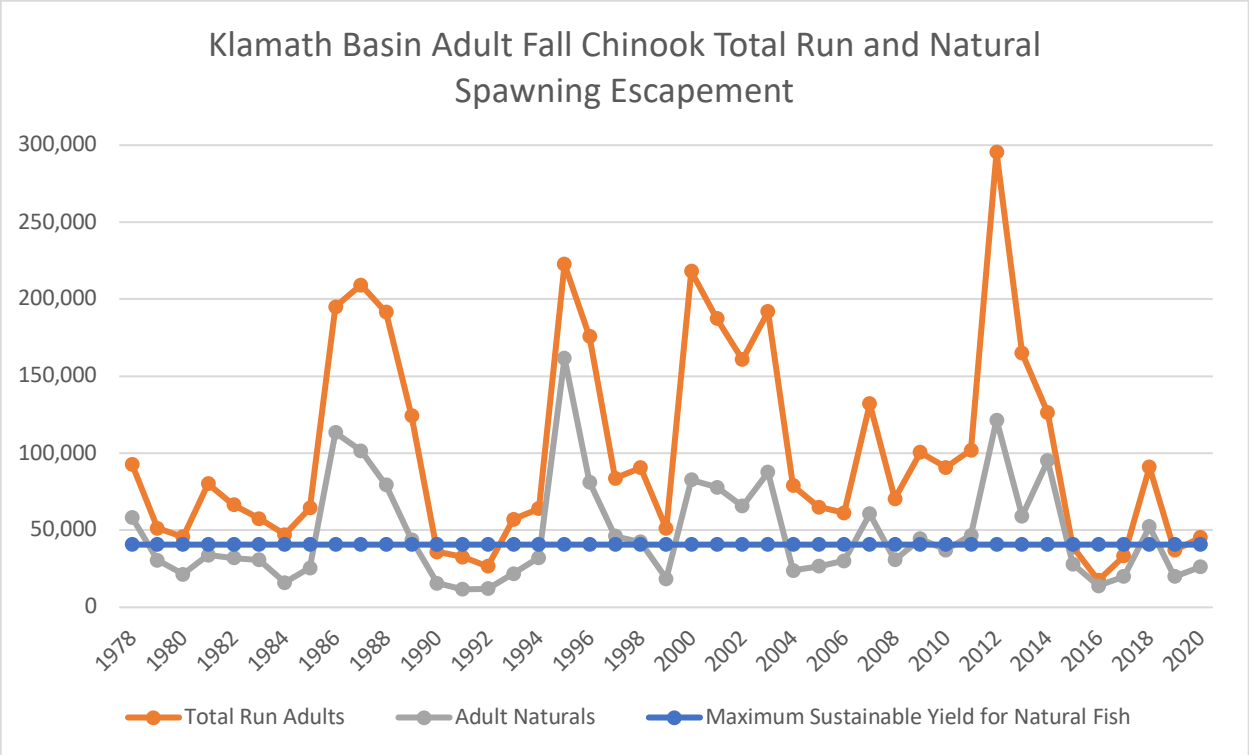
[2] Average abundance of Klamath natural adult Fall Chinook spawning escapement from 2016 – 2020 was 26,481 fish, from 2011 – 2015 was 70,136, and from 1978 – 2015 was 51,297. Data taken from CDFW's "Mega-table" titled *Klamath River Basin Fall Chinook Salmon Spawning Escapement, In-river Harvest, and Run-size Estimates, 1978 – 2020*.

[3] Average abundance of Klamath adult Fall Chinook inriver run from 2016 – 2020 was 44,680 fish, from 2011 – 2015 was 145,580, and from 1978 – 2015 was 109,271. Data taken from CDFW's "Mega-table" titled *Klamath River Basin Fall Chinook Salmon Spawning Escapement, In-river Harvest, and Run-size Estimates, 1978 – 2020*.

[4] The Pacific Salmon Fishery Management Plan defines "overfished" as occurring when the three-year geometric mean of a salmon stock's annual spawning escapements falls below the reference point known as the minimum stock size threshold (MSST).

