Notes from the meeting of the
Klamath River Basin Fisheries Task Force
Yreka, CA,
April 28-29, 1992

4/28/92 a.m.

Members present: Nat Bingham, Ken Graves (for Don DeVol), Barbara Holder, Walt Lara, Matthew Leffler, Mike Orcutt, Forrest Reynolds, Bill Shake, Dick Sumner, George Thackeray, Keith Wilkinson

Absentees: Rod McInnis

9:20 a.m. Meeting called to order.

All members introduced themselves. Chairman Shake announced that a public comment period would be provided on the 29th. Shake asked the Task Force for suggested additions or corrections to the meeting's agenda (Attachment 2).

Thackeray announced that he would not make a presentation on the Siskiyou Co. Land Use Management Plan (Agenda item TECHNICAL REPORTS).

Wilkinson requested that public comment be received on the 28th as well as the 29th. (Consensus to accept public comment both days.)

Orcutt offered to provide a briefing on the green sturgeon monitoring project. (Consensus to hear the report.)

The Task Force approved the minutes from their meeting held in LaJolla, Calif.

Agenda item: Status of management plan, Klamath National Forest. (Attachment 3)

(Holder): There have been several updates to the Plan since I gave a brief report at our meeting in Brookings, Oregon. We've had extensive public involvement to develop alternatives which will be finalized and contained in the Land Management Plan. The alternatives represent the range of management strategies we are legally authorized to implement. 240 people attended our public display and commented on the plan. We are presently evaluating those comments. We've sent out newsletters and briefed state and local officials as well as the county Board of Supervisors. The draft plan should be out this summer. Right now, an interdisciplinary team is working on standards and guidelines for fish habitat and riparian zones. We think we'll have a well founded, state of the art fisheries program contained in the plan. I've asked Jim Anderson to provide a presentation to this Task Force.

Mr. Anderson provided a handout for his discussion (Attachment 3).

(Anderson): I'd like to talk about the results of alternative development and the evaluation process. We constructed four multiple use alternatives, and now

we're evaluating them for how well they address management objectives. The first graphic of the handout indicates a decline in the number of watersheds considered "near threshold" by the Forest Service. The second graphic shows the land base as divided up in four risk groups. Of the high group (including granitic soils, dormant landslides, those sites having disproportionate amount of sediment delivery), we went through alternatives of how they protect these types of lands. One of the ways we compare alternatives is not only amount of sediment produced but area of streamside disturbance. We considered 100-300 foot buffers along class I and II streams. Our conclusion is that all alternatives protected riparian zones very well. We combined the most effective components of all alternatives into a synthesis alternative. Land allocation is recommended in some areas to provide wilderness and habitat conservation areas which will protect late seral vegetation, fish habitat, and riparian zones. We hope to have a preferred alternative in draft form this summer, which will be commented on by the public. The final plan should be completed in 1993.

Q: Would you explain "threshold?"

A: It's cumulative effects modeled in erosion equivalents. Sediment data is pretty generalized.

Q: What are "watershed clusters?"

A: They are compositions of all watershed on the Klamath National Forest. Forest hydrologists determine which watersheds are to be clustered. We've identified a group of watersheds that are at their thresholds for sediment delivery. These are termed "watersheds at risk." We've limited timber entry for the next decade in order to restore these watersheds. However, harvest must occur to help defray the cost of restoration.

Q: Have you considered cooperative timber management? (Where you forecast fish losses and make recommendations to prevent or mitigate for these losses.)

A: These are project specific, and we've tried not to emphasize mitigation. We're trying to avoid catastrophic loss such as in the 1987 fires.

(Shake): Those of us who have dealt with PFMC the last few weeks recognize the importance of habitat restoration and protection. I commend for your planning process.

<u>Agenda item: Salmon Basin watershed inventory and spring chinook restoration.</u> (Attachments 4, 5, and 6.)

[Mr. West opened with a brief status report on the Salmon River sediment budget project.]

(West): (Discussing the spring chinook restoration project, Attachments 4 and 5) We made a presentation of the recovery project to the regional forester and staff in San Francisco. The reception was good, they were very supportive. The video letter and conservation strategy went to the U.S. Forest Service Washington D.C. Office, which resulted in a $250,000 increase in our FY1992 fisheries budget. Last year (FY91) we had a budget of $830,000, this year our budget is

$1.08 million. The handout (Attachment 4) explains how the $250,000 is being spent. The funding exceeds $400,000 because of a combination of watershed management funding sources. This year we are implementing some of the actions identified in the conservation strategy. We've completed riparian planting projects along the Salmon River and we're cooperating with UC Northridge to do genetic fingerprinting of Salmon River chinook stocks. We've added $10,000 to the district law enforcement budget to prevent poaching. We also assisted in a very successful poaching prevention workshop which was funded by the Task Force. We're coordinating with California Department of Fish and Game (CDFG) on environmental analyses for bioenhancement work, spawning and rearing channel development, instream cover construction and riparian planting. Road and landslide stabilization will be done in the area called Big Flat (near the Trinity Alps Wilderness). We hope to have the project coordinator position filled by July, 1992. We're hoping to avoid Federal listing of salmon species by investing in habitat restoration at this early stage.

(West handed out Attachment 5) This is a draft of the what is known as a "Life Preserver" which will hopefully allow us to retain local management control and prevent listing. This is our attempt to get all folks in the County involved. We've used volunteers to perform some of the restoration work.

(Holder): Our regional forester has nominated the Salmon River restoration project for a stewardship program. This is an opportunity for significant funding. I hope to get FY93 funding for this program.

(Farro): It should be pointed out that approximately 2/5 of the budget is for restoration of areas that have already been harvested.

(West): Most of the budget is for road restoration because most sediment comes from roads. Many problems exist from roads constructed over 15 years ago. New roads are constructed differently, and shouldn't contribute as significantly to the sediment load.

(Farro): Has the KNF determined how much of the road system was constructed by direct congressional appropriation? There is a mandate by congress to build roads in National Forests, but congress is not aware that there are remedial expenses associated with road construction. Funds for these remedial costs are generated by more timber sales.

(Holder): Many of these road systems, such as Gates Creek, were designed with old engineering techniques that didn't provide the best erosion protection. I don't foresee the KNF continuing this type of road construction, especially on decomposed granitic soils. We are spending engineering money, recreation money, and fisheries money from our KNF budget to restore many of these roads.

(West): Mitch, you're saying we shouldn't be opening timber sales to generate habitat restoration funds, right?

(Farro): Right. There were direct mandates from congress in the past to build roads. I was wondering if the information and real cost is getting back to congress so they realize how expensive these roads really were.

(West): Clear cuts are going to be substantially reduced in this forest region, with an emphasis now being placed on continuous forest canopy. In watersheds of "high concern" minimal harvest will take place.

(West): The KNF is making a sincere attempt in holistic watershed restoration as well. A substantial percentage of the appropriated budget is devoted to resource protection (Attachment 6). Overhead is not greater than 10% forest-wide. This may change because of the way departments within the KNF pay for rent, utilities, etc.

Agenda item: The "Gang of Four" report.

(West): The gang of four was a scientific panel convened by the House Committee on Agriculture. The team was requested to prepare alternatives in managing old growth forests, to consider needs of spotted owls and marbled murrelet, and to include options that would adequately protect sensitive fish stocks. Over 200 fisheries and forestry experts were involved in putting this report together. The report was completed in mid-summer, 1991, and includes two options for operations within the 14 alternatives. The first option provides for inclusion of standards and guidelines in the current timber harvesting operations. The second option places a stronger emphasis on fish and wildlife habitat. Some strategies considered in the second option are to use existing wild and scenic corridors, national parks, and late successional areas for owl preserves. The second component establishes stringent riparian management guidelines. The third component of the report is the identification of key watersheds in the Klamath River basin which will have the 50/11/40 rule applied. (50/11/40 rule is 50% land must contain trees greater than or equal to 11" diameter, and maintain a canopy greater than 40%). Also, the rotation cycle for timber harvest would be 180 years in these areas. The fourth component of the report identifies road management options which are to minimize the impacts that these roads are having. Strategies include removal of nonessential roads, implementing new construction techniques, increased maintenance, increased culvert sizes and frequency. The fifth component of the report addresses treatment of logging slash and prescribed fire. Strategies are to eliminate burns on steep slopes and in riparian areas. The sixth component of the report addresses the issue of livestock grazing. Livestock exclusion from riparian areas, riparian and fish habitat restoration are strategies to be employed. The seventh component addresses cumulative effects from site location of landings and haul roads. The group performed a functional analyses to assess the risk of extinction of the spotted owl, and looked at how well the fish stocks and the marbled murrelet would be protected. A rating scale of low, moderate, and high was used to describe whether objectives for protecting these species would be met. The overall objective of the report is to provide a broad range of standards and guidelines. The panel did not pick an alternative, they were only asked to put together the package of alternatives. No decisions have been made on the alternatives.

Q: When you named key watersheds in the Klamath River basin, were they the ones with spotted owls?

(West): No. Key watersheds as identified by the team were critical watersheds with sensitive fish stocks. That was done on all watersheds, coast wide.

Q: What's the status of this report in congress? What next?

(West): It was given to the subcommittee in August, they analyzed it but have not recommended an action. Right now it's a political hot potato. The Sierra Club requested the USFS to adopt all provisions of the scientific panel's report. All Pacific coast regional foresters met to discuss this. A team in Washington is looking at management options and may choose to adopt a coast wide strategy.

(Holder): It's being discussed, but there's no written decision on it right now. It's pretty unlikely that there will be a complete adoption of the report. Different forests have different management concerns. The four northern forests are discussing how our standards and guidelines relate to our management strategies.

Agenda item: Management of BLM lands, Klamath basin.

[Mr. Francis Berg and Mr. Dick Johnson of the BLM provided the report.]

(Berg): There are four BLM offices within the Klamath basin. There are 200,000+ acres of BLM land in the basin. These are unappropriated lands. My presentation is for land managed by the Redding district office. BLM lands are scattered randomly throughout the basin. There hasn't been much public use on our lands because of accessibility. We have a draft resource management plan, which includes the land management plan for BLM land. We proposed to address landownership, recreation, access, forestry management issues for BLM lands. Some alternatives in our land management plan indicate the need for fisheries management.

Q: When you say lands are "inaccessible", are they blocked by private lands?

(Berg): Yes. Particularly in Scott Valley.

(Berg): We developed five different alternatives, and we're ready to release the final resource management plan which will reveal a major restructuring of management. Land acquisition through trade is proposed. We administer 57,000 acres and we propose that 45,000 of these go into private ownership. We identified 20,000 acres for acquisition, and 11,000 acres have been offered to us for sale. The Klamath River canyon above Iron Gate Reservoir is being considered for inclusion in the national Wild and Scenic system. Jenny Creek would be administered as an area of critical environmental concern. The Horseshoe Ranch management area and west, toward I-5, is also another area of interest for acquisition. We'd maintain Dry Creek in public ownership because of steelhead habitat. The Shasta River canyon would be managed for chinook habitat conservation. Quartz Hill in Scott Valley may be managed cooperatively with local organizations, otherwise it would be transferred to private ownership. The heart of our recommendation for Siskiyou Co. is acquisition of lands within the southern mountainous Shasta Valley, for the Shasta Valley Wetlands Area. Some areas have been dropped, and others have been offered. We're interested in developing native wetlands. We want to protect these areas, enhance water fowl production, improve water quality, enhance native fisheries, enhance wildlife habitat, focus on non-motorized public recreation, and provide grazing for domestic livestock. This is proposed in the land management plan.

Q: What type of strategy would be employed to ensure that grazing would be in concert with other wildlife and fishery management strategies?

(Berg): The objective would be to keep livestock out of riparian zones, and provide offsite watering. Fencing would be used to keep them out. Land will not be purchased if this action is opposed by local government.

(Reynolds): When the department did work in the Shasta River canyon, we had great difficulty ensuring that there would be no new entry by miners. Will the new plan make it easier to perform habitat manipulation and provide for protection?

(Berg): Yes. There are provisions in the plan called "Management guidance and decisions" that would prohibit those types of activities.

Q: How would "Wild and Scenic" river designation impact habitat manipulation?

(Berg): The recommendation is for a "Recreation" designation, and only impoundment of the stream is prohibited with that classification.

Q: Does the area that is no longer being considered for acquisition include Big Springs?

(Berg): Yes.

Agenda item: Report of the stock identification committee. (Attachment 7)

(Barnhart): We've only had one meeting since I reported to this group in Brookings. We met on March 22 in Eureka. We have new members on the committee. We reviewed the assignment given to us by the Task Force, for the benefit of the new members. We haven't discussed steelhead to a great extent, yet. When identifying breeding populations, we'll look at a gene conservation group (metapopulation), a group of fish similar in phenotypic characterizations, genetically similar, a group made up of one or more breeding populations. We're not sure what the distinction is between Iron Gate Hatchery stocks and mainstem stocks. There is not much information available for review.

(Farro): We have a lot of information needs identified. Have you identified ways to get that information?

(Barnhart): We've made assignments to each of the members to collect some information. There are certainly gaps of information that will be reported to this Task Force for consideration.

Public Comment:

Felice Pace (Klamath Forest Alliance): Earlier this morning we heard a briefing on the "Gang of Four report". There is a bill before congress based on this report. This bill will be marked up and will go before the House in May. Two options for fish are: 1) status quo, and 2) the watershed option. There are a number of groups pushing congress to adopt the watershed option. The qualitative

projections for both options are very different. The status quo will lead to loss of some stocks. The watershed option may avoid broad listing of fish stocks. I encourage individual groups to support the watershed option. More importantly, the fisheries scientists believe it's the best chance we have to maintain these stocks. My second comment is on the KNF Land Management Plan. The environmental community has pushed to redirect and increase budgets for road maintenance and removal. We're also pushing model projects. We support the spring chinook recovery plan on the Salmon River and are pushing for more funding. We're working on congressman Herger to support the Salmon River plan. And third, the Gang of Four report identified Beaver Creek as an important tributary to the Klamath. Mixed ownership watershed, water quality and sediment supply are concerns. We're opposing three new timber harvest plans by Fruit Growers Company. We've approached the company about putting these harvests on hold and trying to develop a CRMP with various owners.

Agenda item: Report of the Bureau of Reclamation on 1992 water outlook, Klamath and Trinity Rivers.

[Mr. Bob Davis presented the report for BOR-Klamath Project.]

(Davis): The outlook for the 1992 upper Klamath basin water supply is bleak. We are in our sixth consecutive year of drought. The US Soil Conservation Service projects 33% of average runoff into upper Klamath Lake. The US Fish and Wildlife Service's biological opinion mandates that no water deliveries be made from Clear Lake when lake surface level falls below 4525 feet. Presently, Clear Lake is down to 4522.8 feet. Consequently, there will be no 1992 irrigation deliveries made from Clear Lake under present operational guidelines. We've entered into consultation with the USFWS regarding taking water from Clear Lake. If allowed, the old channel would have to be dredged to allow flow between the two sides of the lake. Gerber Reservoir has about 3,000 acre-feet in storage and the USFWS biological opinion indicates that 2,000 acre-feet are needed to protect endangered sucker species in the reservoir. On the East side of the project, 13,000 acres won't get irrigation water this year. If the USFWS allows us, 8,000 acre-feet of water could be delivered to irrigators. We continued the flow variance at Iron Gate Dam, on the mainstem Klamath River. We cut deliveries to 200 cubic feet per second (cfs) at Keno. This action was taken in an attempt to comply with the USFWS biological opinion to maintain specific surface elevation of upper Klamath Lake. In order to achieve adequate lake levels, we cut agricultural deliveries down to zero in March. We're delivering no water to Class C irrigators this year, resulting in 8,000 acres not being irrigated. The USFWS Tule Lake Refuge is a class A user and deliveries are to start later this week.

Q: What are expectations for flows at Iron Gate Dam this season?

(Davis): We delivered 32,000 acre feet in a 3-week pulse delivery. We've not yet decided to deliver pulse flows in May. The present flow variance is to allow flows of 400-450 cfs at Iron Gate Dam.

Q: How much water will be discharged from Keno Dam for the remainder of the year?

(Davis): We're looking at 200,000 acre-feet for total discharge at Iron Gate Dam.

Q: Why can't you drop the levels at Iron Gate Reservoir to make up flows below the dam?

(Davis): I'm not involved in those decisions, but I think the reservoirs were drafted during those times.

Q: How does one go about authorizing this variance from the minimum flows required by FERC?

(Davis): The variance is instituted by the Klamath Project manager under authority of the Klamath Compact. He makes a call on whether or not irrigation deliveries will be made.

Q: How is water allocated from Upper Klamath Lake?

(Davis): Water allocation is addressed in the Klamath Compact by priority of delivery. Fish and wildlife resources are lower priority than municipal and agricultural uses.

Q: Why is water allocated to marshes on the wildlife refuges? Why isn't water shared downstream?

(Davis): Tule Lake must be maintained in order to make deliveries to agricultural land around Tule Lake.

Q: What are the anticipated agriculture deliveries this year?

(Davis): About 500,000 acre-feet will go to agriculture.

Q: Can the compact be amended to identify minimum instream flow needs in the Klamath River?

(Davis): It would take a congressional act to amend it.

(Hillman): The Klamath Compact was not created by congressional act. It was created by the states of California and Oregon, and submitted to congress for approval.

(Shake): So, it's ratified by congress.

Q: What has been the nature of your discussions with USFWS regarding consultation?

(Davis): Most have centered around studies of endangered suckers and their habitat needs. We've also discussed screening the A canal.

Q: No downstream issues?

(Davis): Yes, we've talked about downstream issues.

(Shake): The consultation has to focus on suckers because of federal listing. The USFWS fisheries department has given comments on downstream needs, but weren't successful on getting flows. We've been working with BOR in getting more water downstream. If a lower Klamath River chinook stock is listed as "Threatened" or "Endangered", there will be competing needs between both the endangered suckers and the salmon.

Q: Has BOR imposed salvage and holding of suckers?

(Davis): We salvaged some fish out of Clear Lake, part went to USFWS Dexter hatchery, some to CDFG's Pit River Hatchery. Some fish salvage will occur on Clear Lake this year.

Q: Are there any fish salvage efforts being considered in Klamath Lake?

(Davis): No, there's enough water there for fish to escape.

[Chet Bowling presented the 1992 operations and water projections for the Central Valley Project.]

(Bowling): In the Central Valley Project (CVP) we're also dealing with a sixth consecutive year of drought. We've been in consultation with USFWS for winter chinook. Earlier this year we were looking at inflows of about 50-60% normal into the Sacramento River. The Trinity River basin did better than most watersheds, maybe 85% of average. This year will be the third year of delivery shortages to water contractors of the project. Because of good rains in January and February, we're looking at delivering 75% of irrigation supplies. Projected carryover is 2.8 million acre-feet. Winter run chinook has impacted our operation this year. We introduced an interim Central Valley Project operation plan for 1992, based on five different scenarios. Looking at the Trinity River, we do have 340,000 acre-feet to be released to the river. The scheduling of that is critical to operations and impacts on winter run salmon in the Sacramento system. We'll meet the desire for high flows in Trinity River in June. June 12-16 will have a 6,000 cfs release from Lewiston to the river in order to provide flushing flows and for the flow studies. We'll probably release 500 to 800 cfs at Lewiston through the summer. Another activity affecting the Trinity, we're looking at two temperature control curtains on Lewiston. One is at the intake to the hatchery. They extend about 30 feet into the water to pull colder water into the hatchery. The second curtain is located in an area up in Lewiston Lake in the narrows. This will be used to prevent mixing, to enable cold water deliveries. We hope to have the first one installed in July, the second in by September 1. We hope to utilize these curtains to provide cold water to both watersheds. These are temporary curtains, but still very expensive ($900,000 for both).

Q: How were the temperature requirements in the Trinity River derived and who developed them?

(Bowling): They result from the plan developed by the North Coast Water Quality Control Board.

Q: What options for relief do contractors have when obligations aren't met?

(Bowling): They can take us to court. Or they can look at transfer options (water from Sacramento River water rights contractors). Many are neighbors, and will share enough just to get by. We provided hardship supplies last year, but haven't provided any this year, yet, but will provide some to M&I contractors.

Q: You're predicting that you will meet the temperature objectives in the Trinity River?

(Bowling): The temperature objectives at Douglas City may not be met, but our model doesn't include operation of temperature curtains in Lewiston. We will probably meet them with the curtains in place. We will also be bypassing the power plant in September at Trinity Dam. The current delivery forecast shows 500,000 acre- feet diverted from the Trinity River, but the final diversion may total between 400,00 to 500,000 delivery.

Agenda item: Report of the American Fisheries Society on status of anadromous stocks, northwest California. (Attachment 8)

[Ms. Soyka Dobush provided a slide show of Northern California river basins, including portions of the Klamath basin and stocks existing therein, for the Humboldt Chapter of the American Fisheries Society.]

(Dobush): (Describing Attachment 8) Our report is an accurate depiction of the current status of stocks. The AFS is not promoting listing of these stocks, and actually hopes to prevent that action. The conclusions drawn by the Humboldt Chapter of AFS are: 49 anadromous salmonid stocks are at risk of extinction. Of the 49 stocks, the Klamath basin contains 3 stocks of spring chinook, 4 stocks of fall chinook, and 3 stocks of coho, all identified as "at risk of extinction." Most winter steelhead stocks are not well known. (See Attachment 8 for a complete list of recommendations made in this report and for a list of stocks and associated risk of extinctions.)

Agenda item: Status of hatchery evaluation. (Attachment 9)

(Wilson): As you recall, you had a proposal from the Klamath Management Zone Coalition to switch hatchery releases from spring to fall and from onsite to offsite. I believe the response by this group was hasty. At the KFMC meeting in Eureka, Dr. McIssac requested more information on spring and fall release data. We looked at release data for 10 years past on Iron Gate Hatchery (IGH) and Trinity River Hatchery (TRH). We analyzed CWT returns. The 10-year average was .862% survival to harvest for IGH fingerling releases. IGH yearling releases averaged 3.379% returns. TRH average returns for fingerling and yearling releases were 1.18% versus 5.76%. The IGH yearlings survived four times the rate of the fingerlings. TRH yearlings survived five times the rate of fingerlings. The response to the KMZ proposal didn't discuss density dependent mortality from hatchery releases. The straying issue of offsite releases was researched for 10 groups of IGH and TRH fish. Six groups had tags recovered in places other than the Trinity River. Straying within the basin cannot be accurately

calculated. It appears that the straying rate is higher, but not conclusive. [Mr. Wilson read a letter (Attachment 9) to the Task Force.]

Q: When will all of these requests be put in written form and presented to the CDFG for consideration?

(Wilson): Hopefully this will be considered by the chairs of the Klamath Fishery Management Council, the Trinity River Task Force, and the Klamath River Basin Fisheries Task Force, at their upcoming meeting.

(Shake): My perception of the meeting of the chairs is to discuss the various things that are ongoing between all three advisory groups, to discuss the need for further coordination. The issues raised would be food for thought, but we will not be prepared to discuss the details that you submit in this report.

(Wilson): The Klamath River Technical Advisory Team will need further direction from these chairs of how much more our involvement will be in this hatchery evaluation project.

Comment and presentation by the Klamath Management Zone Fishery Coalition: (Attachment 10)

[Comment and presentation by Mr. Jim Welter.]

(Welter): (Discussing attachment 10) I've looked at some hatchery release information for both hatcheries in the basin. Looking at the numbers on the first page you will notice that 1985 experienced a large spawner escapement which was the first year of the big ocean fisheries closures. At the same time hatchery production rose from 3 million to over 17 million fish. The fish consistently got smaller, and were released to compete with naturally produced juvenile fish. The resulting returns were smaller. CDFG tried this earlier, and didn't get anything back. Yearling returns resulted in better returns. Looking at the graphs, you will note that escapement trends are directly related to release trends. The drastic reduction in escapement may be a result of excessive hatchery releases. Early releases tend to return 3-year olds, fall releases return 4 and 5 year olds. The remainder of the handout is taken from your Long Range Plan. "Conooks" may be being produced at TRH as a result of hatchery cohos straying and spawning in-river with chinooks. Your paper points out that intermingling hybrids could be causing problems. Many of the problems mentioned in your document are concerns that the KMZ Coalition has. These graphs I've prepared indicate a stock collapse.

Letter to Mr. Boyd Gibbons from Salmon Unlimited: (Attachment 11)

Mike Morford (KRTAT): (Discussing attachment 11) The letter expressed concern about Bacterial Kidney Disease in both Klamath basin hatcheries. It's pretty virulent in both hatcheries. Its the kind of bacteria that creates little boils, which release many bacteria into the water, which exist for long periods of time and has the potential to impact wild stocks. I'd like this Task Force to send a letter to director of CDFG expressing concern about disease transfer from both hatcheries, to try and limit this particular problem.

(Bingham): The time is now for this Task Force to do something about the hatchery production strategy. What is the present strategy this year?

(Hayes): We will raise as many yearlings at both hatcheries as we can. We will activate the Fall Creek facility. Fall Creek is 2nd priority to receive fish for production. One concern of ours is that many Fall Creek fish didn't move out of the system when released last fall. We'll look at our entire hatchery operation internally and coordinate with USFWS.

Q: Has trucking been considered since these fish didn't move last fall?

(Hayes): No. Impacts of straying are a concern.

(Bingham): I agree. The concern I have is what we do this year. The salmon stamp committee has thought about this problem, and we stand ready to pay for trucking fish down the Klamath.

(Reynolds): There are operational constraints regarding releases at the hatcheries and trucking fish. A decision should be made after the level of risk has been evaluated.

(Bingham): I agree. We've discussed this issue extensively in this group. The letter submitted by Salmon Unlimited indicates that we have a disease crisis.

(Wilkinson): ODFW is requesting a review of the hatchery practices, in light of recent information. They support holding fish to yearling, and off site release strategies.

(Reynolds): About 3 years ago, CDFG set goals and restraints for all CDFG operated hatcheries and many privately run hatcheries. These constrains control how fish are handled, transported, and released. We did that because over the years there was an attempt to equate total production at hatcheries with good fishing. That doesn't hold up very well.

(Hayes): In the mid '80s we had too many eggs, and everyone complained about us destroying eggs. Now, we're being told we're producing too many fish.

(Farro): I felt uncomfortable with the review and dismissal of the concept of the KMZ recommendations. I view it as a starting point for discussion. The issue of trucking was possibly the reason for dismissal. I believe we did them a disservice. We should address where we're going with this, especially in a year when not much water is available. We're managing on old mitigation goals.

(Sumner): The fish planted at IGH last November are still here and they are impacting natural fish. It would be better to release some of the older fish in lakes rather than in the river when water is so low.

(Shake): We've got two issues on the table... what to do this year, and what to do in the long-term (hatchery evaluation program).

(Orcutt): We should proceed with caution. We all need to be involved, but I urge that we not act irresponsibly and too quickly.

(Shake): Forrest, how would you suggest that we approach this year's issue of what to do with those fish at Iron Gate Hatchery? Would it help if this Task Force sent a letter stating our concerns about this issue, and maybe suggesting further consideration of the impacts of hatchery fish on natural fish? Perhaps we could suggest a group of technical people look at this issue. The upcoming May releases may already be considered a done deal.

(Reynolds): The intent is to maximize production, without reducing the quality of the product. The issue still up for grabs are those smolts from Trinity River Hatchery. After we set up rearing for yearlings, there will be 700,000 surplus fish available (in excess of the mitigation goal of 300,000).

(Hayes): We're scheduled to release the fish ahead of the 6,000 cfs flow releases at Lewiston in June.

(Wilson): My concern is for the 2 million fingerlings scheduled for release at Iron Gate Hatchery in May. Those would be likely candidates for trucking to prevent competition with Shasta stocks.

(Reynolds): If the Task Force wants to look at feasibility of trucking, a letter requesting this action is appropriate.

(Shake): The whole country is reading about the salmon disaster, we should take some appropriate actions to turn this thing around. But, we must do the right thing with some careful thought.

*** Motion ***

(Holder): I move to send a letter asking CDFG for an analysis of issues raised here today. To include a feasibility analysis of trucking, and a look at the immediate problem of the fish being in May.

(Bingham): Second.

(Orcutt): Specific to IGH operation, or Trinity River hatchery operation?

(Wilkinson): The TRH problem should be resolved by increased Trinity River flows.

Q: Do we want to blend both issues in one letter (trucking, operations)?

(Holder): The analysis could be done in two phases.

(Hillman): When we met in LaJolla we discussed this KMZ Coalition proposal and responded to it. I keep hearing that this issue hasn't been addressed by the Task Force.

(Shake): We sent a letter, and it stated that we needed further evaluation.

(Shake): We have a motion on the floor.

(Pierce): Is this to have CDFG investigate feasibility for trucking, or asking them to do it? If it is requesting them to do it, you should notify the Yurok tribe and the BIA that the point of release will be on the reservation.

(Shake): Please restate the motion.

(Holder): I suggest that we write a letter to CDFG asking for an analysis of immediate issues that have been raised. Specifically, the releases of May fish from IGH, and feasibility of trucking, which would include analysis of consequences, and we've been asked to identify stocking locations.

(Reynolds): The letter should provide CDFG more of an expression of what it is you want us to do. Analyzing this is simply a drill. If the Task Force is asking the CDFG to consider trucking as an option, we need to know that.

(Hillman): I would object to the request to truck as an option for this year.

(Shake): I perceive this letter to indicate: 1) We lay out the present situation, 2) the belief of this group that releasing those fish would do more harm than good, 3) ask the CDFG to examine their release strategies, in doing that, take a look at potential risks. I don't see this as our recommendation to truck. As managers, they have ultimate authority to do with them what they want to do. I think that we're expressing concern and asking them to look at their release strategies.

Hearing no objection, we'll prepare it. I suggest John and Nat draft the letter this evening. We'll discuss the draft letter tomorrow.

*** Action ***

Nat Bingham and John Wilson will draft the letter which will be discussed by the Task Force on 4/29.

(Shake): The next issue is long-term hatchery operation. What are we going to do?

(Wilkinson): These issues require new and innovative strategies to address these problems. We're facing our inability to adjust to rapidly changing conditions.

(Orcutt): We're operating with a lack of data and speculating what river temperatures will be. Some attempts at research to provide good information should be implemented.

(Bingham): A pure philosophical discussion or study is not going to provide very useful information. We should learn from doing. Use the data that we generate by using CWT information from fish trucked, review existing information, etc.

(Shake): This group is not in a position of managing the hatcheries. If we can provide assistance and ideas of how to improve products and reduce impacts on wild stocks, we'll all benefit.

(Reynolds): On marking fish, there are two types of hatchery review. A facility review and a review of operation. Trucking is an adjunct to hatchery operation, something that must be considered. A management strategy can also be developed to achieve a management goal, and ensure that the goal can be achieved by the facility.

(Hayes): Production goals at IGH are set by court decree. Changing goals is more difficult than at first appearance.

(Lara): The long range plan says that TWG will work with CDFG to ensure that large scale operations won't impact wild stocks. Our concerns are well stated in the LRP.

(Shake): We have an upcoming meeting of the chairs, this issue should be an agenda item.

*** Action ***

Place long-term operations of CDFG hatcheries on agenda of chair meeting.

(Dobush): The AFS would advocate that the three chairs address issues of disease transfer and genetic mixing of stocks. We also suggest separation of egg takes in differing stocks. We would like to see a reduction in production to accommodate yearling production only.

(Shake): Those are issues that should be addressed by the evaluation program.

(Orcutt): For the record, I would ask that tribal representatives be involved in this evaluation.

(Shake): It was understood that tribes would be represented at that meeting, and other members may also attend.

