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ANALYSIS OF PAST AND PRESENT SALMON AND STEELHEAD SUPPLEMENTATION Hillman & Mulling 89 DRAFT PART 1 Prepared by: William H. Miller Travis C. Coley Howard L. Burge Tom T. Kisanuki Dworshak Fisheries Assistance Office U.S. Fish and Wildlife Service Ahsahka, Idaho Submitted to: U.S. Department of Energy Bonneville Power Administration Project No. 88-100 May 15, 1990

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- Part 2 "Database for unpublished and ongoing supplementation projects" reviewed for "Analysis of past and present supplementation project" (under separate cover)
- Part 3 Report on "Concepts for a model to evaluate supplementation of natural salmon and steelhead stocks with hatchery fish."

 Prepared by T.C. Bjornn Idaho and C.R. Steward, April, 1990, Cooperative Fish and Wildlife Research Unit, Moscow, Idaho (under separate cover)
- Part 4 Report on "Supplementation of salmon and steelhead stocks with hatchery fish: a synthesis of published literature" by Cleve Steward and T.C. Bjornn, March 1990, Idaho Cooperative Fish and Wildlife Research Unit, Moscow, Idaho (under separate cover)

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ABSTRACT

Supplementation or planting salmon and steelhead into various locations in the Columbia drainage has occurred for over 100 years. All life stages, from eggs to adult fish have been used by fishery managers in attempts to establish, rebuild, or maintain anadromous fish runs. This project summarizes and evaluates past and current supplementation of salmon and steelhead. A conceptual model is proposed that could be used to evaluate supplementation. Conclusions and recommendations are made concerning supplementation.

The published literature was reviewed under a sub-contract to the Idaho Cooperative Fish and Wildlife Research Unit (ICFWRU) and is presented under separate cover as Part 4 of this report. Published literature reviewed was on a worldwide bases and not restricted to just salmon and steelhead of the northwest. The published literature suggests that properly designed and implemented supplementation programs can be compatible with wild fish management. The authors of the published literature stressed the concern for genetic factors and interactions between hatchery and wild fish. Some evidence was found which suggests that hatchery fish in a number of situations adversely impacted the wild populations and, therefore, caution should be used when planning supplementation projects. Salmonid growth and survival is believed to be density-dependent in freshwater and marine environments. However, the published literature reviewers found little direct evidence for competition between hatchery and wild fish in salt water. There was little evidence found to suggest that diseases or parasites are routinely transmitted from hatchery to wild fish. Hatchery rearing conditions and stocking methods can have an effect on post release survival of hatchery fish. Stress was considered by many authors to be a key factor in survival of stocked anadromous fish. Smolts were the most common life stage released and size of smolts correlated positively with survival. Success of hatchery stockings of eggs and presmolts was found to be better if they are put into productive, underseeded habitats. Stocking time, method, species stocked, and environmental conditions of the receiving waters, including other fish species present, are factors to consider in supplementation programs. Various authors have reviewed these factors but no uniform conclusion could be drawn.

The conceptual model to evaluate supplementation of anadromous fish was also subcontracted to the ICFWRU and is presented under separate cover as Part 3 of this report. Concepts and the basic components for a model are discussed by the authors. It was concluded that the model should be similar in form and function to the life-history model being used for system planning, except that additional genetic groups of fish must be tracked through multiple generations. The number of genetic groups monitored is suggested as six. Coefficients used for the system planning model will provide a basis for selecting coefficients for individual stocks. The authors suggested managers should participate in determining the level of resolution desired from the model.

The unpublished and ongoing supplementation work was reviewed primarily by the authors of this report. Direct contact was made in person or by telephone and data compiled on a computer database. Areas covered in the review of unpublished and ongoing supplementation included Oregon, Washington, Idaho, Alaska, California, British Columbia and the New England states working with Atlantic salmon. Over 300 projects were reviewed and entered into a computer

database. This completed database is contained under separate cover as Part 2 of this report. Our conclusions based on the published and unpublished literature are as follows: -Examples of success at rebuilding self-sustaining anadromous fish runs with hatchery fish are scarce. -Successful stocking to rebuilding runs can be done but will take considerable planning and effort to mesh the hatchery product to the wild/ natural fish. -There is a very real need to evaluate all supplementation projects when they are initiated. -Successes we recorded were primarily in harvest augmentation, a term we use to describe supplementation where the primary purpose is to return adults for sport, tribal or commercial harvest. -Adverse impacts to wild stocks have been shown or postulated from about every type of hatchery fish introduction where the intent was to rebuild

-Reestablishing runs or introductions to areas not inhabitated by wild/natural populations have shown some good successes.

-The stock of fish is an important factor to consider when supplementing. The closer the hatchery stock is to the natural, the higher the chances for success.

-Chinook salmon seem to be the most difficult salmon species to supplement. A return of 3-5% is considered good by most managers for this species.

-Salmon species with the shorter freshwater life cycle, overall, have shown the higher success from supplementation. For example, chum and pink salmon.

-Short-run stocks of salmon and steelhead have responded more positively to supplementation than longer-run stocks.

-Wild/natural fish have consistently shown a higher survival rate than hatchery fish, usually many fold higher.

-Overstocking of hatchery fish may be a significant problem in many supplementation projects.

-The use of wild broodstock by British Columbia has shown success in their chinook and steelhead supplementation programs.

-Both Alaska and British Columbia are having some success using streamside incubation boxes and subsequent outplanting of fry.

-Genetic considerations should be an initial concern of all supplementation efforts aimed at rebuilding existing runs of anadromous fish.

-Interpretation of genetic studies of hatchery/wild interaction will be difficult and time frames needed to get second and third generation data will be long - maybe 15 to 20 years.

Overall, our conclusion was that protection and nurturing of wild/natural runs needs to be a top management priority. There are no guarantees that hatchery supplementation can replace or augment natural production. For the Columbia River system, we concluded that all hatchery fish should be marked so that visual identification is possible. This will not only permit a more precise harvest management, but also permit better broodstock management and supplementation evaluation. At this time, only hatchery steelhead are all marked.

Finally, we concluded that supplementation efforts in the northwest needs to be annually updated and summarized since there are many ongoing supplementation projects where future data could benefit others.

INTRODUCTION

This BPA funded project was initiated in the fall of 1988. The project purpose was to summarize and evaluate past and current supplementation of salmon and steelhead with special reference to the Pacific Northwest. Supplementation is defined for this project as the planting of eggs, fry, presmolts, smolts or adults to augment natural runs of salmon and steelhead. In some cases supplementation was reviewed where natural runs had been extirpated and were being rebuilt or where runs were being established in new areas previously unaccessible to anadromous runs of salmon and steelhead. Reestablishing extirpated runs and opening up new areas for salmon and steelhead production does in general terms supplement total natural production of the Columbia River. In Alaska, the term "enhancement" is used when referring to supplementation. However, the Alaska enhancement includes many fish stocking scenarios which are for the purpose of increasing commercial harvest opportunities and do not directly contribute to building natural runs. We have termed this type of supplementation as "harvest augmentation." Harvest augmentation occurs in many other areas including the Columbia River.

There are four parts to this report. This is the first part and contains a summary of information on past and ongoing projects of supplementation in the northwest, Alaska and New England. Part 2 contains the specific project by project data that was reviewed for unpublished and ongoing supplementation as recorded on our computer database. Part 2 can be supplied in hard copy (paper) or on a high density floppy disk (5 1/4") for use in dBASE III+ software for an IBM compatible computer. Areas covered in Part 2 include Oregon, Washington, Idaho, Alaska, California, British Columbia, and New England. Part 3 is a separate publication on "Concepts for a Model to Evaluate Supplementation of Natural Salmon and Steelhead Stocks with Hatchery Fish." The Part 3 report authored by T.C. Bjornn and C.R. Steward was subcontracted to the Idaho Cooperative Fish and Wildlife Research Unit, (ICFWRU) at the University of Idaho, Moscow, Idaho. Part 4 of this report is the formal literature review entitled "Supplementation of Salmon and Steelhead Stocks with Hatchery Fish: A Synthesis of Published Literature." The published literature review was also subcontracted out to ICFWRU and is authored by C.R. Steward and T.C. Bjornn. Although all four parts of this report can stand alone, it will benefit the reader to review Parts 2, 3, and 4 to fully appreciate the conclusions and recommendations contained in this summary report.

Following is a list of definitions for fish stocking related terms used in this report:

- Supplementation Planting hatchery products, egg, fry, fingerling, presmolt, smolts and adults, to build up naturally producing stocks of salmon and steelhead.
- Restoration Planting hatchery products and/or improving habitat to reestablish extirpated runs or runs that are critically low in numbers.
- Enhancement General term that includes many stocking and habitat improvement scenarios that are used to improve fish runs. Can include supplementation, colonization, restoration and harvest augmentation.

Colonization - A term used to describe establishing anadromous fish runs in areas where historically the species being stocked was not endemic.

Harvest augmentation - The stocking of anadromous fish where the primary purpose is to return adults for sport, tribal or commercial harvest.

Rebuilding - Planting hatchery products to augment natural runs of salmon and steelhead. In this report used synonymously with supplementation.

Hatchery stock - having been hatched and partially reared in a hatchery or other artificial production facility.

Wild stock - naturally reproducing stocks of fish that have not been supplemented or augmented with hatchery fish.

Natural stock - naturally reproducing stocks of fish that have been at one time supplemented with hatchery fish.

The three objectives for this project were: (1) summarize and evaluate past and current supplementation of salmon and steelhead; (2) develop a conceptual "model" of processes affecting the results of supplementation; and (3) make recommendations relative to future supplementation research and needs.

METHODS

The development of a conceptual model of processes affecting the results of supplementation and the review of past supplementation contained in the published literature was contracted out to the Idaho Cooperative Fish and Wildlife Research Unit and are under separate covers as Parts 3 and 4 of this final report.

Key species included in this analysis were: steelhead ($\underline{Oncorhynchus\ mykiss}$), chinook salmon (\underline{O} . $\underline{tshawytscha}$), coho salmon (\underline{O} . $\underline{kisutch}$), sockeye salmon (\underline{O} . \underline{nerka}), pink salmon (\underline{O} . $\underline{qorbuscha}$), chum salmon (\underline{O} . \underline{keta}) and Atlantic salmon ($\underline{Salmo\ salar}$). Of the above species, we emphasized review of work on steelhead and chinook salmon which were the two species identified as priority species for supplementation research work in the proposed Five-Year Work Plan (Supplementation Technical Work Group, 1988).

We summarized the current supplementation effort and unpublished supplementation work by making personnel contacts with fishery workers throughout the study area. Data was entered on a standardized form and put in a computer dBASE III+ format. Detailed information from this review is contained under separate cover as Part 2 of this report. Part 2 report can be supplied to the reader in hard copy (paper) or on computer disk in dBASE III+ format. Although we attempted to contact all the key individuals involved with supplementation in the study area, there are undoubtedly some individuals overlooked. However, we believe that enough contacts were made to determine major areas of supplementation effort and general success rates.

STUDY AREA

For our review of current supplementation effort, we emphasized the Pacific Northwest. We included work being done in Oregon, Washington, Idaho, California, Alaska, and British Columbia. Some limited information is also included from the Eastern U.S. on Atlantic salmon. In the published literature review in Part 4, the authors included references worldwide.

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GENERAL OVERVIEW

Anadromous salmonids have been artificially propagated in the Pacific Northwest for over 100 years. Fishery managers have used hatchery production to maintain recreational and commercial fisheries and to rebuild runs. The question that has been asked for the Columbia River Basin is "How can hatchery production be used to rebuild depleted natural runs of salmon and steelhead in this large altered river system and maintain the genetic integrity of the various stocks and races of fish?"

During the past 20-30 years, salmon and steelhead hatchery propagation in the Columbia River has dramatically increased. Raymond (1988) estimated that beginning in 1970 new hatcheries were then doubling the number of smolts starting their migration to the sea on the Snake River while on the middle Columbia this number was attained in 1975. The results of all this hatchery production has been that in recent years the majority of salmon and steelhead entering the Columbia River have been of hatchery origin. Also, during this period wild/natural escapement has remained low or for many stocks decreased. For the Snake River Basin 80 to 90% of steelhead and 90% or more of the chinook salmon smolts passing Lower Granite Dam in the past few years have been of hatchery origin.

The Columbia River Fish and Wildlife Plan of 1987 has established the goal of doubling the salmon and steelhead runs to the Columbia River from the current size of 2.5 million fish to 5 million fish. A cornerstone of this program is to increase wild/natural production to fully utilize available habitat in the system. Although we have been producing hatchery fish for a number of years in the Columbia, there are still many unanswered questions concerning how to utilize hatchery fish for supplementing wild/natural runs. The 1987 Columbia River Basin Fish and Wildlife Program, Section, 700 (h), recognizes this problem and stated that "Bonneville shall fund research to determine the best methods of supplementing naturally spawning stocks with hatchery fish, particularly in the upper main stem Snake and Columbia rivers." This analysis of supplementation was undertaken to assist in directing which areas of research need to be prioritized for supplementation in the upper Columbia River. Priority species of interest are upriver chinook salmon and steelhead. Priority area is the Snake River drainage of the upper Columbia River system.

¹Larry Basham, Fish Passage Center, Portland, Oregon, pers. comm., March, 1989

For this project, we have compiled most of the available information concerning supplementation in order to inform managers and fishery workers on techniques and procedures relative to successes and failures. We have also summarized those areas where information gaps exist and where future research needs to be directed.

RESULTS

General

Supplementation of natural or wild stocks of anadromous fish can be defined as the introduction of hatchery fish to augment or build runs. (See definitions, page 1).

In Alaska, supplementation is called enhancement while in British Columbia it is called enhancement and colonization. Colonization in the British Columbia context means putting salmon into new areas previously void of salmonids. Putting hatchery fish out in order to increase numbers of adults available for fishery harvest has been termed as enhancement, colonization and supplementation by various individuals and in agency literature. For this report, we termed stocking for primarily harvest benefits as "harvest augmentation." In the strict sense of this review, putting hatchery fish out into areas where stocks of the introduced species have not existed is not supplementation. However, information on return rates, analysis of use, and success at establishing spawning population can be used to help guide supplementation of wild/natural stocks.

Information we have reviewed point to the importance of a potential genetic impact from supplementation with hatchery fish. The concern expressed in the literature (see Part 4, Literature Review by Steward and Bjornn) and from people interviewed was that hatchery fish introduction if not done properly could adversely impact the capability of the natural stock to self perpetuate. There is some information in the literature review that will help understand these potential adverse impacts. Smith et al. (1985) pointed out some of these same concerns in their earlier literature review report on outplanting.

A number of projects are presently underway, whereby, workers are attempting to minimize any genetic impact of supplementation. Procedures which are being used to minimize adverse genetic impacts from supplementation include:

- 1. Using a proportion of the adults in the wild or natural run as broodstock.
- 2. Stocking fish sizes believed to be compatible with natural production using unfed hatchery fry which are outplanted when natural fry are emerging, i.e. sockeye fry in a producing lake.
- 3. Limiting the density of stocked fish so they do not "overwhelm" or adversely compete with wild/natural production.

There seems to be a different perception as to which is the correct supplementation procedure in different areas. One item that the authors noted was the trend in Alaska toward hatcheries producing and supplementing more with smolt size fish. While the Columbia Basin states are considering

supplementing more with sub-smolts -- fry and fingerling. This can be explained to some extent by the intent of supplementation. In the Columbia drainage, much of the supplementation is done to specifically build up or augment wild and natural runs. While in Alaska the intent is to produce more adults for "harvest augmentation", while protecting wild stocks. In Alaska, they are trying to separate hatchery introductions from wild population by time of return and release locations. In the Columbia Basin supplementation managers are trying in many cases to match hatchery production to the wild/natural population in time and place in order to rebuild runs.

Oregon

Background

Anadromous fish production in Oregon supports natural populations of chinook, coho, sockeye, chum salmon, steelhead and cutthroat trout. Oregon encompasses fifty river and lake systems in coastal systems or tributaries flowing into the Columbia River (Anon. 1982a). There is a small run of introduced sockeye in the Willamette River and a small run of natural chum in Tillamook Bay.

Artificial production of anadromous fish began in 1877 on the Clackamas and Rogue Rivers (Anon. 1982a). There are currently 34 state fish hatcheries and 3 or 4 private anadromous hatcheries, "ocean ranchers", operating in the state. The State hatcheries produced a total of 75 million fish in release year 1988 (Table 1).

Table 1. Oregon's 1988 State hatchery releases of anadromous salmonids (excluding STEP).

Summer Steelhead	Winter Steelhead	<u>Coho</u>	Spring Chinook	Fall Chinook
3,906,110	3,186,256	12,674,018	11,743,330	43,395,333
'Primarily (Columbia Rive	r releases.		

The Oregon Department of Fish and Wildlife's (ODFW) mission or charge for anadromous fish resources is to: "Maintain populations and distributions of anadromous salmon and trout to provide the greatest possible recreation, commercial, and nonconsumptive benefits to present and future generations of Oregon citizens" (Anon. 1982a).

Oregon has further partitioned their mission statement into four general goals.

Goal I. Achieve and maintain optimum populations of naturally produced anadromous salmon and trout.

Goal II. Achieve and maintain optimum populations of artificially produced anadromous salmon and trout.

Goal III. Maximize the utilization of harvestable surpluses of anadromous salmon and trout in concert with other management goals.

Goal IV. Achieve and maintain an orderly and equitable harvest.

Oregon has recently taken a major (bold) step with the adoption of it's natural production and wild fish management policy. Oregon's managers state that the maintenance of wild stocks is a biological necessity to insure the future abundance of both naturally and artificially produced runs (Anon. 1990a). Managers in Oregon believe that despite past stocking practices, that distinct stocks of wild indigenous fish are still viable. Their managers also state that prior to 1960, the majority of hatchery fish released did not live to reproduce. These failures primarily resulted from improper stocking practices, i.e. time and size at release, poor quality fish and/or stocking fish poorly adapted for the environment (Anon. 1982a).

Steelhead

Endemic runs of summer and winter races of steelhead occur in Oregon. Winter steelhead are primarily coastal, whereas the summer steelhead range encompasses coastal as well as eastern Oregon streams.

Release size for Oregon steelhead smolts is 5-6 fish/lb (60-90g; 200-215 mm). Oregon has noted that straying is more common with smolt releases. Oregon managers believe that bigger is better for steelhead.

Outplanting unfed fry, short-fed pre-smolts probably presents the highest potential for interference with indigenous fish.

Hatchery philosophy in Oregon over much time (1890-1960) centered around releases of unfed fry and pre-smolts. These hatchery fish were usually superimposed on healthy stocks of natural fish in good habitat with ineffective or counter-productive results.

Oregon biologist are currently experimenting with sterilization of summer steelhead in the Willamette Subbasin as a means of preventing inbreeding of hatchery summer steelhead with wild winter steelhead. The hatchery summer's provide a sport fishery while the wild summer run rebuilds.

¹ Ken Kenaston, pers. comm., Oregon Department of Fish and Wildlife, Corvallis, Oregon, pers. comm. April, 1990

Coho

Coho salmon in Oregon occur primarily in coastal streams and from the Columbia River (lower river tributaries). Based on historical catch records, one can easily deduce that the Columbia River once produced at lease as many coho as Oregon coastal streams.

Oregon's hatchery releases have increased from 7.5 million in 1960 to 12 million in 1988 (excluding private releases). Private "ocean ranching" has increased the total releases for Oregon. Coho production occurs at 18 public and 4 private hatcheries. Most natural production now occurs in coastal streams. Wild stocks comprised approximately 46 percent of the ocean harvest in 1969 (Anon. 1982b). Whereas, they comprised only 25 percent for the period 1977-80. Coho produced in Oregon contributes to a number of commercial and sport fisheries.

The Oregon coho hatchery program was enlarged in the 1960s, which generated much optimism. In the late 60s, adult coho fluctuations became prevalent between years. In 1977, coho abundance dropped to the lowest level since 1962.

The significance of this downward trend occurred in spite of increased hatchery production. The theories of why coho production went the opposite of predictions are numerous. After thirty years of intensive artificial production, enhancement projects have been unable to equal the historic level of natural production.

Due to the downward trend in adult escapements of wild and hatchery stocks in a time of increasing hatchery smolt releases, ODFW has taken actions to determine the mechanisms responsible for mortality. ODFW addressed these concerns by designing seven managements objectives in their coho management plan. Several of these include supplementation strategies. Oregon new directive is to supplement natural runs with indigenous broodstock as per wild fish policy and to explore methods to improve hatchery fish.

Oregon recently determined that they can significantly increase densities of juvenile coho at the end of the summer rearing period in most streams. However, releases of hatchery pre-smolts has reduced the density of wild juvenile coho by 40-50 percent. The results showed that hatchery pre-smolts should only be stocked in habitat that is greatly underseeded. Stocking hatchery pre-smolts produced a net loss for adult returns (Nickelson 1981).

Release size for coho vary between 35-38 g (12-13 fish /lb) for hatcheries with survival rates less than two percent. When survival is greater than two percent Oregon managers recommend releasing 23-25 g (23-25 fish/lb) fish. Size at release becomes less critical in years with high upwelling (Johnson 1982).

Chinook

Fall - The fall chinook salmon of coastal Oregon are healthy and support populations as high or higher than at anytime in the last century. The landings during 1986, 1987, and 1988 have never been higher during the seventy years they have been activity fished in the ocean (Nicholas and Hankin 1989). The complexities of natural processes make it impossible to state for sure how this happened. However, the one sure statement that we can make is that hatchery programs are not responsible for the healthy status. The vast majority of coastal rivers are presently supporting wild chinook populations at levels equal to anything in the past century (Nicholas and Hankin 1989). Oregon biologist believe that the credit belongs to the natural healing in the past three decades occurring in many lower main stem rivers and estuaries. The recovery of coastal chinook salmon has occurred with little or no "tweaking" from agencies. The famous Elk River study concluded that wild and hatchery systems were only weakly compatible. These data were collected over 20 years from a hatchery that was meticulously managed to mirror the wild run. This study makes the point that "hatchery and natural production systems could coexist if hatchery management practices take extraordinary care not to reduce the productive capacity of the ecosystem" (Nicholas and Downey 1989). These data lead us to believe that coastal chinook salmon stocks are healthy and productive because they have productive habitat and without the assistance of major artificial propagation projects.

 $\underline{\mathbf{Spring}}$ - Oregon's spring chinook management primarily focuses on releases of smolts. Outplanting oversize smolts generates excessive returns of subjacks and increases straying.

The Willamette River historically produced the major portion of the run in the Columbia Basin. Because of dam construction and years of habitat degradation wild runs contribute only a small percentage to the spring chinook salmon return and hatchery direct releases contribute approximately 95 percent of adult return. Evaluation of wild stocks of spring chinook salmon in the Willamette Subbasin have not been completed.

At present spring chinook supplementation evaluation programs state wide are inconclusive. However, smolt (180-190 mm) releases have produced the best adult returns.

STEP

Oregon's Salmon Trout Enhancement Program (STEP) recruits the services of volunteer citizens to assist with habitat improvement projects, population and spawning surveys, and streamside hatchboxes. The STEP program began in 1982 and in 1988-89 the hatchbox segment released a total of 2.6 million salmonid fry (Table 2).

²Max Smith, pers. comm., Oregon Department of Fish and Wildlife, Springfield, Oregon, pers. comm. April, 1990

Table 2. Total salmonid fry released in 1988-89 Oregon STEP program.

Spring Chinook	Fall Chinook	Coho	Winter Steelhead		
168,023	571,372	1,035,223	686,653		
Chu	<u>m</u>	Cur	tthroat		
23,6	12	113,076			

This program involves individuals and conversation groups throughout the state. However, coastal streams provide the major production.

Prior to STEP, Oregon biologist could not document substantial adult return from fry releases. While STEP evaluations are incomplete and difficult to document, the adult contributions seem disappointing at best.

Summary

Oregon placed much emphasis on coho enhancement in the 1960s-70s with little success. While coho was in the limelight, coastal fall chinook received little or no enhancement attention. However, coastal fall chinook rebounded to near historic levels when left to fend for themselves. Protection and healing of mainstream rivers and estuaries probably deserve some of the credit. The fact the wild fish returned to healthy populations when provided adequate habitat deserves a closer look by supplementation proponents.

The STEP citizen volunteer program focuses primarily on fry releases. The early evaluations have shown disappointing adult returns.

Biologists have documented that larger smolts bring back more adults. They also have data that shows that hatchery fish can adversely affect wild stocks.

Because of the preponderance of evidence of the inadequacies of rebuilding runs with hatchery fish, Oregon recently established a new natural production and wild fish management plan. It is too early for the ramifications of this program to be obvious. However, introducing indigenous wild/natural broodstock into hatchery program cannot help but produce positive results.

The results of this wild fish management policy will assist others in the Columbia Basin evaluate more effective supplementation techniques.

Washington

Background

Anadromous fish runs in Washington include chinook, chum, coho, sockeye, and pink salmon and steelhead, and sea run cutthroat trout. Systems that support anadromous runs include tributaries to the Columbia River, coastal systems, and the Puget Sound and it's numerous tributaries.

Artificial production of anadromous salmonids in Washington is conducted by state, federal and tribal hatcheries. Over 340 million fish were releases in Washington in 1987, (Table 3).

Table 3. Numbers of anadromous salmonids released in Washington in 1987.

Winter Steelhead	Summer Steelhead	Fall Chinook	Spring Chinook	Coho	Chum
1,803,646	3,349,917	139,359,630	17,896,634	88,363,656	90,171,973

Steelhead

The Washington Department of Wildlife (WDW) manages the steelhead runs in Washington. The WDW raises smolts almost exclusively with more than 6 million steelhead released annually. This stocking effort is mainly to increase harvestable numbers, not to rebuild natural or wild runs. The operational procedures of WDW hatcheries has created a separation between the run timing of hatchery produced fish and naturally produced fish. They are presently managed as separate runs with the early run consisting primarily of domesticated hatchery stocks and the later run primarily wild stock.

Generally wild steelhead broodstock are not used in WDW hatchery programs. They have found it "operationally difficult" to incorporate wild fish into hatchery production programs. The Tuttle River is an exception to this rule and, in the past, WDW has looked at the feasibility of utilizing wild broodstock in other Washington rivers. Presently many WDW biologists believe that wild broodstocks are responding favorably to the current management practices. In the Kalama River 58% of the total winter steelhead run consists of wild fish. The Elwha River averages only 14% wild fish in the total run. Also, since 1984 all hatchery fish are marked before release and fishing regulations require that all unmarked fish caught are to be released.

Steve Lieder, Washington Department of Wildlife, Kalama, Washington, pers. comm., March, 1990

There is mixing of wild and hatchery stocks and WDW estimates that 44% of the wild summer steelhead returning to the Kalama River are the direct offspring of naturally spawning hatchery fish. The WDW has also found that wild steelhead appear to be 8.6 times as effective as hatchery fish in producing adult returnees (Leider et al. 1989).

Survival rates for hatchery winter steelhead range from 9.1% for the 1982 brood year in the Green River to 0.21% for 1980 brood year in Cook Creek tributary to the Quinault River. An overall average return rate for hatchery winter steelhead is 3.9% (based on data on smolt return rates for 8 western Washington rivers).

Salmon

The Washington Department of Fishery (WDF) manages most of the salmon runs in Washington. State salmon programs are presently developing a framework of guidelines that will give the supplementation programs management direction. These guidelines will allow WDF to fully document, plan, coordinate and evaluate ongoing and future activities. They are currently attempting a more focused evaluation on drainages managed as natural, i.e. Gray Harbor, Queets, Quillayute, Skagit, Snohomish, and Stillaguamish Rivers.

Hatchery management programs are conducted by the state in South Puget Sound drainages. Most of these drainages are supplemented to meet higher salmon harvest rates, maximize seeding and realize hatchery goals. These programs are primarily operational programs with little or no evaluation. Harvest augmentation is a management goal in many of these programs.

Within Washington, off station releases accounted for 22% of all releases by state and federal hatcheries in 1985 and 1986. This amounted to more than 154 million salmon, 60% of these were coho, 26% chum, 13% fall chinook, and 0.4% spring chinook.

In some instances where the chinook runs have declined they are utilizing hatchery fish in an effort to rebuild runs.

Wild broodstock programs have been attempted with chinook and coho. WDF had problems with wild broodstock in hatchery production situations. Wild coho broodstock had low fry to smolt survival. The Stillaguamish River summer chinook program is currently set up to incorporate wild broodstock and the program is also shifting from fry plantings to smolt plantings with higher survival rates.

<u>Chinook</u> - The majority of supplementation work on chinook in Washington is being conducted by Indian Tribes; outplanting approximately 9,000,000 juvenile chinook annually. The main purpose of this outplanting is to enhance or establish a fishery. Most of the fish are stocked as fingerlings (>7,000,000), with survival rates for fingerling to adult ranging from slightly less than 1.0% to 0.1%. Outplanted smolts have slightly higher survival rates, estimated at around 1.0% (summarized from: Part 2, Database for Unpublished and Ongoing Supplementation Projects).

The Yakima Enhancement Study documented survival for wild chinook smolts to adults at 4.4% in 1983, compared to only 0.05% for hatchery releases. Furthermore, while trapped outmigrating smolts had a higher survival rate for those fish that were acclimated and volitional released, their survival to adults was the same as those not acclimated (Fast et al. 1988).

Summer chinook salmon are managed primarily for natural production in the Wenatchee, Methow, Okanogan, and Similkameen Rivers.

A negative factor supplementation efforts may have is the stocking of hatchery fish may actually reduce the numbers of wild fish. Hillman and Mullan (1989) found that hatchery releases of age-0 chinook salmon in the Wenatchee River "pulled" 38 to 78% of wild chinook and 15 to 45% of wild age-0 steelhead from stream margins and downstream as the hatchery fish moved, unless wild fish could not see them.

Chum - Most chum supplementation efforts in Washington are concentrated in South Puget Sound and its small drainages. Like chinook, a number of Indian tribes are conducting supplementation work to enhance or provide a fishery. Review of the database (Part 2, Database for Unpublished and Ongoing Supplementation Project) revealed that within Washington over 20,000,000 chum fry are outplanted annually with 0.07 to 1.0% return to hatchery being realized.

A number of programs utilize pond rearing and volitional releases of fish.

Coho - Coho fry are widely stocked in many small streams in Washington with no separation or differentiation made between hatchery and wild fish. Over 92,000,000 juveniles were outplanted, in 1985 and 1986 combined, to augment harvest. Releases of 395,800 yearlings to the Nisqually River has realized a 10-14% return to the fishery, (Part 2, Database for Unpublished and Ongoing Supplementation Projects) whereas fry outplants in the Chehalis Basin are estimated to be 0.05 to 0.09% to catch as adults, depending upon stock.

The WDF is collecting wild broodstock for rebuilding coho runs on the Quillayute, Hoh and Queets River System. They have estimated that cost per spawned female averaged \$330. Juvenile fish are reared to fry, then restocked into systems that are below full seeding levels. The limited data collected so far indicates that survival from fry planting to smolt emigration is simply not high enough to result in more smolts than would have been produced had the adults been allowed to spawn naturally (Anon. 1989).

In the past WDF has outplanted yearling coho in Grays Harbor and Willapa Bay. This was used to reduce hatchery surplus and improve wild production. Releases of yearlings were not cost effective and was discontinued.

¹Rick Brix, Washington Department of Fisheries, Montesano, Washington, pers. comm., April, 1990

Summary

Another effect supplementation projects may have is their impacts on other salmon species. A coho enhancement project in the Puget Sound area was at least circumstantially linked to a major decline (50%) in the pink salmon run in a nearby river. This evidence is supported by the fact that the rest of the Puget Sound pink runs increased by 38% in the same time period. (Ames, 1980)

Steelhead management in Washington has benefited from the marking of all hatchery produced fish. This allows immediate sight identification of hatchery and wild fish. Further separation of hatchery and wild fish is realized by a difference in run timing. This difference is used in segregating fish for the hatchery and to limit intermixing.

Idaho

Background

Idaho stocks of anadromous fish are in a very depressed state. Because of this depressed state of low numbers of wild/natural stocks, much of the supplementation work can be considered as restoration. Restoration centers primarily on chinook salmon and steelhead trout. Historically, Idaho supported runs of steelhead, sockeye and coho salmon as well as three races of chinook salmon; spring, summer and fall. Hydroelectric dams, habitat degradation and overfishing have contributed to the decline of Idaho's anadromous fish run. Coho salmon no longer enter Idaho and can be considered extirpated from the state. The last coho to pass Lower Granite Dam, first dam on the Snake River downstream of Idaho border, was a single adult in 1986, and only two fish passed in 1985. Sockeye salmon is now being considered by NMFS for endangered species designation in the upper Snake River. Last year, 1989, only two adults were recorded to have passed Lower Granite Dam. Thus, sockeye may also be extirpated from Idaho. Fall chinook salmon are not being actively managed in Idaho. The Snake River below Hells Canyon Dam downstream to the confluence of the Clearwater is the only area where there are still significant numbers of fall chinook in Idaho. The Washington Department of Fisheries has initiated a program on fall chinook in this Snake River section.

Idaho, therefore, is primarily managing three groups of anadromous fishessummer steelhead, summer chinook salmon, and spring chinook salmon. Of these three groups, steelhead and spring chinook account for most of the effort. In 1989, over 23 million hatchery fish were released above Lower Granite Dam on the Snake River. Most of these hatchery fish originated from production facilities located in Idaho. Some did come from Oregon's Grande Ronde and Imnaha River systems. Of the 23+ million; 9,600,000 were spring chinook and 9,900,000 were steelhead—the two major hatchery species reared in the state.

Steelhead

The potential Snake River steelhead run, as based on the 1954-1967 base years, was estimated for the Lower Snake River Compensation Plan (LSRCP), as 114,800 (Herrig, 1990). In 1988, 99,714 steelhead were counted over Ice Harbor Dam.

although this number seems to be approaching the LSRCP goal, it is estimated that 70-80% of the steelhead run returning to the Snake River are hatchery fish. It is estimated that 10 to 15 percent of the steelhead smolts passing Lower Granite Dam from the Snake River drainage are wild/natural.

Adult returns to the Snake River above Lower Granite in the past three or four years (1986-1989) have demonstrated the greater survival of wild fish over hatchery fish. Data for steelhead indicate that 20 to 34 percent of the adult fish crossing over Lower Granite Dam are wild; this is from an estimated 10 to 18 percent wild smolts passing downstream (Koski, et al. 1989). This indicates as much as a two-fold survival advantage of wild/natural steelhead smolts above Lower Granite Dam.

Idaho Fish and Game in their Idaho Anadromous Fish Plan (Anon. 1985) has established goals of returning steelhead and salmon to Idaho. Recent returns on steelhead indicates that the state is achieving their goal, or about to achieve their goal, of smolt-to-adult survival of 2 percent for wild/natural and 1 percent for hatchery fish. However, the total number of wild/natural fish returning to Idaho is considered to be well below that needed to fully seed available habitat.

As can be seen from the preceding hatchery release numbers, Idaho is in a very large hatchery program. Almost all of the stocking and outplanting in the state has been done with smolts. Most smolts have been released at hatchery racks and have been used for mitigation, harvest augmentation, and broodstock development. Supplementation of wild/natural runs is just now getting more emphasis in Idaho. Although in recent years hatchery fish have been outplanted or introduced into natural stream areas, the program was usually the result of extra production at the hatchery facilities of fry, fingerling, pre-smolts or smolts and even adults which permitted the stocking of what was considered "underseeded" waters.

One of the earlier locations where steelhead were outplanted from state hatcheries was to the Pahsimeroi River in a program that reestablished the runs from the mid-Snake River to this tributary to the Salmon. Reestablishing the mid-Snake run was made necessary by the construction of the Hells Canyon dams on the Snake River which is a barrier to anadromous fish migration. On the Pahsimeroi project, returning adult steelhead are collected for egg take at the Pahsimeroi trap, but all natural fish and some hatchery fish (to total one-third of run) are released upstream for natural production. Separation of hatchery fish from wild/natural fish is made possible by the adipose clip which is placed on all hatchery steelhead. A similar type program of allowing one-third of the steelhead run to spawn naturally has also recently been initiated on the East Fork of the Salmon River. For the Pahsimeroi River project, about 900,000 smolts are released annually with an estimated adult return to Idaho of 1.18 percent. Hatchery fish make up approximately 93 percent of the sportsman catch on the Salmon River. Sport fishery regulations

Kent Ball, Idaho Department of Fish and Game, Salmon, Idaho, pers. comm., January, 1990.

require that all non-hatchery steelhead, fish with an adipose fin, be returned to the river.

Salmon

Spring - The Snake River system once produced the majority of spring anadromous chinook in the Columbia River system (Fulton 1968). Today this run is only a remnant of what used to occur. The LSRCP spring-summer adult goals for the Snake River were made using the 1954-1967 counts and using the highest count as the potential production for the Snake River. For spring-summer chinook, the potential run was estimated at 122,200 adults (Herrig 1990). In 1988, the spring chinook run over Ice Harbor, the first dam in the Snake River, totaled 34,394 (Anon. 1989b). It is estimated that up to 80% of these spring chinook were hatchery fish.

Although data is quite limited, it has been estimated that less than 10 percent of the chinook salmon smolts passing Lower Granite Dam are wild. Data on the separation of wild and natural fish is just now being accumulated at upriver dams on the Snake River.

For spring chinook, the survival of wild fish may be as much as three- or four-fold better than hatchery fish. For instance, the Idaho Department of Fish and Game has estimated wild spring chinook smolt survival to adult in Marsh Creek at 1.2 percent back to Idaho when good flows were recorded at Lower Granite Dam for smolt passage. Rapid River hatchery spring chinook salmon on the other hand recorded smolt to adult survival to Idaho of around 0.3 percent when good downstream smolt passage flows at the dam were recorded. Hatchery returns as stated, of 0.3 percent on good flow years and one or more fold less on a low water year, indicate that much work is left to be done for returning spring chinook to Idaho.

Within the last few years, a number of satellite fish rearing stations have been established in the Clearwater and Salmon River drainages, both tributaries to the Snake. These satellite stations are used for trapping adults and also for partial rearing of juveniles. These stations are meant to augment the wild/natural runs that are present in some of the tributary areas.

Spring chinook salmon supplementation in Idaho has come primarily under the LSRCP. This program has facilities on the upper Salmon and Clearwater river drainages where spring chinook are trapped, eggs taken, and juveniles reared. Fingerling are outplanted into ponds for volitional release in the fall and smolts are transported out to tributary streams for building runs. Although there are a number of active programs for outplanting various life stages of spring chinook, including fry, fingerlings, pre-smolts, and smolts; evaluation of what has worked has been nearly impossible. Return rates to racks of LSRCP

²Larry Basham, Fish Passage Center, Portland, Oregon, pers. comm., April, 1990

Charlie Petrosky, Idaho Department of Fish and Game, Boise, Idaho, pers. comm., February, 1990

facilities and to the rack at Rapid River Hatchery indicate very low survival rates. For example, spring chinook adult return rates from smolt releases at Dworshak National Fish Hatchery range from 0.074 to 0.238 percent with an average of 0.205 percent. These rates are not dramatically different from those experienced at other LSRCP facilities where return rates have been checked.

Rapid River Hatchery return rates have varied from 0.02 to 0.89% with the best return rates in the 1960s. In recent years, the return rate, smolt-to-adult has been near 0.20% quite similar to other spring chinook returns in the upper Columbia (Levendofske et al. 1989).

Summer - Supplementation of both spring and summer chinook salmon has just recently gotten into full swing in Idaho. Summer chinook salmon are supplemented primarily on the South Fork of the Salmon River. McCall Hatchery, which started releasing summer chinook smolts to the South Fork in 1980 to help supplement that run, has in the last four or five years produced significant numbers of smolts. The goal of that facility is 1 million smolts per year. During 1988 and 1989 1,060,400 and 975,000 summer chinook smolts were released into the South Fork from McCall Hatchery. The program in the South Fork entails a weir on the stream where the adults are trapped and eggs are taken. One-third of the fish are taken for hatchery production and the other two-thirds are passed upstream for natural production. Return rates from marked coded-wire tagged summer chinook salmon released at McCall indicate a smolt-to-adult survival of 0.80% for Brood Year (BY) 1981, 0.44% for BY 1982, and 0.46% for BY 1983 (Herrig 1990).

Summary

Idaho is working to rebuild runs of summer steelhead, spring chinook and summer chinook in the Snake River Basin. Management of steelhead has centered on designating wild streams where no hatchery fish are to be planted, Middle Fork of Salmon, South Fork of Salmon and Selway rivers, and to restrict planting in other areas. The marking of all hatchery steelhead has aided Idaho managers in evaluating hatchery programs and in documenting the status of wild steelhead. The steelhead goals of smolt-to-adult survival of 1% for hatchery fish and 2% for wild fish is almost achieved. However, the numbers of wild fish are less than needed for natural habitat seeding.

Spring chinook are in very poor shape in Idaho. Returns of both hatchery and wild stocks are very depressed. Hatchery supplementation to rebuild runs has, to date, not worked. Managers are not getting close to their goal of returning 0.8% for hatchery fish. Right now most hatchery fish returns are nearer 0.2% or only 25% of the goal.

California

Background

Anadromous salmonids native to California are chinook, coho, sockeye, pink, and chum salmon, and steelhead, and cutthroat trout. Historically, chinook and steelhead runs were widespread and abundant throughout the state. Habitat degradation and loss through dam building, water developments, watershed

alteration, and over fishing contributed to the decline of salmonids throughout the state.

Hatcheries were built to mitigate for these losses and are operated by the California Department of Fish and Game (CDFG), and U.S. Fish & Wildlife Service (FWS). In early culture practices, eggs were obtained from various California and out-of-state waters to re-establish or supplement dwindling stocks. The mixing of non-endemic stocks throughout California have likely altered the composition of distinct genetic pools. Despite this, hatchery production efforts have either maintained or increased spawner escapements in many waters. Anadromous fish stocking in California is in a restoration phase trying to rebuild runs and also, in a harvest augmentation phase to provide fish for commercial, sport, and tribal harvest.

During the past two decades, private groups have become involved in habitat restoration projects. Private propagation programs have also expanded, particularly in affected areas where state involvement was minimal or lacking.

The federal and state management agencies, and private groups have all focused on the importance of restoring fall chinook and winter steelhead. These two species are receiving the highest attention in both habitat rehabilitation and supplementation efforts. In coastal areas where coho runs prevailed historically, interest has increased in re-establishing these stocks. The distributions and abundance of sockeye, pink, and chum salmon are so limited that propagation efforts for these species has not been practical.

Government and private efforts are attempting to rebuild salmonid runs through stock management, supplementation, and habitat rehabilitation programs. Although efforts are on-going to restore wild spawning populations, the major emphasis is the production of hatchery fish for harvest augmentation. With this emphasis, the re-building of wild stocks, may be limited to some coastal waters and a few sub-basin streams within California's major river systems.

The role of supplementation will become more crucial in California as wild runs of chinook, coho, and steelhead continue their recent state-wide declining trends.

Chinook

Winter chinook are known only to the upper Sacramento River, and this race is a federally listed threatened species. Coleman National Fish Hatchery (CNFH) represents the only entity propagating winter chinook. Only one adult pair was spawned at CNFH in 1989.

Spring chinook are native in the Klamath River and Sacramento River basins, and are represented by hatchery and wild stocks. The status of the wild stocks are not well-known, but may be tenuous. The hatchery stocks that are propagated at Trinity River Hatchery (TRH) and Iron Gate Hatchery (IGH) appear to be stable. The South Fork Trinity River spring stock abundance has declined, and this geographical stock may become a candidate for state listing as a threatened species.

Fall chinook is the dominant anadromous salmonid in California. The state (CDFG) and FWS are the largest producers of fall chinook, annually releasing approximately 30 million and 16 million juveniles, respectively. The U.S. Department of Agriculture, Forest Service (FS), U.S. Bureau of Indian Affairs (BIA), various Indian Tribes, and private groups also propagate fall chinook. Private groups produce over one million fall chinook annually (Table 4).

Table 4. Estimated releases of anadromous salmonids from private California projects (permit and contract categories) during 1989.

	Fall <u>Chinook</u>	<u>Coho</u>	Winter <u>Steelhead</u>	Coastal Cutthroat
Rearing				
Independent production	186,350	77,225	76,310	500
Eggs from CDFG	163,000	0	13,999	
Ocean Pen-rearing	51,082	_	-	- 11
Natal stocks				
Yearlings	246,189	188,956	247,780	14,000
Smolts	479,712			
Totals	1,126,333	266,181	338,089	14,500

Natal stocks releases are progeny of broodstock taken from natural populations.

Federal and state hatcheries commonly truck their releases, particularly in the Sacramento River system, to bypass numerous water pumping stations and diversions. These fish are usually trucked to San Francisco bay or the river delta. Another outplanting technique used to enhance survival is to divide release groups and plant into adjacent drainages or different locations within the same drainage. Outplanted and trucked release chinook groups have exhibited higher survival than those released on-site. Private programs have also experienced higher ocean contribution rates and inland return success from yearling-sized releases rather than fingerling (smolt) releases.

A late fall chinook population occurs in the upper Sacramento River, and is propagated at CNFH. This late fall population may be declining in abundance.

Culture methods were generally similar among private projects. Circular rearing tanks and raceway-type troughs were the most common systems for rearing juveniles. Fiberglass produce truck bins ("tomato-tubs") have become popular in California for rearing juveniles. Some projects reported using earthen ponds, dough-boy swimming pools, and plastic cooler tubs to rear salmonids. There are two estuary/ocean pen rearing projects, whereby juvenile chinook are reared to the smolt stage, and released. The estuary project's ocean contribution rates ranged from 0.14-7.28%, while the ocean rearing project's releases returned at a rate of 2% to the local fisheries.

Disease was not a major concern among private groups. Reported disease problems were usually linked to higher seasonal water temperatures or

insufficient water supply. All of the private projects exhibited very good cultural practices, which probably has aided in minimizing outbreaks of disease. Columnaris, and fungus were among the more commonly reported diseases.

Coho

Coho salmon utilize coastal streams for spawning. They are native to the Russian, Klamath, and Eel Rivers, and other coastal streams. In contrast to the known historical status and distribution, the present wild populations are remnant, and the status of some stocks are uncertain.

Coho are propagated by CDFG and private groups. Federal agencies, and Indian Nations are not propagating coho salmon in California. In recent years, CDFG has annually released about 1 million coho yearlings into state waters. The CDFG operates the Noyo River Egg Collection Station on the South Fork Noyo River. Eggs taken from this station have been used to supplement or reestablish coho runs to other coastal waters.

Prairie Creek Fish Hatchery (PCFH) releases about 100,000 coho annually, and represents the largest level of production from non-CDFG agency. Recent adult return rates to PCFH for coho was 3%. The city of Arcata rears coho salmon and steelhead in a wastewater marsh aquaculture project. The yearlings are then released into a stream adjacent to the marsh. Coho releases average 5,000 annually, and adult returns range from about 0.1% to 0.3%

The 1989 coho salmon production from private projects (including county and local programs) contributed 266,181 yearlings to California waters. The Humboldt Fish Action Council (HFAC), and the Monterey Bay Salmon and Steelhead Project are the two largest private coho producers, releasing about 25,000, and 23,000 yearlings annually, respectively. The HFAC's coho releases contributed an estimated 0.2% to the 1989 ocean fishery, the inland recovery rate was also 0.2%.

Steelhead

Steelhead are widely distributed throughout California. The majority of California's stocks from the larger river systems (Sacramento, Klamath/Trinity) are augmented or sustained by hatchery operations. Within these basins, and in other coastal streams, numerous waters have remnant or near-extinct runs of wild winter race steelhead. The winter run is the dominant form in California. The middle fork of Eel River has the only native run of summer run steelhead in the state. This native stock is not supplemented. A Washougal River (Washington) stock of summer steelhead was introduced into the Mad River, and has been established as a small naturally spawning run. In some years these adult fish enter the Mad River Hatchery, and are propagated independently from winter steelhead.

