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19 **IN THE UNITED STATES DISTRICT COURT**
20 **FOR THE EASTERN DISTRICT OF CALIFORNIA**

21 SAN LUIS & DELTA-MENDOTA WATER
22 AUTHORITY and WESTLANDS WATER
23 DISTRICT,

24 Plaintiffs,

25 v.

26 SALLY JEWELL, et al.,

Defendants,

HOOPA VALLEY TRIBE; PACIFIC COAST
FEDERATION OF FISHERMEN'S
ASSOCIATIONS; INSTITUTE FOR
FISHERIES RESOURCES; and YUROK
TRIBE,

Defendant-Intervenors.

Case No. CV F 13-1232 LJO-GSA

DECLARATION OF MICHAEL ORCUTT
RE 2014 RIVER CONDITIONS

Judge: Hon. Lawrence J. O'Neill

Date: No Hearing Set

Time: No Hearing Set

Crtrm.: No Hearing Set

1 I, Michael Orcutt, declare as follows.

2 1. I am a fisheries biologist and a member of the Hoopa Valley Tribe. I serve as
3 Director of the Fisheries Department of the Hoopa Valley Tribe, located on the Hoopa Valley
4 Indian Reservation in northern California.

5 2. The rights of the Hoopa Valley Tribe include the right of the Tribe and its
6 members to make a moderate living based on taking fish of the Trinity and Klamath Rivers.
7 For that reason, the Hoopa Valley Tribe, through its Fisheries Department, is intimately
8 involved in preservation and propagation of fish resources of the Klamath River Basin,
9 including its largest tributary, the Trinity River. Among other things, the Tribe carries out
10 functions authorized by the Record of Decision for the Trinity River Mainstem Fishery
11 Restoration (Dec. 19, 2000) (“ROD”).

12 3. At this time, the Hoopa Valley Tribe’s fisheries resources are at risk of a
13 catastrophic fish die-off in the Lower Klamath River because of dry hydrological conditions
14 and because of the practices of the Department of Interior, Bureau of Reclamation, in managing
15 the water resources of the Central Valley Project in California and the Klamath Irrigation
16 Project in Oregon. The Tribe has periodically urged supplemental flows from the Trinity River
17 to protect salmon in the Lower Klamath River since the devastating die-off of adult salmon of
18 2002. The Tribe continues to support supplemental flows in 2014.

19 4. Conditions in the Lower Klamath River have been poor this summer and they
20 continue to degrade. Attached to this Declaration is an August 15, 2014 memorandum from
21 Dr. Joshua Strange, who testified last year in this case. Dr. Strange concludes that “a fish kill is
22 more likely than not in 2014 among adult fall Chinook salmon migrating in the Lower Klamath
23 River.” *Id.* at 3. He notes that 22 salmon carcasses were counted in the Lower Klamath River
24 on August 14, 2014, which is an indication of the generally poor condition of fish this year and
25 the elevated state of fish diseases. He points out that an additional stressor “is the high amount
26

1 of the toxic blue-green algae microcystis . . . that is being released into the River from the
2 Klamath Hydroelectric Reservoirs.” *Id.* at 7.

3 5. Viewed alongside record returns predicted this year in the Columbia River, the
4 pre-season prediction for Klamath River fall chinook run size appears low. The Klamath
5 prediction is known to vary widely from final post-season counts, at times under-predicting by
6 a factor of two or more. Reports of higher than normal numbers of early-arriving fall chinook,
7 provided by Yurok Tribal Fisheries Department, are suggestive of a higher than predicted run
8 size.

9 6. Toxic blue green algae has in recent days been verified in the Trinity River for
10 the first time, prompting the Humboldt County Department of Health and Human Services
11 to post warnings after detecting toxins in water samples retrieved at a popular swimming
12 beach located upstream from the Reservation boundary. Blue green algae thrives in slow
13 moving water at higher temperatures such as have been common over the past several weeks.
14 Attached is a letter from the Deputy Director, Division of Sanitation Facilities Construction, to
15 the Regional Director, Bureau of Reclamation, dated August 20, 2014, which expresses
16 “support for emergency water releases from Trinity Reservoir to protect public health related to
17 drinking water quality in the Trinity River.”