Agenda item: Status of 1992 harvest management:

(Wilkinson): A brief comment on the harvest management proposal... it's not been approved or signed. My position was to represent the KMZ coalition, and I can also speak for the ocean troll industry, its an unmitigated disaster.

*** Motion ***

(Sumner): I empathize with this statement. We all know we're in a situation of diminishing returns. I would like the Task Force to entertain a motion that we send a letter to PFMC or Dept. of Commerce indicating our concerns about dipping into the escapement floor.

(Hillman): If Dick's comment was a motion, I'll second it.

(Wilkinson): I speak against the motion. If the Task Force steps into the allocation issue, it opens the door for the PFMC and KFMC to step into the restoration process. If the intent is to go on record with personal preference, it sets a dangerous precedent.

(Bingham): I would vote against the motion too. The whole coast is shut down. The issue was that there were fish available to harvest that don't come from the Klamath River. We had to try to make those fish accessible.

(Hillman): I believe that it is appropriate that this body concern itself with harvest issues that will impact Klamath stocks. It is inappropriate to fish into the Klamath River stocks.

(Lara): Last year we fished below the escapement level. It wasn't intentional but this year is. I do think that it is our business.

(Sumner): If Shasta River stocks are listed it will impact irrigation, especially in this time of drought.

(Bingham): Education and communication between the agriculture and fishing communities is needed in order for us to understand each other's concerns.

(Farro): There is no sign of improvement for next year. There's enough pain for all parties. I see this as rubbing salt in the wound if we proceed.

(Shake): I don't hear a consensus to send a letter. A majority opinion was suggested but I think it's too sensitive an issue and may divide this Task Force. The Dept. of Interior is drafting a letter from the Secretary of Interior to Secretary of Commerce addressing these issues. It would be divisive for this group to send a letter. So with that, we'll not send one.

(Orcutt): In fairness to the public, in Keith's report he didn't mention that the KFMC did discuss Klamath spring chinooks. I think we should hear that portion of the issue and I will report on that. The KRTAT was asked to look at all Klamath River spring chinook stocks, and to reevaluate their run size predictors. ODFW has expressed concerns of harvest rates by inriver harvesters on some stocks. There was consensus to look at all the impacts on spring chinook stocks for future management consideration.

Public comment:

John Wilson (KRTAT): You must consider that harvest constitutes .1 percent of total mortality of fish population. If you zero the fishery out, zero the other things impacting the populations. The escapement floor of 35,000 fish is based on biological information that indicates that rearing habitat is limiting total production, not escapement. I asked in my letter "who's in charge of the overall package?" It sounds like the mitigation goals have tied the CDFG's hands in operating cooperatively. The management strategy evaluation is a good idea. Both hatcheries are in good shape, there facilities are able to produce many fish, but we must address the management issues driving the operations.

(Reynolds): CDFG is not constrained by mitigation agreements. CDFG can discuss operations with PP&L. Our hands are not tied in cooperating with the Task Forces in restoration work.

Fred Schutte (Brookings Port): Businesses are at risk on the coast. If we're asked to cut more it's the kiss of death for coastal communities.

Jim Welter (KMZ Fishery Coalition): In drought conditions, hatchery production must be reduced because of the lack of habitat. Your on the right track by working with the hatcheries. I hope you can resolve the problem.

Meeting adjourned for the evening.

4/29/92

Agenda Item: Report of the planning subcommittee, on watershed-based restoration planning. (Attachment 12)

(Bingham): The committee met February 26 to review the work accomplished at the LaJolla meeting. The structural model produced in Lajolla was based on the concept of similarity of options. (Describing attachment 12) We decided that it would be more helpful to reorganize options in the form of an action plan. (Mr. Bingham continued through the document, reading the titles of each category.) The target was to try and get at least one watershed model plan developed by the end of this year. It's a reasonable expectation since a couple of watershed groups already exist (the Shasta Valley and French Creek CRMPs). If we continue our program at $1 million per year of funding, this Task Force can continue to micro-manage each proposal. However, this planning structure is designed to empower local groups, allowing them to develop their own subbasin plans. These local groups would be encouraged to seek outside funding. This is the way I see this succeeding.

(Reynolds): Is there an attempt at standardizing the approach to plan development and restoration?

(Bingham): Some standardization will be required, but needs are different for each watershed.

(Shake): What does the Task Force wish to do? We all agree with the concept. We could entertain a motion that would accept the subcommittee proposal and action plan.

*** Motion ***

(Bingham): So moved.

(Thackeray): Second.

(Shake): At LaJolla, we agreed subbasin planning was the way to achieve our restoration goals. It would be locally driven, a way to get more funding, and local commitment. We agreed on the concept and developed a subcommittee to develop it. Now we can approve or disapprove the process the subcommittee recommends.

(Bingham): It's just a framework right now and will need to be fleshed out.

(Pierce): Under category 2, there's a line that says "develop budget requests." I would like a feeling of the Task Force's intent in this statement. Are these CRMP groups going to be administratively funded to hire grant writers, biologists, and additional staff?

(Bingham): That was not discussed by the committee. I defer to Ron Iverson.

(Iverson): Those are all possibilities. Someone must decide how those things must be done, the specific methods are left open to the Task Force.

(Bingham): Experience shows that coordinator positions are essential to getting anything accomplished. Someone must coordinate and plan for these things.

(Farro): I'm in favor of this approach. The weakness of our long range plan is implementation. I see this as a way to get it implemented.

(Shake): This group agreed that we'll get more done by developing this watershed planning and action implementation process. There may be existing groups that can take this process and develop proposals right now.

(Lara): The purpose of going to LaJolla was to use NMFS computer equipment for clearing animosities between all of the actions and policies, so we could all have direction and priority of action in order to proceed.

(Shake): That was part of the purpose. Another purpose was to look at most important policies that would give the most impact.

(Thackeray): I agree with what you said. Even contractors can use the product from LaJolla to address these issues.

Q: Does this make our job of going through proposals any easier?

(Shake): It will. In terms of funding, it would be a lot easier to look at actions developed by those watershed groups, then determine what the priority actions are. The budget process would be very simple if all subbasin plans were in place.

Q: Nat, what would the next step be if approved?

(Bingham): For staff to begin soliciting input. Steps are in this document. KRFRO would begin by developing a list of subbasins and watersheds. It's laid out right here.

(Shake): Assignments are in place. We could get a status report at our next meeting from Staff. Hearing no objection, we'll approve the process.

*** Motion carried. ***

Q: By next meeting, are we hoping to have a list of watersheds to receive comment on?

(Pierce): Bob Franklin has scheduled the TWG to meet May 18-21, to develop criteria to use for watershed subbasin delineation.

(Shake): This must be a major discussion point of each meeting. This is where it will really happen.

Agenda item: Public comment on watershed-based planning.

Marsha Armstrong (Siskiyou Daily News): This group must recognize that there are other uses and interests rather than fisheries restoration. The proposed road closures in French Creek created some contention. I suggest that you include all interest groups to this planning process. You need better outreach to get all people involved. The media needs better briefing information as well.

Agenda item: Report of the comment review committee for the Upper Basin Amendment.

(Wilkinson): The committee met April 27 at KRFRO Office. The committee recommends approval of the upper basin amendment. We also suggest that the public comments received on the amendment be handled editorially by staff. There were some issues brought up that must be discussed. The issue of water development in the upper basin, i.e. Salt Caves Hydro project is changing continually, and should be updated editorially before final printing. Another issue of concern is that there may be implications in the amendment of committing to restoration of non-anadromous fishes. This Task Force must emphasize that its charge is for restoration of anadromous fish. Water quality and quantity issues are our primary concern in the upper basin. That concludes the committee's comments, and I would make a strong recommendation for approval of the upper basin amendment with editorial changes made.

(Orcutt): Bob Franklin was supposed to be at the meeting, he was not able to make it. With that, I haven't had a chance to look at it. I don't feel strongly enough to support the recommendation, but wouldn't object if supported by this group.

*** Motion ***

(Bingham): I agree we should keep the focus on anadromous fish. I move we accept recommendation by subcommittee.

(Motion seconded by Sumner.)

Q: If adopted, does it bring us into the arena into endangered fishes in the upper basin? Some of our recommendations in the plan may involve us in the recovery of those populations.

(Wilkinson): The stated position in this amendment is to be involved for water quality and quantity issues only. Not restoration of non-anadromous fishes.

(Bingham): The motion is to limit our involvement to anadromous fish only and to water quality and quantity issues only.

(Wilkinson): The comments from the committee were to recommend approval but to specify our involvement. The committee has recommendations for the amendment process if approved.

Elwood Miller (Klamath Tribe): I don't think this committee has to be worried about involvement with having to restore endangered species. This group's involvement will be at later date. Water quality and quantity should be focus at this point.

(Shake): Hearing no objections, we will approve the recommendation.

*** Motion carried. ***

(Wilkinson): Our second recommendation is for the amendment process to be opened October, 1995, through January 1, 1996 for amendment, and opened thereafter in 5-year cycles.

(Hillman): There was a high degree of concern about the amendment process, and how the process would be restraining. There was reluctance to approving the plan, and those in opposition were reassured that the process would be open. I'm concerned about confining the amendment process to this schedule.

(Wilkinson): We considered these things in making the recommendation. If we have a 90-day window to receive comments, added to the public hearing process, and all other logistical problems associated with this process, we're looking at 6 months of work. If we amend the plan more frequently we'll spend most of our time performing this process.

(Hillman): This Task Force should have a mechanism in place to react to changing situations by amending the plan when necessary.

(Wilkinson): Is there another time frame that you would recommend?

(Hillman): I don't know. Are your recommendations in writing?

*** Motion ***

(Wilkinson): I would put them in the form of a motion for discussion. The proposal is to open the amendment and public comment period October 1, 1995, with a closing date of January 1, 1996.

(Hillman): I don't have an alternative time frame without seeing this recommendation in writing.

(Shake): The subcommittee should develop the proposal in writing and present it to the Task Force. If Leaf's concern were addressed we could begin the process whenever deemed necessary.

(Wilkinson): We could amend the motion to the above, with "the amendment process can be initiated at the request of the chair" added to it, which would allow responsiveness.

*** Action ***

Keith Wilkinson will draft this proposal and present it at our next meeting for discussion.

Discussion tabled until next meeting.

New business:

*** Motion ***

(Wilkinson): I would like to see Mr. Elwood Miller of the Klamath Tribe be placed on Technical Work Group to represent the Tribe.

(Hillman): 2nd.

*** Motion carried. ***

*** Action ***

Mr. Elwood Miller will represent the Klamath Tribe on the Technical Work Group.

Agenda item: Task Force discussion, action, assignments to complete the Upper Basin Amendment.

(Shake): What's the next step in this adoption of the upper basin amendment? It was suggested that we edit the plan as per the subcommittee's review of the comments, and then to make that edited version of the plan available to all interested parties, including a summary of the comments. This will be accompanied with a Federal Register notice indicating availability of the amendment. That would take care of the amendment.

(Wilkinson): Staff has the ability to do editorial work on the plan. I hope that it will be relatively soon. I would also suggest an immediate expansion of educational materials be made available to upper basin schools.

*** Action ***

KRFRO staff will proceed with editorial work on the upper basin amendment, including preparing the Federal Register notice of availability.

Discussion item: Further discussion of draft letter prepared by Nat Bingham and John Wilson. Subject: Request for evaluating hatchery impacts and considering trucking juveniles. (Attachment 13)

(Reynolds): A copy of the letter should go to the director of CDFG. I would ask John Hayes if there is a policy on hand that would prohibit trucking?

(Hayes): Yes, I think goals and constraints of hatchery operation guidelines would prohibit that.

(Reynolds): That has to do with the disease spreading issues and straying of IGH stocks into other drainages. Other than that, I don't see anything wrong with the letter.

(Shake): What about the substance of the request?

(Reynolds): It's a recommendation for CDFG to do a little work, but I think it needs to be done.

(Pierce): There is a policy in Chapter five of the long range plan that addresses this issue. After much discussion, the Task Force agreed that you didn't want to close the door on trucking, but the comment was put in specifically to address the trucking issue and use of eggs offsite. It was understood at the time that trucking wasn't something we considered as a proper management method.

(Shake): Yesterday, we didn't disagree with the possibility of trucking. We're responding to a critical need.

(Bingham): We're asking that these recommendations be considered, and for an assessment of the consequences. Just because of a policy in the plan we shouldn't have our hands tied.

(Lara): The fish are going to stray.

(Hayes): There is evidence that that will happen, as exemplified in Trinity River releases and releases at IGH.

(Wilkinson): I have a concern that there is nothing in the letter indicating the temporary nature of the request.

(Bingham): We can add something that speaks to that.

(Orcutt): I believe the letter should contain supportive information, not speculation. Natural and wild populations are not considered. I object to this letter because wild stocks are what we manage for, not hatchery stocks. We are committed to restoring wild stocks. Also, another thing that bothers me, we're making a recommendation to CDFG. In so doing, it is a commitment by the Task Force. A decision may be made by CDFG that will affect us.

(Shake): We stated yesterday that we are not the managers. We're simply making a recommendation. The question is to make or not to make the recommendation. If we object, we'll not send the letter.

(Bingham): I hear two solid objections to the letter. I would offer the draft letter to the opposition for redraft.

(Orcutt): I don't think that I can write the letter to fit your objectives.

(Bingham): Then, the question to ask the Task Force is "Are we comfortable with the status quo operation?" If so, we should kill the letter.

(Hillman): This Task Force should take a hard look at the real issue which is water quantity and quality. The present water release strategy at Iron Gate Dam is fatally flawed.

(Holder): I made the original motion in response to public's concerns and request for action to alleviate the concerns. I think it would be good to specifically address the short-term problem, that of the drought, while we try to work out the long-term problems. We're asking for an analysis to see whether current hatchery management strategies are working.

(Shake): I'm not clear on the concerns being expressed here. Is it straying and impacts on wild stocks? Or is it competition between wild and hatchery stocks? If we don't want to do anything, we are saying that the risk of competition between wild and hatchery juveniles is not as great as the risk of straying. I'm hearing that the concern for straying is greater than the concern for impacts of hatchery fish on wild stocks.

Q: What was the position of this group in responding to the KMZ Coalition proposal?

(Shake): To respond with a letter, indicating that the professional review was performed. Since that time water conditions have become more severe, and this is not a final say on this issue.

(Hillman): I understood that the technical people were to look at the recommendation, and a response was to go to the coalition. The discussion and final statement at the LaJolla meeting by technical people was, I thought, our response to this issue.

(Bingham): I read all of the technical reports, straying was presented as a concern (and I agree). Again, this letter is to perform a risk assessment of the issue. The bottom line, no one has proven straying is bad for the resource. The consequence is supposition, and the real consequence is that 3 million fish are to be put in on top of the wild stocks.

(Hayes): Our smolts go out behind the naturally produced fish in the system. What we're talking about here is that there are a lot of wild fish in transit down river, if we truck hatchery fish to the estuary, they'll be ahead of the wild fish, and saturate the estuary.

(Pierce): The concern presented by the coalition was that increased hatchery production has created excessive competition between hatchery and wild fish. This year's releases should be similar to the numbers of fish stocked before drastic increased releases occurred. John is right, that trucking fish to the estuary will severely impact wild stocks. We're not addressing the issue the coalition brought up about releasing excessive amounts of fish.

(Orcutt): This group, by saying nothing, is not necessarily accepting status quo. There is a meeting scheduled of the chairs to discuss this issue.

(Reynolds): We're trapping Shasta River and Bogus Creek fish to determine what the interactions are between hatchery and wild stocks. We're prepared to make

some assessments of the situation based on that data. The tone of this letter is that CDFG should consider trucking IGH smolts this year. If this Task Force doesn't support it, the letter should be changed.

(Wilson): Certain hatchery releases also demonstrated a high straying rate, much higher than some groups released offsite. There's no guarantee that by releasing fish onsite you will prevent straying. Release site and timing is something that can be controlled, water delivery and temperature isn't controllable. Also, fish might be trapped upriver this year by thermal barriers. If action isn't taken this year, we may be set up to lose fish like 1987. This is a reaction to a natural phenomena. If the hatchery is susceptible to natural conditions, then maximum production each year can't be maintained. Those 3 million fish to be released at IGH in May will impact wild fish. CDFG is in best position to evaluate those risks.

(Farro): A question to those folks opposing this... Are you uncomfortable with having the CDFG look at this issue and making their own decision?

(Orcutt): The CDFG is well aware of the intent of the proposal for trucking. I can't support it because of the risk factor.

(Hillman): In response to Mitch's question, I would like to refer back to the comment from CDFG about the letter, and what the letter implies. The tone of the letter is a request to truck fish downstream.

(Pierce): A suggested changed: Paragraph 2, last sentence should read "request CDFG to critically analyze the following alternatives", and after bullet 5, to include "The Task Force policy requires an analysis of disease transmission (Policy 5.A.1.b of the long range plan." So, the tone is changed from a recommendation to truck, to analyzing the issue.

(Bingham): Would you be willing to take the "critically" out?

(Pierce): It's up to the Task Force.

(Orcutt): All of these things need to be looked at, and I can agree with the letter as simply a request for analysis.

*** Motion ***

(Bingham): I'll move to change the suggested language, and add the paragraph referencing our policy.

(Lara): CDFG has already told us that there is evidence of straying. The information is already known. The question is whether we plant fish up there, or down in the lower river. I'm concerned with releases at both ends, it sounds to me like the fish are going to impact them both ways. I'm not for trucking fish down to the lower river.

(Hillman): In the first paragraph of the letter we refer to severe stress caused by low flows and high water temps. Everyone is aware of the conditions, but have they been documented. CDFG has documented that these fish have not moved out?

(Reynolds): Yes.

(Shake): Yes, the Arcata USFWS Office is doing downstream migrant monitoring, and haven't seen the fish.

(Farro): I would offer to the tribes that their fishery programs should be looking at downstream migration conditions in the rivers. I suggest to the tribe that they begin documenting conditions.

(Bingham): I appreciate the spirit of compromise here by the tribes. I support the letter as modified, let's call the question.

*** Motion failed. ***

Agenda item: Action planning.

(Iverson): We put this item in the draft agenda because it seemed like action planning hadn't been brought to closure after the LaJolla meeting. You have prioritized some of the policies from the long range plan, about 30 of them. That prioritized options field was sent out with the FY93 RFP as guidance on how the Task Force sees prioritization of those policies. There was discussion at LaJolla whether there was endorsement of that prioritization, and whether it would be worthwhile to extend the prioritization to other policies. The discussion item is whether you want to do further prioritization. One option was to leave planning to local groups. Another option would be to have a detailed, complete set of priorities prepared by the Task Force, and provided to local groups for guidance, with various possibilities in between. Action planning as set out at the Brookings meeting has only been partially completed. You should decide how to carry on.

(Shake): Didn't we talk about certain items in the plan not really fitting the subbasin approach, and those would be acted upon by this Task Force? The others would be developed by local groups.

(Iverson): Yes. Some policies are only applicable to basin wide level.

(Shake): Do you have a recommendation on how we should go?

(Iverson): If this planning is turned over to local folks, it appears that they will have much difficulty with it. I recommend more Task Force effort at it, possibly involving Dave Mackett again.

(Bingham): Maybe the planning subcommittee should work on this some more. ISM is doable on a PC. Dave Mackett is using a PC now. We need his skills as a facilitator. We have two options: 1) to go through this in a facilitated meeting, or, 2) to do it by subcommittee.

(Shake): We've approved subbasin concepts earlier today. We have a packet of stuff put together in LaJolla to consider now. The question is to give this packet of stuff to subbasin groups, or to further refine it before handing it over.

(Bingham): I would suggest that the committee consider all policies in developing an action plan. The committee could prepare a report to the Task Force.

Q: Would this be an effort to prioritize policies?

(Bingham): It ties into the ranking process used by the Technical Work Group. They would take the prioritized list of policies when ranking funding proposals. Most of the problems with the Klamath basin are already identified in the plan, and action planning is where we go about the process of deciding what we're going to do.

(Shake): Would you put your comments in the form of a motion?

*** Motion ***

(Bingham): I move that this action planning be turned over to the planning committee for further work. All Task Force members are welcome to participate.

(Shake): We have, because of the LaJolla process, some guidance to give to the Technical Work Group this year, but more is needed. I support the motion because we need to continue identifying policies needing action planning. When completed, we would give the refined product to the Technical Work Group.

(Bingham): I would request that the planning committee have the latitude to take things from the long range plan and place into the action plan.

(Shake): I would expect the committee to do that. And expect these things to be highlighted for discussion at our Task Force meetings. We agreed in LaJolla that if we gave our planning product from that meeting to the public, it would probably confuse them.

(Orcutt): I would suggest that the Technical Work Group have some input to the committee's product, because the TWG is responsible for using the action plan.

*** Motion carried. ***

*** Action ***

Planning committee will meet to further develop the action plan. Time and location of meeting will be decided by the committee.

Agenda item: Annual work planning, Fiscal year 1993.

[There was some confusion as to what this agenda item was to include. Chairman Shake asked Ron Iverson to describe it.]

(Iverson): This was discussed in the past. We're looking forward to an upcoming fiscal year and we have a detailed set of policies in the long range plan that are supposed to guide our restoration efforts. The question is "what is proposed to be done by various entities represented on the Task Force?" This question is especially addressed to those representatives that have the ability to pursue accomplishment of the policies. This report is for those representatives to say

what it is they intend to do in the upcoming fiscal year. The reason for this discussion at this time in the funding cycle is that it will provide an idea of where tribal and agency dollars are to be spent in the upcoming fiscal year, including where work will be focused. There might be a need to put more focus on funding proposals where agencies are not addressing the policies. Another advantage is that you might identify some overlaps where two or more entities are intending to do the same thing, where coordination might be considered. We have never in the past laid out what each agency plans to do. The intent is to allow this group to work from a basis of complete knowledge.

[Many Task Force members indicated that they were not prepared to give these reports. Chairman Shake requested that each member provide a written report to KRFRO for later distribution. The Task Force agreed to hear the report prepared by the Department of Interior (Attachment 14).]

*** Action ***

Task Force members will prepare a written report on their upcoming restoration activities. Specifically, reports will address how policies in the long range plan will be achieved. Reports should be received at KRFRO before the May 18-21 TWG meeting.

Report from Hoopa Valley Tribe, on the green sturgeon project.

(Orcutt): In 1989-90 the Hoopa tribe was involved in habitat assessment and restoration of Pine Creek. Last year, FY1991 the Tribe was funded to implement watershed restoration projects in the Pine Creek drainage. Some of that work is ongoing. In 1992, we have a proposal to monitor green sturgeon. Last year there was concern expressed by some of the Task Force members that green sturgeon monitoring projects should be lower priority than those dealing with salmonids. We were assigned to sit on a subcommittee of tribal members and agency employees (USFWS and CDFG) to formulate a more systematic approach dealing with the long-term data needs and to coordinate our efforts. The subcommittee hasn't met. I've talked with other committee members, and we're planning to get together. The proposal process is underway again, and I hope that those wanting to be involved in the green sturgeon monitoring projects can do so. I will also provide a written report to KRFRO. Some activities you might wish to be advised of: 1) The Hoopa Tribe Timber and Forestry department has gone to great lengths to gather support from the tribal council to provide adequate riparian protection. 2) We're developing an integrated resources management plan for the Hoopa Reservation. We'll have more of a written report on these activities.

Agenda item: Status of FY1993 RFP process.

(Shake): We have a copy of a letter from Ron Iverson calling for a budget committee meeting on May 22, in Redding. I urge you to attend the meeting and put together a packet of projects for funding.

(Alcorn): (Describing the FY93 RFP process). The ad hoc committee to develop the RFP met in February. The RFP was sent out in mid-March, with a closing date of April 24. We received 106 funding proposals. Staff will mail out copies of all proposals to TWG and budget committee members by May 6. All Task Force

members can receive copies of proposals if you notify us that you want them. The TWG is scheduled to meet May 18-21, with proposer comment on the 20th. The Federal Panel is scheduled to meet that same week in Redding to review all of the proposals for sufficiency for government contracting. The list of acceptable proposals will be hand carried to the TWG with commentary. This list will be provided to the TWG by Wednesday the 20th. The budget committee will then meet on the 22nd, to determine funding amounts by category. This workplan will then be provided to the Task Force for consideration at your June 15-17 meeting to develop the final FY1993 workplan.

[Discussion ensued regarding the scheduling of the Federal Panel, with a request being made to have the Federal Panel meet the week prior to the Technical Work Group meeting.]

*** Action ***

KRFRO staff will attempt to reschedule the Federal Panel meeting for the week prior to the Technical Work Group meeting.

(Bingham): Jimmy Smith cannot sit on the TWG as my representative. I would like to nominate his replacement just before meeting. I will notify Bob Franklin.

(Farro): As a non-agency individual, it's difficult to respond to that request to be at the meeting to support proposals. I don't have a solution, but it's just a shortcoming in the process.

(Shake): We've gone over this process many times. As we go through the process, we might look at it in order to modify and improve it. To change now would confound the process.

*** Action ***

KRFRO as well as Task Force and TWG members, will examine the process to look for ways to improve it.

(Shake): I would ask Forrest for an update on the CDFG proposal ranking process.

(Reynolds): We've forwarded copies of all CDFG proposals in the Klamath River basin to KRFRO. We are to convene a review panel to sort through them. We'll be getting through these shortly. We are not authorized to provide funding other than salmon stamp and Prop. 70 money. These only provide money for habitat restoration projects. About $350,000 comes from cigarette tax monies. Salmon stamp revenues are way down. A couple million dollars remain in the Prop. 70 program. (Prop. 70 is the Parks and wildlife initiative--State Bond Act.) Prop 70 resulted from an effort from Zeke Grader (PCFFA) to get additional verbiage in the Act that provided about $10 million for salmon habitat, and $7 million for habitat if any money is left over from a wild-trout hatchery, which will take it all.

(Bingham): The Prop. 70 funding source is about out of money, and the committee will try to get another initiative on the ballot to continue funding. There is not as much voter support.

Agenda item: Administrative.

(Shake): Are there any suggested agenda items for our June meeting? The majority of the meeting will be taken up by the budget process.

(Wilkinson): A written proposal on the plan amendment process is to be discussed.

(Orcutt): A hatchery evaluation status report should be included. The report should be for the long-term and short-term issues we've discussed here at this meeting.

(Shake): A report on the long term evaluation may not be available until the chairs meet. Do we have a date and location for that meeting?

(Iverson): The meeting of the three chairpersons is set for Friday, June 26 at the Federal Office Building, Bureau of Reclamation Office in Sacramento.

(Shake): The Task Force meeting is scheduled for the 15-17th of June. In Trinidad or Eureka. Additional agenda items: 1) a report on briefing for Klamath Compact Commission Chair Anna Sparks on May 6, 1992, and 2) a discussion of CDFG permit regulations for suction dredge mining.

(Hillman): Where is the meeting with Sparks to be held, is it open to other folks?

(Iverson): It's in Eureka but I don't know exactly where, I don't know if it's open. It's up to her. We can find out.

(Shake): We might think about asking her to attend a Task Force meeting, and provide a report of our activities to her. We could also discuss with her the importance of minimum flows in the Klamath River. If you have any other agenda items, notify Ron Iverson. We have a public comment period scheduled for the end of this meeting. We've also got a report scheduled at 1:00 pm from the Shasta Valley CRMP.

Public comment:

Ken Super (Quartz Valley Indian Reservation): The Quartz Valley Indian Reservation has recently received federal status. We would like to get involved in this restoration work. I've talked to ranchers, and have read your restoration plan. The ranchers are mostly willing to work with the Task Force, however, due to the fact that work will occur on some of their lands, they want to be involved and provide input on planting and stability projects. We live with ranchers in Quartz Valley, and they have the best interest of fisheries restoration.

(Shake): I suggest you get on the mailing list, and you have opportunity to attend all of our meetings.

(Thackeray): You will be interested to know that a Scott Valley CRMP is forming there. You'll get an invite to the next meeting.

Marcia Armstrong (Siskiyou Daily News): It is difficult for the public to travel to all of your meetings because of the distance. I suggest that you find facilities that have television cameras available for people to watch from distant areas. The second thing I want to point out is that the media needs to have briefing information prior to these meetings to accurately cover them.

Unidentified: Will the public be able to get the reports to be compiled of all activities by Task Force entities? If so I would like a copy.

(Iverson): Yes.

John Wilson: I would like to thank you for considering the issue brought up by the coalition. I feel good about the communication we've had here.

Jim Welter: One thing that bothers me is that the main thrust of our proposal was to reduce impact of hatchery stocks on natural production. All I've heard at this meeting is a discussion of the trucking issue. You must work to reduce impacts of hatchery fish on wild fish.

End of Public comment.

Report: Shasta Valley CRMP Coordinator.

(Dave Webb): You funded my 1/2 time position to coordinate restoration work in the Shasta Valley for FY1992. We have submitted proposals for FY1993 funding to fence 11 miles of the Shasta River. We've got 1.75 miles already funded. We've planted 12,000 willow slips. We're developing our own home-grown GIS system. We've developed a streambank/riparian area evaluation system. We're documenting where restoration efforts might give the greatest benefits. We were able to provide a photo used on the portable display developed by Paula Yoon. We've documented habitat and riparian area conditions on the Shasta River. I've developed a slide show and made several presentations. I have also made myself available to teachers to assist them in revegetation and fish rearing projects. I've provided tools and other materials for these projects. We were able to secure permission from a landowner to install an outmigrant trap on the river to monitor salmonid production. We trapped many young-of-the-year juveniles, indicating that there is still good production occurring in the Shasta River. Coho, chinook, and steelhead are getting up to the upper basin and successfully spawning. I'm working with the KRFRO to get liability coverage for volunteers. Working with volunteers is slow and expensive, but essential to achieve the restoration. Part of my job is to meet landowners to discuss fishery issues, and explain why their cooperation is necessary. Issues that come up continually are:

> Why are landowners considered responsible for the collapse of the Shasta River chinook stocks, when harvest of stocks is excessive, and identification of these fish is uncertain? They emphasize the need for adequate escapement.
>
> They find it hard to believe that the riparian conditions were different in the past. I can look in historic references and cannot conclude that

riparian growth was substantial prior to the 1930's. How can I propose to these landowners that habitat problems are the only source of the problem when fish existed while habitat was the same. These people conclude that no matter who is responsible for the most recent declines, we are all responsible to improve runs.

I present these conclusions to you because I work for you. I hope you'll take these issues and consider them, and take whatever means you feel is appropriate to the PFMC, that their actions have the potential to undermine my effectiveness in the field. We will do our part to restore the fishery. With your help it won't take long.

(Wilkinson): Dave, my experience with the volunteer program in Oregon is that it was neither slow or expensive, but was very profitable. There were 10,000 volunteers, raising over 1 million fish per year. Regarding your implication that overharvest is resulting in declining stocks, I ask that you review the data, and seek an opinion on the causes for declines of these runs. There are some things going on that we don't understand.

(Webb): In response to your comment about volunteer work, it is expensive in terms of my time. I agree with you that volunteers are the only way we can achieve the restoration goal.

(Wilkinson): If I'm going to have any success on this Task Force, it will be represented by KRFRO staff that will be an interacting force between the Task Force and volunteer groups. It is clear that these groups are necessary for the success of this program.

(Shake): Regarding the harvest decisions of the PFMC. I have expressed concerns regarding harvest impacts on returning fish populations. In defense of the council, everybody is extremely concerned about habitat. The council is looking at ways to be more effective. The Magnuson Act indicates that the PFMC can make recommendations to agencies, with responses required. There is a lot of power at the council in terms of individuals representing various entities which affect habitat. The message you can carry back to the farmers is that harvest conservation is certainly a key issue, but even more important to the council are the habitat conditions.