Steelhead propagation ranks second to the chinook salmon for all anadromous salmonid releases. The state (CDFG) and FWS are the main producers of steelhead. The Indian Tribes do not propagate steelhead.

Coleman National Fish Hatchery raises about one million winter steelhead annually at the facility. These fish are released as yearlings on-site and off-site. Contribution rates for on-site releases ranged from 0.10% to 0.25%, and 0.10% to 0.50% for off-site releases. The Forest Service operates two spawning channels, at Kelsey, and Indian Creek. Although intended primarily for fall chinook, these channels are also utilized by steelhead and coho salmon.

With the exception of the Merced River Fish Facility, winter steelhead are raised in every CDFG anadromous hatchery. The estimated annual production is about 4.5 million from these facilities. The steelhead are released as yearling smolts. Release strategies vary by facility, and also in response to the continuing drought. In wet years in the Sacramento River system steelhead are trucked to the San Francisco bay estuary. The on-site steelhead releases from Mokelumne River Fish Hatchery also serves as put-and-take fishery, while the off-site releases are trucked to Rio Vista (delta area) or the estuary. Reliable return rates to the Sacramento River basin hatcheries were not available, but based on results achieved with chinook, off-site releases are assumed to yield higher ocean and inland returns.

Private programs (includes county and local projects) produced 338,089 steelhead trout in 1989. The largest programs were (average annual production): Rowdy Creek Fish Hatchery, 75,000; the Mendocino County Fish & Game Commission, 70,000; Monterey Bay Salmon and Trout Project, 45,000; and Gualala River Steelhead Project, 30,000.

Coastal Cutthroat Trout

The coastal cutthroat trout occurs in coastal waters from the Eel River drainage and northward. The present range may be identical to the known historical distribution. However, the abundance has declined considerably, although existing populations are believed to be stable. There are about 120 streams with cutthroat, comprising about 700 miles of habitat. Although cutthroat trout are not as popular as other anadromous species, increasing harvest pressure on the other species may elevate the importance of cutthroat as a sport fish species.

The Fisheries Department of Humboldt State University (HSU) has begun propagating anadromous coastal cutthroat for the purpose of enhancing sport fishing in the local Humboldt County lagoons. The first release of 14,000 juveniles is scheduled for the spring of 1990. These fish are reared at the HSU hatchery then trucked to local lagoons. Humboldt County and HSU are the only entities propagating coastal cutthroat in California. About 500 cutthroat trout are released annually from Prairie Creek Fish Hatchery. These cutthroat are released as yearlings and are intended to contribute to the local inland sport fisheries.

Summary

There is considerable interest in supplementation, especially among private groups. Consensus among private groups expressed a need for additional programs, to rehabilitate additional waters which formerly produced salmonids. They also voiced the need to work together with the State to meet common

objectives. The majority of the state personnel interviewed were generally in agreement with the private faction.

One concern that was apparent among virtually all groups was the issue of inter-basin transfers of salmonid stocks. Although most people were aware of the biological implications, some felt that inter-basin transfers were necessary to attain their goals. Others expressed a need to end all inter-basin transfers of all life stages. Although CDFG has a formal policy against inter-basin transfer of stocks, the supplementation review indicated that this practice is common and widespread. The CDFG has transferred stocks for supplementation purposes, in order to establish and maintain runs. Particularly in waters with depressed or extirpated stocks, some private programs have received both endemic and non-endemic eggs from CDFG.

Although the state's intent has been to supplement and expand dwindling or geographically extinct wild stocks, a formally organized state-wide active program to increase wild stocks (through supplementation) was not apparent from the state personnel interviewed. Maintaining high production levels appears to be a driving force within the hatchery management system. Many personnel from all sectors expressed concern about the proper levels (density) of stocking. Additionally, various measures to promote the survival and return of hatchery stocks (such as trucking juveniles downstream) have been successful, but does little to aid the natural production.

Although private projects are also motivated to maximizing their production, they have not deviated from their grass-roots objectives of rebuilding local remnant stocks. The private projects appear to be limited by economics; the materials, personnel, technology, and funding necessary to define the capability and nature of these projects. California's private sector has the potential to increase present levels of supplementation with additional funding.

Guidelines among public agencies and private groups on the biologically appropriate levels of production and supplementation are lacking. This problem needs to be addressed to promote an organized and scientifically sound approach to rebuilding salmonid stocks.

Alaska

Background

Alaska has two entities doing enhancement of salmon and steelhead, private non-profit (PNP) hatcheries and the Alaska Department of Fish and Game, Fisheries Rehabilitation Enhancement and Development (FRED) Division hatcheries. PNP hatchery programs provide a structure for fishermen to be involved with the commercial fisheries programs. The PNP are supported by Regional Aquaculture Association and produce fish for commercial fishery harvest. There are seven regional aquaculture associates in Alaska. The PNP rear pink, chum, coho, chinook and sockeye salmon at their hatcheries. In 1988 PNP hatcheries took a total of 1,045,620,000 eggs and released 819,800,000 fry and smolts (Holland, 1989). Most releases were pink and chum salmon fry, approximately 626 million pink fry and 186 million chum fry. In 1988 there were 22 PNP hatcheries in Alaska. The Regional Aquaculture

Associations are supported by a tax on the commercial salmon harvest as well as the sale of fish returning to the PNP hatcheries.

Alaska's FRED Division program focuses on the development of new enhancement technology, hatchery production for sport, personal use, subsistence and non-cost recovery commercial fisheries, technical services, permitting, and habitat restoration and rehabilitation. The PNP hatcheries program is administered by FRED under a permitting system.

The FRED system operates 16 hatcheries and several ancillary hatchery facilities. In 1988 FRED hatcheries released 412.6 million fry and smolts of which 407,080,080 were salmon and steelhead (Holland, 1989). Of this 407 million 1988 release, 320 million were pink and chum salmon. See Table 5 for breakdown by species of salmon and steelhead released by PNP and FRED hatcheries in Alaska for 1988.

Most of PNP hatcheries produce pink and chum salmon with some sockeye, coho, and chinook. Sockeye rearing is increasing. Plans are moving forward to produce more sockeye smolts at a number of Alaska hatcheries both PNP and FRED operated facilities.

Table 5. Releases of fry and smolts, salmon and steelhead, from Public Non-profit (PNP) and Alaska Department of Fish and Game, FRED Division hatcheries, 1988.

PNP I	Hatcheries	FRED Division	on Hatcheries
Species	Number (1,000)	Species	Number (1,000)
Chum	186,050	Chum	106,531
Pink	625,820	Pink	213,580
Sockeye	1,000	Sockeye	68,142
Coho	4,720	Coho	14,441
Chinook	2,210	Chinook	4,115
TOTAL	819,800	Steelhead	271
		TOTAL	407,080

From: FRED 1988 Annual Report to the Alaska State Legislature, edited by J.S. Holland, Ph.D., Number 89. Alaska Department of Fish and Game Division of Fisheries Rehabilitation, Enhancement and Development, January 1989.

There is some limited work going on to rebuild or supplement wild/natural runs of salmon and steelhead in Alaska. But most of the hatchery effort is to increase runs for harvest augmentation. Generally, fish are released directly from the hatchery or introduced to areas where the adults can be harvested while wild stocks are managed for escapement. There is also an effort in Alaska to introduce salmon to unutilized production areas where barriers or other factors have restricted access of fish. Recently there have been programs established to bring fish back to areas just for a specific type of harvest - sport, commercial or subsistence. Fry, fingerling, and smolts are

released directly into coves, small streams, lakes or river areas to key adults back to human access areas for harvest.

Alaska's hatchery program is rated quite successful in that it is providing more stability in the commercial fisheries program. In 1987, roughly 25% of the total statewide salmon harvest was from salmon that migrated from public (FRED) and PNP programs. In 1988, this figure was 24% (Hartman et al. 1989). To separate wild stocks from hatchery stocks in a mixed stock fishery, many hatchery fish are marked with coded-wire tags. In some fisheries, hatchery fish are separated by timing into a fishery area and by location of return. Overall, fisheries management in Alaska is directed primarily for wild fish escapement with hatchery releases directed for harvest augmentation.

Chinook

Chinook programs have not been as successful as some of the other hatchery programs in Alaska. But in terms of adult returns compared to those in the Columbia system these too can be considered successful. Chinook adult returns in the 2-4% range from smolt plants have been common (Dudiak and Boyle 1988). The goal for smolt releases of chinook, coho, and sockeye salmon is to get 3 percent or better adult returns. Programs to build fisheries in selected areas for chinook harvest augmentation has worked quite well in Alaska. Chinook smolt releases in Prince William Sound had returns in the 4-5% range.

Supplementation of natural runs is done almost exclusively with native broodstock. Fry, fingerling and smolts have been planted out to natural areas. In the Kasilof River FRED program biologist have stocked chinook smolts back into areas with wild stock and noted no impacts on wild stocks. They did note that survival of hatchery fish was about one-half of what they thought it should be (Kyle and Litchfield 1989).

Managers in Alaska are doing some lake rearing of chinook with fish from the Gulkana Hatchery, a Copper River stock. Fed fry are taken out by plane and planted into lakes in the upper Copper River. This is a pilot study and no data is available yet.

Sockeye

Sockeye salmon rearing is increasing both in PNP and FRED Division hatcheries in Alaska. This is primarily because sockeye is the premier fish in the commercial fisheries with the best market price. Also, in recent years techniques for managing around IHN disease have been improved and techniques of both lake fertilization and lake production modelling have progressed so determination of production potential can be assessed.

¹Keith Pratt, FRED Divisions, Alaska Department of Fish and Game, Anchorage, Alaska, pers. comm., February, 1990

²Bruce Suzumota, Prince William Sound Aquaculture Association, pers. comm., February, 1990

Sockeye in Alaska are planted into barren lakes or lakes with adult barriers and to supplement existing stocks. Lakes are usually only a few miles from salt water. A program of lake fertilization is done following a liminological study to identify needed fertilizers. Where supplementation of a sockeye lake is done, the native stocks are used as brood where possible. Also, because of some of the excellent returns of sockeye, adults from smolts released, as high as 35 percent out of Big Lake, new programs are being planned to rear more sockeye to smolt size. 1

Following are some examples of survival of various stocking techniques:

Sockeye stockings of unfed fry into lakes; expecting a greater than 1% survival in the Gulkana River area. Sockeye stocked in Summit Lake of the Gulkana drainage as unfed fry have returned at 0.8% as adults.

Some sockeye smolt stocking into Big Lake have adult returns at a rate as high as 35%.

Planting eyed eggs in upper Thumb River, a tributary of Karluk Lake, has increased adult returns to Karluk Lake and spawners to upper Thumb River. Eyed egg survival to fry is reported as exceeding survivals commonly obtained from natural spawners (White 1986).

Fingerling sockeye released into Hidden Lake built up the production for the lake. It was believed spawning area was the limiting factor. Fingerling-to-smolt survival averaged about 20% and smolt-to-adult survival averaged around 15% (Litchfield and Flagg 1988).

Streamside hatching facilities at Gulkana for sockeye and chinook salmon also seem to be working exceptional well. Ground water from the stream is directed through large units of Kitoi egg boxes where sockeye and chinook eggs have been placed. As fry hatch, they are washed into a trapping and enumeration area and from there outplanted. Fry hatch at a similar time as natural spawned eggs would hatch. This is a low technology, low cost method of producing large numbers of salmon fry.

Coho

Coho salmon are stocked into lakes, streams, and net pens for enhancement purposes. Stocking and enhancement procedures in lakes are similar to the sockeye supplementation effort. Some limited success has been achieved with coho lake stocking, but this program is still in the evaluation stage. Also, some coho work is being done with net pens in the inlets and salt water areas. Success here has been fairly good with some PNP reports of 15 to 20 percent adult survival for smolt releases.

Bob Chlupach, Alaska Department of Fish and Game, Big Lake, Alaska, pers. comm., December, 1989

⁴Ken Roberson, Alaska Department of Fish and Game, Glennallen, Alaska, pers. comm., January, 1990

Some examples of percentage of adult returns from hatchery releases for coho are as follows:

Coho fingerling to adult from Seldovia Lake approximately 1% (Dudiak and Boyle, 1988).

Coho fingerling to adult from Caribou Lake approximately 2-3% (Dudiak and Boyle, 1988).

Coho on Homer Spit - up to 4% return from smolts (Dudiak and Boyle, 1988).

Coho in Yukon River of fingerling release was 4.0-8.5% for hatchery fish - wild fish were 13.4% (Raymond, 1986).

Coho smolts released from net pens in Prince William Sound had a return rate in the 15-20% range.

Pink and Chum

Pink and chum salmon are released as fry, either fed or unfed, and go directly to the ocean. Release can occur directly from hatcheries, or from other sites where fish migrate directly to the ocean. Some net pens are used with feeding programs to try and match release of fry to plankton peaks in inlet and bay areas. Keys to success seem to be getting fish to estuary or bay areas at peak of food production.

In Tutka Bay, Boyle and Dudiak (1986) recorded survival rates for hatchery released pink salmon fry as 12.5% for fed fry and 14.5% for unfed fry. Most other releases have shown a higher return for fed fry over unfed fry. Lower rates near 1-3% for unfed fry are common for both pink and chum fry releases (Kohler 1984, McDaniel et al. 1984). Feeding fry a few weeks and releasing with plankton peaks have tended to promote a higher survival, up to 14% with several around 8%.

Steelhead

There is very little work being done with steelhead trout in Alaska. No specific evaluation information was found.

Summary

Alaska has been successful in efforts to supplement salmon runs. However, their success has been primarily in the harvest augmentation area. Their management scheme is to manage for wild stock escapement and use supplementation to increase salmon runs for the commercial fishery. In a few cases, natural sockeye stocks have been rebuilt but much of the impetus for this rebuilding was for harvest.

Separating hatchery stocks from wild stocks has occurred by bringing salmon back to areas where no natural population exist and by separating by time of return when fish move through a commercial fishing area.

Ideas that seem useful for Columbia River supplementation include: (a) streamside spawning and incubation units, Kiotoi boxes, and outplanting of fry, (b) lake fertilization and fry planting schemes for sockeye, (c) separating hatchery stocks from wild stocks by place and time of return, and (d) managing for wild stock escapement with hatcheries keyed to harvest augmentation.

British Columbia

Background

The province of British Columbia (BC) probably comes closer to true supplementation than any area in the Northwest. Their Fraser River basin is similar to our Columbia River basin. However, BC does not have as many dams and subsequent major fish passage problems. Their Salmonid Enhancement Program (SEP) began in 1977 to double their salmonid production. The province supplements natural production by the most natural means and thereby reduces cost. Currently BC has a moratorium on new hatchery construction. They concentrate primarily on using existing hatcheries to incubate gametes from indigenous brood stock. They also employ stream side upwelling incubation units, side channel construction with ground water to incubators to produce rearing habitat. The province also uses spawning channels to extend the amount of spawning area available. These channels are of particular value for sockeye, pink, and chum salmon. The spawning channels also provide rearing habitat for other species such as chinook and coho.

In the late 1970s, SEP in its infancy, developed facility targets in a piecemeal fashion. The present system evolved by dividing the geographic regions into management units. Each unit reviewed the individual stocks as to the status, ability to manage and capacity for additional production potential. The geographical working groups (there are 10 in BC) develop recommendations for additional production through enhancement and management strategies. When a project shows promise, the management unit outlines the expected economic and social benefits to expect from their project and then submits it to the Treasury Board. For allocation of construction and operating dollars, the project must demonstrate an estimated 1.5 to 1 benefit/cost ratio (Hurst and Blackman 1988). Each project uses estimated survival rates for each type of enhancement strategy and is sized to meet the goals of the program based on these.

In situations where there are sufficient spawners and suitable habitat the province biologist have increased productivity of lakes and streams by the application of fertilizers. This promotes increased growth of the basic components of the salmonid food chain. SEP also concentrates on habitat improvements for enhancing salmonid productivity by some basic stream improvements. These improvements may require physical cleanup, placement of boulders, planting of stream side vegetation, flow control and eliminate possible pollution sources. BC uses these techniques after carefully assessing the situations.

Steelhead

BC's total steelhead supplementation for 1989 was only 2.4 million fish. These were supplemented into 28 systems. Steelhead are released at three life history stages: smolt, parr, and fry. The strategy of the smolt programs is to grow the smolts as large as possible (60-100 g or 190-220 mm), then outplant during late April to late May. The smolt to adult survival varied from 1% for small smolts to almost 10% for 60 g smolts (BC's program released 800,000 smolts in 1987). They determined that they could gain 30-40% smolt to adult survival by lower river releases, i.e. tide water. They had much lower survival for groups released only 10 km upstream. BC's major limitation in steelhead research is returning adult enumeration.

<u>Parr</u> - BC released 355,000 parr in BY 1987. They use two strategies for parr releases, both with 15 g fish (30/lb). Fish released in fall or released in spring as yearlings.

This program began in 1987 and the return data for the Coquihalla R. demonstrated a parr to adult survival of 2.6%. They expected 3.2% parr to adult survival. Based on cost comparisons to produce 100 adults BC concluded that if you have the habitat, parr are more cost effective over fry or smolts.

 $\underline{\text{Fry}}$ - BC stocks steelhead fry for two primary reasons: Colonization - defined as releasing fry above anadromous barriers, and supplementation - stocking fry in underseeded stream reaches.

From the 1987 brood year BC released 1.2 M; 2.0g fry (200/lb) into 28 systems. A typical release method is by helicopter to enhance dispersal. BC fry stocking began in the early 80s. Criteria used for survival of fry to smolt are largely dependent on: 1. age at smolting, 2. amount of physically suitable habitat for all life history stages, 3. size of fish released 4. productivity of different streams, i.e. total alkalinity can very from 4 to 200 mg/l 5. presence of competitors or predators. They state that in their early fry programs that they overstocked. In the early days they used no prescribed stocking formula. This program produced disappointing results. Fisheries assessment biologist went back to streams and developed site specific biostandards for stocking densities. They now release fish at more conservative stocking densities, considering the release size of the fry and the available habitat. They no longer calculate the number of fry stocked on the basis of the total wetted area of the stream. Now stocking densities only consider total usable areas. BC biologists cite many examples of over stocking resulting in decreases in growth performance of both hatchery and wild juveniles. The results of the Coquihalla R. are encouraging. Fry to adult survival have ranged from 0.4 to 1.3 percent and compared to the expected survival of 1.3 percent (Ptolemy 1986). They measured a four fold increase in standing crop of juveniles fry released.

Salmon

In release year 1988, the province recorded releases of approximately 530 million pink, chum, coho, sockeye and chinook salmon (Table 1). BC biologists use indigenous broodstock to ensure against stocking maladapted fish. They

release the progeny from wild fish into the parent watershed after ad-clipping in order to attempt to supplement with a genetically equivalent hatchery strains.

Broodstock are spawned (stream side) 1:1 male/female ratio and gametes taken to hatcheries. Biologists verify carrying capacities of life stage to be stocked in terms of usable habitat before outplanting progeny.

Table 1. British Columbia's salmonid production from SEP facilities, 1988 release year.

Species	Juveniles <u>Released</u>	Expected <u>Adults</u>	Canadian <u>Catch</u>
Pink	62,713,919	1,325,423	727,357 1,163,013 707,6 812,754 483,376 13,792 26,944 3,934,884
Chum	213,391,888	2,535,674	
Coho	18,470,120	1,099,881	
Sockeye	171,988,081	2,063,346	
Chinook	63,624,513	895,503	
Cutthroat	238,680	20,584	
Steelhead	2,371,647	45,407	
TOTAL	532,798,848	7,985,818	

From SEP 1988-89 update booklet.

Chinook

For the 1988 release year, BC recorded a release of 63.6 million chinook salmon at various life stages. Production of chinook salmon (stream and ocean types) for supplementation is primarily through hatchery operations (federal, provincial and community economic development programs). These hatcheries do not recycle broodstock. BC biologists also develop ground water side channels with unwilling incubation for chinook production. These ground water channels also provide critical rearing habitat.

Sockeye, Chum and Pink

Spawning channels, lake fertilization, barrier removal and habitat improvements are the primary enhancement methods for sockeye, pink and chum salmon. BC biologists recently constructed a new spawning channel at Glendale Cove on Knight Inlet that will potentially produce one million adult pink salmon annually. Channel production has realized an egg to fry survival of 81 percent (Anon. 1989c). The channel addresses natural low flow problems by drawing water through a pipeline from Tom Browne Lake.

Lake fertilization increases production in the enhancement of sockeye, pink and chum salmon. Fertilization takes the place of the thousands of carcasses from spawned out adults that once fertilized these lakes.

Coho

Biologists from the Department of Fisheries and Oceans primarily use natural and semi-natural enhancement and secondary hatchery production to supplement coho salmon stocks. We visited a new construction site on the Englishman River (Vancouver Island). The Englishman utilizes side channel production for the lower river and coho salmon colonization for the inaccessible reaches. Spawning and rearing channels built in 1988 use ground water and infiltration galleries to provide water flows. In areas not accessible to spawners, coho salmon fry obtained from a nearby hatchery were stocked. For succeeding years, wild stocks from the Englishman are the preference for donor stocks.

Eight streams that empty into Baynes Sound have been the traditional backbone of the Georgia Strait coho sports fishery. However, commercial fisheries also target these runs which led to overfishing and depressed stocks. They became the focus of rebuilding in 1988. It became impractical to manage the eight streams separately because of extreme exploitation. Biologists now manage them as one unit with stocks treated as a single gene pool. The small genetic differences do not justify managing each stream separately. Also, too few fish return to attempt separate stock management for each stream. Thirty pair of wild adults, collected from the eight streams, provide smolt production. All outplanted smolts are ad-clipped to facilitate wild broodstock collection in subsequent years using this management strategy. Fry are never more than one generation removed from wild stock. The use of wild broodstock each generation in their SEP supplementation more than pays for the additional labor. We believe this procedure may be of benefit in the Columbia Basin where possible to implement.

Public Participation

BC provides an opportunity for many citizens to volunteer their time in enhancing salmonids. The Salmonid Enhancement Program sponsors one of the most unique public participation program in North America. This program provides community advisors, stationed throughout the province, to give technical and financial assistance. Individuals, clubs, schools, service organizations and community groups may apply for this program.

Opportunities for such participation lie in maintaining, restoring and improving the stream habitat essential to salmonid production. Through public participation, enhancement projects also offer a unique opportunity to develop a greater awareness of the salmonid resource and man's influence on the stream environment.

Examples of fish producing activities include:

- -selective removal of log jams or boulders which form obstructions
- -removal of garbage and debris from streams and stream banks
- -location and cataloging pollution sources
- -location and cataloging former spawning grounds or rearing areas.
- -improvement of access for fish through rapids or over falls, and/or installation and maintenance of small fishways
- -stream mapping and inventory

-construction, installation and maintenance of fish facilities such as incubation boxes or spawning and rearing channels

-"adoption" of small streams or portions of streams for clean-up and improvement on a continuing basis. Other projects promote an awareness of salmonids

-design and implementation of educational programs in local schools or clubs -improvements for public access and viewing, such as trail cutting, viewing

sites, nature signs

-production of educational material such as displays for malls, libraries, schools or presentations such as brochures, posters, and slide shows

Summary

In the 13 years since BC's Salmonid Enhancement Program began, they have seen real progress toward meeting their goals of doubling the runs. Their total budget for 1988/89 was approximately \$42 million. They de-emphasize recycling hatchery broodstock to a rack and placed a moratorium on new hatchery construction. They developed objectives and goals to utilize natural production and semi-natural production in supplementing their stocks.

It would be tempting at this juncture to dismiss SEP's objectives as unrealistic in the Columbia Basin. However, their upper Fraser and Thompson River stocks of steelhead and chinook salmon migrate hundreds of miles inland to spawning grounds. BC biologists still practice the same sound genetic principals as with coastal stocks. The Whitehorse Rapids Hatchery on the Yukon River continues to collect wild broodstock in view of adult immigrations of 3520 Km (2200 miles). We believe the judicious use of wild broodstock for BC supplementation work has been a positive factor in their successes.

We, in the Columbia Basin, should be envious of their management predicament. They only have to coordinate between two agencies. The Department of Fisheries and Oceans (DFO) and the Ministry of Environment coordinate and manage supplementation in BC. The provincial government manages steelhead and DFO oversees salmon management. They do not have to run the gauntlet of countless agencies and committees that attempt to manage the Columbia Basin stocks. It appears their bureaucracy may be down to fighting weight.

New England

Atlantic Salmon Program

Much of the information contained in this section was obtained from the New England Atlantic Salmon Program Annual Progress Reports for 1987 and 1988 and the 1989 Annual Report of the U.S. Atlantic Salmon Assessment Committee (Anon. 1987, 1988, 1990b). Telephone conversations with the various program coordinators also clarified much of the overall trends.

Background

Historically, Atlantic salmon thrived in rivers from Maine to Connecticut, with major runs found in the Connecticut, Merrimack and Penobscot Rivers. By the late 18th Century, the Atlantic salmon was essentially extirpated from these areas due to the Industrial Revolution and overfishing. While the

Atlantic salmon was never totally eliminated from all Maine Rivers, their numbers were greatly reduced and by 1872 the federal government began stocking rivers in Maine. During the period 1872-1959, more than 63,340,000 juvenile Atlantic salmon were released into drainages throughout Maine.

Today's program receives much of it's direction from the Atlantic Sea-Run Salmon Commission, which was formed in 1947. The overall goal of the program is to restore a self-sustaining population of Atlantic salmon by the year 2021. The Atlantic Salmon Program is divided into four major programs involving state and federal agencies, private industry and conservation organizations. Collectively, about 5.5 million juvenile Atlantic salmon were released into 15 New England rivers in 1989. The Maine program received 36 percent of the releases, 34 percent went to the Connecticut River program, 23 percent to the Merrimack River program and 7 percent to the Pawcatuck River program. The stocking summary for 1989 is shown in Table 7. From 1980 through 1988, almost 27 million juvenile salmon had been stocked into New England rivers with almost 50 percent being fry releases and about 25 percent age 1 smolt releases. During this same 9 year period, 33,486 adult Atlantic salmon have returned to 16 rivers in New England. Of these returns, 80 percent has been to the Penobscot River in Maine. It is estimated that 10 percent of the returns to the Penobscot is from natural production. 1

Table 7. Atlantic salmon stocking summary by program in 1989.

PROGRAM	FRY	Ø+PARR	1PARR	1SMOLT	2SMOLT	TOTAL
Maine USA Canada	580,000 66,000	430,500	282,200	524,300 0	80,200 10,300	1,897,200 76,300
Merrimack River	1,033,000	60,000	88,600	58,200	0	1,239,800
Pawcatuck River	0	379,900	35,900	6,400	0	422,200
Connecticut River GRAND TOTAL	1,242,000 2,921,000	272,900 1,143,300	116,300 523,000	221,000 809,900	90,500	1,852,200 5,487,700

Sport fishing for Atlantic salmon is not permitted in the Connecticut or Pawcatuck Rivers. Fishing is allowed in parts of the Merrimack watershed, however, there were no reported catches in 1989. Total catches of Atlantic salmon in Maine was reported at 1,007 fish in 1989, 520 of those were released. The Penobscot River produced 86 percent of the total catch. An exploitation rate of 10% was set to help accelerate the restoration of the Penobscot salmon run.

¹Jerry Marancik, U.S. Fish and Wildlife Service, Orland, Maine, pers. comm., February, 1990

So called "wild" rivers, the Dennys, E. Machias, Machias, and Narraguagus Rivers, in Maine still receive releases of fry, parr, and smolts, 270,800 in 1989. But, returns to these rivers are believed to be primarily of wild origin, principally from natural reproduction with limited number originating from fry releases. In New England "wild" generally refers not only to fish produced naturally, but also to fish produced from fry stockings.

While all of the programs receive various life stages of Atlantic salmon, each of the four programs has a different emphasis, the Maine program is mainly a smolt stocking program, the Merrimack receives mainly fry, the Connecticut is a combined fry and smolt program and the Pawcatuck is a parr stocking program.

Fry Stocking

The Merrimack River program is a restoration effort relying mainly on fry stocking that scatter plants fry into nearly all suitable rearing habitats. Roughly 250 miles of stream are presently included in the program. In 1989 and 1988, over 1.0 million and 1.7 million fry respectively were released in the river basin. The fry stocking goal for the Merrimack River Basin is 1.8 million.

The majority of returning salmon are trapped and held to be used for spawning. Domesticated captive broodstock and reconditioned kelts are also used to obtain the number of eggs desired for the program. All fry stocked into Merrimack drainages in 1987 were of Merrimack River origin.

Fry are stocked at 20 to 50 fry per 100 square meter unit depending on the quality of habitat, etc. Seven index sites are then monitored for growth and survival, condition factors and water quality.

Since 1982, roughly 40 percent of the adult returns to the Merrimack River have originated from the fry stocking program. Seventy-four percent of these fry emigrate as two year old smolts. The contribution of the fry program was 66 percent of returns in 1988 and 67 percent in 1989. It should be noted that total fish for 1988 and 1989 was 65 and 84 respectively, which are the first and second lowest full-season totals since salmon returns to the river were first documented in 1982. The range of adult returns to the Merrimack for 1983 to 1987 is 103 to 214 with a mean of 137. Total return through 1989 numbers 860. The adult return rate for 1984 fry plants surviving to 1+ parr was estimated at 0.04 percent. Total return fry to adult was .005% for 1984 releases. Of the adults returning to the Merrimack 78% return as 2-seawinters, 18% as 1-sea-winters and 4% as 3-sea-winters.

The Connecticut River program utilizes fry releases in it's restoration efforts with a stocking goal of 2.0 million fry. In 1989 and 1988, over 1.2 million and 1.3 million fry respectively were released in the river basin. Minta et al. (1987) found the survival of "wild" smolts (smolts produced from fry releases) to adults was nearly 10 times greater than hatchery smolt to adults return rates for a Connecticut River tributary in 1984. These "wild" fish comprised 36% of the total run. Y. Cote, a Quebec biologist, found that flow for 30 to 40 days after stocking is a critical factor in fry survival.

Parr Stocking

While Atlantic salmon parr are stocked in a number of locations in New England, they are mostly incidental by-products that are graded out of one year smolt programs. The Pawcatuck River program in Rhode Island is an exception to this, in that parr are stocked almost exclusively. The Pawcatuck Program is unique in a number of other ways also. Because the watershed is near the southern extent of the range of Atlantic salmon, the Pawcatuck River is not the typical cold water river found farther north. Furthermore, predator species, abundant in this drainage, exact a heavy loss on salmon fry. The Pawcatuck Program is also the smallest of the four Atlantic salmon programs, hence the smallest budget. For these reasons the program has decided that parr stockings are the most cost effective method of developing their salmon program. Further problems have developed from the parental source of these parr. The program currently uses only domesticated captive broodstock (fish that have never gone to sea) as their egg source. There is evidence that this strain is inferior to sea run parents, thus producing poor return rates in the progeny. Return rates for the program range from 0.0% to 0.009% with a mean of 0.003%. Releases in 1989 numbered over 400,000 parr, which is the largest number of fish stocked into this system since the program began in 1979.

Smolt Stocking

The smolt program is the most successful of the various programs. The Penobscot River in Maine received over 416,000 smolts in 1989 (47% of the smolts released). Overall adult returns to the Penobscot have ranged from 0.23% to 1.32% with a mean of 0.71%. In 1989, 2719 fish returned to traps in the Penobscot, of which 813 were 1-sea-winter fish, 1,864 2-sea-winter fish, 4 3-sea-winter fish and 38 were previous spawners. The Maine stocking program utilizes returning salmon and domesticated captive broodstock for egg takes. Additionally, returning adults unneeded for egg takes are released to spawn naturally; in 1988 this amounted to 2,141 out of 2,688 fish trapped in the Penobscot River.

The long-term objectives established for the Penobscot River are:

- 1. Achieve an annual production of 185,000 wild smolts.
- Ensure a minimum of 6,000 adults will be available for spawning annually.
- 3. Provide a minimum of 2,000 adult salmon for sport harvest annually.

The Connecticut River program also utilizes smolts in it's restoration effort with 10 to 32% of total releases being smolts. This program released 221,000 and 395,300 smolts in 1989 and 1988, respectively. The smolt stocking goal for the Connecticut program is 590,000. Smolt to adult return rates for

¹Mark Gibson, Rhode Island Division of Fish and Wildlife, W. Kingston, Rhode Island, pers. comm., March, 1990

hatchery smolts released in the Connecticut River basin ranges from 0.006 to 0.159% depending upon year and location.

Smolts in Connecticut are generally stocked from hatchery trucks via "quick release" hoses or netted off trucks directly into ponds. In 1989 one lot of coded-wire tagged smolts (22,500 fish) was placed into a 15-by-15 meter net pen in the lower Connecticut River and towed two kilometers into Long Island Sound and released. One purpose of that project is to compare returns rates of salmon that were not subjected to river related mortality. Data on the success of this technique will not be available for a few years.

Tagged Atlantic salmon smolts and parr are used to help determine the contribution of the New England Atlantic salmon programs to the ocean harvest, as well as allowing sight identification and to ascertain the contribution of various life stages to the run.

Summary

While adult return rates are generally low for the Atlantic salmon program, it should be remembered that the program is a restoration effort because of degraded river systems. Furthermore, the program does not base it's success in terms of adult returns, but on what is learned and the directions then taken. While the progress is slow, it is continuing to move forward. Wild fry or smolts were found to survive to adults at a much higher rate than hatchery smolts.

The reuse of kelts for egg taking was a new procedure we have not considered in the Columbia Basin.

River flow at time of fry release seemed to be a factor to consider in the success of fry plants.

Broodstock that has never gone to ocean as used in Pawcatuck program is believed to be inferior to sea run broodstock. Again, the genetics of the broodstock should be a factor to consider when implementing supplementary programs.

Releases of smolts seems to be the more successful of all life stages released in the Atlantic salmon program. In the Penobscot, the average return rate, smolt-to-adult, has averaged 0.71% the past few years.

CONCLUSIONS

Examples of successes at rebuilding self-sustaining anadromous fish runs with hatchery fish are scarce or non-existent. The successes we recorded in the unpublished literature were mainly in harvest augmentation, not rebuilding runs.

It seems that adverse impacts to wild/natural stocks have been shown or postulated from about every type of hatchery fish introduction where the intent was to rebuild an existing wild/natural run. However, where hatchery fish have been released into virgin areas; barren lakes, above falls or barriers, in new geographic areas, directly into estuaries or coves, they have

performed quite well, but in these cases we usually are not attempting to build a self-perpetuating run, merely producing adult fish for augmenting harvest. When we attempt to introduce hatchery fish on top of an existing population to build or rebuild the run to "historic" levels of production or to "full seeding" levels of production, problems seem to develop. The hatchery fish do not perform as well as the natural/wild fish and adverse impacts to the wild/natural stocks have been indicated and in many instances demonstrated. (Reisenbichler and McIntyre, 1977; Chilcote et al. 1986).

Plans to double anadromous fish runs in the Columbia River Basin as stated in the Northwest Power Planning and Conservation Act may be placing too much emphasis on hatchery production. This effort may continue to erode the genetic integrity of wild stock. We believe that the only way to "double the runs" in the Columbia Basin is to provide optimum habitat for natural producing stocks with limited hatchery supplementation. In addition some hatchery programs should probably look at "harvest augmentation" with no or minimal impacts to natural production. If hatchery production, as we know it today, would solve the problem, we would have doubled the runs 50 years ago.

Based on this and from recent interviews with fishery managers from the various Pacific coast states and providences, we believe that supplementation needs to be divided into two distinct categories. These would be: (1) supplementation for "harvest augmentation," and (2) supplementation for "natural production augmentation." We believe this separation does in fact now exist but that success has mainly been in number (1) supplementation for harvest augmentation.

Time, effort and knowledge needed to accomplish harvest supplementation is much less than that needed for production supplementation. In order to supplement production, we need to know the ecology of the area, the factors limiting present production, the unique qualities of the stock of fish to be supplemented, and the most efficient means for supplementation. Also, the time frames for determining success stretches into multiple life cycles for production supplementation while for harvest supplementation, we can determine success in one generation.

The two basic questions asked in the supplementation "Proposed Five-Year Work Plan", prepared by the Supplementation Technical Work Group, March 1988, are considered still quite valid. "What are the best techniques for supplementing wild and natural stocks and what are the effects of supplementation on endemic populations?" Also, we consider the information presented in Smith et al. (1985) in their "Outplanting Anadromous Salmonids - A Literature Survey" to be very pertinent and does in fact contain representative information we have found to be substantiated in our own literature work and interviews.

Fishery agencies have been stocking anadromous fish for many years in the Pacific Northwest. There have been reports of increasing adult returns from various types of planting strategies. Outplantings of smolts return the highest percentage of adults for both salmon and steelhead. However, there is mixed results on the ability to rebuild or increase natural runs by supplementing with hatchery fish. A few examples suggests that it is possible to supplement natural runs with hatchery fish without adverse effects. For instance -- In Oregon, the Elk River run of fall chinook has been supplemented

for approximately 20 years. Although no major adverse effects have been noted from this highly controlled supplementation program, conversely the natural run of fall chinook did not significantly increase either.

In Idaho, plants of fry steelhead in some upper Salmon River drainages is believed to have contributed to the building up of natural spawning fish in a few of the drainages. No numerical information is available. In BC, the Coquihalla River biologists have documented steelhead fry to adult success as high as 1.3 percent and parr to adult survival of 2.6 percent for hatchery fish. After releasing hatchery fry a four-fold increase in standing crop of the stream was noted. Long range build up of natural production was not shown because of the annual stocking programs. In New England, work with Atlantic salmon demonstrates how difficult it is to rebuild and reestablish anadromous fish runs. Stockings of fry and smolts have both returned adults but natural production has not really taken off.

We may have created an "environmental predicament" where "man's ability to modify the environment increases faster than his ability to foresee the effects of his activities" (Bella and Overton 1972). We must make every effort to reduce the genetic consequences of large scale outplanting. We feel that in many instances anadromous fish could do a better job of rebuilding if we would place a moratorium on "helping" them for several generations and refocus our efforts to protect and enhance habitat. We have tried for 100 years "to have our cake and eat it too", the time is ripe for more innovative methods of hatchery outplanting.

Again, we may need to look at what factors caused the runs to decrease in the first place. If we have not ameliorated the problems which caused the runs to decrease, we will not be able to build up natural runs by just supplementing with hatchery fish. Also, if harvest management is not linked with supplementation, the increased harvest on supplemented fish may in fact put increased harvest pressure on natural stocks. Thus, the overall result would be a negative impact to natural production.

Following are some general conclusions based on our review of supplementation.

- -Chinook salmon, particularly upriver stocks, is the most difficult salmon species to successfully supplement with hatchery fish. This is because of the greater distance from the ocean and the longer freshwater life cycle.
- -The stock of fish is an important factor to consider when supplementing. The closer the hatchery stock is to the supplemented stock or original natural stock, the better chances are for success. Ideally, the hatchery supplementation brood fish should be taken from the natural stock that is to be supplemented.
- -Salmon species with shorter freshwater life cycle, overall, have shown a higher success rate from hatchery supplementation and have less negative impact on wild/natural populations. Pink and chum salmon supplementation projects in Alaska and BC are examples of this success.

-Short run stocks of salmon and steelhead have responded more positively to supplementation than longer-run stocks. In some cases, it was shown that introducing hatchery stock to a river system a few kilometers closer to the estuary significantly increased rate of adult returns. -Wild/natural fish have higher survival rates than hatchery fish. Whether you are using pink salmon in Alaska, Atlantic salmon in Maine, coho salmon on the coast or upriver chinook salmon in the Columbia, where tests were made to compare survival to adult; the wild/natural produced fish had a higher survival rate than associated hatchery produced fish. -Over stocking of hatchery fish may be a significant problem in a lot of supplementation projects. If hatchery fish are overstocked in a system, the result is decreased performance of both hatchery and wild/natural fish. Scattering or distributing the supplemented hatchery stock is more successful than single spot techniques which tend to overstock areas of planting and leave unplanted areas understocked. -Spread of disease from hatchery fish to wild/natural fish does not seem to be a major problem. However, this may be because there is very little documentation to support disease incidence in wild/natural fish. Dead or moribund fish in the wild are very difficult to collect. -When supplementing with hatchery fish, it takes 1-2 weeks for supplemented fish to acclimate, based on observed behavior studies and blood chemistry analysis. -Stream flow and water conditions are important factors to consider when planting fry or parr in a stream. -Ocean competition for space or food does not seem to be a factor regulating salmon and steelhead numbers. Although ocean conditions seem to impact survival, i.e. "El Nino", the competition between stocks or within stocks of fish in the ocean has not been shown to be a significant factor. -There is a need to evaluate supplementation efforts when projects are

initiated. In order to do hatchery evaluation work or compare survival, hatchery fish need to be identified uniquely from wild/natural stock. There is a need to have a unique visual mark for hatchery produced chinook salmon.

-Using supplementation techniques that exists on sockeye salmon programs in Alaska and BC, we could probably reestablish and rebuild upper Columbia River sockeye runs. Successful programs integrate lake fertilization with fry

-Hatchery broodstock management for supplementation needs to be stressed. The "Summary of Recommendations Regarding Hatchery Production Principles" in draft form, June 6, 1989, System Planning Oversight Committee, reflect many of the concerns with hatchery broodstock management for supplementation.

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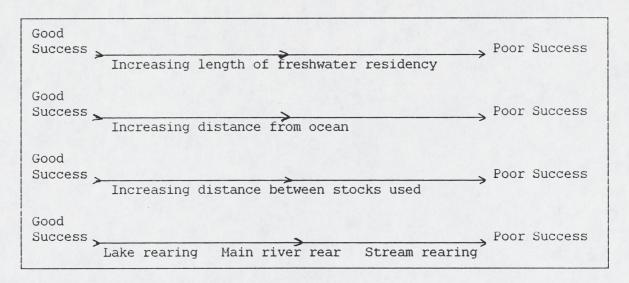
plantings of appropriate stocks.

-Overall, conclusions from our review of supplementation show that there are many documented cases of introduced hatchery fish returning adults to a specific area. However, little data was found on the capability or probability of supplemented hatchery fish building up and sustaining, over time, naturally spawning fish. Figure 1 summarizes some of the factors mentioned above relative to supplementation success.

Supplementation has provided positive results in the following:

- a) BC is having success with chinook coho and steelhead by using only wild broodstock and scatter planting the hatchery produced fish through the supplemented area.
- b) BC also concluded that for steelhead in some instances parr stocking was more cost effective than either fry or smolts.
- c) Alaska and BC are having success using stream side incubation boxes with stream water diverted through boxes. Fry are scatter planted and spot planted from these stream incubator systems.

Figure 1. General success of supplementation with hatchery fish to returning adult.



Introduced hatchery fish will augment the number of returning adults to a particular area, but if the factors which originally caused the natural runs to decline are not corrected, production will not significantly change. In fact, in some cases the presence of additional hatchery adults can lead to increased exploitation thus decreasing the natural production even faster. In some studies, wild/natural stocks were shown to be more viable than hatchery stocks. Thus, replacing wild/natural fish with hatchery fish and cross breeding wild/natural and hatchery fish can result in less viable production. (See Part 3, "Concepts for a Model....with Hatchery Fish" by Bjornn and Steward, April 1990).

We had difficulty understanding all the ramifications of genetic impacts associated with supplementation. From the literature review of Steward and Bjornn (Part 4 of this report) it was concluded that from a genetic perspective hatchery fish have probably not genetically adversely impacted chances for recovery of stocks of fish in the northwest. They believed, however, that genetic impacts do result from hatchery plants. It will be difficult to do long-term genetic studies on impacts of supplementation. First, one would need a benign genetic mark to follow through a number of generations. Then one would need to follow enough population for a long enough period to document long-term trends. (See Part 3 of this report for complexities of following generations with models). Even after a study is completed, we believe it would be quite difficult to interpret the results. For instance, if supplementing with hatchery fish resulted in a change in 30 percent in the alleles frequency, you were monitoring or if the hatchery fish genetic mark ended up in over 50 percent of your natural stock, what would it mean? The bottom line we believe is natural production from an area measured in smolts produced and ultimately in adults produced.

Does supplementation of anadromous fish work? We believe that it can work and success seems to vary dramatically by (1) species, (2) stock, (3) area, and (4) method or type of supplementation. Also, success depends on goals we are trying to achieve. If we are looking at harvest augmentation, we can cite many successful examples. If we look at natural production augmentation, we have very few successful examples.

Recommendations

Following are recommendations based on our review of the published literature, unpublished literature and personal contacts with biologists involved with supplementation:

- Protection and nurturing wild/natural runs need to be a top management priority. There are no guarantees that hatchery supplementation can replace or augment natural production for all cases where specific runs are low. And if we do initiate supplementation efforts, the chances of success would be increased by using the wild/natural stocks in supplementation efforts.
- 2. Goals should be established for all supplementation projects. Goals in terms of percent adult return or percentage of increase in the production of smolts. Goals need to be set prior to initiating supplementation effort.
- 3. Harvest augmentation types of supplementation need to be categorically separated from rebuilding supplementation.
- 4. All supplementation efforts to re-establish or rebuild runs should be monitored and evaluated to determine if goals are being achieved.
- 5. More information needs to be acquired on wild/natural production for the various species, stocks and runs. Production rates, survival rates, etc. need to be determined for wild/natural runs in order to compare how we are doing at rebuilding.

6. BKD research on spring chinook salmon is high priority. BKD is believed to be a big factor in the recent low level returns of spring and summer chinook in the Columbia River Basin. 7. A means of identifying hatchery salmon from wild/natural salmon needs to be instituted for the Columbia River Basin. A visual mark is needed so hatchery and wild/natural escapement and production can be monitored and runs managed separately. 8. A means needs to be established for annually summarizing and updating supplementation efforts by geographic area. Many supplementation projects are underway or planned throughout the northwest. Since supplementation projects normally span a number of years, it is important to annually update our information base. A state-by-state annual summary based on the format of the New England Atlantic salmon program annual reports is suggested. Suggested Research 1. BKD related research for chinook salmon. a. Ways to limit infection rate in hatchery fish b. Infection rate of wild/natural fish c. Time and size of fish relative to infection rate 2. Assessment of factors limiting wild/natural production by area by species in association with carrying capacity of stream or lake. 3. Impact of hatchery smolt releases on wild/natural smolt production and migration. 4. Develop a hatchery rearing broodstock program for stock rebuilding that minimizes adverse genetic impacts to wild/natural stocks. Explore use of wild/natural stocks. Sperm cryopreservation and other innovations could be used to direct hatchery production to a more compatible product. Using kelts for wild steelhead production could be investigated. 5. Need to determine natural production parameters for stocks to be supplemented. 6. Need to develop a means of identifying hatchery from wild/natural fish for salmon in Columbia River Basin. Need a visual mark so we can selectively harvest and propagate known stocks. 7. Need to set a goal for supplementation return that is realistic and feasible. Such as a 1% return for SCS smolt supplementation. 8. Need to explore use of streamside upwelling incubation boxes or systems to match natural production timing. 40

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Analysis of Past and Present Salmon And Steelhead Supplementation



DATABASE FOR UNPUBLISHED AND ONGOING SUPPLEMENTATION PROJECTS

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Project No. 88-100

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Introduction

During 1989 and spring of 1990, agency biologists and others involved with supplementation of anadromous fish were contacted to determine what supplementation projects had been recently conducted which were not formally published and what type of supplementation projects were presently underway.

The areas covered in this review included Oregon, Washington, Idaho, California, Alaska, British Columbia, and New England. In all areas except the New England states, personal contacts were made with the various agency biologists by individuals from the U.S. Fish and Wildlife Service.