Figure 1. Klamath Basin Adult Fall Chinook Total Run Size and Natural Spawning Escapement, 1978 – 2020 (data from CDFW "Mega-Table" titled *Klamath River Basin Fall Chinook Salmon Spawning Escapement, In-river Harvest, and Run-size Estimates, 1978 – 2020).*

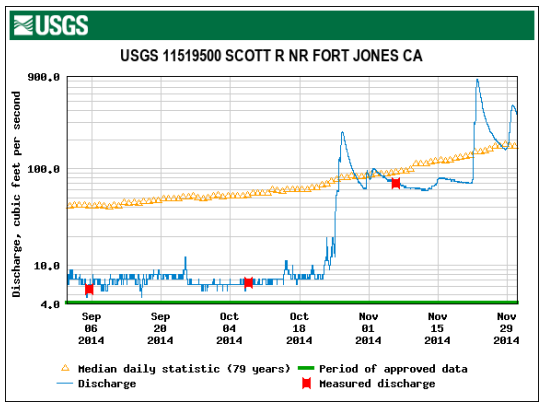


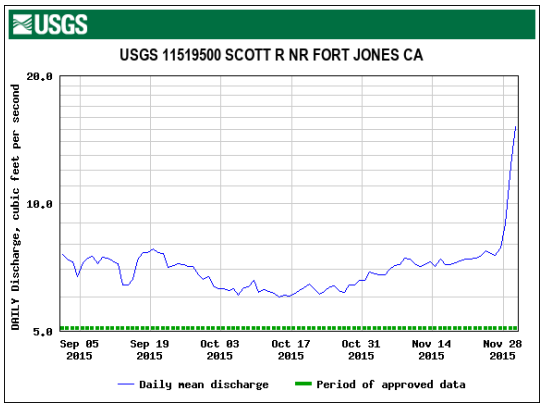
In addition to flow management in the Klamath River contributing to extremely high juvenile disease rates, our salmon also encounter substantial flow management problems in some Klamath Basin tributaries that once supported large runs of fall Chinook, such as the Scott and Shasta Rivers. In the Scott River, flows have not been high enough in the canyon reach of the Lower Scott River so that fall Chinook can migrate to their spawning grounds in and above Scott

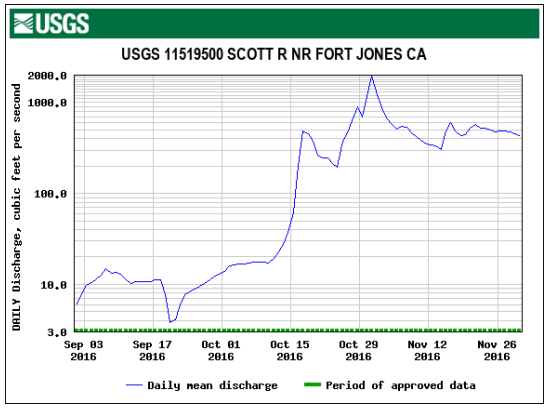
Valley. As noted in a study conducted by Dr. Thomas Hardy (Hardy and Shaw, 2017[5]), flows need to be at least 57 cfs to allow fish passage of adult Chinook salmon through the canyon reach. This estimate is substantiated in a report prepared by CDFW (2017[6]), which recommends that flows be at least this high and higher, to provide for adult fish passage to the spawning grounds. As noted in the Hardy report, per CDFW data collected at weir counting stations, the Fall Chinook spawning migration typically peaks in the Scott River during mid-late October. Analysis of flow data collected by USGS at the Fort Jones gauge station (Figure 2) shows that during three (2015, 2018, and 2020) of the past six years flows were far below levels necessary for fall Chinook to migrate through the canyon, therefore their migration to the spawning grounds was inhibited. Furthermore, during 2014 and 2016, flows inhibited migration during the first half of the spawning migration. Without access to the spawning grounds, it's no wonder that the abundance of Scott River Fall Chinook is in substantial decline. Run size of fall Chinook in the Scott River for the five-year period of 2016 – 2020 was only 27% of the run size during the previous five years (2011-2015) and only 34% of the run size for the entire prior period of record (1978 – 2015).

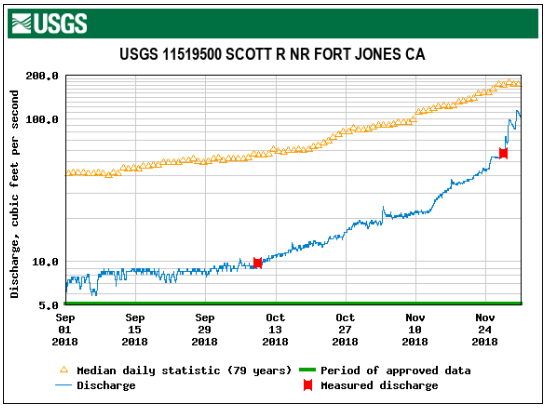
[5] Hardy, T.B. and Shaw, T.A. *An Evaluation of the Anadromous Fish Instream Flow Need for the Lower Scott River, in Siskiyou County, California. Phase I, Report.* 42 pages.
[6] CDFW, 2017. Interim Instream Flow Criteria for the Protection of Fishery Resources in the Scott River Watershed. Siskiyou County. 29 pages.

