5. KLAMATH RIVER SPORT FISHING

Today's Item **Information** ☐ **Action** ☒

Adopt proposed changes to Lower Klamath River Basin sport fishing regulations.

Summary of Previous/Future Actions

- Discussion hearing — Dec 9-10, 2015; San Diego
- Notice hearing — Feb 10-11, 2016; Sacramento
- **Today's adoption hearing** — **Apr 18, 2016; Teleconference**

Background

The Klamath River System, consisting of the Klamath River Basin and the Trinity River Basin, is managed through the cooperation of State, federal and tribal management agencies. FGC annually adopts Klamath River System sport fishing regulations consistent with federal fishery management goals. Specific bag and possession limits are adopted after the Pacific Fishery Management Council (PFMC) reviews West Coast salmon stocks and fishery allocations have been proposed, scheduled during the Apr 8-14, 2016 PFMC meeting. Two tribal entities within the Klamath River System (Hoopa Valley Tribe and Yurok Tribe) maintain fishing rights for ceremonial, subsistence and commercial fisheries that are managed consistent with federal fishery management goals.

Subsection 7.50(b)(91.1) is proposed for amendment to:

1. **Change quota, bag limit and possession limit.** For notice purposes, DFW recommends an allocation range of 0-67,600 adult Klamath River fall-run Chinook salmon (KRFC); bag limit between 0-4 KRFC with no more than 0-4 fish over 22" until the sub-quota is met, then 0 fish over 22"; possession limit between 0-12 KRFC with no more than 0-12 fish over 22" when the take of salmon over 22" is allowed.

2. **Clean up for clarity and consistency.**

3. **Modify Existing Blue Creek Mouth Area Closure**. This option would modify the regulations for the existing closure on the Klamath River during the Jun 15-Sep 14 closure period by reducing the distance downstream of the mouth of Blue Creek from ½ mile to 500 feet. The distance of the closure above the mouth of Blue Creek would remain at 500 feet. The regulations for the Sep 15-Dec 31 fishing closure on the main stem Klamath River would not change.

No changes are proposed for the Klamath River spit, or for Klamath River spring-run Chinook salmon opening and closing dates or bag, possession and size limits.

Significant Public Comments

1. One comment supporting the proposed reduction in distance of the Blue Creek mouth area closure (Exhibit 3)
2. One comment supporting the repeal of the Blue Creek mouth area closure and

supporting a study (Exhibit 4)

3. One comment supporting no change to the current Blue Creek mouth area closure or, in the alternative, a closure distance downstream of the mouth of Blue Creek of 1000 feet (Exhibit 5)
4. One comment supporting no change to the current Blue Creek mouth area closure (Exhibit 6)

Recommendation

FGC staff: Adopt the proposed changes as recommended by DFW and determine whether to move forward with any modification to the Blue Creek closure.

DFW: KRFC bag limit of 2 fish-no more than 1 adult, and a possession limit of 6 fish-no more than 3 adults. DFW will provide the final PFMC in-river quota at the Apr 18 teleconference. DFW has no recommendation regarding the closure around the mouth of Blue Creek.

Exhibits

1. ISOR, dated Feb 11, 2016
2. DFW email, received Apr 4, 2016
3. Letter from Jonathan Weaver, received Feb 5, 2016 (this comment was received after the late comment deadline for the Feb 10-11 meeting)
4. Letter from Ronnie Britschgi, received Feb 5, 2016 (this comment was received after the late comment deadline for the Feb 10-11 meeting)
5. Email from Friends of Del Norte, received Mar 9, 2016 (this exhibit was also provided under the public forum agenda item at the Mar 15 teleconference)
6. Email from Yurok Tribe, received Apr 5, 2016

Motion/Direction

1. Moved by _____ and seconded by _____ that the Commission adopts the proposed changes to subsection (b)(91.1) of Section 7.50 related to Klamath River sport fishing regulations for the 2016 season and other changes for clarity and consistency, as recommended by the Department.

AND

2a. Moved by _____ and seconded by _____ that the Commission adopts the proposed changes to the regulations regarding the fishing closure on the Klamath River around the mouth of Blue Creek during the Jun 15-Sep 14 closure period by reducing the distance downstream of the mouth of Blue Creek to 500 feet.

OR

2b. Moved by _____ and seconded by _____ that the Commission adopts the “no change” alternative regarding the fishing closure on the Klamath River around the mouth of Blue Creek during the Jun15-Sep14 closure period.

STATE OF CALIFORNIA
FISH AND GAME COMMISSION
INITIAL STATEMENT OF REASONS FOR REGULATORY ACTION
(Pre-publication of Notice Statement)

Amend Subsection (b)(91.1) of Section 7.50
Title 14, California Code of Regulations
Re: Klamath River Sport Fishing Regulations

I. Date of Initial Statement of Reasons: February 11, 2016

II. Dates and Locations of Scheduled Hearings:

(a) Discussion Hearing: Date: December 10, 2015
Location: San Diego

(b) Notice Hearing: Date: February 11, 2016
Location: Sacramento

(c) Adoption Hearing: Date: April 18, 2016
Location: Teleconference

III. Description of Regulatory Action:

(a) Statement of Specific Purpose of Regulation Change and Factual Basis for Determining that Regulation Change is Reasonably Necessary:

The Klamath River System, which consists of the Klamath River and Trinity River basins, is managed through a cooperative system of State, federal, and tribal management agencies. Salmonid regulations are designed to meet natural and hatchery escapement needs for salmonid stocks, while providing equitable harvest opportunities for ocean sport, ocean commercial, river sport and tribal fisheries.

The Pacific Fishery Management Council (PFMC) is responsible for adopting recommendations for the management of sport and commercial ocean salmon fisheries in the Exclusive Economic Zone (three to 200 miles offshore) off the coasts of Washington, Oregon, and California. When approved by the Secretary of Commerce, these recommendations are implemented as ocean salmon fishing regulations by the National Marine Fisheries Service (NMFS).

The California Fish and Game Commission (Commission) adopts regulations for the ocean salmon sport (inside three miles) and the Klamath River System sport fisheries which are consistent with federal fishery management goals.

Two tribal entities within the Klamath River System, the Hoopa Valley Tribe and the Yurok Tribe, maintain fishing rights for ceremonial,

subsistence and commercial fisheries that are managed consistent with federal fishery management goals. Tribal fishing regulations are promulgated by the Hoopa and Yurok tribes.

For the purpose of PFMC mixed-stock fishery modeling and salmon stock assessment, salmon greater than 22 inches are defined as adult salmon (ages 3-5) and salmon less than or equal to 22 inches are defined as grilse salmon (age 2).

Klamath River Fall-Run Chinook

Klamath River fall-run Chinook salmon (KRFC) harvest allocations and natural spawning escapement goals are established by the PFMC. The KRFC harvest allocation between tribal and non-tribal fisheries is based on court decisions and allocation agreements between the various fishery representatives.

The 2016 KRFC in-river sport fishery allocation recommended by the PFMC is currently unknown. All proposed closures for adult KRFC are designed to ensure sufficient spawning escapement in the Klamath River Basin and equitably distribute harvest while operating within annual allocations.

Klamath River Spring-Run Chinook

The Klamath River System also supports Klamath River spring-run Chinook salmon (KRSC). Naturally produced KRSC are both temporally and spatially separated from KRFC in most cases.

Presently, KRSC stocks are not managed or allocated by the PFMC. The in-river sport fishery is managed by general basin seasons, daily bag limit, and possession limit regulations. KRSC harvest will be monitored on the Lower Klamath River in 2016 and ensuing years by creel survey.

KRFC Allocation Management

The PFMC 2015 allocation for the Klamath River System sport harvest was 14,133 adult KRFC. Preseason stock projections of 2016 adult KRFC abundance will not be available from the PFMC until March 2016. The 2016 basin allocation will be recommended by the PFMC in April 2016 and presented to the Commission for adoption prior to its April 2016 meeting.

For public notice requirements, the Department of Fish and Wildlife (Department) recommends the Commission consider an allocation range of 0 – 67,600 adult KRFC in the Klamath River Basin for the river sport fishery. This recommended range encompasses the historical range of the Klamath River Basin allocations and allows the PFMC and Commission to make adjustments during the 2016 regulatory cycle.

The Commission may modify the KRFC in-river sport salmon harvest allocation which is normally 15 percent of the non-tribal PFMC harvest allocation. Commission modifications need to meet biological and fishery allocation goals specified in law or established in the PFMC Salmon Fishery Management Plan otherwise harvest opportunities may be reduced in the California ocean fisheries.

The annual KRFC in-river harvest allocation is split into 4 geographic areas with subquotas assigned to each. They are as follows:

1. for the main stem Klamath River from 3,500 feet downstream of the Iron Gate Dam to the Highway 96 bridge at Weitchpec -- 17 percent of the sport fishery allocation;
2. for the main stem Klamath River from downstream of the Highway 96 bridge at Weitchpec to the mouth -- 50 percent of the sport fishery allocation;
3. for the Trinity River downstream of the Old Lewiston Bridge to the Highway 299 West bridge at Cedar Flat -- 16.5 percent of the sport fishery allocation; and
4. for the Trinity River downstream from the Denny Road bridge at Hawkins Bar to the confluence with the Klamath River -- 16.5 percent of the sport fishery allocation.

The spit area (within 100 yards of the channel through the sand spit formed at the Klamath River mouth) closes to all fishing after 15 percent of the total Klamath River Basin quota has been taken downstream of the Highway 101 bridge.

These geographic areas are based upon the historical distribution of angler effort and ensure equitable harvest of adult KRFC in the upper Klamath River and Trinity River. The subquota system requires the Department to monitor angler harvest of adult KRFC in each geographic area. All areas will be monitored on a real time basis except for the following:

<u>Klamath River upstream of Weitchpec and the Trinity River:</u> Due to funding and personnel reductions, the Department will be unable to deploy adequate personnel to conduct harvest monitoring in the Klamath River upstream of Weitchpec and in the Trinity River for the 2016 season. The Department has reviewed salmon harvest and run-timing data for these areas. Based on this review, the Department has developed a Harvest Predictor Model (HPM) which incorporates historic creel survey data from the Klamath River downstream of Iron Gate Dam to the confluence with the Pacific Ocean and the Trinity River downstream of Lewiston Dam to the confluence with the Klamath River. The HPM is driven by the positive relationship between KRFC harvested in the Lower and Upper Klamath River and the Trinity River. The HPM will be used by the Department to implement fishing closures to ensure that anglers do not exceed established subquota targets.

Current Sport Fishery Management
The KRFC in-river sport harvest allocation is divided into geographic areas and harvest is monitored under real time subquota management. KRSC in-river sport harvest is managed by general season, daily bag limit, and possession limit regulations.

The Department presently differentiates the two stocks by the following dates:

Klamath River
1. January 1 through August 14 - General Season KRSC.
   For purposes of clarity, daily bag and possession limits apply to that section of the Klamath River downstream of the Highway 96 bridge at Weitchpec to the mouth.

2. August 15 to December 31 - KRFC quota management.

Trinity River
1. January 1 through August 31 – General Season KRSC.
   For purposes of clarity, daily bag and possession limits apply to that section of the Trinity River downstream of the Old Lewiston Bridge to the confluence with the South Fork Trinity River.

2. September 1 through December 31 – KRFC quota management.

The daily bag and possession limits apply to both stocks within the same sub-area and time period.

Blue Creek Area Management
On April 17, 2015, the Commission adopted regulations to close the main stem Klamath River near the mouth of Blue Creek to reduce catch and release mortality in a thermal refuge area and protect late-fall-run Chinook salmon holding prior to entering Blue Creek. The closures were as follows:

1. From June 15 through September 14, the main stem Klamath River is closed to all fishing from 500 feet above the mouth of Blue Creek to ½ mile below the mouth of Blue Creek.
2. From September 15 through December 31, the main stem Klamath River is closed to all fishing within 500 feet of the mouth of Blue Creek.