Methods

For each project on supplementation, a data sheet was filled out (Figure 1). The data was then entered on the computer for easy access and summary. Information is in dBASE III+ software. It is organized alphabetically by species, so Atlantic Salmon projects are listed first, then chinook salmon, and so on. Codes used in data entry and reporting are shown in Table 1.

Results

More than 140 contacts provided over 300 unpublished and ongoing supplementation projects for review. (Projects were divided by species and locations since there was no other way to relate stocking numbers, life stages, results, etc. back to the species or location in question). Although we probably did not contact everyone with supplementation information, we believe enough people were contacted so that the major projects were reviewed and general conclusion can be reached.

The data is displayed in a couple of formats. Table 2 lists information by species, race, drainages, contact, telephone number, etc. Then for those with a hard copy (paper), Appendix II is a summary of each project, listing more information than in the tabular format. A high density floppy disk (5 1/4") is available for use in dBASE III+ software for an IBM compatible computer. The diskette contains all information recorded for each project. Appendix I lists a description of each data field that is contained in the database.

SUPPLEMENTATION REVIEW DATA

INTERVIEWER:	DATE:
PRINCIPAL CONTACT:	AGENCY:
PHONE: ADD	RESS:
PROJECT:	
ONGOING? Y / N	PROGRESS REPORTS? Y / N
SPECIES:	RACE:
STOCK(S):	LIFE STAGE(S):
MAJOR DRAINAGE:	SUB DRAINAGE:
STREAM(S):	REACH(S):
PROJECT DATE: 1 ST STO	CKING DATE: LAST DATE:
NUMBERS RELEASED:	AV.#/YR:
PURPOSE OF PROJECT: DID IT WORK? Y / N	
EVALUATION: NA / QA / QN : % COMPLETE	
Could augmentation provide additional evaluation? Y / N STOCKING DETAILS:	
ACCLIMATION DETAILS:	
OTHER PRESTOCKING INFO:	
IMPACTS: _{RESEARCH BASED} :	
	OPINION:
CONTROL DETAILS:	
COST EFFECTIVENESS:	
PROBLEMS:	
DISEASES:	
OTHER COMMENTS:	

Table 1. Codes used in data entry and reporting of supplementation projects.

SPECIES		RACE	STOCK	
AS	ATLANTIC SALMON		MIXED	
СМ	СНИМ		BJ CH CW EL EN ES FI GA GO GR GS HD JC KY NO NO WL	BLACKJACK CREEK CHAMBERS CREEK COWLING CREEK ELWHA ENETAI ELSON CREEK FINCH CREEK GEORAGE ADAMS GOVERS CREEK GREEN RIVER GARRISON SPRINGS HOOD CANAL JOHNS CREEK KETA CREEK KENNEDY CREEK NOOKSACK NISQUALLY QUILCENE WALCOTT WALCOTT SLOUGH
СО	соно		AL	ALSEA
			BC BL CK	BIG CREEK BLACK CREEK CLARKS CREEK
СН	CHINOOK		CQ CZ DN EL FRA GH GR HO IC JG KA LM MN NY PR QC QN QD SK SO ST SR SY SY SY SY SY SY SY SY SY SY SY SY SY	COQUILLE COWLITZ DUNGENESS ELWHA FRENCH CREEK GEORGE ADAMS GRAYS HARBOR GREEN RIVER HOH HUMPTULIPS INDIAN CREEK JOLLY GIANT CREEK KLASKANINE KALAMA CREEK LOST MAN CREEK LEWIS RIVER HATCHERY MILLSTONE RIVER MINTER CREEK NOOKSACK NOYO PRARIE CREEK PUYALLUP QUILCENE QUINAULT QUINSAM SANDY SKAGIT SKOOKUMCHUCK SCOTT RIVER SALMON RIVER SKYKOMISH SILETZ TEMILE LAKES TRENT RIVER WALCOTT SLOUGH WALLACE
Cil	SATIOON	FAL FALL	AB AM	ABERNATHY AMERICAN RIVER

Table 1. Codes used in data entry and reporting of supplementation projects. (Cont.)

BC BIG CREEK BO BONEVILLE BT BATTLE CREEK BW BIG WHITE SALMON CH CHETCO RIVER ER EEL RIVER FT FEATHER RIVER FT FEATHER RIVER FW FRESHWATER CREEK HL HOLLOW CREEK (EEL RIVER) HR HORSE LINTO CREEK KM KLAMATH RIVER LF LYONS FERRY LR LITTLE WHITE SALMON MC MERCED RIVER MO MAD RIVER MO MOKELUMME RIVER HT MATTOLE RIVER RY REDWOOD CREEK RS RUSSIAN RIVER RW WILLAMETTE LFA LATE FALL BT BATTLE CREEK (KLAMATH) SPR SPRING BO BONNEVILLE CA CARSON CL CLEARWATER CZ COWLITZ CC EAGLE CREEK ET ENTIAT FT FEATHER RIVER HO MOSSPOT KO KOOSKIA (=CLEAR CREEK) LE LEAVENWORTH LW LITTLE WHITE SALMON MK MCKEUZH WK NOOKSACK RG ROUGH RIVER RR RAPIO RIVER RR RAPIO RIVER RR RAPIO RIVER SS SOUTH SANTIAM WILLAMETTE WK NOOKSACK RG ROUGH RIVER RR RAPIO RIVER RR RAPIO RIVER RR RAPIO RIVER RR RAPIO RIVER WM WILLAMETTE WS SACRAMENTO RIVER SS SOUTH SANTIAM SULU SOLEDUCK TIN TRINITY RIVER TR TRASK WM WILLAMETTE WS WARM SPRINGS WI WINTER SUM SUMMER MC MC CALL SUM SUMMER MC MC CALL SUM SUMMER MC MC CALL SUM SUMMER DS DESCHUTES RIVER DU DWORSHAK "B" EF EAST FORK "B" EL EEL RIVER HC HELLS CANYON "A"				
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EL EEL RIVER				
EL EEL RIVER			EF	EAST FORK "B"
HC HELLS CANYON "A"			EL	EEL KIVER
TILLES CANTON A			HC.	HELLS CANYON "A"
			110	HELES CANTON "A"

PINK SALMON SOCKEYE STEELHEAD

PK SO SH

Table 1. Codes used in data entry and reporting of supplementation projects. (Cont.)

		LINTED	LE LF MK PA PB RS SK SS SW	LEAVENWORTH LYONS FERRY MCKENZIE PAHSIMEROI "A" PAHSIMEROI "B" RUSSIAN RIVER SKAMANIA SOUTH SANTIAM SAWTOOTH "A"
	WIN	WINTER	AL BC CQ EC FH KL KR MA MF NH NN NS	ALSEA BIG CREEK COQUILLE EAGLE CREEK FISHHAWK KLASKANINE KEOGH RIVER MAKAH MARION FORKS NEHALEM NORTH NEHALEM NORTH SANTIAM NORTH UMPQUA
	UNK	UNKNOWN	AC AM BC BT ER FT GR IC JG MO NP RC RS SL SM SN ST TU	ADOBE CREEK AMERICAN RIVER BIG CREEK BATTLE CREEK EEL RIVER FEATHER RIVER GARCIA RIVER INDIAN CREEK JOLLY GIANT CREEK MOKELUMNE RIVER NAPA RIVER ROWDY CREEK RUSSIAN RIVER SALT CREEK SMITH RIVER SAN LORENZO RIVER SCOTT RIVER TULE
CU CUTTHROAT TROUT	SEA	SEA-RUN .	AL CO SH SO	ALSEA COASTAL SHELTON STONE LAGOON
ANY SPECIES			WI UNK MIXED	WILD/NATIVE UNKNOWN
EVALUATION			NA QN QA	NOT ATTEMPTED QUANTITATIVE QUALITATIVE

Table 1. Codes used in data entry and reporting of supplementation projects. (Cont.)

LIFE	STAGES		DRAINAGE
EG	EGG	CR	COLUMBIA RIVER
FY	FRY	PS	PUGET SOUND DRAINAGES
FN	FINGERLING	OC	OREGON COAST DRAINAGES
PS	PRE-SMOLTS	WC	WASHINGTON COAST DRAINAGES
SM	SMOLTS	BC	BRITISH COLUMBIA DRAINAGES
10	1 OCEAN	AC	ALASKA COAST DRAINAGES
20	2 OCEAN	CC	CALIFORINA COAST DRAINAGES
30	3 OCEAN	SR	SACRAMENTO RIVER
AD	ADULTS	СТ	CONNETICUT RIVER
YR	YEARLING	MR	MERRIMACK RIVER
VA	VARIABLE	MC	MAINE COAST DRAINAGES
PR	PARR	PR	PAWCATUCK RIVER

AGENCIES

AGENCIES	
ABREC	ALPHA BIO-RESOURCES ENVIRONMENTAL CONSULTANTS
ADFG	ALASKA DEPT. OF FISH AND GAME
BIA	BUREAU OF INDIAN AFFAIRS
CCSE	CENTRAL COAST SALMON ENHANCEMENT
CDEP	CONNETICUT DEPT. OF ENVIRONMENTAL PROTECTION
CDFG	CALIFORNIA DEPT. OF FISH AND GAME
CFSO	CANADA DEPT. OF FISHERIES AND OCEANS - OPERATIONS
COAPW	CITY OF ARCATA-DEPT OF PUBLIC WORKS
CRSA	CARMEL RIVER STEELHEAD ASSOCIATION
FBSRA	FORT BRAGG SALMON RESTORATION ASSOC.
FOG	FRIENDS OF GARCIA
FWS	US FISH AND WILDLIFE SERVICE
GRC	GARBERVILLE ROTARY CLUB
GRSP	GUALALA RIVER STEELHEAD PROJECT
НВСО	HUMBOLDT COUNTY
HFAC	HUMBOLDT FISH ACTION COUNCIL
НОН	HOH INDIAN TRIBE
HSU	HUMBOLDT STATE UNIVERSITY
HVBC	HOOPA VALLEY BUSINESS COUNCIL
IDFG	IDAHO DEPT. OF FISH AND GAME
LUMM	LUMMI INDIAN TRIBE
MBSTP	MONTEREY BAY SALMON/TROUT PROJECT
MCFG	MENDOCINO COUNTY FISH AND GAME
MEBC	MINISTRY OF ENVIRONMENT, BRITISH COLUMBIA
MFM	MAKAH FISHERIES MANAGEMENT
MSRSC	MAINE SEA RUN SALMON COMMISSION MUCKLESHOOT TRIBE
MUCK MWSSG	MATTOLE WATERSHED SALMON SUPPORT GROUP
NCIDC	NORTHERN CALIFORNIA INDIAN DEVELOPMENT COUNCIL
NISQ	NISQUALLY INDIAN TRIBE
NOOK	NOOKSACK TRIBE
NRS	NAPA RIVER STEELHEAD
ODFW	OREGON DEPT. OF FISH AND WILDLIFE
PCFFA	PACIFIC COAST FEDERATION FISHERMAN'S ASSOC.
PNPT	POINT NO POINT TREATY COUNCIL
PSD	PETULUMA SCHOOL DISTRICT
PUT	PUYALLUP TRIBE
RHSI	RURAL HUMAN SERVICES, INC.
RIDFW	RHODE ISLAND DIV. OF FISH AND WILDLIFE
SFU	SIMON FRASER UNIVERSITY
SKAG	SKAGIT SYSTEMS COOPERATIVE
SOC	STATE OF CALIFORNIA
SQAX	SQUAXIN TRIBE
SRKC	SMITH RIVER KIWANS CLUB
STIL	STILLAQUAMISH INDIAN TRIBE SUQUAMISH TRIBE
TCSF	TYEE CLUB OF SAN FRANCISCO
TULA	TULALIP INDIAN TRIBE
USFS	US FOREST SERVICE
VDFW	VERMONT DEPT. OF FISH AND WILDLIFE
WDF	WASHINGTON DEPT. OF FISHERIES
WDW	WASHINGTON DEPT. OF WILDLIFE
YAKI	YAKIMA INDIAN TRIBE

Table 2. Data on anadromous salmonid supplementation projects.

								MET ONT			
	SPECIES	S RACE	STOCK	LIFE	MAJOR DRAINAGE	SUB E DRAINAGE	EVAL	AGENCY	PRINCIPAL CONTACT	PHONE	#/YEAR RELEASED
1.	AS		MIXED	FY	СТ		QN	FWS	CARL BARREN	(802)826-4438	100000
2.	AS		MIXED	FY	CT		QN	USFS	STEVE ROY	(802)773-0300	205000
3.	AS		MIXED	FY	CT		QN	VDFW	KEN COX	(802)886-2215	0
4.	AS		MIXED	SM, FY	CT		QN	CDEP	STEVE GEBHARD	(203)443-0166	0
5.	AS		MIXED	FY,SM,PR	CT			FWS	TED MEYERS	(413)863-3555	2000000
6.	AS		MIXED	SM, FY, PR	MC		QN	FWS	JERRY MARANCIK	(207)469-6701	1900000
7. 8.	AS AS		MIXED	SM, FY, PR	MC		QN	MSRSC	ED BAUM	(207)941-4452	1900000
9.	AS		MIXED MIXED	FY,SM,PR PR	MR		QN	FWS	LARRY STOLTE	(603)225-1411	1500000
10.	CH		MINLO	AD	PR BC		QN	RIDFW	MARK GIBSON	(401)789-0281	400000
11.	СН			FY	BC		QN	ABREC CFSO	J. FEE GORDON BEREZAY	16011666-9616	2150
12.	СН				CC			SRKC	BOB WILLS	(604)666-8646 (707)487-3443	125000 150000
13.	СН		AM	SM	SR	18040005	QN	CDFG	RON DUCEY	(916)355-0666	4000000
14.	CH		BR	FY,SM	BC		QN	CFSO	GORDON BEREZAY	(604)666-8646	107344
15.	СН		CA	SM	CR	17030001		YAKI	TOM SCRIBNER	(509)865-5121	0
16. 17.	CH		CC	SM	AC		QN	ADFG	GARY KYLE	(907)262-9369	146420
18.	CH		CC	SM	AC		QN	ADFG	NICK DUDIAK	(907)235-8191	90000
19.	CH		CC	SM SM	AC AC		QN	ADFG	NOCK DUDIAK	(907)235-8191	150000
20.	СН		CR	FN, FY	CR	17070105	QN	AD F G	NICK DUDIAK	(907)235-8191	100000
21.	СН		EG	FY	AC	17070105	QN	ADFG	LARRY DIMMICK KEN ROBERSON	(503)374-8540 (907)822-5520	900000 16000
22.	СН		FR	PR,SM	BC		QN	SFU	G.E. ROSBERG	(604)438-1712	0
23.	CH		FT	FN	CC	18050002		TCSF	HACK COLLINS	(415)454-7754	50000
24.	CH		IC	SM	CC	18010206	QN	USFS	BILL BEMIS	(916)842-6131	7000
25.	СН		MIXED	SM	OC		QA	ODFW	JAY NICHOLAS	(503)737-4431	0
26. 27.	CH CH		MT	PS, FN	CC	18010108		MWSSG	GARY PETERSON	(707)629-3514	30000
28.	CH		RC RW	YR	CC	18010209		SOC	TOM GREENER	REFER TO TEXT	50000
29.	CH		ST	YR SM	CC	18010102		НВСО	STEVE SANDERS	(707)488-2253	50000
30.	СН		TH	FRY	CC BC	18010208	QN	USFS	JACK WEST	(916)842-6131	25000
31.	СН		WI	SM	AC		QN	CSFO ADFG	D.C. SEBASTIN BOB CHLUPACH	() - (907)892-6816	0
32.	СН		WI	PS	OC	17100304		ODFW	JAY NICHOLAS	(503)737-4431	260000 1000000
33.	СН	FAL		SM	CC	18010102		HFAC	JUD ELLINWOOD	(707)444-8903	12000
34.	CH	FAL	BC	SM	CR	17080006	QA	ODFW	QUENTIN SMITH	(503)325-3653	4000000
35.	СН	FAL	ВТ	PS,SM	SR	18020118	QN	FWS	GENE FORBES	(916)365-8622	16000000
36. 37.	CH	FAL	CH	EG, FY, SM	OC	17100306		ODFW	GARY SUSAC	(503)332-4744	400000
38.	CH	FAL	CH EL	SM	00	17100312		ODFW	AL MCGIE	(503)737-4431	0
39.	CH	FAL	ER	SM	OC CC	18010106	NA	ODFW	GARY SUSAC	(503)332-4744	185000
40.	СН	FAL	ER	SM, FY, YR	00	17100306		CD F G	ROYCE GUNTER GARY SUSAC	(707)433-6325	200000
41.	СН	FAL	FT	SM	SR	18020125		CDFG	DON SCHLICTING	(503)332-4744 (916)538-2222	1000000
42.	СН	FAL	FT	FY,SM	SR	18050002		FWS	MARTY KJELSON	(209)466-4421	800000
43.	CH	FAL	FW	YR	CC	18010102	QN	HFAC	CHRISTOPHER TOOLE	(707)443-8369	14000
44.	CH	FAL	GR, NQ	FN	PS	17110015		NISQ	WILLIAM THOMAS	(206)456-5221	1317610
45. 46.	CH	FAL	GR, PU, DS, ES		PS	17110019		SQAX	JOHN BARR	(206)426-9783	330792
47.	CH	FAL	GR,SS GV,CH,GR,GS	FY	PS PS	17110013		MUCK	DENNIS MOORE	(206)939-3311	1606484
48.	СН	FAL	HD, DS, FI, GA		PS	17110019 17110017		SUQ	PAUL DORN	(206)598-3311	1308170
49.	СН	FAL	HL	FN, SM	CC	18010106			CHRIS WELLER WAYNE O'BRYANT	(206)297-3422 (707)925-6458	872667
50.	СН	FAL	HR	YR	CC	18010112			MITCH FARRO	(707)839-5664	100000 30000
51.	СН	FAL	KM	YR	CC	18010206		BIA	DELMAR ROBINSON	(916)246-5141	9000
52.	CH	FAL	LR	SM	CC	18010108	QN	PCFFA	MITCH FARRO	(707)839-5664	50000
53.	CH	FAL	MA	FN	PS .	17110019		FWS	DAVID ZAJAC	(206)753-9460	450000
54. 55.	CH	FAL	MC	SM, YR	CC	18040009			MICHAEL COZART	(209)563-6410	800000
56.	CH	FAL	MD MO	YR	CC	18010105			BRUCE BARNGROVER	(707)822-0592	200000
57.	CH	FAL	NO, GR, SM, SO	SM EN DS	CC PS	18050002			DON ESTEY	(209)759-3383	2500000
58.	СН	FAL	PU, GR, DS	FN	PS	17110004 (17110014 (STEVE SEYMOUR	(206)734-8180	1242593
59.	СН	FAL	SS, GR	FN, FR	PS	17110014			RUSSELL LADLEY DENNIS MOORE	(206)593-0254 (206)939-3311	384002 387630
60.	СН	FAL	SY, GR, SM	FN	PS	17110019			CLIFF BENGSTON	(206)653-7477	925000
61.	СН	FAL	TN	SM,YR	CC	18010212			GERALD BIDELL	(916)778-3931	1400000
62.	CH	FAL		YR	CC	18010212	NC		MICHAEL ORCUTT	(916)625-4268	35000
63.	CH	FAL	UM, AL	SM	00	17100303		ODFW	JERRY SWAFFORD	(503)496-3484	100000
64.	CH	FAL	UNK	FN	SR	18020104	NC		JAMES SMITH	(916)527-3043	50000
66.	CH	FAL	UR URB	SM FY, FN	CR CR	17030001	14		TOM SCRIBNER	(509)865-5121	302000
67.	CH	LFA	HP	ŞM	CC	17080001 1 18010208 1			DICK JOHNSON	(206)837-3311	0
						13010200 1	1/1	HCIDC	RONNIE PIERCE	(707)839-3637	15000

Table 2. Data on anadromous salmonid supplementation projects (continued)

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	SPECIES	RACE	STOCK	LIFE STAGE	MAJOR DRAINAGE	SUB DRAINAGE	EVAL	AGENCY	PRINCIPAL CONTACT	PHONE	#/YEAR RELEASED
68.	СН	LFA	KM	PS	СС	18010208	ON	NCIDC	WALTER LARA, JR.	(707)482-4535	8000
69.	СН	LFA	OM	WM	CC	18010208		NCIDC	RONNIE PIERCE	(707)839-3637	15000
70.	СН	LFA	SA	YR	SR	18020118		FWS	GENE FORBES	(916)365-8622	900000
71.	CH	SPR		PR	ВС			CFSO	GORDON BEREZAY	(604)666-8648	0
72.	CH	SPR		SM, FY, PS	CR	17030001		YAKI	DAVE FAST	(509)865-5121	100000
73.	CH	SPR		FN,SM	CR			FWS	BILL MILLER	(208)476-7242	200000
74.	CH	SPR		SM, FN	CR			FWS	BILL MILLER	(208)476-7242	375000
75.	CH	SPR		FY, FN, SM, AD	CR			IDFG	BURT BOWLER	(208)743-6502	80000
76. 77.	CH	SPR	FD.	FY,EG	CR		011	IDFG	CHARLIE PETROSKY	(208)334-3791	99900
78.	CH	SPR SPR	FR FT	PR SM	BC SR	18020125	QN	CFSO CDFG	GORDON BEREZAY	(604)666-8646	0
79.	CH	SPR	HD, CZXNK, SU		PS	17110018		FWS	DON SCHLICTING DAVID ZAJAC	(916)538-2222 (206)753-9460	2000000 150000
80.	CH	SPR	LE	FN, FY	CR	17020011	411	FWS	JIM MULLEN	(509)548-7573	780000
81.	CH	SPR	LO	AD	CR	17060104	QN	ODFW	RICH CARMICHAEL	(503)963-1777	0
82.	CH	SPR	MK	PS,SM	CR	17090004		ODFW	SCOTT LUSTED	(503)896-3513	1100000
83.	CH	SPR	NO	FN,PS	PS	17110004	QA	LUMM	STEVE SEYMOUR	(206)734-8180	80719
84.	CH	SPR	NO	FY	PS	17110004		NOOK	PAT PETUCHOV	(206)592-5176	200000
85.	CH	SPR	RG	AD	00	17100307		ODFW	MIKE EVENSON	(503)878-2235	0
86. 87.	CH	SPR SPR	RG SS	SM FY	00	17100307		ODFW	MIKE EVENSON	(503)878-2235	100000
88.	CH	SPR	TN	SM, YR	CR CC	17090004 18010212		ODFW	DENNIS WISE	(503)378-6925	400000
89.	CH	SPR	TR	FY	00	10010212	QA	CDFG	GERALD BIDELL JOHN CASTEEL	(916)778-3931 (503)842-2741	2000000
90.	СН	SPR	WM	PS, SM	CR	17090009		ODFW	BOB SOHLER	(503)782-2933	3300000
91.	СН	SPR	WM	PS	CR	17090001		ODFW	MAX SMITH	(503)726-3517	1000000
92.	CH	SUM		SM	CR			IDFG	KENT BALL	(208)756-2271	950000
93.	CH	SUM	SF	FY	CR	17060208	QN	IDFG	CHARLIE PETROSKY	(208)334-3791	178640
94.	CH	SUM	ST	FN	PS	17110008	QA	STIL	KIP KILLEBREW	(206)435-8770	81093
95.	CH	UNK		YR	CC	18060006		CCSE	PAUL CLEVELAND	(805)773-3316	50000
96. 97.	CH	UNK	ER	SM	CC	18010106		PCFFA	SCOTT DOWNIE	(707)923-3459	100000
98.	CM	WIN	SA CL	PS FY	SR CR	18020103 17090007	QN	FWS OD FW	GENE FORBES	(916)365-8622	0
99.	CM		EL,QC,WL,EN		PS	17110019	04	PNPT	WAYNE BOWERS CHRIS WELLER	(503)657-6822 (206)297-3422	0 1166286
100.			ES, JC	FY, EG	PS	17110019		SQAX	JOHN BARR	(206)426-9783	402767
101.	CM		FI, HD, GR, KC	THE PARTY OF THE P	PS	17110013		MUCK	DENNIS MOORE	(206)939-3311	530350
102.			FI,KC	FY	PS	17110013	QN	MUCK	DENNIS MOORE	(206)939-3311	114467
103.			MA	FY	PS	17110019	NA	FWS	DAVID ZAJAC	(206)753-9460	1400000
104.			NO		AC		QA	ADFG	JIM RAYMOND	(907)452-1531	750000
105.			NO	FY,EG	PS	17110004		NOOK	GARY MACWILLIAMS	(206)592-5176	81000
107.			NO OC	FY	PS PS	17110004		NOOK	GARY MACWILLIAMS	(206)592-5176	299275
108.			NO,QC PU,HD,GA,CH	FY	PS PS	17110004 17110014		LUMM	STEVE SEYMOUR RUSSELL LADLEY	(206)734-8180 (206)593-0254	183859 325050
109.			ST ST	FY	PS	17110014		STIL	KIP KILLEBREW	(206)435-8770	460450
110.	CM		WC	FY	PS	17110018		FWS	DAVID ZAJAC	(206)753-9460	2300000
111.	CM		WL	FY	PS	17110018		FWS	DAVID ZAJAC	(206)753-9460	3693760
112.		ENL	CW, GO, BJ	EG, FY	PS	17110019		SUQ	PAUL DORN	(206)598-3311	3620000
113.		L	NQ	EG	PS	17110015		NISQ	WILLIAM THOMAS	(206)456-5221	542133
114.		N	KY	FR,EG	PS	17110015		NISQ	WILLIAM THOMAS	(206)456-5221	312760
115. 116.		N,L	ES,JC,GS	FY,EG	PS	17110019		SQAX	JOHN BARR	(206)426-9783	1906732
117.		N,L	WL	FY	PS	17110019		TULA	CLIFF BENGSTON	(206)653-7477	4000000
118.				FY	AC BC		QN	ADFG	JIM RAYMOND	(907)452-1531	125000
119.				FN	CC	18010102	GN	CFSO HFAC	ROBERT HURST JUD ELLINWOOD	(604)756-7296 (707)444-8903	9500 25000
120.	CO .			YR	CC	18010102	QA	COAPW	DAVID HULL	(707)822-5957	1500
121.	CO			FY	CR	17020011		FWS	JIM MULLAN	(509)548-7573	61800
122.				FN	CR	17080002	NA	WDF	ROBIN NICHOLAY	(206)225-7413	2000000
123.				YR	PS	17110008		WDF	JIM AMES	(205)753-0196	0
124. 125.			AL 07 00	SM	OC	17100205		ODFW	MARIO SOLAZZI	(503)737-4431	300000
126.			AL,SZ,CQ	FY		17100206	QN	ODFW	MARIO SOLAZZI	(503)737-4431	0
127.			BC,ST	SM		17080006	ON	ODFW	DAVE RIEBEN	(503)458-6512	0
128.			BG BG	SM FN,PS,SM	CC AC	18060012	QN	MBSTP	DAVE STREIG	(408)458-3095	3000
129.			CC	FN FN	AC		QN	ADFG	BOB CHLUPACH NICK DUDIAK	(907)892-6816 (907)235-8191	1500000 200000
130.			CC	SM	AC		QN		NICK DUDIAK	(907)235-8191	120000
131.			CH		ВС		QN		MATTHEW FOY	(604)666-3678	0
132.			CK	FY		17110004			DON HENDRICK	(206)336-9538	160500
133.			CK	FY		17110004		WDF	DON HENDRICK	(206)336-9538	78700
134.	CU		CK	FY	PS	17110004	QN	WDF	DON HENDRICK	(206)336-9538	65400

											# 045.10
	CDECIES D	ACE	STOCK	LIFE	MAJOR	SUB	EVAL	ACENCY	PRINCIPAL	PHONE	#/YEAR RELEASED
	SPECIES R.	ALE	STUCK	STAGE	DRAINAGE	DRAINAGE	EVAL	AGENCI	CONTACT	PHONE	KELEASED
										.004.454.5004	705000
135.			CK, WL, GA, WR		PS	17110015		NISQ	WILLIAM THOMAS	(206)456-5221	395800
136.			CM	SM	WC	17100204		ODFW	MARIO SOLAZZI	(503)737-4431	240000 850000
137.			CR	SM FY	CR SJ	17110020	NA	ODFW	WAYNE STENDROSKY CHRIS WELLER	(503)374-8381 (206)297-3422	788060
139.			EL, DN	FY	SJ	17110020		PNPT	CHRIS WELLER	(206)297-3422	94500
140.			FC FC	SM,PS	OC	171100215	47	ODFW	TIM SCHAMBER	(503)487-4152	.0
141.			FR	FY	BC	11100203	QN	CFSO	ROBERT HURST	(604)756-7296	10000
142.			HL	YR	CC	18010106		GRC	JIM JOHNSON	(707)928-2293	15000
143.			HO, QN	FY, FN	WC	17100101	QN	НОН	JIM JORGENSEN	(206)374-6582	83942
144.	CO		HU	FY	WC	17100103	QN	WDF	DAVE SEILER	(206)586-1994	132000
145.	CO		IC	FN, YR	CC	18010206	QN	USFS	BILL BEMIS	(916)842-6131	7000
146.			JG	FN, YR	CC	18010102		COAPW	DAVID HULL	(707)822-5957	5000
147.			KL,BC	SM	CR	17080006		ODFW	QUENTIN SMITH	(503)325-3653	1400000
148.			LM	YR	CC	18010102		HBCO	STEVE SANDERS	(707)488-2253	100000 15000
149.			LR	FY	CC	18010108	QN	PCFFA ADFG	MITCH FARRO BOB CHLUPACH	(707)839-5664 (907)892-6816	450000
151.			LS MA	SM, FN FY	PS	17110019	UN	MFM	MARK LARIVIERE	(206)645-2201	244531
152.			MA	SM	PS	17110019	ON	FWS	DAVID ZAJAC	(206)753-9460	265000
153.			MI	FY	BC	11110017	QN	CFSO	ROBERT HURST	(604)756-7296	26000
154.			MI	FY	PS	17110019		SUQ	PAUL DORN	(206)598-3311	335370
155.	CO		MI	SM	PS	17110019	QA	SUQ	PAUL DORN	(206)598-3311	57053
156.	CO		MI, PU, WR, KA	FY	PS	17110015	QN	NISQ	WILLIAM THOMAS	(206)456-5221	332600
157.			MIXED	SM	OC		QA	ODFW	JAY NICHOLAS	(503)737-4431	0
158.			MN	FY, FN	PS	17110019		WDF	CHUCK BARANSKI	(206)753-0197	25000
159.			MT	YR,SM	CC	18010108	QN	MWSSG	GARY PETERSON	(707)629-3514	8000
160.			NE	SM, FY	00	17100202	OH	ODFW	GARY YEAGER	(503)368-6828 (206)734-8180	800000 1014080
161.			NO,SY,SK,SO	YR	PS CC	17110004 18010102		LUMM	STEVE SEYMOUR ALLAN GRASS	(707)743-1535	30000
163.			NY	YR	CC	18010105		CDFG	BRUCE BARNGROVER	(707)822-0592	225000
164.			NY,PR	YR	CC	18010102		HFAC	CHRISTOPHER TOOLE	(707)443-8369	22000
165.			PU	FY	PS	17110014		PUT	RUSSELL LADLEY	(206)593-0254	269455
166.			QC	SM	PS	17110018		FWS	DAVID ZAJAC	(206)753-9460	500000
167.			QU, BL	FY	BC		QN	CFSO	ROBERT HURST	(604)756-7296	8500
168.	CO		RC	YR	CC	18010209	QN	SOC	TOM GREENER	REFER TO TEXT	4000
169.			RS	FN, YR	CC	18010106	QN	CDFG	ROYCE GUNTER	(707)433-6325	120000
170.			SD	FY	CR	17090008		ODFW	DENNIS WISE	(503)378-6925	750000
171.			SN	SM	CC	18060005	QN	MBSTP	DAVE STREIG	(408)845-3095	20000
172.			SR	SM, AD	CR	17080001		ODFW	DICK WHITLATCH	(503)668-4222	0
173. 174.			SR ST	FY	CR CC	17090007 18010208	ON	ODFW	JACK WEST	(503)657-6822 (916)842-6131	15000
175.			ST,SK	FN, YR	PS	17110008		STIL	KIP KILLEBREW	(206)435-8770	46999
176.			SY,SK	SM	PS	17110019		TULA	CLIFF BENGSTON	(206)653-7477	718000
177.			TM	FY,SM	OC	17100304		ODFW	PAUL REIMERS	(503)888-5515	30000
178.	СО		TM	PS, SM	OC	17100304	QN	ODFW	PAUL REIMERS	(503)888-5515	180000
179.	CO		TM, NY	SM, YR	CC	18010209		SRKC	BOB WILLS	(707)487-3443	10000
180.			TR	FY	BC		QN	CFSO	ROBERT HURST	(604)756-7296	7500
181.			WA	SM	CR	17070106		WDF	DICK JOHNSON	(206)837-3311	2500000
182.		AL	CZ	FN	CR	17070105		WDF	DAVE SEILER	(206)586-1994	505000
183.		AL	CZ	FN	CR	17070105		WDF	DAVE SEILER	(206)586-1994	0
184.		AL	DN	SM	PS	17110018		WDF	TIM FLINT	(206)753-0198	64850
185. 186.		AL	DN GH	FY	PS	17110018		WDF	TIM FLINT	(206)753-0198 (206)249-4628	27447 716000
187.		AL	GH	FN SM	WC WC	17100103 17100105		WDF WDF	RICK BRIX	(206)249-4628	0
188.		AL	GH	PS	WC	17100105		WDF	RICK BRIX	(206)249-4628	257000
189.		AL	GR	FY	PS	17110019		WDF	TIM FLINT	(206)753-0198	58000
190.		AL	GR	FY	PS	17110013		WDF	DAVE SEILER	(206)586-1994	3099080
191.		AL	GR, PU	SM	PS	17110015		WDF	TIM FLINT	(206)753-0198	196750
192.	CO F	AL	HU	PS	WC	17100105		WDF	RICK BRIX	(206)249-4628	0
193.		AL	LW	FY, SN	CR	17080002		WDF	GREG JOHNSON	(206)753-3956	161805
194.		AL	MI	FN	PS	17110019		WDF	TIM FLINT	(206)753-0198	36000
195.		AL	PU	SM	PS	17110015		WDF	TIM FLINT	(206)753-0198	53150
196.		AL	PU,MI	FY	PS	17110016		WDF	TIM FLINT	(206)753-0198	1457265
197. 198.		AL	QC,MI SD	FY	PS WC	17110018 17100101		WDF WDF	RICH KOLB	(206)586-9344 (206)586-1994	0
199.		AL	SD,QT	FY	WC	17100101		WDF	DAVE SEILER DAVE SEILER	(206)586-1994	0
200.		AL	SD, SR	FY	WC	17100101		WDF	DAVE SEILER	(206)586-1994	123731
201.		AL	SY	SM	PS	17110016		WDF	TIM FLINT	(206)753-0198	0

Table 2. Data on anadromous salmonid supplementation projects (continued)

				LIFE	MAJOR	SUB			PRINCIPAL		#/YEAR
	SPECIES	RACE	STOCK	STAGE	DRAINAGE	DRAINAGE	EVAL	AGENCY	CONTACT	PHONE	RELEASED
202	co	EAL	TOUTLE	FN	CR	17080005	ON	WDF	GREG JOHNSON	(206)753-3956	1200000
202.		FAL	CO	SM, FN	WC	17100103		WDW	BILL FREYMOND	(206)533-9335	23400
		SEA SEA	CO	SM, FN	WC	17100103		WDW	BILL FREYMOND	(206)533-9335	26090
204.			CO	SM, FN	WC	17100104		WDW	BILL FREYMOND	(206)533-9335	7325
206.		SEA SEA	CO	SM, FN	WC	17100105		WDW	BILL FREYMOND	(206)533-9335	6792
207.		SEA	CO	SM, FN	WC	17100101		WDW	BILL FREYMOND	(206)533-9335	3000
208.		SEA	RW	YR	CC	18010102		НВСО	STEVE SANDERS	(707)488-2253	500
209.		SEA	SH	SM, FN	PS	17110019		WDW	BILL FREYMOND	(206)533-9335	1000
210.		SEA	SH	SM	PS	17110018		WDW	BILL FREYMOND	(206)533-9335	29905
211.		SEA	SH	SM, FN	PS	17110017		WDW	BILL FREYMOND	(206)533-9335	35820
212.		SEA	SO	YR	CC	18010102		HSU	ERIC LOUDENSLAGER	(707)826-3445	40000
213.		JLA	ST	FY	PS	17110008		STIL	KIP KILLEBREW	(206)435-8770	172500
214.			TU	FY	AC		QN -	ADFG	NICK DUDIAK	(907)235-8191	300000
215.			, ,	FY	BC		QN	MEBC	JEREMY HUME		0
216.				SM, YR	CC	18010109		GRSP	DON MCDONALD	(707)884-3884	30000
217.			AC	FN, YR	CC	18010110		PSD	TOM FURRE	(707)778-4703	0
218.			AL	SM	OC		QN	ODFW	KEN KENASTON	(503)737-4431	280000
219.			AM	TY	SR	18040005		CDFG	RON DUCEY	(916)355-0666	450000
220.			AR	SM, FN	AC			ADFG	NICK DUDIAK	(907)235-8191	10000
221.			BC,ST	SM	CC	18060012	QN	MBSTP	DAVE STREIG	(408)458-3095	5000
222.			CM	YR	CR	17020008		WDW	JOE FOSTER	(506)754-4624	0
223.			CR	PS, SM, 20, 30		18060012		CRSA	ROY THOMAS	(408)625-2255	14000
224.			ER	YR	CC	18010106		GRC	JIM JOHNSON	(707)923-2293	25000
225.			ER	YR	CC	18010102	QN	нвсо	STEVE SANDERS	(707)488-2253	50000
226.			FT	FN, YR	SR	18020125	QN	CDFG	DON SCHLICTING	(916)538-2222	3000000
227.	SH		GR	YR	CC	18010108	NA	FOG	CRAIG BELL	(707)882-2150	30000
228.	SH		IC	YR	CC	18010206	QN	USFS	BILL BEMIS	(916)842-6131	250
229.	SH		JC	FN, YR	CC	18010102	QN	COAPW	DAVID HULL	(707)822-5957	2000
230.	SH		KR	SM .	BC		QN	MEBC	BRUCE WARD		20000
231.	SH		MA	FY	PS	17110019		MFM	MARK LARIVIERE	(206)645-2201	96359
232.	SH		MD	YR	CC	18010105	NA	CDFG	BRUCE BARNGROVER	(707)822-0592	400000
233.	SH		MO	YR	CC	18050002	NA	CDFG	DON ESTEY	(209)759-3383	50000
234.	SH		NP	YR	CC	18050002	QN	NRS	GEORGE CARL	(707)252-1440	7000
235.	SH		RC	YR	CC	18010209		SOC	TOM GREENER	REFER TO TEXT	50000
236.	SH		RS	YR	CC	18010109	NA	MCFG	BILL TOWNSEND	(707)462-5228	70000
237.			RS	YR	CC	18010106		CDFG	ROYCE GUNTER	(707)433-6325	200000
238.			SM	PS	SC	18010209	NA	RHSI	DENNIS CONGER	(707)464-7441	800
239.			SMITH RIVER		CC			SRKC	BOB WILLS	(707)487-3443	75000
240.			SN	SM	CC	18060005		MBSTP	DAVE STREIG	(408)458-3095	40000
241.			ST	VA	CC	18010208		USFS	JACK WEST	(916)842-6131	400
242.			TU,BC,SL	YR	CC	18010112		00.511	DAVID REIELS	(916)628-5012	6000
243.			VA	SM	00	47070000	QN	ODFW	KEN KENASTON	(503)737-4431	1000000
244.			YK, SK, RI, PR		CR	17030002		MDM	JIM CUMMINS	(509)575-2740 (208)756-2271	790000
245.		SUM		FN	CR	170/0705	QN	IDFG	KENT BALL	(208)476-7242	1200000
246.		SUM		SM, AD	CR	17060305	UN	FWS FWS	BILL MILLER BILL MILLER	(208)476-7242	1000000
247.		SUM	CII	AD, FY, SM	CR	17110015	0.4		BOB LELAND	(206)753-5700	23632
248.		SUM	CH	SM	PS	17070306		WDW OD FW	JIM NEWTON	(503)296-4628	162000
249.		SUM	DS	SM	CR					(503)737-4431	127000
250.		SUM	DS	SM	CR	17070306 17090004		ODFW	BOB LINDSAY	(503)896-3513	120000
251.		SUM	MK,SS	SM	CR	17090004		OUTW	SCOTT LUSTED BRAIN BLACKMAN	(303)090-3313	23550
252.		SUM	NR	FY	BC		QN QN		BOB GRIFFITH	(604)387-3660	11400
253.		SUM	SC	FY	BC	17090004		ODFW	JOHN HOSKINS	(503)896-3294	108000
254.		SUM	SK	SM SM	CR	17090004		ODFW	GREG LIPSIEA	(503)367-3437	220000
255. 256.		SUM	SK SK	SM	OC PS	17110005		WDW	BOB LELAND	(206)753-5700	25350
257.		SUM	SR	SM, FY, FN, AD		17110003	QN	IDFG	KENT BALL	(208)756-2271	900000
258.		WIN	SK	FY FY	CR	17090007		ODFW	WAYNE BOWERS	(503)657-6822	0
259.		WIN		SM, PS	OC	17090008		ODFW	LYLE CURTIS	(503)994-8606	80000
260.		WIN	AL	SM SM	00	17100304		ODFW	PAUL REIMERS	(503)888-5515	30000
261.		WIN	AL,CQ	SM	00	17100205		ODFW	TERRY FISHER	(503)487-7240	675000
262.		WIN	BC BC	SM	CR	17080003		ODFW	MEL KELLY	(503)455-2234	570000
263.		WIN	BC	SM	OC	17090005		ODFW	DAN BARRETT	(503)394-2496	75000
264.		WIN	BC,KL	SM	CR	17080006		ODFW	QUENTIN SMITH	(503)325-3653	650000
265.		WIN	BG, QN, CH	SM	WC	17100105		WDW	BILL FREYMOND	(206)533-9335	85825
266.		WIN	BT, SA	YR	SR	18020118		FWS	GENE FORBES	(916)365-8622	1000000
267.		WIN	CC	SM	OC	17090008		ODFW	CHARLIE STANLEY	(503)392-3485	340000
268.		WIN	СН	SM	PS	17110019		SQAX	JOHN BARR	(206)426-9783	44258

Table 2. Data on anadromous salmonid supplementation projects (continued)

				LIFE	MAJOR	SUB			PRINCIPAL		#/YEAR
	SPECIES	RACE	STOCK	STAGE		DRAINAGE	EVAL	AGENCY	CONTACT	PHONE	RELEASED
269.	SH	WIN	СН	SM	PS	17110018	QN	WDW	BILL FREYMOND	(206)533-9335	80840
270.		WIN	СН	SM	PS	17110017		WDW	BILL FREYMOND	(206)533-9335	24310
271.		WIN	СН	SM	PS	17110014		WDW	BOB LELAND	(206)753-5700	142080
272.	SH	WIN	СН	SM	PS	17110013	QN	WDW	BOB LELAND	(206)753-5700	192580
273.		WIN	СН	SM	PS	17110012		WDW	BOB LELAND	(206)753-5700	58515
274.	SH	WIN	СН	SM	PS	17110007	QN	WDW	BOB LELAND	(206)753-5700	248260
275.		WIN	CH -	SM	PS	17110002		WDW	BOB LELAND	(206)753-5700	37255
276.		WIN	СН	SM	PS	17110019		TULA	CLIFF BENGSTON	(206)653-7477	60000
277.		WIN	CH	SM	PS	17110019		WDW	BOB LELAND	(206)753-5700	22667
278.		WIN	CH	SM	PS	17110016		WDW	BOB LELAND	(206)753-5700	35000
279.		WIN	СН	SM	PS	17110008		WDW	BOB LELAND	(206)753-5700	110425
280.	SH	WIN	СН	SM	SJ	17110020		WDW	BILL FREYMOND	(206)533-9335	3610
281.		WIN	CH	SM	SJ	17110020		WDW	BILL FREYMOND	(206)533-9335	69100
282.		WIN	СН	SM	SJ	17110021		WDW	BILL FREYMOND	(206)533-9335	63925
283.		WIN	СН	SM	WC	17100104		WDW	BILL FREYMOND	(206)533-9335	17795
284.		WIN	CH, BG	SM, FY	WC	17100101		WDW	BILL FREYMOND	(206)533-9335	171711
285.		WIN	CH, NO	SM	PS	17110004		WDW	BOB LELAND	(206)753-5700	115600
286.	SH	WIN	CH, SK	SM	PS	17110007		SKAG	JIM GIBSON	(206)466-3163	50000
287.		WIN	CH, SN	SM	PS	17110009		WDW	BOB LELAND	(206)753-5700	339925
288.		WIN	CH, SN	SM	PS	17110010		WDW	BOB LELAND	(206)753-5700	339925
289.		WIN	CH, SN	SM	PS	17110011		WDW	BOB LELAND	(206)753-5700	339925
290.	SH	WIN	CH, SO	SM	WC	17100104	QN	WDW	BILL FREYMOND	(206)533-9335	65793
291.		WIN	CH, VW	SM	WC	17100104		WDW	BILL FREYMOND	(206)533-9335	11250
292.	SH	WIN	CH, WK	SM	WC	17100104		WDW	BILL FREYMOND	(206)533-9335	51492
293.	SH	WIN	CH, WY	SM	WC	17100104	QN	WDW	BILL FREYMOND	(206)533-9335	63267
294.	SH	WIN	CL	SM	CR	17090011		ODFW	GEORGE NANDOR	(503)630-7210	30000
295.	SH	WIN	CO,CH	SM, EG	CR	17070105	NA	WDW	ULF RASSMUSSEN	(206)837-3131	300000
296.	SH	WIN	EL	FN	PS	17110017	QA	PNPT	CHRIS WELLER	(206)297-3422	71545
297.	SH	WIN	GR,GS	FN	PS	17110013	NA	MUCK	DENNIS MOORE	(206)939-3311	30035
298.	SH	WIN	GS, CH, GR	SM	PS	17110013		MUCK	DENNIS MOORE	(206)939-3311	31665
299.	SH	WIN	KR		BC		QN	CFSO	PAT A. SLANEY	(604)228-1158	0
300.	SH	WIN	MA	SM	PS	17110019	QN	FWS	DAVID ZAJAC	(206)753-9460	65000
301.	SH	WIN	MF	FY	CR	17090005	QN	ODFW	DENNIS WISE	(503)378-6925	150000
302.	SH	WIN	NS	FY	CR	17090008	QN	ODFW	DENNIS WISE	(503)378-6925	150000
303.	SH	WIN	NS	SM	oc	17090005		ODFW	RANDY WINTERS	(503)854-3522	220000
304.	SH	WIN	PU,QN	FN	PS	17110014	QA	PUT	RUSSELL LADLEY	(206)593-0254	35778
305.	SH	WIN	QN, GV	SM	PS	17110019	QN	SUQ	PAUL DORN	(206)598-3311	36715
306.	SH	WIN	WI	FY	PS	17110019	QN	WDW	TOM JOHNSON	(206)765-3979	0
307.	SO			FN, FY	AC		QN	ADFG	NICK DUDIAK	(907)235-8191	2000000
308.	SO			FN	AC		QN	ADFG	DAVID LITCHFIELD	(907)262-9369	1400000
309.	SO			EG	AC		QN	ADFG	LORNE WHITE	(907)486-4791	6000000
310.	SO		GU	FY	AC		QA	ADFG	KEN ROBERSON	(907)822-5520	9999999
311.	SO		GU	FRY	AC		QN	ADFG	KEN ROBERSON	(907)822-5520	9999999
312.	SO		GU	FY	AC		QA	ADFG	KEN ROBERSON	(907)822-5520	3000000

APPENDIX I

DATABASE FIELD LIST AND DESCRIPTION

Appendix I. Database field list and description.