(Wilkinson): You might want to contact the Oregon STEP program coordinator in Portland regarding the issue of volunteer liability.

(Farro): I appreciate the frank comments from Dave. We need this kind of feedback. Our investment for on the ground, watershed based groups is hopefully going to get us this same kind of feedback.

[Mrs. Hart, secretary of the SVCRMP read attachment 15.]

(Shake): In terms of asking us to pass your message along to the PFMC, it relates to what I said earlier to Dave. I will pass this message along, that there is concern to allow adequate escapement.

(Hart): I would invite you to send your habitat specialists to view this habitat.

(Shake): The PFMC does not have habitat experts, they have a committee of concerned individuals who use the council to inform agencies on the habitat issues. CDFG and tribes have good biologists that may wish to tour the Shasta River with you.

(Reynolds): CDFG biologists were fully apprised of the need to meet the inriver escapement goal. Even without fishing those escapement goals wouldn't be met this year. There was tremendous pressure to open the commercial season. Everyone agreed that fishing into the floor was not good biology, however the department is dealing with the issue of keeping a livelihood in place.

(Wilkinson): To improve communication between the agricultural and ocean fishing communities, I can provide your CRMP with ocean or coastal perspectives so you will know what our concerns are.

(Orcutt): The Hoopa Tribe will commit to be available to look at this watershed.

(Hillman): I wish to thank the CRMP for extending an invitation to the tribes and other interested parties to be involved in the effort.

(Farro): Speaking for Humboldt Co., I feel remiss in not offering to be involved over here. Communication is necessary, and I will commit to be more involved.

(Holder): My congratulations to the SVCRMP for enlisting volunteer work, for providing local public information, and for your habitat restoration efforts.

Public comment:

Unidentified: The local California Conservation Corps is to be abolished in July because of funding shortfalls. They have been very involved in education of the public. There is also a perception that large offshore fishing fleets are taking salmon in large numbers. This Task Force should try to clarify that perception, whether it's accurate or not.

(Shake): An issue concerning salmon harvest this past year is the by-catch of juvenile salmon in the whiting fishery (shore-based and factory trawlers). There is an observer program required on those vessels. The council has changed the boundaries and fishing techniques to minimize impacts on the salmon. Regarding the high seas drift net fisheries, the foreign fleets do intercept salmon and steelhead, but most fish are sockeye and chum salmon. Coho and chinook are near-shore species and don't range far out into ocean. Impacts on Klamath River stocks are minimal. Recently there was legislation passed where the United States supports a ban on high seas gillnetting. The U.S. is phasing this out.

<u>Discussion of the sound system demonstrated at this meeting:</u>

(Shake): What do you think of the sound system?

(Sumner): It helps me because I'm hard of hearing.

(Wilkinson): I think it's a necessity.

(West): I'd like to know the cost. There's a significant concern by the local public regarding how administration monies are being spent.

Announcement:

(Holder): Local, federal, state, and county officials have put on Natural resource meetings for public awareness. A meeting on riparian area restoration is to occur on June 10 in Yreka. You are encouraged to attend.

Closing comments:

(Shake): Everyone in the country is aware of the status of the west coast salmon runs. The route of the problem is habitat condition. It's incumbent upon all of us to get the word out to all regarding the problems. It's the only way for us to get people involved in habitat restoration efforts on a large scale. If no effort, we'll have status quo.

(Thackeray): Could you clarify the statement that it is habitat and not harvest?

(Shake): I'm talking about drought problems, not just degradation. It's a combination of a whole host of things, loss of habitat, degradation, ocean survival, drought, and El Nino. It's time that the whole country wakes up to the issue. Many folks are talking about a west coast salmon restoration initiative that will assist further in habitat restoration.

(Reynolds): To add to what you said, the drought is coast wide and is impacting all anadromous fish stocks. The state government tells us that this is not the time to ask for money because of fiscal problems, but the timing is right regarding the fact that the issue is hot and on everyone's minds.

(Farro): On the issue of trucking fish, I feel serious frustration when we're making a decision not to try and use the best science available to deal with the situation. We must look at what our best option is. I ask that we all put aside our agendas and work cooperatively to achieve the restoration.

(Shake): Thank you all for attending. Meeting adjourned.

ATTACHMENT 1

KLAMATH RIVER BASIN FISHERIES TASK FORCE

Attendance Roster, April 28-29, 1992 meeting in Yreka, Oregon.

Task Force Members Present	Representing
Nat Bingham	California Commercial Salmon Fishing Industry
Mitch Farro	Humboldt County
Ken Graves for DeVol	Del Norte County
Leaf Hillman	Karuk Tribe
Barbara Holder	U.S. Department of Agriculture
Walt Lara, Jr.	Yurok Tribe
Matthew Leffler	Trinity County
Michael Orcutt	Hoopa Indian Tribe
Forrest Reynolds	California Department of Fish and Game
Bill Shake (Chair)	U.S. Department of Interior
Dick Sumner	California In-River Sport Fishing Community
George Thackeray	Siskiyou County
Keith Wilkinson	Oregon Dept. of Fish and Wildlife

Task Force Members Absent	Representing
Rod McInnis for Fullerton	National Marine Fisheries Service

Others Attending	Representing
Chuck Lane	U.S. Fish and Wildlife Service, Trinity Office
Mike Dowling	Self
Jim Welter	Klamath Management Zone Fishery Coalition
Fred Schutte	KMZ Fishery Coalition, Brookings Port
John Wilson	Klamath River Technical Advisory Team
Wayne Callagan	Deborah Callagan Construction Company
John Hayes	California Department of Fish and Game
Marcia Armstrong	Siskiyou Daily News
Joyce Jones	Northern Calif. Indian Development Council
Craig Bienz	Klamath Tribe
Elwood Miller	Klamath Tribe
Bob Davis	U.S. Bureau of Reclamation, Klamath Project
Dave Webb	Shasta Valley Coordinated Resource Mgt. Plan
Gary De Salvatore	Siskiyou Co. Fish and Game Commission
Francis Berg	U.S. Bureau of Land Management, Redding Office
Dick Johnson	U.S. Bureau of Land Management, Redding Office
John Dawson	California Department of Fish and Game
Dick Cowardin	Self
Harold Tripp	Karuk Tribe
Bob Rohde	Self
Mike Morford	Self
Bob Bartholomew	U.S. Soil Conservation District, Yreka District
Sari Sommarstrom	Self
Richard Bersch	Copco Lake

Others attending	Representing
Susan Hart	Shasta Valley Coordinated Resources Mgt. Plan
Ken Super	Quartz Valley Indian Reservation
Mark Buettner	U.S. Bureau of Reclamation, Klamath Project
Felice Pace	Klamath Forest Alliance
Chet Bowling	U.S. Bureau of Reclamation, Central Valley Proj.
Richard Dragseth	Fruit Growers Co.
Mike Bryan	Klamath Basin Fisheries Task Force, Tech Wrk Grp

ATTACHMENT 2

KLAMATH TASK FORCE

AGENDA

MEETING OF APRIL 28-29, 1992, YREKA, CA

Tuesday, April 28

ADMINISTRATIVE (0900 - 0930)

Review, approval of agenda and previous minutes

TECHNICAL REPORTS

Land management (0930 - 1200)

Status of management plan, Klamath National Forest (Holder)

Salmon Basin watershed inventory and spring chinook restoration (West)

The "Gang of Four" Report (West)

Management of BLM lands, Klamath basin (F. Berg)

Siskiyou County land use plan and water policy (Thackeray)

Water management (1:15 - 2:30)

Report of the Bureau of Reclamation on 1992 water outlook, Klamath and Trinity Rivers (C. Bowling, R. Davis)

Fish management (2:30 - 5:00)

Report of the stock identification committee (Barnhart)

Report of the American Fisheries Society on status of anadromous stocks, northwest California (S. Dobush)

Status of hatchery evaluation (Klamath Technical Advisory Team w/commentary by Nat Bingham)

Status of 1992 harvest management (Wilkinson)

Wednesday, April 29

PROGRAM PLANNING

Watershed-based planning (8:00 - 9:00)

Report of the planning subcommittee, on watershed-based restoration planning (Bingham)

Public comment on watershed-based planning

Task Force discussion, action, assignments on procedure for watershed-based planning

Wednesday, April 29 (Continued)

Upper Basin Amendment (9:00 - 10:00)

Report of the comment review committee (Wilkinson)

Task Force discussion, action, assignments to complete the Upper Basin Amendment

Action planning (10:00 - 11:00)

Task Force discussion, action, assignments on completing prioritization and scheduling of long range plan policies

Annual work planning, Fiscal year 1993 (11:00 - 2:00)

Task Force commitments to carrying out long range plan policies, FY93:

- Agriculture
- CDFG
- Hoopa Tribe
- Interior
- Karuk Tribe
- Yurok Tribe
- Other commitments

Status of RFP process (Alcorn)

- Public comment on annual work planning
- Task Force discussion, action, assignments

NEW BUSINESS (2:30 - 3:00)

PUBLIC COMMENT (3:00 - 3:30)

ADMINISTRATIVE (3:30 - 4:00)

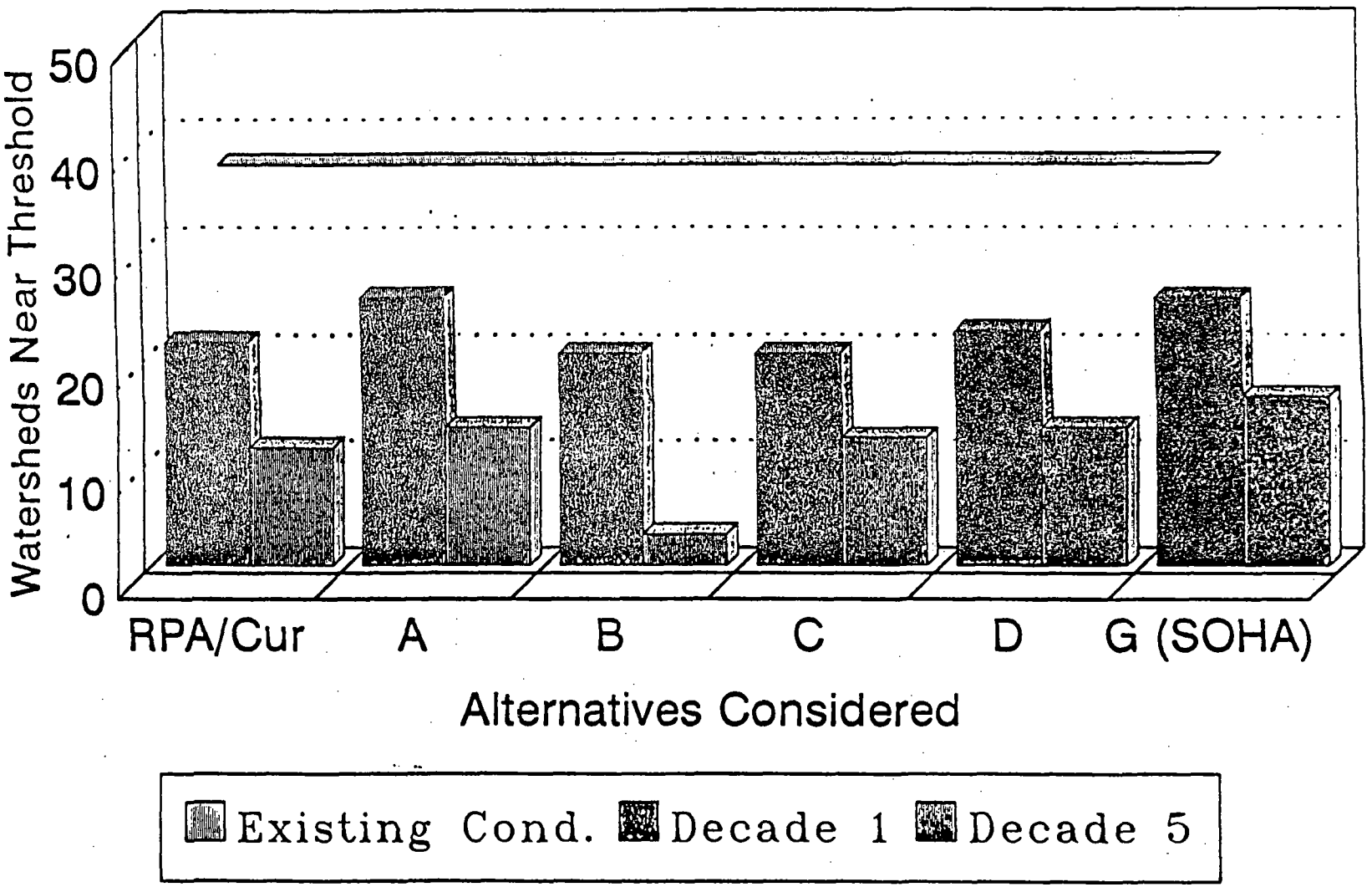
Agenda items for June meeting

Assignments

Adjourn

Alternative Comparison

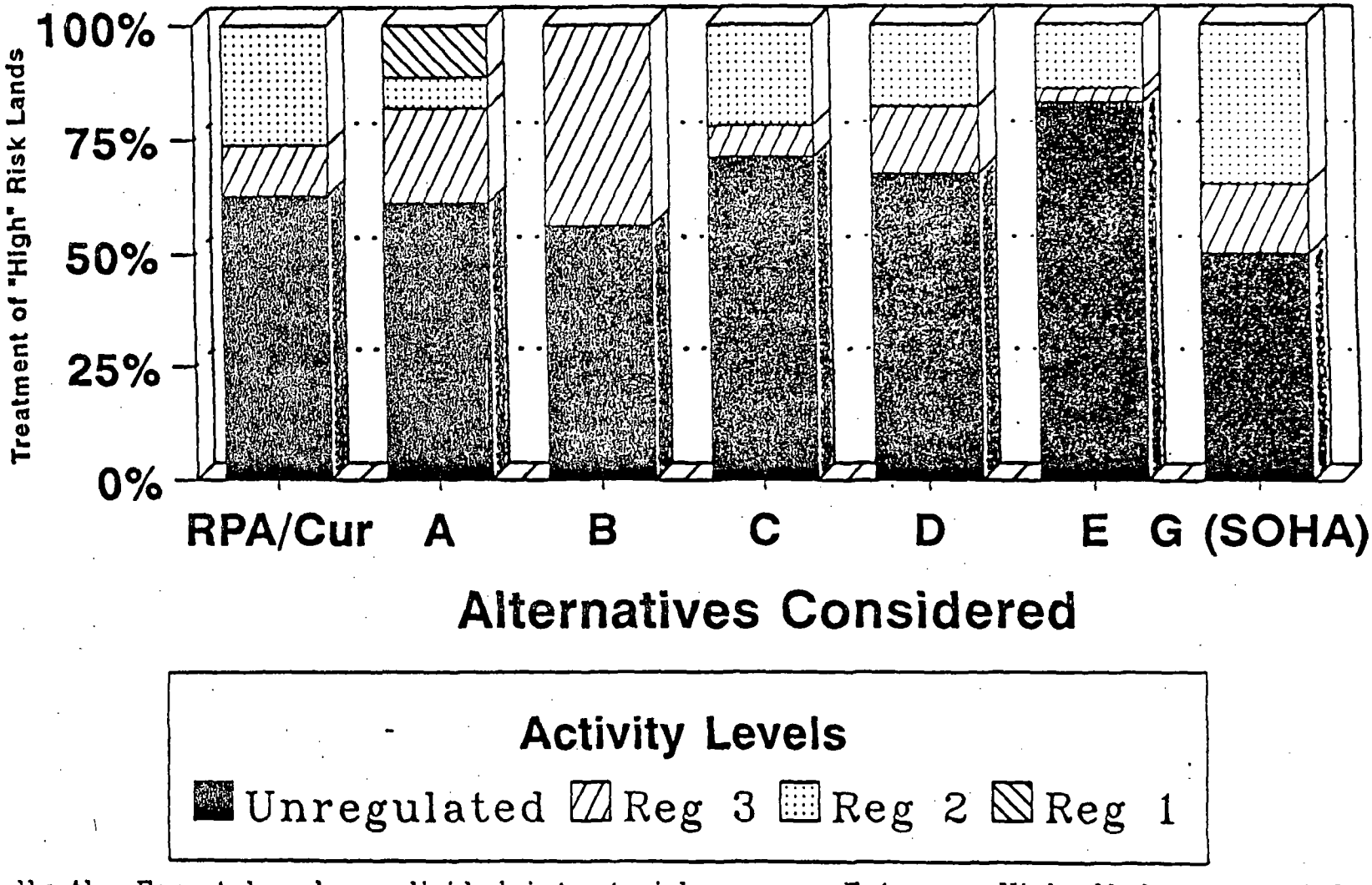
Watershed Conditions Over Time



There are a total of 111 watershed clusters being analyzed in the Forest Plan. The graph represents the number of those watershed cluster that are estimated to be within 90% of the "Threshold" levels. Thresholds are those levels that indicate to the Forest that more indepth study is needed.

ATTACHMENT 3

Alternative Comparison
Management of Sensitive Lands



Geologically the Forest has been divided into 4 risk groups: Extreme, High, Moderate, and Low. The extreme risk lands are not scheduled for a sustained timber harvest. The alternatives will treat the other groups differently. This graph shows how the alternatives treat the "high" risk group.

definitions in the following table will be used for

2/28/92

TABLE 1. GUIDELINES FOR DETERMINING MINIMUM SMZ WIDTHS

Stability			Minimum Horizontal SMZ Width (Feet) On Both Sides Of Stream		
Stream Class	Stream Channel	Sideslope	Perennial Stream	Intermittent Stream	Ephemeral Stream
I	Stable	Stable	300		-
		Unstable	300		-
	Unstable	Stable	300		-
		Unstable	300		-
II *	Stable	Stable	300	300	-
		Unstable	300	300	-
	Unstable	Stable	300	300	-
		Unstable	300	300	-
III	Stable	Stable	100	50	-
		Unstable	150	150	-
	Unstable	Stable	100	100	-
		Unstable	200	200	-
IV	Stable	Stable	-	25#	25#
		Unstable	-	100	75
	Unstable	Stable	-	50	25#
		Unstable	-	100	100

* For Class II streams, SMZ widths apply for fisheries values described in FSH 2509.

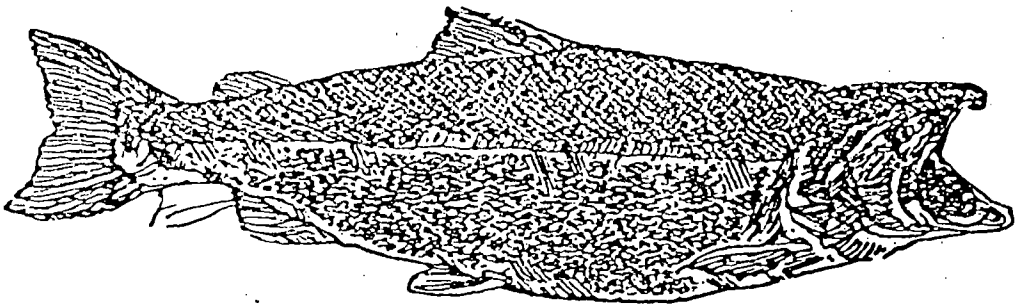
Soils

FY 92 SPRING CHINOOK PROGRAM-OF-WORK

The following program of work was developed to begin implementation of the spring chinook conservation strategy. All components of the program fit into the Action Options contained in the "conservation strategy".

Project	Estimated Cost	Product/Target
	SALMON RIVER R.D.	
Genetic Stock I.D. (coop)	$10,000 (CA 1)	Report from UC Northrdg.
Poaching Mgt. (Law enfcmt.)	$10,000 (CA1)	LEO days
Bioenhancement Env. Anal.	$20,000 (CA1)	Environmental Assessment
Instream Cover	$30,000 (CA221)	15 structures (MAR 36.2)
Spawning/Holding Inventory	$32,000 (CA1)	1090 acres (MAR 36.3)
Riparian Plant/Pond Devel.	$50,000 (CA222)	80 acres (MAR 36.1)****
Habitat Typing	$18,000 (CA1)	900 acres (MAR 36.3)
Road stabilization	$35,000(CA222,FW22,LT23)	50 acres (MAR 36.1, MAR 13.0)
Landslide Stabilization	$70,000(CA222, FW22)	19 acres (MAR36.1, MAR 13.0)
Program Operations	$30,000 (CA1)	Program Administration
SALMON R. SUBTOTAL	$305,000	
	HAPPY CAMP/UKONOM ZONE	
Spawning/Holding Inventory	$ 2,000 (CA1)	354 acres (MAR 36.3)
Riparian Planting	$ 5,500 (CA222)	4 acres (MAR 36.1)
Habitat typing Wooley	$11,200 (CA1)	560 acres (MAR 36.3)
Gates/Wooley rehab	$154,000(CA222,FW22,LT23)	70 acres (MAR 13.0, MAR 36.1)
HC/UKONOM SUBTOTAL	$172,700	
	SUPERVISOR'S OFFICE	
Program Coordinator	$20,000 (CA1)	1/3 FTE

TOTAL SPRING CHINOOK FY 92 PROGRAM = $497.700



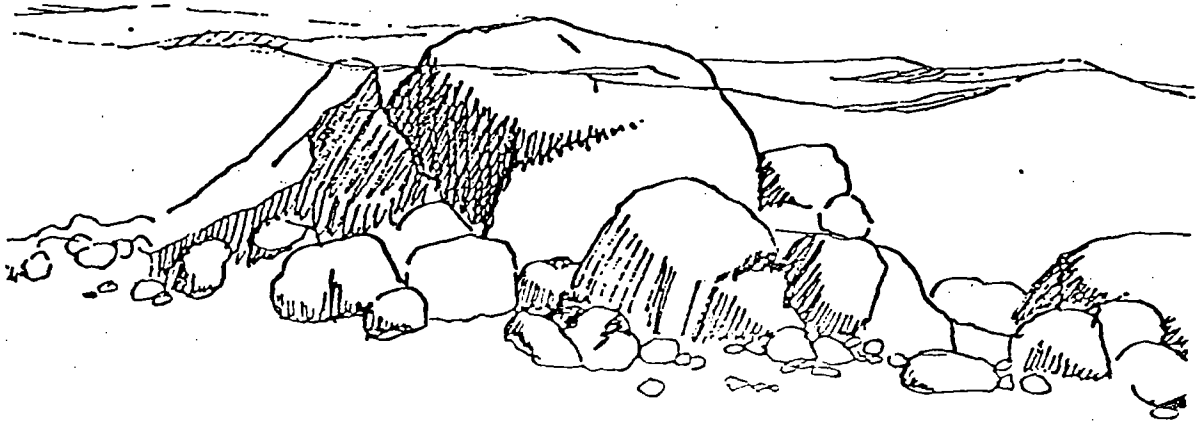
SPRING-RUN CHINOOK SALMON

For centuries the rivers of Northern California have been the site of an annual miracle. Each year, as regular as the sun rising, the salmon return to continue the cycle of life. Humans have held this yearly spectacle in awe since the first people came to this land and its rivers of fish. People have been linked to these fish for their food, spiritual guidance and culture, for thousands of years. In more modern times the salmon of Northern California still contribute mightily to our quality of life today. Some of these contributions include:

*a significant commercial fishery * support for a unique lifestyle * a quality food source * a sportfisheries that attract people from all over the country to rest, recreate, and fish the rivers of Northern California * a highly significant subsistence fishery to Native Americans who have lived along these rivers for centuries.

SOMETHING EXTRA SPECIAL

There is something else too. There is something special about a magnificent fish that endures so many hardships to return to the very place of it's birth after traveling hundreds, maybe thousands of miles, seemingly with a mission only to perpetuate the species. Not a day or a mile goes by without someone or something trying to catch it. Still, the species has survived for thousands of years. Salmon mean different things to different people, but knowing that they endure touches most people in an awe inspiring way. Even to those who do not fish, or eat fish, or depend on the commercial benefits of salmon, their loss would would leave a large void.



LOSING GROUND

Unfortunately, in many places the salmon runs have dropped dramatically. Some dipping to the level where they may be lost forever, without help. As you may already be aware, salmon populations are in trouble over much of the west coast of the continental United States. In fact, several stocks have been proposed for protection under the Endangered Species Act. Not one thing, but a combination of things is responsible for the decline. Heavy commercial, sport, and subsistence fishing; a history of stream altering floods and catastrophic fires; a string of consecutive drought years; poaching; certain poorly conceived roads, mining practices, and timber harvest units; El Nino ocean conditions, etc.. have all combined to reduce the fish populations. Too much pressure at the same time is taking a toll. Many activities, if done responsibly can be beneficial, but they must be balanced and properly implemented. One thing is certain however, action is needed to reverse this trend.

WHAT IS HAPPENING?
THE SPRING-RUN CHINOOK IN THE SALMON RIVER ARE IN TROUBLE.

Of immediate concern is the spring run of chinook salmon in Northern California's Salmon River. Salmon River hosts what may be the largest wild run of spring chinook remaining in California. While these fish were once abundant, recent population surveys show that their numbers have fluctuated widely and decreased in the last several years to returns of only several hundred fish. These indicators point out that this spring-run chinook is in serious trouble. How much trouble is arguable, but many authorities believe they may be "at high risk of extinction." It is clear, however, that they need extra protection and enhancement if the fish are to recover to stable population levels.

THREATENED AND ENDANGERED?

Some people have talked about petitioning to have the Salmon River spring chinook federally listed as a Threatened or Endangered Species like the spotted owl. At this time there have been no formal proposals to list. It has been strongly debated, but all sides of issue tend to agree on one thing. It would be better for the fish and for the people affected to accomplish recovery mutually, without formal listing. This demands, however, that there will be cooperation, understanding, and perhaps sacrifice on all sides. The recovery of the fish would eventually benefit all. Listing in and of itself doesn't help a species, it just makes things extremely messy. Listing would probably include inflexible restrictions to river use and adjacent activities; initiate a very complicated, time-consuming, and costly, paper process. It would probably pit special-interest groups against one another instead of focusing on cooperative solutions. Litigation usually results. Worst of all it could hamper the implementation of projects that would be beneficial for the fish. Action taken to prevent listing is much more productive, both for the animal and the people. This type of strategy would keep problem-solving at the local level where effective and workable solutions can be worked out.

HOW ITS LOSS COULD THIS AFFECT YOU

The spring-run chinook, which along with all other species of salmon contributes so much to our quality of life. Think how life would be different if the fish were to go extinct. What would the Salmon River be without salmon.

But...how about the effect on people if the fish were to become listed, or worse go extinct. If the fish were to be listed it is likely that restrictions to our fishing practices, and many other fishing related traditions and industries would be imposed. Fishing moratoriums could be invoked. In addition, land use practices, which may impact fish habitat, such as logging, mining, water use, recreation, and many other uses could be severely restricted. This could have a major economic and social impact that would affect large numbers of people.

WHAT SHOULD BE DONE?

The United States Forest Service is responsible for providing for a sustained flow of renewable resources, including fish, quality water, timber, minerals and many others from the National Forests to meet the needs of the nations' people. The Klamath National Forest recognizes the seriousness of the situation and the possible consequences to the fish as well as the implications to industry, economy and peoples's quality of life. We, as resource managers, have a responsibility to help the fish and continue the benefits for as many people as possible. We feel that we are in a unique position to bring together people from different agencies, different view points, and different values to initate a strategy satisfactory to all.

WHAT HAS BEEN DONE SO FAR?

The Klamath National Forest began developing an action strategy to turn around the alarming population decline of the spring-run chinook last spring. A central part of that effort has been the involvement of representatives of many interests and agencies that are concerned about the future of this fish. Our efforts have focused on developing a list of action items designed to restore and improve high quality salmon habitat in the Salmon River basin. This list has been completed, and many projects have been funded and will be implemented in 1992.

WE NEED YOUR UNDERSTANDING AND ASSISTANCE

This action strategy takes an aggressive approach to sustaining and enhancing the wild population of spring-run chinook in the Salmon River. This approach will not be cheap, and it will not be easy, it may not even be enough. But if action isn't taken soon the fish will likely be lost within several decades.

To implement this strategy we realize that you need to understand the issues and believe that this is the right way to go. Each of us can have some effect as individuals and organizations. We invite you to participate in any way that you can. If we join together as partners we can focus our combined talents and expertize on bringing the spring-run chinook back to healthy population levels. Even if you can't be a partner we want to hear from you and we would like to explain why we feel the Action Strategy is important to further the rebound of the spring-run chinook in the Salmon River. The important thing is that you get more information to make an informed choice.

Through our joint efforts, the waters of the Salmon River will someday once more enjoy strong runs of these spectacular fish.

Fisheries and Earth Sciences
1992 Program Summary

Klamath National Forest
USDA - Forest Service

INTRODUCTION

The Klamath National Forest occupies about 1.7 million acres of rugged mountainous terrain in northern California. This Forest is endowed with a richly diverse and productive flora and fauna as a result of its location. Since the Klamath is located east of the Coast Range, north of the Sierra Nevada, south of the Cascades, and west of the Great Basin, it is a melting pot of soil types, geology, vegetation, birds, mammals, fish, and even insects. Fish stocks include fall, winter, and summer-run steelhead, spring and fall run chinook salmon, coho salmon, pacific lamprey, american shad, black bass, various sunfish, minnows, brown and rainbow trout, and eastern brook trout (char). About 1200 miles of coldwater streams and 1260 acres of lakes provide habitats for these fish species. An estimated additional 2550 miles of perennial streams are tributary to those which bear fish populations.

Climate of the area ranges from arid on the east side to very moist on the westside. Winter snows are common over the entire forest, sometimes accumulating to a depth of over twenty feet at higher elevations. Due to the proximity to the Pacific Coast, warm rains during the winter are also common sometimes resulting in severe flooding if snowpacks are melted by those storms. Intense summer thunderstorms are common at higher elevations. Natural geologic or fluvial responses to those events have been magnified by mans activities in the area. Beaver trapping, mining, agriculture, and timber harvest, have affected stream channels and riparian areas in the area for over two hundred years. Resource management is extremely complex in this diverse natural system.

THE MISSION

The principle mission of the National Forest is one of land stewardship: "Caring for the land and serving the people". We furthur define our Fisheries and Earth Science mission as one of: a) resource protection and maintenance where naturally productive conditions are unimpaired by historic activities; b) resource restoration where natural productivity has been impaired by mans influence; c) mitigation of activites that could impair future resource productivity if left unmitigated; and d) effectiveness evaluation of the above activities to ensure objectives are met in a cost effective and timely manner.

THE WORKFORCE

There are twenty-seven permanent employees on the Klamath NF working directly in Fisheries or Earth Science (Soils, Geology,

Watershed, and Air) program activities. This highly skilled and experienced cadre of professionals and technicians is nearly evenly divided between Fisheries and Earth Science functional areas. Roughly one third of the workforce is stationed in the Supervisor's Office (Yreka), the remaining two-thirds of the staff are stationed at Ranger District offices.

THE FISCAL YEAR 1992 PROGRAM

General

The fisheries and earth sciences program can be divided into two basic funding categories: National Forest System (NFS) appropriations from Congress and Cooperative Work (CW) finances from cooperative accounts. No matter what the source of funding, the basic program is shaped to fit "the mission" elements previously described. There is a good deal of work activity overlap between elements (eg: inventories provide information which serves as the basis for evaluations, development of restoration prescriptions, and development of appropriate mitigation measures for timber program support). A substantial portion of the program efforts are being focused on activities which will help lead to the recovery of spring-run chinook populations in the Salmon River basin. It is likely that this effort will grow in the next decade as efforts to federally list this fish stock are increased by interest groups. The objective of the Klamath National Forest is to recover these fish stocks so that federal listing is unnecessary in the future. A brief description of the spring-run chinook salmon situation is attached to this summary.