The Commission's action was a precautionary conservation measure to provide maximum resource protection and ensure long term sustainability during a critical multi-year drought.

Proposed Changes

No changes are proposed for the general (KRSC) opening and closing season dates, and bag, possession and size limits.

No changes are proposed for the Klamath River spit area.

The following changes to current regulations are proposed:

KRFC QUOTA MANAGEMENT: Seasons, Bag and Possession Limits

For public notice requirements, a range of KRFC bag and possession limits are proposed until the 2016 Klamath River Basin quota is adopted. As in previous years, no retention of adult KRFC salmon is proposed for the following areas, once the subquota has been met.

The proposed open seasons and range of bag and possession limits for KRFC salmon stocks are as follows:

1. Klamath River - August 15 to December 31
2. Trinity River - September 1 to December 31
3. Bag Limit - [0-4] Chinook salmon – of which no more than [0-4] fish over 22 inches total length may be retained until the subquota is met, then 0 fish over 22 inches total length.
4. Possession limit - [0-12] Chinook salmon of which [0–12] fish over 22 inches total length may be retained when the take of salmon over 22 inches total length is allowed.

Necessity: The recommended ranges allow the Commission to make the final adjustments for alignment with the federal 2016 regulatory process. The final KRFC bag and possession limits will align with the final federal regulations to meet biological and fishery allocation goals specified in law or established in the PFMC Salmon Fishery Management Plan otherwise harvest opportunities may be reduced in the California ocean fisheries.

BLUE CREEK AREA MANAGEMENT

Members of the public approached the Commission at its December 10, 2015 hearing requesting removal of the existing closures around the mouth of Blue Creek. In response, the Commission directed the Department to add regulatory options for consideration concerning management of the Blue Creek area. The following option regarding the management of the Blue Creek area is being provided for Commission consideration and action.

Modify Existing Blue Creek Mouth Area Closure

This option would modify the regulations for the existing fishing closure on the Klamath River during the June 15 through September 14 period by reducing the distance closed downstream of the mouth of Blue Creek from ½ mile to 500 feet. The distance of the closure above the mouth of Blue Creek would remain at 500 feet. The regulations for the September 15

through December 31 fishing closure on the main stem Klamath River would not change. Local angling constituents and many fishing guides support this option with a closure distance of 500 feet.

Necessity: This Commission has been lobbied by local elected representatives by letter and testimony to consider reducing the existing closure area to provide more fishing opportunity in a historical popular fishing location. This option is provided for the Commission to consider potential approaches to craft a balanced compromise between maintaining resources protection while continuing limited fishing opportunities where allowable.

The Department and Yurok Tribe have been in collaboration designing a study to assess sport fishing hook and release mortality in the Blue Creek closure area. The final study design will need to incorporate the regulatory option selected (modified distance or status quo) in order to account for potential angler presence and fishing pressure in the study area.

OTHER
Other changes are proposed for clarity and consistency.

Benefits of the Proposed Regulations

It is the policy of this State to encourage the conservation, maintenance, and utilization of the living resources of the ocean and inland waters under the jurisdiction and influence of the State for the benefit of all the citizens of the State. In addition, it is the policy of this State to promote the development of local California fisheries in harmony with federal law respecting fishing and the conservation of the living resources of the ocean and inland waters under the jurisdiction and influence of the State. The objectives of this policy include, but are not limited to, the maintenance of sufficient populations of all species of aquatic organisms to ensure their continued existence and the maintenance of a sufficient resource to support a reasonable sport use. Adoption of scientifically-based Klamath River Basin salmon seasons, size limits, and bag and possession limits provides for the maintenance of sufficient populations of salmon to ensure their continued existence.

The benefits of the proposed regulations are conformance with federal law, sustainable management of Klamath River Basin fish resources, and promotion of businesses that rely on sport salmon fishing in the Klamath River Basin.

(b) Authority and Reference Sections from Fish and Game Code for Regulation:

Authority: Sections 200, 202, 205, 215, 220, 240, 315 and 316.5, Fish and Game Code.

Reference: Sections 200, 202, 205, 215 and 316.5, Fish and Game Code.

(c) Specific Technology or Equipment Required by Regulatory Change:

None.

(d) Identification of Reports or Documents Supporting Regulation Change:

In-River Sport Fishing Economics Technical Report, National Oceanographic and Atmospheric Administration, National Marine Fisheries Service, September 2011.

(e) Public Discussions of Proposed Regulations Prior to Notice Publication:

A public meeting was held in conjunction with a Del Norte County Supervisors meeting January 12, 2016 in Crescent City California. The object of the meeting was to receive public, Tribal and County Supervisor input regarding regulatory options for the Blue Creek area of the mainstem Klamath River for consideration for 2016 Klamath River Basin sport fishing regulations.

The meeting was attended by approximately 30 members of the public, three Yurok Tribal representatives (including two council members), seven Department staff, four Del Norte County Supervisors, one Legislature representative, and one member of the Fish and Game Commission.

A number of alternatives for the Blue Creek area were recommended for consideration at the meeting including the following:

1. Status quo (retain closure).
2. Re-open with no restrictions
3. Modify the closure distance
4. Base a closure on either flow or temperature criteria

Near the conclusion of the meeting a show of hands was requested by the County Supervisors for support of the above options preferred by the audience. The Yurok Tribal representatives endorsed the status quo, several fishing guides supported complete re-opening, and the majority of the audience supported modifying the current closure distance of 1/2 mile downstream of Blue Creek, during June 15 to September 14, to 500 ft.

The last option (closure based on flow or temperature criteria) was not polled in the show of hands.

The conclusion of the meeting focused on a potential study of hooking mortality in the Blue Creek area which the Department and Yurok Tribe have been discussing. The public supports this effort and would like to be involved in any way possible.

IV. Description of Reasonable Alternatives to Regulatory Action:

(a) Alternatives to Regulation Change:

i. The use of more liberal regulations for bag limits, possession limits and fishing methods. For KRFC salmon, more liberal regulations would be less desirable than those proposed because they could create risk of an intense fishery reaching or exceeding the quota in a very short time. Reaching the quota in a very short time could be damaging to the local economy. Exceeding the allowable harvest could be damaging to the KRFC salmon stocks.

ii. Base any closures of the main stem Klamath River around the mouth of Blue Creek on either flow or temperature criteria. Currently there are no public real time flow or temperature gauges in the Blue Creek area, nor has there been flow or temperature standards developed which could be used to trigger such closures. Additionally, closing a small section of the river based on these standards is not consistent with other California river management or the goal of simplifying State fishing regulations.

iii. Remove All Existing Blue Creek Area Closures
This alternative would remove all existing fishing closures on the main stem Klamath River near the mouth of Blue Creek. This alternative would not provide maximum resource protection and ensure long term sustainability during a critical multi-year drought.

(b) No Change Alternative:

The No Change Alternative would leave the current 2015 daily bag and possession limit regulations in place and would not conform to the PFMC Klamath River Basin quota for 2016. The change is necessary to continue appropriate harvest rates and an equitable distribution of the harvestable surplus.

The No Change Alternative for Blue Creek would keep in place the existing fishing closures on the main stem Klamath River near the mouth of Blue Creek between June 15 and December 31.

(c) Consideration of Alternatives:

In view of information currently possessed, no reasonable alternative considered would be more effective in carrying out the purpose for which the regulation is proposed, would be as effective and less burdensome to affected private persons than the proposed regulation, or would be more cost effective to affected private persons and equally effective in implementing the statutory policy or other provision of law.

V. Mitigation Measures Required by Regulatory Action:

The proposed regulatory action will have no negative impact on the environment; therefore, no mitigation measures are needed.

VI. Impact of Regulatory Action:

The potential for significant statewide adverse economic impacts that might result from the proposed regulatory action has been assessed, and the following initial determinations relative to the required statutory categories have been made:

(a) Significant Statewide Adverse Economic Impact Directly Affecting Businesses, Including the Ability of California Businesses to Compete with Businesses in Other States:

The proposed action will not have a significant statewide adverse economic impact directly affecting business, including the ability of California businesses to compete with businesses in other states. The proposed regulations are projected to have minor impact on the net revenues to local businesses servicing sport fishermen. If the 2016 KRFC quota is reduced, visitor spending may correspondingly be reduced and in the absence of the emergence of alternative visitor activities, the drop in spending could induce business contraction. However, this will not likely affect the ability of California businesses to compete with businesses in other states. The preservation of Klamath River salmon stocks is necessary for the success of lower and upper Klamath River Basin businesses which provide goods and services related to fishing. The proposed changes are necessary for the continued preservation of the resource and therefore the prevention of adverse economic impacts.

(b) Impact on the Creation or Elimination of Jobs Within the State, the Creation of New Businesses or the Elimination of Existing Businesses, or the Expansion of Businesses in California; Benefits of the Regulation to the Health and Welfare of California Residents, Worker Safety, and the State's Environment:

The proposed regulations range from no fishing of KRFC adult salmon to a normal Klamath River Basin salmon season. The Commission anticipates some impact on the creation or elimination of jobs in California. The potential employment impacts range from 0 to 45 jobs which are not expected to create, eliminate or expand businesses in California. The Commission anticipates impacts on the creation, elimination or expansion of businesses in California ranging from no impact to reduced revenues to approximately 30 businesses that serve sport fishing activities. However, the possibility of growth of businesses to serve substitute activities exists. Adverse impacts to jobs and/or businesses would be less if fishing of steelhead and grilse KRFC salmon is permitted than under a complete closure to all fishing. The impacted businesses are generally small

businesses employing few individuals and, like all small businesses, are subject to failure for a variety of causes. Additionally, the long-term intent of the proposed action is to increase sustainability in fishable salmon stocks and, consequently promoting the long-term viability of these same small businesses.

The Commission anticipates benefits to the health and welfare of California residents. Providing opportunities for a salmon sport fishery encourages a healthy outdoor activity and the consumption of a nutritious food.

The Commission anticipates benefits to the environment by the sustainable management of California's salmonid resources.

The Commission does not anticipate any benefits to worker safety because the proposed action does not affect working conditions.

(c) Cost Impacts on a Representative Private Person or Business:

The agency is not aware of any cost impacts that a representative private person or business would necessarily incur in reasonable compliance with the proposed action.

(d) Costs or Savings to State Agencies or Costs/Savings in Federal Funding to the State:

None.

(e) Nondiscretionary Costs/Savings to Local Agencies:

None.

(f) Programs Mandated on Local Agencies or School Districts:

None.

(g) Costs Imposed on Any Local Agency or School District that is Required to be Reimbursed Under Part 7 (commencing with Section 17500) of Division 4, Government Code:

None.

(h) Effect on Housing Costs:

None.

VII. Economic Impact Assessment:

The regulatory amendments of subsections of Section 7.50 under consideration will set the 2016 Klamath River Basin salmon sport fishing regulations to conform to the PFMC fall-run Chinook allocation guidelines. The Klamath River Basin is anticipated to be open for sport salmon fishing at levels similar to the 2015 quotas; however the possibility of marine fishery area closures still exists. Ocean closures may in turn result in PFMC recommendations for Klamath River Basin sport salmon fishery closures for the take of adult salmon. Adverse or positive impacts to jobs and businesses will depend on the 2016 KRFC allocation ultimately adopted by the PFMC and the specific regulations promulgated by the Commission.

The proposed regulations present a range from 100 percent of last year's Klamath River Basin salmon season to 0 percent or no salmon fishing on adult Chinook salmon (greater than 22 inches) in 2016. Under all scenarios sport fishing will be allowed for steelhead and grilse fall-run Chinook salmon (2 year-old salmon 22 inches or less) regardless of PFMC regulations, thus any adverse impacts to businesses would be less severe than under a complete closure of fishing.

Based on a 2011 NMFS report on In-River Sport Fishing Economics of the Klamath River, under a normal season non-resident Klamath River sport salmon and steelhead anglers contribute about $3,397,572 in direct expenditures, resulting in about $4,108,977 (2015$) in total economic output to California businesses. This revenue supports about 70 jobs in the State.