18 7. In the future, coordinated operation of the Central Valley Project and the
19 Klamath Irrigation Project facilities is essential since Lower Klamath River flow conditions are
20 influenced directly by both projects. However, in 2014, the Klamath Reclamation Project has
21 made no supplemental flow for fisheries protection available and is constrained from doing so
22 by Upper Klamath Lake levels required by a Biological Opinion. In addition, flows in the
23 Klamath above the confluence with the Trinity River are based solely on meeting requirements
24 to avoid jeopardy to southern Oregon/northern California coast Coho salmon, which are listed
25 as threatened under the Endangered Species Act.

1 8. Because of on-going fishery restoration requirements under the Trinity River
2 Record of Decision, it is essential that the 2014 supplemental flows for the Lower Klamath
3 River not be charged against ROD water releases in water year 2015. Any reduction in water
4 year 2015 ROD flow releases below those dictated by water supply conditions would violate
5 the provisions of § 3406(b)(23) of Pub. L. 102-575 and the Record of Decision.

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I declare under penalty of perjury that the foregoing is true and correct.

Executed at Hoopa, California on this 26th day of August, 2014.

s/ Michael Orcutt (as authorized on 8/26/14)
Michael Orcutt

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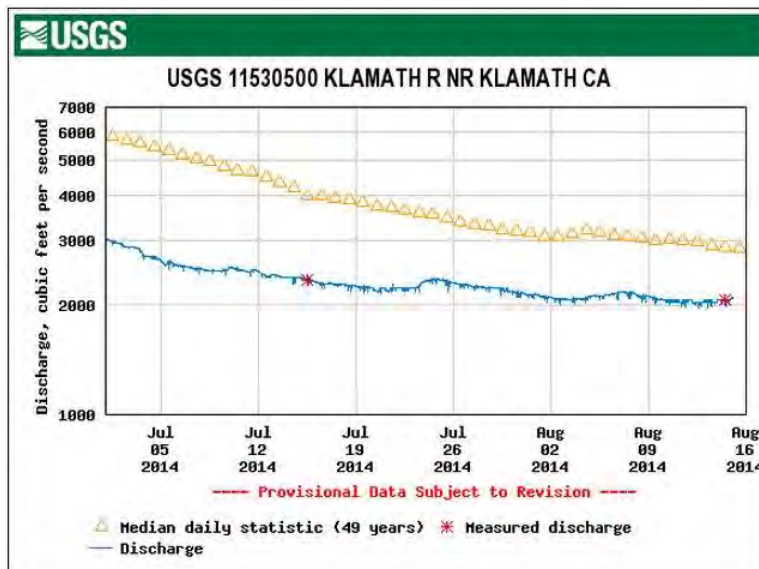
August 15th 2014