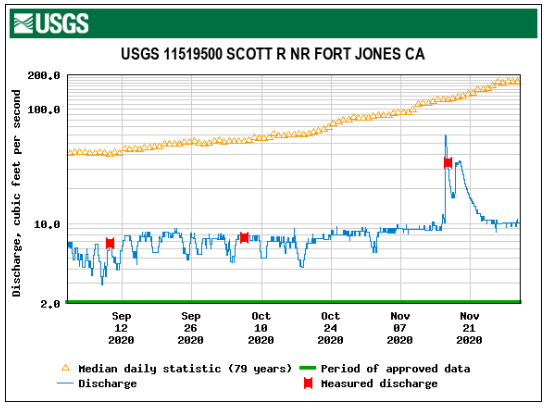
Figure 2. USGS Flow Data for the Scott River near Fort Jones, CA from September 1 – November 30, during 2014, 2015, 2016, 2018, and 2020.











The Shasta River is a smaller-sized but extremely important tributary to the Klamath River, entering the river approximately 178 miles from the mouth and about 12 miles below Iron Gate Dam. Although the Shasta River is small in terms of absolute flow, it is a powerhouse salmon producer and is capable of producing a significant portion of the Klamath Basin's Chinook salmon.

The Shasta River suffers from the same type of flow problems as many other streams in the north part of California, mainly having to do with agricultural withdrawals that prevent adequate instream flows to support river ecology and fish. Because there is no single management entity on the Shasta River, flows drop precipitously on April 1, which undoubtedly strands many young salmon. It is not uncommon for Shasta River flows to drop by over 50% in a day. During the peak of summer diversions in hot weather, up to 95% of the flow of the Shasta River is diverted leaving the River dewatered and fish stranded to die.

ii. Yurok Fall Chinook Salmon Fishery

During recent decades, fall Chinook have comprised the mainstay of the Yurok Tribal fishery, partially because of the decline of other species, such as spring Chinook and Coho salmon that have life history strategies that require them to stay in degraded freshwater habitats through the hot summer period for substantially longer periods of time than Fall Chinook. Unfortunately, even our fall fishery has experienced substantial decline in recent years due to the deterioration of the fall Chinook run, and now falls far short of meeting the subsistence and ceremonial needs of Tribal fishers.

During 2017, when the Yurok Tribe received an allocation of only 650 fish, the lowest Yurok allocation on record (since records began to be kept in 1978), the Yurok Tribal Council chose to completely close (with the exception of a small elders' fishery) our fall subsistence

fishery for the first time in history. Instead, they let most these fish migrate to their spawning grounds, given the stock was already at levels far below conservation standards. Since 2016, Tribal members have repeatedly been unable to meet their subsistence, and ceremonial needs. In fact, the average annual harvest of adult fall Chinook by the Yurok Tribe, with a population of over 6,000 members, has averaged only 4,921 fish during the period of 2016 – 2020. This compares with an average annual harvest by the Tribe of 45,884 fish during the prior five-year period of 2011 - 2015 (nearly an order of magnitude more than from 2016 - 2020), and an annual average harvest of 23,952 from 1989 - 2015.

Furthermore, the Tribe's commercial fishing opportunities have been impacted even more, as we have not had a viable commercial fishery since 2015 due to allocations that were far too small to meet our subsistence and ceremonial needs. In other words, we have not had a meaningful commercial fishery in over five years. This compares with the fact we had fall Chinook commercial fisheries each of the six years prior to 2015. We did attempt to have a commercial fishery during 2019, targeting a commercial take of 14,000 fish, however the run did not materialize as projected. The return of adult fall Chinook during 2019 was approximately 38% of what had been projected pre-season, and the age-4 component of the run, expected to be the driver of the Yurok fishery that year, had been over-projected by 6.2 times. We only harvested 1,878 adult fish for commercial purposes in 2019.

iii. Coho Salmon

Williams et al (2006[7]) identified nine populations of Coho Salmon within the Klamath Basin; one (Lower Klamath) within the Northern Coastal diversity stratum, five within the

[7] Williams, T. H., E. P. Bjorkstedt, W. G. Duffy, D. Hillemeier, G. Kautsky, T. E. Lisle, M. McCain, M. Rode, R. Glenn Szerlong, R. S. Schick, M. N. Goslin, and A. Agrawal. 2006. Historical Population Structure of Coho Salmon in the Southern Oregon/Northern California Coasts Evolutionary Significant Unit. NOAA Technical Memorandum. NOAA-TM-NMFS-SWFSC-390. 85.