Table 1. Klamath Salmon and Steelhead Total Economic Output

Klamath Sport Fishing	Salmon	Steelhead	Total
Total Output	$ 2,659,983	$ 1,448,993	$ 4,108,977
Labor Income	$ 1,230,739	$ 670,430	$ 1,901,168
Jobs	45.3	24.7	69.9

The 2016 option for Blue Creek is a component of this economic assessment, but there is no fishery data for this area or a comparable surrogate fishery available. Although the Commission has received two letters from fishing guides that indicate their lost 2015 revenue in the range of $15,000 to $20,000 dollars (20 to 25 days) per guide, the impact of any Blue Creek option is inseparable from the full basin-wide economic assessment for annual Klamath River Basin salmon and steelhead fisheries.

Therefore, the Department is unable to determine whether there is an economic impact from the Blue Creek closures beyond the economic assessment discussed in the following sections on the creation/elimination of jobs in the state, the creation of new businesses or the elimination of existing businesses in the state, and the expansion of businesses currently doing business in the state.

Three adult salmon catch projections evaluated here are as follows: 100 percent of the 2015 Klamath River Basin adult salmon catch limit; 50 percent of the 2015 basin adult salmon catch limit; and 0 percent of the 2015 basin adult salmon catch limit.

(a) Effects of the Regulation on the Creation or Elimination of Jobs Within the State:

Projection 1. 100 percent of the 2015 adult salmon catch limit: The Commission does not anticipate any adverse impacts on the creation or elimination of jobs, as the quotas would not decrease effort nor curtail the number of visitors and thus probable visitor expenditures in the fisheries areas.

An assumption of the NMFS report is that increases in expenditures by resident anglers associated with expanded fishing opportunities would be accommodated by reduced expenditures on other locally purchased goods and services – with no net change in local economic activity. For non-resident anglers, however, increases in local expenditures associated with increases in local fishing opportunities would be accomplished by diverting money that they would otherwise spend outside the local area. Thus the economic impact analysis focuses on non-resident angler expenditures, which represent 'new money' whose injection serves to stimulate the local economy.

The NMFS study excluded the Trinity River, the largest tributary to the Klamath. The Trinity River is allocated 33 percent of the Klamath River Basin fall-run Chinook salmon total allocation. Using the Trinity allocation as a measure of salmon angler effort, and thus impacts on associated businesses that support anglers, the total non-resident angler contribution to the entire Klamath River Basin (including the Trinity River) is estimated to be $4,108,977 (2015$) in total economic output. This revenue, again using a 33 percent increase to account for the Trinity River, provides an estimated total of 70 jobs in the State (assuming that personnel costs also rise with inflation). This is a conservative estimate of total economic impact as it counts only non-resident angler expenditures. Non-resident salmon or steelhead angler average expenditures are estimated to be $107.42 (2015$) per angler day (for lodging, food, gasoline, fishing gear, boat fuel, and guide fees) based on a NMFS sponsored survey. Resident average expenditures per angler day are estimated to be 60 percent less (markedly reduced lodging, gasoline and food expenditures) which yields an estimate of $42.60 per angler day. Resident anglers comprise about 36 percent of Klamath River Basin anglers.

Projection 2. 50 percent of the 2015 adult salmon catch limit: The Commission anticipates some impact on the creation or elimination of jobs which is offset due the continued sport fishing allowed for steelhead and grilse fall-run Chinook salmon (2 year-old salmon 22 inches or less). A 50 percent salmon catch reduction will likely reduce visitor spending by slightly less than 50 percent, given price elasticities of demand for salmon fishing activity of less than one. As the "price" of fishing per unit catch increases the demand for fishing trips declines by a lesser extent, particularly in the short-run. While difficult to predict, job losses

associated with a 50 percent reduction in the salmon catch limit are expected to be less than half of the estimated total jobs supported by salmon angler visits (i.e. fewer than 23 jobs).

Projection 3. 0 percent of the 2015 adult salmon catch limit: In the event of fisheries closures in some or all Klamath River Basin areas, the Commission anticipates less than 50 percent reduction in fishery-related jobs. As mentioned earlier, sport fishing for steelhead and grilse fall-run Chinook salmon (2–year-old salmon less than 22 inches) will still be allowed, thus lessening any job losses. A closure on the take of adult Chinook salmon was instituted in 2006 and only steelhead and grilse salmon could be legally harvested that year. The effect of the 2006 closure, as measured by angler days on the Klamath River, resulted in an approximate 50 percent drop in angler days, compared to the 2000-2005 average (12,000 angler days vs. 23,300 angler days). Job creation or elimination tends to lag in adjustment to changes in consumer demand. Thus, the potential impacts of a closure on the take of adult Chinook are estimated to result in the loss of less than 45 jobs due to the continued sport fishing allowed for steelhead and grilse fall-run Chinook salmon (2 year-old salmon 22 inches or less).

(b) Effects of the Regulation on the Creation of New Businesses or the Elimination of Existing Businesses Within the State:

Projection 1: 100 percent of the 2015 adult salmon catch limit: The Commission does not anticipate any impacts on the creation of new business or the elimination of existing businesses, as the quotas would not decrease effort nor curtail the number of visitors and thus probable visitor expenditures in the fisheries areas.

Projection 2. 50 percent of the 2015 adult salmon catch limit: The Commission anticipates a decline in visits to the fishery areas of less than 50 percent due the continued sport fishing allowed for steelhead and grilse fall-run Chinook salmon (2 year-old salmon 22 inches or less). This may result in some decline in business activity, but the Commission does not anticipate any impacts on the creation of new business or the elimination of existing businesses directly related to fishing activities. However, with less effort being expended on salmon fishing, the possibility of substitute activities and the growth of businesses to serve those activities exists.

Projection 3. 0 percent of the 2015 adult salmon catch limit: In the event of salmon fisheries closures in some or all Klamath River Basin areas, the Commission anticipates a decline in regional spending and thus reduced revenues to the approximately 30 businesses that serve sport fishing activities with unknown impacts on the creation of new business or the elimination of existing businesses. However adverse impacts will be mitigated by the continued opportunity to harvest steelhead and grilse salmon. Additionally, the long-term intent of the proposed action is to

increase sustainability in fishable salmon stocks and, consequently, the long-term viability of these same small businesses.

(c) Effects of the Regulation on the Expansion of Businesses Currently Doing Business Within the State:

Projection 1. 100 percent of the 2015 adult salmon catch limit: The Commission does not anticipate any impacts on the expansion of businesses in California as the quotas would not increase effort nor increase the number of visitors and thus probable visitor expenditures in the fisheries areas.

Projection 2. 50 percent of the 2015 adult salmon catch limit: The Commission does not anticipate any impacts on the expansion of businesses in California. Decreases in expenditures by resident anglers associated with reduced fishing opportunities may be offset by increased expenditures on other locally purchased goods and services – with no net change in local economic activity. For non-resident anglers, however, decreases in local expenditures associated with decreases in local fishing opportunities may result in increases in other expenditures outside the Klamath River Basin area.

Projection 3. 0 percent of the 2015 adult salmon catch limit: In the event of salmon fisheries closures in some or all Klamath River Basin areas, the Commission does not anticipate any expansion of businesses in California. Decreases in expenditures by anglers associated with reduced fishing opportunities may be partially offset by increased expenditures on other locally purchased goods and services as visitors fish for steelhead, grilse salmon, or substitute salmon fishing with other recreational pursuits.

(d) Benefits of the Regulation to the State's Environment:

Under all projections, the Commission anticipates benefits to the environment in the sustainable management of Klamath River Basin salmonid resources. It is the policy of this State to encourage the conservation, maintenance, and utilization of the living resources of the ocean and inland waters under the jurisdiction and influence of the State for the benefit of all the citizens of the State. In addition, it is the policy of this State to promote the development of local California fisheries in harmony with federal law respecting fishing and the conservation of the living resources of the ocean and inland waters under the jurisdiction and influence of the State. The objectives of this policy include, but are not limited to, the maintenance of sufficient populations of all species of aquatic organisms to ensure their continued existence and the maintenance of a sufficient resource to support a reasonable sport use. Adoption of scientifically-based Klamath River Basin seasons, size limits, and bag and possession limits provides for the maintenance of sufficient populations of salmon and steelhead to ensure their continued existence.

(e) Benefits of the Regulation to the Health and Welfare of California Residents:

Under all projections, the Commission anticipates benefits to the health and welfare of California residents. Providing opportunities for a Klamath River Basin sport salmon and steelhead fisheries encourages a healthy outdoor activity and the consumption of a nutritious food. Salmon and steelhead sport fishing also contributes to increased mental health of its practitioners as fishing is a hobby and form of relaxation for many. Salmon and steelhead sport fishing also provides opportunities for multi-generational family activities and promotes respect for California's environment by the future stewards of California's natural resources.

(f) Benefits of the Regulation to Worker Safety:

Under all projections, the Commission does not anticipate benefits to worker safety because the proposed regulations will not impact working conditions.

(g) Other Benefits of the Regulation:

Concurrence with Federal Law: California's salmon sport fishing regulations need to conform to the new Federal regulations to achieve optimum yield in California. The PFMC annually reviews the status of west coast salmon populations. As part of that process, it recommends west coast adult salmon fisheries regulations aimed at meeting biological and fishery allocation goals specified in law or established in the Salmon Fishery Management Plan. These recommendations coordinate west coast management of sport and commercial ocean salmon fisheries off the coasts of Washington, Oregon, and California and California inland sport salmon fisheries. These recommendations are subsequently implemented as ocean fishing regulations by the NMFS and as sport salmon regulations for State marine and inland waters by the Commission.

Informative Digest/Policy Statement Overview

The Klamath River System, which consists of the Klamath River and Trinity River basins, is managed through a cooperative system of State, federal, and tribal management agencies. Salmonid regulations are designed to meet natural and hatchery escapement needs for salmonid stocks, while providing equitable harvest opportunities for ocean sport, ocean commercial, river sport and tribal fisheries.

The Pacific Fishery Management Council (PFMC) is responsible for adopting recommendations for the management of sport and commercial ocean salmon fisheries in the Exclusive Economic Zone (three to 200 miles offshore) off the coasts of Washington, Oregon, and California. When approved by the Secretary of Commerce, these recommendations are implemented as ocean salmon fishing regulations by the National Marine Fisheries Service (NMFS).

The California Fish and Game Commission (Commission) adopts regulations for the ocean salmon sport (inside three miles) and the Klamath River System sport fisheries which are consistent with federal fishery management goals.

For the purpose of PFMC mixed-stock fishery modeling and salmon stock assessment, salmon greater than 22 inches are defined as adult salmon (ages 3-5) and salmon less than or equal to 22 inches are defined as grilse salmon (age 2).

Klamath River Fall-Run Chinook

Klamath River fall-run Chinook salmon (KRFC) harvest allocations and natural spawning escapement goals are established by the PFMC. The KRFC harvest allocation between tribal and non-tribal fisheries is based on court decisions and allocation agreements between the various fishery representatives.

The 2016 KRFC in-river sport fishery allocation recommended by the PFMC is currently unknown. All proposed closures for adult KRFC are designed to ensure sufficient spawning escapement in the Klamath River Basin and equitably distribute harvest while operating within annual allocations.

Klamath River Spring-Run Chinook

The Klamath River System also supports Klamath River spring-run Chinook salmon (KRSC). Naturally produced KRSC are both temporally and spatially separated from KRFC in most cases.

Presently, KRSC stocks are not managed or allocated by the PFMC. The in-river sport fishery is managed by general basin seasons, daily bag limit, and possession limit regulations.

KRFC Allocation Management

The PFMC 2015 allocation for the Klamath River System sport harvest was 14,133 adult KRFC. Preseason stock projections of 2016 adult KRFC abundance will not be available from the PFMC until March 2016. The 2016 Klamath River Basin allocation

will be recommended by the PFMC in April 2016 and presented to the Commission for adoption prior to its April 2016 meeting.