NFS APPROPRIATIONS (TOTAL $2,276,000)

Resource protection, maintenance and effectiveness evaluation

Total allocation available = $841,600

This program element includes future program planning, development and maintenance of cooperative relations, providing "walk-in" service to the public, supervision, reporting on attainments, inventory of resource conditions, providing full time support to development of the Klamath Land and Resource Management Plan, evaluation of effectiveness of mitigation measures and practices, and other typical "operations". Especially noteworthy activities in this category include:

a) Funding of two Fisheries Coop Graduate Students at Humboldt State University to provide a clearer picture of Spring Chinook salmon freshwater habitat requirements;

b) Participation of the Forest Supervisor on the Klamath River Basin Fish and Wildlife Restoration Task Force and the Forest Fish and Watershed Staff Officer as her technical work group representative;

c) Implementation coordination of a habitat conservation plan for spring chinook salmon;

d) Full-time participation of 4 journey-level professionals on the L&RM Plan interdisciplinary team representing Soils, Geology, Watershed, and Fisheries;

e) Staff group leadership in developing application of New Perspectives on the Klamath including participation in organization review and program management review teams;

f) Coordinated Resource Inventory (CRI) of 33,000 acres on Butte Valley National Grassland and Ukonom Ranger District;

g) Fish habitat inventory of 5200 acres of stream and riparian area, spawning ground utilization surveys for steelhead and chinook salmon, and spring chinook salmon habitat use inventories;

h) Development of basin plans for restoration of fish habitat and riparian condition, using prior year inventory data as the basis for restoration prescription;

i) Developmant of a conservation strategy for summer steelhead which will identify future activities necessary to reduce the liklihood of this fish stock becoming federally listed as a threatened species;

j) Challenge cost-share contribution of KNF share to a multitude of cooperative projects ranging from genetic differentiation of spring-run chinook salmon to planting of riparian vegetation and reconstruction of existing forest roads to reduce erosion and stream sedimentation;

k) Additional support to the timber management, minerals extraction, grazing, and recreation programs is included in this general operations activity, because support allocations are inadequate to cover the needed level of journey professional analysis and input.

Restoration of resource productivity

Total allocation available = $623,000

This group of activities includes restoration of fish habitat and watershed productivity on the forest. Where possible, the use of natural restoration techniques is emphasized (eg: riparian revegetation, placement of woody debris, etc.) unless the identified problem stems from some sort of manmade structure (road, bridge, culvert, etc.) in which case the most cost-effective and expedient solution is generally sought.

The fisheries restoration program includes placement of 98 instream structures (predominantly wood pieces or groups of pieces) to restore anadromous and inland fish habitat productivity and restoration of about 272 acres of stream and riparian habitat. Riparian habitat restoration emphasizes improvement of summer shade and/or increasing the stocking density of coniferous trees to provide future sources of large woody debris and moderate extreme cold winter water temperatures. Restoration of stream habitat typically results from reduction of

sediment input from mans activites (road bedding, road surfacing, culvert modification, and landslide stabilization).

The watershed restoration program focuses on correction of road related erosion problems (principally stabilization of road surfaces, fillslopes, and culvert discharges), riparian area revegetation, and sediment trapping (from watersheds damaged in 1987 fires). Total activity in the watershed restoration program in this year will affect 337 acres of highly erosive soils, reducing erosion, sedimentation, and maintaining future soil productivity.

Mitigation of timber harvest activities (timber support)

Total allocation available = $460,000

This portion of the program provides journey-level input to the planned 84 million board-foot timber sale program on the forest. This level of timber support provides the appropriate degree of information and analysis for the complex timber program.

Other obligations and assessments

Total obligated = $201,400

This portion of the program consists of estimated and actual assessments and obligations to other functions and activities including: overhead assessment at the supervisors and ranger district offices, assessed support to Land and Resource Management Planning, Law enforcemnt, contracting, rents, utilities, etc.

CW AUTHORIZATIONS TOTAL = $ 948,000

This is the "Cooperative Work" portion of the fisheries and watershed program, which includes support to salvage timber sales (SSSS), Knutson-Vandenburg (KV) funds generated for timber sale area improvement from closed timber sales and CWFS (other cooperative accounts) funds contributed to the forest to complete projects agreed upon with other groups or state and federal agencies. Because of the constant state of change of the CWFS program it is not possible to give a summary of exactly how much work is under agreement during the federal fiscal year, thus the reason for the estimate. A more complete and in-depth accounting of CWFS program will be completed by October 1992 for the annual accomplishment report.

Typically these programs consist of resource mitigation and restoration activities similar to those previously described above. A substantial part of the program is available to support timber salvage and the Klamath River restoration efforts.

Klamath River Task Force Stock Identification Committee Meeting

March 26, 1992 - Minutes

Attendees:

Jerry Barnes, Roger Barnhart, George Coutsky, David Hankin, Paul Hubbell, Matt Longenbaugh, Eric Loudenslager, Mike Maahs, Don McIsaac, Barry McPherson, Mike Orcutt, Jack West

Absent: Graham Gall

Briefly reviewed committee assignment by Klamath River Task Force for new members.

Long discussion regarding definitions of spawning groups looking at recent categories suggested by Oregon Department of Fish and Wildlife. Reached a concensus on the following possible major groups:

A. breeding population = a population geographically and temporally isolated (isolation does not have to be complete), with consistent spawning in a discrete area with a low level of straying. (embellished definition)

B. metapopulation = gene conservation group; made up of one to several breeding populations; all genetically similar with similar phenotypic characteristics (my definition)

C. stock = ? ex. spring chinook, fall chinook

D. species = chinook salmon Oncorhynchus tshawytscha

Example: Fall chinook

A. Breeding populations - 1. upper main stem Klamath; 2. Shasta River; 3. Scott River

B. Metapopulation = 1, 2 & 3 combined (perhaps)

C. Fall chinook

D. Chinook

Committee listed breeding populations for fall and spring chinook, Klamath and Trinity rivers using Chap. 4 of Management Plan. Following are breeding populations of fall and spring chinook for Klamath River:

Breeding Populations

Fall Chinook Salmon:

Iron Gate Hatchery
Upper Main Stem Klamath River (Scott River to Iron Gate)
*Bogus Creek
Shasta River
Scott River
*Shackleford Creek
Salmon River

Upper Middle Klamath River Tributaries
(Clear, Beaver, Elk, Indian, Horse, Grider Creeks)
Lower Middle Klamath River Tributaries
(Red Cap, Camp, Pine Creeks)
Lower Klamath River Tributaries
(Pecwan, Blue Creeks)
Upper Mainstem Trinity River to Junction City
(Trinity River Hatchery, Upper mainstem, *Canyon, *North Fork Trinity)
*Mainstem Trinity River (Junction City to South Fork Trinity River)
South Fork Trinity River
Lower Trinity River Mainstem and Tributaries (South Fork Trinity River to mouth)

Spring Chinook Salmon

Salmon River
*Wooley Creek
Upper Mainstem Trinity River and Trinity River Hatchery
*North Fork Trinity River
*Canyon Creek
New River
South Fork Trinity River

*Need more information before final categorization

The following committee assignments were made:

1. J. Barnes - check with Klamath-Trinity National Forest on surveys done on Canyon Creek and N. Fk. Trinity River

   - Red Cap, Camp Creeks - history of surveys, chinook spawning, marked fish

2. P. Hubbell - Willow Creek and Junction City weir data - Ad marked salmon percentage

3. J. West - Shackleford Creek spawner data etc., Surveys of middle-upper Klamath River tributaries

4. M. Longenbaugh - Survey data on Pecwan Creek

Tentative date for next meeting - May 27, 1992 - Some members felt we'd better meet 1 1/2 days - possibly 1/2 day on 5/28.

Meeting adjourned - 4:30 p.m.

Encs: Adult spring chinook, summer steelhead counts (source: Gerstung, CDFG).

Roger A. Barnhart

FACTORS IN NORTHERN CALIFORNIA THREATENING STOCKS WITH EXTINCTION

By Patrick Higgins, Soyka Dobush and David Fuller

Humboldt Chapter of the American Fisheries Society
P.O. Box 210
Arcata, California 95521

The national Endangered Species Committee of the American Fisheries Society (AFS) recently published a report on the threat of extinction facing populations of anadromous salmonids throughout the Pacific Northwest (Nehlsen et al. 1991). The Humboldt Chapter of AFS began research in October 1991 for this report detailing the status of stocks of coho salmon (Oncorhynchus kisutch), chinook salmon (O. tshawytscha), steelhead (O. mykiss) and sea run coastal cutthroat trout (O. clarki) that might be at some risk of extinction in the chapter area. The Humboldt AFS territory covers coastal drainages in California from the Russian River north to the Oregon border, including the Klamath and Trinity Rivers.

The purpose of this Humboldt AFS report is to examine assertions made by Nehlsen et al. (1991) with respect to the actual health of the stocks classified in northwestern California and to describe the factors that have lead to stock declines. It is hoped that the report will be a catalyst for cooperation in preserving and restoring those runs that may be headed for extinction. Natural and human induced factors have contributed to the decline of salmon, steelhead and coastal cutthroat trout populations in northwestern California. These factors include drought, forest fires, floods, poor ocean productivity, major dams, impacts of logging and related sedimentation of stream beds, mineral and gravel mining, over-grazing, diversions, exotic species introductions, over-fishing, and hatchery practices.

STOCK STRUCTURE OF ANADROMOUS SALMONIDS

The homing tendency of salmon leads to the evolution of races or "stocks" which develop specific adaptations to their native environments (Ricker 1972). The "stock concept", which recognizes these distinct sub-populations, is widely accepted in fisheries science (Berst and Simon 1981). Survival strategies of native salmonid juveniles, such as timing of out migration, are flexible and respond to environmental cues but also have heritable components that are genetically based. Genetic comparisons can be used to distinguish between stocks but such tests are not always conclusive (Utter 1981). Resistance to disease, early life-history strategies, special morphological traits such as body size or shape, number and size of eggs, ocean migration patterns, spawn timing, or date of the return to their home stream are also criteria that may be used to define stocks (Nicholas and Hankin 1988a). Nehlsen et al. (1991) point out that "it is at the stock level that conservation and rehabilitation of salmon, if it is to be successful, will take place."

STOCKS AT RISK

It is now recognized that stocks of anadromous salmonids, such as the winter run chinook salmon on the Sacramento River, may be defined as species in terms of the federal Endangered Species Act (National Marine Fisheries Service 1980). The term "species" is defined in Section 3 of the ESA to include "any subspecies of fish or wildlife or plants, and any distinct population segment of any species of vertebrate fish or wildlife which interbreeds when mature." The term "endangered species" means any species which is in danger of extinction throughout all or a significant portion of its range (Federal Register 1973, from the Endangered Species Act). An endangered population is one that shows a persistent decline in its spawning population (Bjornn and Horner 1980). When a stock declines to fewer than 500 individuals, it may face a risk of loss of genetic diversity which could hinder its ability to cope with future environmental changes (Nelson and Soule 1986). A random event such as a drought or variation in sex ratios may lead to extinction if a stock is at an extremely low level (Gilpin and Soule 1990). The National Marine Fisheries Service (NMFS), (1987) acknowledged that, while 200 adults might be sufficient to maintain genetic diversity in a hatchery population, the actual number of Sacramento River winter run chinook needed to maintain genetic diversity in the wild would be 400-1100.

Nehlsen et al. (1991) used three categories of risk to describe stocks. Stocks at "high risk of extinction" or category A populations showed continuing spawner declines with fewer than 200 adults. Category B stocks were those "at moderate risk of extinction" that might have currently stable populations above 200 spawners but that have declined substantially from historical levels. "Stocks of concern" (C) are low and unstable but specific information may be lacking on veridic population numbers, or have higher spawner escapements but some specific threat is known that could cause severe population decline or loss.

METHODS

Humboldt AFS sent questionnaires to its members and other fisheries professionals throughout northwestern California requesting specific responses to Nehlsen et al. (1991) and additional information on other stocks at risk. Information was gathered from file records and reports from the California Department of Fish and Game, U.S. Fish and Wildlife Service, and the U.S. Forest Service. Restoration groups conducting spawning surveys in various watersheds were also consulted. A current study for the NMFS (Brown and Moyle in press) on the status of coho salmon provided additional information. A final draft was circulated to 24 members of the Cal-Neva chapter of AFS in February 1992 for further review. Humboldt chapter members received a final draft for peer review in March 1992.

FINDINGS

This report identifies 49 naturally spawning Pacific salmon and anadromous trout stocks at varying degrees of risk, in the north coast region of California from Russian River north to the Oregon border. Of these 20 are at high risk of extinction, three are at moderate risk of extinction, and 26 are of special concern (Table 1).

Northern California fisheries scientists generally agreed with the findings of Nehlsen et al. (1991). However, local scientists provided current information pertaining to: population levels of stocks delineated in Nehlsen et al. (1991); and additional stocks which were unrecognized in the Nehlsen et al. (1991) document. In contrast to Nehlsen et al. (1991) coastal cutthroat trout have been reclassified at a lower risk (from B to C). Nehlsen et al. (1991) classified the Eel and Klamath River summer steelhead stocks at -B- risk level. More detailed assessment from local professionals has subdivided and reclassified summer steelhead as follows: Middle Fork Eel River -C- (lower risk); North Fork Eel River and Van Duzen River -A- (higher risk); Middle Klamath tributaries, Salmon River and South Fork Trinity River -A- (higher risk); while the North Fork Trinity River, New River, Mad River and Redwood Creek have similar risk classifications of -B-. Winter steelhead were not mentioned in our north coast area due to insufficient information for risk assessment. Coho salmon were divided from small streams north of San Francisco (Nehlsen et al. (1991) into individual basins as more detailed information was available to classify 13 coho stocks at -C- or -A- risk levels. Changes in the fall chinook classifications include deletion of Smith and Russian Rivers from the Nehlsen (1991) list and addition of Little River, Bear River and South Fork Trinity River all at level -C-. Redwood Creek, Mad River and Eel river fall chinook stocks were reassessed to stocks of concern rather than the Nehlsen et al. (1991) moderate risk assessment. Two spring chinook stocks were added to the Nehlsen et al. (1991) list, South Fork Trinity and Trinity rivers at high risk of extinction.

Russian River pink salmon (O. gorbuscha) were reported by Nehlsen et al. (1991) as a stock at high risk of extinction but were left off the Humboldt AFS list. Contributors felt that pink salmon and chum salmon (O. keta) in California should not be classified with other anadromous salmonid stocks at risk. While the past occurrence of pink and chum salmon is of historic interest and adds a long term perspective on habitat decline, they probably do not represent retrievable gene resources, because their appearance is presently incidental. These species are still sporadically encountered in numerous northern California streams (Peter Moyle personal communication). A small spawning population of chum salmon exists on Mill Creek, in the Smith River basin (Jim Waldvogel personal communication).

The lack of information often prevented finer distinctions of sub-populations in larger watersheds. This report does not necessarily imply that all stocks listed are synonymous with distinct populations as defined under the Endangered Species Act of 1973.

Table 1. Northwestern California stocks of Pacific anadromous salmonids risk of extinction. A= high risk of extinction, B= moderate risk extinction, C= stock of concern.

CHINOOK SALMON

Spring Race

Klamath River (Salmon River) (A)*
South Fork Trinity River (A)
Trinity River (C)
Smith River (A)*

Fall Race

Lower Klamath (below Weitchpec) (B)*
South Fork Trinity (C)
Scott River (C)*
Shasta River (A)*
Humboldt Bay Tributaries (A)*
Bear River (C)
Redwood Creek (C)
Little River (C)
Mad River (C)
Eel River (C)
Mattole River (A)*

COHO SALMON

Lower Klamath (below Weitchpec) (C)*
Trinity River (C)*
Scott River (A)
Humboldt Bay Tributaries (C)
Eel River (C)
Pudding Creek (A)
Big River (C)
Navarro River (C)
Garcia River (A)
Russian River (A)
Redwood Creek (C)
Wilson Creek (C)
Little River (C)
Mad River (A)
Mattole River (A)
Noyo River (C)
Ten Mile River (C)
Albion River (C)
Gualala River (A)
Bear River (C)

STEELHEAD TROUT

Summer Race

Middle Fork Eel River (C)
North Fork Eel River (A)
Middle Klamath Tributaries (A)**
South Fork Trinity River (A)
North Fork Trinity River (B)
Mad River (A)*
Redwood Creek (A)*
Van Duzen River (A)
Salmon River (A)
New River (B)

COASTAL CUTTHROAT TROUT

Lower Eel River (C)
Lower Klamath (C)
Mad River (C)
Wilson Creek (C)

* Same designation as list in Nehlsen et al. (1991)
** Dillon, Elk, Indian, Clear, Red Cap and Bluff Creeks

CAUSES FOR DECLINE

Nehlsen et al. (1991) stated that the "decline of salmon, steelhead, and sea-run cutthroat trout populations has resulted from habitat loss and damage, and inadequate passage and flows caused by hydropower, agriculture, logging and other developments; over-fishing, primarily of weaker stocks in mixed stock fisheries; and negative interactions with other fishes, including non-native hatchery salmon and steelhead." All of these factors, plus natural events, have contributed to the decline of anadromous salmonid stocks in northwestern California. While there is consensus on the relative risk of loss of populations, fish scientists don't have consensus on causes and relative weight.

Habitat loss: Northwestern California has some of the most erodible terrain in the world (Judsen and Ritter 1964, California Department of Water Resources 1982a). Continental plate collisions off the coast cause buckling of the earth's crust forming major faults on land that almost all rivers in the region follow (Carver and Burke 1987). Marine sediments form the majority of the parent material in the Coast Range. Because these weakly consolidated materials are uplifted, over-steepened, and sheared by faults (Carver et al. 1983), then pelted by intense rainfall, they are very prone to landslides (CDWR 1982a).

With the high inherent erosion risk and intensive timber management on the north coast, flood events can cause major soil loss (Janda et al. 1975, [illegible]th Science Associates 1981). Sedimentation of stream beds is implicated [illegible]a principal cause of declining salmonid populations in the region. Mass [illegible]sting of steep, erodible hillslopes where timber harvest has occurred, and [illegible]ailure of roads on unstable slopes has caused catastrophic erosion (MacCleery 1974, Janda et al. 1975, Wahrhaftig 1976, LaVen and Lehre 1977, Kelsey 1980, ESA 1981, Hagans et al. 1986). A complete list of streams impaired by non-point source pollution, primarily sediment from timber harvest, has been identified for the Environmental Protection Agency and the State Water Resources Control Board water quality data bases, and is included as Appendix A (Humboldt AFS 1987,1989).

Severe erosion risk also exists on decomposed granitic soils which occur in the Klamath Mountains in a band that extends from Mt. Ashland south to Grass Valley Creek near Weaverville. Streams impaired by decomposed granite sands include Grass Valley Creek, the Upper Trinity River, and Cottonwood Creek and Beaver Creek in the Middle Klamath Basin. Despite construction of a $20 million sediment retention structure, Grass Valley Creek annually pours tons of sediment into the Trinity River severely degrading spawning and rearing habitat for salmon and steelhead. Timber harvests have recently been approved by the California Department of Forestry (CDF) in areas below Buckhorn Dam despite high erosion risk. The Scott River has also experienced considerable degradation of fish habitat as a result of decomposed granitic sands derived from logged areas, road surfaces, and road cuts (Sommerstrom et al. 1990). Scott River tributaries with problems related to decomposed granite include French, Sugar, Crystal, Patterson, and Kidder Creeks.

Many low gradient tributaries throughout the region were former optimal salmon spawning and rearing streams. Large logs that lodged in flatter stream reaches caused scouring and deep hole formation which provi optimal rearing habitat for coastal cutthroat trout and coho salmon (Seddell et al. 1988). Additionally, channels in these reaches were often braided, creating side channels with lower water velocities that are preferred by young-of-the-year fish (Nawa et al. 1990). Unfortunately, these low gradient areas are also where problems persist if large quantities of sediment enter the stream system (Lisle 1981). Large logs that were washed out or buried in past floods are not being replaced naturally due to logging in stream side areas (Seddell et al. 1988).

Loss of pools from sedimentation has reduced rearing habitat, but evidence is emerging that stability of spawning gravel may be the critical limiting factor for salmon. In studies of aggraded stream beds in southwest Oregon, Nawa et al. (1990) found that scour and fill during minor storms (two year events) was sufficient to cause mortality of salmonid eggs and alevin. Spawning populations of chinook salmon in Euchre Creek decreased from 2000 to fewer than 200 and coho populations are now extinct (Nawa et al. 1990). Work by Payne and Associates (1989) indicates that gravels are extremely unstable in lower Klamath tributaries: mortality of eggs similar to that noted by Nawa et al. (1990) could be occurring there.

Numerous north coast streams are so aggraded that surface flows are lost during summer months. Plugs of sediment where aggraded tributaries join main rivers often block migration routes for adult and juveni salmonids (Payne Assoc. 1989). Many tributaries that were spared dur past floods have recently suffered from over-cutting of timber and may experience substantial habitat deterioration in the event of a future flood (Coats and Miller 1981).

When large amounts of sediment fill valley bottoms, riparian vegetation shows major damage. Stream side conifers were partially buried by past floods and died. Lisle (1981) noted that recruitment of conifers, into stream side areas altered by debris flows, may take more than a century. Even willows and alders have difficulty colonizing stream side zones in highly aggraded streams because of gravel instability (Lisle 1981). High stream temperatures become a chronic problem because of lack of shade. Temperature increases can shift ecological relationships allowing fish species, such as suckers, dace or shiners, to become dominant over salmonids (eg. Reeves 1985). Removal of riparian vegetation can make streams in interior areas more subject to freezing and anchor ice formation (Jack West personal communication).

Races of salmon spawned along the entire length of most north coast rivers as recently as the 1950s (USFWS 1960). The Eel River mainstem had a capacity for over 100,000 salmon redds (USFWS 1960). Success of main river spawners seems to have greatly decreased after the 1955 or 1964 floods (Scott Downey and Mike Morford personal communication). Main river channels have become increasingly unsuitable for all salmonids during summer months due to high stream temperatures (Kubicek 1977, Rogers and Wood 1990, USFW

91). Over 25% of the pools in the main forks of the Eel River reach temperatures of over 80 degrees F during summer (Kubicek 1977). Decreasing stability of spawning gravels due to aggradation was asserted to be the major cause of declines of salmon runs on the South Fork of the Trinity River (CDWR 1982b) and may have also played a role in loss of mainstem spawning salmon in other rivers in the region.

Additional problems for salmonids and other fishes have resulted as a result of sediments filling main river channels. Holding pools for summer steelhead and spring chinook on the South Fork of the Trinity were filled (CDWR 1982b) and the channel has yet to recover significantly (Haskins and Irrazary 1988). Green sturgeon (Acipenser medirostris) were no longer observed in the South Fork Trinity after the 1964 flood and their occurrence in the Eel may have also greatly decreased (Pat Foley personal communication). The candlefish or eulachon (Thaleicthys pacificus) is a smelt that spawns in the lowest seven miles of the Klamath River. It has been an important food resource for the Yurok Indians, who have noted in recent years that the fish has been in a dramatic decline (USFWS 1991).

Fine sediment has also filled estuaries of north coast rivers, greatly diminishing carrying capacity of these areas of vital importance to juvenile chinook salmon and coastal cutthroat trout (Puckett 1977, Hofstra 1983, Busby 1991). Species diversity declined dramatically in the Eel River estuary and the estuary decreased considerably in size between 1950 and 1977 (Higgins 1991). The ocean survival for chinook salmon juveniles is greatly increased if fish are able to attain larger size by rearing for an extended period in the estuary (Simenstad et al. 1982, Healy 1982). Lack of habitat area in the estuary due to sedimentation may be forcing juvenile chinook salmon into the ocean at a less than optimal size thus reducing their ocean survival (Nicholas and Hankin 1988b).

Dams on the Trinity and Klamath Rivers now block hundreds of miles of spawning habitat. The spring race of chinook and coho salmon adapted to the Upper Klamath basin and Upper Trinity steelhead, chinook and coho salmon were lost as a result of dam construction. Main river habitat on the Klamath and Trinity Rivers below the dams has been impacted by flow diversion. Since portions of these rivers adjacent to the dams rarely experience floods, the complex natural river channel has not been maintained. Approximately 80% of flows from the Trinity watershed above Lewiston have been diverted to the Central Valley since 1965. Decreased habitat area, lack of recruitment of spawning gravels, unnatural channel restriction by vegetation, and loss of flushing flow events all contribute to diminished carrying capacity for salmonids in rivers below dams. Nutrient loading associated with grazing, combined with increased insolation of reservoirs create algal blooms in the reservoir above Iron Gate Dam on the Klamath which contribute to water quality problems in the river below.

Agricultural diversion of stream flows, removal of riparian vegetation from over-grazing, and water quality problems related to agricultural runoff have adversely effected salmon and steelhead runs in the Scott and Shasta Rivers of the Klamath Basin. Water temperatures over 90 degrees F have been measured on the Shasta River in recent years (Rogers and Wood 1991).

The Russian River has special problems because of the growing population in its watershed. Suburban and urban development in the riv corridor often seriously degrades tributaries. Sewage treatment faciliti for the city of Santa Rosa are sometimes overwhelmed during storms and dump raw sewage into the river. Gravel extraction has depleted some tributaries of spawning substrate while main river gravel mining has included complete destruction of old river terraces and associated riparian communities. Warm Springs Dam has blocked spawning gravel recruitment and blocked access to natural spawning areas. Increasing diversions to supply a growing wine industry have de-watered some tributaries that formerly supported fish. The County of Sonoma has been mandated by the State Attorney General to build more adequate fish passage at the Healdsberg Dam. The dam has restricted passage to adult salmonids in years of low flow.

Hatchery Practices: Problems related to hatchery practices have also played a role in the decline of some stocks, especially coho salmon, in northwestern California. The Humboldt Chapter of AFS has been seeking cessation of stock transfers of non-native anadromous salmonids by the California Department of Fish and Game for some time (Humboldt AFS 1975). The Chapter membership supported a resolution to that effect in 1987 (Humboldt AFS 1987). Non-native salmon or steelhead stocks have been introduced as broodstock in hatcheries and widely transplanted (Brown and Moyle in press, USFWS 1991). Studies have shown that anadromous salmonids transferred to other watersheds rarely persist for more than two generations, without assistance from artificial culture, due to lack of appropriate adaptations to their new environment (Altukhov and Salmenkova 1986). Withler (1982), in an extensive literature review, found no successful case establishing a new run of anadromous salmonids by transplanting stoc anywhere on the West Coast.

When non-native hatchery strays spawn in the wild, young fish with non-native genes result (Altukhov and Salmenkova 1986). Studies in the Pacific northwest have shown that juvenile salmonids spawned by stray hatchery fish and hatchery-wild hybrids have lower survival rates (Riesenbichler and McIntyre 1977, Smith et al. 1985, Chilcote et al. 1986). Juvenile fish that are hybrids or of hatchery origin may lack resistance to disease, or other traits critical for survival (Kapucinski 1984). The impacts of stock transfers increase dramatically if non-native anadromous salmonids are planted on top of wild populations for several generations (Riggs 1990). If this occurs, "genetic swamping" or loss of local adaptations may lead to population extinction (Altukhov and Salmenkova 1986).

Non-native anadromous salmonids have been transferred routinely by the California Department of Fish and Game to almost all north coast basins. The Iron Gate Hatchery coho broodstock was founded with eggs from the Columbia River Basin and has since been transplanted to several Klamath River tributaries, Prairie Creek Hatchery, Mad River Hatchery, Smith River, Freshwater Creek and other locations (Marshall 1970, Hiser 1978-89). Coho from Washington state were also used to start a rearing program on Freshwater Creek (Will 1976-78). Trinity River Hatchery's coho salmon broodstock was formed from numerous non- native stocks and subsequently planted in th

th Fork of the Trinity and Mad River Hatchery (Beddell 1974-89). Coho mon stocks from the Quilicene (Washington) and Klaskanine Rivers (Oregon) re widely transplanted throughout northwestern California in the 1950's d 1960's (Richard Ridenhour personal communication).

The Noyo fish culture station for coho salmon, operated by the California Department of Fish and Game, supplemented its broodstock in years of low escapement in the 1970's with eggs from the Alsea River in Oregon and the Washougal River in Washington as documented in CDFG transfer permits). Noyo coho have been transplanted to almost all Mendocino coastal streams, Mad River Hatchery, Prairie Creek Hatchery, and are the origin of the broodstock at Warm Springs Hatchery on the Russian River (Will 1976-78, Snyder and Sanders 1979, Estey 1984). Studies of coho salmon in Mendocino County streams show that native alleles are very rare, probably as a result of gradual hybridization following stock transfers (Jennifer Nielsen personal communication). Brown and Moyle (in press) report that nineteen stock introductions of non-native coho salmon to the Mad River have occurred during eighteen years of Mad River Hatchery operation. Stock transfers of steelhead have also occurred in northwestern California. Washougal River summer steelhead were introduced into the Mad River Hatchery, Prairie Creek Hatchery, and Trinity River Hatchery (Will 1976-78). The Trinity River winter steelhead broodstock was formed from numerous non-native components (Bedell 1974-89). The winter steelhead run at the Mad River Hatchery was originally founded on Eel River stocks from Benbow Dam. The steelhead from Mad River Hatchery were widely transplanted during the mid-1970s in a "Coastal Steelhead Planting and Release Program" (Will 1976-78). Streams nted included Smith River, the Eel River, Garcia River, Gualala River, inity River, Klamath River and the Van Duzen River. Behnke (1982) cited a ow return rate for Mad River Hatchery steelhead smolts planted in the Gualala River in 1977, a much smaller size than the native strain on return, and only a 4% success ratio for repeat spawning as compared to a 38% rate for wild Gualala steelhead. Stock transfers of anadromous salmonids from the egg taking station at Van Arsdale Dam to watersheds other than the Eel River were also common (Richard Ridenhour personal communication).

The California Department of Fish and Game has used hatchery coho from many sources to enhance runs and re-establish populations in California coastal streams. The Oregon Department of Fish and Wildlife embarked on a similar coho salmon enhancement program in the 1970's using one broodstock to supplement runs in streams along the entire Oregon coast. Evaluation of the Oregon program showed that introduced coho juveniles showed lower survival rates than native coho juveniles, while native smolt production was decreased by competition (Nickleson 1986). Adult returns to the stream were about equal in stocked and unstocked streams but subsequent smolt production was decreased in stocked streams (Smith et al. 1985). The Solazzi et al. (1983) evaluation concluded that widespread transplantation of fingerling coho salmon lacked sustained biological benefit . Nickelson (1986) reported that coho salmon stocks in Oregon shifted from a balance of 50% hatchery and 50% wild fish to 85% hatchery and 15% wild fish.

Stock transfers within large watersheds may also compromise genetic diversity of runs adapted various sub-basins. Iron Gate Hatchery fall chinook salmon have been used to supplement runs in numerous tributaries downstream as far as Pecwan Creek below the convergence of the Trinity River (Hiser 1978-89). Run timing in these transplanted stocks may be inappropriate because of different rainfall and runoff patterns in the various areas of the Klamath Basin and may decrease genetic diversity (USFWS 1991). Winter steelhead from Rowdy Creek Hatchery are transplanted to many tributaries throughout the Smith River watershed.