Cost Effects

Problems

Diseases

Comments

Database Field Description Record Number ID Number Interviewer Initials of person who did the interview Date _ Date of interview Principal Contact Contact for the project Agency Coded, see Table 1 Phone number of contact Phone Address Address of contact Project name Project Yes or no answer Ongoing Progress Report Yes or no answer Coded, see Table 1 Species Fall/winter/spring/summer (coded, see Table 1) Race Fish stock, if known (coded, see Table 1) Stocks Life stages stocked (coded, see Table 1) Life Stages State/Province Where project is located Geographical area or drainage (coded, see Table 1) Major Drainage Sub Drainage EPA 8 digit river reach code Verbal Description River Name of EPA reach code EPA 3 digit stream reach code Stream(s) Stream Name of EPA reach code Description Reaches of streams stocked (if known) Reach(s) Year and month project was initiated Project Date First Stocking Date Year and month of first stocking Year and month of last stocking Last Date Total number of fish released Number Released Average Number/Year Average number of fish released annually Main purpose of project Purpose Did it Work Yes or no answer Evaluation Coded, NA-not attempted, QN-quantitative, QA-qualitative Percent of Evaluation completed Percent Complete Type of evaluation and results Details Survival rates, if known Survival Rates Could Augmentation Help Yes or no answer Type of stocking, i.e. truck, scatter-plant, etc. Stocking Details Acclimation Details Type (if any) of acclimation Other information related to stocking, rearing, etc. Other Restocking Info Impacts (Research) Research based impacts Impacts (Opinion) Opinion based impacts Control Details Details of control, if any

Cost effectiveness, if known

Any problems (biological or political)

Diseases of supplementation or natural stocks

Any other information that might be pertinent to the project

APPENDIX II

SUMMARY OF SUPPLEMENTATION PROJECTS

1. SPECIES: AS RACE: STOCK(S): MIXED

MAJOR DRAINAGE: CT SUB DRAINAGE: WHITE RIVER

CONTACT: CARL BARREN PHONE: (802)826-4438

AGENCY: FWS ADDRESS: FED. BLDG., BOX 1140, MONTPELIER, VT 05602

PROJECT: CONNETICUT RIVER PROGRAM

PURPOSE: RESTORATION

EVALUATION: QN : FISH STOCKED IN MAY AT 26mm AVERAGED 69.25mm IN AUGUST

SURVIVAL: 7.5% SURVIVAL, FRY TO SMOLT

STOCKING DETAILS: SCATTER-PLANTED AT 40 FRY/100 METER SQ.

ACCLIMATION DETAILS: STOCKED WHEN WATER TEMP. WAS 52-56 DEGREES F

OTHER PRE STOCKING INFO: YEARLINGS RANGED 3 TO 5 PER 100 METER SQ. UNIT.

IMPACTS; RESEARCH: ATLANTIC SALMON, RAINBOW & BROOK TROUT ALL PRESENT AT INDEX STATIONS

IMPACTS; OPINION:

CONTROL DETAILS:

OTHER COMMENTS: CRITICAL FACTOR IN FRY SURVIVAL IS AVERAGE DAILY FLOW FOR 30 TO 40

DAYS AFTER STOCKING

2. SPECIES: AS RACE: STOCK(S): MIXED
MAJOR DRAINAGE: CT SUB DRAINAGE: WHITE RIVER
CONTACT: STEVE ROY PHONE: (802)773-0300
AGENCY: USFS ADDRESS: GREEN MTN, NAT. FOREST, RUTLAND, VT 05702
PROJECT: CONNETICUT RIVER PROGRAM
PURPOSE: RESTORATION ONGOING: Y
EVALUATION: QN:
SURVIVAL: SURVIVAL .33 TO 12.0 %, FOR 0 TO 1+
STOCKING DETAILS: SACTTER PLANTED AT 24-40 FISH/100 METER SQ.
ACCLIMATION DETAILS:
OTHER PRE STOCKING INFO: HABITAT INVENTORIED TO DETERMIONE STOCKING LEVELS
IMPACTS; RESEARCH: OVER 60% OF FISH IN STREAMS ARE ATLANTIC SALMON JUVENILES
IMPACTS; OPINION:
CONTROL DETAILS:
OTHER COMMENTS: PLAN TO USE A PASSIVE SMOLT TRAP TO MONITOR & ACCESS ATLANTIC SALMON
PRODUCTION FROM MAJOR STREAMS ON THE FOREST

3. SPECIES: AS RACE: STOCK(S): MIXED
MAJOR DRAINAGE: CT SUB DRAINAGE: WHITE AND WEST RIVERS
CONTACT: KEN COX PHONE: (802)886-2215
AGENCY: VDFW ADDRESS: RR1, BOX 33, NORTH SPRINGFIELD, VT 05150
PROJECT: CONNETICUT RIVER PROGRAM
PURPOSE: RESTORATION ONGOING: Y
EVALUATION: QN :
SURVIVAL: MEAN OF 36% SURVIVAL, FRY TO 0+ PARR
STOCKING DETAILS: FRY ARE SCATTER PLANTED INTO SUTITABLE HABITAT
ACCLIMATION DETAILS: ACCLIMATED TO STREAM WATER TEMPERATURE
OTHER PRE STOCKING INFO: TARGET DENSITIES OF 24 TO 48 PER 100 METER SQ.
IMPACTS; RESEARCH:
IMPACTS; OPINION:
CONTROL DETAILS:
OTHER COMMENTS:

4. SPECIES: AS RACE: STOCK(S): MIXED

MAJOR DRAINAGE: CT SUB DRAINAGE: FARMINGTON RIVER

CONTACT: STEVE GEBHARD PHONE: (203)443-0166

AGENCY: CDEP ADDRESS: P.O. BOX 248, WATERFORD, CT 06385

PROJECT: CONNETICUT RIVER PROGRAM

PURPOSE: RESTORATION ONGOING: Y

EVALUATION: QN : HATCHERY SMOLT TO ADULT RETURN RATE = .04%

SURVIVAL: WILD SMOLT (HATCHERY FRY) TO ADULT = .32%

STOCKING DETAILS: SMOLTS STOCKED FROM QUICK RELEASE HOSES OR NETTED FROM TRUCK ACCLIMATION DETAILS: FED FRY STOCKED IN PLASTIC BAGS FILLED WITH OXYGEN OTHER PRE STOCKING INFO: SOME SMOLTS WERE IMPRINTED WITH MORPHOLINE IMPACTS; RESEARCH: IMPACTS; OPINION:

CONTROL DETAILS:
OTHER COMMENTS: MAJORITY OF EGGS OBTAINED FROM ADULT RETURNS SOME FROM RECONDITIONED KELTS

5. SPECIES: AS RACE: STOCK(S): MIXED

MAJOR DRAINAGE: CT SUB DRAINAGE: CONNETICUT RIVER
CONTACT: TED MEYERS PHONE: (413)863-3555

AGENCY: FWS ADDRESS: P.O. BOX 71, TURNER FALLS, MA 01376

PROJECT: CONNETICUT RIVER PROGRAM
PURPOSE: RESTORATION ONGOING: Y

EVALUATION: SURVIVAL:
STOCKING DETAILS:
ACCLIMATION DETAILS:
OTHER PRE STOCKING INFO: SMOLTS = GREATER THAN 15 CM
IMPACTS; RESEARCH:
IMPACTS; OPINION:
CONTROL DETAILS:
OTHER COMMENTS: 10% OF FISH CAPTURED AT HOLYOKE DAM, MA ARE ALLOWED TO CONTINUE UPSTREAM MIGRATION

6. SPECIES: AS RACE: STOCK(S): MIXED
MAJOR DRAINAGE: MC SUB DRAINAGE: 15 RIVERS IN MAINE
CONTACT: JERRY MARANCIK PHONE: (207)469-6701
AGENCY: FWS ADDRESS: GRAIG BROOK NFH, E. ORLAND, ME 04431
PROJECT: MAINE ATLANTIC SALMON PROGRAM
PURPOSE: RESTORATION ONGOING: Y
EVALUATION: QN : 26,790 FISH HAVE RETURNED TO MAINE RIVERS
SURVIVAL:
STOCKING DETAILS:
ACCLIMATION DETAILS:
OTHER PRE STOCKING INFO:
IMPACTS; RESEARCH: 10% OF RETURNS TO THE PENOBSCOT R. IS FROM NATURAL PRODUCTION
IMPACTS; OPINION:
CONTROL DETAILS:
OTHER COMMENTS: 2,141 OUT OF 2,688 FISH (IN 1988) ALLOWED TO SPAWN NATURALLY

7. SPECIES: AS RACE: STOCK(S): MIXED

MAJOR DRAINAGE: MC SUB DRAINAGE: 15 RIVERS IN MAINE

CONTACT: ED BAUM PHONE: (207)941-4452

AGENCY: MSRSC ADDRESS: P.O. BOX 1298, BANGOR, ME 04401

PROJECT: MAINE ATLANTIC SALMON PROGRAM

PURPOSE: RESTORATION ONGOING: Y

EVALUATION: QN :

SURVIVAL: ADULT RETURNS RANGE FROM .23 TO 1.32%, MEAN = .71%

STOCKING DETAILS: MAINLY SMOLT STOCKING

ACCLIMATION DETAILS:

OTHER PRE STOCKING INFO: 47% OF RELEASES TO THE PENOBSCOT RIVER

IMPACTS; RESEARCH: FISH UNNEEDED FOR EGG TAKES ARE ALLOWED TO SPAWN NATURALLY

IMPACTS; OPINION: RETURNS TO "WILD" RIVERS ARE PRIMARILT OF WILD ORIGIN

CONTROL DETAILS:

OTHER COMMENTS: MAINE PRODUCED ALL OF THE SPORT CATCH IN 1989, 86% OF THAT FROM THE PENOBSCOT RIVER

8. SPECIES: AS RACE: STOCK(S): MIXED
MAJOR DRAINAGE: MR SUB DRAINAGE: MERRIMACK RIVER
CONTACT: LARRY STOLTE PHONE: (603)225-1411
AGENCY: FWS ADDRESS: RALPH PILL MKTPLACE, #400, 22 BRIDGE ST, CONCORD, NH 03301
PROJECT: ATLANTIC SALMON STOCKING PROGRAM
PURPOSE: REESTABLISH RUNS ONGOING: Y
EVALUATION: QN : 776 ADULT RETURNS THROUGH 1988, NOW MARKING TO SEPARATE ORIGIN
SURVIVAL:
STOCKING DETAILS: STOCK AT 15 TO 59 FRY/UNIT DEPENDENT ON QUALITY OF HABITAT
ACCLIMATION DETAILS: N/A
OTHER PRE STOCKING INFO: RELEASE DATE IS CRITICAL, WATER SHOULD APPROACH 10 C
IMPACTS; RESEARCH: 40% OF ADULT RETURNS HAVE ORGINATED FROM FRY STOCKING PROGRAM
IMPACTS; OPINION:
CONTROL DETAILS: N/A
OTHER COMMENTS: RETURNING ADULTS HAVE NEVER SURPASSED BROOD STOCK REQUIRMENTS

9. SPECIES: AS RACE: STOCK(S): MIXED
MAJOR DRAINAGE: PR SUB DRAINAGE: PAWCATUCK RIVER
CONTACT: MARK GIBSON PHONE: (401)789-0281
AGENCY: RIDFW ADDRESS: P.O. BOX 218, W. KINGSTON, RI 02892
PROJECT: PAWCATUCK RIVER PROGRAM
PURPOSE: RESTORATION ONGOING: Y
EVALUATION: QN:
SURVIVAL: RETURN RATES 0 TO .009%, MEAN = .003%
STOCKING DETAILS:
ACCLIMATION DETAILS:
OTHER PRE STOCKING INFO: PARR RAISED FROM DOMESTICATED CAPTIVE BROODSTOCK
IMPACTS; RESEARCH: SEA SURVIVAL CORRELATED WITH SMOLT SIZE
IMPACTS; OPINION:
CONTROL DETAILS:
OTHER COMMENTS: CAPTIVE BROODSTOCK PRODUCES SALMON THAT ARE LESS FIT FOR SURVIVAL IN
THE MARINE ENVIRONMENT

10. SPECIES: CH RACE: STOCK(S):
MAJOR DRAINAGE: BC SUB DRAINAGE: SHUSWAP RIVER
CONTACT: J. FEE PHONE:
AGENCY: ABREC ADDRESS: VICTORIA, B.C.
PROJECT: EVALUATION OF CHINOOK & COHO OUTPLANTING OPPORTINUITY, SHUSWAP RIVER
PURPOSE: HABITAT EVALUATION ,ONGOING: N
EVALUATION: QN : RETURN OF 240-430 FISH
SURVIVAL:
STOCKING DETAILS: STOCKED TO DENSITIES OF 3.0 AND 6.0 G/SQ. METER
ACCLIMATION DETAILS:
OTHER PRE STOCKING INFO: WOULD FULLY SEED USUABLE REARING HABITATS
IMPACTS; RESEARCH:
IMPACTS; RESEARCH:
IMPACTS; OPINION:
CONTROL DETAILS:
OTHER COMMENTS: BC DOES RECONNAISSANCE REPORTS ON ALL STREAMS BEFORE SUPPLEMENTATION
TO DETERMINE OPPORTUNITIES FOR RESTORATION & ENHANCEMENT OF ENDIMICS

11. SPECIES: CH RACE: STOCK(S):
MAJOR DRAINAGE: BC SUB DRAINAGE: UPPER FRASER RIVER
CONTACT: GORDON BEREZAY PHONE: (604)666-8646
AGENCY: CFSO ADDRESS: 555 W HASTINGS ST., VANCOUVER, BC V6B 5G3
PROJECT: PENNY CHINOOK PILOT HATCHERY, OPERATIONAL HISTORY, 1980-83
PURPOSE: HATCHERY EVALUATION ONGOING: Y
EVALUATION: QN :
SURVIVAL: EGGS TO FRY = 74-90%, FRY TO ADULT = 0 -.10%
STOCKING DETAILS: VIA HELICOPTER IN OXYGENATED 360 LITER TANKS
ACCLIMATION DETAILS: BROODSTOCK COLL. FROM & FRY TRANSPORTED TO NATAL STREAMS
OTHER PRE STOCKING INFO: FRY TAGGED @ 1-2 G
IMPACTS; RESEARCH: LOW SUR. TO ADULT INDICATES THE PROD. STRATEGY SHOULD BE REASSESSED IMPACTS; OPINION: MODIFY PROGRAM TO INCREASE POST-RELEASE SURVIVAL
CONTROL DETAILS:
OTHER COMMENTS: OPERATION RESULTED IN SUCCESSFUL REARING OF CHINOOK FRY IN COLD WATER 1-5 oC

12. SPECIES: CH RACE: STOCK(S):

MAJOR DRAINAGE: CC SUB DRAINAGE: SMITH RIVER

CONTACT: BOB WILLS PHONE: (707)487-3443

AGENCY: SRKC ADDRESS: PO BOX 328, SMITH RIVER, CA 95567

PROJECT: ROWDY CREEK FISH HATCHERY

PURPOSE: ENHANCE FISHERIES ONGOING: Y

EVALUATION: : NO CWT/FIN-CLIPS FOUND IN LAST 5 YRS OF CARCASS SURVEYS BY CDFG

SURVIVAL: 64% OF RETURNS ARE FACILITY ORGIN CHINOOK

STOCKING DETAILS: HELD UNTIL FALL RAINS

ACCLIMATION DETAILS: N/A

OTHER PRE STOCKING INFO:

IMPACTS; RESEARCH: SUBSTANTIAL INCREASE IN 1989

IMPACTS; OPINION: NO GENETIC IMPACTS, DUE TO USE OF LOCAL STOCKS

CONTROL DETAILS: N/A

OTHER COMMENTS:

13. SPECIES: CH RACE: STOCK(S): AM

MAJOR DRAINAGE: SR SUB DRAINAGE: AMERICAN RIVER

CONTACT: RON DUCEY PHONE: (916)355-0666

AGENCY: CDFG ADDRESS: 2001 NIMBUS RD., RANCHO CORDOVA, CA 95670

PROJECT: NIMBUS FISH HATCHERY

PURPOSE: MITIGATION ONGOING: Y

EVALUATION: QN : CWT PROGRAM; CARCASS COUNTS ANNUALLY; SOME CREEL CENSUS SURVIVAL:

STOCKING DETAILS: TRUCKED; DAYTIME RELEASES

ACCLIMATION DETAILS:
OTHER PRE STOCKING INFO:
IMPACTS; RESEARCH: HIGH LEVEL OF RETURNS IS MAINTAINED; SOME STRAYING IMPACTS; OPINION:
CONTROL DETAILS: SPLIT RELEASE CWT STRATEGY
OTHER COMMENTS: BEST SURVIVAL IS FROM BERKELEY RELEASE AT 30 FISH/LB

14. SPECIES: CH-RACE: STOCK(S): BR
MAJOR DRAINAGE: BC SUB DRAINAGE: HARRISON RIVER
CONTACT: GORDON BEREZAY PHONE: (604)666-8646
AGENCY: CFSO ADDRESS: 555 W. HASTINGS ST., VANCOUVER, BC V6B 5G3
PROJECT: BIRKENHEAD RIVER CHINOOK HATCHERY OPERATIONAL HISTORY 1977-86
PURPOSE: ENHANCE RUNS ONGOING: Y
EVALUATION: QN : LOW RETURNS INDICATE VERY POOR MARINE SURVIVAL
SURVIVAL: LOW TAG RETURNS FOR 77-81 BROODS 0-0.3%
STOCKING DETAILS: FRY RELEASED 2-4G BY 1984 AND 5-7G LATER
ACCLIMATION DETAILS:
OTHER PRE STOCKING INFO:
IMPACTS; RESEARCH: BIRKENHEAD HATCHERY UNABLE TO MEET GOALS DUE TO LOW ESCAPEMENT IMPACTS; OPINION: PROBLEM AGGRAVATED BY HIGH EXPLOTATION RATE IN INDIAN FISHERY
CONTROL DETAILS: LOW TAG RETURNS MAY BE RESULT OF INSUFICIENT TAGGED FISH
OTHER COMMENTS: LIMITED COHO & STEELHEAD PRODUCTION

15. SPECIES: CH RACE: STOCK(S): CA
MAJOR DRAINAGE: CR SUB DRAINAGE: YAKIMA RIVER
CONTACT: TOM SCRIBNER PHONE: (509)865-5121
AGENCY: YAKI ADDRESS: PO BOX 151, TOPPNENISH, WA 98948
PROJECT: U.S. VS OREGON, YAKIMA R. COHO
PURPOSE: ENHANCE RUN AND FISHERY ONGOING: Y
EVALUATION: : CWT 30% FOR LAST FEW YEARS
SURVIVAL:
STOCKING DETAILS: TRUCKED AND RELEASED
ACCLIMATION DETAILS: N/A
OTHER PRE STOCKING INFO: DIVERSION DAMS
IMPACTS; RESEARCH:
IMPACTS; OPINION: POTENTIAL IMPACTS ON RESIDENT RBT AND SPRING CHINOOK
CONTROL DETAILS: N/A
OTHER COMMENTS: LOOKING INTO TRIBUTARY RELEASES

16. SPECIES: CH RACE: STOCK(S): CC
MAJOR DRAINAGE: AC SUB DRAINAGE: KASILOF RIVER
CONTACT: GARY KYLE PHONE: (907)262-9369
AGENCY: ADFG ADDRESS: 34828 KALIFORNSKY BEACH RD. B, SOLDOTNA, AK 99669
PROJECT: CROOKED CREEK, CHINOOK SALMON
PURPOSE: HATCHERY EVALUATION ONGOING: Y
EVALUATION: ON : NO DATA ON WILD
SURVIVAL: HATCHERY FISH SM TO AD 1.4% (1974-1976)
STOCKING DETAILS: STOCKED SMOLTS ON EXISTING WILD POPULATION
ACCLIMATION DETAILS:
OTHER PRE STOCKING INFO: SMOLTS RAISED IN ONE YEAR AT WARM WATER HATCHERY
IMPACTS; RESEARCH: NO IMPACTS ON WILD FISH MEASURED
IMPACTS; OPINION: SURVIVAL BELIVED TO BE HALF OF WHAT IT SHOULD BE
CONTROL DETAILS:
OTHER COMMENTS: IN 1979-81 HATCHERY FISH COMPRISED ABOUT 30% OF THE RUN BASED ON
CREEL CENSUS AND WEIR TRAPPING

1)

17. SPECIES: CH RACE: STOCK(S): CC
MAJOR DRAINAGE: AC SUB DRAINAGE: KACHIMOK BAY
CONTACT: NICK DUDIAK PHONE: (907)235-8191
AGENCY: ADFG ADDRESS: 3298 DOUGLAS ST., HOMER, AK 99603
PROJECT: HALIBUT COVE LAGOON CHINOOK SALMON ENHANCEMENT
PURPOSE: ENHANCE FISHERY ONGOING: Y
EVALUATION: QN :
SURVIVAL: SURVIVAL RATE OF 0.32 TO 6.06%, OVERALL AVERAGE OF 2.36%
STOCKING DETAILS: TRUCKED TO BARGE THEN TO RELEASE AREA
ACCLIMATION DETAILS: SOME HAD 8 DAYS OF ACCLIMATION IN NET PENS IN LAGOON
OTHER PRE STOCKING INFO: SMOLTS FED IN NET PENS
IMPACTS; RESEARCH: CREATED A VERY GOOD CHINOOK SPORT FISHERY
IMPACTS; OPINION:
CONTROL DETAILS: CWTed FISH FROM 1986 RELEASE ARE STILL OUT
OTHER COMMENTS: NET PEN HOLDING IMPROVED SURVIVAL TO ADULT, 4.4-6.1%

18. SPECIES: CH RACE: STOCK(S): CC
MAJOR DRAINAGE: AC SUB DRAINAGE: DIRECT OCEAN RELEASE
CONTACT: NOCK DUDIAK PHONE: (907)235-8191
AGENCY: ADFG ADDRESS: 3298 DOUGLAS ST., HOMER, AK 99603
PROJECT: HOMER SPIT CHINOOK, COHO & PINK SALMON ENHANCEMENT
PURPOSE: ENHANCE FISHERY ONGOING: Y
EVALUATION: QN :
SURVIVAL: 1984 2.3% RETURN RATE, 1985 2.9% RETURN RATE
STOCKING DETAILS: RELEASED INTO INTER TIDAL INLET OF THE HOMER SPIT
ACCLIMATION DETAILS: SOME FISH ACCLIMATED IN NET PENS FOR 5 DAYS
OTHER PRE STOCKING INFO: 50% OR MORE EACH YR PUT IN NET PENS FOR 2-5 DAYS
IMPACTS; RESEARCH:
IMPACTS; OPINION:
CONTROL DETAILS: 86 RELEASE HAD CWTed LOT OF 21,400 FISH
OTHER COMMENTS: TRIED MORPHOLINE TO ATTRACT FISH TO THE OTHER AREAS ALONG SPIT, DID
NOT WORK. DURING LAST 3 YRS HAVE RELEASED COHO AND PINKS ALSO.

19. SPECIES: CH RACE: STOCK(S): CC

MAJOR DRAINAGE: AC SUB DRAINAGE: SELDOVIA BAY
CONTACT: NICK DUDIAK PHONE: (907)235-8191

AGENCY: ADFG ADDRESS: 3298 DOUGLAS ST., HOMER, AK 99603

PROJECT: SELDOVIA BAY CHINOOK SALMON ENHANCEMENT
PURPOSE: ENHANCE FISHERY ONGOING: Y
EVALUATION: QN : ONE SALT RETURNS WERE HIGH APPROX. 500

SURVIVAL:
STOCKING DETAILS: STOCKED JUNE 1 & 2, TRUCK AND BARGE
ACCLIMATION DETAILS: 88,000 OUT OF 191,855 WERE PUT IN NET PENS FOR 5 DAYS
OTHER PRE STOCKING INFO: FISH IN NET PENS WERE FED
IMPACTS; RESEARCH:
IMPACTS; OPINION:
CONTROL DETAILS:
OTHER COMMENTS:

20. SPECIES: CH RACE: STOCK(S): CR
MAJOR DRAINAGE: CR SUB DRAINAGE: CLACKAMIS RIVER
CONTACT: LARRY DIMMICK PHONE: (503)374-8540
AGENCY: ODFW ADDRESS: STAR RT., BOX 750, CASCADE LOCKS, OR 97014
PROJECT: OXBOW HATCHERY
PURPOSE: MITIGATION ONGOING: Y
EVALUATION:
SURVIVAL:
STOCKING DETAILS:
ACCLIMATION DETAILS:
OTHER PRE STOCKING INFO:
IMPACTS; RESEARCH:
IMPACTS; OPINION:
CONTROL DETAILS:
OTHER COMMENTS:

21. SPECIES: CH RACE: STOCK(S): EG
MAJOR DRAINAGE: AC SUB DRAINAGE: COPPER RIVER
CONTACT: KEN ROBERSON PHONE: (907)822-5520
AGENCY: ADFG ADDRESS: P.O. BOX 47, GLENNALLEN, AK 99588
PROJECT: LOWER GULKANA HATCHERY CHINOOK PROJECT
PURPOSE: ENHANCE PRODUCTION ONGOING: Y
EVALUATION: QN : JUST STARTED BUT WILL BE QUANTIFIED RESULTS
SURVIVAL:
STOCKING DETAILS: FED FRY STOCKED BY AIRPLANE
ACCLIMATION DETAILS: ON SITE ACCLIMATION
OTHER PRE STOCKING INFO:
IMPACTS; RESEARCH:
IMPACTS; OPINION:
CONTROL DETAILS: WILL CWT JUVINILES THIS YEAR 1990
OTHER COMMENTS: LAKE REARING CHINOOK, TO ENHANCE AND EVALUATE LAKE REARING POTENTIAL
TRYING TO BRING CHINOOK BACK TO AREA FOR BROODSTOCK ALSO

22. SPECIES: CH RACE: STOCK(S): FR
MAJOR DRAINAGE: BC SUB DRAINAGE: FRASER RIVER
CONTACT: G.E. ROSBERG PHONE: (604)438-1712
AGENCY: SFU ADDRESS: SIMON FRASER UNIV., BC
PROJECT: JUVN. CHINOOK & COHO MIGRATION MONITORING, LOWER FRASER RIVER
PURPOSE: STOCK EVALUATION ON:
EVALUATION: QN:
SURVIVAL: LOW SURVIVAL DUE TO ESTUARY TIMING
STOCKING DETAILS:
ACCLIMATION DETAILS:
OTHER PRE STOCKING INFO:
IMPACTS; RESEARCH: COHO STOCKED CLICKED IN W/ NATURAL COHO
IMPACTS; OPINION: INDICATED THAT HATCHERY CHINOOK BEHAVIOR WAS DIFFERENT
CONTROL DETAILS:
OTHER COMMENTS: STUDY LOOKED AT MIGRATION TIMING TO FEASER RIVER ESTURAY

23. SPECIES: CH RACE: STOCK(S): FT
MAJOR DRAINAGE: CC SUB DRAINAGE: SAN FRANCISCO BAY
CONTACT: HACK COLLINS PHONE: (415)454-7754
AGENCY: TCSF ADDRESS: P.O.BOX 328, SAN RAFAEL, CA 94915
PROJECT: SALMON REARING PROJECT
PURPOSE: ENHANCE FISHERY

EVALUATION: QN : CWT PROGRAM (3 YEARS); SURVIVAL STUDIES ON CWT GROUPS BY CDFG
SURVIVAL: OCEAN CONTRIB. RATE=.14%-7.28%
STOCKING DETAILS: DAYTIME RELEASE WITH THE TIDE AT 6-7 FISH/LB
ACCLIMATION DETAILS:
OTHER PRE STOCKING INFO:
IMPACTS; RESEARCH:
IMPACTS; RESEARCH:
IMPACTS; OPINION: UNKNOWN
CONTROL DETAILS:
OTHER COMMENTS: THIS IS A PEN REARING FACILITY

24. SPECIES: CH RACE: STOCK(S): IC
MAJOR DRAINAGE: CC SUB DRAINAGE: KLAMATH RIVER
CONTACT: BILL BEMIS PHONE: (916)842-6131
AGENCY: USFS ADDRESS: KLAMATH NF, 1215 S.MAIN ST., YREKA, CA 96097
PROJECT: INDIAN CREEK SPAWNING CHANNEL
PURPOSE: PROVIDE SPAWNING HABITAT ONGOING: Y
EVALUATION: QN : REDD/CARCASS COUNTS
SURVIVAL:
STOCKING DETAILS: VOLUNTARY MIGRATION OUT OF CHANNEL
ACCLIMATION DETAILS:
OTHER PRE STOCKING INFO: 1987: 9 CHIN USED CHANNEL; 1988, 1989=NO USEAGE
IMPACTS; RESEARCH: CHANNEL IS BEING USED BY ADULTS
IMPACTS; OPINION:
CONTROL DETAILS:
OTHER COMMENTS:

25. SPECIES: CH RACE: STOCK(S): MIXED
MAJOR DRAINAGE: OC SUB DRAINAGE: COOS RIVER, SIUSLAW RIVER, YAQUINA RIVER
CONTACT: JAY NICHOLAS PHONE: (503)737-4431
AGENCY: ODFW ADDRESS: 28655 HWY 34, CORVALLIS, OR 97330
PROJECT: DISTRIBUTION AND ABUNDANCE OF HATCHERY AND WILD SALMON
PURPOSE: RESEARCH ONGOING: N
EVALUATION: QA : SEINED; DETERMINED AVERAGE CATCH PER SEINE HAUL
SURVIVAL:
STOCKING DETAILS: NA
ACCLIMATION DETAILS:
OTHER PRE STOCKING INFO:
IMPACTS; RESEARCH:
IMPACTS; OPINION: THERE IS POTENTIAL FOR COMPETITION BETWEEN HATCHERY AND WILD FISH
CONTROL DETAILS:
OTHER COMMENTS: IMPACTS BASED ON-#'S OF FISH, AVAILABILITY OF ESSENTIAL RESOUR
CES, COMPETATIVE EFFICIENCY OF HATCHERY FISH; INFORMATION REPORT#83-7

26. SPECIES: CH RACE: STOCK(S): MT
MAJOR DRAINAGE: CC SUB DRAINAGE: MATTOLE RIVER
CONTACT: GARY PETERSON PHONE: (707)629-3514
AGENCY: MWSSG ADDRESS: P.O.BOX 188, PETROLIA, CA 95538
PROJECT: MATTOLE WATERSHED SALMON SUPPORT GROUP
PURPOSE: ENHANCE WILD STOCKS ONGOING: Y
EVALUATION: QN : CWT PROGRAM(2 YEARS); JUVENILE TRAPPING; SPAWNING SURVEYS
SURVIVAL:
STOCKING DETAILS: DUSK OR EVENING RELEASE WITH NEW MOON PHASE
ACCLIMATION DETAILS: TEMPERATURE ACCLIMATION
OTHER PRE STOCKING INFO: FISH TAKEN OFF FEED AND SALTED PRIOR TO STOCKING
IMPACTS; RESEARCH:
IMPACTS; OPINION: POPULATIONS ARE STATIC NO INCREASE OR DECREASE
CONTROL DETAILS:
OTHER COMMENTS: STOCKS MAY BE STATIC DUE TO JUVENILE BOTTLENECK IN ESTUARY

27. SPECIES: CH RACE: STOCK(S): RC
MAJOR DRAINAGE: CC SUB DRAINAGE: SMITH RIVER
CONTACT: TOM GREENER PHONE: REFER TO TEXT
AGENCY: SOC ADDRESS: BAR-O-BOYS RANCH, 15005 HWY 199, GASQUET, CA 95543
PROJECT: BAR-O-BOYS
PURPOSE: EDUCATION ONGOING: Y
EVALUATION: QN : SUMMERTIME SNORKELLING; SPAWNING SURVEYS; ADULT TRAPPING-FUTURE
SURVIVAL:
STOCKING DETAILS: DIRECT; TRUCKED; SALTED PRIOR TO RELEASE
ACCLIMATION DETAILS:
OTHER PRE STOCKING INFO: SPAWNING HABITAT IS BELOW CARRYING CAPACITY
IMPACTS; RESEARCH:
IMPACTS; OPINION: ABUNDANCE IS LOWER THAN IN PREVIOUS DECADES
CONTROL DETAILS:
OTHER COMMENTS: PROGRAM WILL CHANGE FROM ROWDY CREEK STOCKS TO MONKEY CREEK
STOCKS

28. SPECIES: CH RACE: STOCK(S): RW
MAJOR DRAINAGE: CC SUB DRAINAGE: REDWOOD CREEK
CONTACT: STEVE SANDERS PHONE: (707)488-2253
AGENCY: HBCO ADDRESS: PRARIE CREEK FISH HATCHERY, ORICK, CA 95555
PROJECT: PRARIE CREEK FISH HATCHERY
PURPOSE: PROVIDE SALMON FOR OFF-SHORE FISHERIES ONGOING: Y
EVALUATION: QN : SPAWNING SURVEYS; FIN-CLIP PROGRAM
SURVIVAL:
STOCKING DETAILS: RELEASE WITH NEW MOON; 10% FIN-CLIPPED
ACCLIMATION DETAILS:
OTHER PRE STOCKING INFO:
IMPACTS; RESEARCH: NATURAL STOCKS WERE ENHANCED
IMPACTS; OPINION:
CONTROL DETAILS:
OTHER COMMENTS: POACHING AND ILLEGAL GILL NETTING PROBLEMS

29. SPECIES: CH RACE: STOCK(S): ST

MAJOR DRAINAGE: CC SUB DRAINAGE: KLAMATH RIVER
CONTACT: JACK WEST PHONE: (916)842-6131

AGENCY: USFS ADDRESS: KLAMATH NF, 1215 S.MAIN ST., YREKA, CA 96097

PROJECT: KELSEY CREEK SPAWNING-REARING CHANNEL

PURPOSE: PROVIDE SPAWNING HABITAT ONGOING: Y

EVALUATION: QN : REDD/CARCASS COUNTS; JUVENILE TRAPPING; STANDING CROP ESTIMATES
SURVIVAL:

STOCKING DETAILS: VOLUNTARY MIGRATION OUT OF CHANNEL

ACCLIMATION DETAILS:
OTHER PRE STOCKING INFO:
IMPACTS; RESEARCH: CHANNEL IS USED BY ADULTS
IMPACTS; OPINION:
CONTROL DETAILS:
OTHER COMMENTS:

30. SPECIES: CH RACE: STOCK(S): TH
MAJOR DRAINAGE: BC SUB DRAINAGE: THOMPSON RIVER
CONTACT: D.C. SEBASTIN PHONE: () AGENCY: CSFO ADDRESS:
PROJECT: OUTPLANTING OPPORTUNITIES FOR CHINOOK, COHO & STEELHEAD IN 6 TRIBS.
PURPOSE: HABITAT EVALUATION ONGOING: N
EVALUATION: QN :
SURVIVAL:
STOCKING DETAILS: 24 HA OF STREAM HABITAT PROPOASED TO BE STOCKED
ACCLIMATION DETAILS:
OTHER PRE STOCKING INFO:
IMPACTS; RESEARCH:
IMPACTS; OPINION: MAY PRODUCE 6,300 ADULT CHINOOK
CONTROL DETAILS:
OTHER COMMENTS: OPPORTUNITY FOR COHO FRY OUTPLANT PRODUCTION MAY BE PRESENT IN ALL
STUDY

31. SPECIES: CH RACE: STOCK(S): WI
MAJOR DRAINAGE: AC SUB DRAINAGE: SUSITNA RIVER
CONTACT: BOB CHLUPACH PHONE: (907)892-6816
AGENCY: ADFG ADDRESS: P.O. BOX 520209, BIG LAKE AK 99652
PROJECT: NORTHERN COOK INLET CHINOOK AND COHO SALMON ENHANCEMENT
PURPOSE: RESEARCH
EVALUATION: QN :
SURVIVAL: 1985 RELEASE 0.4% SURVIVAL TO ADULTS FOR ALL 3 GROUPS
STOCKING DETAILS: HAULED BY TRUCK
ACCLIMATION DETAILS: MATCHER TEMPERATURE
OTHER PRE STOCKING INFO:
IMPACTS; RESEARCH: FIND CORRECT TIME TO RELEASE SO THEY GET TO SALT WATER ON TIME
IMPACTS; OPINION:
CONTROL DETAILS:
OTHER COMMENTS: THEY ARE GOING TO MAINLY SMOLT RELEASES NOW. ESTIMATE ADULT SURVIVAL
TRYING TO TUNE IN ON TIME OF SMOLTIFICATION

32. SPECIES: CH RACE: STOCK(S): WI
MAJOR DRAINAGE: OC SUB DRAINAGE: COOS RIVER (SYSTEM)
CONTACT: JAY NICHOLAS PHONE: (503)737-4431
AGENCY: ODFW ADDRESS: 28655 HWY 34, CORVALLIS, OR 97330
PROJECT: CHINOOK MARKING PROGRAM-STEP
PURPOSE: RESEARCH ONGOING: Y
EVALUATION: QN : CWT PROGRAM; CONTRIBUTION TO FISHERY AND NATURAL SPAWNING
SURVIVAL:
STOCKING DETAILS: TRUCKED
ACCLIMATION DETAILS:
OTHER PRE STOCKING INFO:
IMPACTS; RESEARCH:
IMPACTS; OPINION:
CONTROL DETAILS:
OTHER COMMENTS: THIS PROGRAM HAS JUST STARTED, NO RETURNS AS OF YET

33. SPECIES: CH RACE: FAL STOCK(S):
MAJOR DRAINAGE: CC SUB DRAINAGE: FRESHWATER CR
CONTACT: JUD ELLINWOOD PHONE: (707)444-8903
AGENCY: HFAC ADDRESS: 500 FRESHWATER RD, FRESHWATER, CA 95501
PROJECT: FRESHWATER CREEK SALMON TRAPPING & SPAWNING STATION
PURPOSE: ENHANCE WILD STOCKS ONGOING: Y
EVALUATION: : GAGE SUCCESS IN RELEASE QUALITY & QUANITY, NOT ADULT RETURNS
SURVIVAL:
STOCKING DETAILS: TANK TRUCK & RELEASED INTO METAL PIPE AT 15/LB
ACCLIMATION DETAILS: N/A
OTHER PRE STOCKING INFO: RELEASES BASED ON WATER & PHYSIOLOGICAL CONDITIONS
IMPACTS; RESEARCH: MINOR STRAYING WITHIN HUMBOLDT BAY, STRONG IMPRINTING
IMPACTS; OPINION: POSSIBLE REDUCTION IN VARIABILITY OF POPULATION
CONTROL DETAILS: N/A
OTHER COMMENTS: REARED OUT OF BASIN, IN COCHRAN PONDS & AT MAD RIVER HATCHERY

34. SPECIES: CH RACE: FAL STOCK(S): BC
MAJOR DRAINAGE: CR SUB DRAINAGE: KLASKANINE RIVER
CONTACT: QUENTIN SMITH PHONE: (503)325-3653
AGENCY: ODFW ADDRESS: ROUTE 1, BOX 764, ASTORIA, OR 97103
PROJECT: KLASKANINE FISH HATCHERY
PURPOSE: MITIGATION ONGOING: Y
EVALUATION: QA : STREAM SURVEYS(CEDC); CWT PROGRAM
SURVIVAL:
STOCKING DETAILS: LOSSES DUE TO TRUCKING STRESS; 200,000 CWT
ACCLIMATION DETAILS: NA
OTHER PRE STOCKING INFO: NA
IMPACTS; RESEARCH:
IMPACTS; OPINION: NO INCREASE IN ADULTS OBSERVED
CONTROL DETAILS: NA
OTHER COMMENTS: SILT PROBLEMS MIGHT ALSO BE AFFECTING THE SURVIVAL OF NATURAL
SPAWNERS

35. SPECIES: CH RACE: FAL STOCK(S): BT
MAJOR DRAINAGE: SR SUB DRAINAGE: BATTLE CREEK
CONTACT: GENE FORBES PHONE: (916)365-8622
AGENCY: FWS ADDRESS: CNFH, ROUTE 1, BOX 2105, ANDERSON, CA 96007
PROJECT: COLEMAN NATIONAL FISH HATCHERY
PURPOSE: MITIGATION ONGOING: Y
EVALUATION: QN : CWT PROGRAM; DAM COUNTS; JUVENILE STUDIES; SPAWNING SURVEYS
SURVIVAL: on-site:0.01-0.5% (fry); off-site: 0.01-0.8% (fry)
STOCKING DETAILS: TRUCKED; RELEASES TIMED WITH FLUSHING FLOWS PAST RBDD
ACCLIMATION DETAILS:
OTHER PRE STOCKING INFO: BATTLE CREEK STOCKS ARE GENETICALLY DISCRETE
IMPACTS; RESEARCH: SPAWNING IN MAINSTREAM AND TRIBUTARIES
IMPACTS; OPINION:
CONTROL DETAILS:
OTHER COMMENTS: HATCHERY STOCKS WERE DEVELOPED FROM NATIVE STOCKS, THEY ARE
BELIEVED TO BE VERY SIMILAR TO THEM STILL

36. SPECIES: CH RACE: FAL STOCK(S): CH
MAJOR DRAINAGE: OC SUB DRAINAGE: CHETCO RIVER
CONTACT: GARY SUSAC PHONE: (503)332-4744
AGENCY: ODFW ADDRESS: 95159 ELK RIVER RD., PORT ORFORD, OR 97465
PROJECT: ELK RIVER STUDY
PURPOSE: ENHANCE RUNS ONGOING: Y
EVALUATION: NA:
SURVIVAL:
STOCKING DETAILS: TRUCK SMOLTS AND FRY, USE HATCH BOXES
ACCLIMATION DETAILS: 1 YEAR ONLY MAYBE 2, NO EVALUATION
OTHER PRE STOCKING INFO: PRE HATCHERY EVALUATION WAS COMPLETED
IMPACTS; RESEARCH: BROODSTOCK SEINED FROM CHETCO R., 25,000 CWT STOCK ASSESSMENT
IMPACTS; OPINION: FEEL THAT IT STABALIZES RUN
CONTROL DETAILS: /A
OTHER COMMENTS: PUBLIC HAS INFLUENCED ALLOCATION INCREASES TO THE CHETCO, AS WELL AS
INCREASES IN MARKING AND EVALUATION

37. SPECIES: CH RACE: FAL STOCK(S): CH
MAJOR DRAINAGE: OC SUB DRAINAGE: CHETCO RIVER
CONTACT: AL MCGIE PHONE: (503)737-4431
AGENCY: ODFW ADDRESS: 28655 HWY 34, CORVALLIS, OR 97300
PROJECT: CHETCO RIVER SMOLT RELEASE CONTRIBUTIONS
PURPOSE: RESEARCH, ENHANCE FISHERY ONGOING: Y
EVALUATION: QN : CONTRIBUTION AND DISTRIBUTION OF CATCH BASED ON MARKED FISH; CREEL
SURVIVAL:
STOCKING DETAILS: TRUCKED
ACCLIMATION DETAILS:
OTHER PRE STOCKING INFO:
IMPACTS; RESEARCH: 4-14.3% CONTRIBUTION TO THE COMMERCIAL AND SPORT CATCH
IMPACTS; OPINION:
CONTROL DETAILS:
OTHER COMMENTS: NEED TO ADAPT HATCHERY REARING PROGRAMS TO THE NATURAL LIFE
HISTORY OF THE STOCKS; INFORMATION REPORT #87-1, ODFW

38. SPECIES: CH RACE: FAL STOCK(S): EL

MAJOR DRAINAGE: OC SUB DRAINAGE: BRUSH CREEK
CONTACT: GARY SUSAC PHONE: (503)332-4744

AGENCY: ODFW ADDRESS: 95159 ELK RIVER RD., PORT ORFORD, OR 97465

PROJECT: BRUSH CREEK
PURPOSE: ENHANCE WILD STOCKS ONGOING: Y
EVALUATION: NA :
SURVIVAL:
STOCKING DETAILS: STOCK IN SPRING
ACCLIMATION DETAILS: N/A
OTHER PRE STOCKING INFO:
IMPACTS; RESEARCH: .15 FRY PER METER SQUARED JUST BEFORE SMOLT, IN 3 HABITAT TYPES
IMPACTS; OPINION:
CONTROL DETAILS: N/A
OTHER COMMENTS: FEEDS DIRECTLY INTO OCEAN

39. SPECIES: CH RACE: FAL STOCK(S): ER

MAJOR DRAINAGE: CC SUB DRAINAGE: RUSSIAN RIVER

CONTACT: ROYCE GUNTER PHONE: (707)433-6325

AGENCY: CDFG ADDRESS: 3246 SKAGGS SPRINGS RD., GEYSERVILLE, CA 95441

PROJECT: WARM SPRINGS FISH HATCHERY

PURPOSE: RE-ESTABLISH RUN, ENHANCE RUNS ONGOING: Y

EVALUATION: QN : NO FIN-CLIP RETURNS AS OF JUNE, 1989

SURVIVAL:

STOCKING DETAILS: RELEASE WITH LUNAR PHASE; 100% FIN-CLIPPED (1986-88)

ACCLIMATION DETAILS:

OTHER PRE STOCKING INFO: FISH TAKEN OFF FEED; SALTED PRIOR TO STOCKING

IMPACTS; RESEARCH: STOCKS ARE BEING REBUILT AND ENHANCED

IMPACTS; OPINION:

CONTROL DETAILS:

OTHER COMMENTS:

40. SPECIES: CH RACE: FAL STOCK(S): ER
MAJOR DRAINAGE: OC SUB DRAINAGE: ELK RIVER
CONTACT: GARY SUSAC PHONE: (503)332-4744
AGENCY: ODFW ADDRESS: 95159 ELK RIVER RD., PORT ORFORD, OR 97465
PROJECT: ELK RIVER STUDY
PURPOSE: ENHANCE FISHERY ONGOING: Y
EVALUATION: NA:
SURVIVAL:
STOCKING DETAILS: SMOLTS RELEASED AFTER MAJOR OUTMIGRATION OF NATURAL STOCK
ACCLIMATION DETAILS: REARED IN RIVER WATER AT HATCHERY
OTHER PRE STOCKING INFO: BROODSTOCK IS PICKED TO MATCH TNE NATURAL RUN
IMPACTS; RESEARCH: 75% OF PROGENY TO THE WILD
IMPACTS; OPINION: PROGENY OF HATCHERY FISH SPAWANED IN WILD ARE CONSIDERED WILD
CONTROL DETAILS: HATCHERY RELEASE OF 315,000 WITH 25,000 MARKED
OTHER COMMENTS: USING WILD FISH IS NOT PART OF STUDY, BUT IS DONE
HATCHERY FISH DO SPAWN WITH WILD FISH

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41. SPECIES: CH RACE: FAL STOCK(S): FT
MAJOR DRAINAGE: SR SUB DRAINAGE: FEATHER RIVER
CONTACT: DON SCHLICTING PHONE: (916)538-2222
AGENCY: CDFG ADDRESS: 5 TABLE MTN. BLVD., OROVILLE, CA 95965
PROJECT: FEATHER RIVER FISH HATCHERY
PURPOSE: MITIGATION ONGOING: Y
EVALUATION: QN : AERIAL SPAWNING SURVEYS; TIME OF RELEASE; CWT (11 YEARS OF DATA)
SURVIVAL:
STOCKING DETAILS: DAYTIME RELEASES
ACCLIMATION DETAILS:
OTHER PRE STOCKING INFO:
IMPACTS; RESEARCH: INCREASED RETURNS; HATCHERY AND WILD FISH CROSSING
IMPACTS; OPINION: ON-SITE RELEASES GIVE LOWEST RETURNS
CONTROL DETAILS:
OTHER COMMENTS: BEST RETURNS COME FROM BERKELEY RELEASE AT 30 FISH/LB; ESTUARY
RELEASES WORK BEST TO AVOID LOSSES DUE TO DIVERSIONS, PREDATION ETC.