For public notice requirements, the Department of Fish and Wildlife (Department) recommends the Commission consider an allocation range of 0 – 67,600 adult KRFC in the Klamath River Basin for the in-river sport fishery.

Current Sport Fishery Management

The KRFC in-river sport harvest allocation is divided into geographic areas and harvest is monitored under real time subquota management. KRSC in-river sport harvest is managed by general season, daily bag limit, and possession limit regulations.

The daily bag and possession limits apply to both stocks within the same sub-area and time period.

Blue Creek Area Management

On April 17, 2015, the Commission adopted regulations to close the main stem Klamath River near the mouth of Blue Creek to reduce catch and release mortality in a thermal refuge area and protect late-fall-run Chinook salmon holding prior to entering Blue Creek. The Commission's action was a precautionary conservation measure to provide maximum resource protection and ensure long-term sustainability during a critical multi-year drought.

Proposed Changes

No changes are proposed for the general (KRSC) opening and closing season dates, and bag, possession and size limits.

The following changes to current regulations are proposed:

<u>KRFC QUOTA MANAGEMENT: Seasons, Bag and Possession Limits</u>

For public notice requirements, a range of KRFC bag and possession limits are proposed until the 2016 Klamath River Basin quota is adopted. As in previous years, no retention of adult KRFC salmon is proposed for the following areas, once the subquota has been met.

The proposed open seasons and range of bag and possession limits for KRFC salmon stocks are as follows:

1. Klamath River - August 15 to December 31
2. Trinity River - September 1 to December 31
3. Bag Limit - [0-4] Chinook salmon of which no more than [0-4] fish over 22 inches total length may be retained until the subquota is met, then 0 fish over 22 inches total length.
4. Possession limit - [0-12] Chinook salmon of which [0–12] fish over 22 inches total length may be retained when the take of salmon over 22 inches total length is allowed.

BLUE CREEK AREA MANAGEMENT

The following option is provided for public discussion, and Commission consideration and action.

Modify Existing Blue Creek Mouth Area Closure

This option would modify the regulations for the existing fishing closure on the Klamath River during the June 15 through September 14 closure period by reducing the distance closed below the mouth of Blue Creek from ½ mile to 500 feet. The distance of the closure above the mouth of Blue Creek would remain at 500 feet. The regulations for the September 15 through December 31 fishing closure on the main stem Klamath River would not change. Local angling constituents and many fishing guides support this option with a closure distance of 500 feet.

Other changes are proposed for clarity and consistency.

Benefits of the Proposed Regulations

The benefits of the proposed regulations are in conformance with federal law, sustainable management of Klamath River Basin salmonid resources, and promotion of businesses that rely on sport fishing in the Klamath River Basin.

The proposed regulations are neither inconsistent nor incompatible with existing State regulations. The Legislature has delegated authority to the Commission to promulgate sport fishing regulations (Sections 200, 202, 205, 315, and 316.5, Fish and Game Code). Commission staff has searched the California Code of Regulations and has found no other State regulations related to the sport fishing in the Lower Klamath River Basin.

Regulatory Language

Subsection (b)(91.1) of Section 7.50 is amended to read:

Proposed changes for subsection 7.50(b)(91.1)(A)

(91.1) Anadromous Waters of the Klamath River Downstream of Iron Gate Dam (Lower Klamath River Basin). The regulations in this subsection apply only to waters of the Klamath River system which are accessible to anadromous salmonids. They do not apply to waters of the Klamath River which are inaccessible to anadromous salmon and trout, for example, portions of the Klamath River system upstream of Iron Gate Dam, portions of the Trinity River system upstream of Lewiston Dam, and the Shasta River and tributaries upstream of Dwinnel Dam. Fishing in these waters is governed by the General Regulations for non-anadromous waters of the North Coast District (see Section 7.00(a)(4)).
(A) Hook and Weight Restrictions.
1. Only barbless hooks may be used. (For definitions regarding legal hook types, hook gaps and rigging see Chapter 2, Article 1, Section 2.10.)
2. During closures to the take of adult salmon, it shall be unlawful to~~anglers shall not~~ remove any adult Chinook salmon from the water by any means~~, such as by dragging the fish on shore or using a net~~.

Proposed option for subsection 7.50(b)(91.1)(B)

Modify closure for Blue Creek from June 15 to September 14

(B) General Area Closures.
1. No fishing is allowed within 750 feet of any Department of Fish and Wildlife fish-counting weir.
2. No fishing is allowed from the Ishi Pishi Road bridge upstream to and including Ishi Pishi Falls from August 15 through December 31. EXCEPTION: members of the Karuk Indian Tribe listed on the current Karuk Tribal Roll may fish at Ishi Pishi Falls using hand-held dip nets.
3. No fishing is allowed from September 15 through December 31 in the Klamath River within 500 feet of the mouths of the Salmon, the Shasta and the Scott rivers and Blue Creek.
4. No fishing is allowed from June 15 through September 14 in the Klamath River from 500 feet above the mouth of Blue Creek to ~~1/2 mile~~500 feet downstream of the mouth of Blue Creek.

Proposed changes for subsection 7.50(b)(91.1)(C), (D) and (E)

(C) Klamath River Basin Possession Limits.
1. Trout Possession Limits.
a. The brown trout possession limit is 10 brown trout.
b. The hatchery trout or hatchery steelhead possession limits are as follows:

(i) Klamath River - 4 hatchery trout or hatchery steelhead.
(ii) Trinity River - 4 hatchery trout or hatchery steelhead.
2. Chinook Salmon Possession Limits.
a. Klamath River downstream of the Highway 96 bridge at Weitchpec from January 1 to August 14 and the Trinity River downstream of the Old Lewiston Bridge to the confluence of the South Fork Trinity River from January 1 to August 31: 2 Chinook salmon.
b. Klamath River from August 15 to December 31 and Trinity River from September 1 to December 31: ~~9~~ [0-12] Chinook salmon. No more than ~~6~~ [0-12] Chinook salmon over 22 inches total length may be retained when the take of salmon over 22 inches total length is allowed.
(D) Klamath River Basin Chinook Salmon Quotas.
The Klamath River fall Chinook salmon take is regulated using quotas. Accounting of the tribal and non-tribal harvest is closely monitored from August 15 through December 31 each year. These quota areas are noted in subsection (b)(91.1)(E) with “Fall Run Quota” in the *Open Season and Special Regulations* column.
1. Quota for Entire Basin.
The ~~2015~~2016 Klamath River Basin quota is ~~14,133~~[0-67,600] Klamath River fall Chinook salmon over 22 inches total length. The department shall inform the commission, and the public via the news media, prior to any implementation of restrictions triggered by the quotas. (NOTE: A department status report on progress toward the quotas for the various river sections is updated weekly, and available at 1-800-564-6479.)
2. Subquota Percentages.
a. The subquota for the Klamath River upstream of the Highway 96 bridge at Weitchpec and the Trinity River is 50% of the total Klamath River Basin quota.
(i) The subquota for the Klamath River from 3,500 feet downstream of the Iron Gate Dam to the Highway 96 bridge at Weitchpec is 17% of the total Klamath River Basin quota.
(ii) The subquota for the Trinity River main stem downstream of the Old Lewiston Bridge to the Highway 299 West bridge at Cedar Flat is 16.5% of the total Klamath River Basin quota.
(iii) The subquota for the Trinity River main stem downstream of the Denny Road bridge at Hawkins Bar to the confluence with the Klamath River is 16.5% of the total Klamath River Basin quota.
b. The subquota for the Lower Klamath River downstream of the Highway 96 bridge at Weitchpec is 50% of the total Klamath River Basin quota.
(i) The Spit Area (within 100 yards of the channel through the sand spit formed at the Klamath River mouth) will close when 15% of the total Klamath River Basin quota is taken downstream of the Highway 101 bridge.
(E) Klamath River Basin Open Seasons and Bag Limits.
All anadromous waters of the Klamath River Basin are closed to all fishing for all year except those areas listed in the following table. Bag limits are for trout and Chinook salmon in combination unless otherwise specified.

Body of Water	***Open Season and Special Regulations***	***Daily Bag Limit***

1. Bogus Creek and tributaries.	Fourth Saturday in May through August 31. Only artificial lures with barbless hooks may be used.	2 hatchery trout or hatchery steelhead**
2. Klamath River main stem from 3,500 feet downstream of Iron Gate Dam to the mouth.		
a. Klamath River from 3,500 feet downstream of the Iron Gate Dam to the Highway 96 bridge at Weitchpec.	January 1 to August 14.	0 Chinook salmon 2 hatchery trout or hatchery steelhead**
	Fall Run Quota ~~2,403~~[0-11,492] Chinook Salmon August 15 to December 31, ~~2015~~2016.	~~3~~[0-4] Chinook salmon - no more than ~~2~~[0-4] fish over 22 inches total length until subquota is met, then 0 fish over 22 inches total length. 2 hatchery trout or hatchery steelhead**
	Fall Run Quota Exception: Chinook salmon over 22 inches total length may be retained from 3,500 feet downstream of Iron Gate Dam to the Interstate 5 bridge when the department determines that the adult fall-run Chinook salmon spawning escapement at Iron Gate Hatchery exceeds 8,000 fish. Daily bag and possession limits specified for fall-run Chinook salmon apply during this exception.	
b. Klamath River downstream of the Highway 96 bridge at Weitchpec.	January 1 to August 14.	2 Chinook salmon 2 hatchery trout or hatchery steelhead**

	Fall Run Quota ~~7,067~~[0-33,800] Chinook Salmon August 15 to December 31, ~~2015~~2016.	~~3~~[0-4] Chinook salmon - no more than ~~2~~[0-4] fish over 22 inches total length until subquota is met, then 0 fish over 22 inches total length. 2 hatchery trout or hatchery steelhead**
	Fall Run Quota Exception: Spit Area (within 100 yards of the channel through the sand spit formed at the Klamath River mouth). This area will be closed to all fishing after 15% of the Total Klamath River Basin Quota has been taken. ~~All legally caught Chinook salmon must be retained. Once the adult (greater than 22 inches) component of the total daily bag limit has been retained anglers must cease fishing in the spit area.~~ All legally caught Chinook salmon must be retained. Once the adult (greater than 22 inches) component of the total daily bag limit has been retained anglers must cease fishing in the spit area.	
3. Salmon River main stem, main stem of North Fork downstream of Sawyer's Bar bridge, and main stem of South Fork downstream of the confluence of the East Fork of the South Fork.	November 1 through February 28.	2 hatchery trout or hatchery steelhead**
4. Scott River main stem downstream of the Fort Jones-Greenview bridge to the confluence with the Klamath River.	Fourth Saturday in May through February 28.	2 hatchery trout or hatchery steelhead**
5. Shasta River main stem downstream of the Interstate 5 bridge north of Yreka to the confluence with the Klamath River.	Fourth Saturday in May through August 31 and November 16 through February 28.	2 hatchery trout or hatchery steelhead**

6. Trinity River and tributaries.		
a. Trinity River main stem from 250 feet downstream of Lewiston Dam to the Old Lewiston Bridge.	April 1 through September 15. Only artificial flies with barbless hooks may be used.	2 hatchery trout or hatchery steelhead**
b. Trinity River main stem downstream of the Old Lewiston Bridge to the Highway 299 West bridge at Cedar Flat.	January 1 to August 31.	2 Chinook salmon 5 brown trout 2 hatchery trout or hatchery steelhead**
	Fall Run Quota ~~2,332~~[0-11,154] Chinook Salmon September 1 through December 31, ~~2015~~2016.	~~3~~[0-4] Chinook salmon - no more than ~~2~~[0-4] fish over 22 inches total length until subquota is met, then 0 fish over 22 inches total length. 5 brown trout 2 hatchery trout or hatchery steelhead**
	Fall Run Quota Exception: Chinook salmon over 22 inches total length may be retained downstream of the Old Lewiston Bridge to the mouth of Indian Creek when the department determines that the adult fall-run Chinook salmon spawning escapement at Trinity River Hatchery exceeds 4,800 fish. Daily bag and possession limits specified for fall-run Chinook salmon apply during this exception.	
c. Trinity River main stem downstream of the Highway 299 West bridge at Cedar Flat to the Denny Road bridge at Hawkins Bar.	January 1 through August 31.	2 Chinook salmon 5 brown trout 2 hatchery trout or hatchery steelhead**
	September 1 through December 31.	Closed to all fishing.