Stock transfers may introduce diseases to which native populations do not have resistance (Pacific Northwest Fish Health Protection Committee 1989). Noyo River hatchery coho salmon stocks are known to harbor bacterial kidney disease (BKD). BKD is problematic because juvenile fish may appear healthy but their inability to adjust to salt water may cause mortality during smoltification (PNFHPC 1989). The disease can be passed from fish to fish in the wild, so transplanting Noyo coho salmon could be introducing this disease to wild populations of salmon and steelhead.

Recent epidemics of infectious hematopoietic necrosis (IHN) at Trinity River Hatchery (Foote 1990) are implicated in very low returns of fall chinook salmon to the facility in 1990 and 1991. Chen (1984) discovered that several strains of IHN exist and that salmonid juveniles are often not resistant to strains of IHN not endemic to their watershed. Introduction of non-native salmon and steelhead eggs to the Trinity Hatchery (Bedell 1974-89) may have carried with them a non-endemic strain of this disease leading to the recent epidemic.

All steelhead, rainbow trout, and chinook salmon native to the mainstem Klamath River have evolved resistance to a virulent pathogen, Ceratomyxa shasta, which seems to have its origin in marshes in the Upper Klamath Basin (Carlton 1989, Buchanan in press). Outplanting of Trinity River Hatchery steelhead substantially increased straying rates of this largely exotic stock (USFWS 1991). Subsequent interbreeding with wild steelhead may have had a negative impact on their resistance to C. shasta similar to decreasing resistance to C. shasta that resulted from stock introductions of coho salmon in the Nehalem River in Oregon (Kapucinski 1984).

Hatchery broodstocks can also lose genetic diversity due to brood handling practices, insufficient founding population size, low returns, or other factors (Simon et al. 1986, Simon 1988). Fertility of Iron Gate Hatchery coho has dropped to 38% due to inbreeding depression resulting from very low returns during the 1970's. Hedrick et al. (1987) noted that chinook and coho salmon hybrids were occurring in the Trinity River Hatchery. Current research is being conducted to discover the extent of chinook/coho crossing at the hatchery (Tom Hassler personal communication). Spring chinook salmon at Trinity River Hatchery may overlap in their time of return with early run fall chinook. It is possible that unless a systematic approach is taken to marking or segregation of these runs that spring run timing could be lost.

Care must be taken to prevent mixing of hatchery stocks with the few remaining wild spring chinook populations such as those in the Salmon River basin (CDFG 1990). In addition, stock segregation between fall and spring chinook stocks must be preserved by preventing within basin stock transfer of fall-run progeny to traditional spring-run habitat. This action may contribute to hybridization between these stock groups.

Competition between hatchery juveniles and wild fish has been documented as a cause for a decrease in wild stocks in other areas (Smith et al. 1985, Steward and Bjornn 1990). Stempel (1988) felt that such competition might be occurring in the main stem of the Klamath and Trinity Rivers resulting in low survival of both hatchery and wild juvenile salmonids. Trinity River and Iron Gate Hatcheries greatly increased production of chinook salmon juveniles from about five million annually before 1985 to about 18.5 million as adult returns to the hatchery increased (USFWS 1991). Combined production of juveniles from the hatcheries since 1985 has often exceeded the CDFG production goal of 11.3 million juvenile chinook salmon by 50% or more. These years of high hatchery output have now been followed by two consecutive years of record low escapement of chinook salmon to the Klamath Basin in 1990 and 1991. The pattern of increased hatchery output and decreased adult escapement would be consistent with density dependent rearing mortality in the river and/or estuary limiting survival of both hatchery and wild salmonid juveniles. There is emerging evidence that competition for food in the ocean might also limit survival of hatchery coho of Columbia River origin in years of poor upwelling (McGie 1984, Riesenbichler and Emlen 1988, Nieur 1990).

Introduction of Exotic Species: Non-native fishes have been introduced into rivers throughout northwestern California for over a century but transplanted stocks did not usually survive. Recent introduction of the Sacramento squawfish (Ptychocheilus grandis) into the Eel River drainage, however, is causing a serious problem (Brown and Moyle 1990). Squawfish attain large size and eat smaller fish as they mature. The species has spread to most areas of the Eel River basin in a little over a decade and is better adapted to warm water conditions in the main Eel River during summer than are native salmonids. Smallmouth bass (Micropterus dolomieu) are widespread on the Russian River. If the increasing temperature trend in main rivers is not reversed, shifts toward dominance of warm water adapted species can be expected to increase (Reeves 1985).

Harvest: Over-fishing in the early days of European settlement led to the depletion of some stocks even before habitat degradation. Stocks of chinook salmon on the Eel River dropped to low levels due to over-harvest as early as 1878 (Higgins 1991). Commercial fisheries on the Klamath River were banned in the early 1930's due to dramatic drops in escapement (McEvoy 1986). A commercial fishery for spring chinook also existed on the Smith River until 1932 (Wendy Cole personal communication). Fisheries in recent time have been much more closely regulated but problems of over-harvesting salmon off northern California have been documented as recently as the late 1970's (Hankin 1985, Hankin 1990).

Populations reaching extremely low levels are vulnerable to exploitation and may be driven to extinction. Problems arise in "mixed stock" fisheries such as ocean salmon fisheries, where hatchery salmon which can sustain harvest rates up to 90%, are harvested together with wild salmon, which can stand a maximum harvest rate of 65% (Ricker 1980, Fraidenberg and Lincoln 1985). When wild stock population estimates decline their risk of extinction increases. Exploitation rates for wild stocks should be adjusted to the stock population levels. Conservation problems can arise from in-river fisheries in the Klamath Basin if high fishing effort is exerted while stocks at risk are passing through the lower river (USFWS 1990b). The ability to target hatchery stocks in harvest strategies would relieve pressure on the wild stocks.

Current harvest management strategies do not deal with the issue of protecting specific depressed wild stock populations. The Genetic Stock Identification Report (Gall et al. 1989) found that the model used by the Pacific Fisheries Management Council (PFMC) may have substantially under-estimated the ocean catch of chinook salmon from the Klamath River in the 1987 and 1988 season. The Klamath Ocean Harvest Model (KOHM) was developed using the catch data of Trinity River Hatchery and Iron Gate Hatchery salmon that have been coded wire tagged. Results of Gall et al. (1989) suggest that wild salmon from the Klamath Basin may not exhibit the same migratory patterns as hatchery fish and, therefore, may not be adequately protected by the KOHM. The Klamath Management Zone (KMZ) closures may intensify fishing efforts in areas north and south of the zone. Wild fish having migration patterns to the north or south of the KMZ would, therefore, experience elevated fishing pressure as a result of current management in many years (USFWS 1991). Late season fisheries off the mouth of the Mad, Eel, and Mattole Rivers allowed by the PFMC (1990) in recent years target some runs described at risk of extinction in Table 1. Klamath National Forest spawning surveys have found a chronic problem with under escapement of fall chinook salmon in many streams that have good habitat quality. Runs in these streams may also be experiencing adverse impacts due to ocean harvest.

Despite extensive and prolonged habitat depletion and degradation, northern California continues to possess significant quantities of productive salmonid habitat. Disturbingly, much of this habitat receives little utilization due to depressed natural spawner escapements. For example, a natural spawner escapement goal of 115,000 for fall chinook in the Klamath River basin was established by CDFG and adopted by PFMC (CH2MHill 1985). This goal was in part based on the capacity of available habitat. Realization of this goal has occurred in only three of 14 years between 1978-1991 (PFMC 1992), despite extensive habitat restoration efforts. Further, in-river returns of natural spawners for 1990 and 1991 fell below the minimum escapement floor of 35,000 adults, and is expected to again in 1992 (PFMC 1992). Overescapement has occurred in very limited and localized instances (eg. Bogus Creek) and is considered primarily a result of hatchery straying.

The Klamath Fisheries Management Council, which advises the PFMC on the harvest of Klamath Basin stocks, has expressed concern over the incidental catch of Klamath River chinook salmon in the whiting fishery off the northern California coast. This fishery has had an allowable incidental catch of 10,000 chinook salmon in recent years. The effects on the ocean food chain of removing millions of pounds of whiting and potential food resource depletion for adult chinook salmon has never been evaluated.

High seas drift net fishing has been implicated as a cause for decline of large winter steelhead from coastal streams in California (Light et al. 1988) although little documented evidence has been available to substantiate this. Observations of steelhead returning to Rowdy Creek Hatchery (Smith River) in 1992 showed healed gillnet scars on 30 adults out of the 155 returning (Jim Waldvogel personal communication). Japan, with the largest north Pacific drift net fleet, has agreed to cease such activities in May 1992. The United Nations continues efforts to halt drift net fishing by South Korea and Taiwan.

Illegal harvest or poaching can be a serious problem for salmon and steelhead on their spawning beds. Spring salmon and summer steelhead races have greater vulnerability because they hold in very clear streams throughout summer. Decline of summer steelhead and spring chinook populations on the Salmon River and on the South Fork of the Trinity River are at least partially as a result of poaching. Roelofs (1983) also cited poaching of summer steelhead as a serious problem on the New River. The Middle Fork of the Eel River summer steelhead are considered a "stock of concern" because of concerns about poaching. Runs of summer steelhead on the North Fork of the Eel may have been driven to near extinction by poaching (Mike Morford personal communication).

<u>Natural Contributions to Declines:</u> Extensive wildland fires burned large areas of California in 1987 causing destabilization of many watersheds. Salvage logging after the burns may have significantly elevated erosion and mass wasting potential. Numerous middle Klamath River tributaries were effected including important anadromous fish producing streams such as Grider Creek, Elk Creek, Indian Creek and Clear Creek. The Salmon River was profoundly effected; particularly those areas that were burned previously in the 1977 Hog Fire. Erosion risk in the Salmon River is highest in drainages with decomposed granitic terrain such as Crapo Creek, Olsen Creek, Kanaka Creek and the North Fork Salmon River. A large area of the South Fork of the Trinity River watershed was also burned in 1987 and another major fire burned the upper watershed in 1988.

Climatic cycles have played a major role in reducing many runs of anadromous salmonids regionally. Frissell and Hrai (1988) described a change in rainfall patterns for southern Oregon. From 1900 to 1950, storm peaks occurred from November to January but after 1950 storms have typically arrived later, from late December through February. The combined effects of unstable stream beds and later storm cycles has selected for late runs of chinook salmon (Frissell and Hrai 1988).

Northern California rainfall patterns from 1988 to 1992 document very low rainfall from October through December. These months are the critical spawning time for chinook and coho salmon runs. The drought has restricted access to many tributary spawning salmon stocks for almost a full life cycle (Scott Downey personal communication). These fish have been forced to spawn in main river habitat where the risk of mortality of eggs and alevins is very high, because of stream bed movement and poor gravel quality. Drought conditions are further exacerbated by aggraded conditions of streambeds. Payne and Assoc. (1989) found that access to lower Klamath River tributary mouths was blocked by large deltas that had been deposited since 1964. Several of these tributaries lack surface flow into November in drought years as a result of aggradation.

Loss of large deep pools in lower mainstem rivers has reduced holding habitat for emigrating adult fish. These fish, while awaiting winter rains, must hold in the estuary or off the mouth of rivers possibly increasing their vulnerability to predation by marine mammals and to ocean fisheries.

Ocean conditions off northern California and their relationship to survival of anadromous salmonids is poorly studied except for recognition that El Nino currents decrease growth and survival of both chinook and coho salmon. Brodeur (1990), in studies off Oregon and Washington, found that the diet of juvenile coho salmon in the ocean shifted in years with varying degrees of upwelling. He concluded that lack of food resources and intensive planting of coho smolts were leading to density dependent mortality in the ocean in some years.

RECOMMENDATIONS

Managers must protect all existing suitable habitat from degradation through reform of land and water regulations, management and enforcement. Populations listed in this report cannot survive without maintaining existing quality habitat and will not rebound without large and small scale efforts in the following areas.

* Private timber land managers must fully commit to erosion control and prevention on their lands. Major soil loss and attendant loss of silvicultural productivity can be expected if this effort is not initiated (Coats and Miller 1981). Part of the solution to habitat problems is a substantial reform of California Forest Practice Rules (Humboldt AFS 1992). Activities on unstable soil types should be limited in order to decrease erosion risks and to protect against future flood damage (CDWR 1982a). Existing roads in poor condition or design must be up-graded or put to bed (Furniss et al. 1990). Review of timber harvest plans must include limits on allowable watershed disturbance to prevent over-cutting and subsequent fisheries habitat degradation (Coats and Miller 1981). Continuing timber harvest in basins currently impaired might require off site erosion control to mitigate for any increase in sediment expected from logging activities. Large conifers must be left in stream side zones, not just for shade but for the important habitat elements they provide (Seddel et al 1988). Riparian restoration in all previously harvested streamside locations would accelerate compliance with desired future conditions and should be a primary objective for the land managers.

In interior basins, water conservation and riparian restoration could reverse habitat declines and help restore fisheries while maintaining agricultural productivity. Protection and restoration of riparian areas and enforced diversion screening and maintenance would decrease soil loss for farmers while providing improved fish habitat. Increasing efficiency of water use in the Central Valley would reduce demands on Trinity River water and allow further water allotments for aquatic habitat needs. Increased flow in the Trinity River recently awarded to the Hoopa Indian Tribe, in recognition of their reserve rights, is a positive advance towards restoring the productivity of the system. Sufficient flows to maintain channel integrity below all dams must be developed for long term fish habitat maintenance. Channel maintenance flows need to be developed for all dam impacted river systems. Marsh restoration in areas surrounding Upper Klamath Lake could significantly improve water quality in the lake and in all of the Klamath River below it.

* The only apparent solution to protecting salmon stocks at risk from mixed stock harvest is to selectively harvest hatchery salmon and release wild salmon in all fisheries where feasible. If all hatchery salmon were marked, this strategy could be implemented. Movement toward stock preservation has produced a succession of guidelines for genetic conservation (Lannan and Kapuscinski 1984, Riggs 1986,1990) utilized in transforming propagation facilities into a successful management tool. It is possible that current planting levels may be far higher than optimal (Riesenbichler and Emlen 1988), and lower planting levels coupled with a universal marking

system would help reduce hatchery operations and marking costs. In-riv cooperation could develop harvest monitoring strategies that would shi efforts towards hatchery stocks and away from stocks at risk of extinctio Catch-and-release fisheries for wild steelhead may be necessary as well.

* Stock transfers of all anadromous salmonids in California should cease (Humboldt AFS 1987). Salmon and steelhead hatcheries should be fully integrated into restoration efforts and optimal levels of smolt production determined by scientific methods. Emphasis on yearling programs for chinook salmon, especially at Iron Gate Hatchery, may provide greater cost efficiency and exert lower competition impacts on wild stocks. A complete re-evaluation of hatchery operation in California, similar to that recently completed in the Columbia River Basin (Riggs 1990), is needed in light the current status of anadromous salmonids in the state.

* Integration of small scale hatchbox projects, or bioenhancement, with state of the art hatchery practices should focus on inherent risks of interbreeding, and assessment and evaluation of such practices to determine effectiveness and value to stock restoration. Bioenhancement programs should be required to conform to clearly defined objectives with consideration of possible impacts to endemic fish and aquatic species as well as community diversity composition. Prioritization in application to address biological need, gene pool dilution, and ability to monitor and evaluate effectiveness must be incorporated into these small scale efforts.

* Spawning ground surveys have indicated potential conflicts between instream mining operations and larval development of steelhead in Klama River tributaries. Impacts of mining activities may be reduced thro coordination of local operating seasons with life history requirements. Create holistic mining management to limit the maximum number and magnitude of disturbance that each basin resource can handle. The ability to enforce existing regulations as well as reform regulations obviously outdated would be an appropriate management solution.

* Stocks at risk of extinction should be allowed to maintain minimum viable populations in order to avoid federal intervention and species listing. Extreme caution should be applied in management decisions when stocks are at critically low levels. Current wild stock population trends must be reversed. Wild stock escapement goals should be determined, set, monitored and evaluated for every watershed basin in California. Reassessment of the Klamath escapement goals based on current data available must be undertaken. Underutilization of existing good habitat is apparent and documented with present escapement levels. The current "natural" escapement floor for the Klamath system does not address individual stock populations which could become extinct if these populations are not monitored. Evaluate the current minimum escapement floor for the Klamath system and mandate a no harvest policy when the floor is approached.

CONCLUSION

The findings of the Humboldt Chapter of AFS concur with those of Nehlsen et al. (1991) and Brown and Moyle (in press); numerous stocks of salmon and steelhead in northern California are threatened with extinction. These fish are important to the economy and culture of northwestern California and maintaining wild stocks offers the best hope of restoring self sustaining runs that will be able to withstand natural stochastic events. Loss of these locally adapted anadromous salmonids may be irreversible without preserving and expanding available refugia. Nehlsen et al. (1991) state that in order for anadromous salmonid stocks to survive and prosper into the next century that "a new paradigm" must emerge "that advances ecosystem function and habitat restoration rather than hatchery production." Successful recovery of fisheries populations depends on efforts from both fisheries and land (habitat and watershed) managers. While the primary focus of land managers should be habitat protection, fisheries managers must sustain the existence of individual stocks through retention of viable spawning population escapement. Success will require a long-term commitment to develop and implement a recovery strategy capable of restoring interlinked terrestrial and aquatic systems in an ecosystem approach.

Ultimately, the best solutions for protecting and restoring fisheries habitat will come from local communities and land owners as well as from fisheries professionals. Farmers and ranchers in the Shasta Valley are very capable of arriving at the best solutions for improving efficiency of water use in their area. Similarly, interdisciplinary professionals could also help formulate the best solutions to controlling erosion while continuing to maintain viable forest products industry in northwestern California. Problems like controlling poaching and introduction of exotic fishes also require local community support. Erosion control and prevention could also be a major source of jobs for displaced timber workers. Long term economic benefits to rural communities from increased tourism as fishing improves could also be considerable. Volunteer opportunities should develop into internships and job placement in areas of monitoring, contracting and implementing viable restoration activities.

It is the hope of the Humboldt Chapter of AFS that by clearly portraying the magnitude of the problems facing anadromous salmonids in northwestern California, all parties will recognize the need to cooperate and willingly join efforts to prevent loss of salmon and steelhead populations. If we fail to take immediate action, wide spread loss of stocks will occur. If cooperation is not forthcoming, protection of many of the stocks at risk could be sought under the Endangered Species Act. Humboldt AFS would rather help build cooperation for a community based restoration program that takes a long-term approach to ecosystem recovery.

ACKNOWLEDGEMENTS

Thanks to the following people who attended meetings, shar information or provided comments on our report.

Bruce Amato
Randy Bailey
Dr. Roger Barnhardt
Greg Bryant
Mike Callaghan
Wendy Cole
Scott Downey
Rod Fortier
Ken Gallagher
Karen Kenfield
Wendy Jones
Jim Lintz
Mike McCain
David Menem
Dr. Peter Moyle
Alan Olson
Larry Preston
Dr. Richard Ridenhour
Jim Waldvogel
Brian White
David Anderson
Jerry Barnes
Paul Brouha
Ken Byrne
Vicki Campbell
Barry Collins
Todd Flannigan
Bryan Furman
Colinda Guiterres
Tom Kisanuki
Aldaron Laird
Mike Maahs
Dave McCloud
Mike Morford
Jennifer Nielsen
Joe Polos
Dr. Terry Roelofs
Park Steiner
Tom Wesaloh
Dave Will

REFERENCES

Altukhov, Y.P. and E.A. Salmenova. 1986. Stock transfer relative to natural organization, management, and conservation of fish populations. In: Population Genetics and Fisheries Management Eds. Ryman and Utter. University of Washington Press. Seattle, Washington.

Bedell, G.W. 1974-89. Annual Report for Trinity River Salmon and Steelhead Hatchery. California Dept. of Fish and Game. Inland Fisheries Div. Sacramento, Ca.

Behnke, R.J. 1982. Wild trout sport fisheries and hatchery programs for the future. Proceedings from symposium: The role of hatcheries in the management of wild salmonids. Cal Trout, San Francisco, Calif. USA.

Berst, A.H. and R.C. Simon (eds.).1981. Proceedings of the Stock Technical Report of Fisheries and Aquatic Sciences Concept Symposium. Canadian Jour. of Fisheries and Aquatic Sciences. 38 (12).

Bjornn, T.C. and N. Horner. 1980. Biological criteria for classification of Pacific salmon and steelhead as threatened or endangered under the Endangered Species Act. Report to NMFS, Seattle, Wash.

Brodeur, G. 1990. Are juvenile salmon food resources limited in the coastal environment? In: Proceedings from Estuary and Ocean Productivity Workshop, USFWS, Klamath Field Office, Yreka, Calif. p 29-60.

Brown, L.R. and P.B. Moyle. 1990. Eel River Survery: Final Report. Dept of Fish and Wildlife, Univ. of Calif., Davis. Contract

-46-R-2 for the Calif. Dept. of Fish and Game.

Brown, L.R. and P.B. Moyle. In Press. Draft report on the status of coho salmon in California. National Marine Fisheries Service, Terminal Island, Calif.

Buchanan, D. In press. Klamath Basin Trout. From ODFW studies on: Diversity Within and Between Rainbow Trout in Oregon River Basins. Oregon Department of Fish and Wildlife, Research Station, Corvalis, Oregon.

Busby, M. 1991. The abundance of epibenthic and planktonic macrofauna and feeding habits of fall chinook salmon (Oncorhynchus tshawytcsha) in the Mattole River estuary/lagoon. M.S. Thesis, Humboldt State Univ. 130 p.

Calif. Dept. of Water Resources. 1982a. Watershed Management for

Unstable and Erodible Areas in Northwestern California. Prepared for U.S. EPA and the Calif. State Water Resource Control Board. 68 p.

Calif. Dept. of Water Resources. 1982a. South Fork of the Trinity River salmonid enhancement study. CDWR, Northern District, Red Bluff, Calif. 175pp

Carlton, A. 1989. Ceratomyxa shasta geographic and seasonal distribution in northern California and comparative salmon strain susceptibility. M.S. Thesis. Humboldt State University, Arcata, Calif.

Carver, G.A., T.A. Stephens, and J.C. Young. 1983 Quaternary thrust and reverse faulting on the Mad River fault zone, coastal northern California. Geo. Soc. of Amer. abstracts with programs. Vol. 15, no.5.

Carver, G.A., and R.M. Burke. 1987. Late Pleistocene and Holocene paleoseismicity of Little Salmon and Mad River thrust fault systems, NW California. Implications to the seismic potential of the Cascadia Subduction Zone. Geo. Soc. of Amer. abstracts. Vol. 9, no. 7.

Cedarholm, C.J. 1983. Clearwater River wild steelhead spawning timing. Proceedings of Olympic Wild Fish Conference. Peninsula College, Port Angeles, Washington.

Chen, M.F. 1984. Comparative susceptibility of salmonid fishes and salmonid fish cells to five isolates of infectious hemotopoietic necrosis and biological properties of two plaque variants. PHD Dissertation, Oregon State Univ., Corvallis, Ore.

Chilcote, M.W., S.A. Leider, J.J. Loch. 1986. Differential reproductive success of hatchery and wild summer steelhead under natural conditions. Trans. Amer. Fish. Soc. 115: 726 -735.

Coats, R.N. and T.O. Miller. 1981. Cumulative silvicultural impacts on watersheds: a hydrologic and regulatory dilemma. Environmental Management. 5(2):147-160.

Earth Science Associates. 1981. Lower Klamath Basin Investigation. For the USDI, Bureau of Indian Affairs, Palo Alto, Calif. 141 p.

Estey, D.F. 1981. Annual Report Warm Springs Salmon and Steelhead Hatchery, 1981-82. Region 3, Calif. Dept. of Fish and Game, Inland Fisheries Div.

Foote, J.S. 1990. Disease survey proposal for salmonid populations in the Trinity River. USFWS memo. Coleman Fish Hatchery, Anderson, Calif.

Fraidenberg, M.E. and R.H. Lincoln. 1985. Wild Chinook Salmon Management: An International Conservation Challenge. No. Amer. Jour. of Fisheries Mgmnt. 5:311-329.

Frissell, C.A. and T.Harai. 1988. Life history patterns, habitat change, and productivity of fall chinook stocks of southwest Oregon. In: Proceedings of 1988 Northeast Pacific Chinook and Coho Workshop. Ed. B. Shepard. American Fisheries Soc.

Furniss, M.J., T.D. Roelofs, and C.S. Yee. 1991. Road Construction and Maintenance. In Influences of Forest and Rangeland Management on Salmonid Fishes and Their Habitats. Amer. Fish. Soc. special publication. 19:297-323

Gall, G.A., B. Bentley, C. Panattoni, E.Childs, C. Qi, S. Fox, M. Mangel, J. Brodziak and R.Gomulkiewicz. 1989. Chinook Mixed Stock Fishery Project. University of California. Davis, Calif.

Gilpin, M.E. and M.E. Soule. 1990. Minimum Viable Populations: Processes of Species Extinction. In Michael Soule (ed.): Conservation Biology: The Science of Scarcity and Diversity, Univ. of Michigan Press. pp 19-36.

Hagans, D.K., W.E. Weaver, and M.A. Madej. 1986. Long term on site and off site effects of logging and erosion in the Redwood Creek Basin in northern California. Nat. Council on Air and Streams, Tech. Bull. 460. 260 Madison Av., N.Y., N.Y.

Hankin, D.G. 1985. Analyses of recovery data released from fall chinook salmon released from Iron Gate Hatchery and Trinity River Hatchery, and implications for management of wild and hatchery chinook salmon stocks in the Klamath River system. Contract with USDI BIA, Northern California, Hoopa. 117 p.

Hankin, D.G. 1990. Effects of monthly releases of hatchery-reared chinook salmon and size at age of maturity and fishery contribution rate. ODFW, 90-4 Portland, Ore. 37p.

Haskins, D.M. and R.A. Irrizarry. 1988. A Holistic Appraisal of Cumulative Watershed Effects on Watershed Conditions and Fisheries, South Fork of the Trinity River, Northwestern California. USDA Forest Service, Shasta-Trinity National Forest, Redding, Calif. 41 p.

Healy, M.C. 1982. Juvenile Pacific salmon in estuaries; the life support system. pp.315-341. In V. Kennedy (ed.) Estuarine Comparisons. Academic Press. N.Y.,N.Y. 709 pp.

Hedrick, R.P., S.E. LaPatra, J.L. Fryer, T. McDowell, and W.H. Wingfield. 1987. Susceptibility of coho (Oncorhynchus kisutch) and chinook salmon (Oncorhynchus tshawytscha) hybrids to experimental infections with infectious hematopoietic necrosis virus (IHNV). Bull. of the European Assoc. of Fisheries Pathology. 7(4), 97.

Higgins, P.T. 1991. Habitat Types of the Eel River Estuary and Their Associated Fishes and Invertebrates. In: C. Roberts (ed.) Report on Fish and Wildlife Species of the Eel Delta. Funded by Eel River RCD, USDA Soil Cons. Ser., Eureka, Calif.

Hiser, C.A. 1978-89. Annual Report from Iron Gate Salmon and Steelhead Hatchery. California Dept. of Fish and Game. Inland Fisheries Div. Sacramento, Ca.

Hofstra, T.D. 1983. Management alternatives for Redwood Creek Estuary. Redwood National Park, Arcata, Calif. USA.

Humboldt AFS. 1975. Letter to Region 1 CDFG by President Hank Pennington regarding stock transfers. Humboldt AFS files, Arcata, Calif.

Humboldt AFS. 1987a. Stock Transfer Policy Resolution to California Salmon and Steelhead Advisory Committee. Ratified by Membership at 1987 annual meeting. Humboldt AFS files, Arcata, Calif.

Humboldt AFS. 1987b. Chapter position on State Water Resources Control Board Data Base on Impaired Water Bodies. Letter to Don Maughn, Chair SWRCB. April 26, 1987. Humboldt AFS files.

Humboldt AFS. 1989. Chapter input into EPA water pollution data base. Letter to Tuck Vath, NCRWB, Dec. 12, 1989. Humboldt AFS files, Arcata, Calif.

Humboldt AFS. 1992. Comments to Board of Forestry on Revision of Forest Practice Rules. Letter to Dean Cromwell, Exec Sec. BOF, February 23, 1992. Humboldt AFS files, Arcata, Calif.

Janda, R.J., K.M. Nolan, D.R. Harden and S.M. Coleman. 1975. Watershed conditions in the drainage basin of Redwood Creek, Humboldt County, California. U.S. Geologic Survey, Menlo Park, Calif. Open File Report 75-568. 266 p.

Judson, S. and D.F. Ritter. 1964. Rates of Regional Denudation in the United States. Jour. of Geophys. Research. Vol. 69, 11:

3395-3401.

Kapuscinski, A.R. 1984. Genetics concerns in salmon and steelhead conservation and enhancement. Genetics Workshop for Enhancement Planning Team. Oregon State University. Newport, Oregon.

Kelsey, H.M. 1980. A sediment budget and an analysis of geomorphic processes in the Van Duzen River basin, north coastal California, 1941-1975: Summary. Geol. Soc. Am. Bull., Part I, 91:190-195.

Kojan, E. 1976. Mass erosion sensitivity analysis, Hitchcock Creek Zone, South Fork Mountain, Shasta-Trinity National Forest. USDA Forest Service Project no. 14447.

Kubicek, P.F. 1977. Summer water temperature conditions in the Eel River system with reference to trout and salmon. M.S. Thesis, Humboldt State Univ., Arcata, Calif. 198 p.

LaVen, R. and A. Lehre. 1977. The effects of timber harvest and roads on sediment yield and channel morphology in the Fox Planning Unit, Six Rivers National Forest, Eureka, Calif.

Lichatowich, J.A. and J.D. McIntyre. 1987. Use of hatcheries in the management of Pacific anadromous salmonids. American Fisheries Society Symposium. 1: 131-136.

Light, J.T., S. Fowler, and M. Dahlberg. 1988. High seas distribution of North American steelhead as evidenced by recoveries of marked or tagged fish. Fish. Research Institute, Univ. of Wash., Seattle. FRI-UW-8816.

Lisle, T.E. 1981. The recovery of stream channels in north coastal California from recent large floods. In: K. Hashagen (ed) Habitat Disturbance and Recovery Proceedings. Cal Trout, San Francisco, Calif. p 31-41.

MacCleery, D.W. 1974. Logging on South Fork Mountain, a look at past activities and implications for future management of the area. USDA Forest Service, Shasta-Trinity National Forest, Redding, Calif.

Marshall, L. 1970. Annual Iron Gate Salmon and Steelhead Hatchery Report, Fifth Year of Operation, 1969-70. CDFG Inland Fisheries Division, Region 1, Redding, Sacramento, Calif.

McEvoy, A.F. 1986. The fishermen's problem: ecology and law in California fisheries, 1850-1980. Cambridge University Press, New York. 368 p.

McGie, A.M. 1984. Evidence for density-dependence among coho salm stocks in the Oregon Production Index Area. p.37-49. In W. Percy (ed.): The influence of ocean conditions on the production of salmonids in the north Pacific. OSU, Sea Grant Pub.

Murphy, G.I. and J.W. DeWitt. 1951. Notes on the fishes and the fishery of the lower Eel River, Humboldt County, California. Cal. Fish and Game, Inland Fisheries, Redding, California. 30p.

Murray, R. 1967. The Lewiston Trapping Facility, Second Year of Operation, 1959-60. CDFG Inland Fisheries Division, Region 1, Redding, Sacramento, Calif.

National Marine Fisheries Service (NMFS). 1980. Policy position papers for the consideration of Columbia River salmon under the Endangered Species Act. Paper #2: Biological thresholds of endangerment. NMFS, Seattle, Wash.