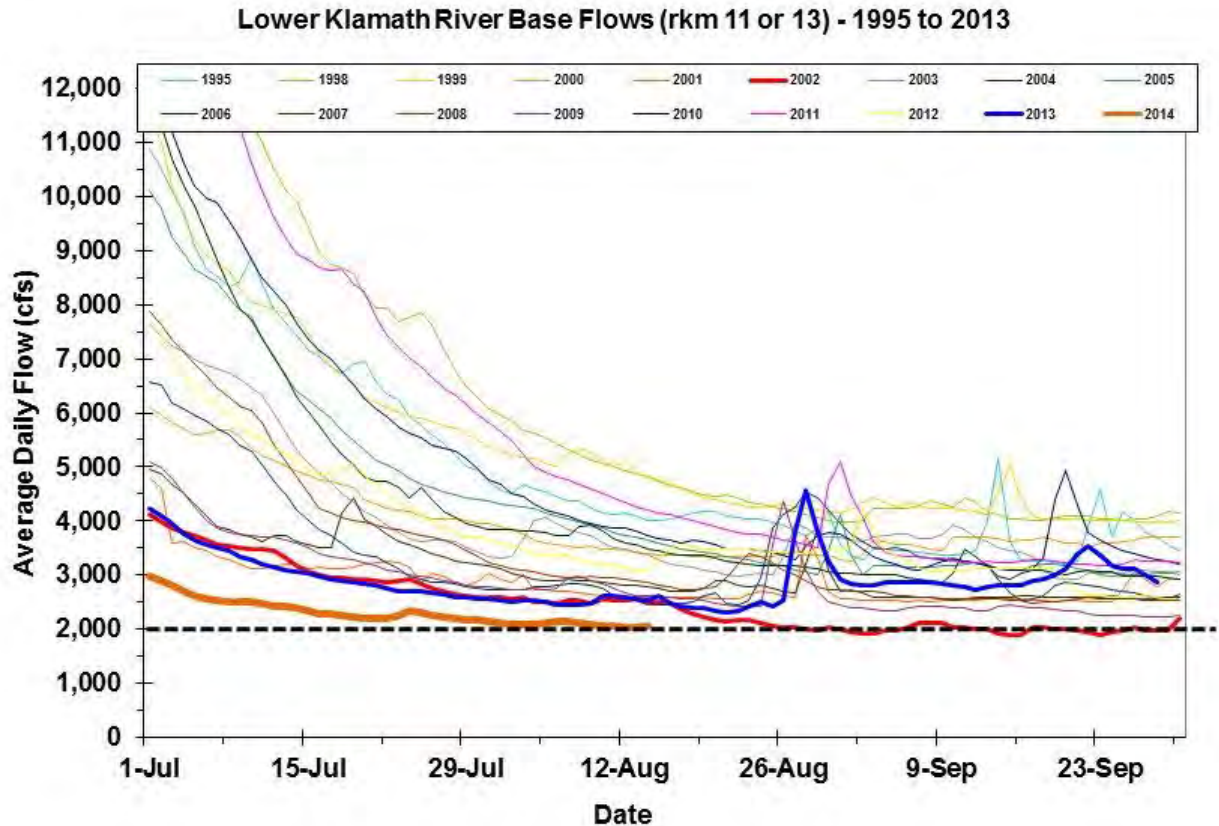
FROM: Dr. Joshua Strange, Stillwater Sciences (jss@stillwatersci.com)

TO: Whom it may concern

RE: Update on flow forecasts for the lower Klamath River and adult salmon fish kill risk for 2014

The following briefly summarizes up-to-date guidance on projected flow levels in the lower Klamath River for the 2014 adult fall Chinook salmon migration season and associated fish kill risk (i.e., the Ich outbreak that occurred in September of 2002). Flows in July and August of 2014 are exceptionally low, significantly lower than in July of 2002 (the fish kill year), and are already well below the minimum protective flow recommendation of 2,500 cfs during the peak fall Chinook salmon migration season. Flows as of 8/14/2014 are only 2,062 cfs and continue to drop (as measured in the lower Klamath River 13 km above the Pacific Ocean). The protective minimum flow rate of 2,500 cfs has been recommended proactively for all forecasted run sizes of less than 170,000 fall run Chinook salmon during four week peak migration season approximately from late August and September (i.e., Strange 2010a; Hayden et al. 2012; TRRP 2012; Joint Memo USFWS NMFS 2013 – these citations and others contain more supporting background information and analysis than is presented in this brief memo). Large and short duration pulse flows (e.g., centered on approximately September 1st when water temperatures typically begin to cool below migration thresholds throughout the basin, Strange 2010b and Strange 2012) have been employed to help flush any Ich parasites safely out to sea that have may have built up over the summer followed by increased baseflows (e.g. 2013). Due to the time delay between detecting and confirming an Ich outbreak, the speed at which Ich can spread from non-detectable levels to a large-scale outbreak, and the lag in travel time of water released from upstream dams to its arrival in the lower Klamath River, proactive flow releases have been strongly recommended to prevent an outbreak before it occurs rather than reactive flow releases once an outbreak is already occurring and an unknown number of fish, likely a large number, will receive a lethal dose of Ich parasites.