d. New River main stem downstream of the confluence of the East Fork to the confluence with the Trinity River.	September 15 through November 15. Only artificial lures with barbless hooks may be used.	2 hatchery trout or hatchery steelhead**
e. Trinity River main stem downstream of the Denny Road bridge at Hawkins Bar to the mouth of the South Fork Trinity River.	January 1 to August 31.	2 Chinook salmon 5 brown trout 2 hatchery trout or hatchery steelhead**
	Fall Run Quota ~~2,331~~[0-11,154] Chinook Salmon September 1 through December 31, ~~2015~~2016. This is the cumulative quota for subsections 6.e. and 6.f. of this table.	~~3~~[0-4] Chinook salmon - no more than ~~2~~[0-4] fish over 22 inches total length until subquota is met, then 0 fish over 22 inches total length. 5 brown trout 2 hatchery trout or hatchery steelhead**
f. Trinity River main stem downstream of the mouth of the South Fork Trinity River to the confluence with the Klamath River.	January 1 to August 31.	0 Chinook salmon 5 brown trout 2 hatchery trout or hatchery steelhead**

	Fall Run Quota ~~2,331~~[0-11,154] Chinook Salmon September 1 through December 31, ~~2015~~2016. This is the cumulative quota for subsections 6.e. and 6.f. of this table.	~~3~~[0-4] Chinook salmon - no more than ~~2~~[0-4] fish over 22 inches total length until subquota is met, then 0 fish over 22 inches total length. 5 brown trout 2 hatchery trout or hatchery steelhead**
g. Hayfork Creek main stem downstream of the Highway 3 bridge in Hayfork to the confluence with the South Fork Trinity River.	November 1 through March 31. Only artificial lures with barbless hooks may be used.	2 hatchery trout or hatchery steelhead**
h. South Fork Trinity River downstream of the confluence with the East Fork of the South Fork Trinity River to the South Fork Trinity River bridge at Hyampom.	November 1 through March 31. Only artificial lures with barbless hooks may be used.	2 hatchery trout or hatchery steelhead**
i. South Fork Trinity River downstream of the South Fork Trinity River bridge at Hyampom to the confluence with the Trinity River.	November 1 through March 31.	0 Chinook salmon 2 hatchery trout or hatchery steelhead**

* Wild Chinook salmon are those not showing a healed adipose fin clip and not showing a healed left ventral fin clip. **Hatchery trout or steelhead in anadromous waters are those showing a healed adipose fin clip (adipose fin is absent). Unless otherwise provided, all other trout and steelhead must be immediately released. Wild trout or steelhead are those not showing a healed adipose fin clip (adipose fin is present).
Note: Authority cited: Sections 200, 202, 205, 215, 220, 240, 315 and 316.5, Fish and Game Code. Reference: Sections 200, 202, 205, 215 and 316.5, Fish and Game Code.

Fonbuena, Sherrie@FGC

From: Mitchell, Karen@Wildlife
Sent: Monday, April 04, 2016 2:18 PM
To: Yaun, Michael@FGC; Miller-Henson, Melissa@FGC; Fonbuena, Sherrie@FGC; Ashcraft, Susan@FGC
Cc: Barrow, Scott@Wildlife; Martz, Craig@Wildlife; Bloom, Roger@Wildlife
Subject: Klamath Pre-Adopt for April 18 Teleconference

Commission staff:

There are no changes to the Klamath ISOR and just one comment for no change to Blue Creek since the public notice. The Department's bag and possession limit recommendation is: fall-run Chinook salmon bag limit of two fish no more than one adult, and a possession limit of 6 fish no more than 3 adults. This recommendation will not change once the PFMC sets the final in-river quota due to low KRFC abundance.

The Department will provide the final PFMC in-river quota at the April 18 teleconference.

Thank you,

Karen

Karen Mitchell
Senior Environmental Scientist (Specialist)
California Department of Fish & Wildlife
Fisheries Branch
830 S Street
Sacramento, CA 95811
Office: (916) 445-0826
Fax: (916) 327-8854
Karen.Mitchell@wildlife.ca.gov

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To whom it may concern:

I wanted to take time to address the Blue Creek closure on the Klamath River. I believe a 500 foot closure upstream and downstream is ethical. I believe a complete closure of the fishery is completely unwarranted. I will also add that I am a flight paramedic for REACH Air Medical Services and love fish on the Klamath river. I am not a fishing guide, and do not have any financial interest in the Blue Creek fishery. I do have several friends that are fishing guides on the Klamath and this closure does have a huge impact on them. It also has a significant financial impact on Del Norte County. This is extremely frustrating considering there has been no biological or scientific data to support such a closure.

In short, I believe every effort should be made to develop a plan that allows sport fishing to continue to be enjoyed by thousands of enthusiasts every year.

Thanks for your time,

Jonathan Weaver
[redacted]

[redacted]

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2016 FEB -5 PM 2:04

MLS

Ronnie B. (Britschgi)
co-owner
Rivers West Lodge
Klamath Rivee Ca.

Feb 2 2016

Re Blue Creek Closure

Dear Commissioners

I have been fishing the Klamath and Trinity River since the mid 60's. Friend's and Family loved it so much we bought Rivers West Lodge in 2006. Every year the Lodge broke even every year, paying all the bill's and taxes.

Because of the Blue creek closure in 2015 50 percent of our clients canceled. Guides were canceled, local employees laid off, and RWL went into debt $11,000 ±.

Local RV Parks in Klamath and Klamath Glenn lost 40-50 percent of their business.

I spend 8-10 weeks per year fishing the lower Klamath from the mouth to Johnson's and some. Every year is different. Water tempature, water flows, and when the fish arrive and depart upriver. Where they hold and when they move.

Blue Creek is definetly a hot spot.

I have always wondered if the sport fisherman take more fish in one seasons or the yurocks take more fish in one drift thru Blue Creek?

In all these years I haven't seen or heard of anyone doing a scientific study on the River let alone Blue Creek.

The Yuroks use words like conservation, when they almost close the estuary with nets. They take native steelhead, coho salmon and sturgeon. Many a time in the middle of the night I hear motors on the River and I think someone is messing with the Boats on our Docks but it's drift netting.

They say subsistence but they sell to the highest bidder with cash.

They say cultural but they now have monophillament ~~nets~~ nets with motor boats.

They say economics but the Blue Creek closure probably cost the million of dollars of tousm from fisherman that did not come.

They talk of minimizing waste but sports fisherman do not waste.

"Lining/flossing can be fixed by a maximum leader length such as 48".

If you don't overturn the Blue Creek closure than everyone including the Yuroks should play by the same rules!!

See you at the meeting Feb 11th

[redacted]

Thank you

Ronnie B R.W.L.

Friends of Del Norte ***Committed to our environment since 1973***

A nonprofit, membership based conservation group, advocating sound environmental policies for our region.

PO Box 229, Gasquet, CA 95543

March 4, 2016
ATT: Fish and Game Commission, regarding Klamath- Blue Creek fishing regulations 2016

Hearing: Conference Room, 50 Ericson Court, Arcata, California; Adoption hearing April 18, 2016, at 8:30 a.m. Written comments submitted by 12:00 noon on April 13, 2016, by email to FGC@fgc.ca.gov

We are concerned that the compromise closure of Blue Creek is insufficient to protect the valuable and genetically unique coastal run at Blue Creek. The compromise, of reducing the closure from ½ mile down stream to only 500 feet downstream, leaves most of the thermal refugia open for fishing, or 68% of the measured thermal refugia being open to concentrated and harmful fishing practices.

Although we still advocate for actual measurement of the thermal refugia and full closure to protect this valuable run, please modify the compromise, or add a compromise alternative to provide closure for half of the thermal refugia, at 1000' closure below the mouth and 500' above.

The discussion hearing in February allowed for another alternative and for variability in the distances to be modified. An additional notice of adoption could be provided timely, for thirty days before the adoption hearing.

A 50/50 compromise would leave approximately 50% of the refugia closed. The purpose of the compromise is to leave some room for fishing, but also a reasonable amount of closure to protect this valuable fishery.

The Yuroks actually measured the refugia to extend ½ mile below the mouth. Although this can vary some, being more likely with overall warmer temperatures and longer summer dry periods predicted, the severely reduced closure will not be effective to the purpose of reducing take, and giving the fish a real refuge.

Each river mouth closure should be looked at individually, to provide the specific and necessary protection needed. One size does not fit all rivers.

Thank you,

Ted Souza and Bill Bowman and Eileen Cooper, FODN board and Fishery committee

YUROK TRIBE

190 Klamath Boulevard • Post Office Box 1027 • Klamath, CA 95548

April 5, 2016

California Fish and Game Commission
1416 Ninth St.
Room 1320
Sacramento CA, 95814

Re: Lower Klamath River fishing regulations

Dear Commissioners:

On behalf of the Yurok Tribe, I would like to reiterate the Yurok Tribal Council's concern with catch and release fishing in the thermal refuge area at the confluence of Blue Creek (river mile 17), within the exterior boundaries of the Yurok Reservation, while Klamath River water temperatures are excessively warm. I request that the Blue Creek conservation closure adopted by the Commission in 2015 be continued during the 2016 season. Due to the stress and mortality that is associated with catch and release fishing while water temperatures are warm, we request that the Commission maintain the conservation closure in the Blue Creek refuge from 500 ft. upstream of the Blue Creek confluence to ½ mile downstream of the confluence.

The Tribe has submitted letters and given testimony to the Commission regarding this issue on several occasions since 2014, as well as during 1996. Rather than repeat our previous correspondence regarding this issue, I have attached our most recent letter dated January 25, 2016. I would like to thank the Commission for the opportunity given to our staff and Council member Thomas Willson to present information to you regarding this issue during your February 11th Commission meeting.

I am aware that the Commission has received public input in opposition to the Blue Creek conservation area closure that was adopted during 2015 and that the Commission is considering reducing the size of the conservation closure from a ½ mile to 500 feet downstream of Blue Creek. We are concerned with this potential reduction in size of the conservation area, as it will provide far less protection for fish that are using the refuge area to escape inhospitable Klamath River water temperatures, for the following reasons:

1) During 2015, on a relatively cool day in August, we surveyed the extent of the thermal refuge to extend approximately ½ mile downstream (attached as Appendix A). We've also made numerous observations since the late 1990's of congregations of adult salmonids holding in the refuge throughout the approximate ½ mile reach of the thermal refuge.

Phone: (707) 482-1350 • Fax: (707) 482-1377

2) If the configuration of the Klamath River near the Blue Creek confluence remains similar to recent years, the proposed 500' would do little to protect fish using the refuge. Most fishing during recent years has occurred below the 500' mark. However, it is worth noting that the channel configuration can change from year to year, causing a shift in where most fish reside and associated fishing occurs.

In summary, the Tribe requests that the Blue Creek conservation closure that was adopted by the Commission in 2015 be continued during the 2016 season. I would also like to re-invite the Commission to visit with the Yurok Tribal Council on the Yurok Reservation. Such a meeting would allow us to discuss issues of mutual concern in regard to the management and conservation of the Klamath River fishery and provide you an opportunity to visit the Lower Klamath River via a boat ride if your schedules allow. Please contact Dave Hillemeier (Fisheries Director) if you would like to try to coordinate such a meeting with our schedule.