Interior Klamath diversity strata, and three within the Interior Trinity diversity strata. Diversity strata are groups of populations that likely exhibit genotypic and phenotypic similarity due to exposure to similar environmental conditions or common evolutionary history (Williams et al. 2006, p 24).

Six of the nine Klamath Basin Coho Salmon populations were identified as being "functionally independent" populations (considered to be historically viable-in-isolation and with at least 95% self-recruitment (Williams 2006, p 8). The three populations closest to Iron Gate Dam, and therefore most affected by the altered Klamath River flow regime caused by the Bureau's diversions to the Project, are all considered functionally independent populations; namely the Upper Klamath population, the Shasta River population, and the Scott River population.

These three independent populations (Upper Klamath, Scott, and Shasta River populations), with closest proximity to Iron Gate Dam have also been identified by NMFS as "core" populations in the SONCC Coho recovery plan (NMFS 2014 (D-27)). NMFS notes (2014 p 4-4) that each population plays a role in recovery, however those identified as "core" populations are those that are likely to respond to recovery actions and achieve a low risk of extinction most quickly. These core populations are anticipated to contribute the most to the viability of the diversity strata and hence recovery of the ESU (NMFS Recovery Plan, p 5-1). As noted in the NMFS 2016 Status Review (p 11) "The biological recovery criteria are as follows. In order for the ESU to be viable, all "core" populations should be at low risk of extinction…." Unfortunately, the three core populations of the Upper Klamath Basin are far from being at low risk of extinction. NMFS considers the Upper Klamath and Shasta River populations to both be at "high risk of extinction" and the Scott River population is considered to be at "moderate risk

of extinction" (NMFS Recovery Plan, p. ES-4). In fact, during the past five years, the minimum number of spawners identified as necessary for recovery of each of these Upper Klamath populations (NMFS 2014, p 4-6) exceeded actual spawning escapement abundance by more than an order of magnitude (two orders of magnitude for the Shasta River population) (Table 1).

Additional concern regarding the Scott and Shasta River populations (Upper Klamath population data has inadequate resolution for such an analysis) is that their abundance trajectory during recent years trends dramatically downward. During the seven-year period of 2007 – 2013, the Shasta River abundance of Coho spawners averaged 92 fish annually, yet this average dropped to 44 spawners for the seven years from 2014 – 2020 (Table 1). A similar analysis for the Scott River shows the average annual abundance from 2007 – 2013 was 850 spawners, yet this abundance dropped to an average of 592 spawners from 2014 – 2020 (Table 1). This trajectory toward extirpation is not sustainable.

Table 1. Spawning escapement of Coho salmon to the Shasta, Scott, and Upper Klamath independent core populations of the SONCC ESU, 2007 – 2020[8].

	Shasta	Scott	Upper Klamath[1,2]
Return Year	**Total Coho Returns**		
2007	249	1622	
2008	30	62	
2009	9	81	<250
2010	44	911	<350
2011	62	344	<300
2012	115	201	<300
2013	134	2731	<300
2014	46	485	<300
2015	45	212	<300
2016	52	226	<300
2017	41	382	<300
2018	39	737	<300
2019	50	346	<300
2020	37	1754	<no data>
Average 2007-2020	68	721	
Average 2007-2013	92	850	
2014-2020	44	592	
Low Risk Threshold (required for viability)	4,700	6,500	8,500

iv. Spring Chinook Salmon

Spring-run Chinook Salmon were once the dominant run of Chinook salmon on the Klamath River but are now relegated to a few remnant wild populations and a hatchery supported run in the upper Trinity near Trinity Dam. The spring Chinook runs in the Shasta and