42. SPECIES: CH RACE: FAL STOCK(S): FT
MAJOR DRAINAGE: SR SUB DRAINAGE: SACRAMENTO RIVER & SIUSAN BAY
CONTACT: MARTY KJELSON PHONE: (209)466-4421
AGENCY: FWS ADDRESS: 4001 NORTH WILSON WAY, STOCKTON, CA 95205
PROJECT: CHINOOK STOCKING EVALUATION
PURPOSE: STOCKING EVALUATION ONGOING: Y
EVALUATION: QN : RECOVERIES OF CWT FISH
SURVIVAL: FY-HIGHER IN STREAMS THAN DELTA, SM-RELATED TO TEMP, DIVER, DIR
STOCKING DETAILS: TRUCK TRANSPORT, DAYTIME RELEASES
ACCLIMATION DETAILS: N/A
OTHER PRE STOCKING INFO: DIVERSION DAMS, ALL FISH MARKED
IMPACTS; RESEARCH: STRAYING OF RELEASED FISH, MERCED R FISH STRAY AT HIGHER RATE
IMPACTS; OPINION: STRAYING POSSIBLEY DUE TO LOWER FLOWS IN SAN JOAQUIN R
CONTROL DETAILS: VARIED TREATMENTS, UP TO 6 CODES IN ONE PERIOD OF RELEASE
OTHER COMMENTS: ADULTS PROBLEY RETURN TO HATCHERY OF ORGIN

43. SPECIES: CH RACE: FAL STOCK(S): FW
MAJOR DRAINAGE: CC SUB DRAINAGE: HUMBOLDT BAY
CONTACT: CHRISTOPHER TOOLE PHONE: (707)443-8369
AGENCY: HFAC ADDRESS: P.O.BOX 154, EUREKA, CA 95501
PROJECT: COCHRAN CREEK REARING PONDS
PURPOSE: ENHANCE RUNS

EVALUATION: QN : SPAWNING SURVEYS (4 YEARS); SOME OUT-MIGRANT TRAPPING
SURVIVAL:
STOCKING DETAILS: DAYTIME RELEASES AROUND THE NEW MOON PHASE
ACCLIMATION DETAILS:
OTHER PRE STOCKING INFO: RELATIVE DENSITY MONITORING IS ON-GOING
IMPACTS; RESEARCH:
IMPACTS; OPINION: MINIMAL STRAYING; DIFFICULT TO QUANTIFY AFFECTS DUE TO SMALL LOT SIZES
CONTROL DETAILS:
OTHER COMMENTS: LOCAL RESIDENTS CLAIMED THAT THE FRESHWATER CREEK FISHERY WAS
DEPLETED BY THE MID 60'S, IT HISTORICALLY HAD LARGE RUNS

44. SPECIES: CH RACE: FAL STOCK(S): GR,NQ
MAJOR DRAINAGE: PS SUB DRAINAGE: NISQUALLY RIVER
CONTACT: WILLIAM THOMAS PHONE: (206)456-5221
AGENCY: NISQ ADDRESS: 4820 SHE-NAH-NUM DR SE, OLYMPIA, WA 98503
PROJECT: NISQUALLY TRIBE CHINOOK FN ON-STATION RELEASES
PURPOSE: ENHANCE FISHERY AND RUN ONGOING: Y
EVALUATION: QN : PRODUCES +/- 40% OF TOTAL RETURNS TO THE RIVER AND HARVEST
SURVIVAL: TOTAL SURVIVAL TO HARVERST IS +/- 0.5%
STOCKING DETAILS: RAISED TO 50-100/LB, VOLITIONALLY RELEASED TO NISQUALLY
ACCLIMATION DETAILS: HATCHERY WATER IS DRAWN FROM RIVER
OTHER PRE STOCKING INFO: AGE COMPOSITION DATA TAKEN AT HATCHERY RACK RETURNS
IMPACTS; RESEARCH:
IMPACTS; OPINION: IMPACT TO WILD STOCK SHOULD BE MINIMAL, SINCE THERE IS NO GENETIC DIFF.
CONTROL DETAILS: CWT TAG UP TO 20% OF FISH AS INDICATOR STOCK FOR US/CANADA
OTHER COMMENTS: SURPLUS PRODUCTION OUTPLANTED 500/LB, NO EVAL. DONE
PROGRAM IS COORDINATED WITH WDF: EGG BANK FOR S.PUGET SOUND

45. SPECIES: CH RACE: FAL STOCK(S): GR,PU,DS,ES
MAJOR DRAINAGE: PS SUB DRAINAGE: ELSON CREEK
CONTACT: JOHN BARR PHONE: (206)426-9783
AGENCY: SQAX ADDRESS: WEST 81 HIGHWAY 108, SHELTON, WA 98584
PROJECT: ELSON CREEK HATCHERY FALL CHINOOK RELEASES
PURPOSE: ESTABLISH FISHERY ONGOING: N
EVALUATION: QA : MINIMAL ADULT RETURNS NOTED; PROJECT DISCONTINUED
SURVIVAL:
STOCKING DETAILS: DUMP-PLANTED, ON-STATION RELEASES
ACCLIMATION DETAILS: N/A
OTHER PRE STOCKING INFO: N/A
IMPACTS; RESEARCH:
IMPACTS; OPINION: VERY FEW ADULT RETURNS, PROGRAM DISCONTINUED IN 87
CONTROL DETAILS:
OTHER COMMENTS: ELSON CREEK IS TOO SMALL TO ATTRACT CHINOOK

46. SPECIES: CH RACE: FAL STOCK(S): GR,SS
MAJOR DRAINAGE: PS SUB DRAINAGE: GREEN RIVER
CONTACT: DENNIS MOORE PHONE: (206)939-3311
AGENCY: MUCK ADDRESS: TRIBAL ADMIN, 39015 172ND AVE SE, AUBURN, WA 98002
PROJECT: KETA CREEK HATCHERY CHINOOK FRY OUTPLANTS
PURPOSE: PROVIDE FOR FISHERY, UTILIZE HABITAT ONGOING: Y
EVALUATION: NA : 1989 1ST YEAR OF 3 YEAR OLD RETURNS. FOOT & FLOAT SURVEYS
SURVIVAL:
STOCKING DETAILS: REARED TO +/- 500-600/LB, TRANSPORTED AND SCATTER PLANTED
ACCLIMATION DETAILS: N/A
OTHER PRE STOCKING INFO:
IMPACTS; RESEARCH: UNKNOWN
IMPACTS; OPINION:
CONTROL DETAILS: N/A
OTHER COMMENTS: AFFECTS >80 MIS OF STREAM. SOOS CR. STOCK HAS +/- 25% STRAYING
COOPERATIVE STOCKING PROGRAM WITH WEYERHAUSER CO. USING HELI PLANTING

47. SPECIES: CH RACE: FAL STOCK(S): GV, CH, GR, GS
MAJOR DRAINAGE: PS SUB DRAINAGE: KITSAP PENINSULA
CONTACT: PAUL DORN PHONE: (206)598-3311
AGENCY: SUQ ADDRESS: PO BOX 498, SUQUAMISH, WA 98392
PROJECT: SUQUAMISH TRIBAL CHINOOK SMOLT PLANTS
PURPOSE: PROVIDE FOR FISHERY ONGOING: Y
EVALUATION: QN : HARVEST OF 7500-9000 FISH, OVERWHELMING SUCCESS
SURVIVAL: 1% TO FISHERIES
STOCKING DETAILS: REARED TO SMOLTS AT HATCHERY & PONDS, VOLITIONALLY RELEASED
ACCLIMATION DETAILS: REARED IN PONDS AT GORST, CLEAR, AND DOGFISH CR
OTHER PRE STOCKING INFO: THERE ARE LOW OR NO LEVELS OF NATURAL CHINOOK
IMPACTS; RESEARCH:
IMPACTS; OPINION: MINIMAL IMPACT DUE TO LITTLE OR NO NATURAL SPAWNING
CONTROL DETAILS: BROOD STOCK IS CWT AS A US/CANADA INDICATOR STOCK.
OTHER COMMENTS: WOULD LIKE TO EXPAND CLEAR & DOGFISH CR OPER. TO 1 MIL/YR
NO DIRECTRED HARVEST ON BROOD STOCK AT GROVERS CR HATCHERY

48. SPECIES: CH RACE: FAL STOCK(S): HD,DS,FI,GA
MAJOR DRAINAGE: PS SUB DRAINAGE: PUGET SOUND (SOUTHWEST RIVERS)
CONTACT: CHRIS WELLER PHONE: (206)297-3422
AGENCY: PNPT ADDRESS: 7850 NE LITTLE BOSTON RD, KINGSTON, WA 98346
PROJECT: ENETAI
PURPOSE: ENHANCE RUN AND FISHERY ONGOING: Y
EVALUATION: NA:
SURVIVAL:
STOCKING DETAILS: OUTPLANTS 450,000/YR, 300-400/LB INTO MAINSTEM,TRIBS,SFK
ACCLIMATION DETAILS: N/A
OTHER PRE STOCKING INFO: N/A
IMPACTS; RESEARCH: UNKNOWN
IMPACTS; OPINION: THE FISH ARE RELEASED AT LARGER SIZES(50-100/LB) AT THE HATCHERY
CONTROL DETAILS: N/A
OTHER COMMENTS:

49. SPECIES: CH RACE: FAL STOCK(S): HL
MAJOR DRAINAGE: CC SUB DRAINAGE: EEL RIVER
CONTACT: WAYNE O'BRYANT PHONE: (707)925-6458
AGENCY: FBSRA ADDRESS: 49448 HOLLOW TREE RD., WESTPORT, CA 95448
PROJECT: HOLLOW TREE CREEK HATCHERY
PURPOSE: ENHANCE RUNS, PROVIDE STOCK FOR ELSEWHERE ONGOING: Y
EVALUATION: QN : CDFG-CWT IN 1988 AND 1987
SURVIVAL:
STOCKING DETAILS: NEW MOON PHASE RELEASE; CWT-->50,000 IN '88, 10,000 IN '87
ACCLIMATION DETAILS:
OTHER PRE STOCKING INFO: FISH TAKEN OFF FEED PRIOR TO RELEASE; SALTED ONCE/WEEK
IMPACTS; RESEARCH:
IMPACTS; OPINION: SOME FISH DIDN'T RETURN TO HATCHERY BUT WERE SEEN IN THE LOWER RIVER
CONTROL DETAILS:
OTHER COMMENTS: EGG INFERTILITY DUE TO PROBLEMS DURING SPAWNING & INCUBATION

50. SPECIES: CH RACE: FAL STOCK(S): HR

MAJOR DRAINAGE: CC SUB DRAINAGE: TRINITY RIVER
CONTACT: MITCH FARRO PHONE: (707)839-5664

AGENCY: PCFFA ADDRESS: 216 H ST., EUREKA, CA 95501

PROJECT: KLAMATH-TRINITY FALL CHINOOK ENHANCEMENT PROJECT

PURPOSE: ENHANCE RUNS ONGOING: Y

EVALUATION: QN : USDI SPAWNING SURVEYS SINCE 1981; CWT PROGRAM

SURVIVAL:

STOCKING DETAILS: FISH NOT HANDLED DURING RELEASE; RELEASED AFTER 1ST STORMS

ACCLIMATION DETAILS:

OTHER PRE STOCKING INFO: FOREST SERVICE HAS ESTIMATED CARRYING CAPACITY

IMPACTS; RESEARCH: MARK RETURNS INDICATE PROGRAM IS SUCCESSFUL

IMPACTS; OPINION:
CONTROL DETAILS:
OTHER COMMENTS:

51. SPECIES: CH RACE: FAL STOCK(S): KM
MAJOR DRAINAGE: CC SUB DRAINAGE: KLAMATH RIVER
CONTACT: DELMAR ROBINSON PHONE: (916)246-5141
AGENCY: BIA ADDRESS: 1900 CHURN CREEK RD., REDDING, CA 96022
PROJECT: CAPPELL SALMON HATCHERY
PURPOSE: RE-ESTABLISH RUNS ONGOING: Y
EVALUATION: QN : CWT PROGRAM
SURVIVAL:
STOCKING DETAILS: CWT-17,000-SOME RECOVERED
ACCLIMATION DETAILS:
OTHER PRE STOCKING INFO:
IMPACTS; RESEARCH:
IMPACTS; OPINION:
CONTROL DETAILS:
OTHER COMMENTS: POOR HATCHERY DESIGN

52. SPECIES: CH RACE: FAL STOCK(S): LR
MAJOR DRAINAGE: CC SUB DRAINAGE: LITTLE RIVER
CONTACT: MITCH FARRO PHONE: (707)839-5664
AGENCY: PCFFA ADDRESS: P.O.BOX 291, TRINIDAD, CA 95570
PROJECT: LITTLE RIVER FALL CHINOOK ENHANCEMENT PROGRAM
PURPOSE: ENHANCE RUNS, EDUCATION ONGOING: Y
EVALUATION: QN : CWT PROGRAM; SPAWNING GROUND SURVEYS SINCE 1985
SURVIVAL:
STOCKING DETAILS: 100% CWT; TRUCKED; LATE EVENING RELEASES WITH LUNAR PHASE
ACCLIMATION DETAILS: TEMPERATURE ACCLIMATION
OTHER PRE STOCKING INFO:
IMPACTS; RESEARCH: FIRST RETURNS CAME IN 1988, SHOWS PROJECT HAS CONTRIBUTED TO RUNS
IMPACTS; OPINION:
CONTROL DETAILS: SPLIT RELEASE STRATEGY (LOWER VS. UPPER RIVER)
OTHER COMMENTS: LAND USE PRACTICES CAN IMPACT PROJECT; ADULT MALES USED ONLY
ONCE; ONLY MARKED FISH ARE SPAWNED

53. SPECIES: CH RACE: FAL STOCK(S): MA
MAJOR DRAINAGE: PS SUB DRAINAGE: SOOES RIVER
CONTACT: DAVID ZAJAC PHONE: (206)753-9460
AGENCY: FWS ADDRESS: FAO-OLYMPIA, 2625 PARKMONT LN, OLYMPIA, WA 98502
PROJECT: MAKAH NATIONAL FISH HATCHERY
PURPOSE: ENHANCE RUNS ONGOING:
EVALUATION: QN : CWT PROGRAM
SURVIVAL:
STOCKING DETAILS: TRUCKED; HIGH PERCENTAGE MARKED WITH CWT
ACCLIMATION DETAILS: PRE-MIGRATION ACCLIMATION FOR APPROXIMATELY 2 MONTHS
OTHER PRE STOCKING INFO: NA
IMPACTS; RESEARCH: SUCCESSFUL FOR HATCHERY RELEASES, BUT NOT UP-RIVER RELEASES
IMPACTS; OPINION:
CONTROL DETAILS: NA
OTHER COMMENTS:

54. SPECIES: CH RACE: FAL STOCK(S): MC
MAJOR DRAINAGE: CC SUB DRAINAGE: SAN JOAQUIN RIVER
CONTACT: MICHAEL COZART PHONE: (209)563-6410
AGENCY: CDFG ADDRESS: P.O.BOX 94, SNELLING, CA 95369
PROJECT: MERCED RIVER FISH FACILITY
PURPOSE: MITIGATION ONGOING: Y
EVALUATION: QN : OUT-MIGRANT STUDIES; CWT PROGRAM; SPAWNING SURVEYS; YEARLING SURVEY SURVIVAL:
STOCKING DETAILS: DAYTIME RELEASES; TRANSPORT IN SALT; RELEASE WITH LUNAR PHASE ACCLIMATION DETAILS:
OTHER PRE STOCKING INFO: 650,000 CWT PER YEAR MAXIMUM
IMPACTS; RESEARCH: RUN NUMBERS HAVE INCREASED; MIXING OF BASIN STOCKS
IMPACTS; OPINION: STRAYING TO OTHER SYSTEMS IS HIGHER DURING DRY YEARS
CONTROL DETAILS: DIFFERENT CWT CODES FOR DIFFERENT RELEASE SITES
OTHER COMMENTS: SELF-REPRODUCING POPULATIONS HAVE BEEN DEVELOPED

55. SPECIES: CH RACE: FAL STOCK(S): MD
MAJOR DRAINAGE: CC SUB DRAINAGE: MAD RIVER
CONTACT: BRUCE BARNGROVER PHONE: (707)822-0592
AGENCY: CDFG ADDRESS: 1660 HATCHERY RD., ARCATA, CA 95521
PROJECT: MAD RIVER FISH HATCHERY
PURPOSE: ENHANCE RUNS ON NORTH FORK MAD AND SELECTED TRIBUTARIES
SURVIVAL:
STOCKING DETAILS: RELEASED AT NEW MOON PHASE; TRUCKED IN SALT SOLUTION
ACCLIMATION DETAILS:
OTHER PRE STOCKING INFO:
IMPACTS; RESEARCH: NO APPARENT CHANGE IN CHINOOK POPULATION SIZE
IMPACTS; OPINION:
CONTROL DETAILS:
OTHER COMMENTS:

56. SPECIES: CH RACE: FAL STOCK(S): MO
MAJOR DRAINAGE: CC SUB DRAINAGE: SAN FRANCISCO BAY
CONTACT: DON ESTEY PHONE: (209)759-3383
AGENCY: CDFG ADDRESS: P.O.BOX 158, CLEMENTS, CA 95227
PROJECT: MOKELUMNE RIVER FISH HATCHERY
PURPOSE: MITIGATION, ENHANCEMENT ONGOING: Y
EVALUATION: QN : SPORADIC CWT EFFORTS; ANNUAL CARCASS COUNTS
SURVIVAL:
STOCKING DETAILS: DAYTIME RELEASES
ACCLIMATION DETAILS:
OTHER PRE STOCKING INFO: EGGS EXCHANGED OCCASIONALLY WITH FEATHER RIV. HATCHERY
IMPACTS; RESEARCH: HIGH RATE OF STRAYING DUE TO UNRELIABLE ATTRACTION FLOWS
IMPACTS; OPINION: IN-RIVER STOCKS ARE BELIEVED TO BE PRIMARILY HATCHERY FISH
CONTROL DETAILS:
OTHER COMMENTS: ON-SITE RELEASES ARE NOT VERY SUCCESSFUL; BEST RELEASES ARE AT
BERKELEY AT 30 FISH/LB; THERE IS PROBABLY A REMNANT RUN OF SPRING CHINOOK

57. SPECIES: CH RACE: FAL STOCK(S): NO,GR,SM,SO
MAJOR DRAINAGE: PS SUB DRAINAGE: NOOKSACK RIVER
CONTACT: STEVE SEYMOUR PHONE: (206)734-8180
AGENCY: LUMM ADDRESS: 2616 KWINA ROAD, BELLINGHAM, WA 98226
PROJECT: LUMMI-SKOOKUM CR HATCHERY FALL CHINOOK
PURPOSE: ENHANCE FISHERIES
EVALUATION: ON : NOT MANY UPRIVER RELEASES, CURRENTLY
SURVIVAL: SURVIVAL < 1.0%
STOCKING DETAILS: VOLITIONALLY RELEASED
ACCLIMATION DETAILS: REARED AT KWINA POND, VOLITIONALLY RELEASED INTO LOWER R.
OTHER PRE STOCKING INFO: OUTMIGRATION INFO AVAILABLE
IMPACTS; RESEARCH:
IMPACTS; OPINION: MANAGED FOR HATCHERY FISH, ON NATURAL PRODUCTION KNOWN
CONTROL DETAILS: NOW TAG LUMMI BAY NET PEN FISH. NEXT YR WILL TAG LOWER R. REL
OTHER COMMENTS: ESTIMATES THE TRIBE IS WITHIN 4YRS OF DETERMINING EFFECTIVENES
FISH ARE PLANTED TO RM 14.0 OF SOUTH FORK: AFFECTS ABOUT 50 RIVER MILES.

58. SPECIES: CH RACE: FAL STOCK(S): PU,GR,DS
MAJOR DRAINAGE: PS SUB DRAINAGE: PUYALLUP RIVER
CONTACT: RUSSELL LADLEY PHONE: (206)593-0254
AGENCY: PUT ADDRESS: 6824 PIONEER WAY WEST, PUYALLUP, WA 98371
PROJECT: PUYALLUP CHINOOK
PURPOSE: ENHANCE RUN AND FISHERIES ONGOING: Y
EVALUATION: QA : NO INCREASE TO RUN SIZE, SPAWNING SURVEYS IN MAIN STEM UNRELIABLE
SURVIVAL:
STOCKING DETAILS: DUMP-PLANTED TO LOWER REACHES OF DRAINAGE
ACCLIMATION DETAILS: N/A
OTHER PRE STOCKING INFO: CARRING CAP. NOT DETERMINED
IMPACTS; RESEARCH:
IMPACTS; RESEARCH:
IMPACTS; OPINION: SOME MIXING OF STOCK, ANYTHING THAT INCREASES NUMBERS IS BENEFICIAL
CONTROL DETAILS: 798234 CWT TO CLARKS CR.IN 1985-87
OTHER COMMENTS: RESULTS OF PROJECT MEASURED IN ADULT RETURNS AND HARVEST.
11,325 FISH RV-CLIPPED RELEASED TO HYLEBOS CREEK IN 81

59. SPECIES: CH RACE: FAL STOCK(S): SS, GR
MAJOR DRAINAGE: PS SUB DRAINAGE: GREEN RIVER
CONTACT: DENNIS MOORE PHONE: (206)939-3311
AGENCY: MUCK ADDRESS: TRIBAL ADMIN, 39015 172ND AVE SE, AUBURN, WA 98002
PROJECT: KETA CR. HATCHERY ON-STATION CHINOOK RELEASES
PURPOSE: PROVIDE FOR FISHERIES, ONGOING: Y
EVALUATION: QA : INCREASING COMM. HARVEST, NUMBERS OF RACK RETURNS & SPAWNERS
SURVIVAL:
STOCKING DETAILS: REAR FOR 45-90 DAYS, DUMP-RELEASE ON STATION
ACCLIMATION DETAILS: N/A
OTHER PRE STOCKING INFO: SPAWNING SURVEYS RUN, SCALE SAMPLING TO EST. RETURN
IMPACTS; RESEARCH:
IMPACTS; OPINION: MANAGED FOR HATCHERY FISH, SO HARVEST IMPACTS WILD STOCK
CONTROL DETAILS: CWT TAGGED SINCE 1981, HAVE 6 YEARS OF RETURN DATA
OTHER COMMENTS: NOT A US/CANADA INDICATOR STOCK
RAISING CHINOOKS IMPACTS CHUM PRODUCTION DUE TO LACK OF SPACE

60. SPECIES: CH RACE: FAL STOCK(S): SY,GR,SM
MAJOR DRAINAGE: PS SUB DRAINAGE: TULALIP BAY
CONTACT: CLIFF BENGSTON PHONE: (206)653-7477
AGENCY: TULA ADDRESS: 10610 WATERWORKS ROAD, MARYSVILLE, WA 98720
PROJECT: TULALIP TRIBAL HATCHERY FALL CHINOOK RELEASES
PURPOSE: PROVIDE FOR FISHERIES ONGOING: Y
EVALUATION: QN : RETURNS ARE UNKNOWN AND VARIABLE. SURVIVAL TO TULALIP BAY=0.1%
SURVIVAL: 0.1%
STOCKING DETAILS: INCUBATED IN HEATH SYSTEM. ACCELERATED IN WELL WATER
ACCLIMATION DETAILS: REARED IN PONDS 80/LB, FORCED RELEASE W/ CHUM IN MAY
OTHER PRE STOCKING INFO:
IMPACTS; RESEARCH:
IMPACTS; OPINION: UNKNOWN IMPACTS TO WILD STOCKS
CONTROL DETAILS: CHINOOK CWT AS AN INDICATOR STOCK FOR US/CANADA
OTHER COMMENTS: COOPERATIVE PROGRAM WITH WDF

61. SPECIES: CH RACE: FAL STOCK(S): TN
MAJOR DRAINAGE: CC SUB DRAINAGE: KLAMATH RIVER
CONTACT: GERALD BIDELL PHONE: (916)778-3931
AGENCY: CDFG ADDRESS: P.O.BOX 162, LEWISTON, CA 96052
PROJECT: TRINITY RIVER SALMON AND STEELHEAD HATCHERY
PURPOSE: MITIGATION ONGOING: Y
EVALUATION: QN : CWT PROGRAM; SPAWNING GROUND SURVEYS; JUVENILE TRAPPING;
SURVIVAL:
STOCKING DETAILS: DIRECT OR TRUCKED; DAYTIME RELEASES; 10-15% CWT
ACCLIMATION DETAILS:
OTHER PRE STOCKING INFO:
IMPACTS; RESEARCH: INCREASED RETURNS TO HATCHERY
IMPACTS; OPINION: HISTORY OF USING REARING NON-ENDEMIC STOCKS
CONTROL DETAILS:
OTHER COMMENTS: EVALUATION DETAILS CON'T. - LIESTAGE COMPARISONS; CONTRIBUTIONS
TO USER GROUPS

62. SPECIES: CH RACE: FAL STOCK(S): TN
MAJOR DRAINAGE: CC SUB DRAINAGE: TRINITY RIVER
CONTACT: MICHAEL ORCUTT PHONE: (916)625-4268
AGENCY: HVBC ADDRESS: P.O.BOX 417, HOOPA, CA 95546
PROJECT: HOOPA VALLEY BUSINESS COUNCIL FISHERIES ENHANCEMENT PROJECT
PURPOSE: ENHANCE RUNS ONGOING: Y
EVALUATION: QN : CWT PROGRAM; SPAWNING SUREYS; OUT-MIGRANT TRAPPING<-EVAL.SINCE 1984
SURVIVAL: 1981-85 B.Y. CONTRIB. RATE RANGE=.538-7.014
STOCKING DETAILS: 100% MARKED; RELEASE ON NEW MOON PHASE AT 5-10 FISH/LB
ACCLIMATION DETAILS:
OTHER PRE STOCKING INFO: CONTRIB. RATE= (EST. # HARVEST/# REL) X 100
IMPACTS; RESEARCH: PRELIMINARY-SUBSTANTIAL CONTRIBUTION TO OCEAN FISHERY
IMPACTS; OPINION:
CONTROL DETAILS:
OTHER COMMENTS:

63. SPECIES: CH RACE: FAL STOCK(S): UM, AL
MAJOR DRAINAGE: OC SUB DRAINAGE: ALSEA RIVER, UMPQUA RIVER
CONTACT: JERRY SWAFFORD PHONE: (503)496-3484
AGENCY: ODFW ADDRESS: HC 60, BOX 13, IDLEYLD PARK, OR 97447
PROJECT: ROCK CREEK FISH HATCHERY
PURPOSE: ENHANCE WILD STOCKS

CVALUATION: SURVIVAL:
STOCKING DETAILS:
ACCLIMATION DETAILS:
OTHER PRE STOCKING INFO:
IMPACTS; RESEARCH:
IMPACTS; CPINION:
CONTROL DETAILS:
OTHER COMMENTS:

64. SPECIES: CH RACE: FAL STOCK(S): UNK
MAJOR DRAINAGE: SR SUB DRAINAGE: SACRAMENTO RIVER
CONTACT: JAMES SMITH PHONE: (916)527-3043
AGENCY: FWS ADDRESS: P.O. BOX 667, RED BLUFF, CA 96080
PROJECT: COLEMAN HATCHERY RELEASE EVALUATION
ONGOING: Y
EVALUATION: QN : OCEAN FISHERIES, HATCHERY RETURNS, SPAWNING GROUND SURVEYS
SURVIVAL:
STOCKING DETAILS: SEASONAL RELEASES
ACCLIMATION DETAILS: N/A
OTHER PRE STOCKING INFO: STANDARD MINIMUM NUMBER OF 50,000
IMPACTS; RESEARCH:
IMPACTS; OPINION: MINIMAL IMPACTS BASINWIDE, BUT SPECIFIC LOCAL IMPACTS MAY BE OCCURING
CONTROL DETAILS: NORMAL, STANDARD RELEASES IN NUMBERS EQUAL TO EXPER. RELEASES
OTHER COMMENTS:

65. SPECIES: CH RACE: FAL STOCK(S): UR
MAJOR DRAINAGE: CR SUB DRAINAGE: YAKIMA RIVER
CONTACT: TOM SCRIBNER PHONE: (509)865-5121
AGENCY: YAKI ADDRESS: PO BOX 151, TOPPNENISH, WA 98948
PROJECT: CHINOOK PEN REARING
PURPOSE: ENHANCE RUN ONGOING: Y
EVALUATION: DIRECT COMPARISON
SURVIVAL:
STOCKING DETAILS: OPEN PENS
ACCLIMATION DETAILS: PEN REARED FOR ONE MONTH
OTHER PRE STOCKING INFO:
IMPACTS; RESEARCH:
IMPACTS; OPINION: MAY INCREASE PREDATION DUE TO COVER PROVIDED PREDATORS BY PENS
CONTROL DETAILS: COMPARING SUNNYSIDE RELEASES TO PEN REARING STOCK

OTHER COMMENTS:

66. SPECIES: CH RACE: FAL STOCK(S): URB
MAJOR DRAINAGE: CR SUB DRAINAGE: WASHUGAL RIVER
CONTACT: DICK JOHNSON PHONE: (206)837-3311
AGENCY: WDF ADDRESS: WASHOUGAL FISH HATCHERY, WASHOUGAL, WA 98671
PROJECT: WASHOUGAL HATCHERY
PURPOSE: HABITAT UTILIZATION ONGOING: Y
EVALUATION: NA : N/A WOULD LIKE TO SEE EVALUATION
SURVIVAL:
STOCKING DETAILS: TRUCKED
ACCLIMATION DETAILS: N/A
OTHER PRE STOCKING INFO:
IMPACTS; RESEARCH:
IMPACTS; OPINION: THINK CHINOOK ARE CONTRIBUTING TO LOWER WASHUGAL R. NATURAL SPAWNING
CONTROL DETAILS: N/A
OTHER COMMENTS: POTENTIAL PROGRAM WOULD BE TO LOOK AT LONG TERM TRENDS BASED ON
OUTPLANTING PROGRAMS

67. SPECIES: CH RACE: LFA STOCK(S): HP
MAJOR DRAINAGE: CC SUB DRAINAGE: KLAMATH RIVER
CONTACT: RONNIE PIERCE PHONE: (707)839-3637
AGENCY: NCIDC ADDRESS: 1111 FORSON RD., MCKINLEYVILLE, CA 95521
PROJECT: HIGH PRARIE CREEK FACILITY
PURPOSE: RE-ESTABLISH RUNS ONGOING: Y
EVALUATION: NA : IT WILL BE MONITORED
SURVIVAL:
STOCKING DETAILS: HAND RELEASED WITH BUCKETS AND NETS FROM TRANSPORT TANKS
ACCLIMATION DETAILS:
OTHER PRE STOCKING INFO: LIMITED SPAWNING HABITAT BECAUSE OF LOGGING
IMPACTS; RESEARCH:
IMPACTS; RESEARCH:
IMPACTS; OPINION: ANTICIPATED RESTORATION OF NATURAL STOCKS THROUGH STRAYING
CONTROL DETAILS:
OTHER COMMENTS: CONCERN OVER THE USE OF HERBICIDES BY LOCAL LANDOWNERS; PROJECT
IS CONFINED BY LOW SUMMER FLOWS (EXTENDED REARING ISN'T POSSIBLE)

68. SPECIES: CH RACE: LFA STOCK(S): KM

MAJOR DRAINAGE: CC SUB DRAINAGE: KLAMATH RIVER

CONTACT: WALTER LARA, JR. PHONE: (707)482-4535

AGENCY: NCIDC ADDRESS: 550 PJ MURPHY MEMORIAL DR., KLAMATH, CA 95548

PROJECT: HUNTER/SPRUCE CREEK/HIGH PRARIE CREEK FACILITIES

PURPOSE: RE-ESTABLISH RUNS, TRIBAL FISHERY ONGOING: Y

EVALUATION: QN : USFWS TRAPS HUNTER CRK.; WILL LOOK FOR REDDS IN HUNTER & HI.PRAR.

SURVIVAL:

STOCKING DETAILS: TRANSPORTED IN TUBES

ACCLIMATION DETAILS:

OTHER PRE STOCKING INFO:

IMPACTS; RESEARCH: PROGRAM HAS PRODUCED SEVERAL ADULTS TO PROJECT WATERS

IMPACTS; OPINION: NATIVE STOCKS HAVE BEEN EXTIRPATED

CONTROL DETAILS:

OTHER COMMENTS: USFWS ALSO TRAPS JUVENILES IN HUNTER CRK.

69. SPECIES: CH RACE: LFA STOCK(S): OM
MAJOR DRAINAGE: CC SUB DRAINAGE: KLAMATH RIVER
CONTACT: RONNIE PIERCE PHONE: (707)839-3637
AGENCY: NCIDC ADDRESS: 1111 FORSON RD., MCKINLEYVILLE, CA 95521
PROJECT: OMAGAR CREEK FACILITY
PURPOSE: RE-ESTABLISH RUNS ONGOING: Y EVALUATION: NA : IT WILL BE MONITORED SURVIVAL: STOCKING DETAILS: HAND RELEASE WITH BUCKETS AND NETS FROM TRANSPORT TRUCK ACCLIMATION DETAILS: OTHER PRE STOCKING INFO: LIMITED SPAWNING HABITAT DUE TO LOGGING IMPACTS; RESEARCH:
IMPACTS; OPINION: ANTICIPATED RESTORATION OF NATURAL STOCKS THROUGH STRAYING
CONTROL DETAILS: OTHER COMMENTS: PROJECT IS CONFINED BY LOW SUMMER FLOWS (EXTENDED REARING IS NOT POSSIBLE)

70. SPECIES: CH RACE: LFA STOCK(S): SA
MAJOR DRAINAGE: SR SUB DRAINAGE: BATTLE CREEK
CONTACT: GENE FORBES PHONE: (916)365-8622
AGENCY: FWS ADDRESS: CNFH, ROUTE 1, BOX 2105, ANDERSON, CA 96007
PROJECT: COLEMAN NATIONAL FISH HATCHERY
PURPOSE: MITIGATION, ESTABLISH RUN
EVALUATION: QN : CWT PROGRAM IN THE PAST
SURVIVAL: on-site smolt: 0.01-2.0%; off-site smolt: 0.01-2.5%
STOCKING DETAILS: DIRECT RELEASE OR TRUCKED ONGOING · Y ACCLIMATION DETAILS: ACCLIMATION DETAILS:
OTHER PRE STOCKING INFO:
IMPACTS; RESEARCH: A LATE FALL RUN HAS BEEN ESTABLISHED IN BATTLE CREEK
IMPACTS; OPINION: HATCHERY CHINOOK GENETICALLY SIMILAR TO BATTLE CREEK CHINOOK
CONTROL DETAILS:
OTHER COMMENTS: 20% OF THE SACRAMENTO RIVER FISH ARE TRAPPED, MOVED TO AND
SPAWNED AT COLEMAN; TRIBUTARY SPAWNING IS UNKNOWN EXCEPT IN BATTLE CREEK

71. SPECIES: CH RACE: SPR STOCK(S):
MAJOR DRAINAGE: BC SUB DRAINAGE: FRASER RIVER
CONTACT: GORDON BEREZAY PHONE: (604)666-8648
AGENCY: CFSO ADDRESS: 555 W HASTINGS ST., VANCOUVER, BC V6B 5G3
PROJECT: PRODUCTIVITY & ENVIRONMENTAL REARING COND. FRASER R. ESTUARY
PURPOSE: HATCHERY EVALUATION ONGO ONGOING: **EVALUATION:** SURVIVAL: STOCKING DETAILS: ACCLIMATION DETAILS:
ACCLIMATION DETAILS:
OTHER PRE STOCKING INFO:
IMPACTS; RESEARCH: HATCHERY STOCK DON'T SUR. ESTURAINE REARING IF ENTER DURING FRESHETTE
IMPACTS; OPINION: COMPETOR SPECIES MAY MOVE IN DURING FRESHETTE & LIMIT FOOD SUPPLY
CONTROL DETAILS:
OTHER COMMENTS: FOOD THAT IS THERE WHEN NATURAL FISH ARRIVE IS MISSING WHEN HATCHERY
(0+) CHINOOK ARRIVE

72. SPECIES: CH RACE: SPR STOCK(S):
MAJOR DRAINAGE: CR SUB DRAINAGE: YAKIMA RIVER
CONTACT: DAVE FAST PHONE: (509)865-5121
AGENCY: YAKI ADDRESS: PO BOX 151, TOPPNENISH, WA 98948
PROJECT: YAKIMA RIVER SPRING CHINOOK ENHANCEMENT STUDY
PURPOSE: ENHANCE RUNS PURPOSE: ENHANCE RUNS

EVALUATION: : ADULT RETURNS, SMOLT OUTMIGRANTS, ID STOCKS, CURRENT SITUATIONS
SURVIVAL: EGG TO SMOLT =6.32%, SMOLT TO ADULT =5.3%
STOCKING DETAILS: TRUCKED, SOME GROUPS WERE ALLOWED VOLITIONAL RELEASE
ACCLIMATION DETAILS: REARED IN RIVER FED POND FOR ONE MONTH
OTHER PRE STOCKING INFO: LOOKING AT NATURAL PRODUCTION AS IT CURRENTLY EXISTS
IMPACTS; RESEARCH: NO STRAYING WITHIN THE SYSTEM
IMPACTS; OPINION: GENETIC INPUT FROM HATCHERY FISH INTO YAKIMA BASIN PROB. NEGLIGIBLE
CONTROL DETAILS: N/A
OTHER COMMENTS: CURRENTLY DETERMINING THE OPTIMAL STOCK FOR ENHANCEMENT, ALSO THEY
ARE REMOVING I FAVENUARTH STOCKS AT ROSA ARE REMOVING LEAVENWORTH STOCKS AT ROSA

73. SPECIES: CH RACE: SPR STOCK(S):
MAJOR DRAINAGE: CR SUB DRAINAGE: LOCHSA RIVER
CONTACT: BILL MILLER PHONE: (208)476-7242
AGENCY: FWS ADDRESS: P.O. BOX 18, AHSAHKA, ID
PROJECT: UPPER LOCHSA ON THE CLEARWATER RIVER
PURPOSE: ENHANCE RUNS ONGOING: Y EVALUATION: : WIER FIRST OPERATED IN 1989, NO PAST EVALUATION SURVIVAL: STOCKING DETAILS: TRUCKED FROM DWORSHAK NFH TO POWELL & RELEASED ACCLIMATION DETAILS: RAISED ON NF CLEARWATER RIVER OTHER PRE STOCKING INFO: CHINOOK CWTed IN 1989, 60,000 OUT OF 200,000 RELEASED IMPACTS; RESEARCH:
IMPACTS; OPINION:
CONTROL DETAILS:
OTHER COMMENTS: MAY HAVE HAD 1 OCEAN RETURNS IN 1989 BUT WEIR WAS NOT OPERATED DUE TO CONSTRUCTION

74. SPECIES: CH RACE: SPR STOCK(S):
MAJOR DRAINAGE: CR SUB DRAINAGE: CLEARWATER RIVER
CONTACT: BILL MILLER PHONE: (208)476-7242
AGENCY: FWS ADDRESS: P.O. BOX 18, AHSAHKA, ID 835:
PROJECT: LOLO CREEK ON THE CLEARWATER RIVER PURPOSE: ONGOING: Y EVALUATION: : SNORKLING DATA SURVIVAL: ABOUT .15% ADULT RETURN STOCKING DETAILS: TRUCKED AND RELEASED ACCLIMATION DETAILS: RAISED ON NF CLEARWATER RIVER WATER OTHER PRE STOCKING INFO: IMPACTS; RESEARCH:
IMPACTS; OPINION: FINGERLINGS RELEASED AT 160/LB TENDED TO STAY AROUND RELEASE SITE CONTROL DETAILS: OTHER COMMENTS: SOME ADULTS OUTPLANTED FROM KOOSKIA NFH, EFFECTIVENESS UNKNOWN

75. SPECIES: CH RACE: SPR STOCK(S):
MAJOR DRAINAGE: CR SUB DRAINAGE: CLEARWATER RIVER
CONTACT: BURT BOWLER PHONE: (208)743-6502
AGENCY: IDFG ADDRESS: 1540 WARNER, LEWISTON, ID 83501
PROJECT: RED RIVER ON THE SOUTH FORK OF THE CLEARWATER RIVER PURPOSE ONGOING: Y EVALUATION: : CWT, FIRST RETURN WAS IN 1981 SURVIVAL: AVG REDD COUNT 166, PRIOR REDD COUNTS AVERAGED 35 STOCKING DETAILS: POND REARED ACCLIMATION DETAILS: OTHER PRE STOCKING INFO: IMPACTS; RESEARCH: IMPACTS; OPINION: CONTROL DETAILS: OTHER COMMENTS:

76. SPECIES: CH RACE: SPR STOCK(S):
MAJOR DRAINAGE: CR SUB DRAINAGE: SALMON RIVER
CONTACT: CHARLIE PETROSKY PHONE: (208)334-3791
AGENCY: IDFG ADDRESS: 600 WALNUT ST., BOISE, ID 83707
PROJECT: BOULDER CREEK PASSAGE BARRIER REMOVAL PROJECT
PURPOSE: ESTABLISH RUN ONGOING: N **EVALUATION:** SURVIVAL: SURVIVAL, FRY TO PARR 28.1%, EGG TO PARR 1.1% STOCKING DETAILS: TRUCKED AND RELEASED ACCLIMATION DETAILS: OTHER PRE STOCKING INFO: CHINOOK TAKEN FROM RAPID RIVER HATCHERY
IMPACTS; RESEARCH: OPENED 101,959 SQ METERS OF SALMON HABITAT
IMPACTS; OPINION:
CONTROL DETAILS:
OTHER COMMENTS: CHINOOK FRY WILL BE STOCKED OVER NEXT SEVERAL TO ESTABLISH POP. OF

FISH ABOVE BARRIER SITE

77. SPECIES: CH RACE: SPR STOCK(S): FR
MAJOR DRAINAGE: BC SUB DRAINAGE: FRASER RIVER
CONTACT: GORDON BEREZAY PHONE: (604)666-8646
AGENCY: CFSO ADDRESS: 555 W. HASTINGS ST., VANCOUVER, BC V6B 5G3
PROJECT: RELEASE STRATIGIES
PURPOSE: EVALUATION ONGOING: Y
EVALUATION: QN : OCT. RELEASES APPEAR BEST, WITH ONE MORE YR DATA THEY'RE @ .5%
SURVIVAL: 0-.5%, MEAN = .15%
STOCKING DETAILS: RELEASES WERE MARCH TO JUNE & OCT., FOR 5 HATCHERIES
ACCLIMATION DETAILS: JUNE FISH GOT THERE SOONER
OTHER PRE STOCKING INFO:
IMPACTS; RESEARCH: 0+ RELEASES DIDN'T WORK FOR STREAM TYPE CHINOOK
IMPACTS; OPINION: THINKS ESTUARY IS BOTTLENECK, NATURAL FISH SURVIVE FRESH WATER & OCEAN
CONTROL DETAILS: 0
OTHER COMMENTS: THE EARILER FISH ARE RELEASED THE POORER THE SURVIVAL, THEY ARE LOST
IN ESTUARY.