Sincerely,

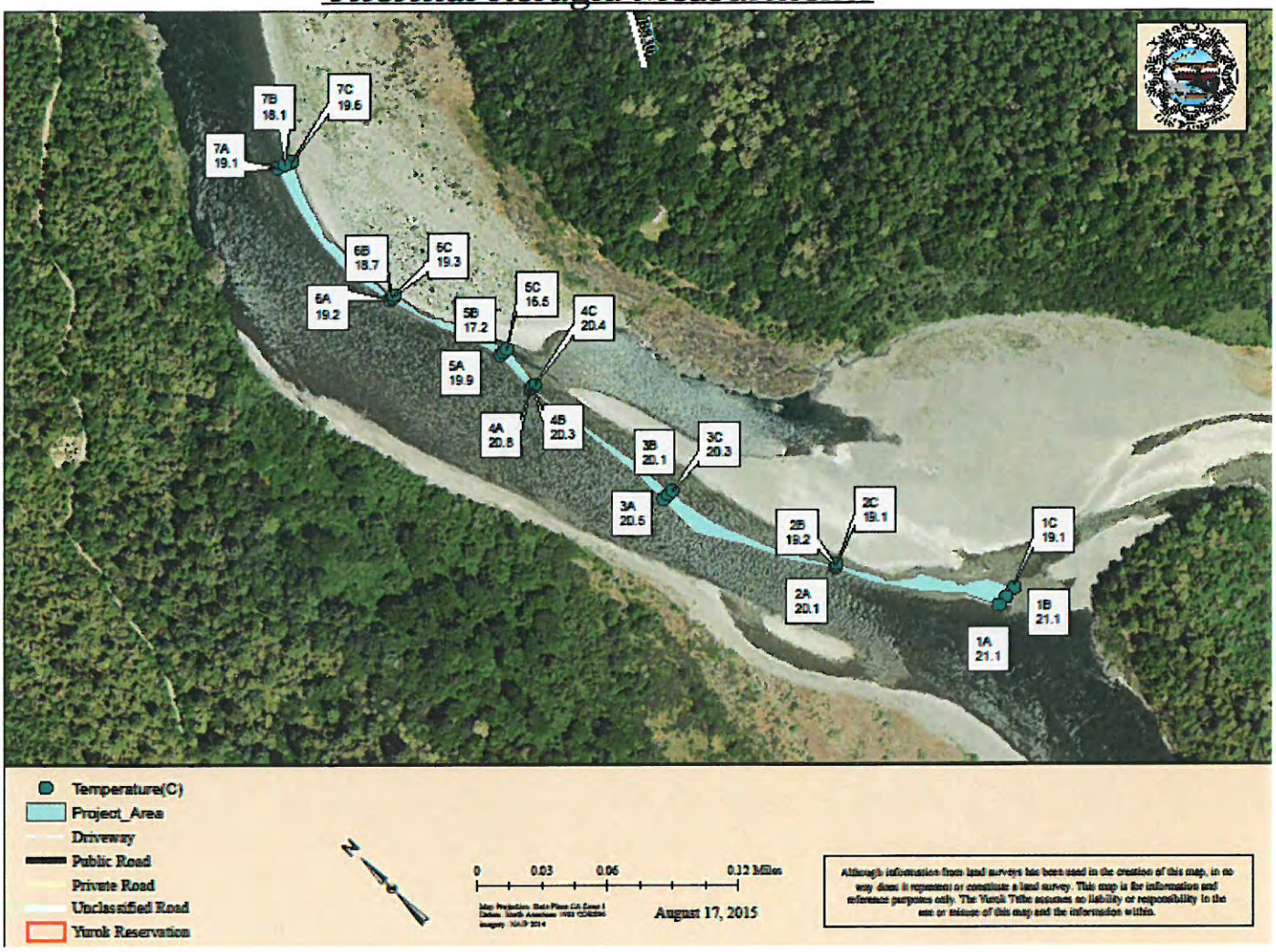
Thomas O'Rourke, Chairman

Cc: Chuck Bonham, CDFW Director

Stafford Lehr, CDFW Chief Fisheries Branch

Appendix A.

Thermal Refugia Measurments



YUROK TRIBE
190 Klamath Boulevard • Post Office Box 1027 • Klamath, CA 95548

January 25, 2016

California Fish and Game Commission
1416 Ninth St.
Room 1320
Sacramento CA, 95814

Re: Lower Klamath River fishing regulations

Dear Commissioners:

As you may be aware, the Yurok Tribe sent letters and gave testimony to the California Fish and Game Commission during 2014 and 2015 to request modification of recreational fishing regulations in the Lower Klamath River, within the boundaries of the Yurok Reservation, to conserve salmonid populations of the Klamath-Trinity Basin. Our proposed modifications were designed to minimize the mortality of fish caught and released while exposed to environmental conditions conducive to excessive mortality both at the confluence of the river with the ocean due to pinniped predation, and at the confluence of Blue Creek due to warm water temperatures. We appreciate the Commission's receptiveness to our recommendations and the resultant modifications to the Klamath-Trinity sport fishing regulations that were adopted last year.

The Tribe is aware the Commission has received public input in opposition to the Blue Creek conservation closure adopted last year, including a recommendation that this area be re-opened during the 2016 season. The Tribe recognizes that adoption of the conservation closure is not without controversy. It mirrors the healthy debate surrounding regulations the Yurok Tribal Council adopts annually to protect spring-run Chinook salmon, green sturgeon, stocks of fall-run Chinook, coho salmon, and even our own Blue Creek conservation closure.

The Yurok Tribe normally does not make recommendations regarding the management of other fisheries unless there is a conservation concern, which is the basis for the Blue Creek conservation closure. We continue to have concerns associated with catch and release fishing in this area, if it were to be re-opened to angling. The Tribe therefore requests that the Blue Creek Conservation Closure remain in effect during the 2016 season to minimize catch and release fishing for fish that are seeking thermal respite and to protect late fall-run Chinook that are holding prior to entering Blue Creek.

Given that most of the Commissioners are new since this issue was discussed during 2014 and 2015, the Tribe would like to summarize our past correspondence and rationale supporting the

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Blue Creek Conservation Closure. We have also included within the text and in Appendix A data and/or findings from the literature that support our concerns in regard to excessive mortality associated with catch and release fishing when the river is excessively warm.

Rational for Blue Creek Conservation Closure

Thermal refugia

We continue to support the regulations that were adopted last year to protect migrating salmon (spring and fall-run Chinook) and steelhead that rely upon thermal refugia at the mouth of Blue Creek. The regulations adopted during 2015 state: "No fishing is allowed from June 15 through September 14 in the Klamath River from 500 feet above the mouth of Blue Creek to ½ mile downstream of the mouth of Blue Creek."

During the summer months, especially during times of low flow, water temperatures in the mainstem Klamath River often reach 24°C (Figure 1– Yurok Tribal Environmental Program, http://exchange.yuroktribe.nsn.us/lrgsclient/stations/stations.html), well above the optimal migration range and near the acute lethal limit for adult Chinook salmon[1]. Under such warm water conditions, adult salmon and steelhead will stop migrating and hold in the cold water effluent from the mouth of Blue Creek to approximately ½ mile downstream, including "Blue Hole" which is along the bedrock outcropping just downstream of the confluence (Figure 2). During many low flow years, this area holds several hundred, up to a couple thousand, adult salmonids (steelhead and Chinook), that are escaping the intolerably warm Klamath River, as can be seen at the following youtube link: https://www.youtube.com/watch?v=jpX6lCJZeuA . These fish are basically on thermal life support.

[1] Bell, M.C. 1991. Fisheries Handbook of Engineering Requirements and Biological Criteria.
McCullough, D.A. 1999. A Review and synthesis of effects of alterations to water temperature regime on freshwater life stages of salmonids, with special reference to Chinook salmon. Prepared for the U.S. Environmental Protection Agency.
Strange, J.S. 2010. *Upper Thermal Limits to Migration in Adult Chinook Salmon: Evidence from the Klamath River Basin.* Transactions of the American Fisheries Society 139: 1091 – 1108.

Figure 1 Water temperatures in Blue Creek (somewhat representative of Blue Creek thermal refugia, however it is colder in some areas due to groundwater influence and warmer along the margins with the Klamath River) and the mainstem Klamath River near Terwer Creek (downstream of Blue Creek refugia) and the mainstem near Tully Creek (upstream of Blue Creek).

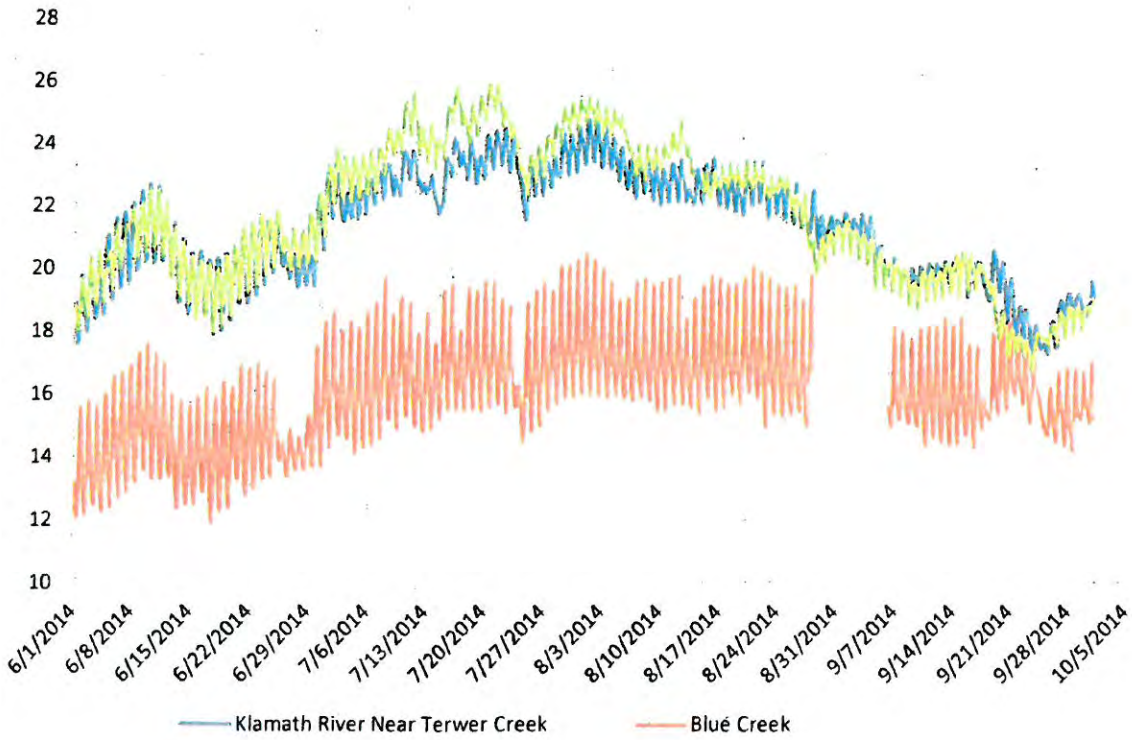
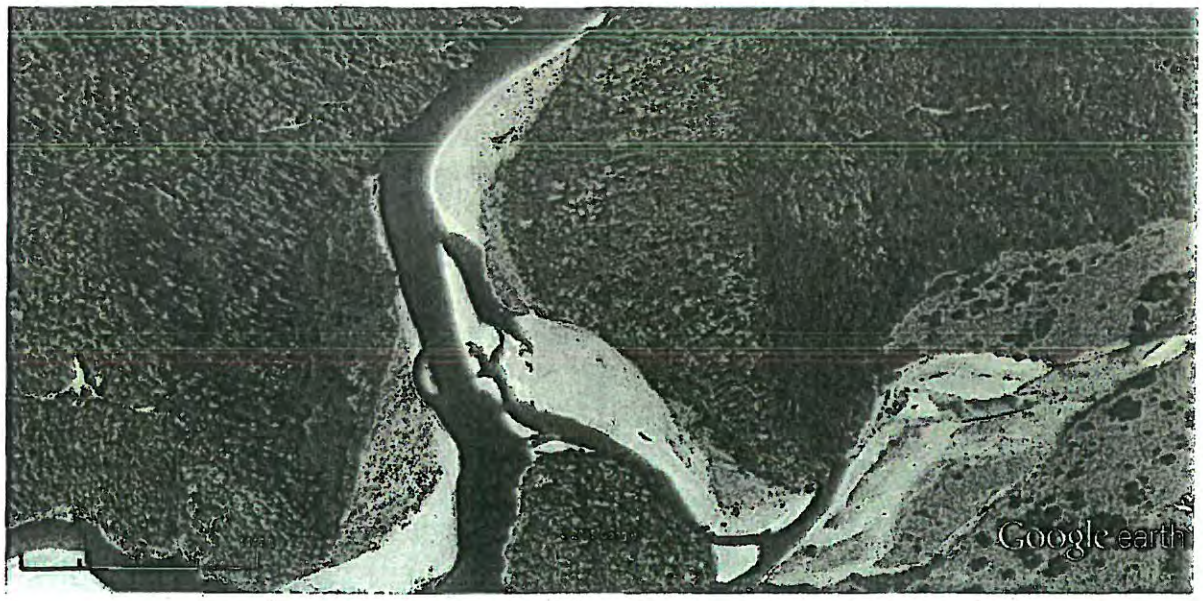


Figure 2 Thermal refugia near the mouth of Blue Creek, Lower Klamath River, CA (Google Earth image, June 2013).