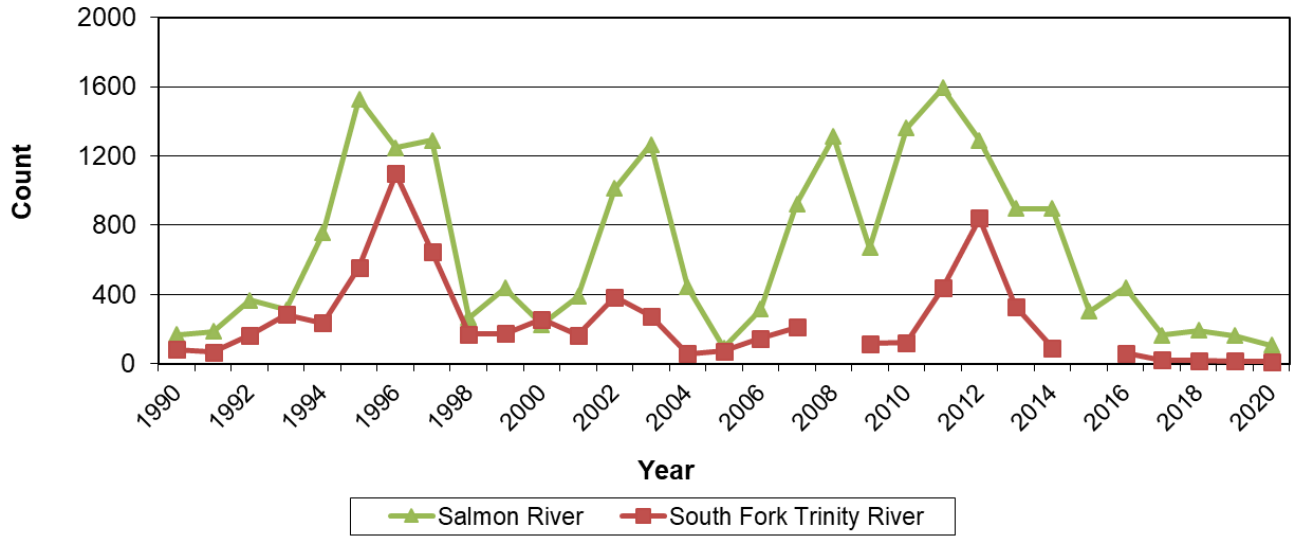
[8] Data obtained from NMFS 2014, and data used by ad-hoc committee of the Pacific Fishery Management Council to develop a harvest control rule for SONCC Coho Salmon.

Scott Rivers went extinct in the 1950's and 1970's respectively, and the upper Klamath spring Chinook run went extinct shortly after the construction of Iron Gate Dam. Construction of the mainstem Klamath River dams and Trinity Dam blocked access to the prime spawning and rearing habitat, and gold mining, water diversions and massive sedimentation from logging and road building also took their toll. The remaining remnant spring Chinook salmon wild populations of the Salmon River and South Fork Trinity Rivers have reached extremely low abundance levels during recent years (Figure 3). In fact, spring Chinook of the Klamath Basin are currently being considered for listing under the federal and state ESA laws.

On the Salmon River, annual snorkel survey counts of spring Chinook salmon have averaged 213 fish from 2016 - 2020, which compares with 995 fish from 2011 – 2015, and 751 fish from 1990 – 2015; the 2016 – 2020 counts were only 21% of the average counts from the prior five-year period.

On the South Fork of the Trinity River (SFTR), annual snorkel survey counts of spring Chinook salmon have averaged 39 fish from 2016 – 2020, which compares with 425 fish from 2011 – 2014 (no data available for 2015) and 291 fish from 1990 - 2015. There was more than an order of magnitude fewer fish during the recent five-year period than during the previous five-year period. It is worth noting that a population estimate conducted by CDFG staff in 1964 estimated that over 11,000 adult spring Chinook were holding in the SFTR. Such low abundance as experienced in the SFTR recently is not sustainable over the long-term, and is indication that this stock is heading toward extirpation without some sort of intervention.

Figure 3. Snorkel Survey Counts of Spring Chinook (Adults and Grilse) in the Salmon River and South Fork Trinity River, 1990 – 2020.



v. Trinity River Stocks

In the face of climate change and chronic drought, it is possible that Spring Chinook Salmon, steelhead, and Coho Salmon would be extirpated from the Trinity River without the cold-water resources of Trinity Reservoir or increased access to their historical high elevation habitats above the Dams. In recent history, the Trinity River produced roughly half of the fall Chinook salmon that returned to the Klamath Basin, but this stock has experienced the same steep declines observed in the rest of the basin in recent years.

The federal dams and diversion of the Trinity River are approximately 60 years old and were designed to store and divert water, not provide for downstream fisheries. Inadequacies of dams, conveyance, and reservoir infrastructure has created difficulties in meeting fisheries recovery objectives and leave the fisheries resources of the Trinity River vulnerable to multi-year drought under current management and infrastructure constraints.