National Marine Fisheries Service (NMFS). 1987. Endangered and threatened species, winter run chinook salmon. Federal Register 52:6041-6048.

Nawa, R.K., C.A. Frissell, and W.J. Liss. 1990. Life History and Persistence of Anadromous Salmonid Stocks in Relation to Stream Habitats and Watershed Classification. Oak Creek Lab O.S.U. Corvalis, Oregon. Performed under contract for Ore Dept. of Fish and Wildlife.

Nelson, K. and M. Soule. 1986. Genetical Conservation of Exploited Fishes. In: Population Genetics and Fisheries Management Eds. Ryman and Utter. University of Washington Press. Seattle, Washington.

Nehlsen, W., J.E. Williams, J.A. Lichatowich. 1991. Pacific Salmon at the Crossroads: West Coast Stocks of Salmon, Steelhead, and Sea-run Cutthroat Trout at Risk. Fisheries Vol. 16, No. 2

Nicholas, J.W. and D.G. Hankin. 1988a. Chinook Salmon Populations in Oregon Coastal River Basins. Descriptions of Life Histories and Assessment of Recent Trends in Run Strengths. Funded by ODFW. Ore St. Univ. Extension Ser. Corvalis, Ore.

Nicholas, J.W. and D.G. Hankin. 1988b. Variations in distribution of juvenile chinook salmon in Oregon coastal river basins: implications to future stock transfer practices. In : Proceedings of 1988 Northeast Pacific Chinook and Coho Workshop. Ed.: B. Shepard. American Fisheries Society.

Nickelson, T.E. 1986. Influence of upwelling, ocean temperature, and smolt abundance on marine survival of coho salmon in th

Oregon production area. Can Jour. of Fish. and Aquat. Sci. 43: 527-535.

PFMC. 1990. Pre-season Report I: Stock abundance analysis for 1990 ocean salmon fisheries. PFMC. Portland, Ore.

PNFHPC (Pacific Northwest Fish Health Protection Committee) 1989. Model Comprehensive Fish Health Protection Program. 1002 N.E. Holladay Street, Portland, Oregon, 97232-4181.

Payne, T.R. and Assoc. 1989. Lower Klamath River tributary delta study. U.S. Dept. of Interior, BIA, Redding, Calif.

Puckett, L.K. 1977. The Eel River Estuary - Observations on Morphometry, Fishes, Water Quality, and Invertebrates. Cal. Fish and Game under contract with Cal. Dept. of Water Resources. 26 pp.

Reeves, G.H. 1985. Competition between redside shiners and steelhead trout in the Umpqua River, Oregon. Doctoral thesis, Oregon State University, Corvalis, Ore.

Ricker, W.E. 1972. Heredity and environmental factors effecting certain salmonid populations. In: Stock Concept of Pacific Salmonids. H.R. MacMillan Lecture on Fisheries. Vancouver B.C.

Ricker, W.E. 1980. Causes of decrease in age and size of chinook salmon (Oncorhynchus tshawytscha). Canadian Tech. Report 944. Dept. of Fisheries and Oceans, Ottawa, Canada.

Riesenbichler, R.R. and J.D. McIntyre. 1977. Genetic Differences in growth and survival of juvenile hatchery and wild steelhead trout. J. Fisheries Res. Board of Can 34:123-128.

Riesenbichler, R.R. and J.M. Emlen. 1988. A re-evaluation of models predicting density-dependent survival at sea for coho salmon. In: B.G. Shepard (ed.): Proceedings of 1988 Northeast Pacific Chinook and Coho Salmon Workshop. Western Div. AFS. Pacific NW Chapter, Penticton, B.C., Canada.

Riggs, L. 1990. Principles for genetic conservation and production quality. Northwest Power Planning Council contract no. C90-005. Portland, Oregon.

Riley, J. 1967. Annual Report for Iron Gate Salmon and Steelhead Hatchery, First Year of Operation, 1965-66. CDFG Inland Fisheries, Region 1, Redding, Calif.

Roelofs, T.D. 1983. Current Status of Summer Steelhead Stocks and Habitat, and Recommendations for Their Management. U.S. Forest Service, Region 5. San Francisco, California.

Rogers, D. and R. Wood. 1991. Shasta River Fisheries Water Quali Project, 1990-91. River. Funded by Klamath River Task Ford U.S.F.W.S. Klamath Field Office, Yreka, Calif. 39 p.

Royal, L.A. 1972. An Examination of Anadromous Trout Program of the Washington State Game Program. Mimeographed Report. Wash. Department of Game. Olympia, Washington.

Sanders, S.W. 1980-1983. Annual Report Hollow Tree Creek Egg Taking Station. Region 3, Calif. Dept. of Fish and Game, Inland Fisheries Div.

Sanders, S.W. 1979-1982. Annual Report Noyo River Egg Collecting Station 1964 through 1978. Region 3, Calif. Dept. of Fish and Game, Inland Fisheries Div.

Sedell, J.R., P.A. Bisson, F.J. Swanson, and S.V. Gregory. 1988. What we know about large trees that fall into streams and rivers. In: From the Forest to the Sea: A Story of Fallen Trees. USDA Forest Service and U.S. Dept. of Interior, BLM. Gen. Tech. Report PNW-GTR-229. Portland, Ore.

Simenstad, C.A., K.L. Fresh, and E.O. Salo. 1982. The role of Puget Sound and Washington coastal esturies in the life history of Pacific salmon: an unappreciated function. In V. Kennedy (ed) Estuarine Comparisons. Academic Press. N.Y., N.Y. 709 pp

Simon, R.C. 1988. Seven Avenues for Redress of Fish Hatchery Problems Involving Restricted Genetic Variability. Proceedings of the American Fisheries Society Bioenhancement Seminar. Portland, Ore.

Simon, R.C., J.D. McIntyre, H. Hemmingson. 1986. Family size and effective population size in a hatchery coho salmon population. Canadian Journal of Fisheries and Aquatic Sciences 43: 2434-2442.

Smith, E.A., B.A. Miller, J.D. Rogers, M.A. Buckman. 1985. Outplanting Anadromous Salmonids - A Literature Survey. Oregon Department of Fish and Wildlife for Bonneville Power Administration. Project No. 85-68.

Snyder, R.U. and S.W. Sanders. 1979. Summary of Operations Noyo River Egg Collecting Station 1964 through 1978. Region 3, Calif. Dept. of Fish and Game, Inland Fisheries Div.

Solazzi, M.F., S.L. Johnson, T.E. Nickelsen. 1983. The effectiveness of stocking hatchery coho pre-smolts to increase rearing densities of juvenile coho in Oregon coastal streams. 14 p. Oregon Dept. of Fish and Wildlife. Portland, Oregon.

Sommerstrom, S., E.M. Kellogg, and J.L. Kellogg. 1990. Scott River Basin Granitic Sediment Study. Coop agreement 14-16-001-89506 Siskiyou RCD, and Klamath River Task Force, USFWS Yreka, Calif.

Stempel, M. 1988. Possible implications of integrating hatchery and natural production of salmon and steelhead in the Trinity River Basin. USFWS, Weaverville, California.

Steward, C.R. and T.C. Bjornn. 1990. Supplementation of salmon and steelhead stocks with hatchery fish: a synthesis of published literature. Idaho Cooperative Fisheries and Wildlife Research Unit, Univ. of Idaho, Moscow, Id. 83843. Tech. Report 90-1.

U.S. Fish and Wildlife Service. 1960. Survey of chinook salmon spawning habitat in northwestern California. In Natural Resources of Northern California. U.S.D.I. Fish and Wildlife Service, Pacific Southwest Field Committee.

U.S. Fish and Wildlife Service. 1988. Klamath River Fisheries Assessment Program-Annual Report 1988. Fish. Assistance Office, Arcata, California.

U.S. Fish and Wildlife Service. 1990a. Klamath Fisheries Assessment Program: Investigations on lower tributaries Klamath River. Fish. Assistance Office, Arcata, Calif.

U.S. Fish and Wildlife Service. 1990b. Klamath-Trinity River Basin spring chinook salmon stock evaluation and run-size forecast. USFWS Fish. Assistance Office, Arcata, Calif. 31 p.

U.S. Fish and Wildlife Service. 1991. Long Range Plan for the Klamath River Basin Conservation Area Fishery Restoration Program. Klamath Field Office, Yreka, Calif. 320 p.

Utter, F.M. 1981. Biological criteria for definition of species and distinct intraspecific populations of anadromous salmonids under the U.S. Endangered Species Act of 1973. Canadian Jour. of Fisheries and Aquatic Sci. 38:1626-1635. Wahrhaftig, C. 1976. Statement of Erosion Problems in Redwood Creek. Memo to the Board of Forestry. January 15, 1976. From CDFG files, Eureka, California.

Will, R.D. 1976-78. Annual Report Mad River Salmon and Steelhead Hatchery. Calif. Dept. of Fish and Game, Region 1, Inland Fisheries Division.

Withler,F.C. 1982. Transplanting Pacific Salmon. Canadian Tech Report of Fisheries and Aquatic Sciences 1079. 27 p.

Personal Communications

Cole, Wendy: U.S. Forest Service Fishery Biologist, Gasquet R.D., Six Rivers National Forest.

Downey, Scott: California Fish and Game Restoration Coordinator, Eel and Mattole Rivers.

Foley, Patrick: Graduate student at Humboldt State University studying green sturgeon

Hassler, Tom: Professor of Fisheries, USFWS Cooperative Unit HSU.

Laird, Alderon: Trinity Fisheries Restoration Association.

Morford, Mike: Member of Klamath River Management Council Tech Team

Moyle, Peter: Professor of Fisheries, Univ. of Calif. at Davis.

Nielsen, Jennifer: Doctoral Candidate in Fisheries at U.C. Berkeley.

Ridenhour, Richard: Professor of Fisheries, Humboldt State University, Arcata, California.

West, Jack: U.S. Forest Service Resource Officer, Klamath National Forest, Yreka, Calif.

Waldvogel, Jim: U.C. Marine Advisor, Crescent City, Calif.

APPENDIX A

Impaired Waterbodies Entered by Humboldt AFS into Clean Water Data Base for California State Water Resources Control Board and U.S. Environmental Protection Agency

Ah Pah Creek
Black Butte River
Browns Creek
Dean Creek
Eel River
Eel River
Eel River Estuary
Etna Creek
French Creek
Garcia River
Gualala River
Hayfork Creek
Kidder Creek
Klamath River
Klamath River Estuary
Mad River
Mattole River
Mattole River Estuary
McGarvey Creek
Moffett Creek
Omagar Creek
Pelletreau Creek
Post Creek
Redwood Creek
Redwood Creek Estuary
Salt River
Scott River
South Fork of the Trinity River
Van Duzen River

To: Klamath Fishery Management Council, Basin Task Force, Klamath Technical Advisory Team and anyone interested in Klamath Restoration.

From: John Wilson

Survival of yearling chinook salmon is four to five times that of fingerlings. Fingerling salmon require additional growth to reach smoltification and will utilize available habitat, space, and food. Naturally produced fingerlings also utilize the same habitat,space and food. Fingerling salmon move out of tributary streams in early spring and rear in the main channel as they migrate to sea. Natural timing of these outmigrations occur over several months and may be a factor of genetics and environment. Recent drought conditions have greatly reduced water flow and quality, diversions and withdrawals have intensified the impacts of this drought. Natural production faces extreme stress from these factors. Present hatchery practices and mitigation obligations are adding to the stress and decreasing the survival of the natural component of chinook salmon in the following ways.

1. Mitigation from Iron Gates Hatchery is stated in terms of smolts planted, six million, or the equivalent of 48,000 natural spawners (250 smolts per spawning pair) .Presently a large portion of this mitigation is released at IGH in April. Wild salmon from Bogus, Shasta and Scott River located below IGH are moving out of these tributaries into the main stem of the Klamath River at the same time. Chinook habitat and carrying capacity are rapidly decreasing. The result is low survival rate for both natural and hatchery production. Since hatchery fingerling tend to be larger than naturally produced fingerlings, the impact on these smaller fish may be extreme. Shasta River has shown major declines in production in recent years, and is of great concern to managers..

2. Trinity River Hatchery operates on a mitigation goal of 9000 fish returning to the base of the dam. To accomplish this requires an upper Trinity Basin escapement of 45,000 adults. If the strategy to meet this goal is to operate

the hatchery to produce the greatest number of early maturing fish ,(fingerling releases), then the stage is set for a stock collapse due to the shortening of the maturity schedule. (three consecutive years of broodyear failure, and only a few four year old fish left to spawn). Other downsides include egg availability, contribution to fisheries,and adult escapement.

If the mitigation strategy is to pump 45,000 spawners annualy into the upper Trinity, to get 9,000 to the dam, many of these fish would have little spawning success due to imposition of redds, and their offspring would experience even less success rearing, due to the large numbers of hatchery fish competing for the limited habitat available in the mainstem below Lewiston. The lack of geographic distribution of natural spawners and hatchery plants places excessive demands on the limited habitat available. Acomplishing the mitigation goal could also be met by restricting both ocean and river fisheries to generate the needed escapement. The present mitigation goal is not compatible with the present basin recovery plan. Present mitigation practices must be changed to protect wild fish populations.

Changes should include:

1.Release strategy based on seasonal environmental conditions present in the basin, number of natural fingerlings utilizing natural rearing areas and total numbers of natural spawners. Reduce or eliminate fingerling releases when natural populations are high, drought conditions are present,and natural seeding is adequate. Increase fingerling releases in years of poor emergence or low spawner counts,if habitat is underseeded. Yearling releases should be used to meet mitigation and broodstock requirements. Some fish may end up as surplus and might have to be destroyed.

2. Establish mitigation goals that are consistant with maximizing natural production. Raw numbers, be they smolts or spawners, are a poor method of evaluating the success of the mitigation program. Contribution to fisheries and perpetuation of the species are better indices of mitigation success.Allow natural production uncontested use of all available habitat.

3. Develop and maintain a selective breeding program that will increase the natural component of hatchery broodstock, create genetic diversity within the hatchery

program and mark all hatchery releases for identification so that a proper mix of hatchery and wild fish can be maintained in natural spawning populations. Improve homeing tendency and genetic makeup of hatchery fish to minimize effects of straying on natural spawning populations.

4. Acknowledge that mitigiation has not been provided to offset adverse effects on downstream habitat, and resulting reduction of productivity of fish populations.Include these losses for consideration when defining mitigation responsibility at time of relicensing power and water projects.

5 Additional information required to make wise management decisions;

Do CWT groups accurately represent production hatchery releases, and are the numbers of fish released accurate?
Are the fish released adequately smoltified to guarantee rapid outmigration and optimal ocean survival?
Are they in good condition,good health and free of disease?
Are diseases effecting hatchery production and are diseases being transmitted to natural populations?
What additional measures can be done to combat disease?
Has the genetic impact of straying of hatchery fish been determined?
Have the environmental conditions (hot water) limiting release timing of hatchery production been documented? Have release strategies incorporated this data?

Will successful hatchery programs discount the need for additional streamflows to protect natural fish production?
Are all agencies involved in Klamath Basin restoration working together to accomplish the same goals?
Are research projects co-ordinated between agencies to avoid duplication? Is there one agency overseeing all activities conducted by the Basin Restoration Plan? WHO?

TABLE 1

The following table lists recovery rates(number recovered divided by number released) in % forCWT production releases from IGH and TRH for fingerlings and yearlings by brood year. Also included in the columns to the right are natural spawning escapement, and number and age of fall chinook released from corresponding brood years. The ten year average is listed at the bottom of the first four columns, and the comparisons of those averages are entered below the ten year averages. Useing this method yearlings would be expectd to survive at a rate 3.92 times for IGH and 4.86 times for TRH, that of fingerlings.

Year	IGH-F	IGH-Y	TRH-F	TRH-Y	NAT.es	Hat.fing	Hat.year	B.year
1978	*	2.949	.564	1.173	58492	378572	401935	1978
1979	2.485	4.462	.521	5.297	30637	1740500	1648739	1979
1980	.837	2.144	.296	3.340	21483	3450072	2068524	1980
1981	1.106	.945	.185	1.012	33857	1858366	2095613	1981
1982	.455	5.615	.357	2.773	31951	1316695	1777263	1982
83	1.112	6.232	3.708	17.154	30784	5568717	2272070	1983
84	.897	5.992	2.708	8.344	16064	3410369	1923606	1984
1985	.753	3.815	3.217	8.263	25677	14054694	2126337	1985
1986	.039	.294	.127	8.976	113360	16525007	1184764	1986
1987	.075	1.339	.168	1.255	101717	8610205	1002343	1987
total	7.76	33.79	11.85	57.59	78886	13028695	2109038	1988
10 yr. av.	.862	3.379	1.185	5.76	43718	7861460	1424342	1989
Y/f		3.92		4.86	13051			1990
					11110			1991

Prepared by J.Wilson, KRTAT

TABLE 2

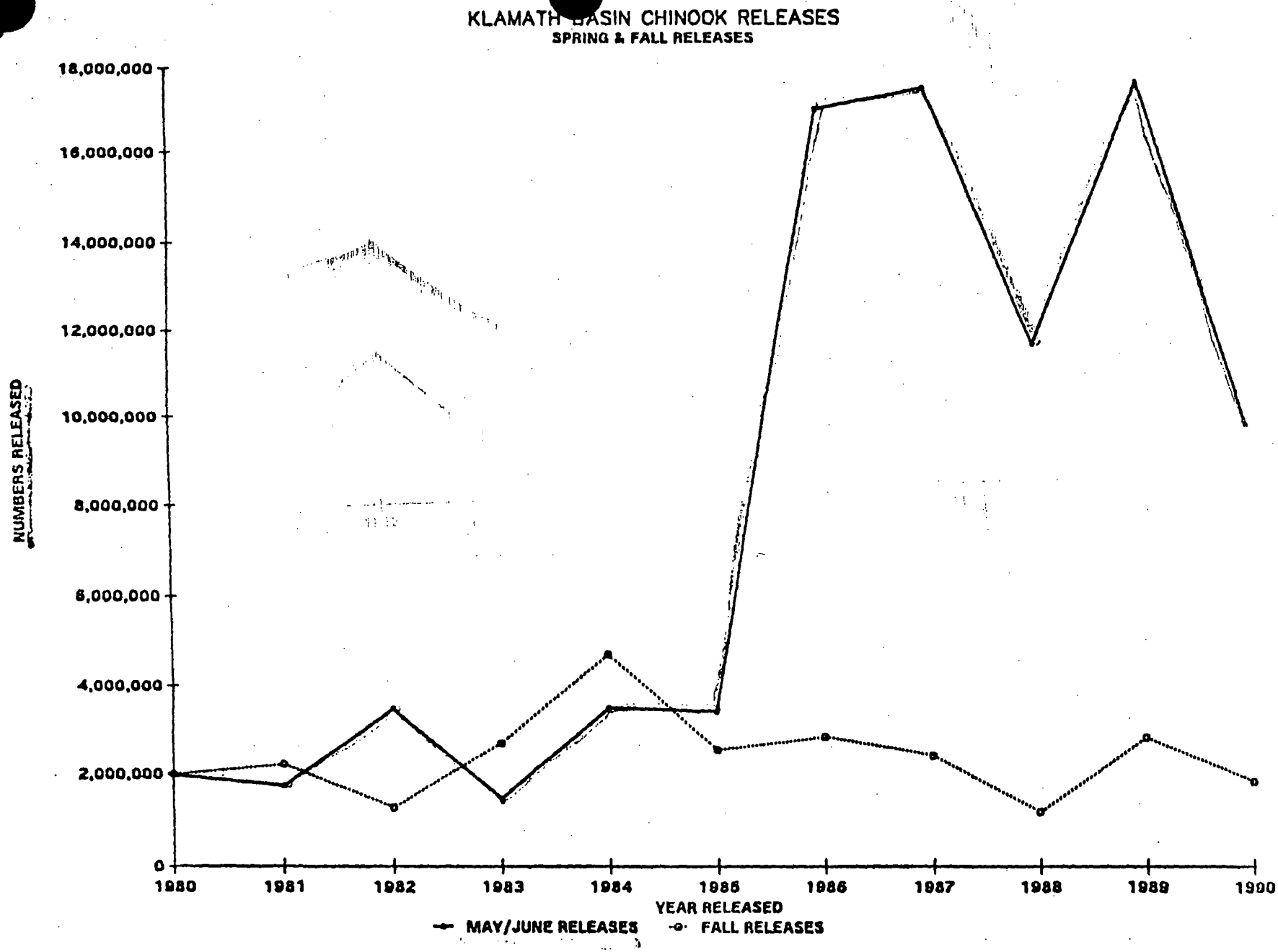
The following table compares recovery rates (total tags recovered divided by total tags) of on site and off site releases of hatchery fall chinook fingerling and yearling releases from Klamath Basin hatcheries. The right column (offsite/onsite) indicates the expected increase or decrease in survival rate for offsite releases compared to onsite production releases at the hatchery. The bottom three entries represent the average rate for all releases, fingerlings and yearlings. Off site fingerlings would be expected to survive at a rate three times that of on site releases, while yearling offsite releases showed only slight improvement over onsite releases. The offsite releases represented in this table were not entirely in the lower river, but represented several release sites.

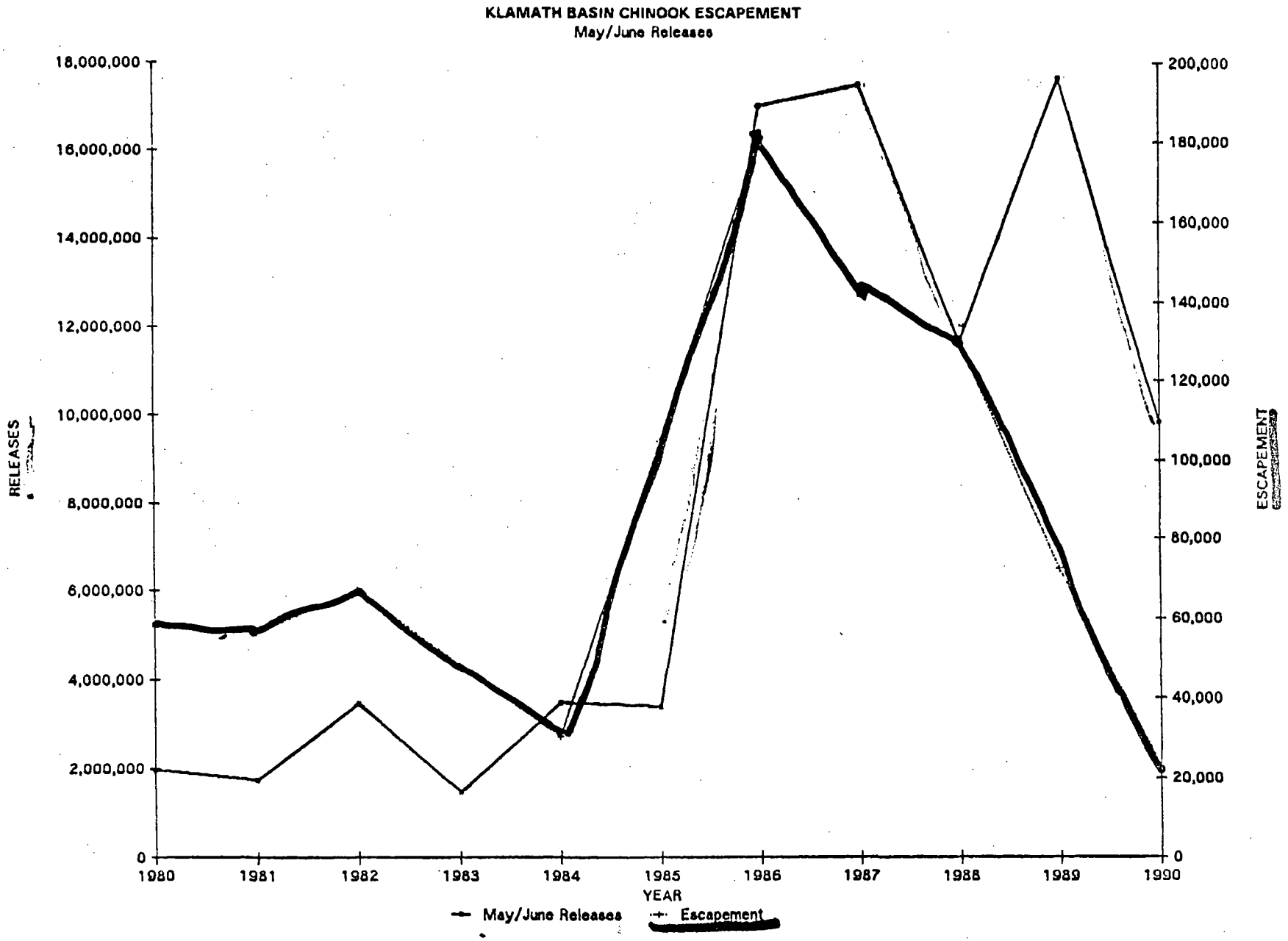
Brood Yr.	on site	off site	type	off/on	
1978	.564	.995	F	1.76	66110
1979	.52	4.479	F	8.61	66117
1981	.185	.785	F	4.24	65201
1982	4.587	3.934	Y	.86	65911
1982	.455	.426	F	.94	65921
1982	2.773	4.923	Y	1.78	65609-10-11
1982	.357	.699	F	1.96	65607-66123
1983	6.232	8.299	Y	1.33	65926
1983	1.123	1.575	F	1.40	65924
1983	17.154	9.814	Y	.57	65614-5-1
1983	3.242	9.101	F	2.80	65608
1984	5.992	3.650	Y	.61	65935
1984	.897	3.379	F	3.79	65928
1984	8.344	6.415	Y	.77	65620
1984	2.708	2.973	F	1.10	65624
~~1985~~	~~3.815~~	~~12.039~~	~~Y~~	~~3.16~~	
~~1985~~	~~3.815~~	~~3.107~~	~~Y~~	~~.81~~	
Av.off/on				2.15	
F.off/on				2.96	
Y.off/on				1.03	

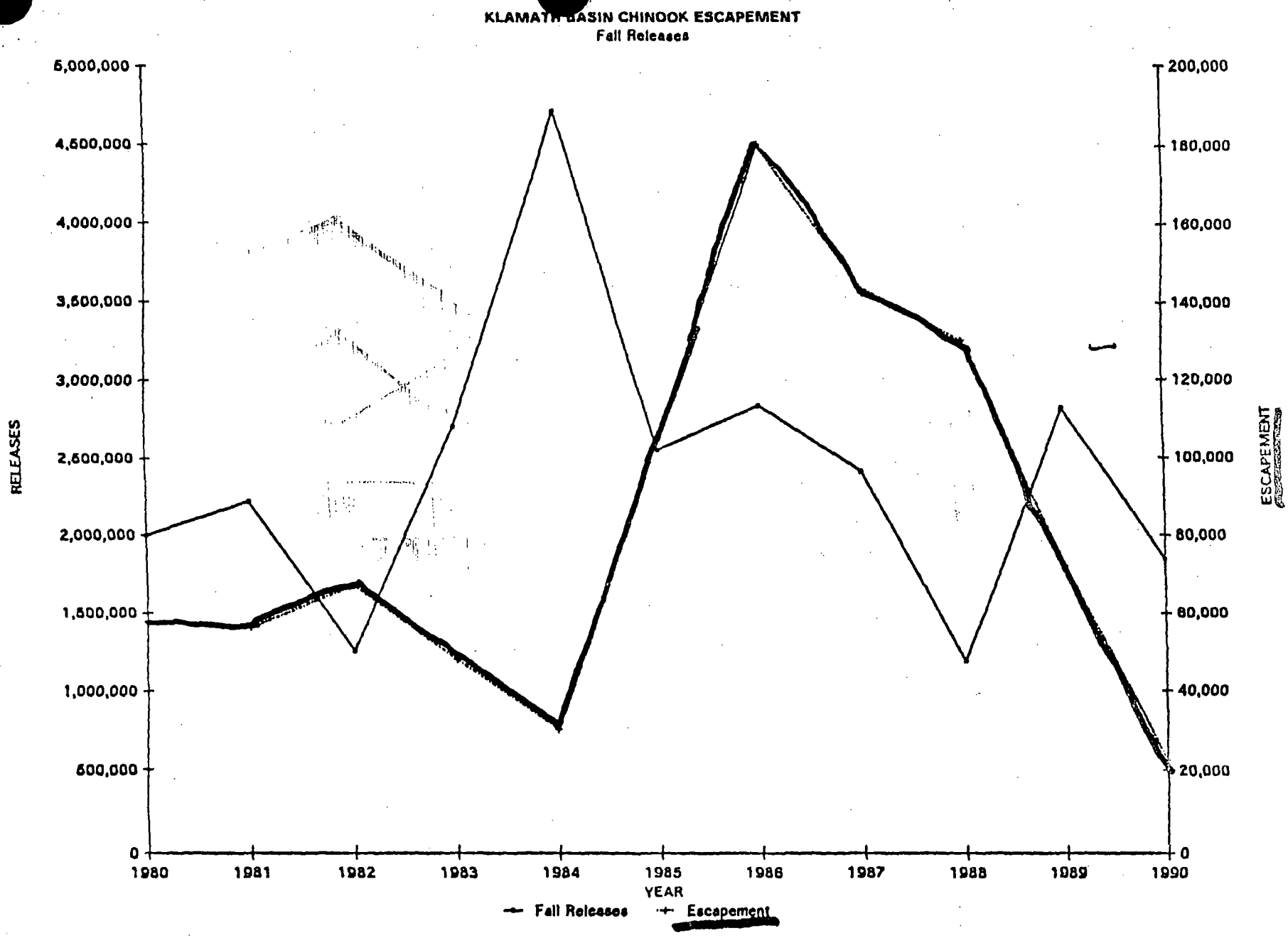
Prepared by J.Wilson, KR TAT

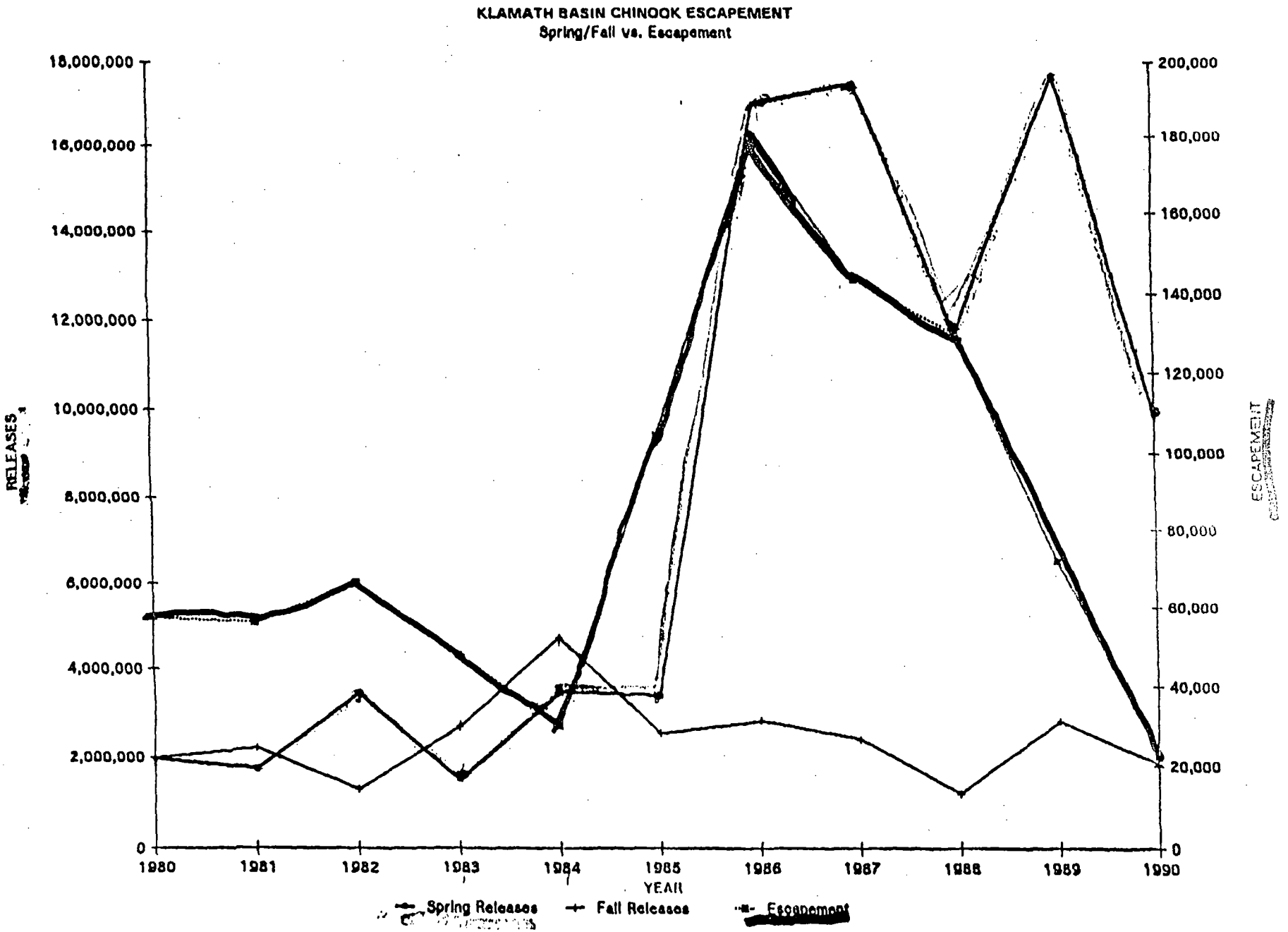
Klamath Basin Chinook Spawner Escapement