We believe fish that make it to the Blue Creek thermal refugia should be allowed respite. It is inappropriate to harass these fish, via catch and release fishing, at a time when they are physiologically vulnerable; such harassment during warm water temperatures can lead to extreme physiological stress and even death (see references with pertinent data presented in Appendix A).

Typical angling techniques at the mouth of Blue Creek during the summer months include hooking steelhead and/or salmon that are holding in the thermal refugia, and then playing them for an extended period of time in the ambient river that is several degrees warmer (sometimes at lethal levels) to be eventually released, unless they are a hatchery steelhead or Chinook salmon that is harvested. Such catch and release under these conditions negatively affects the fish by exposing them to dramatic changes in water temperature over a brief time period, and by subjecting them to extreme stress while they are exposed to near lethal water temperatures; both resulting in unnecessary stress and/or death at a time that these fish are already stressed.

Fish health recommendations are to not expose fish to a change in water temperature of more than 1° C per two minutes, or put them through an immediate thermal change of more than 2-3° C at a time (Post G. 1987[2]). While the thermal regime within the Blue Creek thermal refugia area is variable, partially due to groundwater seeps that flow into Blue Hole downstream of Blue Creek that create refugia that is even colder than the creek itself, the refugia area is commonly at least 4-6° C colder than ambient river temperatures (Figure 5) during the warmest times of the summer. Removing fish abruptly from this refugia and then playing and subsequently releasing them into the warm Klamath River can result in extreme stress.

Catch and releasing fish within the warm river temperatures such as those experienced in the Klamath River near Blue Creek (Figure 5) causes extreme stress and/or mortality. Few studies have been conducted with salmonids at such high river temperatures, partially because salmonids have evolved to avoid such temperatures; however there are ample studies available that indicate substantially increased catch and release mortality associated with water temperatures that are substantially cooler than those of the Lower Klamath River near Blue Creek during the summer months. An overview of some of these studies is presented in Appendix A.

Study at Blue Creek

It should be noted that short-term mortality from fish being caught and released under warm water conditions is a primary concern. Due to the bioenergetics cost associated with being severely stressed from angling under such warm water conditions, we are also concerned regarding the long-term success of these fish at spawning, as well as the fate of their progeny.

[2]Post, G. 1987. Text Book of Fish Health. Page 279.

Severe stress has been shown to affect reproduction, quality of gametes, and survival of progeny in fish[3]. We do not know whether the fish caught and released from the thermal refuge at Blue Creek experience stress levels near those in these cited studies. However, given that these fish are basically on thermal respite, in relatively crowded conditions (another stressor), we are concerned regarding the ultimate success of these fish at spawning and producing healthy progeny.

Another concern is that fish caught and released during times of warm water conditions have a suppressed immune response system. As noted in the literature, stress is known to effect the immune response of fish, making them more vulnerable to disease and eventual mortality[4].

We are supportive of conducting a study to assess relatively short-term catch and release mortality impacts at the mouth of Blue Creek. While there are plenty of studies (Appendix A) that show salmonids experience excessive mortality when caught and released in warm water, the situation at Blue Creek is somewhat unique, given that there is thermal refuge nearby for fish recovery if they able to find it. However, it must be noted up-front that there are significant challenges and limitations associated with the assessment of catch and release impacts in warm water upon the spawning/reproductive success of fish, which is our ultimate goal. Assessing short-term mortality is feasible and we are willing to participate in such an effort. However, assessing long-term effects upon reproductive success from a bioenergetics perspective is much more challenging.

Contrary to the desires of some, it is not always possible to quantify biological responses for site specific management actions; instead managers are forced to turn to the literature to guide management decisions. It is our hope that the results of a catch and release mortality study at the mouth of Blue Creek will be used in conjunction with what is known from the literature to guide future management decisions to minimize negative effects upon the spawning success of fish utilizing the thermal refuge at Blue Creek.

Is there a problem?

Some have questioned whether the conservation closure is addressing a problem. We believe there is a conservation concern given the magnitude of fishing that occurs when this area is open to angling and the hostile water temperatures the fish are exposed to, especially during times of

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[3] Shreck et al. 2000. *Effects of stress on fish reproduction, gamete quality, and progeny.* Aquaculture 197 (2001) 3-24.
Campbell et al. 1992. *Stress reduces the quality of gametes produced by rainbow trout.* Biological Reproduction. 1992 December; 47(6): 1140-50.
Nadeau et al. 2010. *The effects of experimental energy depletion on the physiological condition and survival of adult sockeye salmon (Oncorhynchus nerka) during spawning migration.* Environ. Biol Fish (2010) 88:241-251.

[4] Bonga, S.E.W. 1997. *The stress response in fish.* Physiological Reviews, Vol. 77, No. 3, July 1977. (pages 611-612).

dry hydrologic conditions. The magnitude of fishing in this area has been anecdotally characterized in a report[5] drafted by a consulting firm (Fishery Foundation of California) that was conducting survey work for the Delta Mendota water district in the Lower Klamath River during 2014. They stated the following:

"At Blue Creek on August 13, 2014 angler density was high and visibility poor, therefore catch rate was used to roughly estimate fish density. Based on visual observations of 11 anglers catching approximately one steelhead per minute for a two hour period, we estimate 440 catches. One individual angler reported landing fifty steelhead that day. Several steelhead carcasses, likely the result of angling stress, were observed in the mainstem downstream of Blue Creek".

We fully acknowledge this type of information is anecdotal at best, however it does indicate that catch rates in the Blue Creek thermal refuge area can be quite high and that some mortality may result. The cause of the mortalities observed in this study is speculation, however it does indicate that mortality is occurring from stressful conditions, whether it be the warm water temperatures, angling, a combination of the two, or something else.

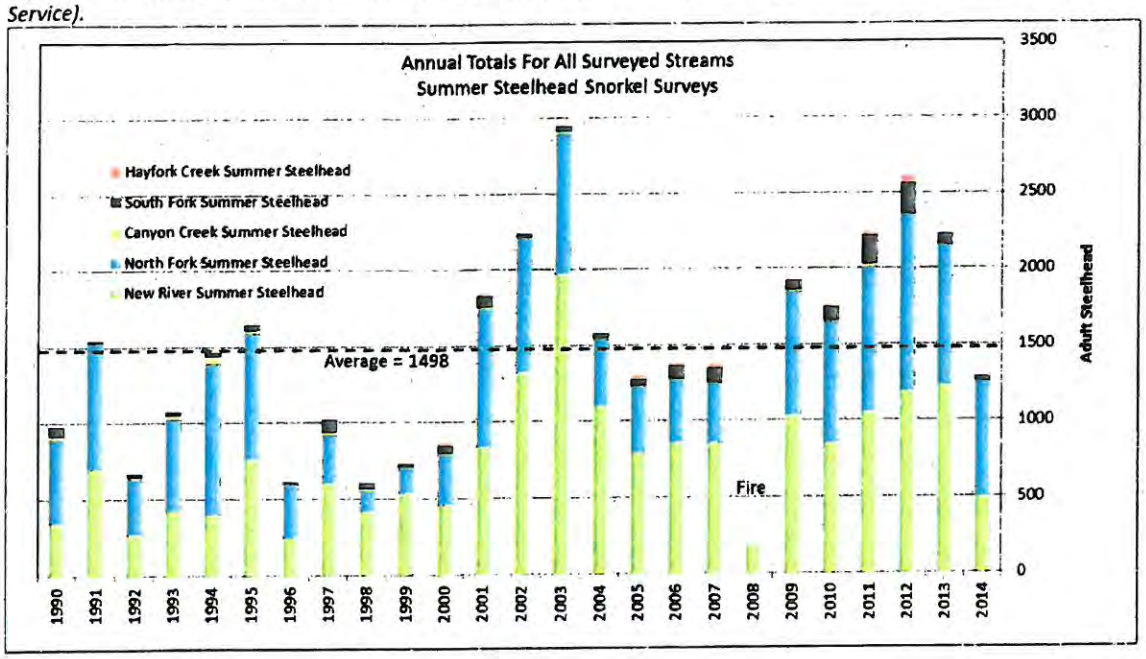
Status of the species

It has also been noted to the Commission previously that the fish caught in this fishery are not listed under the Endangered Species Act (ESA), so the purpose of the conservation closure is questioned. It is our hope that the co-managers of our resource will manage for healthy, robust populations for future generations, not just to prevent species from being listed under the ESA. We have repeatedly advocated for multi-species, ecosystem based management of the fisheries resources in the Klamath River.

Most the fish caught in this area are summer-run steelhead, however there are also spring Chinook and fall-run Chinook encountered. Counts from the Trinity Basin tributaries (Figure 3 - Klamath tributary counts not readily available at the time of this letter) have been relatively stable during recent years, averaging about 1,500 fish per year, however abundance has been far from robust. Wild spring-run Chinook populations have been at relatively low abundance during recent years, especially in the South Fork Trinity River, with abundance being less than 100 fish during 4 of the past 13 years; while this population is not listed under the ESA, we are concerned about its continued existence. Therefore, we ask that these populations be managed prudently by minimizing mortality associated with catch and release fishing.

[5] Kennedy, T. 2014. *Investigation of water temperature, velocity, and habitat characteristics of adult salmonid holding habitat in the Lower Klamath River, August 12 – September 11, 2014.* Prepared for the San Luis and Delta Mendota Water Authority. 15pp. (page 10).

Figure 3 Adult counts of summer steelhead from tributaries of the Trinity River, 1990 – 2014 (data obtained from the U.S. Forest Service).



Protection of Blue Creek Late Fall-run Chinook

We also support the continued addition of Blue Creek to the list of tributaries that are closed at their confluence with the Klamath River to protect fish that are holding prior to migration up their natal tributary, the current regulation last year states:

"No fishing is allowed from September 15 through December 31 in the Klamath River within 500 feet of the mouths of the Salmon, the Shasta and the Scott rivers and Blue Creek."

Our rationale for the fall conservation closure at the mouth of Blue Creek is to protect the genetically unique adult late-fall run Chinook salmon that return to spawn from mid-October through December. These fish are known to hold in the confluence pool in the Klamath River from late September until substantial rains stimulate their migration up Blue Creek. Blue Creek late-fall run Chinook are the stronghold of the Lower Klamath and likely the source population for other Lower Klamath tributaries. We request that fish holding in this area be given protection from harvest pressure similar to what is given to Chinook returning to the Salmon, Scott, and Shasta Rivers.