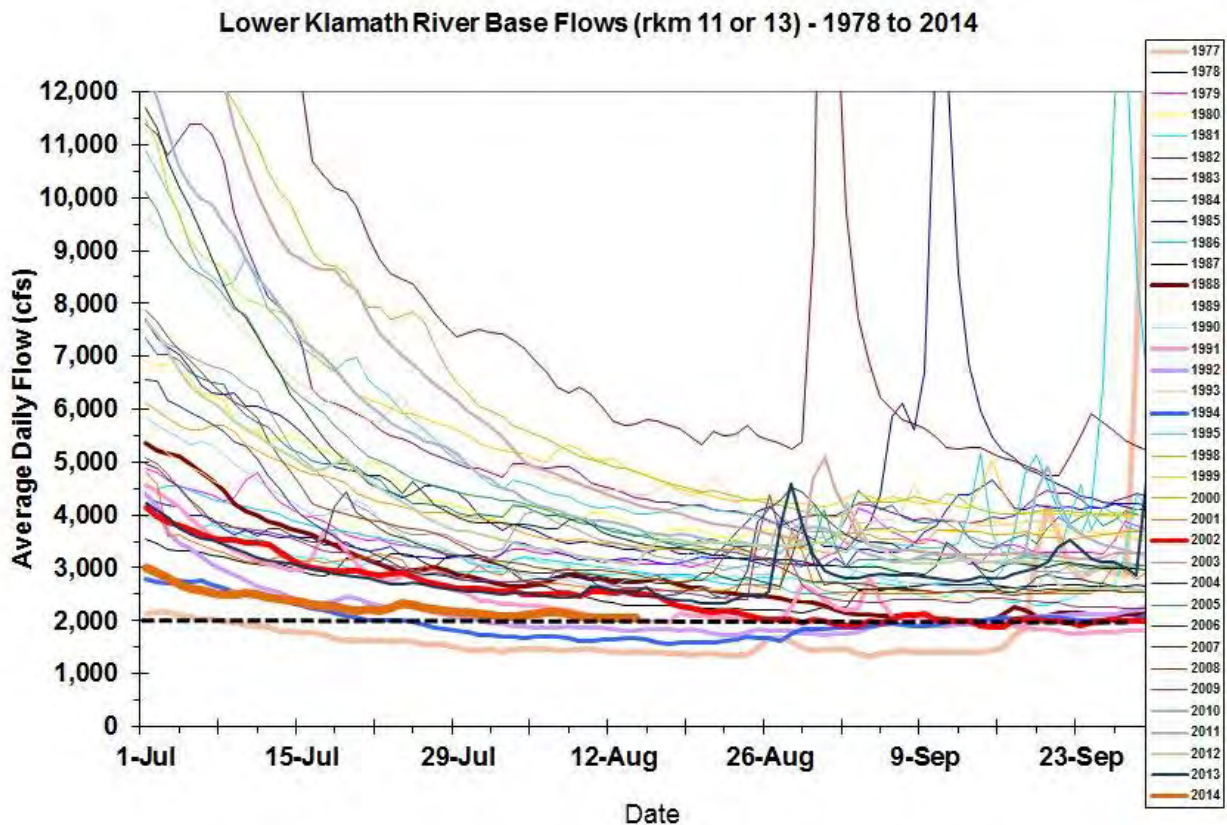




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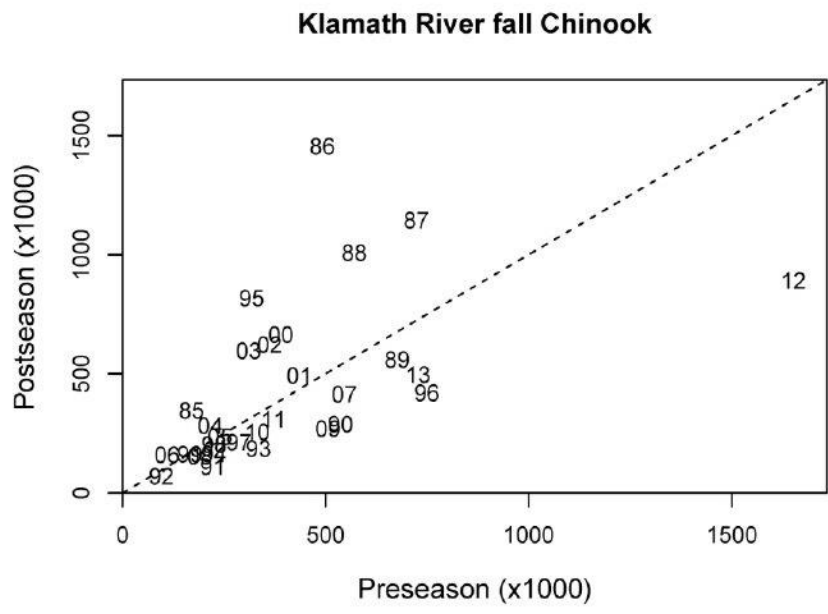
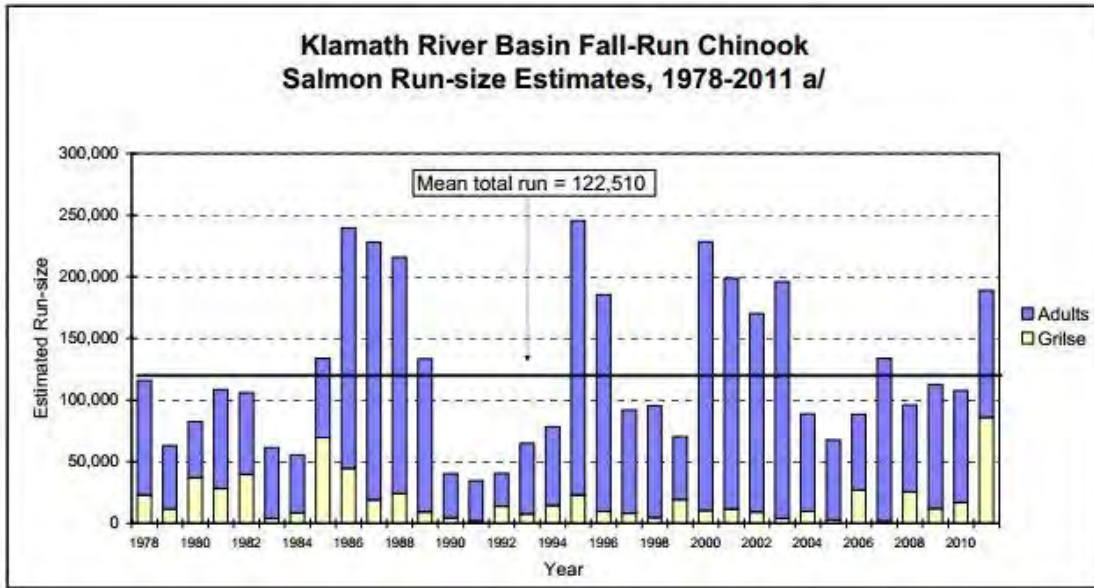
Flows for July 2014 in the lower Klamath River are tied for the second lowest on record with 1994 (period of record from 1963 to 2014 with 1992 also similar). However, releases from Iron Gate Dam on the Klamath River were 300 cfs lower in July of 1994 compared to 2014 (with Lewiston Dam releases on the Trinity River being equivalent), meaning that accretions are ~ 300 cfs lower in July of 2014 compared to the exceptionally dry year of 1994. The extreme drought year of 1977 had the driest July and September on record yet flows did increase on September 20th of that year to over 3,200 cfs from precipitation. In 1994, flows also increased by in September (on the 1st) to approximately 2,000 cfs. Simply put, the drought conditions of 2014 are extreme and appear to be headed towards near record levels for the month of September in the lower Klamath River based on the period of record. Tree ring research indicates that California may be experiencing its driest consecutive 3-year period in the last 500 years (newscenter.berkeley.edu/2014/01/21/states-water-woes/). This is cause for concern and indicates that flows will likely continue to drop more than is typical from July to October (flows from accretions typically continue to slowly decrease until around September 1st). The amount to which flows will drop between now (late July 2014) and the period of concern (primarily the last week of August and the first three weeks of September) is of major importance.