78. SPECIES: CH RACE: SPR STOCK(S): FT

MAJOR DRAINAGE: SR SUB DRAINAGE: FEATHER RIVER

CONTACT: DON SCHLICTING PHONE: (916)538-2222

AGENCY: CDFG ADDRESS: 5 TABLE MTN. BLVD., OROVILLE, CA 95965

PROJECT: FEATHER RIVER FISH HATCHERY

PURPOSE: MITIGATION ONGOING: Y

EVALUATION: QN : ANNUAL AERIAL SPAWNING SURVEYS

SURVIVAL:

STOCKING DETAILS: DAYTIME RELEASES, TRUCKED OFF-SITE

ACCLIMATION DETAILS:

OTHER PRE STOCKING INFO:

IMPACTS; RESEARCH: NO NET CHANGES IN NUMBERS

IMPACTS; OPINION:

CONTROL DETAILS:

OTHER COMMENTS: BEST RETURNS CAME FROM ESTUARY RELEASES AT 30 FISH/LB

79. SPECIES: CH RACE: SPR STOCK(S): HD,CZxNK,SU
MAJOR DRAINAGE: PS SUB DRAINAGE: BIG QUILCENE RIVER
CONTACT: DAVID ZAJAC PHONE: (206)753-9460
AGENCY: FWS ADDRESS: FAO-OLYMPIA, 2625 PARKMONT LN, OLYMPIA, WA 98502
PROJECT: QUILCENE NATIONAL FISH HATCHERY
PURPOSE: ASSIST THREATENED SPECIES ONGOING: Y
EVALUATION: QN : OUT-MIGRANT STUDIES; CWT TO EVALUATE SURVIVAL,MIGRATION,HARVEST
SURVIVAL:
STOCKING DETAILS: DIRECT RELEASE; 618,000 CWT (1983-88)
ACCLIMATION DETAILS: NA
OTHER PRE STOCKING INFO: NA
IMPACTS; RESEARCH:
IMPACTS; RESEARCH:
IMPACTS; OPINION: MINOR
CONTROL DETAILS:
OTHER COMMENTS: INADEQUATE HOLDING FACILITIES TO OVER-SUMMER FISH, WATER QUALITY
CAN BE POOR AT TIMES, ADULT LOSSES SOMETIMES SUFFERED

80. SPECIES: CH RACE: SPR STOCK(S): LE
MAJOR DRAINAGE: CR SUB DRAINAGE: WENATCHEE RIVER
CONTACT: JIM MULLEN PHONE: (509)548-7573
AGENCY: FWS ADDRESS: P.O. BOX 549, LEAVENWORTH, WA 98826
PROJECT: LEAVENWORTH EXPERIMENTAL CHANNEL
PURPOSE: ENHANCE WILD STOCKS ONGOING: Y
EVALUATION: : SUPP. NOT GOING TO PRODUCE ANYTHING UNLESS VERTUALLY UNSEEDED
SURVIVAL: 60-80% MORTALITY WITHIN TEST STREAMS
STOCKING DETAILS: TRANSPORT TRUCK
ACCLIMATION DETAILS: N/A
OTHER PRE STOCKING INFO:
IMPACTS; RESEARCH: 50-60 SPAWNERS ON 2.6 MILES OF ICE CREEK
IMPACTS; OPINION: PIDED PIPER EFFECT ACTUALLY REDUCES #'S OF WILD FISH (SEE COMMENTS)
CONTROL DETAILS: FISH RELEASED OUTSIDE OF SIDE CHANNEL
OTHER COMMENTS: OUTMIGRATION BEHAVIOR OF HATCHERY FISH DIFFERS FROM WILD FISH & WILD
FISH TEND TO GROUP W/ HATCHERY FISH & FOLLOW THEM DOWNSTREAM

81. SPECIES: CH RACE: SPR STOCK(S): LO
MAJOR DRAINAGE: CR SUB DRAINAGE: SNAKE RIVER
CONTACT: RICH CARMICHAEL PHONE: (503)963-1777
AGENCY: ODFW ADDRESS: BAGLEY SCI BLDG, E OR ST COL, LA GRANDE, OR 97850
PROJECT: CHINOOK ADULT OUTPLANT PROGRAM
PURPOSE: PROVIDE TRIBAL ADULTS
EVALUATION: QN : HATCHERY RETURNS, HARVEST ESTIMATES, SPAWNING SURVEYS, SCALE ANAL.
SURVIVAL:
STOCKING DETAILS: RELEASED AT A 1:1 SEX RATIO
ACCLIMATION DETAILS: N/A
OTHER PRE STOCKING INFO: N/A
IMPACTS; RESEARCH: POOR RESULTS, UNACC 60-70% LOSS & 10-15% OF UPSTREAM RELE. RETURNED IMPACTS; OPINION:
CONTROL DETAILS:
OTHER COMMENTS: IT IS POSSIBLE THAT A LATER RELEASE WOULD PROVIDE BETTER RESULTS
(IE. THE FISH WOULD BE CLOSER TO SEXUAL MATURITY)

82. SPECIES: CH RACE: SPR STOCK(S): MK
MAJOR DRAINAGE: CR SUB DRAINAGE: WILLAMETTE RIVER
CONTACT: SCOTT LUSTED PHONE: (503)896-3513
AGENCY: ODFW ADDRESS: 43863 GREER DR., LEABURG, OR 97489
PROJECT: MCKENZIE SALMON HATCHERY
PURPOSE: MITIGATION ONGOING: Y
EVALUATION: QA : AERIAL SURVEYS(EUGENE WATER BOARD); DAM COUNTS; CWT PROGRAM SURVIVAL:
STOCKING DETAILS: 60,000 CWT AND AD-CLIPPED; SPRING AND FALL RELEASES
ACCLIMATION DETAILS: NA
OTHER PRE STOCKING INFO: NA
IMPACTS; RESEARCH: NA
IMPACTS; OPINION: HAVE SEEN AN INCREASE IN ADULTS
CONTROL DETAILS: NA
OTHER COMMENTS:

83. SPECIES: CH RACE: SPR STOCK(S): NO
MAJOR DRAINAGE: PS SUB DRAINAGE: NOOKSACK RIVER
CONTACT: STEVE SEYMOUR PHONE: (206)734-8180
AGENCY: LUMM ADDRESS: 2616 KWINA ROAD, BELLINGHAM, WA 98226
PROJECT: LUMMI-SKOOKUM CR HATCHERY
PURPOSE: ESTABLISH FISHERY
EVALUATION: QA: TAG DATA SHOWS FISH W/ ACCEL. HATCHERY GROWTH HAD BEST RETURNS
SURVIVAL: 60,000 SMOLTS REL., 0.02% SURVIVAL, EGG SURVIVAL GOOD
STOCKING DETAILS: RELEASE 0-AGE FISH 30/LB, DUMP RELEASED IN SKOOKUM
ACCLIMATION DETAILS: N/A
OTHER PRE STOCKING INFO: OUTMIGRATION STUDIES, FOR TIMING, SIZE.
IMPACTS; RESEARCH:
IMPACTS; OPINION: MINIMAL IMPACT ON WILD FISH AS TRIBE IS USING WILD BROODSTOCK
CONTROL DETAILS: ALL FISH CWT TAGGED TO COMPLY WITH US/CANADA TREATY
OTHER COMMENTS: POSSIBLE INBREEDING, PROBLEMS WITH POACHING & COLD HATC. WATER
GENETICS ARE DIFFERENT BETWEEN NFK & SFK FISH

84. SPECIES: CH RACE: SPR STOCK(S): NO
MAJOR DRAINAGE: PS SUB DRAINAGE: NOOKSACK RIVER
CONTACT: PAT PETUCHOV PHONE: (206)592-5176
AGENCY: NOOK ADDRESS: NOOKSACK TRIBE, P.O. BOX 157, DEMING, WA 98244
PROJECT: DEADHORSE REARING POND
PURPOSE: PROVIDE FOR FISHERY, ENHANCE RUNS ONGOING: Y
EVALUATION: NA : FIRST PLANTING OF NEW PROJECT
SURVIVAL: EXPECT 200 ADULTS (0.1%)
STOCKING DETAILS: FRY FROM HATCHERY PLACED INTO POND & REARED MAY TO JUNE
ACCLIMATION DETAILS: REARED 2 WEEKS, RELEASED TO LOWER DEADHORSE CR
OTHER PRE STOCKING INFO: SPAWNING SURVEYS DONE IN AREA
IMPACTS; RESEARCH: NO ADVERSE IMPACTS TO NATURALLY-OCCURRING SALMONIDS IS EXPECTED
IMPACTS; OPINION:
CONTROL DETAILS: FISH CWT TO PROVIDE HARVEST AND RETURN INFO
OTHER COMMENTS:

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85. SPECIES: CH RACE: SPR STOCK(S): RG
MAJOR DRAINAGE: OC SUB DRAINAGE: ROGUE RIVER
CONTACT: MIKE EVENSON PHONE: (503)878-2235
AGENCY: ODFW ADDRESS: 200 COLE M RIVERS RD., TRAIL, OR 97541
PROJECT: RECYCLING ADULT SPRING CHINOOK SALMON THROUGH THE SPORT FISHERY
PURPOSE: RESEARCH, ENHANCE RUNS AND FISHERY ONGOING:
EVALUATION: QN : ESTIMATED STRAYING FROM CARCASS COUNTS AND ANGLER CATCH
SURVIVAL:
STOCKING DETAILS: TRUCKED DOWNSTREAM FROM HATCHERY AFTER BEING TAGGED
ACCLIMATION DETAILS:
OTHER PRE STOCKING INFO:
IMPACTS; RESEARCH: 4% STRAYED TO SPAWN NATURALLY; 9.5% WERE CAUGHT BY ANGLERS
IMPACTS; OPINION:
CONTROL DETAILS:
OTHER COMMENTS: INFORMATION REPORT #84-10, ODFW

86. SPECIES: CH RACE: SPR STOCK(S): RG
MAJOR DRAINAGE: OC SUB DRAINAGE: ROGUE RIVER
CONTACT: MIKE EVENSON PHONE: (503)878-2235
AGENCY: ODFW ADDRESS: 200 COLE M RIVERS MEMORIAL DR., TRAIL, OR 97541
PROJECT: CHINOOK OFF-STATION SMOLT RELEASES
PURPOSE: ENHANCE FISHERY ONGOING: Y
EVALUATION: QN : CWT PROGRAM; FIN-CLIP PROGRAM
SURVIVAL:
STOCKING DETAILS: 25,000/YEAR CWT, 75,000 CLIPPED; PLANTED 25 MILES DOWNSTREAM
ACCLIMATION DETAILS:
OTHER PRE STOCKING INFO:
IMPACTS; RESEARCH: 2/3 OF THE FISH RETURNED TO THE HATCHERY AS ADULTS
IMPACTS; OPINION:
CONTROL DETAILS:
OTHER COMMENTS: THE 1981 BROOD YEAR WAS AFFECTED BY EL NINO= POOR SURVIVAL
THE 1983 BROOD YEAR SURVIVED THE BEST

87. SPECIES: CH RACE: SPR STOCK(S): SS
MAJOR DRAINAGE: CR SUB DRAINAGE: WILLAMETTE RIVER
CONTACT: DENNIS WISE PHONE: (503)378-6925
AGENCY: ODFW ADDRESS: 2487 LANCASTER DR., SALEM, OR 97305
PROJECT: STEP- MID-WILLAMETTE DISTRICT
PURPOSE: EDUCATION, ENHANCEMENT ONGOING: Y
EVALUATION: NA :
SURVIVAL:
STOCKING DETAILS: DIRECT RELEASE FROM HATCHBOX
ACCLIMATION DETAILS: NA
OTHER PRE STOCKING INFO: NA
IMPACTS; RESEARCH: NA
IMPACTS; OPINION: INCREASE IN ADULTS-ATTRIBUTED TO ALL PROGRAMS AS WELL AS STEP
CONTROL DETAILS: NA
OTHER COMMENTS: MANAGEMENT GOAL WERE REACHED

88. SPECIES: CH RACE: SPR STOCK(S): TN

MAJOR DRAINAGE: CC SUB DRAINAGE: KLAMATH RIVER

CONTACT: GERALD BIDELL PHONE: (916)778-3931

AGENCY: CDFG ADDRESS: P.O.BOX 162, LEWISTON, CA 96052

PROJECT: TRINITY RIVER SALMON AND STEELHEAD HATCHERY

PURPOSE: MITIGATION ONGOING: Y

EVALUATION: QN : CWT PROGRAM; SPAWNING SURVEY; JUVENILE TRAPPING; *-SEE COMMENTS SURVIVAL:

STOCKING DETAILS: DIRECT OR TRUCKED; DAYTIME RELEASES; 10-15% CWT

ACCLIMATION DETAILS:

OTHER PRE STOCKING INFO:

IMPACTS; RESEARCH: STRAYING RATE IS HIGH TO COLE RIVERS, OREGON- 60-90%

IMPACTS; OPINION: MOST MAINSTEM SPAWNERS ARE BELIEVED TO BE OF TRH ORIGIN CONTROL DETAILS:

OTHER COMMENTS: EVALUATION DETAILS CON'T.- LIFESTAGE COMPARISONS; CONTRIBUTION TO USER GROUPS. HIGH STRAYING RATE OUTSIDE KLAMATH/TRINITY BASIN

89. SPECIES: CH RACE: SPR STOCK(S): TR
MAJOR DRAINAGE: OC SUB DRAINAGE: TRASK RIVER
CONTACT: JOHN CASTEEL PHONE: (503)842-2741
AGENCY: ODFW ADDRESS: 4909 3RD ST., TILLAMOOK, OR 97141
PROJECT: STEP - TILLAMOOK DISTRICT
PURPOSE: ENHANCEMENT ONGOING: Y
EVALUATION: QA : FIN CLIPPED SOME FRY FOR CREEL CENSUS THIS YEAR
SURVIVAL:
STOCKING DETAILS: TRY TO NOT OVERSTOCK STREAMS OR PLANT ON TOP OF NATIVE FISH
ACCLIMATION DETAILS: N/A
OTHER PRE STOCKING INFO: 33,400 FIN CLIPPED
IMPACTS; RESEARCH:
IMPACTS; OPINION: N/A
CONTROL DETAILS: N/A
OTHER COMMENTS:

90. SPECIES: CH RACE: SPR STOCK(S): WM
MAJOR DRAINAGE: CR SUB DRAINAGE: WILLAMETTE RIVER
CONTACT: BOB SOHLER PHONE: (503)782-2933
AGENCY: ODFW ADDRESS: 76389 FISH HATCHERY RD., OAKRIDGE, OR 97463
PROJECT: WILLAMETTE FISH HATCHERY
PURPOSE: MITIGATION ONGOING: Y
EVALUATION: QN : TIME OF RELEASE STUDIES; RADIO TRACKING; CWT PROGRAM
SURVIVAL:
STOCKING DETAILS: 60,000 CWT EVERY YEAR; 80,000 FOR TIME OF RELEASE STUDY
ACCLIMATION DETAILS: NA
OTHER PRE STOCKING INFO: NA
IMPACTS; RESEARCH: BEST SURVIVAL IN MARCH AT 150mm
IMPACTS; OPINION:
CONTROL DETAILS: NA
OTHER COMMENTS:

91. SPECIES: CH RACE: SPR STOCK(S): WM
MAJOR DRAINAGE: CR SUB DRAINAGE: WILLAMETTE RIVER (MID)
CONTACT: MAX SMITH PHONE: (503)726-3517
AGENCY: ODFW ADDRESS: 3150 E.MAIN ST., SPRINGFIELD, OR 97478
PROJECT: RESERVOIR REARING OF WILLAMETTE SPRING CHINOOK
PURPOSE: MITIGATION ONGOING: Y
EVALUATION: QN : LOOK FOR ADULT RETURNS
SURVIVAL:
STOCKING DETAILS: NA
ACCLIMATION DETAILS: NA
OTHER PRE STOCKING INFO: CARRYING CAPACITY OF RESERVOIR=524 FINGERLINGS/SF.ACRE
IMPACTS; RESEARCH: DECREASE IN ADULT RETURNS OVER TIME
IMPACTS; OPINION: ADULT RELEASES IN STREAM OF ORIGIN CAN GENERATE FUTURE ADULTS
CONTROL DETAILS: NA
OTHER COMMENTS: ADULTS WERE RELEASED ABOVE DAM FROM 1965-81; CARRYING CAPACITY
BASED ON SMOLT SIZE AND TIME OF MIGRATION

92. SPECIES: CH RACE: SUM STOCK(S):
MAJOR DRAINAGE: CR SUB DRAINAGE: SALMON RIVER
CONTACT: KENT BALL PHONE: (208)756-2271
AGENCY: IDFG ADDRESS: P.O. BOX 1336, SALMON, ID 83467
PROJECT: SOUTH FORK SALMON RIVER
PURPOSE: ONGOING: Y
EVALUATION: SURVIVAL:
STOCKING DETAILS: TRUCKED
ACCLIMATION DETAILS:
OTHER PRE STOCKING INFO: CWTed 300,000 FOR 89 RELEASE, FOR OCEAN HARVEST EVAL.
IMPACTS; RESEARCH:
IMPACTS; RESEARCH:
IMPACTS; OPINION: 1/3 OF RUN IS RELEASED UPSTREAM OF WIER FOR NATURAL SPAWNING
CONTROL DETAILS:
OTHER COMMENTS: FISH CAPTURED AT SF, SPAWNED AT SALMON R., PROGENY REARED AT MC CALL
HATCHERY THEN RESTOCKED BACK TO THE SOUTH FORK SALMON

93. SPECIES: CH RACE: SUM STOCK(S): SF

MAJOR DRAINAGE: CR SUB DRAINAGE: SALMON RIVER
CONTACT: CHARLIE PETROSKY PHONE: (208)334-3791

AGENCY: IDFG ADDRESS: 600 WALNUT ST., BOISE, ID 83707

PROJECT: JOHNSON CREEK PASSAGE BARRIER REMOVAL PROJECTS
PURPOSE: ESTABLISH RUN ONGOING: N

EVALUATION: QN : SONRKEL SURVEYS
SURVIVAL: 13.4-15% SURVIVAL TO SMOLTS, 1 ADULT SEEN IN 1986

STOCKING DETAILS: TRUCKED & RELEASED

ACCLIMATION DETAILS:
OTHER PRE STOCKING INFO: CHINOOK RAISED AT MCCALL HATCHERY
IMPACTS; RESEARCH: EST. 436,000 SQ. METERS OF USABLE SPAWNING & REARING AREA OPENED UP
IMPACTS; OPINION: STEELHEAD POPULATION WILL BE MANAGED FOR WILD PRODUCTION,NO STOCKING
CONTROL DETAILS:
OTHER COMMENTS: WILL CONTINUE TO BE STOCKED FFROM MC CALL UNTIL NATURAL SPAWNING OF
ADULTS SEED THE AREA

94. SPECIES: CH RACE: SUM STOCK(S): ST

MAJOR DRAINAGE: PS SUB DRAINAGE: STILLAGUAMISH RIVER

CONTACT: KIP KILLEBREW PHONE: (206)435-8770

AGENCY: STIL ADDRESS: 3439 STOLUCKQUAMISH LN, ARLINGTON, WA 98223

PROJECT: STILLAGUAMISH CHINOOK

PURPOSE: ENHANCE RUNS ONGOING: Y

EVALUATION: QA : SPAWNING SURVEYS DONE ANNUALLY

SURVIVAL: RELATIVE SURVIVAL RATES TO BE EVALUATED

STOCKING DETAILS: DUMP PLANTED INTO MAINSTEM & MOUTHS OF TRIBS

ACCLIMATION DETAILS: 41,115 FN AT FORTSON POND FOR 16 DAYS AVG. IN 89

OTHER PRE STOCKING INFO: TRY TO MATCH PLANTINGS TO TIME & SIZE OF WILD OUTMIGR IMPACTS; RESEARCH:

IMPACTS; RESEARCH:

IMPACTS; OPINION: ANY INCREASE IS A BENEFIT, RUN IS SLOWLY INCREASING

CONTROL DETAILS: 405,998 FISH TAGGED WITH CWT

OTHER COMMENTS: ADDL. STREAMS: ARMSTRONG, HARVEY, CANYON, BEAVER, PERRY, & PALMER

95. SPECIES: CH RACE: UNK STOCK(S):
MAJOR DRAINAGE: CC SUB DRAINAGE: SAN LUIS HARBOR, RELEASED 3/4 MI FROM SHORE
CONTACT: PAUL CLEVELAND PHONE: (805)773-3316
AGENCY: CCSE ADDRESS: PO BOX 1308, ARROYO GRANDE, CA 93420
PROJECT: CENTRAL COAST SALMON ENHANCEMENT
PURPOSE: ESTABLISH RUN
ONGOING: Y
EVALUATION: : 1/10 OF RETURNING ADULTS ARE FIN CLIPPED
SURVIVAL:
STOCKING DETAILS: PEN IS OPENED AFTER ACCLIMATION REIOD
ACCLIMATION DETAILS: SALT WATER ADDED OVER A 7 DAY PERIOD
OTHER PRE STOCKING INFO: RAISED IN PLASTIC PENS IN OCEAN
IMPACTS; RESEARCH: INCREASED # OF CHINOOK RETURNING OF CAPTURED IN PORT VICINITY
IMPACTS; OPINION:
CONTROL DETAILS: N/A
OTHER COMMENTS: THIS GROUP PLANS TO ALSO REAR STEELHEAD IN THE FUTURE

96. SPECIES: CH RACE: UNK STOCK(S): ER
MAJOR DRAINAGE: CC SUB DRAINAGE: EEL RIVER
CONTACT: SCOTT DOWNIE PHONE: (707)923-3459
AGENCY: PCFFA ADDRESS: PO BOX 278, REDWAY, CA 95560
PROJECT: EEL RIVER SALMON RESTORATION PROJECT
PURPOSE: REESTABLISH RUNS ONGOING: Y
EVALUATION: : REDD/CARCASS COUNTS, JUVENILLE TRAPPING (FYKE NETS), WEIR COUNTS
SURVIVAL:
STOCKING DETAILS: SYNCRONIZE WITH LUNAR PHASE AND WATER TURBIDITY
ACCLIMATION DETAILS: TEMPERATURE
OTHER PRE STOCKING INFO:
IMPACTS; RESEARCH:
IMPACTS; OPINION: INSIGNIFICANT
CONTROL DETAILS: N/A
OTHER COMMENTS:

.

97. SPECIES: CH RACE: WIN STOCK(S): SA
MAJOR DRAINAGE: SR SUB DRAINAGE: SACRAMENTO RIVER
CONTACT: GENE FORBES PHONE: (916)365-8622
AGENCY: FWS ADDRESS: CNFH, ROUTE 1, BOX 2105, ANDERSON, CA 96007
PROJECT: COLEMAN NATIONAL FISH HATCHERY
PURPOSE: ASSIST THREATENED SPECIES ONGOING: Y
EVALUATION: QN : ANTICIPATE 100% CWT PROGRAM
SURVIVAL:
STOCKING DETAILS: TRUCKED AT NIGHT TO REDUCE BIRD PREDATION
ACCLIMATION DETAILS:
OTHER PRE STOCKING INFO:
IMPACTS; RESEARCH:
IMPACTS; OPINION: POSITIVE IMPACTS ANTICIPATED FROM ENHANCED SURVIVAL AND CULTURING
CONTROL DETAILS:
OTHER COMMENTS: THIS PROGRAM ONLY BECAME ON-GOING SINCE 1989, PRIOR TO 1989 IT
WAS INTERMITTENT

98. SPECIES: CM RACE: STOCK(S): CL
MAJOR DRAINAGE: CR SUB DRAINAGE: WILLAMETTE RIVER (MID)
CONTACT: WAYNE BOWERS PHONE: (503)657-6822
AGENCY: ODFW ADDRESS: 17330 S.EVELYN ST., CLACKAMAS, OR 97015
PROJECT: STEP PROGRAM MID-WILLAMETTE DISTRICT
PURPOSE: ENHANCE WILD STOCKS ONGOING: Y
EVALUATION: :
SURVIVAL:
STOCKING DETAILS:
ACCLIMATION DETAILS:
OTHER PRE STOCKING INFO:
IMPACTS; RESEARCH:
IMPACTS; OPINION:
CONTROL DETAILS:
OTHER COMMENTS:

99. SPECIES: CM RACE: STOCK(S): EL,QC,WL,EN
MAJOR DRAINAGE: PS SUB DRAINAGE: HOOD CANAL
CONTACT: CHRIS WELLER PHONE: (206)297-3422
AGENCY: PNPT ADDRESS: 7850 NE LITTLE BOSTON RD, KINGSTON, WA 98346
PROJECT: HOOD CANAL CHUM
PURPOSE: ENHANCE RUN AND FISHERY ONGOING: N
EVALUATION: QA : DIFFICULT TO ASSESS; NO MARKED FISH IN POPULATION
SURVIVAL:
STOCKING DETAILS: EGG BOXES PLACED IN STREAMS ALONG HOOD CANAL.
ACCLIMATION DETAILS: N/A
OTHER PRE STOCKING INFO: N/A
IMPACTS; RESEARCH: INDEFINITE RESULTS
IMPACTS; OPINION: THE PROGRAM MAY NOT HAVE HARMED THE RUNS, BUT PROBABLY DID NOT HELP.
CONTROL DETAILS: NONE
OTHER COMMENTS:

100. SPECIES: CM RACE: STOCK(S): ES, JC
MAJOR DRAINAGE: PS SUB DRAINAGE: BUDD INLET
CONTACT: JOHN BARR PHONE: (206)426-9783
AGENCY: SQAX ADDRESS: WEST 81 HIGHWAY 108, SHELTON, WA 98584
PROJECT: LEINGANG AND ADAMS CR.
PURPOSE: ESTABLISH FISHERY, INITIALIZE RUN ONGOING: N
EVALUATION: QN : SPAWNING SURVEYS DONE TO DETERMINE ESCAPEMENT
SURVIVAL: ADAMS CR. FRY(.15%), LEINGANG CR EGGS(.04%)
STOCKING DETAILS: FRY DUMP-PLANTED, EYED-EGG PLANTS INTO ARTIFICAL REDDS
ACCLIMATION DETAILS: N/A
OTHER PRE STOCKING INFO: STREAMS DETERMINED TO BE UNSEEDED FOR CHUM
IMPACTS; RESEARCH:
IMPACTS; OPINION:
CONTROL DETAILS: N/A
OTHER COMMENTS: TOM BURNS HAS STUDIED THE EFFECTIVENESS OF EYED-EGG PLANTS
EGG RELEASES IN 86 RESULTED IN SIMILAR RETURNS (0.054%)IN STREAMS

101. SPECIES: CM RACE: STOCK(S): FI, HD, GR, KC
MAJOR DRAINAGE: PS SUB DRAINAGE: GREEN RIVER
CONTACT: DENNIS MOORE PHONE: (206)939-3311
AGENCY: MUCK ADDRESS: TRIBAL ADMIN, 39015 172ND AVE SE, AUBURN, WA 98002
PROJECT: KETA CR HATCHERY - ON-STATION CHUM RELEASES
PURPOSE: PROVIDE FOR FISHERY ONGOING: Y
EVALUATION: QN : FOOT AND RAFT SURVEYS
SURVIVAL: 0.18% RETURN TO SPAWNING, (1% OF TOTAL)
STOCKING DETAILS: REARED TO +/- 350 PER LB., DUMP RELEASED ON STATION
ACCLIMATION DETAILS: N/A
OTHER PRE STOCKING INFO: GENETIC ID WORK DONE TO DETERMINE CROSSING
IMPACTS; RESEARCH:
IMPACTS; OPINION: HARVEST OF HATCHERY FISH ALSO IMPACTS WILD FISH
CONTROL DETAILS: N/A
OTHER COMMENTS: WILL BE USING EAST KITSAP STOCK IN FUTURE
HEAVY CANADIAN HARVEST. CHINOOK PROD. ADVERSELY IMPACTS CHUM PROD.

102. SPECIES: CM RACE: STOCK(S): FI, KC
MAJOR DRAINAGE: PS SUB DRAINAGE: GREEN RIVER
CONTACT: DENNIS MOORE PHONE: (206)939-3311
AGENCY: MUCK ADDRESS: TRIBAL ADMIN, 39015 172ND AVE SE, AUBURN, WA 98002
PROJECT: KETA CR. HATCHERY CHUM FRY OUTPLANTS
PURPOSE: PROVIDE FOR FISHERIES

EVALUATION: QN : INCREASING COMM. HARVEST, SPAWNING SURVEYS & RACK RETURNS
SURVIVAL: 1% RETURN
STOCKING DETAILS: REARED TO +/- 350/LB, SCATTER-PLANTED TO GREEN R TRIBS
ACCLIMATION DETAILS: N/A
OTHER PRE STOCKING INFO: SPAWNING SURVEYS, DETERMINE WILD/HATCH RATIO BY SCALES
IMPACTS; RESEARCH: UNKNOWN
IMPACTS; OPINION:
CONTROL DETAILS:
OTHER COMMENTS: HATCHERY MOVED FROM BURNS CREEK TO KETA CREEK IN 1978
HEAVY CANADIAN HARVEST

103. SPECIES: CM RACE: STOCK(S): MA
MAJOR DRAINAGE: PS SUB DRAINAGE: SOOES RIVER
CONTACT: DAVID ZAJAC PHONE: (206)753-9460
AGENCY: FWS ADDRESS: FAO-OLYMPIA, 2625 PARKMONT LN, OLYMPIA, WA 98502
PROJECT: MAKAH NATIONAL FISH HATCHERY
PURPOSE: ENHANCE RUNS ONGOING:
EVALUATION: NA :
SURVIVAL:
STOCKING DETAILS: DIRECT RELEASE INTO SALTWATER
ACCLIMATION DETAILS: REARED IN SOOES RIVER WATER FROM EGG TO RELEASE
OTHER PRE STOCKING INFO: NA
IMPACTS; RESEARCH:
IMPACTS; OPINION: NO INCREASE IN ADULTS
CONTROL DETAILS: NA
OTHER COMMENTS: CONTINUATION OF PROJECT IS UNDETERMINED BECAUSE OF OUTBREAK OF
VHS OUTBREAK AT HATCHERY

104. SPECIES: CM RACE: STOCK(S): NO
MAJOR DRAINAGE: AC SUB DRAINAGE: NOATUK RIVER
CONTACT: JIM RAYMOND PHONE: (907)452-1531
AGENCY: ADFG ADDRESS: 1300 COLLEGE ROAD, FAIRBANKS, AK 99701
PROJECT: OBSERVATIONS OF THE EMIGRATION OF HATCHERY PRODUCED CHUM SALMON
PURPOSE: RESEARCH ONGOING:
EVALUATION: QA:
SURVIVAL:
STOCKING DETAILS:
ACCLIMATION DETAILS: RELEASED DIRECTLY FROM HATCHERY
OTHER PRE STOCKING INFO:
IMPACTS; RESEARCH:
IMPACTS; RESEARCH:
IMPACTS; OPINION: LIMITED VALUE, FOOD HABITS SIMILAR
CONTROL DETAILS:
OTHER COMMENTS: MIGRATION RATES OF FEEDING BEHAVIOR SIMILAR BETWEEN HATCHERY & WILD
FISH

105. SPECIES: CM RACE: STOCK(S): NO
MAJOR DRAINAGE: PS SUB DRAINAGE: NOOKSACK RIVER
CONTACT: GARY MACWILLIAMS PHONE: (206)592-5176
AGENCY: NOOK ADDRESS: P.O. BOX 157, DEMING, WA 98244
PROJECT: NOOKSACK TRIBAL CHUM OUTPLANTINGS
PURPOSE: ENHANCE FISHERY
EVALUATION: QN : SPAWNING SURVEYS & SUPPLEMENTARY WORK WHEN REQUESTED
SURVIVAL: 80-90% EYED EGGS TO FRY. SMITH CR., 0.04%
STOCKING DETAILS: INCUBATION BOX ON SMITH CR. OTHER CRS FRY RELEASED
ACCLIMATION DETAILS:
OTHER PRE STOCKING INFO: N/A
IMPACTS; RESEARCH: RUN BUILT FROM ZERO, FISH RETURN THROUGH HEAVY HARVEST.
IMPACTS; OPINION: ASSUMED THAT THERE IS NO IMPACT TO NON-HATCHERY FISH.
CONTROL DETAILS:
OTHER COMMENTS:

106. SPECIES: CM RACE: STOCK(S): NO
MAJOR DRAINAGE: PS SUB DRAINAGE: NOOKSACK RIVER
CONTACT: GARY MACWILLIAMS PHONE: (206)592-5176
AGENCY: NOOK ADDRESS: P.O. BOX 157, DEMING, WA, 98244
PROJECT: RUTSATZ SLOUGH CHUM
PURPOSE: PROVIDE FOR FISHERIES, DEVELOP SURPLUS ONGOING: Y
EVALUATION: QA : SPAWNING SURVEYS AND STOCK UPDATES
SURVIVAL:
STOCKING DETAILS: EAGLETON BOXES, AND FRY RELEASED AT +/- 500
ACCLIMATION DETAILS: N/A
OTHER PRE STOCKING INFO: NATIVE BROODSTOCK CAPTURED & HELD UNTIL SPAWANING
IMPACTS; RESEARCH:
IMPACTS; OPINION: LOW IMPACT TO GENETIC COMPOSITION, SINCE USING NATIVE BROODSTOCK
CONTROL DETAILS: NO MARKED FISH TO EVALUATE EFFECTIVENESS
OTHER COMMENTS: IN 85 THE NOOKSACK R CHANNEL MOVED CAUSING LOSS OF ACCESS
CHANNEL CHANGE CAUSED WATER FLOW TO BE REDUCED BY ONE HALF

107. SPECIES: CM RACE: STOCK(S): NO,QC

MAJOR DRAINAGE: PS SUB DRAINAGE: NOOKSACK RIVER
CONTACT: STEVE SEYMOUR PHONE: (206)734-8180

AGENCY: LUMM ADDRESS: 2616 KWINA ROAD, BELLINGHAM, WA 98226

PROJECT: LUMMI-SKOOKUM CR. HATCHERY
PURPOSE: DEVELOP SURPLUS FOR STOCKING ONGOING: N
EVALUATION: QA : EGG BANK SUPPLIES MANY EGGS TO COOP EGG BOX PROGRAMS, ETC.
SURVIVAL:
STOCKING DETAILS: FRY SCATTER-PLANTED INTO LOWER RIVER TRIBS, 1 WK OF FEED
ACCLIMATION DETAILS: N/A
OTHER PRE STOCKING INFO: SPAWNING SURVEYS AVAILABLE FOR NATURAL SPAWNING
IMPACTS; RESEARCH:
IMPACTS; OPINION: MINIMAL IMPACT TO NATURAL STOCKS, INCREASED PRODUCTION FOR TOTAL RUN
CONTROL DETAILS: N/A
OTHER COMMENTS: OUTMIGRATION STUDY IN SILVER CREEK. GOAL OF 1 MIL EGG/YR
CHUM MANAGED FOR NATURAL PRODUCTION

108. SPECIES: CM RACE: STOCK(S): PU,HD,GA,CH
MAJOR DRAINAGE: PS SUB DRAINAGE: PUYALLUP RIVER
CONTACT: RUSSELL LADLEY PHONE: (206)593-0254
AGENCY: PUT ADDRESS: 6824 PIONEER WAY WEST, PUYALLUP, WA 98371
PROJECT: PUYALLUP CHUM
PURPOSE: ENHANCE FISHERIES ONGOING: Y
EVALUATION: QA : LARGE INCREASING RUN AND INCREASE IN HARVEST, RUN ESTAB. FROM 0
SURVIVAL: RELATIVE SURVIVAL STUDIED, EFFECTIVE PROGRAM
STOCKING DETAILS: DUMP-PLANTED: FRY FROM PONDS TO TRUCK TO RELEASE SITE
ACCLIMATION DETAILS: N/A
OTHER PRE STOCKING INFO: PUYALLUP R GORGE IS POSSIBLE BARRIER TO ADULT CHUM
IMPACTS; RESEARCH:
IMPACTS; OPINION: RUN ESTABLISHED FROM NOTHING, USING IMPORTED STOCKS
CONTROL DETAILS: N\A
OTHER COMMENTS: HABITAT DEGRADATION INCLUDING WATER DIVERSIONS/NON-POINT POLLU
FOREST PRACTICES CAUSE SOME WATER QUALITY DEGRADATION.

MAJOR DRAINAGE: STOCK(S): ST
MAJOR DRAINAGE: PS SUB DRAINAGE: STILLAGUAMISH RIVER
CONTACT: KIP KILLEBREW PHONE: (206)435-8770
AGENCY: STIL ADDRESS: 3439 STOLUCKQUAMISH LN, ARLINGTON, WA 98223
PROJECT: STILLAGUAMISH CHUM
PURPOSE: ENHANCE FISHERIES, INITIALIZE RUNS ONGOING: Y
EVALUATION: QN : INCRESE OF RACK RETURNS, FISH TO FISHERY, AND EGG TAKES
SURVIVAL: 0.07% RETURN TO HATCHERY RACKS
STOCKING DETAILS: FRY DUMP-PLANTED INTO STREAMS. RELEASED AT 450/LB SINCE 87
ACCLIMATION DETAILS:
OTHER PRE STOCKING INFO: CM ,CH ,PK ,CO ,SH , & CUT PRESENT IN SYSTEM.
IMPACTS; RESEARCH:
IMPACTS; OPINION: MINIMAL IMPACT ON GENETICS, RUN SIZE IS INCREASING, AS IS HARVEST
CONTROL DETAILS: N/A
OTHER COMMENTS: DROUGHT CURTAILED PROGRAM IN 86, NO CHUM PLANTED
EYED-EGG PLANTS BEGUN IN 89 EXPECT GOOD RETURNS

110. SPECIES: CM RACE: STOCK(S): WC
MAJOR DRAINAGE: PS SUB DRAINAGE: BIG QUILCENE RIVER
CONTACT: DAVID ZAJAC PHONE: (206)753-9460
AGENCY: FWS ADDRESS: FAO-OLYMPIA, 2625 PARKMONT LN, OLYMPIA, WA 98502
PROJECT: QUILCENE NATIONAL FISH HATCHERY
PURPOSE: PROVIDE TRIBAL ADULTS ONGOING: Y
EVALUATION: NA :
SURVIVAL:
STOCKING DETAILS: DIRECT RELEASES
ACCLIMATION DETAILS: REARED IN BIG QUILCENE WATER FROM EGG TO FRY
OTHER PRE STOCKING INFO: NA
IMPACTS; RESEARCH: NA
IMPACTS; RESEARCH: NA
IMPACTS; OPINION: NO IMPACT- WILD FISH SPAWN IN SEPT., HATCHERY SPAWN OCT.-DEC.
CONTROL DETAILS: NA
OTHER COMMENTS:

MAJOR DRAINAGE: PS SUB DRAINAGE: HOOD CANAL
CONTACT: DAVID ZAJAC PHONE: (206)753-9460
AGENCY: FWS ADDRESS: 2625 PARKMONT LN, BLDG A, OLYMPIA, WA 98502
PROJECT: QUILCENE NATIONAL FISH HATCHERY
PURPOSE: ENHANCE FISHERIES ONGOING: N
EVALUATION: QN : MEAN RUN SIZE, FOR YEARS 1916-76, WAS 16,518
SURVIVAL: FED FRY RETURN RATE .34%, UNFED RATE .29%
STOCKING DETAILS: TRUCKED FROM QUILCENE NFH TO WALCOTT FACILITY AND RELEASED ACCLIMATION DETAILS: FRY RELEASED FROM WALCOTT SLOUGH VOLITIONALLY
OTHER PRE STOCKING INFO: CHUM RUN CREATED AND MAINTAINED THROUGH FRY PLANTS IMPACTS; RESEARCH:
IMPACTS; OPINION:
CONTROL DETAILS: NONE
OTHER COMMENTS: ADULTS SPAWNED AT WALCOTT, EGGS TO QUILCENE, FRY BACK TO WAL.
RELEASED INTO WALCOTT SLOUGH; THIS WAS ORIGINALLY A CREATED SALMON RUN

112. SPECIES: CM RACE: ENL STOCK(S): CW,GO,BJ
MAJOR DRAINAGE: PS SUB DRAINAGE: KITSAP PENINSULA
CONTACT: PAUL DORN PHONE: (206)598-3311
AGENCY: SUQ ADDRESS: PO BOX 498, SUQUAMISH, WA 98392
PROJECT: SUQUAMISH TRIBAL CHUM
PURPOSE: ENHANCE RUNS, REESTABLISH FISHERY ONGOING: Y
EVALUATION: QA : EVALUATION IS BY RACK RETURN TO COWLINGS CR. HARVEST
SURVIVAL:
STOCKING DETAILS: OUTPLANTS,EGG BOXES,& ARTIFICIAL REDDS, FOCUS ON UNDERSEEDED
ACCLIMATION DETAILS: N/A
OTHER PRE STOCKING INFO: STREAM, SPAWNING SURVEYS RUN BY WDF
IMPACTS; RESEARCH:
IMPACTS; RESEARCH:
IMPACTS; OPINION: RETURNS TO HATCHERY AND HARVEST HAVE INCREASED BY AN ORDER OF MAGNITUDE
CONTROL DETAILS: N/A
OTHER COMMENTS: MANAGED FOR OVER-ESCAPEMENT ON BROODSTOCK
90% OF RELEASES ARE OF NORMAL-TIME FISH (CHICO CR STOCK)

113. SPECIES: CM RACE: L STOCK(S): NQ

MAJOR DRAINAGE: PS SUB DRAINAGE: NISQUALLY RIVER

CONTACT: WILLIAM THOMAS PHONE: (206)456-5221

AGENCY: NISQ ADDRESS: 4820 SHE-NAH-NUM DR SE, OLYMPIA, WA 98503

PROJECT: NISQUALLY TRIBAL LATE CHUM EGG PLANTS

PURPOSE: REESTABLISH RUNS ONGOING: Y

EVALUATION: QA : FED FRY PROGRAM UNSUCCESSFUL, EGG PROGRAM UNKNOWN

SURVIVAL: 1% PER 1,000 EGGS (0.1%)

STOCKING DETAILS: EGGS TO ARTIF. REDDS IN UNDERSEEDED ST., IF HIGH H20, FRY REL

ACCLIMATION DETAILS: N/A

OTHER PRE STOCKING INFO: SPAWNING SURVEYS COMPLETED ANNUALLY

IMPACTS; RESEARCH: UNKNOWN

IMPACTS; RESEARCH: UNKNOWN

IMPACTS; OPINION: SHOULD BE MINIMAL IMPACT AS NISQUALLY RIVER STOCK IS USED

CONTROL DETAILS: EGGS ONLY GO TO AREAS THAT ARE KNOWN TO NOT BE SPAWNED

OTHER COMMENTS: CONSERVATIVE APPROACH TO COMPLEMENTING WILD CHUM RUN

NISQUALLY CHUM RUNS ARE MANAGED FOR WILD STOCK

114. SPECIES: CM RACE: N STOCK(S): KY

MAJOR DRAINAGE: PS SUB DRAINAGE: NISQUALLY RIVER

CONTACT: WILLIAM THOMAS PHONE: (206)456-5221

AGENCY: NISQ ADDRESS: 4820 SHE-NAH-NUM DR SE, OLYMPIA, WA 98503

PROJECT: NISQUALLY NORMAL CHUM

PURPOSE: REESTABLISH RUNS ONGOING: Y

EVALUATION: QA : INSUFFICIENT RELEASE NUMBERS TO EVALUATE

SURVIVAL:

STOCKING DETAILS: EGGS TO ARTIFICIAL REDDS. FRY REL. IF WEATHER OR WATER POOR ACCLIMATION DETAILS: N/A

OTHER PRE STOCKING INFO: STOCK EXISTED IN SYSTEM IN 1920'S-1940'S. NOW "EXTINCT IMPACTS; RESEARCH:

IMPACTS; RESEARCH:

IMPACTS; OPINION: UNKNOWN, POSSIBLY SOME RETURNS

CONTROL DETAILS: N/A

OTHER COMMENTS: NOT PLANTED IN 88/89, UNAVAILABILITY OF EGGS OR BROODSTOCK ATTEMPT TO OBTAIN 1 MIL EGGS THIS YEAR FOR RELEASE TO CLEAR CR

115. SPECIES: CM RACE: N,L STOCK(S): ES,JC,GS
MAJOR DRAINAGE: PS SUB DRAINAGE: ELSON CREEK AND JOHNS CREEK
CONTACT: JOHN BARR PHONE: (206)426-9783
AGENCY: SQAX ADDRESS: WEST 81 HIGHWAY 108, SHELTON, WA 98584
PROJECT: ELSON CREEK HATCHERY
PURPOSE: ESTABLISH FISHERY, REESTABLISH RUNS ONGOING: Y
EVALUATION: QA : RESULTS ARE BASED ON ADULT RETURNS
SURVIVAL: INFORMATION AVAILABLE
STOCKING DETAILS: FRY DUMPED ON & OFF STATION, EYED-EGGS IN ARTIFICIAL REDDS
ACCLIMATION DETAILS: N/A
OTHER PRE STOCKING INFO: N/A
IMPACTS; RESEARCH: ELSON CR. NOW BLOCKED, ESTMATED +/- 400 ADULT RETURN
IMPACTS; OPINION: CURRENT RETURNS TO ELSON CR. AVERAGE 20,000 ADULTS
CONTROL DETAILS: NO MARKED FISH
OTHER COMMENTS: ELSON CR IS NOW COMPLETELY BLOCKED BY HATCHERY OPERATIONS
JOHNS CR. STOCK NATIVE, LATE RUN-STOCKED TO JOHNS, CRANBERRY CREEK.

117. SPECIES: CO RACE: STOCK(S):
MAJOR DRAINAGE: AC SUB DRAINAGE: YUKON RIVER
CONTACT: JIM RAYMOND PHONE: (907)452-1531
AGENCY: ADFG ADDRESS: 1300 COLLEGE ROAD, FAIRBANKS, AK 99701
PROJECT: GROWTH OF WILD & HATCHERY JUVENILE COHO IN AN INTERIM STREAM
PURPOSE: RESEARCH
EVALUATION: QN:
SURVIVAL: FN TO AD 4.0-8.5% FOR HATCHERY FISH & 13.4% FOR WILD FISH
STOCKING DETAILS: NOT GIVEN
ACCLIMATION DETAILS:
OTHER PRE STOCKING INFO:
IMPACTS; RESEARCH:
IMPACTS; RESEARCH:
IMPACTS; OPINION:
CONTROL DETAILS:
OTHER COMMENTS: IN 1983 3 TIMES THE NORMAL AMOUNT OF FISH WERE STOCKED, GROWTH WAS
DEPERSSED FOR BOTH WILD & HATCHERY FRY, ADULT RETURNS WERE ALSO LOW

118. SPECIES: CO RACE: STOCK(S):

MAJOR DRAINAGE: BC SUB DRAINAGE: CRAIG CREEK

CONTACT: ROBERT HURST PHONE: (604)756-7296

AGENCY: GFSO ADDRESS: 3225 STEPHENSON PT RD, NANAIMO, BC V9T 4P7

PROJECT: CRAIG CREEK

PURPOSE: STOCK EVALUATION

EVALUATION: QN : WILD BROODSTOCK COLLECTED FROM CRAIG CK & REARED IN HATCHERY

SURVIVAL: WILD=4.2%, HATCHERY=3.2%

STOCKING DETAILS: STOCKS DIFFERENTLY MARKED & RELEASED INTO CRAIG CK HEADWATER

ACCLIMATION DETAILS:

OTHER PRE STOCKING INFO: WILD FRY .2 G LARGER THAN HATCHERY FRY

IMPACTS; RESEARCH: SURVIVAL OF WILD FISH SIG HIGHER THAN HATCHERY

IMPACTS; OPINION: STOCKING DENSITIES WERE EXCESSIVE, RESULTING IN LOW SURVIVAL

CONTROL DETAILS:

OTHER COMMENTS: OBJECTIVES: (1) DETERMINE DECLINE IN FRY TO SMOLT SURVIVAL RATE

(2) PROVIDE ADDITIONAL INFO ON OPTIMUM STOCKING DENSITIES FOR COHO

119. SPECIES: CO RACE: STOCK(S):
MAJOR DRAINAGE: CC SUB DRAINAGE: FRESHWATER CREEK
CONTACT: JUD ELLINWOOD PHONE: (707)444-8903
AGENCY: HFAC ADDRESS: 500 FRESHWATER RD., EUREKA, CA 95501
PROJECT: FRESHWATER CREEK SALMON TRAPPING & SPAWNING STATION
PURPOSE: ENHANCE WILD STOCKS
EVALUATION: GAGE SUCCESS IN RELEASE QUALITY AND QUANITY, NOT ADULT RETURNS
SURVIVAL:
STOCKING DETAILS: TRUCKED & DROPPED 10-15 FEET INTO STREAM AT 12-18/LB
ACCLIMATION DETAILS: N/A
OTHER PRE STOCKING INFO: PLANT AFTER MAJORITY HAVE SMOLIFIED, WITH ADEQUATE FLOW
IMPACTS; RESEARCH: MINOR STRAYING WITHIN HUMBOLDT BAY, STRONG IMPRINTING
IMPACTS; OPINION: POSSIBLE REDUCTION IN VARIABILITY OF POPULATION GENETICS
CONTROL DETAILS: N/A
OTHER COMMENTS: RELEASES BASED ON WATER & PHYSIOLOGICAL CONDITIONS

120. SPECIES: CO RACE: STOCK(S):

MAJOR DRAINAGE: CC SUB DRAINAGE: FRESHWATER CREEK

CONTACT: DAVID HULL PHONE: (707)822-5957

AGENCY: COAPW ADDRESS: P.O.BOX 154, EUREKA, CA 95501

PROJECT: KING SALMON PONDS-SEAWATER SALMON REARING FACILITY

PURPOSE: ENHANCE RUNS

CONTACT: VINFORMAL AND ON-GOING; REARING DENSITY, DIET, TIME OF RELEASE

SURVIVAL:

STOCKING DETAILS: STOCKED WITH NEW MOON PHASE; DAYTIME RELEASE; SOME FLOY TAGS

ACCLIMATION DETAILS:

OTHER PRE STOCKING INFO:

IMPACTS; RESEARCH: MINIMAL STRAYING

IMPACTS; OPINION: POSSIBILITY OF CROSSING BETWEEN WILD AND HATCHERY FISH

CONTROL DETAILS:

OTHER COMMENTS: THIS FACILITY IS AN OVERFLOW AREA FOR THE FRESHWATER CREEK

PROJECT

121. SPECIES: CO RACE: STOCK(S):

MAJOR DRAINAGE: CR SUB DRAINAGE: ICICLE CR

CONTACT: JIM MULLAN PHONE: (509)548-7573

AGENCY: FWS ADDRESS: PO BOX 549, LEAVENWORTH, WA 98826

PROJECT: LEAVENWORTH EXPERIMENTAL CHANNEL

PURPOSE: SMOLT PRODUCTION ONGOING: Y

EVALUATION: : SUPPLEMENTATION NOT GOING TO PRODUCE ANYTHING UNLESS UNSEEDED

SURVIVAL: 60-80% MORTALITY WITHIN TEST STREAMS

STOCKING DETAILS: TRANSPORT TRUCK

ACCLIMATION DETAILS: N/A

OTHER PRE STOCKING INFO: NATURAL SPAWNING ALSO
IMPACTS; RESEARCH: 50-60 SPAWNERS ON 2.6 MILES OF ICE CREEK
IMPACTS; OPINION: PIED PIPER EFFECT & DOES NOT CONSIDER EARLY OUTPLANTS AS PART OF PROD.