In summary, the Tribe requests that the Blue Creek conservation closure that was adopted by the Commission in 2015 be continued during the 2016 season. The Tribe would also like to reiterate our invitation to the Commission to visit us on the Yurok Reservation. We would welcome the Commission to the Yurok Reservation for a meeting with our Tribal Council. Such a meeting would allow us to discuss issues of mutual concern in regard to the management and conservation of the Klamath River fishery and provide you an opportunity to visit the Lower

Klamath River via a boat ride if your schedules allow. Please contact Dave Hillemeier (Fisheries Director) if you would like to try to coordinate such a meeting with our schedule.

Sincerely,

James Dunlap, Chairman

Cc: Chuck Bonham, CDFW Director

Stafford Lehr, CDFW Chief Fisheries Branch

Appendix A - Overview of Salmonid Catch and Release Related Literature at Warm Water Temperatures and Associated Findings

Note: The following list some of the literature available regarding catch and release of salmonids under warm water conditions, along with the most pertinent findings from these articiles. This does not represent an exhaustive literature search, but a list of what was readily available while drafting these comments. This overview is not intended to portray a specific mortality rate that is associated with catch and release fishing that occurs near the mouth of Blue Creek, but only intended to show documentation that mortality can be excessive at temperatures less that what is experienced in the mainstem Klamath River near Blue Creek during the summer months.

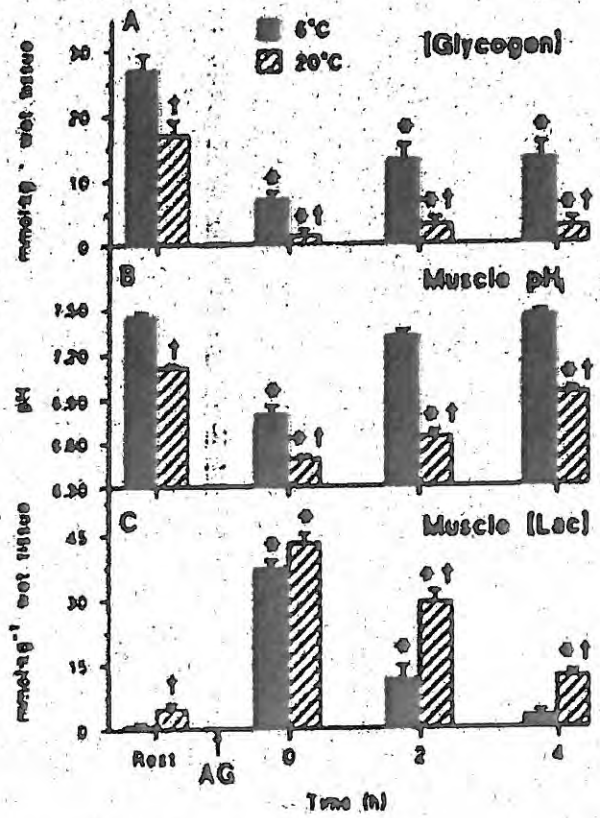
Topic : Physiological stress associated with Catch and Release Fishing Associated with Warm Water Temperature

Wilkie et al. 1996. Physiology and Survival of Wild Atlantic Salmon Following Angling in Warm Summer Waters, Transaction of the American Fisheries Society, 125:572-580.

Tested physiological responses and mortality (n=10) of wild Atlantic Salmon angled at 22°C and compared to those angled at 6°C (Booth et al, 1994). Intramuscular glycogen stores were nearly depleted and there was marked increases in white muscle lactate and post-excercise metabolic proton load following angling at both temperatures. However, contrary to the 6°C trial, there was no glycogen re-synthesis during the 4-h recovery time and lactate elimination and proton correction were much slower in the fish caught under warm conditions. There was also significant delayed post-angling mortality (40%) of the fish caught at 22C and no mortality of the fish caught at the cooler temperature, however it should be noted this was a small sample size (n=10).

Physiological Response of Atlantic Salmon Angled at 20°C vs 6°C

FIGURE 5.—A comparison of the changes in white muscle (A) glycogen concentration, (B) intracellular pH (pH_i), and (C) lactate (Lac) concentration of Atlantic salmon that were angled during the fall at 6°C (solid bars) or during the summer at 20 ± 2°C (hatched bars). Note that for comparative purposes, concentrations are expressed as millimoles per kilogram of wet weight. An asterisk (*) indicates a significant difference from the resting value ($P < 0.05$) at each respective temperature. Daggers (†) indicate data that are significantly different from data generated for salmon angled at 6°C ($P < 0.05$). The 20°C data were generated in the present study, and the 6°C data were taken from Booth et al. (1995).



Mortality = 40% at 20°C (n=10); 0% at 6°C (small sample size)

Topic: Recommendation for subjecting fish to substantial changes in water temperature over a short period of time.

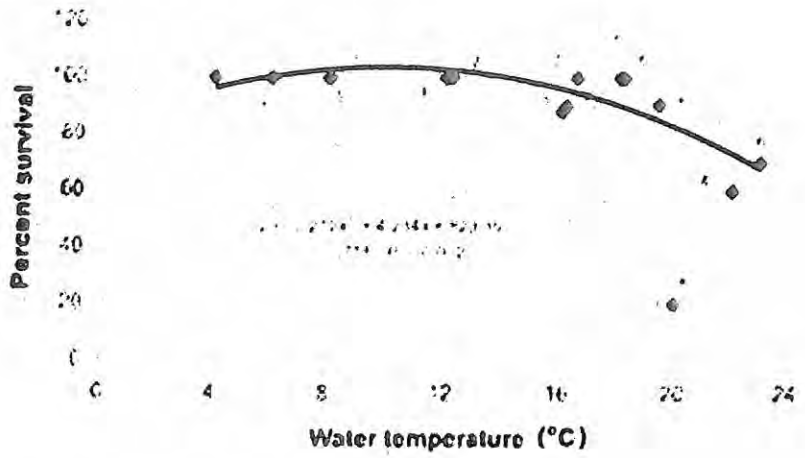
Post, G. 1987. Textbook of Fish Health. Page # 279.

"Thermal adaptation should be done slowly, usually no more rapidly than 1°C per two minutes. Slow adaptation will allow physiological functions to alter slowly, with a minimum of thermal stress. Also, fishes taken from one water temperature and placed into a higher or lower temperature usually should not be subjected to immediate changes of more than 2 to 3°C to reduce thermal stress."

Topic: Mortality Associated with Catch and Release Fishing under Warm Water Conditions

Dempson et al., 2002. Effects of Catch and Release Angling on Atlantic Salmon, Salmo salar L., of the Conne River Newfoundland

Survival Relative to Water Temperature for Several Studies on Atlantic Salmon



Taken from Dempson et al., 2002 Effects of Catch and Release Angling on Atlantic Salmon, Salmo salar L. of the Conne River, Newfoundland

Thorstad et al., 2003. Effects of hook and release on Atlantic salmon in the river Alta, northern Norway. Fisheries Research 60 (2003) 293-307.

NOTE: 4 of these 9 studies were also presented in Dempson 2002 above (which showed total of 7 studies).

Catch and Release Mortality of Atlantic Salmon Summarized from Several Studies

Taken from Thorstad et al., 2003 Effect of Hook and Release on Atlantic Salmon in the River Alta, Northern Norway

Fig. 3. Mortality after hook and release at different water temperatures (average, if given, or median) reported for Atlantic salmon (Thomas, 1976, 1979; Walker and Johnson, 1976; Booth et al., 1975; Davidson et al., 1974; Bielski et al., 1976; Wilde et al., 1996; Anderson et al., 1998; Mäkinen et al., 2000 and this study). Mortality was in most cases recorded for salmon kept in tanks or cages after hook and release (●) and (○). Only three of these studies included control groups, and these studies measured hooked Atlantic salmon (■). Only two studies measured mortality for free-swimming salmon in rivers (▼).

Dotson, T. 1982. Mortalities in Trout Caused by Gear Type and Angler Induced Stress. North American Journal of Fisheries Management. 2: 60-65.

Relationship between Catch and Release Mortality and Temperature of Hatchery Rainbow Trout

Dotson, T. 1982. North American Journal of Fisheries Management. 2: 60-65.

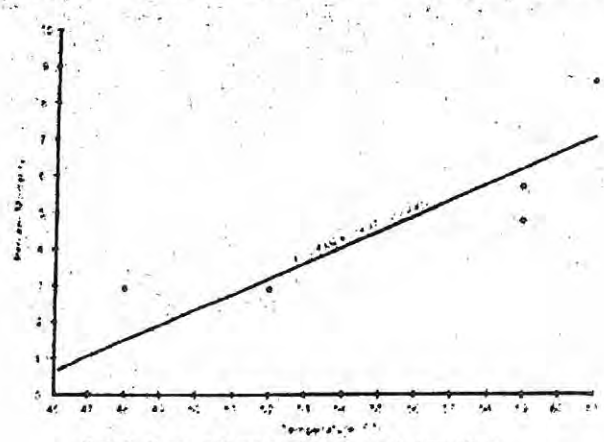


Figure 2. Regression of trout mortality on rising water temperatures.

Schisler. G.P. and E.P. Bergerson. 1996. Post-release Hooking Mortality of Rainbow Trout Caught on Scented Artificial Baits. North American Journal of Fisheries Management.

Estimated Mortality Rate of a 380 mm Rainbow Trout Relative to Temperature and Bleeding Intensity

Schisler, G.P. and E.P. Bergerson. 1996. North American Journal of Fisheries Management 16: 570-578.

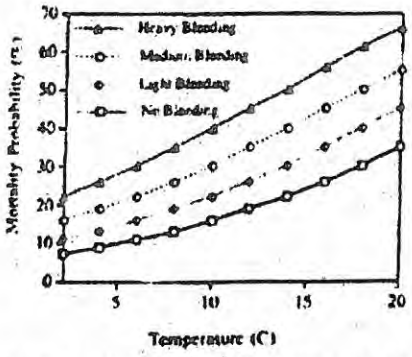


FIGURE 6.—Effect of water temperature (°C) and bleeding intensity on mortality probability of a 380-mm rainbow trout as calculated by the logistical-regression model. The fish was caught on synthetic baits fished passively, played for 60 s, held out of water for 30 s, and critically hooked with the leader not cut. Variables not shown are held constant.

Taylor, G. and R.A. Barnhart. Mortality of Angler Caught and Released Summer Steelhead. Contract #FG5018 IF. Contract report to CDFG.

Probable Hooking Mortality of Adult Summer Steelhead vs. Water Temperature

Taylor, G. and R. A. Barnhart. Mortality of Angler Caught and Released Summer Steelhead. Contract #FG5018 IF. Contract report to CDFG.

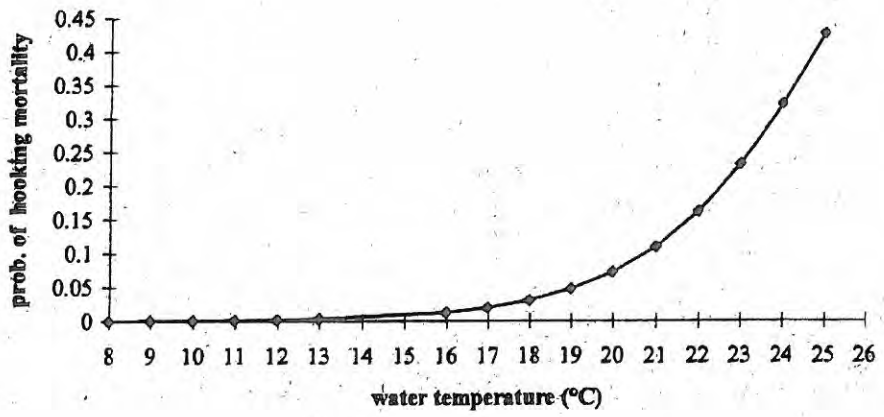



Figure 5. Probability of hooking mortality of adult summer steelhead versus water temperature based on 126 summer steelhead angled from the Mad and North Fork Trinity rivers, California, 1995 and 1996.