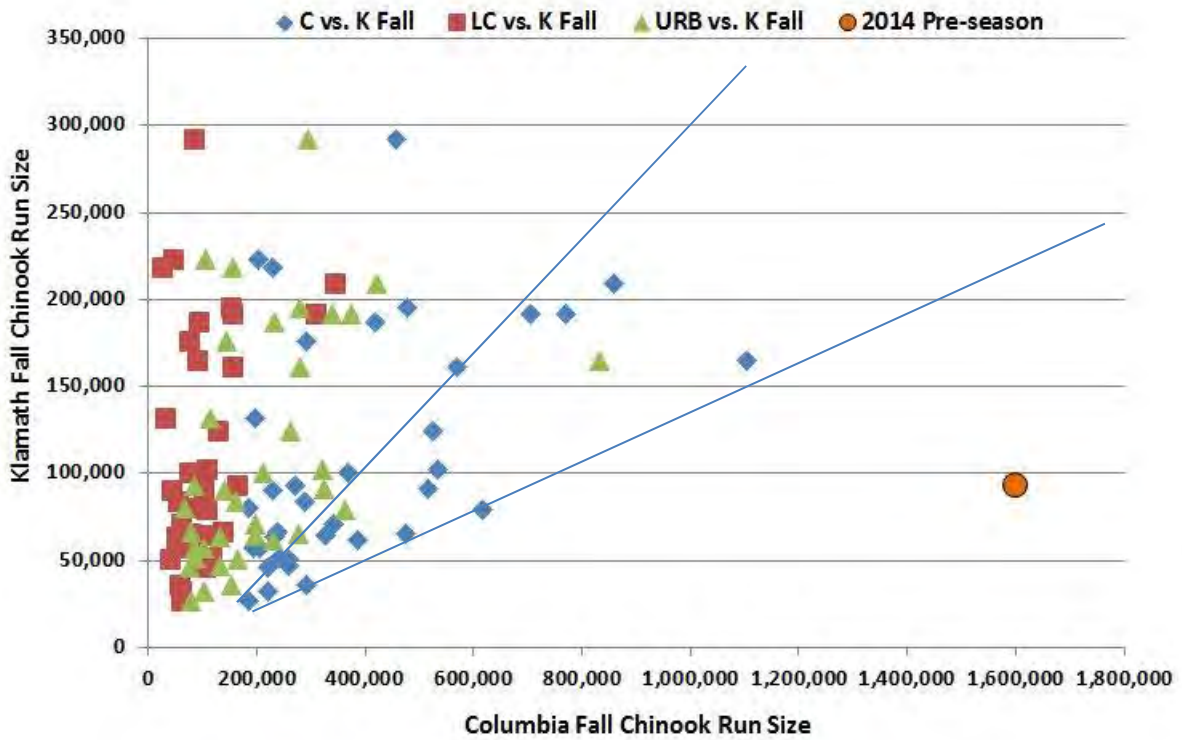
The USGS' CA-NV River Forecast Center advance hydrologic prediction tool provides one means for forecasting flows in the lower Klamath River during the month of September (www.cnrfc.noaa.gov/ahps.php). This tool is designed for forecasting flood events however, and was previously generating less than reliable predictions during low flow conditions. USGS has recently worked to improve the accuracy of predictions during low flow conditions. For example, improved model predictions for flows on 7/17/2014 were only 48 cfs lower than the actual river flows and approximately 173 cfs lower on 8/14/2014. While not perfect, this can be considered useful results. The prediction for flows in the lower Klamath River for 9/1/2014 is 1,822 cfs with a range of 1,817 to 1,930 cfs. Prior to improvements in the river forecast model, I used a multiple linear regression graphing technique to examine the typical slope of decreases (as separated by inflection points) in median and 2002 flows during the dry season, coupled with visual examination for the flow record, which resulted in an estimation that flows will likely reach 1,800 cfs in the lower Klamath River by September 1st 2014 without supplemental protective releases from basin reservoirs (with a potential range of 1,600 to 2,000 cfs). In summary, flows are projected to be the second lowest on record by September of 2014 in the lower Klamath River without protective releases and will likely be substantially lower than the fish kill flows of 2002 (~ 2,000 cfs). Based on projected flow conditions alone, and given the biology of Ich, a fish kill is more likely than not in 2014 among adult fall Chinook salmon migrating in the lower Klamath River if protective flows are not released. However, other uncertainties and unusually severe stressors increase the risk level for an Ich outbreak in 2014.