Year	RELEASES May/June	Fall	Total	SPAWNER ESCAPEMENT
1980	1,965,412	1,999,726	3,965,138	57,683
1981	1,737,588	2,218,866	3,956,454	56,333
1982	3,465,257	1,259,094	4,724,351	67,076
1983	1,470,013	2,701,607	4,171,620	47,966
1984	3,491,882	4,719,731	8,211,613	30,375
1985	3,406,599	2,552,318	5,958,917	104,487
1986	17,022,748	2,834,628	19,857,376	180,263
1987	17,524,433	2,412,211	19,936,644	143,890
1988	11,689,657	1,190,860	12,880,517	130,249
1989	17,657,770	2,816,009	20,473,779	72,288
1990	9,850,400	1,844,731	11,695,131	22,633
1991		0		17,631


KLAMATH BASIN CHINOOK RELEASES
SPRING & FALL RELEASES
18,000,000
16,000,000
14,000,000
12,000,000
10,000,000
8,000,000
6,000,000
4,000,000
2,000,000
0
NUMBERS RELEASED
1980
1981
1982
1983
1984
1985
1986
1987
1988
1989
1990
YEAR RELEASED
MAY/JUNE RELEASES
FALL RELEASES


KLAMATH BASIN CHINOOK ESCAPEMENT
May/June Releases
RELEASES
ESCAPEMENT
18,000,000
16,000,000
14,000,000
12,000,000
10,000,000
8,000,000
6,000,000
4,000,000
2,000,000
0
200,000
180,000
160,000
140,000
120,000
100,000
80,000
60,000
40,000
20,000
0
1980
1981
1982
1983
1984
1985
1986
1987
1988
1989
1990
YEAR
May/June Releases
Escapement


KLAMATH BASIN CHINOOK ESCAPEMENT
Fall Releases
RELEASES
ESCAPEMENT
5,000,000
4,500,000
4,000,000
3,500,000
3,000,000
2,500,000
2,000,000
1,500,000
1,000,000
500,000
0
200,000
180,000
160,000
140,000
120,000
100,000
80,000
60,000
40,000
20,000
0
1980
1981
1982
1983
1984
1985
1986
1987
1988
1989
1990
YEAR
Fall Releases
Escapement


KLAMATH BASIN CHINOOK ESCAPEMENT
Spring/Fall vs. Escapement
18,000,000
16,000,000
14,000,000
12,000,000
10,000,000
8,000,000
6,000,000
4,000,000
2,000,000
0
RELEASES
200,000
180,000
160,000
140,000
120,000
100,000
80,000
60,000
40,000
20,000
0
ESCAPEMENT
1980
1981
1982
1983
1984
1985
1986
1987
1988
1989
1990
YEAR
Spring Releases
Fall Releases
Escapement

Disease and Operational Problems

Diseases present at Trinity River Hatchery include enteric red mouth which is caused by the bacteria Yersinia ruckeri, bacterial kidney disease (BKD), white spot and infectious hematopoietic necrosis (IHN), a viral disease. Seven million coho eggs were found to be at risk to IHN in 1985 and destroyed as a precautionary measure (Bob Corn personal communication). IHN has caused losses of between one and two million chinook salmon annually during spring at Trinity River Hatchery over the last few years (Bill Wingfield personal communication). This problem seems to have been resolved by use of an anti-viral compound, iotophore. No losses were experienced during the spring of 1990 after all eggs had been treated with this substance (Bill Wingfield personal communication). IHN is most severe at temperatures from 40-54 F. (Amos 1985). The hatchery has also recently been equipped with heaters so water temperatures can be raised (Serge Birk personal communication).

Bartley and Gall (1990) recently reported that crosses between chinook and coho salmon ("conooks") were occurring in the Klamath River Basin and particularly at or below Trinity River Hatchery. Chevassus (1979), in a review of the literature, found natural crossing of chinook and coho to be extremely rare. The earlier run timing of the hatchery strain of coho versus original native coho stocks, the large runs of both coho and fall chinook in recent years, and the limited amount of spawning area below the hatchery may be the combination of factors that led to this occurrence.

Hendrick et al. (1987) also noted the crosses occurring at Trinity River Hatchery and described changes in resistance to disease that may be related to the hybridization. They noted that coho were not susceptible to IHN at the hatchery or anywhere in their range. Experiments were conducted by Hendrick et al. (1987) and it was discovered that while pure coho were resistant to IHN, chinook had some susceptibility, and the hybrid conooks had almost no resistance to IHN. Hybridization could lead to increased losses of fish at Trinity River Hatchery to IHN. Bartley (personal communication) indicates that hybrids may retain external characteristics of chinook or coho but sometimes have mixes of both. Thus, the problem of intermixing hybrids into broodstocks could elude graders and continue to exacerbate the problem.

Spring chinook holding in the Trinity River above Junction City during the summer had a high mortality rate in the recent years of high escapement (1986-88). The exact cause of this problem is unknown but USFWS (1990c) used an estimate of 50 percent mortality before spawning for those fish passing above the CDFG Junction City weir. Possible causes include overcrowding and harassment by poachers while the fish are holding during summer (USFWS in press). Two large holding pools have recently been dredged by the Trinity River Restoration Program to try and decrease overcrowding stress.

Increased disease monitoring for Trinity River Hatchery fish and native Trinity River fish is being proposed for 1991 (Foote 1990).

SIDE EFFECTS OF LARGE SCALE HATCHERY PROGRAMS

While Iron Gate and Trinity River Hatcheries are necessary to mitigate for the fish production lost above dams, large scale hatchery operations can have negative side effects. Hatcheries can cause problems for survival of wild populations of the Klamath Basin due to 1) increased competition causing decreased native fish survival, 2) interbreeding of "non-adapted" hatchery adults with native fish, causing reduced survival of offspring, 3) introduction of diseases, and 4) in the worst case, massive hatchery programs can cause stocks to collapse. Examples of the latter problem are taken from case studies elsewhere. Increased fishing pressure in a mixed stock fishery can also be a substantial problem, and is addressed separately in Chapter 4.

Competition Between Hatchery Fish and Native Fish

In the Mainstem Klamath River

Thermal problems in the mainstem of the Klamath River (see Chapters 3 & 4) may be causing a substantial shortage in suitable habitat for outmigrating salmonid juveniles. Sullivan (unpublished) and Mills et al. (unpublished) have found that native chinook and hatchery chinook juveniles move down the main Klamath River throughout the summer. T. Mills (personal communication) has found large concentrations of juvenile salmonids congregated at the mouth of coldwater feeder streams, such as Blue Creek. Young hatchery chinook with fin clips have also been found holding upstream in these cold tributaries in late summer. Migrations of large numbers of juveniles have been noted moving up Indian Creek from the Klamath in summer when the river temperatures were high (Phil Baker personal communication).

In several published reports, fisheries biologists have found that high concentrations of fish result in increased competition for food and space and can decrease survival of both hatchery and native fish (Salo and Baliff 1958, Steward and Bjornn 1990). This phenomenon is termed "density-dependent rearing mortality." When planted, hatchery smolts are larger than native fish so they may displace native fish through competition (Smith et al. 1985). Stempel (1988) felt that problems related to competition between hatchery and native juveniles could be occurring in the main stems of both the Trinity and Klamath River resulting in reduced survival of native fish.

Studies by Mills et al. (unpublished) found that numbers of fall chinook salmon smolts coming from Bogus Creek varied widely between years. While Mills et al. (unpublished) has estimated outmigration of over 1,000,000 smolts in years of optimal escapement, after the storm of February 1986, he estimated that only 27,000 juvenile chinook were produced. In the spring of 1986, Iron Gate Hatchery released over 9,000,000 smolts. Forces of competition due to shear numbers may move the system toward hatchery dominated runs in years when over-wintering conditions are particularly severe.

Royal (1972) found that the survival rates of hatchery steelhead smolts decreased as distance from the ocean and numbers of fish planted increased. Lichatowich and

McIntyre (1987) attributed this to higher density related mortality during migration. Chapman (1989) found that hatchery releases of juvenile chinook drew native chinook and steelhead downstream with them, which he termed "the pied piper effect." Noble, as cited in Royal (1972) also asserted that density dependent factors from planting in excess of carrying capacity can effect other species. The effects of large releases of chinook could be playing a role in decreasing native steelhead populations. Competition with hatchery fish may be much greater on those native stocks from upstream areas, such as the Shasta River, that are exposed to competition for a greater distance in the Klamath during outmigration.

Studies in the Trinity River found that steelhead released at less than six inches did not emigrate. Kerstetter and Keeler (1976) found that the timing of peaks in blood hormone levels that stimulated outmigration were different in native Trinity River steelhead than in hatchery steelhead. They felt that not releasing the fish when hormonal cues would have stimulated outmigration led to this "residual" behavior. Current Iron Gate Hatchery practices (CDFGa no date) call for taking 1,000,000 eggs and rearing 200,000 yearlings. All steelhead in excess of this goal are released to the river at a size less than six inches. If these fish manifest the same behavior as was exhibited on the Trinity, they may be living in the main river, competing for space and food with native fish, and even predating on both hatchery and native outmigrating juveniles. Large residuals have been reported by anglers (Dick Sumner personal communication) and guides have reported an increasing catch of 8 to 10 inch juvenile steelhead during winter (Bob Young personal communication). It is possible that competition from residuals could be one of the factors leading to the poor production of wild steelhead in the Klamath River. Observations on the lower river during 1978-82 indicated that hatchery steelhead may spend one additional year in the river after release, then migrate to the ocean (Dennis Lee personal communication).

In the Tributaries

Iron Gate Hatchery coho were outplanted in Elk, Grider, and Beaver creeks in the Middle Klamath region from 1986-88. Smith et al. (1985) said similar programs in Oregon "lacked biological benefit." Although stocked streams reared more juveniles, researchers observed that native juveniles were displaced by hatchery fish. Further, when hatchery adults returned to spawn with native fish, juvenile recruitment was greatly reduced due to less well-adapted offspring (Smith et al. 1985).

In the Estuary

Studies by CDFG (unpublished) indicate that chinook juveniles did not spend extended periods in the estuary of the Klamath in 1983-85. Sullivan (unpublished) found no scale patterns in fall chinook to indicate extended estuarine rearing as well. In contrast, Snyder, reported in 1931 that juvenile chinook lingered in the estuary and showed their most rapid growth there. Estuarine studies in Oregon (Reimers 1973) found that high densities of chinook juveniles increased intraspecific competition that resulted in early ocean entry. Without the period of rapid growth in the estuary by fall chinook, the chances for survival decreased (Reimers 1973). The estuary appears to be an area where density-dependent rearing mortality could be decreasing the survival of both native and

hatchery chinook. Nicholas and Hankin (1988b) suggested that some Oregon coastal rivers probably could not support increases from hatchery production because of the limited capacity of their estuaries.

In the Ocean

McGie (1984), used the Ricker model to study the population crash of coho in Oregon in 1980, and concluded that density-dependent mortality occurred at sea between hatchery coho in years of poor upwelling. Riesenbechler and Emlen (1988), using the Beverton-Holt population model and data from Oregon coho, predicted that attempts to double present run size on the Columbia River by doubling smolt output would not succeed. Their study predicted that doubling current smolt output from 30 million to 60 million would only increase returns from the current run size of 1 million by 140,000 fish in good upwelling years and by only 80,000 in poor years. Since coho salmon from both Iron Gate and Trinity River Hatcheries are of Columbia River origin, they may be showing similar ocean migration patterns to those described in the case study above. Chinook from both hatcheries show considerable variation in ocean migration, as monitored by coded wire tags, and it is unlikely that chinook stocks from the Klamath are manifesting this problem.

Interbreeding Between Hatchery Fish and Native Fish

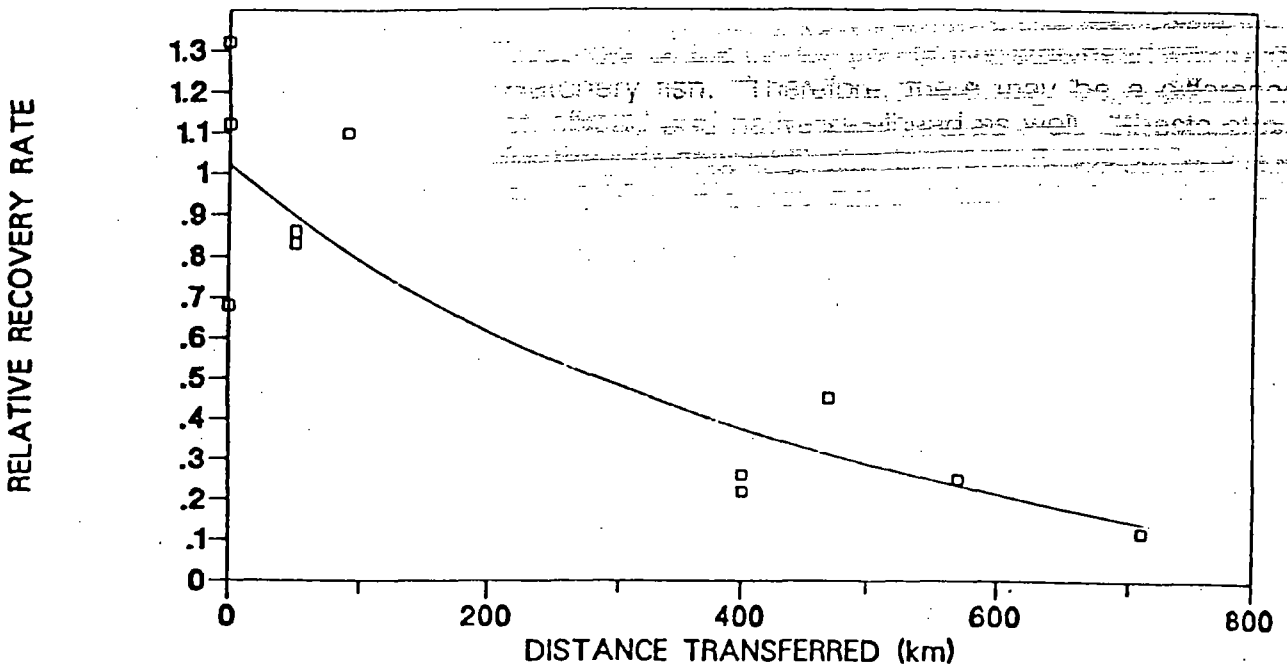
When hatchery broodstocks have non-native components or are inbred, they decrease the smolt production of native populations as they stray into streams to spawn with locally adapted stocks (Riesenbechler and McIntyre 1977, Chilcote et al. 1982, Royal 1972, Solazzi et al. 1983, Ryman and Utter 1987). Local populations may develop special adaptations to local watershed conditions (Ricker 1972). Even if the introduced stock is from a basin that has similar selective pressures, it may have evolved different genetic solutions to the same problem (McIntyre et al. 1988). Almost any survival trait is controlled by several genes referred to as a "coadapted gene complex" (Shields 1982). Because the gene coding was evolved separately for the native and introduced fish, "mingling of two different gene networks (mixing stocks) may disrupt the effectiveness of either" (McIntyre et al. 1988).

The Use of Non-Native Broodstocks

Riesenbichler (1988) found that the survival of transplanted coho salmon decreased in a linear fashion with the distance planted from their native watershed (Figure 5-2). The original coho broodstocks at both major hatcheries in the Klamath Basin were from Cascade Hatchery stocks in Oregon. The distance between their stream of origin, the Columbia River, and the Klamath River is over 800 km. The productivity of the stock is thus predicted to be very low (Figure 5-2). Problems with low productivity and erratic patterns of return of hatchery coho after introduction may have been attributable to the inappropriate adaptations of this stock. Recent improved performance of this stock may reflect adaptations to the hatchery environment (or domestication) allowing better survival under these artificial conditions. Problems with interaction with native populations may still occur, however.

Oregon hatchery programs used coho salmon large central facilities for all of the Oregon coast. As these hatchery coho, lacking adaptations to local conditions, strayed back to spawn with wild stocks, fewer viable smolts were produced (Solazzi et al. 1983). The program of outplanting coho fingerlings an yearlings in Elk, Beaver, and Indian Creeks may have had a negative impact on any wild stocks still remaining in those basins. While this program is currently being monitored to determine if the planting has led to increased self-sustaining coho production, Withler (1982), in a review of the literature, found that the introductions of Pacific anadromous salmonids, using non-native broodstock, have been unsuccessful in producing new self-reproducing populations anywhere on the West Coast.

Figure 5-2 Relative (to local fish) recovery rate for transferred hatchery coho salmon versus distance transferred. Rates are based on recoveries in the fisheries and at the hatchery.



Data from Reisenbichler 1988.

Outplanting also causes increased straying (Royal 1972) so that the impacts of this stock, poorly adapted for local stream conditions, could be felt over a wide area. The number of non-native fish spawning with a local population is a key determinant of whether genetic damage will occur (Riggs 1990). Steelhead were planted away from the Trinity River Hatchery, as far downstream as the estuary, to encourage ocean migration (Bedell 1972). Substantial numbers of these steelhead, which had non-native broodstock components, strayed to Iron Gate Hatchery as a result (Marshall 1974). Offsite releases are no longer accepted practice at Trinity River Hatchery except for chinook salmon pond rearing programs.

The Klamath River has periodic high levels of the protozoan disease organism Ceratomyxa shasta. Marsh areas and lakes are thought to be optimal conditions for this protozoan although the life cycle of the organism remains unknown. All stocks of rainbow

trout in the areas above Iron Gate Dam are resistant to this disease (Buchanan in press). Locally adapted steelhead stocks in the vicinity of Iron Gate Hatchery should also have evolved almost total resistance. Studies on the Nehalem River in Oregon found that introductions of Trask River coho decreased the viability of native Nehalem coho stock substantially because the introduced Trask fish lacked resistance to Ceratomyxa shasta (Kapuscinski 1984). Problems with disease outbreaks at Iron Gate Hatchery occurred as a result of introductions of steelhead strains that were not resistant to this disease. Periodic problems with losses of large numbers of hatchery steelhead continued into the early 1980's (CH2M Hill).

Carlton (1989) has found that chinook salmon at Iron Gate Hatchery have a 4 percent susceptibility to Ceratomyxa while Trinity River Hatchery chinook have a 12 percent susceptibility. Similar studies (Hubbell 1979) on steelhead found similar resistance of Iron Gate Hatchery steelhead and Trinity River Hatchery steelhead (12 percent). It is possible that Iron Gate Hatchery steelhead have less resistance to C. shasta than hatchery chinook because of the earlier non-native steelhead introductions and straying of Trinity River Hatchery fish. Therefore, there may be a difference in resistance between hatchery steelhead and native steelhead as well. Shasta strain rainbow trout were used to test for the presence of C. shasta at Iron Gate Hatchery during the summer of 1990, since this strain of trout is 100 percent susceptible to the disease. The disease organism was present, all Shasta rainbows died, but steelhead losses were not high (Mel Willis personal communication).

Problems with Inbreeding

Even when hatchery broodstock is derived from local populations, inbreeding or improper broodstock management can result in considerable decline in genetic diversity of hatchery stocks (Allendorf and Phelps 1980, Ryman and Stahl 1980, Vuorinen 1984). These fish subsequently have decreased ability to survive in the wild (Phillip and Kapuscinski 1988). If genetic diversity decreases to very low levels reproductive capability drops. This condition is known as "inbreeding depression" and may require broodstock replacement. Inbreeding can result from initial broodstock being too small in size (less than 100 pairs) or subsequent generations of returns to the hatchery declining below these levels (Allendorf and Ryman 1987). Both hatcheries have had years when coho returns have dipped below 100 pairs.

Inadvertent selection, such as taking spawn from only early run fish or those large fish, can also lead to inbreeding (Allendorf and Ryman 1987). The amount of genetic diversity retained by a stock can be measured by a statistical method and is termed "effective population size" (Simon 1988). The number that results from genetic tests and statistical analysis is equivalent to an estimate of the number of fish in the founding broodstock. Despite large founding broodstocks and subsequent returns to some Oregon hatcheries in the thousands, Waples and Teel (1989) found that several large salmon hatcheries had effective population sizes that were substantially less than the founding broodstock and the average number of fish handled. Because of the large number of fish handled, the interchange between Bogus Creek native fish and hatchery broodstock, and current practices at Iron Gate Hatchery, problems with maintaining effective population size for chinook and steelhead seem unlikely. The draft Trinity River

Restoration Mid-program Review (USFWS in press) stresses the need for conserving gene resources through appropriate practices at Trinity River Hatchery. The operation of the Trinity Hatchery is currently under review (Chuck Lane personal communication).

Disease Introductions a Side Effect of Large Scale Fish Culture

The introduction of broodstock or eggs from outside the basin represents an increased threat of introduction of non-endemic disease organisms (PNFHPC 1989). Because native fish are not resistant to such diseases, introductions can be potentially devastating. CDFG guidelines no longer allow fish from outside to be introduced into the Klamath drainage.

Problems with IHN at Trinity River Hatchery have been evident since the hatchery opened in 1963. Problems became particularly acute with regard to chinook in the early 1980's. The movement of Trinity River Hatchery fish below the North Fork of the Trinity was discontinued (CDFGb no date).

Native late run fall chinook were captured in 1987 in the Trinity at Hoopa and the females tested positive for IHN. The conclusion drawn was that IHN was probably present in the system before its discovery at Trinity River Hatchery. Stock transfers were resumed for pond rearing programs in Hoopa in 1989 (Bill Wingfield personal communication).

The introduction of non-native steelhead into the Iron Gate Hatchery broodstock and widespread straying of Trinity River Hatchery steelhead, which also had non-native components, may have conferred some level of reduced resistance to Ceratomyxa shasta to native steelhead populations. Steelhead adults in excess of Iron Gate Hatchery needs were transferred to the Shasta River, Scott River, and other smaller Klamath tributaries. Trinity River Hatchery steelhead strayed to Iron Gate Hatchery at a high rate in the early 1970's (Marshall 1974). It is likely that they also strayed regularly into the wild to spawn.

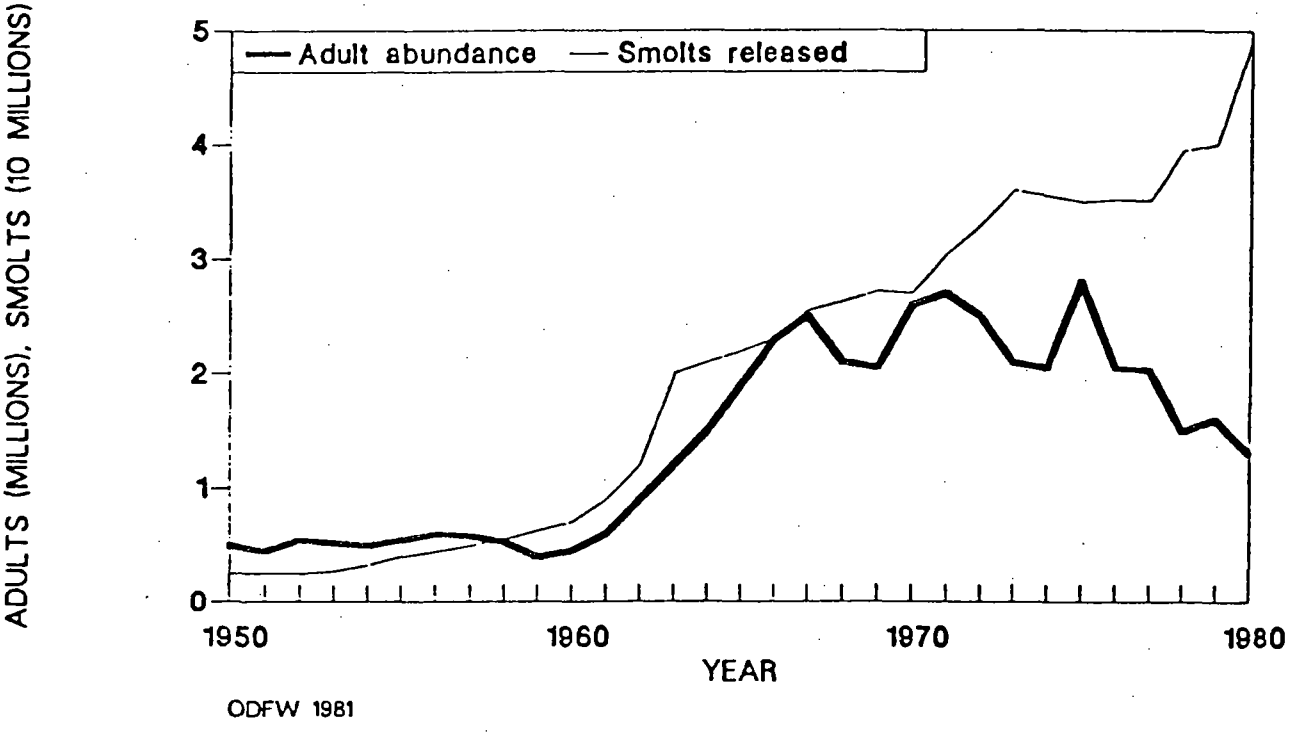
Although no large scale pen rearing projects exist or are planned in the Klamath Basin at present, they could potentially pose the largest threat of disease introductions (Whiteley 1989, Sattaur 1989). Escape from pen rearing projects is a constant problem and escaping fish can introduce diseases directly into native populations as they stray into streams (Sattaur 1989), or reduce resistance of locally adapted populations to diseases already present. Pen rearing projects must use extremely high quantities of antibiotics. Strains of disease organisms may evolve in the rearing pen effluent that are therefore not treatable with currently available antibiotics (Whiteley 1989).

Stock Collapses Associated With Increased Smolt Production

The combined production of the Trinity River and Iron Gate Hatcheries of salmon and steelhead fingerlings and yearlings has increased substantially in recent years. Average plants from 1979 to 1984 were about 6 million fingerlings and yearlings of all species combined. From 1985 to 1988 the average annual plantings totaled 19,500,000. Increases in the number of juvenile salmonids planted do not always succeed in commensurate increases in adults returning to the river.

Oregon instituted a program of coho salmon enhancement using large centralized hatcheries in 1966. As the plants of coho presmolts increased through 1976, ocean harvest and returns increased (Figure 5-3). In 1981 Oregon coho populations crashed (Donaldson 1981). Follow-up studies found that hatchery coho juveniles had a lower survival rate, both in fresh water and in the ocean, and that the ratio of hatchery to wild coho had increased from 50:50 before intensive planting to 85:15 at the time of the study (Solazzi et al. 1983 and Nicholsen 1986). The significance of this latter finding was that native fish populations had been seriously harmed by the hatchery program. The native fish decline led to nearly total dependence on the hatchery coho and to much greater fluctuations in available fish in years of poor upwelling. Riesenbichler and Emlen (1988) and McGie (1984) both concluded that density-dependent factors were inhibiting hatchery fish survival in the ocean.

Figure 5-3 *Trends of coho salmon abundance compared with smolts released from hatcheries (3-year moving average) in OPI Area, 1950-1980.*



Stock collapse also occurred in British Columbia hatchery-supported runs of fall chinook (Paul Starr unpublished data). Again, an increasing production trend of hatchery chinook smolts at first brought increasing returns to the fisheries. As smolt plantings continued to increase, catches began to drop off sharply (Figure 5-4). The percentage of the hatchery fish in the Canadian catch remained high despite the drop in numbers of hatchery fish harvested, indicating a decrease in natural production. Canadian Department of Fisheries and Oceans staff also noted a sharp decline in the survival of hatchery smolts to adults as the numbers of fish reared and released increased (Figure 5-5).