An important management consideration is the temperature of water releases from Trinity Reservoir because they have a direct impact on the fish runs in the Trinity River below the dam. Water release temperatures are dependent on stored water in Trinity Reservoir, which is commonly called the "cold pool." As draw down to storage less than 1.25 million acre-feet (MAF) of water in Trinity Reservoir occurs, water temperatures in summer and fall at the main outlet works, which conveys water downstream, begin to increase rapidly (Figure 4). At storage less than approximately 750 TAF, meeting temperature objectives to protect salmon becomes problematic. Reliance on an auxiliary outlet resulting in bypass of power generation at Trinity Dam becomes necessary. In 1977, as well as 2014 and 2015, low reservoir levels resulted in warm water release temperatures that impacted fish. This year's forecast expects storage to drop below 600 TAF in November, the peak of salmon spawning. The warmest water of the year will be released as salmon spawn during a time of year when water temperatures should naturally be dropping. Failure to meet temperature targets during the late-summer and fall months can lead to the mortality of incubating eggs, causing drought to impact yet another year class of fish reducing future adult returns. Between now and then 420 TAF of Trinity River water are scheduled to be diverted to the Sacramento River. Avoiding these temperature problems requires a more conservative approach when considering exports to the CVP.

The State of California can no longer rely on water of the north to support water needs in the southern part of the state. The in basin needs of fish, wildlife, and people who live downstream should be provided for before out of basin transfers are delivered. As recommended by Reclamation's own Bender (2012) report 750 TAF end of September carryover storage should be considered a minimum storage level for Trinity Reservoir, below which the ability to protect returning adult salmon comes into question. Prudent management requires careful

management of releases to the CVP in order to maintain enough cold pool storage in Trinity Reservoir in case of drought in the next year.

Cold pool storage in Trinity Reservoir will be impacted by climate change with both lower end of September storage and warmer release temperatures. Without robust protections of minimum end of September storage levels, combined with hedging against the inevitability of multi-year droughts, the cold-water resources in Trinity Reservoir could be inaccessible or completely exhausted in future years. Infrastructure improvements such as selective withdrawal in Trinity Reservoir and reconfiguration of Lewiston Reservoir, suggested by Bender (2012) and estimated to cost ~$500,000,000 would increase the resiliency and control of these systems.

If the Trinity Division of the Central Valley Project is to remain in place, the federal government must reinvest to make it less impactful to the environment and honor the federal laws which are in place to prevent damages to fish and wildlife.