Another consideration for fish kill risk and an important uncertainty is adult fall Chinook salmon run size. The mean run size for the period of record (1978 to 2013) is approximately 125,000 fish, and the 2002 run size was above average at approximately 170,000 fish. The 2014 Pacific Fisheries Management Council (PFMC) pre-season forecast for the Klamath Basin is below average at 92,800 fall run Chinook salmon predicted (with 60,000 fish returning in 1994 and an unknown number in 1977). However, as outlined in previous technical documents, the mechanisms responsible for an Ich outbreak such as occurred in 2002 are not nullified by below average run size; rather flow (i.e. water velocities and turnover rates) is the primary determinant of an Ich outbreak (e.g., Bodensteiner et al. 2000). While there may be a theoretical run size that is small enough to preclude a fish kill no matter how low flows are, multiple lines of evidence regarding fish schooling, fish migration behavior, and Ich's mode of infection via swimming cilia, indicate that a below average run size will not adequately compensate for low flows in terms of fish kill risk. In the face of uncertainty regarding the subject of a threshold run size for an Ich outbreak in the lower Klamath River, a cautionary and protective approach is warranted. It should be emphasized that the occurrence of a fish kill is an event determined by multiple interacting probabilities and is best characterized by the concept of risk, which by definition includes uncertainty.

In addition, pre-season forecasts are subject to error and significant under or over predictions with larger magnitude under prediction occurring slightly more frequently than for Klamath fall Chinook stocks than over predictions (data points above the 1:1 line are under predictions). For 2014, Klamath stocks are predicted to be well below average and yet Columbia River fall Chinook stocks are predicted to have the largest run on record in 2014 (PFMC). While there is considerable variability in the relationship between the run size of Klamath and Columbia fall Chinook stocks especially during years of low Columbia stock abundance, Klamath fall Chinook salmon runs are consistently larger than average during years of high Columbia fall Chinook salmon abundance. In other words, if the below average run size predicted for the Klamath River in 2014 actually occurs, it would be the first time since record keeping in 1978 that a run of less than 150,000 fall Chinook salmon came back to the Klamath River during an unusually large Columbia River run. While there is uncertainty in trying to evaluate the accuracy of pre-season run size forecasts with an unknown level of error, the Columbia to Klamath fall Chinook stock abundance relationship strongly suggests that the pre-season forecast for the Klamath River is more likely to be an under-prediction rather than an over-prediction. Simply put, it's more likely than not that more adult fall run Chinook salmon will return to the Klamath Basin in 2014 than is predicted, and the error in prediction could be significant resulting in a true run size similar to or even larger than 2002.





Columbia River fall chinook forecasts, returns

Year	Forecast	Actual return	Percentage of forecast
2007	347,500	219,600	63%
2008	376,700	449,000	119%
2009	532,900	429,000	80%
2010	664,800	657,100	99%
2011	776,300	620,600	81%
2012	654,900	525,200	80%
2013	686,900	1,266,400	184%
2014	1,602,900	-----	-----