Figure 5-4 Trends of Canadian production of hatchery chinook salmon (Calculated from CWT recoveries).*

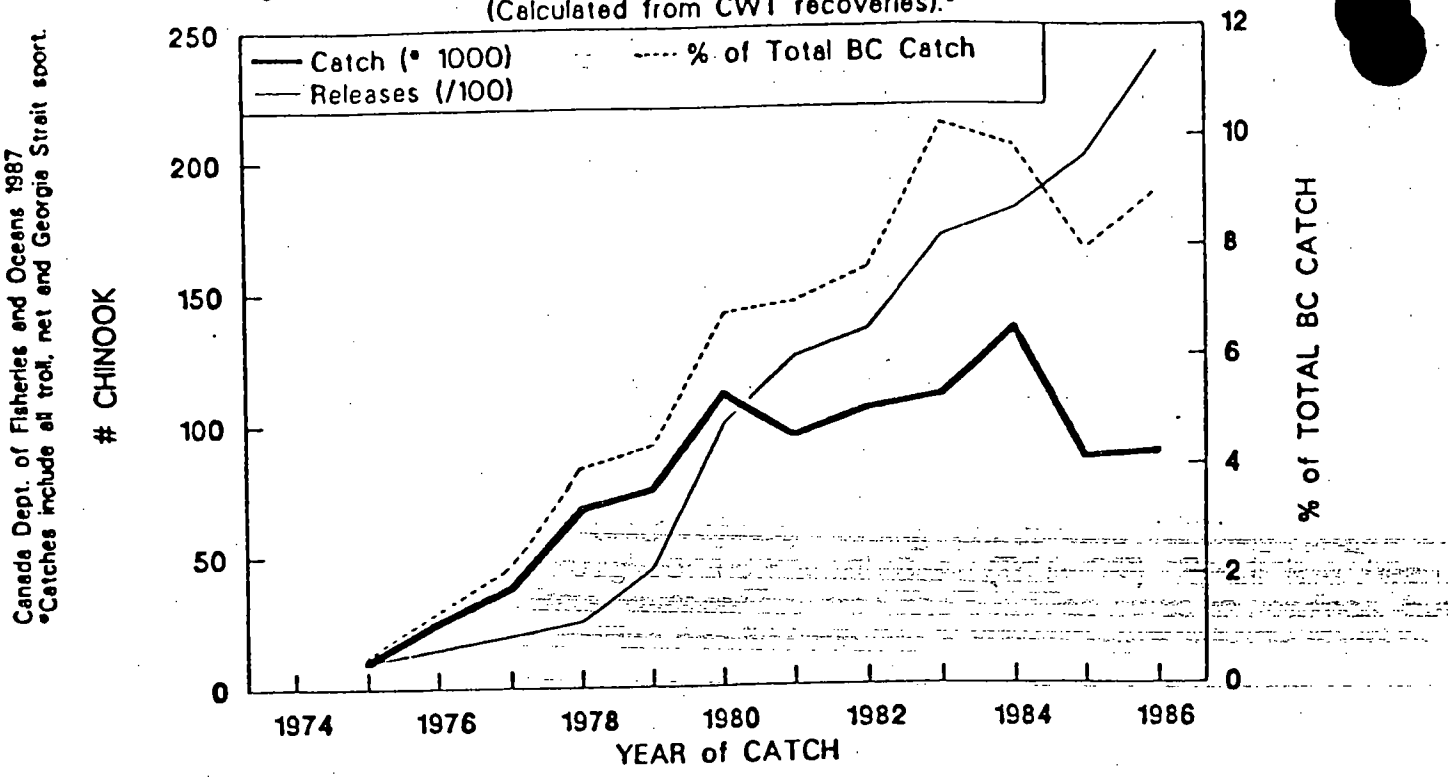
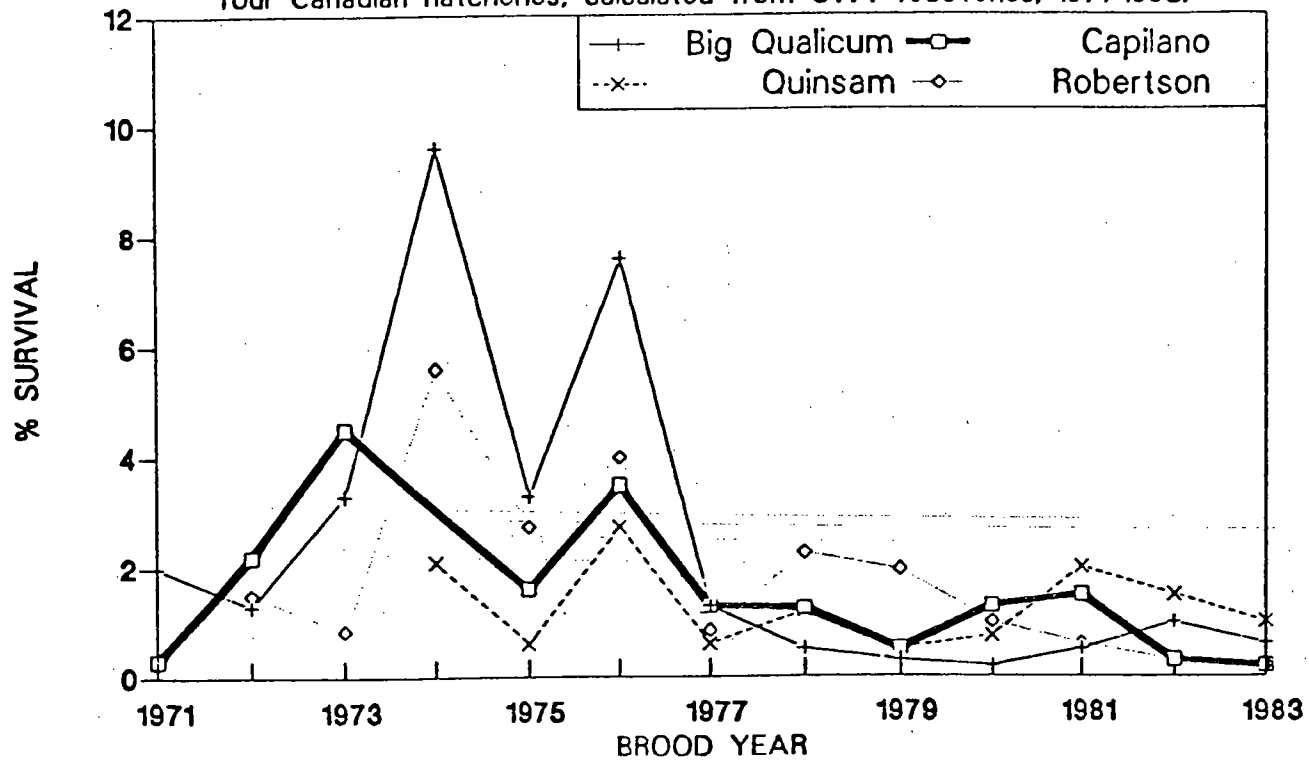


Figure 5-5 Trends of total survivals of hatchery chinook salmon for four Canadian hatcheries, calculated from CWT recoveries, 1971-1983.*



Canada Dept. of Fisheries and Oceans 1984
* All survivals include catch and escapement. Data points for brood years 1982 and 1983, and 1981 for Quinsam, are estimated from partial recoveries.

Given the ecological problems of the main stems of the Trinity and Klamath Rivers (Stempel 1988), it is possible that the increased numbers of juveniles produced at Iron Gate and Trinity River Hatcheries could have adverse impacts on native juveniles. Poor habitat quality in the estuary may also cause problems with competition, particularly for chinook juveniles. While plants of fall chinook juveniles have increased substantially, adults returns have not shown commensurate increases. Ocean conditions may be responsible for the poor adult returns (Mel Odemar personal communication). Because the increases in planting were only began in 1985, not enough year classes have been completed to determine whether any inverse relationship between the number of hatchery fish planted and survival to adulthood. Trends should be monitored to insure that density dependent rearing mortality does not negatively impact survival of hatchery and native juveniles in the river and the estuary.

SMALL SCALE ARTIFICIAL REARING PROJECTS

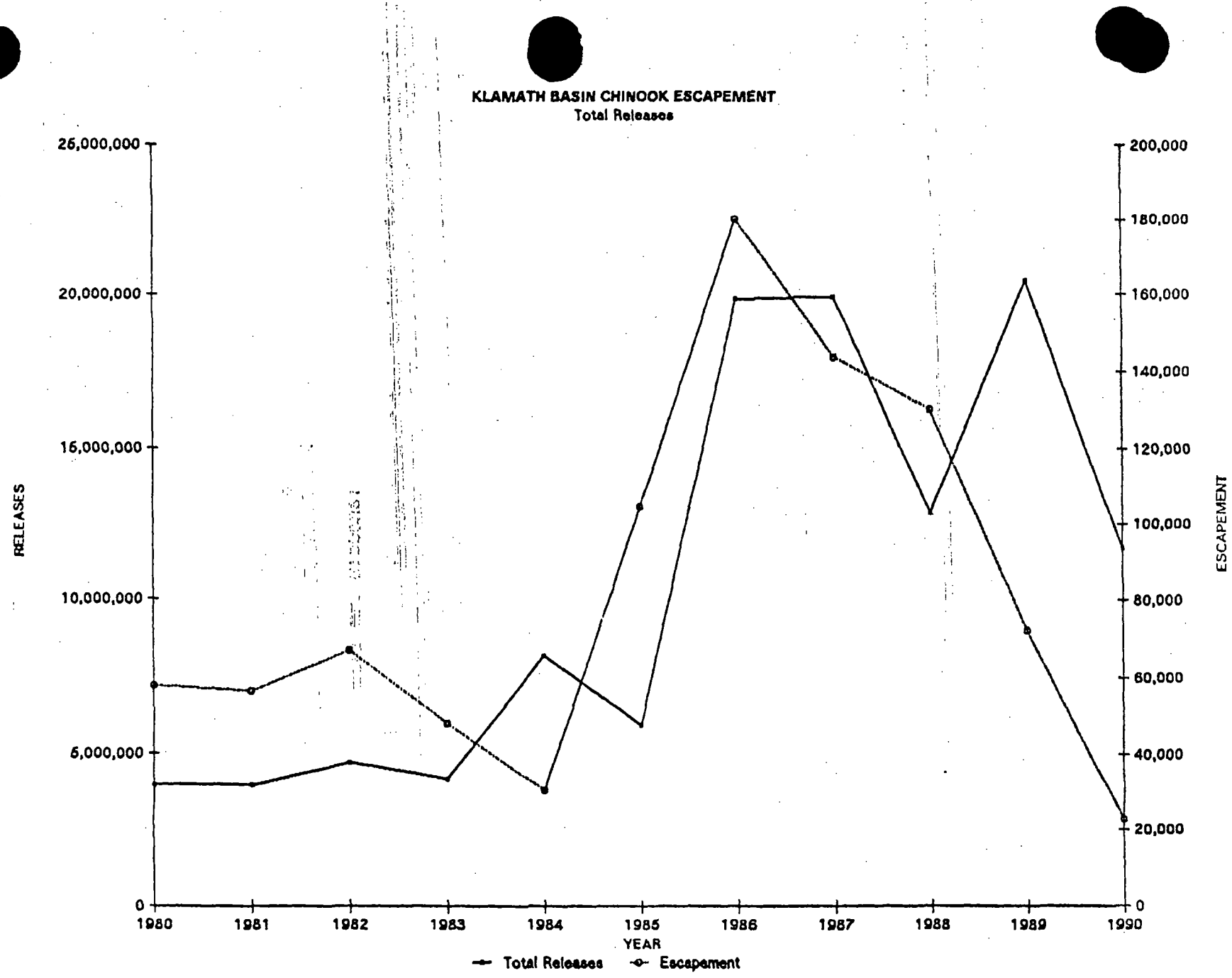
Small-capacity rearing ponds and hatchery programs have been attempted throughout the Klamath Basin (Table 5-7). Ponds have been used largely to rear Iron Gate Hatchery fish from the fingerling stage to yearlings, but several are making the transition now to capturing, hatching, and rearing local stocks. Pond programs usually get Iron Gate juvenile chinook in May and release them from the site in October. Trinity River Hatchery fall chinook have also been transplanted for rearing at Hoopa.

Cooperation Marks Current Efforts

Several small-scale programs are operated in the upper middle region of the Klamath Basin in cooperation between the Karuk Tribe and California Fish and Game, with the department providing supervision. These are the Indian Creek, Elk Creek, and Grider Creek rearing ponds.

The rearing project at Camp Creek, near Orleans, has enjoyed the cooperation of several entities. The Six Rivers National Forest and CDFG helped capitalize rearing facilities, CDFG supervises and the Karuk Tribe has cooperated in supplying staff. Emphasis has shifted from pond rearing Iron Gate fall chinook to capturing native late run chinook for broodstock since 1986. Due to low numbers of returning late fall run adults, the Camp Creek facility has not been at capacity. The U.S. Forest Service built permanent rearing ponds at Bluff Creek and helped with siting ponds at Red Cap Creek. CDFG funds and supervises programs at these two sites in the lower middle Klamath Basin, and the Karuk again provide staffing. Spawning migrations in Bluff Creek were completely blocked by channel changes caused by the 1964 flood. A fish pass was constructed to aid fish upstream migration. After several years of the pond rearing programs using Iron Gate Hatchery fall chinook, spawning activity was re-established.

The Perch Creek ponds are operated to raise steelhead by the Orleans Rod and Gun Club and supervised by CDFG. Some broodstock for this program was procured by angling in the Salmon River but Iron Gate strain steelhead were imported in order to fully utilize the production capabilities.


KLAMATH BASIN CHINOOK ESCAPEMENT
Total Releases
RELEASES
25,000,000
20,000,000
15,000,000
10,000,000
5,000,000
0
ESCAPEMENT
200,000
180,000
160,000
140,000
120,000
100,000
80,000
60,000
40,000
20,000
0
1980
1981
1982
1983
1984
1985
1986
1987
1988
1989
1990
YEAR
Total Releases
Escapement

ATTACHMENT 11

L TOWNSEND
President
P.O. BOX 765
UKIAH, CA 95482
(707) 462-5228

MEL ZELL
Executive Secretary
P.O. BOX 151262
SAN RAFAEL, CA 94915
(415) 454-8498

DON BRADLEY
Chairman of the Board

April 21, 1992

Mr. Boyd Gibbons, Director
California Department of Fish & Game
1416 Ninth Street
Sacramento, CA 95814

Dear Mr. Gibbons:

As you know, Salmon Unlimited is an organization concerned with the conservation, restoration and wise use of our salmon and steelhead trout resources. As such, we are concerned over the apparent decline in certain stocks of fish, especially those of the Klamath/Trinity River systems.

In the fall of 1991, Dr. Foote, U.S. Fish and Wildlife Service, Coleman National Fish Hatchery, reported to the Klamath River Basin Task Force on surveys done in the Trinity River. These surveys indicated that fish, in that system, have been or are exposed to the Bacterial Kidney Disease (BKD). Dr. Cox of your staff recently reported that this disease, (BKD), is present at both Trinity River and Iron Gate Hatcheries. Based on experience elsewhere, BKD has and will continue to have a substantial adverse effect on the production of wild and hatchery produced salmonids. Measures, some perhaps drastic, need to be taken to control the propagation and spread of this disease both here and elsewhere.

Salmon Unlimited proposes that management initiatives be adopted for the fall of 1992 which will:

Require that Trinity River and Iron Gate hatchery brood stock be taken in the lower Trinity and/or Klamath Rivers by use of seines, gill nets or other methods of live capture, and

that fish will be held in the lower river until maturation and will be treated with appropriate antibiotics three to four weeks prior to spawning to reduce or eliminate BKD in the animals, and

that sanitized eggs taken from the brood stock will be relocated to the appropriate hatchery for incubation and rearing under carefully controlled conditions, and

that hatchery produced fish will be released in the lower river, in the fall of the year, to minimize the time of exposure to potential BKD contamination.

Post-it™ brand fax transmittal memo 7671 | # of pages ▸ 5

To Mike Mallock	From Mel
Co.	Co.
Dept.	Phone #
Fax # 707 459 [illegible]	Fax # 541-0246

We recognize that questions will be raised regarding straying of hatchery produced fish, and interaction of hatchery produced fish with remnant populations of wild fish. However, we believe that steps must be taken now to mitigate disease or we may have nothing left to question.

Very truly yours,

SALMON UNLIMITED

Mel Zell, Executive Secretary

MNZ:dlp

Yreka, California

ATTACHMENT 12

United States Department of the Interior

FISH AND WILDLIFE SERVICE

Klamath River Fishery Resource Office
P.O. Box 1006
Yreka, CA 96097-1006

March 16, 1992

Memorandum

TO: Planning Subcommittee Members: Bingham, Franklin, Holder, Orcutt, Pierce, Sumner, West, Wilkinson

FROM: Project Leader, Klamath River FRO
Yreka, California

SUBJECT: Draft notes, planning subcommittee meeting of 2-26-92

Please review the enclosed draft notes, and provide comments in time to get a final version mailed to the Task Force by mid-April. The "Clarification" of new options was done by me alone, so that needs attention. We were supposed to write a glossary, but I don't think I can get to it. If anyone wants to send in definitions of terms, I will add them to the document.

Another change I would favor is dropping the term, "Category." We no longer have these action items arranged in categories based on similarity. Instead, we have five major action items, each with lower order actions or steps for carrying it out.

Ron Iverson

Ronald A. Iverson

Attachment

cc Cates

NOTES

TASK FORCE PLANNING SUBCOMMITTEE

MEETING OF 2/26/92, REDDING

In attendance: Bingham (chair), Franklin, Iverson, Orcutt, Pierce, Sumner, West.

Meeting objectives: Following up on the January Task Force discussion of developing a watershed approach to restoration planning, the subcommittee was assigned to: Add options as needed; clean up the options field; assign tasks; sequence activities; write a report; prepare a glossary.

References: Starting point for discussion was the Preliminary Options Profile, prepared during the January TF meeting and distributed with the notes. It was agreed to reorganize the selected options from the Options Profile into a stepdown action plan format. The reorganized options are displayed below. Numbers in parentheses are option numbers, as assigned at the January meeting.

ACTION PLAN FOR WATERSHED PLANNING

CATEGORY 1: DEFINE SUBBASIN AND WATERSHED PLANNING BOUNDARIES (2,29). OVERALL COMPLETION DATE: 6/15/92.

-- Write a list of subbasins and watersheds (new). Assigned to: KFO.

-- Write criteria for selecting watersheds. Consider: socioeconomic values (46) and existing management direction (31). Assigned to TWG.

-- Define [at] what level of priority a subbasin, watershed or activity should be placed using the criteria (10). Assigned to TWG, to draft.

-- Consider public comment (new). Assigned to: Task Force.

-- Approve a prioritized list of subbasins, watersheds, activities (new). Assigned to: Task Force.

ACTION PLAN FOR WATERSHED PLANNING

CATEGORY 2: DEVELOP A SUBBASIN/WATERSHED PLANNING STRUCTURE (new)

-- Within each subbasin/watershed, [define] [identify] agency and tribal authorities and roles, and identify people who should participate (8,11). Assigned to: TWG, to complete by 6/15/92.

-- Identify lead agency or landowner within each [subbasin] (28). Assigned to TWG, by 6/15.

-- Identify key stakeholders in each watershed (28). Assigned to TWG, by 6/15.

-- Define legal identity or criterion of subbasin groups (19). Assigned to USFWS.

-- Identify entities authorized to take lead in negotiating and establishing CRMPs and MOUs (39). Assigned to TWG, by 6/15.

-- Establish qualifying criteria for subbasin groups and apply to existing groups (new). Assigned to KFO to draft, TF to review/approve by 6/17.

-- Where needed, assist local groups to organize (26). Assigned to KFO (ongoing)

-- Formalize agency, tribal, and subbasin group roles, using MOUs, partnership agreements, or letters of recognition establishing responsibilities (14 and 27). Assigned to TF.

-- Get adequate administrative and technical staff (12, 16b, 43). Assigned to ??

-- Develop budget request (new). Assigned to ??, complete by 4/92.

-- Develop mechanism for public participation (7). Assigned to TF.

ACTION PLAN FOR WATERSHED PLANNING

CATEGORY 3: WRITE SUBBASIN RESTORATION PLANS (NEW). ASSIGNED TO SUBBASIN/WATERSHED GROUPS. TARGET: AT LEAST ONE PLAN WRITTEN BY 11/92.

-- Identify planning roles of:

  -- Task Force (9)
  -- KFO (20)
  -- Local "lead agency" (8,11,27,31)
  -- Subbasin group (new)

  Assigned to Task Force.

-- Identify elements of subbasin plans (new). Assigned to TWG.

-- Provide technical oversight (12, 49). Assigned to TWG, KFO.

-- Prescribe the restoration program (34). Assigned to TF.

-- Review, approve subbasin plans (new). Assigned to TF.

-- Provide public outreach, including educational meetings (47). Assigned to TF, KFO.

-- Publish, distribute plans (new). Assigned to ??

ACTION PLAN FOR WATERSHED PLANNING

CATEGORY 4: IMPLEMENT SUBBASIN PLANS (NEW)

-- Develop multi-year (3-5 year) program of work (24,42). Assigned to subbasin groups and TWG.

-- Write an annual [subbasin] work plan, based on the subbasin plan, from which the RFP is developed (24,42). Assigned to subbasin groups and TWG.

-- Get commitment of tribes and agencies (new). Assigned to TF.

-- Establish an accounting method for all Federal and non-Federal investments (41). Assigned to KFO.

-- Identify immediate actions to be supported through existing subbasin groups (17). Assigned to subbasin groups, TWG. Complete by 6/15/92.

ACTION PLAN FOR WATERSHED PLANNING

CATEGORY 5: EVALUATE AND UPDATE LONG RANGE PLAN AND SUBBASIN PLANS (44)

-- Apply ongoing evaluation (33). Assigned to KFO, TWG.

-- Develop an amendment process for the long range plan (40). Assigned to TF, to get underway by April meeting.

CLARIFICATION OF NEW ACTION ITEMS (drafted by Iverson)

CATEGORY 1

-- Write a list of subbasins and watersheds

Meaning: For each of the six subbasins we are dealing with, list tributary watersheds. These would be mostly third-order streams.

-- Consider public comment

Meaning: Invite public comment on a preliminary list of "planning" watersheds. This could be done by inviting oral comment at a Task Force meeting, and by highlighting the issue in the newsletter and inviting written comment.

-- Approve a prioritized list of subbasins, watersheds, activities

Meaning: After considering public comment, the Task Force establishes the indicated list, as a basis for watershed restoration planning.

CATEGORY 2

DEVELOP A SUBBASIN/WATERSHED PLANNING STRUCTURE

Meaning: Get everything in place that is needed so subbasin plans can be written.

-- Establish qualifying criteria for subbasin groups and apply to existing groups

Meaning: Decide what features are desired in a watershed planning group, and determine which existing groups have these. For example, should the watershed groups be organized along CRMP lines? If so, only groups which are willing to meet in public would qualify.

-- Develop budget request

Meaning: Watershed-based planning is going to cost money. Task Force members who are going to support this planning should budget in advance. If funding is to come from Restoration Program funds, proposals need to be prepared and run through the selection process.

CATEGORY 3

WRITE SUBBASIN RESTORATION PLANS

Meaning: Write a document that shows how the long range restoration plan fits to a particular watershed.

-- Identify planning roles of: Subbasin group

Meaning: Each subbasin or watershed group should be provided a description of their part in the planning task.

-- Identify elements of subbasin plans

Meaning: Identify the basic features that a subbasin plan should have.

-- Review, approve subbasin plans

Meaning: Each plan should be subject to review, possibly including public comment, and final approval by the Task Force and Federal Officer (Shake).

-- Publish, distribute plans

Meaning: Subbasin/watershed plans would be public documents, and the intent would be that people in the watershed would be familiar with them...have a sense of ownership.

CATEGORY 4:

IMPLEMENT SUBBASIN PLANS

Meaning: The fourth major step in the watershed restoration process is to put the long range watershed plan into action.

-- Get commitment of tribes and agencies

Meaning: For the subbasin plan to be meaningful, Task Force tribes and agencies would have to commit to carrying it out, within the limits of their resources and authorities.

ATTACHMENT 13

D R A F T

Mr. Robert Treanor
Executive Director
California Department of Fish and Game
1416 Ninth Street, Room 1207-5
Sacramento, California 95814

Dear Mr. Treanor:

The Klamath River Basin Fisheries Task Force (Task Force) is concerned that wild stocks of chinook salmon in the mainstem Klamath River are under severe stress due to drought caused low flows and high water temperatures. The potential exists for additional stress on theses stocks if hatchery fish are allowed to compete with the natural fish or infect them with hatchery incubated disease.

Since there has been no commitment from the U.S. Bureau of Reclamation (USBR) for additional flows from Iron Gate Dam, it is likely that hatchery releases planned for May will have detrimental impacts on natural production. To avoid this situation and to improve survival of all salmonid stocks, the Task Force requests the California Department of Fish and Game to consider the following alternatives to present practices at Iron Gate Hatchery.

1. Rear as many salmon as possible to yearling size for fall release as can be accommodated at the hatchery. Truck the fish that cannot be held to yearling size downstream for release in the lower river below the thermal barriers.

2. Rear as many fish as possible to yearling and release them in the lower river. Rear remaining fish to 90+mm. and release them on the lower river.

3. Rear as many fish to yearling size as facilities allow. Destroy surplus fish to avoid competition from early releases.

4. A combination of above alternatives.

5. Rear fish to 90 m.m. and truck them to the lower river and release them as long as conditions are adequate for survival.

We request that you conduct a full risk and consequence assessment of the alternatives we have suggested. In that assessment we request that you include the present operational plan to make large releases in may. We believe that this assessment is critical to preserving the salmon fishery of the Klamath River.

REPORT TO THE KLAMATH RIVER FISHERIES TASK FORCE, APRIL 28-29, 1992.

TITLE: FISH AND ENVIRONMENTAL RESTORATION ACTIVITIES TO BE IMPLEMENTED IN FISCAL YEAR 1993 BY AGENCIES OF THE U.S. DEPARTMENT OF INTERIOR IN THE KLAMATH BASIN.

The U.S. Department of Interior is represented in the Klamath Basin by the Fish and Wildlife Service, Bureau of Indian Affairs, Bureau of Land Management, Bureau of Reclamation, and Geological Survey. Primary landholdings of Interior are located in the upper basin, above Iron Gate Dam. Timber production and grazing are the primary land uses on Interior land.

A survey of area offices within the basin revealed the following activities. Activities are lumped as they apply to specific objectives in the long-range fishery restoration plan.

Objective 2.C Protect and improve the water quality of stream habitat from adverse agricultural practices.

U.S. Geological Survey -- Conducting a water quality study in Upper Klamath Lake, focusing on external nutrient loading, causes and potential remedies. Trying to develop a model for determining impacts on lake water quality at varying levels of marsh restoration, riparian restoration, and nutrient supply reductions. GIS technology is to be utilized. Study began in 1992, expected to be completed in 1997.

Bureau of Reclamation (Denver office) -- Developing an "Agency Basin Management Plan" for Agency Lake (adjacent to Upper Klamath Lake). Will be a comprehensive management plan for controlling nutrient loading, restoring natural marsh areas to improve water quality and to establish rearing habitat for endangered suckers. Study to be completed in 1994.

Fish and Wildlife Service -- Toxicity studies being conducted to determine impacts of natural and man caused pollutants on endangered sucker species. Work being conducted in Upper Klamath, Tule, and Lower Klamath Lakes. Study to be completed in 1993.

Fish and Wildlife Service -- Pursuing the purchase of the Wood River Ranch (along Wood River, tributary to Agency Lake), to restore marshes. Potential increase of waterfowl and fish habitat. Purchase may be complete in FY1993.

Bureau of Land Management -- Member of a Coordinated Resource Management Plan (CRMP) group in the Spencer Creek watershed (a tributary of the Klamath River above Iron Gate Dam). The goal of the CRMP is to improve environmental conditions, including instream habitat conditions, by implementing better grazing and timber harvest techniques.

Klamath Tribe -- Partially funded through BIA to monitor water quality

of the Sprague and Williamson Rivers and Upper Klamath Lake, to develop a model which may determine potential impacts to the ecosystem through continued nutrient loading. Another objective is to assess potential impacts of marsh and riparian restoration. (Project similar to USGS study. Both agencies are trying to dovetail efforts.)

Objective 2.E Protect salmon and steelhead habitat from harmful effects of water and power projects in the Klamath Basin.

Fish and Wildlife Service -- The agency helped organize a Klamath Basin Steering Committee (for the upper basin) which will provide input to the Fish and Wildlife Service Enhancement Division (Sacramento office) in developing the long-term endangered species recovery plan. The committee will also be instrumental in developing and implementing a long-term economic and ecological recovery plan for the upper basin. Improved water quality and possibly, quantity in the lower basin may result.

Objective 3. Restore the habitat of anadromous fish of the Klamath River Basin by using appropriate methods that address the factors that limit the production of these species.

Fish and Wildlife Service -- The Drought Relief Act was reauthorized for FY1993 for expenditures of up to $90 million, however no FY1993 money was appropriated for the bill. Drought relief strategies have been developed by the three fishery resource offices in the basin, and will be presented to Interior upon request.

Bureau of Land Management -- Recently completed Land Management Plan for landholdings along the Shasta River and above Iron Gate Dam. Some strategies included in the plan are 1) voluntary land exchanges, 2) reduced livestock grazing along riparian zones of the Klamath and Shasta Rivers, and identification of riparian areas needing restoration 3) acquisition of available lands within the Shasta River canyon, to be managed as an area of critical concern for chinook, 4) maintain 160 acre parcel at the mouth of Dry Creek (a Klamath River tributary below Iron Gate Dam) for steelhead spawning, 5) physical and philosophical changes in land use on Federal lands, emphasizing recreational and biological values of these landholdings.

Bureau of Indian Affairs -- In FY1992, will fill a fishery biologist position to assist the three Indian tribes of the lower Klamath basin in fishery management and possibly fish restoration and production. The Bureau is assisting the Yurok tribe in developing a Natural Resources Department, to be staffed in FY1992, and is preparing a Request For Proposals to perform a biological information needs assessment in the Klamath River Basin, focusing on the need for hydrologic data to support potential claims for water.

Objective 6. Promote public interest in the Klamath River Basin's anadromous fish, their beneficial use and habitat requirements and gain support for the Restoration Program's plans and efforts to restore fish habitat and population numbers.

Bureau of Land Management -- Three initiatives recently developed by the agency are known as 1) "Recreation 2000" emphasizes the desire of the public to recreate in or near water, which will drive future land management decisions toward protecting and enhancing wetland areas, 2) "Fish and Wildlife 2000" emphasizes the value of the natural wildlife amenities versus the commodity based values of livestock grazing and timber harvest on Federal lands, 3) "Bringing Back The Natives" emphasizes the need to restore native fish populations by restoring habitat.

Objective 7. Provide adequate and effective administration to successfully implement the Restoration Plan and Program.

Fish and Wildlife Service -- The agency is developing an upper basin ecosystem planning approach to resource management. The Enhancement Division (Portland) will seek funding through Federal programs such as the Klamath River Fishery Restoration Program to assist in the development of this project. The goal is to implement an ecosystem recovery plan, focusing on wetland restoration and upland management to enhance recovery of the endangered suckers in the Upper Klamath Lake ecosystem. As this program expands, there will be an attempt to coordinate with restoration activities in the lower basin as overseen by the Task Force.

ATTACHMENT 15

SHASTA RIVER
COORDINATED RESOURCE MANAGEMENT PLAN
2821 HARRY CASH ROAD
MONTAGUE, CA 96097

Presentation to Klamath River Task Force, Wednesday April 29th, 1992, 3pm, Yreka, Ca.

As their acting secretary, I have been requested by the Shasta River Coordinated Resource Management Plan group to present their views and concerns regarding recent actions affecting the Klamath Basin fisheries restoration efforts.

The feeling of many members of the CRMP is that if their efforts and those of the Klamath River Task Force are to be effective, there is a need for these groups to be involved in important issues closely related to the restoration of habitat. Such an issue is spawner escapement for the Shasta River.

~~While claims to the contrary have been made~~, spawner escapement has not approached the numbers needed to utilize available habitat in the Shasta River. Spawner-Recruitment curves developed during the 1980's show that the optimum escapement levels for the Shasta River are between 4,000 and 9,000 fall chinook. WHile the PFMC describes the escapement levels into the Klamath System during 1986, 1987, and 1988 as "extremely abundant", the Shasta River saw only 3957, 4697, and 2842, fall chinook during these years, respectively. These numbers are well below the documented numbers needed to utilize availabe Shasta River habitat.

In 1992, before any fishing took place, there were insufficient numbers of chinook to reach minimum escapement figures as determined in the PFMC's framework plan. This plan determined that 35,000 naturally spawning adults should be the minimum escapement into the Klamath River to be protected in all years. The Shasta River CRMP

requests that the Task FOrce examine the soundness of the PFMC's recommendation to permit harvest in this third year in which these minimum escapement levels will not be reached.

The Shasta River CRMP also requests that the Task Force seek a means by which a moratorium on commercial and recreational fishing of Klamath stocks be put into effect until specific stocks can be identified and protected, or until the minimum escapement is exceeded.

In this year when commercial fisherman are being asked to sacrifice their income, a matching contribution from all other user groups would add nearly 15,000 salmon to the proposed escapement and would show a commitment to the long-term recovery of the Klamath River Fall chinook.

The Shasta River CRMP requests that the Klamath Basin Fisheries Task Force forward our comments to the KLamath Fishery Management Council and the Pacific Fishery Management Council.

Sincerely,

Susan Hart
Secretary, SRCRMP

attachments