CONTROL DETAILS: N/A

OTHER COMMENTS:

122. SPECIES: CO RACE: STOCK(S):
MAJOR DRAINAGE: CR SUB DRAINAGE: LEWIS RIVER
CONTACT: ROBIN NICHOLAY PHONE: (206)225-7413
AGENCY: WDF ADDRESS: LEWIS R. SALMON HATCHERY, WOODLAND, WA 98674
PROJECT: LEWIS RIVER SALMON HATCHERY
PURPOSE: ENHANCE RUNS ONGOING: Y
EVALUATION: NA : WALK STREAMS IN FALL, MARKS TO BE EVALUATED BY AGENCY THIS YEAR
SURVIVAL:
STOCKING DETAILS: TRUCK, DIRECT FROM HATCHERY, VOLITIONAL RELEASE
ACCLIMATION DETAILS: N/A
OTHER PRE STOCKING INFO: SALT SOLUTION, PLANT BY LBS NOT NUMBERS
IMPACTS; RESEARCH: HAVE SEEN INCREASE IN ADULTS
IMPACTS; OPINION: BETTER RETURNS WHEN YOU DON'T OVERPLANT AN AREA
CONTROL DETAILS:
OTHER COMMENTS: RELEASED 200,000 FIN CLIPPED FISH/YEAR FOR 2 YEARS, FISH ARE
IMPRINTED WITH MORPHORLINE

123. SPECIES: CO RACE: STOCK(S):
MAJOR DRAINAGE: PS SUB DRAINAGE: STILLAGUAMISH RIVER (TULALIP BAY)
CONTACT: JIM AMES PHONE: (205)753-0196
AGENCY: WDF ADDRESS: GENERAL ADMIN. BLDG., OLYMPIA, WA 89501
PROJECT: WILDSTOCK PINK SALMON
PURPOSE: SUPPLEMENT TRIBAL, COMMERCIAL, NON-INDIAN SPORT FISHERY ONGOING: Y
EVALUATION:
SURVIVAL:
STOCKING DETAILS: VOLITIONAL RELEASE
ACCLIMATION DETAILS: REARED ON STATION
OTHER PRE STOCKING INFO: FIRST RELEASE DATE COINCIDING WITH PINK OUTMIGRANTS
IMPACTS; RESEARCH: PINK PROD. DECLINED 50%, WHILE PUGET SOUND, SNOHOMISH INCREASED 38%
IMPACTS; OPINION: COHO MAYBE RESPONSIBLE FOR LOST PINK PRODUCTION,
CONTROL DETAILS: NA
OTHER COMMENTS: VARIATION IN RUN SIZE AND HISTORICAL DATA BECOME TROUBLESOME WHEN
TRYING TO COMPARE TWO SPECIES

124. SPECIES: CO RACE: STOCK(S): AL
MAJOR DRAINAGE: OC SUB DRAINAGE: ALSEA RIVER
CONTACT: MARIO SOLAZZI PHONE: (503)737-4431
AGENCY: ODFW ADDRESS: 28655 HWY 34, CORVALLIS, OR 97330
PROJECT: SURVIVAL AND HOMING STUDY-COHO
PURPOSE: RESEARCH ONGOING: N
EVALUATION: QN : CWT PROGRAM; CONTRIBUTION TO FISHERY AS ADULTS
SURVIVAL:
STOCKING DETAILS: 6 RELEASE TYPES (COMBOS OF DIRECT, OFF-STATION, ACCLIM., TRUCK)
ACCLIMATION DETAILS: 6 WEEKS AT SILETZ, RELEASED ON SAME DAY AS NEWLY TRUCKED
OTHER PRE STOCKING INFO:
IMPACTS; RESEARCH: HIGHLY VARIABLE; OFF-STATION, ACCLIMATED FISH HAD BEST SURVIVAL
IMPACTS; OPINION:
CONTROL DETAILS: RELEASED DIRECTLY FROM ALSEA HATCHERY
OTHER COMMENTS: THIS REPORT IS IN REVIEW

125. SPECIES: CO RACE: STOCK(S): AL,SZ,CQ
MAJOR DRAINAGE: OC SUB DRAINAGE: SIUSLAW RIVER
CONTACT: MARIO SOLAZZI PHONE: (503)737-4431
AGENCY: ODFW ADDRESS: 28655 HWY 34, CORVALLIS, OR 97330
PROJECT: COHO HATCHBOX (STEP) FRY RELEASE STUDY
PURPOSE: ERSEARCH ONGOING: N
EVALUATION: ON : FRY TRAPPING; POPULATION ESTIMATES
SURVIVAL:
STOCKING DETAILS: PLANTED EARLY AND LATE SPAWNING STOCKS; DIRECT RELEASE
ACCLIMATION DETAILS:
OTHER PRE STOCKING INFO:
IMPACTS; RESEARCH: EARLY SPAWNING STOCKS WERE BLOWN OUT BY FRESHETS; 75% OF LATE STOCKS
IMPACTS; OPINION: REMAINED
CONTROL DETAILS:
OTHER COMMENTS: HIGH WATER HOLDING HABITAT IS IMPORTANT IN KEEPING FISH IN THE
AREA OF RELEASE; 1988 ANNUAL PROGRESS REPORT (F-125-R)

ONGOING: Y

126. SPECIES: CO RACE: STOCK(S): BC
MAJOR DRAINAGE: CR SUB DRAINAGE: BIG CREEK
CONTACT: DAVE RIEBEN PHONE: (503)458-6512
AGENCY: ODFW ADDRESS: RT. 4, BOX 594, ASTORIA, OR 97103
PROJECT: BIG CREEK HATCHERY
PURPOSE: MITIGATION
EVALUATION: :
SURVIVAL:
STOCKING DETAILS:
ACCLIMATION DETAILS:
OTHER PRE STOCKING INFO:
IMPACTS; RESEARCH:
IMPACTS; OPINION:
CONTROL DETAILS:
OTHER COMMENTS:

127. SPECIES: CO RACE: STOCK(S): BC,ST
MAJOR DRAINAGE: CC SUB DRAINAGE: SCOTT RIVER
CONTACT: DAVE STREIG PHONE: (408)458-3095
AGENCY: MBSTP ADDRESS: 324 SWANTON RD., DAVENPORT, CA 95017
PROJECT: MONTEREY BAY SALMON AND TROUT PROJECT
PURPOSE: ENHANCE WILD STOCKS, DEVELOP SURPLUS ONGOING: Y
EVALUATION: QN : ADULT ESCAPEMENT STUDIES; TIME OF RELEASE STUDIES
SURVIVAL:
STOCKING DETAILS: TRUCKED; 100% FIN-CLIPPED
ACCLIMATION DETAILS:
OTHER PRE STOCKING INFO:
IMPACTS; RESEARCH: INCREASE IN ADULT RETURNS
IMPACTS; OPINION:
CONTROL DETAILS:
OTHER COMMENTS:

128. SPECIES: CO RACE: STOCK(S): BG
MAJOR DRAINAGE: AC SUB DRAINAGE: BIG LAKE
CONTACT: BOB CHLUPACH PHONE: (907)892-6816
AGENCY: ADFG ADDRESS: P.O. BOX 520509, BIG LAKE, AK 99652
PROJECT: NORTHERN COOK INLET CHINOOK & COHO SALMON ENHANCEMENT
PURPOSE: ONGOING: Y
EVALUATION: QN : COUNTED SMOLTS PRODUCED, NO ADULT INFO
SURVIVAL: HATCHERY CONTRIBUTED 44.1% IN 1988 OUTMIGRATION
STOCKING DETAILS: FRY STOCKED AT END OF MAY, < 5% MADE IT TO SMOLTS
ACCLIMATION DETAILS: TEMPERATURE, RELEASES MADE RIGHT AT BIG LAKE
OTHER PRE STOCKING INFO: FINGERLING & FRY MOVE TO BIG LAKE TO REAR
IMPACTS; RESEARCH:
IMPACTS; OPINION:
CONTROL DETAILS:
OTHER COMMENTS: LOOK AT FRY TO SMOLT SECTION
BELIEVES THIS IS BEST EVALUATION HE HAS

129. SPECIES: CO RACE: STOCK(S): CC
MAJOR DRAINAGE: AC SUB DRAINAGE: KACHEMAK BAY
CONTACT: NICK DUDIAK PHONE: (907)235-8191
AGENCY: ADFG ADDRESS: 3298 DOUGLAS STREET, HOMER, AK 99603
PROJECT: CARRIBOU & SELDOVIA LAKES COHO SALMON ENHANCEMENT
PURPOSE: ENHANCE FISHERY ONGOING: Y
EVALUATION: ON:
SURVIVAL: FINGERLING TO ADULT 1 TO 2.3%
STOCKING DETAILS: TRUCK TO AIRPORT, AIRCRAFT PLANT
ACCLIMATION DETAILS:
OTHER PRE STOCKING INFO:
IMPACTS; RESEARCH:
IMPACTS; OPINION:
CONTROL DETAILS: SOME FISH PUT INTO CARIBOU LAKE WERE CWTed
OTHER COMMENTS: INTERMITTENTLY BETWEEN 1984-89 BEAR LAKE STOCK USED

130. SPECIES: CO RACE: STOCK(S): CC

MAJOR DRAINAGE: AC SUB DRAINAGE: DIRECT OCEAN RELEASE

CONTACT: NICK DUDIAK PHONE: (907)235-8191

AGENCY: ADFG ADDRESS: 3298 DOUGLAS ST., HOMER, AK 99603

PROJECT: HOMER SPIT CHINOOK, COHO, AND PINK SALMON ENHANCEMENT

PURPOSE: ENHANCE FISHERY ONGOING: Y

EVALUATION: ON:

SURVIVAL: 1 YEAR OF DATA, 4% RETURN ON 88 RELEASE

STOCKING DETAILS: TRANSPORTED BY TRUCH TO HOMER SPIT

ACCLIMATION DETAILS: ABOUT 50% SMOLTS HELD IN NET PENS FOR 5 DAYS

OTHER PRE STOCKING INFO:

IMPACTS; RESEARCH:
IMPACTS; OPINION:

CONTROL DETAILS: TWO LOTS OF CWT'S IN 89 RELEASE 50,000 MARKED

OTHER COMMENTS: ALASKA DRY PELLET & OREGON MOIST PELLET (2 GROUPS CWTed)

1989 RELEASE WAS BEAR LAKE STOCK

131. SPECIES: CO RACE: STOCK(S): CH
MAJOR DRAINAGE: BC SUB DRAINAGE: SQUAMISH RIVER
CONTACT: MATTHEW FOY PHONE: (604)666-3678
AGENCY: CFSO ADDRESS: PACIFIC REGION, 555 W HASTING ST., VANCOUVER, BC V6B 5G6
PROJECT: COHO PRODUCTION FROM UPPER PARADISE CHANNEL - SPAWNING CHANNEL
PURPOSE: INCREASE HABITAT ONGOING: Y
EVALUATION: QN : NATURAL PRODUCTION=4.5 GM/M2 IN PARADISE CHANNEL=31.8 GM/M2
SURVIVAL:
STOCKING DETAILS:
ACCLIMATION DETAILS:
OTHER PRE STOCKING INFO:
IMPACTS; RESEARCH: GROUNDWATER SIDE CHANNEL CAN MAINTAIN OVER 7.0 FRY/M2
IMPACTS; OPINION:
CONTROL DETAILS:
OTHER COMMENTS: STEELHEAD=35.2 GM/M2, IMPORTANT FACTORS ARE STABLE FLOWS & TEMPS,
GRADED GRAVEL SUBSTRATE, RIP-RAP BANKS, 15 CM/SEC FLOW, OVERHEAD CANOPY

132. SPECIES: CO RACE: STOCK(S): CK
MAJOR DRAINAGE: PS SUB DRAINAGE: NOOKSACK RIVER
CONTACT: DON HENDRICK PHONE: (206)336-9538
AGENCY: WDF ADDRESS: 333 E. BLACKBURN, MT VERNON, WA 98273
PROJECT: NOOKSACK COHO
PURPOSE: RESEARCH, MITIGATION ONGOING: N
EVALUATION: QN : FRY DENSITIES DETERMINED (ELECTROSHOCKING)
SURVIVAL: NOT DETERMINED
STOCKING DETAILS: TRUCKED (CIRCULATING TANK) THEN BRIDGE DUMPED
ACCLIMATION DETAILS: N/A
OTHER PRE STOCKING INFO: 3.2 FISH/YARD2 STOCKED; POOR HABITAT ABOVE BARRIER
IMPACTS; RESEARCH: POOR FRY SURVIVAL IN STREAM INDICATED BY SHOCKING, FRY MOVED INTO LK
IMPACTS; OPINION:
CONTROL DETAILS: NONE
OTHER COMMENTS: RM 0.0 - 4.8

133. SPECIES: CO RACE: STOCK(S): CK
MAJOR DRAINAGE: PS SUB DRAINAGE: NOOKSACK RIVER
CONTACT: DON HENDRICK PHONE: (206)336-9538
AGENCY: WDF ADDRESS: 333 E. BLACKBURN, MT VERNON, WA 98273
PROJECT: NOOKSACK COHO
PURPOSE: RESEARCH, MITIGATION ONGOING: N
EVALUATION: QN : FRY DENSITIES DETERMINED (ELECTROSHOCKING)
SURVIVAL: NOT DETERMINED
STOCKING DETAILS: TRUCKED (CIRCULATING TANK) THEN BRIDGE DUMPED
ACCLIMATION DETAILS: N/A
OTHER PRE STOCKING INFO: 1.6 FISH/YARD2 STOCKED
IMPACTS; RESEARCH: INCREASE FRY DENSITY, RELATIVE SUCCESS UNKNOWN
IMPACTS; OPINION:
CONTROL DETAILS: NONE
OTHER COMMENTS: RM 0.0- 5.6

134. SPECIES: CO RACE: STOCK(S): CK
MAJOR DRAINAGE: PS SUB DRAINAGE: NOOKSACK RIVER
CONTACT: DON HENDRICK PHONE: (206)336-9538
AGENCY: WDF ADDRESS: 333 E. BLACKBURN, MT VERNON, WA 98273
PROJECT: NOOKSACK COHO
PURPOSE: RESEARCH, MITIGATION
EVALUATION: QN : FRY DENSITIES DETERMINED (ELECTROSHOCKING)
SURVIVAL:
STOCKING DETAILS: TRUCKED (CIRCULATING TANK) THEN BRIDGE DUMPED
ACCLIMATION DETAILS: N/A
OTHER PRE STOCKING INFO: 1.9 FISH/YARD2 STOCKED
IMPACTS; RESEARCH: POOR FRY SURVIVAL THROUGH SUMMER-UNEXPLAINED
IMPACTS; OPINION:
CONTROL DETAILS: NONE
OTHER COMMENTS: RM 0 - 4.0

135. SPECIES: CO RACE: STOCK(S): CK, WL, GA, WR
MAJOR DRAINAGE: PS SUB DRAINAGE: NISQUALLY RIVER
CONTACT: WILLIAM THOMAS PHONE: (206)456-5221
AGENCY: NISQ ADDRESS: 4820 SHE-NAH-NUM DR SE, OLYMPIA, WA 98503
PROJECT: ON-STATION COHO YEARLING RELEASES
PURPOSE: PROVIDE FOR FISHERY ONGOING: Y
EVALUATION: QN : PROVIDES 10-20% OF TOTAL CONTRIBUTION TO SOUTH SOUND FISHERY
SURVIVAL: 1-2000 RETURN AS ADULTS(.25-.50%) 10-14% TO FISHERY
STOCKING DETAILS: REARED +/- 18/LB IN APR., VOLITIONALLY RELEASED FROM PONDS
ACCLIMATION DETAILS: N/A
OTHER PRE STOCKING INFO:
IMPACTS; RESEARCH:
IMPACTS; OPINION: GOOD NUMBERS RETURN TO RIVER, HARVEST AND NUMBERS ARE INCREASING
CONTROL DETAILS: 5-10% CWT TAGGED AS US/CANADA INDICATOR STOCK
OTHER COMMENTS: IN APRIL, REMAINDER OF FISH ARE FORCED FROM PONDS

ONGOING: N

136. SPECIES: CO RACE: STOCK(S): CM
MAJOR DRAINAGE: WC SUB DRAINAGE: ESTUARY, OFF-SHORE, AND RIVER
CONTACT: MARIO SOLAZZI PHONE: (503)737-4431
AGENCY: ODFW ADDRESS: 28655 HWY 34, CORVALLIS, OR 97330
PROJECT: COHO OCEAN RELEASE STUDY
PURPOSE: RESEARCH
EVALUATION: QN : CWT PROGRAM; CONTRIBUTION TO FISHERY; STRAYING ALSO STUDIED
SURVIVAL:
STOCKING DETAILS: OFF-SHORE, ESTUARY, AND IN-RIVER RELEASES; TRUCKED
ACCLIMATION DETAILS:
OTHER PRE STOCKING INFO:
IMPACTS; RESEARCH: TIDEWATER RELEASES HAD A 4.5 HIGHER SURVIVAL RATE THAN ALL OTHERS
IMPACTS; OPINION:
CONTROL DETAILS: CONTROLS WERE RELEASED DIRECTLY FROM BONNEVILLE HATCHERY
OTHER COMMENTS: THE HOMING ABILITY OF THE FISH WAS PROBABLY DISRUPTED AT THE
TIME OF RELEASE(LACK OF IMPRINTING); ANNUAL PROGRESS REPORT 1985

137. SPECIES: CO RACE: STOCK(S): CR
MAJOR DRAINAGE: CR SUB DRAINAGE: YAKIMA RIVER, UMATILLA RIVER
CONTACT: WAYNE STENDROSKY PHONE: (503)374-8381
AGENCY: ODFW ADDRESS: STAR RT. B, BOX 526, CASCADE LOCKS, OR 97014
PROJECT: CASCADE HATCHERY
PURPOSE: INITIALIZE RUN
ONGOING: Y
EVALUATION: NA:
STOCKING DETAILS:
ACCLIMATION DETAILS: THERMAL
OTHER PRE STOCKING INFO:
IMPACTS; RESEARCH:
IMPACTS; OPINION:
CONTROL DETAILS:
OTHER COMMENTS:

138. SPECIES: CO RACE: STOCK(S): EL
MAJOR DRAINAGE: SJ SUB DRAINAGE: ELWHA RIVER
CONTACT: CHRIS WELLER PHONE: (206)297-3422
AGENCY: PNPT ADDRESS: 7850 NE LITTLE BOSTON RD, KINGSTON, WA 98346
PROJECT: ELWHA
PURPOSE: ENHANCE RUN AND FISHERY
ONGOING: N
EVALUATION: QA : FEW OR NO COHO RETURNS TO OUTPLANTED STREAMS
SURVIVAL:
STOCKING DETAILS: DIRECTLY DUMP-RELEASED FROM TRUCKS, SOME SCATTER PLANTED
ACCLIMATION DETAILS: N/A
OTHER PRE STOCKING INFO: NUMBERS USED TO DETERMINE STOCKING, FELT UNRELIABLE
IMPACTS; RESEARCH:
IMPACTS; OPINION: FELT OUTPLANTING WASN'T EFEC. & MAY HAVE HARMFUL EFFECTS, B DISCONTINUED
CONTROL DETAILS: NONE
OTHER COMMENTS: SINCE 86, COUNCIL HAS PLANTED 300,000 FRY/YR. ABOVE DAMS
THERE IS NO NATURAL REPRODUCTION ABOVE THE DAMS.

139. SPECIES: CO RACE: STOCK(S): EL, DN
MAJOR DRAINAGE: SJ SUB DRAINAGE: HOKO RIVER
CONTACT: CHRIS WELLER PHONE: (206)297-3422
AGENCY: PNPT ADDRESS: 7850 NE LITTLE BOSTON RD, KINGSTON, WA 89346
PROJECT: HOKO COHO FRY OUTPLANTS
PURPOSE: ENHANCE RUN AND FISHERIES, RESEARCH ONGOING: Y
EVALUATION: QA : FEW RECOVERIES - SMOLT OUTMIGRATION EVALUATION NOT COMPLETED
SURVIVAL:
STOCKING DETAILS: DUMP-RELEASED DIRECTLY FROM TRUCKS, SOME SCATTER-PLANTINGS
ACCLIMATION DETAILS: N/A
OTHER PRE STOCKING INFO:
IMPACTS; RESEARCH:
IMPACTS; OPINION: FEW RETURNS TO STREAMS ARE NOTED
CONTROL DETAILS: FISH ARE FIN-CLIPPED
OTHER COMMENTS: MR. WELLER FEELS STUDY IS POORLY DESIGNED AND EXECUTED
FISH NOT CHECKED FOR DELAYED MORTALITY PRIOR TO RELEASE—BIASED RESULTS

140. SPECIES: CO RACE: STOCK(S): FC
MAJOR DRAINAGE: OC SUB DRAINAGE: ALSEA RIVER
CONTACT: TIM SCHAMBER PHONE: (503)487-4152
AGENCY: ODFW ADDRESS: 2418 E.FALL CREEK RD., ALSEA, OR 97324
PROJECT: FALL CREEK HATCHERY
PURPOSE: ENHANCE FISHERY
EVALUATION: :
SURVIVAL:
STOCKING DETAILS:
ACCLIMATION DETAILS:
OTHER PRE STOCKING INFO:
IMPACTS; RESEARCH:
IMPACTS; OPINION:
CONTROL DETAILS:
OTHER COMMENTS:

141. SPECIES: CO RACE: STOCK(S): FR
MAJOR DRAINAGE: BC SUB DRAINAGE: FRENCH CREEK
CONTACT: ROBERT HURST PHONE: (604)756-7296 AGENCY: CFSO ADDRESS: 3225 STEPHENSON PT RD, NANAIMO, BC V9T 4P7
PROJECT: DUDLEY MARSH
PURPOSE: HABITAT EVALUATION
EVALUATION: QN : SURVIVAL LOW BECAUSE OF WINTER KILL
SURVIVAL: 1985=9.8%
STOCKING DETAILS: ONGOING: ACCLIMATION DETAILS:

ACCLIMATION DETAILS:
OTHER PRE STOCKING INFO:
IMPACTS; RESEARCH: TRENCH WORKED AS SANCTUARY FOR HIGH SUMMER WATER TEMPS(SEE COMMENTS)
IMPACTS; OPINION: WOULD PROVIDE ADITIONAL REARING HABITAT IF NO WINTER KILLS
CONTROL DETAILS:

CTUER COMMENTS: TRENCH DUG IN HEAD OF MARSH TO MODERATE HIGH SUMMER TEMPS, IT WORKED OTHER COMMENTS: TRENCH DUG IN HEAD OF MARSH TO MODERATE HIGH SUMMER TEMPS, IT WORKED

142. SPECIES: CO RACE: STOCK(S): HL
MAJOR DRAINAGE: CC SUB DRAINAGE: EEL RIVER
CONTACT: JIM JOHNSON PHONE: (707)928-2293
AGENCY: GRC ADDRESS: 601 HILLCREST, GARBERVILLE, CA 95440
PROJECT: GARBERVILLE ROTARY CLUB REARING PROGRAM
PURPOSE: REESTABLISH RUNS
EVALUATION: CONTROLLED CONTROLLED ONGOING: Y EVALUATION: : CDFG ANNUAL SPAWNING COUNTS SURVIVAL: STOCKING DETAILS: NIGHT RELEASES, TRUCK TRANSPORT, TAIL RELEASE ACCLIMATION DETAILS: N/A OTHER PRE STOCKING INFO: IMPACTS; RESEARCH: CONSISTENT BIOMASS & DENSITY THROUGHOUT, STATIC POPULATIONS IMPACTS; OPINION: CONTROL DETAILS: N/A OTHER COMMENTS:

143. SPECIES: CO RACE: STOCK(S): HO, QN
MAJOR DRAINAGE: WC SUB DRAINAGE: HOH RIVER
CONTACT: JIM JORGENSEN PHONE: (206)374-6582
AGENCY: HOH ADDRESS: HOH TRIBE, HC-80 BOX 917, FORKS, WA 98331
PROJECT: HOH COHO
PURPOSE: ENHANCE RUN FISHERIES ONGOIN
EVALUATION: QN : ESCAPEMENT ESTIMATES ARE FELT UNRELIABLE
SURVIVAL: >10% ON UNMAKED FISH, 5% ON HALF-TAGGED FISH
STOCKING DETAILS: STOCKING INTO UNSEEDED STREAMS, SCATTER-PLANTS IN 89
ACCLIMATION DETAILS: N/A ACCLIMATION DETAILS: STOCKING INTO UNSEEDED STREAMS, SCATTER-TEAMS IN OUTHER PRE STOCKING INFO: SOME GENETIC BACKGROUND INFORMATION TAKEN IMPACTS; RESEARCH: UNKNOWN IMPACTS; OPINION: CONTROL DETAILS: USED SOME HALF TAGS TO EVALUATE HARVEST, SURV. AND COMPETITION OTHER COMMENTS: RELEASED QUINAULT STOCK THROUGH 83, NOW USING WILD BROODSTOCK CHANGES IN ADULT RETURNS BASED ON TWO RELEASE SITES IN THE HOH.

SPECIES: CO RACE: STOCK(S): HU MAJOR DRAINAGE: WC SUB DRAINAGE: CHEHALIS RIVER CONTACT: DAVE SEILER PHONE: (206)586-1994 AGENCY: WDF ADDRESS: RM 115 GEN. ADMIN. BLDG., O OLYMPIA, WA 98504 PROJECT: CHEHALIS RIVER COHO FRY PLANT EVALUATIÓN PURPOSE ONGOING: N EVALUATION: QN : 1,196 FRY-TAGGED SMOLTS TRAPPED IN BEAVER CREEK SURVIVAL: SURVIVAL TO SMOLT = 2.44% STOCKING DETAILS: AVERAGE 590/LB ACCLIMATION DETAILS: OTHER PRE STOCKING INFO: IMPACTS; RESEARCH:
IMPACTS; OPINION: PROBABLE NEG. IMPACTS ON INDIGENOUS, ANADROMOUS & RESIDENT SPECIES
CONTROL DETAILS: 48,957 CWT WITH 1/2-LENGTH TAGS
OTHER COMMENTS: FRY SEEDING LIMITED TO BEAVER CR. DRAINAGE FOR FRY-SM EVALU.

145. SPECIES: CO RACE: STOCK(S): IC

MAJOR DRAINAGE: CC SUB DRAINAGE: KLAMATH RIVER
CONTACT: BILL BEMIS PHONE: (916)842-6131
AGENCY: USFS ADDRESS: KLAMATH NF, 1215 S.MAIN ST., YREKA, CA 96097
PROJECT: INDIAN CREEK SPAWNING CHANNEL
PURPOSE: PROVIDE SPAWNING HABITAT ONGOING: Y
EVALUATION: QN : CARCASS/REDD COUNTS
SURVIVAL:
STOCKING DETAILS: VOLUNTARY MIGRATION OUT OF CHANNEL
ACCLIMATION DETAILS:
OTHER PRE STOCKING INFO: 1988: 15 ADULT COHO USED CHANNEL; 1989=NO USEAGE
IMPACTS; RESEARCH: ADULTS USE THE CHANNEL
IMPACTS; OPINION:
CONTROL DETAILS:
OTHER COMMENTS:

146. SPECIES: CO RACE: STOCK(S): JG

MAJOR DRAINAGE: CC SUB DRAINAGE: HUMBOLDT BAY
CONTACT: DAVID HULL PHONE: (707)822-5957
AGENCY: COAPW ADDRESS: 736 F ST., ARCATA, CA 95521
PROJECT: ARCATA WASTEWATER AQUACULTURE PROJECT
PURPOSE: REESTABLISH RUNS, RESEARCH ONGOING: Y
EVALUATION: QN : CWT PROGRAM; REDD COUNTS; OUT-MIGRANT TRAPPING 2 YEARS AGO
SURVIVAL:
STOCKING DETAILS: BUCKET OUT OR TRUCK; 100% CWT/CLIP/FREEZE BRANDED (3 YEARS)
ACCLIMATION DETAILS:
OTHER PRE STOCKING INFO:
IMPACTS; RESEARCH: CONTRIBUTES TO OVERALL HUMBOLDT BAY ESCAPEMENT
IMPACTS; OPINION: POSITIVE IMPACT ON MAJOR TRIBUTARIES TO HUMBOLDT BAY
CONTROL DETAILS:
OTHER COMMENTS: HAVE EXPERIMENTED WITH RELEASES RELATED TO TIDE AND LUNAR
PHASE; SOME STRAYING TO OTHER TRIBUTARIES

147. SPECIES: CO RACE: STOCK(S): KL,BC
MAJOR DRAINAGE: CR SUB DRAINAGE: KLASKANINE RIVER
CONTACT: QUENTIN SMITH PHONE: (503)325-3653
AGENCY: ODFW ADDRESS: ROUTE 1, BOX 764, ASTORIA, OR 97103
PROJECT: KLASKANINE FISH HATCHERY
PURPOSE: MITIGATION ONGOING: Y
EVALUATION: QA : STREAM SURVEYS(CEDC); CWT PROGRAM
SURVIVAL:
STOCKING DETAILS: LOSSES DUE TO TRUCKING STRESS; 25,000 CWT
ACCLIMATION DETAILS: NA
OTHER PRE STOCKING INFO: NA
IMPACTS; RESEARCH:
IMPACTS; OPINION: NO INCREASE IN ADULTS OSERVED
CONTROL DETAILS: NA
OTHER COMMENTS:

148. SPECIES: CO RACE: STOCK(S): LM

MAJOR DRAINAGE: CC SUB DRAINAGE: REDWOOD CREEK
CONTACT: STEVE SANDERS PHONE: (707)488-2253

AGENCY: HBCO ADDRESS: PRARIE CREEK FISH HATCHERY, ORICK, CA 95555

PROJECT: PRARIE CREEK FISH HATCHERY
PURPOSE: PROVIDE SALMON FOR OFF-SHORE FISHERIES ONGOING: Y
EVALUATION: QN : FIN-CLIP PROGRAM
SURVIVAL: >3% RETURN ON MARKED FISH
STOCKING DETAILS: RELEASE WITH NEW MOON PHASE; 100% FIN-CLIP
ACCLIMATION DETAILS:
OTHER PRE STOCKING INFO:
IMPACTS; RESEARCH: HIGH RETURNS OF FIN-CLIPPED FISH; RUN HAS BEEN ESTABLISHED
IMPACTS; OPINION:
CONTROL DETAILS:
OTHER COMMENTS: THERE HAS BEEN CONSIDERABLE GENETIC MIXING OF COHO STOCKS IN
THE PAST

149. SPECIES: CO RACE: STOCK(S): LR

MAJOR DRAINAGE: CC SUB DRAINAGE: LITTLE RIVER
CONTACT: MITCH FARRO PHONE: (707)839-5664
AGENCY: PCFFA ADDRESS: P.O.BOX 291, TRINIDAD, CA 95570
PROJECT: LITTLE RIVER COHO ENHANCEMENT PROJECT
PURPOSE: INITIALIZE RUN, EDUCATION ONGOING: Y
EVALUATION: QN : SPAWNING GROUND SURVEYS; CWT PROGRAM
SURVIVAL:
STOCKING DETAILS: LATE EVENING RELEASE WITH LUNAR PHASE; 100% CWT; TRUCKED
ACCLIMATION DETAILS: TEMPERATURE ACCLIMATION
OTHER PRE STOCKING INFO:
IMPACTS; RESEARCH: PROJECT HAS CONTRIBUTED TO NATURAL RUN
IMPACTS; OPINION:
CONTROL DETAILS: SPLIT RELEASE STRATEGY (UPPER VS. LOWER RIVER)
OTHER COMMENTS: ADULT MALES ONLY USED ONCE; ONLY MARKED FISH ARE SPAWNED

MAJOR DRAINAGE: CO RACE: STOCK(S): LS

MAJOR DRAINAGE: AC SUB DRAINAGE: LITTLE SUSITNA

CONTACT: BOB CHLUPACH PHONE: (907)892-6816

AGENCY: ADFG ADDRESS: P.O. BOX 520509, BIG LAKE, AK 99652

PROJECT: NORTHERN COOK INLEY CHINOOK AND COHO SALMON ENHANCEMENT

PURPOSE: ONGOING: Y

EVALUATION: QN:

SURVIVAL: FN ACCOUNTED FOR 15% OF RETURN, SM 52% FO TOTAL RETURN

STOCKING DETAILS: TIME OF RELEASE AND NUMBERS OF FINGERLINGS MARKED LOW

ACCLIMATION DETAILS:
OTHER PRE STOCKING INFO: FINGERLINGS & SMOLTS REARED AT 2 DIFFERENT HATCHERIES

IMPACTS; RESEARCH: NO INFO ON IMPACTS

IMPACTS; OPINION:
CONTROL DETAILS: NO CONTROLS, COMPARED 2 TEST GROUPS
OTHER COMMENTS: FINGERLING PROGRAM NOT PROPERLY EVALUATED

151. SPECIES: CO RACE: STOCK(S): MA
MAJOR DRAINAGE: PS SUB DRAINAGE: SOOES RIVER, WAACH RIVER, SAIL RIVER
CONTACT: MARK LARIVIERE PHONE: (206)645-2201
AGENCY: MFM ADDRESS: BOX 115, NEAH BAY, WA 98357
PROJECT: MAKAH COHO
PURPOSE: ENHANCE FISHERY ONGOING: Y
EVALUATION: :
SURVIVAL:
STOCKING DETAILS: DIRECT DUMPS, BACKPACK AND 2" PIPELINES LAID DOWN TO POOLS
ACCLIMATION DETAILS: NONE
OTHER PRE STOCKING INFO: FISH ARE DISPERSED IN SMALL PLANTINGS ALONG STREAMS
IMPACTS; RESEARCH: N/A
IMPACTS; OPINION: N/A
CONTROL DETAILS: COMPARABLE STREAMS SYSTEMS WITHOUT SUPPLEMENTATION
OTHER COMMENTS:

152. SPECIES: CO RACE: STOCK(S): MA
MAJOR DRAINAGE: PS SUB DRAINAGE: SOOES RIVER
CONTACT: DAVID ZAJAC PHONE: (206)753-9460
AGENCY: FWS ADDRESS: FAO-OLYMPIA, 2625 PARKMONT LN, OLYMPIA WA 98502
PROJECT: MAKAH NATIONAL FISH HATCHERY
PURPOSE: ENHANCE RUNS ONGOING:
EVALUATION: QN : CWT PROGRAM
SURVIVAL:
STOCKING DETAILS: TRUCKED; 55,000 MARKED
ACCLIMATION DETAILS: ACCLIMATED 4-6 WEEKS AT WAATCH POND
OTHER PRE STOCKING INFO: NA
IMPACTS; RESEARCH: GOOD RETURNS AND SURVIVAL RATES
IMPACTS; OPINION: SOME WILD STOCK HAS BEEN ABSORBED BY LARGER HATCHERY RUN SIZES
CONTROL DETAILS: NA
OTHER COMMENTS: GENETIC VARIABILITY MAY BE REDUCED DUE TO HATCHERY SPAWNING PR
ACTICES; UNDETERMINED CONTINUATION OF PROJECT BECAUSE OF VHS

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MAJOR DRAINAGE: BC SUB DRAINAGE: MILLSTONE RIVER
CONTACT: ROBERT HURST PHONE: (604)756-7296
AGENCY: CFSO ADDRESS: 3225 STEPHENSON PT RD, NANAIMO, BC V9T 4P7
PROJECT: MILLSTONE R & BRANNEN L COLONIZATION
PURPOSE: HABITAT UTILIZATION ONGOING: Y
EVALUATION: QN : DNSTREAM SM TRAP, SIG DIFF IN LAKE TO RIVER & JULY TO SEPT PLANTS
SURVIVAL: FRY TO SM, (JULY) LAKE=6.7%, (JULY) RIVER=17.7%, (SEPT) LAKE=18%
STOCKING DETAILS: FISH STOCKED IN LAKES & RIVER, RIVER FISH LEFT SYS. FIRST
ACCLIMATION DETAILS:
OTHER PRE STOCKING INFO: STREAMS & LAKE WERE NOT PRODUCING FISH BEFORE PROJECT
IMPACTS; RESEARCH: PREDATION MAY BE A FACTOR AFFECTING FRY SURVIVAL IN LAKES
IMPACTS; OPINION:
CONTROL DETAILS: N/A
OTHER COMMENTS: DATA INDICATES THAT RIVER HABITAT PRODUCED LARGER SMOLTS. RIVER
SMOLTS ACHEIVED & MAINTAINED BETTER K FACTOR.

MAJOR DRAINAGE: PS SUB DRAINAGE: KITSAP PENINSULA
CONTACT: PAUL DORN PHONE: (206)598-3311
AGENCY: SUQ ADDRESS: PO BOX 498, SUQUAMISH, WA 98392
PROJECT: SUQUAMISH TRIBAL COHO FRY OUTPLANTS
PURPOSE: ENHANCE FISHERY
EVALUATION: QA: OVERALL ESCAPEMENT GOOD, HARVEST INCREASING 14-18000/YR
SURVIVAL: LOW SURVIVAL
STOCKING DETAILS: REARED TO 200-300/LB & SCATTER-PLANTED AT ROAD ACCESS POINTS ACCLIMATION DETAILS: N/A
OTHER PRE STOCKING INFO: DATA ON SMOLT OUTMIGRATION, STREAM UTILIZATION SURVEYS IMPACTS; RESEARCH: NO INFO: WDF ASSUMES WILD AND HATCHERY FISH WILL MIX IMPACTS; OPINION:
CONTROL DETAILS: CWT AT GROVER CR, TO ASSESS RETURN RATES. NO TAGS ON OUPLANTS OTHER COMMENTS: WDF SUPPLIES EGGS, TRIBES REARS THE FISH, COOP RELEASE
3 STREAMS RECEIVE BULK OF RELEASES. MOST STREAMS HAVE POOR WATER QUAL.

155. SPECIES: CO RACE: STOCK(S): MI
MAJOR DRAINAGE: PS SUB DRAINAGE: KITSAP PENINSULA
CONTACT: PAUL DORN PHONE: (206)598-3311
AGENCY: SUQ ADDRESS: PO BOX 498, SUQUAMISH, WA 98392
PROJECT: SUQUAMISH TRIBAL ON-STATION COHO SMOLT RELEASES
PURPOSE: PROVIDE FOR FISHERY, ENHANCE FISHERY ONGOING: Y
EVALUATION: QA : POOR CONTRIBUTION FROM SMOLTS, ESCAPEMENT GOOD, HARVEST INCREASING
SURVIVAL:
STOCKING DETAILS: REARED TO +/- 10/LB & DUMP-RELEASED TO GROVERS CR
ACCLIMATION DETAILS: N/A
OTHER PRE STOCKING INFO:
IMPACTS; RESEARCH:
IMPACTS; OPINION: ASSUME THAT HATCHERY AND WILD FISH WILL MIX
CONTROL DETAILS: % OF SMOLTS CWT TO DETERMINE CONTRIBUTION TO HARVEST & RETURN
OTHER COMMENTS:

156. SPECIES: CO RACE: STOCK(S): MI, PU, WR, KA
MAJOR DRAINAGE: PS SUB DRAINAGE: NISQUALLY RIVER
CONTACT: WILLIAM THOMAS PHONE: (206)456-5221
AGENCY: NISQ ADDRESS: 4820 SHE-NAH-NUM DR SE, OLYMPIA, WA 98503
PROJECT: NISQUALLY TRIBAL COHO FRY RELEASES
PURPOSE: ENHANCE RUNS
ONGOING: Y
EVALUATION: QN : SPAWNING SURVEYS NOTED ACCUMULATIONS OF ADULTS AT BARRIERS
SURVIVAL: 4-7,000 SMOLTS FROM 150-200,00 FRY, ADULT RETURN LOW
STOCKING DETAILS: BEAVER CR STOCKED VIA HELICOPTER -SCATTER BUCKET
ACCLIMATION DETAILS: N/A
OTHER PRE STOCKING INFO:
IMPACTS; RESEARCH:
IMPACTS; RESEARCH:
IMPACTS; OPINION: ON IMPACTS SINCE FRY ARE PLANTED TO UNSEEDED AND INACESSABLE STREAMS
CONTROL DETAILS: N/A
OTHER COMMENTS: POSITIVE PUBLIC RELATIONS BENEFITS.
PROBLEM: HATCHERY COHO PRODUCTION REDUCES CHINOOK PRODUCTION

157. SPECIES: CO RACE: STOCK(S): MIXED

MAJOR DRAINAGE: OC SUB DRAINAGE: COOS RIVER, SIUSLAW RIVER, YAQUINA RIVER

CONTACT: JAY NICHOLAS PHONE: (503)737-4431

AGENCY: ODFW ADDRESS: 28655 HWY 34, CORVALLIS, OR 97330

PROJECT: DISTRIBUTION AND ABUNDANCE OF HATCHERY AND WILD SALMON
PURPOSE: RESEARCH

EVALUATION: QA : SEINED; DETEMINED AVERAGE CATCH PER SEINE HAUL

SURVIVAL:
STOCKING DETAILS: NA
ACCLIMATION DETAILS:
OTHER PRE STOCKING INFO:
IMPACTS; RESEARCH:
IMPACTS; RESEARCH:
IMPACTS; OPINION: THERE IS POTENTIAL FOR COMPETITION BETWEEN HATCHERY AND WILD FISH
CONTROL DETAILS:
OTHER COMMENTS: IMPACTS BASED ON-#'S IF FISH, AVAILABILITY OF ESSENTIAL RESOURC
ES, COMPETATIVENESS OF HATCHERY FISH; INFORMATION REPORT #83-7, ODFW

158. SPECIES: CO RACE: STOCK(S): MN

MAJOR DRAINAGE: PS SUB DRAINAGE: PUGET SOUND

CONTACT: CHUCK BARANSKI PHONE: (206)753-0197

AGENCY: WDF ADDRESS: GENERAL ADMINISTRATION BLDG., OLYMPIA WA 89501

PROJECT: GORST CREEK

PURPOSE: RESEARCH

EVALUATION: QN : OUT-MIGRANTS TRAPPED FOR 5 YEARS

SURVIVAL: SEE COMMENTS SECTION

STOCKING DETAILS: SCATTER PLANT BY HAND

ACCLIMATION DETAILS: N/A

OTHER PRE STOCKING INFO: OXYGEN IN TRUCKS, TEMP. MONITORED, WEIGHTED AT SITE

IMPACTS; RESEARCH: N/A

IMPACTS; OPINION: NO WILD FISH USED

CONTROL DETAILS: N/A

OTHER COMMENTS: 7-10% SURVIVAL WHEN PLANTED AS FINGERLINGS, 2.5% WHEN PLANTED

AS FRY

159. SPECIES: CO RACE: STOCK(S): MT
MAJOR DRAINAGE: CC SUB DRAINAGE: MATTOLE RIVER
CONTACT: GARY PETERSON PHONE: (707)629-3514
AGENCY: MWSSG ADDRESS: P.O.BOX 188, PETROLIA, CA 95538
PROJECT: MATTOLE WATERSHED SALMON SUPPORT GROUP
PURPOSE: ENHANCE WILD STOCKS ONGOING: Y
EVALUATION: QN : CWT PROGRAM(2 YEARS); JUVENILE TRAPPING; SPAWNING SURVEYS
SURVIVAL:
STOCKING DETAILS: DUSK OR EVENING RELEASES WITH NEW MOON PHASE
ACCLIMATION DETAILS: TEMPERATURE ACCLIMATION
OTHER PRE STOCKING INFO: FISH TAKEN OFF FEED AND SALTED PRIOR TO STOCKING
IMPACTS; RESEARCH:
IMPACTS; OPINION: POPULATIONS ARE STATIC- NO INCREASE OR DECREASE
CONTROL DETAILS:
OTHER COMMENTS: PROJECT HAS ESTABLISHED RUNS IN DIFFERENT TRIBUTARIES

160. SPECIES: CO RACE: STOCK(S): NE
MAJOR DRAINAGE: OC SUB DRAINAGE: NEHALEM RIVER
CONTACT: GARY YEAGER PHONE: (503)368-6828
AGENCY: ODFW ADDRESS: RT. 1, BOX 292, NEHALEM, OR 97131
PROJECT: NEHALEM HATCHERY
PURPOSE: ENHANCE WILD STOCKS

SURVIVAL:
STOCKING DETAILS:
ACCLIMATION DETAILS:
OTHER PRE STOCKING INFO:
IMPACTS; RESEARCH:
IMPACTS; OPINION:
CONTROL DETAILS:
OTHER COMMENTS:

161. SPECIES: CO RACE: STOCK(S): NO,SY,SK,SO
MAJOR DRAINAGE: PS SUB DRAINAGE: NOOKSACK RIVER
CONTACT: STEVE SEYMOUR PHONE: (206)734-8180
AGENCY: LUMM ADDRESS: 2616 KWINA ROAD, BELLINGHAM, WA 98226
PROJECT: LUMMI - SKOOKUM CR. HATCHERY
PURPOSE: ENHANCE FISHERY
CONGOING: Y
EVALUATION: QN : COHO PROGRAM IS DOING WELL AT SKOOKUM CR
SURVIVAL: EST. 15%
STOCKING DETAILS: FRY SCATTER-PLANTED INTO LOWER RIVER TRIBS, 85-87
ACCLIMATION DETAILS: SINCE 1980, USING SKOOKUM CREEK STOCK
OTHER PRE STOCKING INFO: WILD COHO COMPONENT VERY SMALL
IMPACTS; RESEARCH:
IMPACTS; RESEARCH:
IMPACTS; OPINION: FISHERY MANAGED FOR HAT. FISH. HARVEST HAS IMPACT ON NATURAL COMPONENT
CONTROL DETAILS: LAST 3 YEARS, CWT TO COMPLY W/ US/CAN TREATY FOR HARVEST RATES
OTHER COMMENTS: TRIBE NOW USING 1/2 OF FISH AT NET PENS & REL. 1/2 TO S FORK
EARLY HATCHERY OPER. WAS TO SUPPLY COHO SMOLTS FOR SALT-WATER NET PENS

162. SPECIES: CO RACE: STOCK(S): NY
MAJOR DRAINAGE: CC SUB DRAINAGE: NOYO RIVER
CONTACT: ALLAN GRASS PHONE: (707)743-1535
AGENCY: CDFG ADDRESS: P.O.BOX 176, POTTER VALLEY, CA 94569
PROJECT: NOYO RIVER EGG COLLECTION STATION
PURPOSE: ENHANCE RUNS, DEVELOP STOCKS ONGOING: Y
EVALUATION: QN : SOME SPAWNING GROUND SURVEYS
SURVIVAL:
STOCKING DETAILS: TRUICKED; DAYTIME RELEASES
ACCLIMATION DETAILS: SOME IMPRINTING DONE AT NOYO RIVER AND PARLINE CREEKS
OTHER PRE STOCKING INFO: SOME REARED AT MAD RIVER HATCHERY BUT RELEASED IN NOYO
IMPACTS; RESEARCH:
IMPACTS; OPINION: UNKNOWN-NO MARKED FISH FOR EVALUATION
CONTROL DETAILS:
OTHER COMMENTS: RANDOM SELECTION OF BROODSTOCK

163. SPECIES: CO RACE: STOCK(S): NY
MAJOR DRAINAGE: CC SUB DRAINAGE: MAD RIVER
CONTACT: BRUCE BARNGROVER PHONE: (707)822-0592
AGENCY: CDFG ADDRESS: 1660 HATCHERY RD., ARCATA, CA 95521
PROJECT: MAD RIVER FISH HATCHERY
PURPOSE: INITIATE AND ENHANCE RUNS ONGOING: Y
EVALUATION: QN : SPAWNING SURVEYS ON NORTH FORK MAD R., MILL AND LINDSAY CREEKS
SURVIVAL:
STOCKING DETAILS: RELEASED NEAR NEW MOON PHASE; TRUCKED IN SALT SOLUTION
ACCLIMATION DETAILS:
OTHER PRE STOCKING INFO:
IMPACTS; RESEARCH: INCREASED RETURNS TO HATCHERY AND SOME TRIBUTARY STREAMS
IMPACTS; OPINION:
CONTROL DETAILS:
OTHER COMMENTS: COHO ARE NOT NATIVE TO THIS AREA, HISTORICALLY THESE COHO ARE OF
MIXED STOCKS (ALSEA, OR-KLAMATH & PRARIE CREEK, CA)