SOURCE: Columbia River Technical Advisory Committee

Several other stress factors are notably contributing to increased fish kill risk in 2014. First, spring and summer run Chinook salmon in the Klamath Basin are experiencing higher than normal levels of stress and pre-spawn mortality due to the unusually low flows and high water temperatures, which will likely result in elevated background levels of fish diseases, including columnaris and potentially Ich. For example, approximately 22 salmon carcasses were counted in the lower Klamath River over a 55 mile reach on 8/14/2014, likely due to columnaris. This situation could increase the subsequent disease risk to later entering fall run fish, such as may have occurred in 2002 (a year that was also unusually stressful to spring and summer run Chinook salmon in the Klamath Basin). The difficult migration and warm temperature also results in increased numbers of adult salmon holding at cold water thermal refuges for extended periods, such as has been observed at the mouth of Blue Creek (river mile 16) in July and August of 2014 (Yurok Tribe), which provides an opportune situation for Ich to begin spreading and elevating above background levels. Another stressor that was unusually high in 2014 is the myxosporidian parasites that cause some level of mortality to juvenile salmonids in the Klamath River every year, with 2014 having one of the worst levels of incidence (> 80%) and associated mortality over approximately the last decade since monitoring began. These disease causing parasites quickly infect adult salmon, primarily via the gills, as they enter the Klamath River to begin their migration. While not typically lethal to adult salmon, these parasites attack the intestinal track, liver, and kidneys of salmon, all of which are important organs for immune response. Thus the exceptionally high level of infectious myxosporidian parasites as indicated by juvenile fish health monitoring results in 2014, indicate that this could be a significant and serious additional stressor to migrating adult salmon this fall (True 2014). A final, potentially serious additional stressor that is problematic in 2014 is the high amount of the toxic blue-green algae microcystis (KFHAT 2014, YTEP 2014) that is being released into the river from the Klamath hydroelectric reservoirs. This blue-green alga produces a super-potent toxin that is especially harmful to the liver, which is why the river is currently closed to swimming. The exact impact of this toxin exposure on migrating salmon is unknown, but again, the liver is a very important organ for immune function that is part of the complex physiological process to fight off parasites such as Ich at low to moderate doses. Dual infections with the two myxosporidian pathogens along with exposure to microcystin toxins could act synergistically to make salmon much more vulnerable to Ich parasites.

In conclusion, the risk of a fish kill (Ich epizootic outbreak) occurring in the lower Klamath River in 2014 as occurred in 2002 without proactive protective flow releases is more likely than not with unreasonably high risk due to near-record low flows (forecast of only ~ 1,800 cfs by September 1st). While the predicted below average run size might reduce the fish kill risk to some extent, this risk reduction is not considered sufficient or reliable, and the pre-season run size forecast for Klamath Basin fall Chinook salmon stocks are more likely to be an under prediction this year than an over prediction based on the record abundance of Columbia River fall Chinook salmon stocks. In addition, other stressors are unusually severe this year, all which would be predicted to increase the risk of an Ich outbreak. Proactive protective flow releases are needed in 2014 to reduce the risk of a fish kill to fall run Chinook salmon in the lower Klamath River to reasonable levels and emergency flow criteria that rely on detecting fish killed by Ich at the beginning of an outbreak is not considered adequate or reliable for preventing mass salmon mortality.

References

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Indian Health Service
California Area Office
650 Capitol Mall, Suite 7-100
Sacramento, California 95814-4708

August 20, 2014

Dave Murillo, Regional Director
Mid Pacific Regional Office, Bureau of Reclamation
Federal Office Building
2800 Cottage Way
Sacramento, CA 95825-1898

Re: Trinity Reservoir Emergency Water Release

Dear Mr. Murillo:

The Indian Health Service (IHS), Division of Sanitation Facilities Construction, partners with tribes to provide safe and reliable drinking water systems. In particular, over the past several months, the IHS has been working with tribes on drought-related issues that may impact the vulnerability and risk of these systems.

During our meetings and site visits to the Hoopa Valley Indian Tribe (Tribe), we have noticed that the Trinity River has decreased significantly, and is a concern because the river supplies the Tribe's Julius Marshall water treatment plant which provides over 3,000 people with drinking water. It is our understanding that current river conditions are increasing the likelihood of microcystin cyanobacteria outbreaks, which depending on the bacterial strain that might develop, could adversely impact the Tribe's water treatment plant. Additional releases of water from the Lewiston Dam would improve the water quality in the river to help ensure that potable drinking water supplies are protected and available for use from the Tribe. Therefore, we would like to express our support for emergency water releases from Trinity Reservoir to protect public health related to drinking water quality in the Trinity River.

It would be greatly appreciated if you could consider this during the evaluations and decision making process. If you would like to contact me, I can be reached at 916-930-3981, ext. 340.

Sincerely,

Christopher P. Brady, P.E.
Deputy Director
Division of Sanitation Facilities Construction

cc: Donald Brafford, Director, DSFC