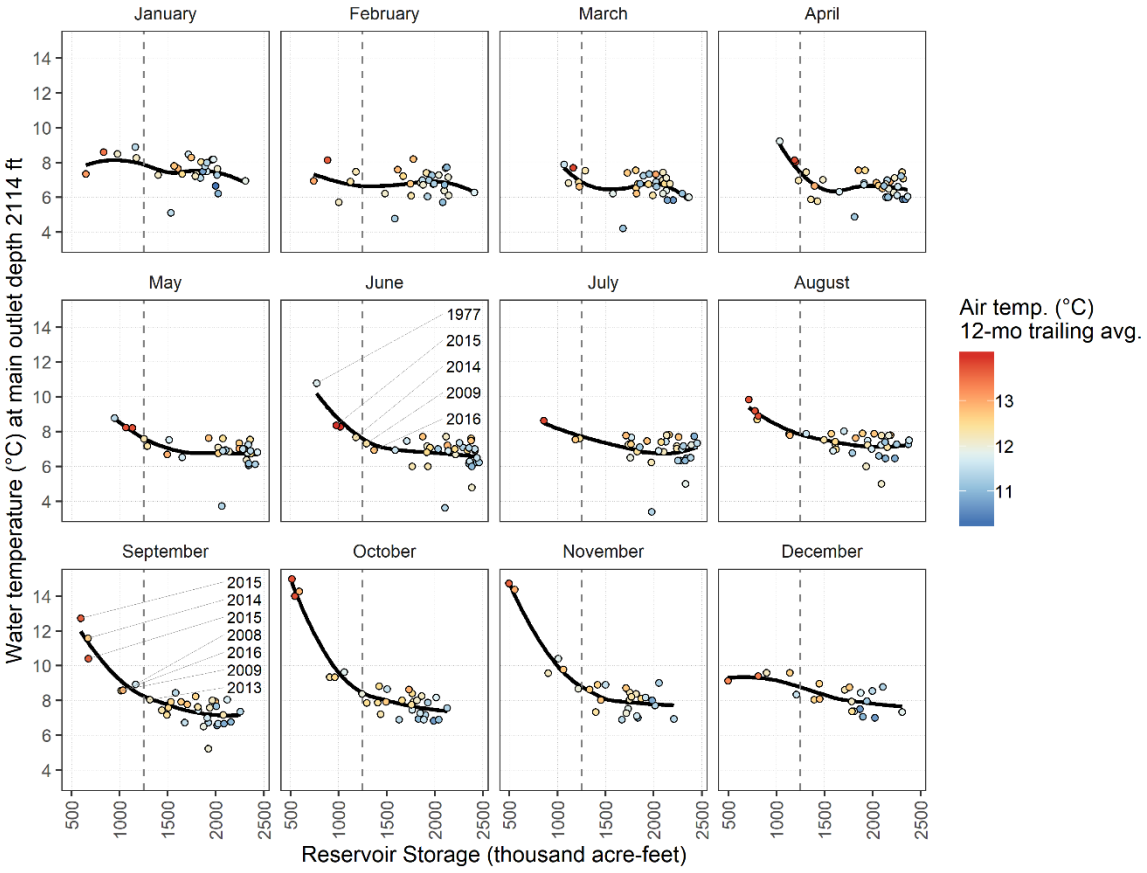


Figure 4. Relationship of Trinity Reservoir storage volume to water temperatures at main outlet elevation (2114 ft) for all months (January–December) in 38 years from 1972–2019, excluding years without data. Temperature targets to protect salmon are 13.5 °C. These graphs show how temperature rises as the cold pool is depleted with significant consequences to the fishery below. The effects are particularly severe in the late summer and fall months when salmon are present in large numbers below the dam.

III. Recommendations

Drought and water management that does not prioritize the needs of salmon has propelled salmon down a trail toward extinction in the Klamath Basin and will lead to ecosystem failure. This not only affects the Yurok and other Tribes of the Klamath Basin, but also affects the economy and well-being of the entire west coast of the United States. At a time when landscape-scale restoration efforts are about to be implemented, such as removal of four dams from the mainstem Klamath River, this is no time to disregard the needs of the populations that will provide the seed stock for salmon reintroduction of the Upper Klamath Basin. Now more than

ever we need to protect the abundance and diversity of these fish populations, yet we continue to watch their demise as their basic need for adequate river flow goes unmet. This is not a new phenomenon for the Klamath Basin, but instead it has become the status quo. Managers continue to attempt to solve our water resource management problems every which way except for addressing the crux of the problem; there is more demand for water in the Klamath Basin than there is water. Long-term solutions need to prioritize the longevity of fish populations and ecosystems, while providing for sustainable levels of agriculture within the basin. Water demand needs to be aligned with supply, rather than repeatedly providing minimal amounts of water to fish.

The Klamath Basin and its tributaries are managed in a way that reflects historical – 19th and 20th century values and hydrology. Water use and allocation policy, law and decisions favor agriculture and irrigation to support an anglo dominated economy of ranching and farming. Consumptive agricultural water uses in the basin and exports from the basin have been perfected through water rights but in stark contrast, there are no ecological or instream flow rights for fish on the Klamath mainstem, Shasta, Scott or Trinity Rivers other than what is required by the Endangered Species Act. These flows represent the bare minimum needs for one specie. They do not support robust populations for all species, nor do they support overall ecosystem vitality.

Further, the water rights of the Yurok Tribe have not been quantified, but this is not for the Tribe's lack of trying. As trustee, the federal government plays a crucial role in empowering the Tribe to assert its water right, yet this has never been done. Meanwhile, the federal government has supported the Klamath Project and irrigation for agriculture to the detriment of the Tribe's rights and the River's health. The Tribe's water rights in the Klamath Basin are senior, reserved federal rights that could be a powerful tool to secure instream flows to support fisheries and

ecosystem health in the Basin. In addition, there are other sources of federal and state laws that should be used to provide instream flows, but they too remain unasserted. Maintaining status quo water management will lead to salmon extinction in the Klamath River and continued widespread ecological harm to the Basin. To keep salmon in the Basin, the Klamath River and its critical tributaries must be restored by improving habitat and increasing instream flows for fish and ecology.

The following should be implemented this year to withstand this year's drought:

1. **Maintain minimum flows on the Klamath River as required by the Coho Biological Opinion**

The Klamath Coho Biological Opinion requires minimum flows throughout the year to prevent "unacceptable long-term harm" to the River. These flows must be maintained through the summer to protect the River and fisheries.

2. **On the Scott River, the California State Water Resources Control Board should adopt emergency instream flow regulations with corresponding reduction to agricultural diversions from the Scott River immediately, to ensure there will be adequate flows in the late-summer and fall for the adult salmon to return home to spawn.**

The California Natural Resource Agency recently transmitted to the State Water Resources Control Board (SWRCB) instream flow recommendations for the Scott River. This enables the SWRCB to enact regulations to secure instream flows in the Scott River for fish. Further, Governor Newsom declared a drought for the Klamath Basin Watershed, including the Counties of Del Norte, Humboldt, Trinity, and Siskiyou. The declaration includes authority for the SWRCB to adopt emergency regulations for instream flows. The SWRCB should immediately

begin the process of adopting emergency regulations for instream flows for the Scott River based on the CNRA instream flow recommendations. Actions need to be taken now to ensure that adequate flows are available for returning salmon in the late-summer and fall time.

3. **Ensure the Trinity cold pool is available this summer for fish**

The in basin needs of fish, wildlife, and people who live downstream from the Trinity River Division should be provided for before out of basin transfers are delivered. We want a commitment from the federal government that Trinity River Reservoir storage will be maximized, and power bypass will be performed as needed to provide cold water in this drought year.

4. **Provide increased releases from Trinity Reservoir to minimize risk of an adult fish kill in the Lower Klamath River.**

Given the extreme nature of this year's drought, and the low flows that are expected in the Lower Klamath, we recommend that augmented flows from Trinity Reservoir be provided if conditions develop that could result in an adult fish kill in the Lower Klamath. The Bureau of Reclamation has an approved EIS for the provision of these flows during dry years such as we are currently experiencing.

5. **Expedite Klamath Dam Removal**

The federal government should support and prioritize Klamath Dam Removal. Klamath Dam Removal is one of the most important aspects of Klamath River Restoration. Removing the dams provides tremendous habitat and water quality benefits that will improve the overall health of the Klamath River ecosystem. Currently, dams are scheduled to be removed in 2023 but regulatory processes threaten to delay removal with significant budgetary implications. The

federal government should support the project and expedite regulatory approvals required to effectuate dam removal.

6. Support funding for restoration projects throughout the Klamath Basin

Critical to any drought relief legislative package is funding for restoration projects through the Klamath Basin. The Yurok Tribe, and other community stakeholders, have numerous "shovel ready" projects that could be implemented if funding were made available. Such projects would benefit the ecosystem overall health and thereby reduce the stress of the system and fish caused by drought.

7. Support equitable funding to the people of the Klamath Basin

Legislative drought relief packages should equally support all communities in the Klamath Basin harmed by the drought. The first round of drought relief provided $15 million to agriculture and only $3 million to tribes. This funding inequity must be remedied in future packages. The Yurok Tribe has prepared a drought relief report that estimates the tribal government's funding needs to respond to drought is tens of millions of dollars.[9]

Also, commercial fisheries disaster relief funding should not be limited to the past five years catch in acknowledgment of long-term consequences of drought on fish populations, and the appropriation of funding for commercial fisheries disaster relief should be increased to better reflect the actual losses suffered by tribal fishing families and businesses.

[9] See, Yurok Tribe 2021 Drought Report Submitted to the Hearing Record

The following long-term solutions should be pursued:

1. Update Interstate Compact between Oregon and California to allocate Klamath Basin water between the states
2. Quantify the Yurok Tribe's water rights in the Klamath Basin
3. Reduce Klamath Project Size to reflect sustainable levels of irrigated acres
4. Study impairments to sucker survival in the Upper Klamath Lake
5. Re-adjudicate the Shasta and Scott River sub-basins in a way that prioritizes the recovery of fish runs in those basins. Both sub-basins suffer from flawed water rights adjudications that make maintaining in-stream flows for fisheries difficult to achieve.
6. Authorize funding to address infrastructure improvements, detailed in USBR report (Bender 2012), and needed to make the Trinity River Division of the Central Valley Project more resilient and capable of meeting the needs of the fish, wildlife, and people downstream.
7. Address landscape-scale fuels buildup using traditional cultural burning. This fuels buildup threatens fisheries through catastrophic fire events and associated massive sediment introduction.

IV. Conclusion

The impacts of this year's drought on the Yurok people and their resources will be long lasting, affecting not only the Yurok Tribe, but the entire west coast of the United States. Farmers, commercial salmon fishermen, tribal members, and ordinary citizens will all be affected. But this drought is not a fluke event. It is part of a larger pattern of drought brought on by climate change. Climate change is no longer some vague future threat, we are seeing its effects happening now, in real time. As we move forward, we need the support to make changes

that will enable sustainable communities from the top to the bottom of the Klamath Basin to thrive. It is possible to weather these changes, but we all need support. Resiliency, adaptation, and securing a future for salmon and people is the future of the Klamath Basin.