164. SPECIES: CO RACE: STOCK(S): NY, PR
MAJOR DRAINAGE: CC SUB DRAINAGE: HUMBOLDT BAY
CONTACT: CHRISTOPHER TOOLE PHONE: (707)443-8369
AGENCY: HFAC ADDRESS: P.O.BOX 154, EUREKA, CA 95501
PROJECT: COCHRAN CREEK REARING PONDS
PURPOSE: ENHANCE RUNS
ONGOING: Y
EVALUATION: QN : SPAWNING SURVEYS (4 YEARS); SOME OUT-MIGRANT TRAPPING
SURVIVAL:
STOCKING DETAILS: DAYTIME RELEASES AROUND NEW MOON PHASE
ACCLIMATION DETAILS:
OTHER PRE STOCKING INFO: RELATIVE DENSITY MONITORING IS ON-GOING
IMPACTS; RESEARCH:
IMPACTS; RESEARCH:
IMPACTS; OPINION: MINIMAL STRAYING; DIFFICULT TO QUANTIFY AFFECTS DUE TO SMALL LOT SIZES
CONTROL DETAILS:
OTHER COMMENTS: HISTORICALLY FRESHWATER CREEK HAD LARGE COHO RUNS, BUT WERE
DEPLETED BY THE MID 60'S

165. SPECIES: CO RACE: STOCK(S): PU
MAJOR DRAINAGE: PS SUB DRAINAGE: PUYALLUP RIVER
CONTACT: RUSSELL LADLEY PHONE: (206)593-0254
AGENCY: PUT ADDRESS: 6824 PIONEER WAY WEST, PUYALLUP, WA 98371
PROJECT: PUYALLUP FISHERIES COHO OUTPLANTS
PURPOSE: ENHANCE FISHERIES ONGOING: Y
EVALUATION: QA : EVALUATES RETURN TO FISHERY AND DOES ELECTROSHOCKING TO COUNT FRY
SURVIVAL:
STOCKING DETAILS: DUMP-PLANTED TO LOWER REACHES OF TRIBS
ACCLIMATION DETAILS: N\A
OTHER PRE STOCKING INFO: COHO STOCKED ONLY INTO PERENNIAL STREAMS
IMPACTS; RESEARCH:
IMPACTS; OPINION:- POOR HARVEST FOR PAST SEVERAL YR. IMPACT ON NATURAL STOCK UNKNOWN
CONTROL DETAILS: NONE
OTHER COMMENTS: NEW HATCHERY EXPECTED TO CAUSE HARVEST ALLOC. PROBLEMS
CARRYING CAPACITIES NOT DETERMINED

166. SPECIES: CO RACE: STOCK(S): QC
MAJOR DRAINAGE: PS SUB DRAINAGE: BIG QUILCENE RIVER
CONTACT: DAVID ZAJAC PHONE: (206)753-9460
AGENCY: FWS ADDRESS: FAO-OLYMPIA, 2625 PARKMONT LN, OLYMPIA, WA 98502
PROJECT: QUILCENE NATIONAL FISH HATCHERY
PURPOSE: ENHANCE FISHERIES ONGOING: Y
EVALUATION: QN : CWT PROGRAM TO DOCUMENT SURVIVAL
SURVIVAL: 5-10% TO ADULT
STOCKING DETAILS: DIRECT RELEASE; 75,000 CWT (1989)
ACCLIMATION DETAILS: REARED IN BIG QUILCENE WATER FROM EGG TO SMOLT
OTHER PRE STOCKING INFO: NA
IMPACTS; RESEARCH: RUN IS MAINTAINED BY HATCHERY PLANTINGS
IMPACTS; OPINION: NATURAL STOCKS WERE ELIMINATED BY HATCHERY OPERATIONS
CONTROL DETAILS: NA
OTHER COMMENTS:

167. SPECIES: CO RACE: STOCK(S): QU, BL
MAJOR DRAINAGE: BC SUB DRAINAGE: KITTY COLEMAN CK
CONTACT: ROBERT HURST PHONE: (604)756-7296
AGENCY: CFSO ADDRESS: 3225 STEPHENSON PT RD, NANAIMO, BC V9T 4P7
PROJECT: KITTY COLEMAN CREEK STUDIES
PURPOSE: STOCK EVALUATION ONGOING: Y
EVALUATION: QN : WILD STOCK & HATCHERY STOCK WERE OUTPLANTED AT SAME TIME
SURVIVAL: WILD STOCK=0.3%, HATCHERY STOCK=0.2%, NO SIG DIFF
STOCKING DETAILS:
ACCLIMATION DETAILS:
OTHER PRE STOCKING INFO:
IMPACTS; RESEARCH: NO SIG DIFF FOR SURVIVAL, SIZES IN SUMMER, SMOLT SIZE & ASSOCIATION
IMPACTS; OPINION: DIFFERENCES IN DISTIBUTION IN STUDY AREA, WILD STOCK MOVED DOWNSTREAM
CONTROL DETAILS:
OTHER COMMENTS: WILD STOCK (FRY) MOVED DOWNSTREAM, HATCHERY STOCK MOVED UPSTREAM

168. SPECIES: CO RACE: STOCK(S): RC
MAJOR DRAINAGE: CC SUB DRAINAGE: SMITH RIVER
CONTACT: TOM GREENER PHONE: REFER TO TEXT
AGENCY: SOC ADDRESS: BAR-O-BOYS RANCH, 15005 HWY 199, GASQUET, CA 95543
PROJECT: BAR-O-BOYS
PURPOSE: EDUCATION ONGOING: Y
EVALUATION: QN : USFS DOES SPORADIC STREAM SURVEYS IN THE AREA
SURVIVAL:
STOCKING DETAILS: ON-SITE; TRUCKED; SALTED PRIOR TO RELEASE
ACCLIMATION DETAILS:
OTHER PRE STOCKING INFO: SPAWNING HABITAT IS BELOW CARRYING CAPACITY
IMPACTS; RESEARCH:
IMPACTS; OPINION: UNKNOWN
CONTROL DETAILS:
OTHER COMMENTS: COHO ARE NOT TO BE REARED IN THE FUTURE

169. SPECIES: CO RACE: STOCK(S): RS
MAJOR DRAINAGE: CC SUB DRAINAGE: RUSSIAN RIVER
CONTACT: ROYCE GUNTER PHONE: (707)433-6325
AGENCY: CDFG ADDRESS: 3246 SKAGGS SPRING RD., GEYSERVILLE, CA 95441
PROJECT: WARM SPRINGS FISH HATCHERY
PURPOSE: MITIGATION ONGOING: Y
EVALUATION: QN : CWT PROGRAM (4 YEARS)
SURVIVAL:
STOCKING DETAILS: 40,000 CWT; RELEASED WITH LUNAR PHASE
ACCLIMATION DETAILS:
OTHER PRE STOCKING INFO: FISH TAKEN FEED; SALTED BEFORE LOADING
IMPACTS; RESEARCH: ESCAPEMENT LEVELS HAVE INCREASED FOR RUSSIAN RIVER AND DRY CREEK
IMPACTS; OPINION: NATIVE STOCK GENE POOL IS NO LONGER INTACT
CONTROL DETAILS:
OTHER COMMENTS: CONTRIBUTES TO OCEAN HARVEST

170. SPECIES: CO RACE: STOCK(S): SD
MAJOR DRAINAGE: CR SUB DRAINAGE: WILLAMETTE RIVER
CONTACT: DENNIS WISE PHONE: (503)378-6925
AGENCY: ODFW ADDRESS: 2487 LANCASTER DR., SALEM, OR 97305
PROJECT: STEP- MID-WILLAMETTE DISTRICT
PURPOSE: EDUCATION, INITIALIZE RUN ONGOING: N
EVALUATION: QN : SOME CARCASS COUNTS
SURVIVAL:
STOCKING DETAILS: DIRECT RELEASE FROM HATCHBOX
ACCLIMATION DETAILS: NA
OTHER PRE STOCKING INFO: NA
IMPACTS; RESEARCH: SPAWNERS RETURNED TO AREA-DUE ONLY TO FRY RELEASES
IMPACTS; OPINION:
CONTROL DETAILS: NA
OTHER COMMENTS: PROGRAM DISCONTINUED

171. SPECIES: CO RACE: STOCK(S): SN
MAJOR DRAINAGE: CC SUB DRAINAGE: MONTEREY BAY
CONTACT: DAVE STREIG PHONE: (408)845-3095
AGENCY: MBSTP ADDRESS: 324 SWANTON RD., DAVENPORT, CA 95017
PROJECT: MONTEREY BAY SALMON AND TROUT PROJECT
PURPOSE: ENHANCE RUNS ONGOING: Y
EVALUATION: QN : OUT-MIGRANT TRAPPING; FIN-CLIPPING PROGRAM IN 1983
SURVIVAL:
STOCKING DETAILS: TRUCKED; 100% FIN-CLIPPED IN 1983
ACCLIMATION DETAILS:
OTHER PRE STOCKING INFO: NOYO RIVER STOCKS ORIGINALLY, MAD RIVER HATCH. STOCKS
IMPACTS; RESEARCH:
IMPACTS; OPINION: STRAYING INTO SOQUEL CREEK; DOWNWARD TRENDS IN COASTAL STREAMS
CONTROL DETAILS:
OTHER COMMENTS:

172. SPECIES: CO RACE: STOCK(S): SR
MAJOR DRAINAGE: CR SUB DRAINAGE: SANDY RIVER
CONTACT: DICK WHITLATCH PHONE: (503)668-4222
AGENCY: ODFW ADDRESS: 39800 SE FISH HATCHERY RD., SANDY, OR 97055
PROJECT: SANDY HATCHERY
PURPOSE: MITIGATION ONGOING: Y
EVALUATION:
SURVIVAL:
STOCKING DETAILS:
ACCLIMATION DETAILS:
OTHER PRE STOCKING INFO:
IMPACTS; RESEARCH:
IMPACTS; OPINION:
CONTROL DETAILS:
OTHER COMMENTS:

173. SPECIES: CO RACE: STOCK(S): SR
MAJOR DRAINAGE: CR SUB DRAINAGE: WILLAMETTE RIVER (MID)
CONTACT: WAYNE BOWERS PHONE: (503)657-6822
AGENCY: ODFW ADDRESS: 17330 S.EVELYN ST., CLACKAMAS, OR 97015
PROJECT: STEP PROGRAM MID-WILLAMETTE DISTRICT
PURPOSE: ENHANCE WILD STOCKS

EVALUATION: :
SURVIVAL:
STOCKING DETAILS:
ACCLIMATION DETAILS:
OTHER PRE STOCKING INFO:
IMPACTS; RESEARCH:
IMPACTS; OPINION:
CONTROL DETAILS:
OTHER COMMENTS:

174. SPECIES: CO RACE: STOCK(S): ST

MAJOR DRAINAGE: CC SUB DRAINAGE: KLAMATH RIVER

CONTACT: JACK WEST PHONE: (916)842-6131

AGENCY: USFS ADDRESS: KLAMATH NF, 1215 S.MAIN ST., YREKA, CA 96097

PROJECT: KELSEY CREEK SPAWNING-REARING CHANNEL

PURPOSE: PROVIDE SPAWNING HABITAT ONGOING: Y

EVALUATION: QN : REDD/CARCASS COUNTS; JUVENILE TRAPPING; STANDING CROP ESTIMATES

SURVIVAL:

STOCKING DETAILS: VOLUNTARY MIGRATION OUT OF CHANNEL

ACCLIMATION DETAILS:

OTHER PRE STOCKING INFO:

IMPACTS; RESEARCH: CHANNEL IS USED BY ADULTS

IMPACTS; OPINION:

CONTROL DETAILS:

OTHER COMMENTS:

175. SPECIES: CO RACE: STOCK(S): ST, SK
MAJOR DRAINAGE: PS SUB DRAINAGE: STILLAGUAMISH RIVER
CONTACT: KIP KILLEBREW PHONE: (206)435-8770
AGENCY: STIL ADDRESS: 3439 STOLUCKQUAMISH LN, ARLINGTON, WA 98223
PROJECT: STILLAGUAMISH COHO
PURPOSE: ENHANCE FISHERIES ONGOING: Y
EVALUATION: QA : WILL DETERMINE ESCAPEMENT ON WILD FISH
SURVIVAL: NOW BEING STUDIED; DATA WORK IN PROGRESS
STOCKING DETAILS: DUMP PLANTED (SKAGIT STOCK 81/82)(STILLAGUAMISH STOCK SINCE)
ACCLIMATION DETAILS: N/A
OTHER PRE STOCKING INFO: CO, PK, SH, & CUT NATIVE TO HARVEY CK, CH IN STILLY
IMPACTS; RESEARCH:
IMPACTS; OPINION: POTENTIAL FOR COMPETITION
CONTROL DETAILS: NO TAGS
OTHER COMMENTS: FISH PLANTED AT RM 1.5 IN HARVEY CREEK

176. SPECIES: CO RACE: STOCK(S): SY,SK
MAJOR DRAINAGE: PS SUB DRAINAGE: TULALIP BAY
CONTACT: CLIFF BENGSTON PHONE: (206)653-7477
AGENCY: TULA ADDRESS: 10610 WATERWORKS ROAD, MARYSVILLE, WA 98270
PROJECT: TULALIP TRIBAL HATCHERY COHO RELEASES
PURPOSE: PROVIDE FOR FISHERIES ONGOING: Y
EVALUATION: QN : RETURN RATE APPEARS TO BE LOWER THAN OTHER PUGET SOUND STOCKS
SURVIVAL: 5% NET FISHERIES, 15% ALL FISHERIES.
STOCKING DETAILS: HEATH INCUB. ON WELL WATER, REAR ON VEXAR SUBSTR.
ACCLIMATION DETAILS: REARING TROUGHS, FINISHING IN DEC. RELEASED IN JUN.
OTHER PRE STOCKING INFO:
IMPACTS; RESEARCH: PINK & CHUM FRY HAD CLEARED ESTUARY BY LATE MAY
IMPACTS; OPINION: TRIBE RELEASES COHO SMOLTS LATER TO AVOID NEAR-SHORE INTERACTIONS
CONTROL DETAILS: CWT, AS COHO ARE USED AS INDICATOR STOCK FOR US/CANADA
OTHER COMMENTS: TARGET IS 1.2 MILLION SMOLTS RELEASED PER YEAR.
COOPERATIVE PROGRAM WITH WDF

177. SPECIES: CO RACE: STOCK(S): TM

MAJOR DRAINAGE: OC SUB DRAINAGE: EEL LAKE
CONTACT: PAUL REIMERS PHONE: (503)888-5515

AGENCY: ODFW ADDRESS: P.O.BOX 5430, CHARLESTON, OR 97420

PROJECT: TENMILE LAKES COHO MARKING PROGRAM

PURPOSE: RESEARCH, ENHANCE RUNS ONGOING: Y

EVALUATION: QN : CWT PROGRAM TO DETERMINE CONTRIBUTION, SURVIVAL, AND ADULT RETURNS SURVIVAL:

STOCKING DETAILS: TRUCKED AND RELEASED INTO THE LAKE
ACCLIMATION DETAILS:
OTHER PRE STOCKING INFO:
IMPACTS; RESEARCH: 20% RESIDUALISM; LOW RETURNS OF ADULTS TO THE LAKE
IMPACTS; OPINION:
CONTROL DETAILS:
OTHER COMMENTS: WILD EEL LAKE COHO HAVE PROBABLY BEEN ELIMINATED, ONLY NATUR-ALLY SPAWNING HATCHERY FISH SUSTAIN THE RUN

178. SPECIES: CO RACE: STOCK(S): TM

MAJOR DRAINAGE: OC SUB DRAINAGE: EEL LAKE
CONTACT: PAUL REIMERS PHONE: (503)888-5515
AGENCY: ODFW ADDRESS: P.O.BOX 5430, CHARLESTON, OR 97420
PROJECT: EEL LAKE COHO STUDIES
PURPOSE: ENHANCE WILD STOCKS
ONGOING: Y
EVALUATION: QN : CWT PROGRAM; SURVIVAL BASED ON CONTRIBUTION AND RETURNING ADULTS
SURVIVAL: 1.17% TO ADULTS
STOCKING DETAILS: STOCK AFTER THE BASS ACTIVITY SLOWS DOWN
ACCLIMATION DETAILS:
OTHER PRE STOCKING INFO:
IMPACTS; RESEARCH: FISH GET PHENOMENAL GROWTH WHEN REARED IN THE LAKE
IMPACTS; OPINION:
CONTROL DETAILS:
OTHER COMMENTS: THIS PROGRAM UTILIZES EEL LAKE AS A REARING AREA; WILD FISH
ARE CONTINUALLY FUSED INTO THIS PROGRAM TO MAINTAIN THE GENETICS

179. SPECIES: CO RACE: STOCK(S): TM,NY
MAJOR DRAINAGE: CC SUB DRAINAGE: SMITH RIVER
CONTACT: BOB WILLS PHONE: (707)487-3443
AGENCY: SRKC ADDRESS: PO BOX 328, SMITH RIVER, CA 95567
PROJECT: ROWDY CREEK FISH HATCHERY
PURPOSE: ENHANCE RIVER & OCEAN FISHERIES ONGOING: Y
EVALUATION: : SPAWNING CARCASS SURVEYS
SURVIVAL:
STOCKING DETAILS: DIRECT RELEASES INTO ROWDY CREEK
ACCLIMATION DETAILS: N/A
OTHER PRE STOCKING INFO:
IMPACTS; RESEARCH:
IMPACTS; OPINION: NO GENETIC IMPACTS BELIEVED DUE TO USE OF LOCAL STOCKS
CONTROL DETAILS: N/A
OTHER COMMENTS:

180. SPECIES: CO RACE: STOCK(S): TR
MAJOR DRAINAGE: BC SUB DRAINAGE: TRENT RIVER, CANADA
CONTACT: ROBERT HURST PHONE: (604)756-7296
AGENCY: CFSO ADDRESS: 3225 STEPHENSON PT RD, NAMAIMO, BC V9T 4P7
PROJECT: TRENT RIVER - COLONIZATION
PURPOSE: HABITAT UTILIZATION ONGOING: Y
EVALUATION: QN : DOWN STREAM SMOLT TRAP ON BRADLEY LK
SURVIVAL: BRADLEY LK FRY TO SMOLT=19%, OUTPLANTED FRY IN TRENT R=5.4%
STOCKING DETAILS: STOCKED FORM 81-86 ONLY EVALUATED IN 86
ACCLIMATION DETAILS: N/A
OTHER PRE STOCKING INFO:
IMPACTS; RESEARCH: BRADLEY L HAS GOOD SMOLT PROD. POTENTIAL & PRODUCED LARGER SMOLTS
IMPACTS; OPINION: 2-2.5 G COHO FRY DO WELL IN LAKES W/ FEW PREDATORS & LOW GRADIENT STS
CONTROL DETAILS: N/A
OTHER COMMENTS:

181. SPECIES: CO RACE: STOCK(S): WA
MAJOR DRAINAGE: CR SUB DRAINAGE: KLICKITAT RIVER
CONTACT: DICK JOHNSON PHONE: (206)837-3311
AGENCY: WDF ADDRESS: WASHOUGAL FISH HATCHERY, WASHOUGAL, WA 98671
PROJECT: KLICKITAT MITIGATION
PURPOSE: ENHANCE RUNS ONGOING: Y
EVALUATION: NA : N/A WOULD LIKE TO SEE EVALUATION
SURVIVAL:
STOCKING DETAILS: TRUCKED, 3.25 HRS
ACCLIMATION DETAILS: N/A
OTHER PRE STOCKING INFO:
IMPACTS; RESEARCH:
IMPACTS; OPINION:
CONTROL DETAILS: N/A
OTHER COMMENTS: BELIEVES ACCLIMATION POND WOULD BE MORE EFFECTIVE

182. SPECIES: CO RACE: FAL STOCK(S): CZ

MAJOR DRAINAGE: CR SUB DRAINAGE: COLUMBIA RIVER

CONTACT: DAVE SEILER PHONE: (206)586-1994

AGENCY: WDF ADDRESS: 3939 CLEVELAND AVE, TUMWATER, WA 98503

PROJECT: DOWNSTREAM MIGR. PASSAGE & SMOLT PROD. EVALUATION

PURPOSE: PASSAGE EVALUATION ONGOING: N

EVALUATION: QN : REFER TO WDF PROGRESS REPORT #200.

SURVIVAL: FINGERLING TO SMOLT 8.7% IN 1983

STOCKING DETAILS: TRUCKED, RELEASED AT 138-148/LB

ACCLIMATION DETAILS: N/A

OTHER PRE STOCKING INFO:

IMPACTS; RESEARCH: MAY HAVE IMPACTED RESIDENT SPECIES, NO ANADROMOUS SPECIES PRESENT IMPACTS; OPINION:

CONTROL DETAILS:

OTHER COMMENTS: PRODUCTION AND SURVIVAL ESTIMATED IN 1983.

183. SPECIES: CO RACE: FAL STOCK(S): CZ
MAJOR DRAINAGE: CR SUB DRAINAGE: COLUMBIA RIVER
CONTACT: DAVE SEILER PHONE: (206)586-1994
AGENCY: WDF ADDRESS: 3939 CLEVELAND AVE, TUMWATER, WA 98503
PROJECT: DOWNSTREAM MIGR. PASSAGE & SMOLT PROD. EVALUATION
PURPOSE: PASSAGE EVALUATION ONGOING: N
EVALUATION: QN : FINGERLING TO SMOLTS SURVIVAL=6.0% IN 1983
SURVIVAL: 6.0%
STOCKING DETAILS: TRUCKED
ACCLIMATION DETAILS: N/A
OTHER PRE STOCKING INFO:
IMPACTS; RESEARCH: MAY HAVE IMPACTED RESIDENT SPECIES, NO ANADROMOUS SPECIES PRESENT
IMPACTS; OPINION:
CONTROL DETAILS:
OTHER COMMENTS: PRODUCTION AND SURVIVAL ALSO EVALUATED IN 1984.

184. SPECIES: CO RACE: FAL STOCK(S): DN
MAJOR DRAINAGE: PS SUB DRAINAGE: HOOD CANAL (NEAR PORT ANGELES)
CONTACT: TIM FLINT PHONE: (206)753-0198
AGENCY: WDF ADDRESS: 115 GENERAL ADMIN. BLDG, OLYMPIA, WA 98504
PROJECT: HOOD CANAL COHO OUTPLANT EVALUATION ONGOING: N
EVALUATION: QN : EVALUATION ONGOING: N
EVALUATION: QN : EVALUATED ON-STATION VS OFF-STATION SMOLT RELEASES USING CWT
SURVIVAL:
STOCKING DETAILS: TRUCKED, SINGLE DUMPS AT EACH CREEK/RIVER
ACCLIMATION DETAILS: N/A
OTHER PRE STOCKING INFO:
IMPACTS; RESEARCH: UNKNOWN
IMPACTS; OPINION:
CONTROL DETAILS: ONE GROUP TRUCKED AND RETURNED TO HAT. POND; NO EFFECT(2YRS)
OTHER COMMENTS: SIGNIFICANT SURVIVAL AND RETURN ON SOME PLANTS

185. SPECIES: CO RACE: FAL STOCK(S): DN
MAJOR DRAINAGE: PS SUB DRAINAGE: HAMMA HAMMA RIVER
CONTACT: TIM FLINT PHONE: (206)753-0198
AGENCY: WDF ADDRESS: 115 GENERAL ADMIN. BLDG., OLYMPIA, WA 98507
PROJECT: HAMMA HAMMA RIVER COHO OUTPLANT EVALUATION
PURPOSE: ONGOING: N
EVALUATION: QN : SHOCKED FOR 1981 FRY FROM HATCHERY PLANTING
SURVIVAL:
STOCKING DETAILS: TRUCKED, DUMPED
ACCLIMATION DETAILS: N/A
OTHER PRE STOCKING INFO:
IMPACTS; RESEARCH:
IMPACTS; OPINION: DUE TO HATCHERY GENETICS SPAWNING ADULTS LOW
CONTROL DETAILS:
OTHER COMMENTS: HIGH 1980 ADULT RETURNS TO JOHNS CR.

186. SPECIES: CO RACE: FAL STOCK(S): GH
MAJOR DRAINAGE: WC SUB DRAINAGE: GRAYS HARBOR
CONTACT: RICK BRIX PHONE: (206)249-4628
AGENCY: WDF ADDRESS: 331 STATE HIGHWAY 12, MONTESANO, WA 98563
PROJECT: GREYS HARBOR FINGERLING PLANT EVALUATIONS
PURPOSE: RESEARCH ONGOING: N
EVALUATION: QN : BASED ON OCEAN FISHING, SAMPLED FOR CWT & SPAWNING GROUND SURVEY
SURVIVAL: 0.001 ESTIMATED CONTRIBUTION RATE.
STOCKING DETAILS: TRUCKED TO BRIDGES & CULVERTS, 0.5% SALINE, NO OXYGEN
ACCLIMATION DETAILS: N/A
OTHER PRE STOCKING INFO:
IMPACTS; RESEARCH: TOTAL OUTPLANTING IN SYSTEM EXCEEDED 6,000,000
IMPACTS; OPINION: SIMPSON HAT. CONTRIBUTION RATE HIGHER THAN HUMPTULIPS HAT. OUTPLANTS
CONTROL DETAILS: N/A
OTHER COMMENTS:
SOME LOW FLOW/FISH DENSITY & SMOLT PROD. DATA NOT ANAL. & MAY BE USEFUL

187. SPECIES: CO RACE: FAL STOCK(S): GH
MAJOR DRAINAGE: WC SUB DRAINAGE: GRAYS HARBOR
CONTACT: RICK BRIX PHONE: (206)249-4628
AGENCY: WDF ADDRESS: 331 STATE HIGHWAY 12, MONTESANO, WA 98563
PROJECT: GREYS HARBOR COHO DENSITY AT LOW FLOW
PURPOSE: EVALUATION ONGOING: N
EVALUATION: QN : DATA AVAILABLE, BUT NOT ANALYZED DUE TO FUNDING
SURVIVAL:
STOCKING DETAILS: TRUCKING; USED SALINE SOLUTION
ACCLIMATION DETAILS: N/A
OTHER PRE STOCKING INFO: NONE
IMPACTS; RESEARCH: NOT ANALYZED
IMPACTS; OPINION:
CONTROL DETAILS: N/A
OTHER COMMENTS: PLANNING TO ATTEMPT TO ANALYZE DATA BUT NO FIRM COMMITTMENT

188. SPECIES: CO RACE: FAL STOCK(S): GH
MAJOR DRAINAGE: WC SUB DRAINAGE: GRAYS HARBOR
CONTACT: RICK BRIX PHONE: (206)249-4628
AGENCY: WDF ADDRESS: 331 STATE HIGHWAY 12, MONTESANO, WA 98563
PROJECT: GRAYS HARBOR OFF-STATION SMOLT RELEASES
PURPOSE: EVALUATION ON: CONTRIBUTION RANGED FROM .00005 TO .0235
SURVIVAL: SMOLTS <20%
STOCKING DETAILS: TRUCKED, MAINSTEM RELEASE SITES, SALINE SOL., 20/LB
ACCLIMATION DETAILS: N/A
OTHER PRE STOCKING INFO: N/A
IMPACTS; RESEARCH: PROBABLE NEG. IMPACTS ON OTHER SPECIES & COHORTS DUE TO PRED./COMP.
IMPACTS; OPINION:
CONTROL DETAILS: HATCHERY ON-STATION RELEASES SERVED AS CONTROL
OTHER COMMENTS: SUGGESTS THAT A CHANGED STUDY COULD YIELD BETTER INFO
TRUCKING STUDY WAS DONE WITH BROOD 1982-83

189. SPECIES: CO RACE: FAL STOCK(S): GR
MAJOR DRAINAGE: PS SUB DRAINAGE: GREEN RIVER
CONTACT: TIM FLINT PHONE: (206)753-0198
AGENCY: WDF ADDRESS: 115 GENERAL ADMIN. BLDG, OLYMPIA, WA 98504
PROJECT: GREEN RIVER COHO OUTPLANT EVALUATION ONGOING: N
EVALUATION: QN : ELECTROFISHING DATA INDICATED INCREASE IN PRE-SMOLT DENSITY
SURVIVAL:
STOCKING DETAILS: NONE
ACCLIMATION DETAILS: N/A
OTHER PRE STOCKING INFO: NONE
IMPACTS; RESEARCH: APPEARED THAT WILD COHO WERE DISPLACED
IMPACTS; OPINION:
CONTROL DETAILS: N/A
OTHER COMMENTS: APPEARED THAT WILD COHO WERE DISPLACED

190. SPECIES: CO RACE: FAL STOCK(S): GR
MAJOR DRAINAGE: PS SUB DRAINAGE: GREEN RIVER, DUWAMISH RIVER
CONTACT: DAVE SEILER PHONE: (206)586-1994
AGENCY: WDF ADDRESS: 3939 CLEVELAND AVE, TUMWATER, WA 98503
PROJECT: DOWNSTREAM MIGR. PASSAGE & SMOLT PROD. EVALUATION
PURPOSE: PASSAGE EVALUATION ONGOING: N
EVALUATION: QN : FRY TO SMOLT SURVIVAL=1.0% IN 1984
SURVIVAL: 1.0%
STOCKING DETAILS: TRUCKED
ACCLIMATION DETAILS: N/A
OTHER PRE STOCKING INFO:
IMPACTS; RESEARCH: MAY HAVE IMPACTED RESIDENT SPECIES, NO ANADROMOUS SPECIES PRESENT
IMPACTS; OPINION:
CONTROL DETAILS:
OTHER COMMENTS: SURVIVAL COULD BE INCREASED; FRY STOCKED AT A VERY SMALL SIZE
ACCESS TO THE UPPER WATERSHED IS LIMITED.

191. SPECIES: CO RACE: FAL STOCK(S): GR,PU
MAJOR DRAINAGE: PS SUB DRAINAGE: NISQUALLY RIVER
CONTACT: TIM FLINT PHONE: (206)753-0198
AGENCY: WDF ADDRESS: 115 GENERAL ADMIN. BLDG, OLYMPIA, WA 98504
PROJECT: NISQUALLY RIVER COHO OUTPLANT EVALUATION
PURPOSE: ONGOING: N
EVALUATION: QN : MOST LIKELY HAD A DECREASED SURVIVAL (COMPARED TO ON-STATION)
SURVIVAL: 3.4%-11.8% EST., HATCH=10-12%
STOCKING DETAILS: TRUCKED, SINGLE DUMP
ACCLIMATION DETAILS: N/A
OTHER PRE STOCKING INFO: NONE
IMPACTS; RESEARCH: NONE
IMPACTS; OPINION: NONE
CONTROL DETAILS: NO CONTROLS ON-STATION
OTHER COMMENTS: 75-76 BROODS; FISH PLANTED IN SYSTEM SHOWED SIGNIF. STRAYING
THE FURTHER AWAY, THE LESS STRAYING TO HATCHERY

192. SPECIES: CO RACE: FAL STOCK(S): HU
MAJOR DRAINAGE: WC SUB DRAINAGE: GRAYS HARBOR
CONTACT: RICK BRIX PHONE: (206)249-4628
AGENCY: WDF ADDRESS: 331 STATE HIGHWAY 12, MONTESANO, WA 98563
PROJECT: GRAYS HARBOR SMOLT TRUCKING STUDY
PURPOSE: RESEARCH
EVALUATION: QN : COMPLETE, BUT DOCUMENTATION ONLY TO EXTENT OF 1989 COHO WORKSHOP
SURVIVAL: CONTROL: 2.43%, TRUCKED ON-STA: 1.86%, OFF-STA: 0.31%
STOCKING DETAILS: SMALL CAPACITY TRUCK; SALINE SOLUTION
ACCLIMATION DETAILS: N/A
OTHER PRE STOCKING INFO: N/A
IMPACTS; RESEARCH: N/A
IMPACTS; OPINION:
CONTROL DETAILS: 3 STUDY GROUPS - ONE CONTROL AND TWO STUDY GROUPS
OTHER COMMENTS:

193. SPECIES: CO RACE: FAL STOCK(S): LW
MAJOR DRAINAGE: CR SUB DRAINAGE: LEWIS RIVER
CONTACT: GREG JOHNSON PHONE: (206)753-3956
AGENCY: WDF ADDRESS: 115 GENERAL ADMIN. BLDG., OLYMPIA, WA 98504
PROJECT: LEWIS RIVER SMOLT TRAPS
PURPOSE: RESEARCH
EVALUATION: QN : SMOLT TRAPPING/TAGGING DATA; CWT AND TRAPPED AS OUTMIGRANT SMOLTS
SURVIVAL: 2-4% SURVIVAL TO TRAP
STOCKING DETAILS: TRUCKED TO FEW KEY DUMP POINTS, BUCKETED (NOT SCATTERED)
ACCLIMATION DETAILS: ONLY AT HATCHERY OF ORIGIN
OTHER PRE STOCKING INFO:
IMPACTS; RESEARCH:
IMPACTS; OPINION:
CONTROL DETAILS: N/A
OTHER COMMENTS:

194. SPECIES: CO RACE: FAL STOCK(S): MI
MAJOR DRAINAGE: PS SUB DRAINAGE: SINCLAIR INLET NEAR BREMERTON
CONTACT: TIM FLINT PHONE: (206)753-0198
AGENCY: WDF ADDRESS: 115 GENERAL ADMIN. BLDG, OLYMPIA, WA 98504
PROJECT: GORST CREEK COHO PRODUCTION
PURPOSE: RESEARCH ONGOING: N
EVALUATION: QN : MONITORED OUT-MIGRATION OF SMOLTS
SURVIVAL: GREATER THAN 5%
STOCKING DETAILS: TRUCKED IN SMALL TANK, SCATTER PLANTED BY BUCKET
ACCLIMATION DETAILS: N/A
OTHER PRE STOCKING INFO: ANADROMOUS BARRIER AT RIVER MI 0.6
IMPACTS; RESEARCH: NO WILD STOCK PRESENT IN PLANTED REACH
IMPACTS; OPINION:
CONTROL DETAILS: N/A
OTHER COMMENTS: THIS OUTPLANTING REPRESENTED "OPTIMUM CONDITIONS"
OTHER INFORMATION AVAILABLE ON PRODUCTIVITY OF HATCHERY STOCK.

195. SPECIES: CO RACE: FAL STOCK(S): PU
MAJOR DRAINAGE: PS SUB DRAINAGE: PUYALLUP RIVER
CONTACT: TIM FLINT PHONE: (206)753-0198
AGENCY: WDF ADDRESS: 115 GENERAL ADMIN. BLDG, OLYMPIA, WA 98504
PROJECT: PUYALLUP RIVER COHO OUTPLANT EVALUATION
PURPOSE: HATCHERY EVALUATION ONGOING: N
EVALUATION: QN : EVALUATION OF ON-STATION VS OFF-STATION RELEASES; CWT FISH USED
SURVIVAL: 50%, LOWER RATE IN OFF-STATION FISH
STOCKING DETAILS: TRUCKED TO SINGLE SITES, DUMPED
ACCLIMATION DETAILS: N/A
OTHER PRE STOCKING INFO:
IMPACTS; RESEARCH: UNKNOWN
IMPACTS; OPINION:
CONTROL DETAILS: CONTROL WAS TWO CWT GROUPS AT HAT., NOT TRUCKED AND RETURNED
OTHER COMMENTS: CWT DATA AVAILABLE TO LOOK AT SPECIFIC RETURN RATES

196. SPECIES: CO RACE: FAL STOCK(S): PU,MI
MAJOR DRAINAGE: PS SUB DRAINAGE: DESCHUTES RIVER
CONTACT: TIM FLINT PHONE: (206)753-0198
AGENCY: WDF ADDRESS: 115 GENERAL ADMIN. BLDG, OLYMPIA, WA 98504
PROJECT: DESCHUTES RIVER COHO OUTPLANT EVALUATION
PURPOSE: ENHANCE RUNS
EVALUATION: QN : NO SIGNIFICANT INCREASE IN SMOLT PRODUCTION RESULTED
SURVIVAL:
STOCKING DETAILS: TRUCKED; SCATTER PLANTED FROM BRIDGES, BUCKETED INTO POOLS
ACCLIMATION DETAILS: ACCLIMATED TO RIVER TEMPS. PRIOR TO STOCKING
OTHER PRE STOCKING INFO: NONE
IMPACTS; RESEARCH: POSSIBLE NEGATIVE IMPACTS ON EXISTING RESIDENT AND ANADROMOUS SPECIES
IMPACTS; OPINION:
CONTROL DETAILS:
OTHER COMMENTS: 1980 BROOD OUTMIGRATED IN 1982
REFER TO WDF PROGRESS REPORT #200 BY SEILER AND NEWHAUSER

197. SPECIES: CO RACE: FAL STOCK(S): QC,MI
MAJOR DRAINAGE: PS SUB DRAINAGE: HOOD CANAL (UPPER)
CONTACT: RICH KOLB PHONE: (206)586-9344
AGENCY: WDF ADDRESS: 115 GENERAL ADMIN BLDG., OLYMPIA, WA 98501
PROJECT: BANGOR NAVAL BASE - DEVILS HOLE COHO PROGRAM
PURPOSE: ONGOING: Y
EVALUATION: QN : ADULT RETURNS WHERE NONE EXISTED AFTER BARRIER ERECTED
SURVIVAL:
STOCKING DETAILS: TRUCKED WITH 02 SHORT DIST. TO CREEKS, BUCKETED TO STREAM
ACCLIMATION DETAILS: N/A
OTHER PRE STOCKING INFO: EGGS HATCHED IN WATERSHED, REARED IN INSTREAM BASINS
IMPACTS; RESEARCH: COHO RUNS REESTABLISHED AFTER LADDER CONSTRUCTED AT OUTLET IN 1980
IMPACTS; OPINION:
CONTROL DETAILS: NONE
OTHER COMMENTS: FRY MIGRATE DOWN TO DEVIL'S HOLE LAKE FOR REARING

198. SPECIES: CO RACE: FAL STOCK(S): SD

MAJOR DRAINAGE: WC SUB DRAINAGE: BOGACHIEL RIVER
CONTACT: DAVE SEILER PHONE: (206)586-1994

AGENCY: WDF ADDRESS: 3939 CLEVELAND AVE, TUMWATER, WA 98503

PROJECT: BOGACHIEL RIVER COHO PRODUCTION EVALUATION
PURPOSE: HATCHERY EVALUATION ONGOING: Y

EVALUATION: ON : REFER TO WDF MEMO, 1989

SURVIVAL: FRY TO SMOLT 4.8% IN 1987

STOCKING DETAILS: TRUCKED

ACCLIMATION DETAILS: N/A
OTHER PRE STOCKING INFO:
IMPACTS; RESEARCH: PROBABLE NEGATIVE IMPACTS TO RESIDENT/ANADROMOUS SPECIES
IMPACTS; OPINION:
CONTROL DETAILS:
OTHER COMMENTS:
NEGATIVE IMPACTS TO RESIDENT/ANADROMOUS SPECIES REDUCES COST-EFFEC

199. SPECIES: CO RACE: FAL STOCK(S): SD,QT

MAJOR DRAINAGE: WC SUB DRAINAGE: BOGACHIEL RIVER

CONTACT: DAVE SEILER PHONE: (206(586-1994

AGENCY: WDF ADDRESS: 3939 CLEVELAND AVE, TUMWATER, WA 98503

PROJECT: BOGACHIEL RIVER COHO PRODUCTION EVALUATION

PURPOSE: HATCHERY EVALUATION ONGOING: Y

EVALUATION: QN:

SURVIVAL: FRY-TO-SMOLT 2.0% IN 1988

STOCKING DETAILS: TRUCKED

ACCLIMATION DETAILS: N/A

OTHER PRE STOCKING INFO:

IMPACTS; RESEARCH: PROBABLE NEGATIVE IMPACTS TO RESIDENT/ANADROMOUS SPECIES

IMPACTS; OPINION:

CONTROL DETAILS:

OTHER COMMENTS: WHEN NAT. SPAWNERS ARE REMOVED FOR BROODSTOCK, COST-EFFECT LOW

NEGATIVE IMPACTS TO RESIDENT/ANADROMOUS SPECIES REDUCES COST-EFFEC

200. SPECIES: CO RACE: FAL STOCK(S): SD, SR
MAJOR DRAINAGE: WC SUB DRAINAGE: CLEARWATER RIVER
CONTACT: DAVE SEILER PHONE: (206)586-1994
AGENCY: WDF ADDRESS: 3939 CLEVELAND AVE, TUMWATER, WA 98503
PROJECT: CLEARWATER RIVER COHO SMOLT PRODUCTION EVALUATION
PURPOSE: HATCHERY EVALUATION ONGOING: Y
EVALUATION: QN:
SURVIVAL: FRY TO SMOLT 3.2% IN 1985
STOCKING DETAILS:
OTHER PRE STOCKING INFO:
IMPACTS; RESEARCH: PROBABLE NEGATIVE IMPACTS TO RESIDENT/ANADROMOUS SPECIES
IMPACTS; OPINION:
CONTROL DETAILS: 61,400 FRY CWT WITH 1/2-LENGTH TAGS
OTHER COMMENTS:

201. SPECIES: CO RACE: FAL STOCK(S): SY
MAJOR DRAINAGE: PS SUB DRAINAGE: DESCHUTES RIVER
CONTACT: TIM FLINT PHONE: (206)753-0198
AGENCY: WDF ADDRESS: 115 GENERAL ADMIN. BLDG., OLYMPIA, WA 98507
PROJECT: COHO OUTPLANT EVALUATION
PURPOSE: ENHANCE RUN
EVALUATION: ON IOWEST ESTIMATE OF SUBJECT: CONOTE CONOTE EVALUATION: ON : LOWEST ESTIMATE OF SURVIVAL TO SMOLT COINCIDED W/ SMOLT OUTPLANT SURVIVAL: STOCKING DETAILS: TRUCKED, DUMPED ACCLIMATION DETAILS: N/A OTHER PRE STOCKING INFO: IMPACTS; RESEARCH:
IMPACTS; OPINION: GENETICALLY UNSUITED TO DISTANT PLANTING
CONTROL DETAILS: OTHER COMMENTS:

202. SPECIES: CO RACE: FAL STOCK(S): TOUTLE
MAJOR DRAINAGE: CR SUB DRAINAGE: TOUTLE RIVER
CONTACT: GREG JOHNSON PHONE: (206)753-3956
AGENCY: WDF ADDRESS: 115 GENERAL ADMIN. BLDG., OLYMPIA, WA 98504
PROJECT: TOUTLE RIVER COHO SALMON FINGERLING PLANTING
PURPOSE: MITIGATION, ENHANCE FISHERIES ONGOING: Y
EVALUATION: QN : SPAWNER RETURNS INCREASING OVER PERIOD 1980-88 IN MANY STEAMS STOCKING DETAILS: TRUCKED W/OXYGEN & RECIRC., SALT, SCATTER BUCKETED ACCLIMATION DETAILS: IN 2YRS, ACCLIMATED IN A .5 ACRE POND FOR ABOUT 2 MONTHS OTHER PRE STOCKING INFO: STOCKING RATES WERE BASED ON CARRYING CAPACITY IMPACTS; RESEARCH:
IMPACTS; OPINION:
CONTROL DETAILS: N/A
OTHER COMMENTS: THIS WORK WAS RECOMMENDED IN SUBBASIN EVALUATION PLAN
TOTAL LBS FISH "OWED"/10 TIMES SMOLTS EXPECTED OUT

203. SPECIES: CU RACE: SEA STOCK(S): CO
MAJOR DRAINAGE: WC SUB DRAINAGE: CHEHALIS RIVER (UPPER)
CONTACT: BILL FREYMOND PHONE: (206)533-9335
AGENCY: WDW ADDRESS: REGION 6 905 E. HERON, ABERDEEN, WA 98520
PROJECT: CHEHALIS CUTTHROAT RELEASES
PURPOSE: PROVIDE FOR FISHERY
EVALUATION: OF FISHERY

EVALUATION: OF FISHERY

EVALUATION: OF FISHERY

COORDINATERS DETURN TO THE FISHERY ONGOING: Y EVALUATION: QA : FEELS THAT GOOD NUMBERS RETURN TO THE FISHERY SURVIVAL: STOCKING DETAILS: RAISED TO SMOLTS, AND RELEASED TO STREAM FROM TRUCK ACCLIMATION DETAILS: N/A OTHER PRE STOCKING INFO: N/A IMPACTS; RESEARCH:
IMPACTS; RESEARCH:
IMPACTS; OPINION: NO IMPACTS ON WILD RUN, NO DATA
CONTROL DETAILS: MOST AD CLIPPED TO IDENTIFY HATCHERY FISH FOR MANAG. PURPOSE
OTHER COMMENTS: DEPARTMENT IS CONCERNED FOR WILD FISH
WILD BROOD STOCK REGULARLY INTRODUCED TO HATCHERY STOCK

204. SPECIES: CU RACE: SEA STOCK(S): CO
MAJOR DRAINAGE: WC SUB DRAINAGE: CHEHALIS RIVER
CONTACT: BILL FREYMOND PHONE: (206)533-9335
AGENCY: WDW ADDRESS: REGION 6 905 E. HERON, ABERDEEN, WA 98520
PROJECT: CHEHALIS TRIBUTARIES SEA-RUN CUTTHROAT OUTPLANTS
PURPOSE: PROVIDE FOR FISHERY
EVALUATION OF THE FIGURERY ONGOING: Y EVALUATION: QA : FEELS THAT GOOD NUMBERS RETURN TO THE FISHERY SURVIVAL: STOCKING DETAILS: RAISED TO SMOLTS, AND RELEASED TO STREAM FROM TRUCK ACCLIMATION DETAILS: N/A OTHER PRE STOCKING INFO: N/A IMPACTS; RESEARCH:
IMPACTS; OPINION: NO IMPACTS ON WILD RUN, NO DATA
CONTROL DETAILS: MOST AD CLIPPED TO IDENTIFY HATCHERY FISH FOR MANAG. PURPOSE
OTHER COMMENTS: DEPARTMENT IS CONCERNED FOR WILD FISH
WILD BROOD STOCK REGULARLY INTRODUCED TO HATCHERY PROGRAM

205. SPECIES: CU RACE: SEA STOCK(S): CO
MAJOR DRAINAGE: WC SUB DRAINAGE: GRAYS HARBOR
CONTACT: BILL FREYMOND PHONE: (206)533-9335
AGENCY: WDW ADDRESS: REGION 6 905 E. HERON, ABERDEEN, WA 98520
PROJECT: GRAYS HARBOUR SEA-RUN CUTTHROAT OUTPLANTS
PURPOSE: PROVIDE FOR FISHERY ONGOING: Y
EVALUATION: QA : FEELS THAT GOOD NUMBERS RETURN TO THE FISHERY
SURVIVAL:
STOCKING DETAILS: RAISED TO SMOLTS, AND RELEASED TO STREAM FROM TRUCK
ACCLIMATION DETAILS: N/A
OTHER PRE STOCKING INFO: N/A
IMPACTS; RESEARCH:
IMPACTS; OPINION: NO IMPACTS ON WILD RUN, NO DATA
CONTROL DETAILS: MOST AD CLIPPED TO IDENTIFY HATCHERY FISH FOR MANAG. PURPOSE
OTHER COMMENTS: DEPARTMENT IS CONCERNED FOR WILD FISH
WILD BROOD STOCK REGULARLY INTRODUCED TO HATCHERY PROGRAM

206. SPECIES: CU RACE: SEA STOCK(S): CO
MAJOR DRAINAGE: WC SUB DRAINAGE: HOQUIAM RIVER
CONTACT: BILL FREYMOND PHONE: (206)533-9335
AGENCY: WDW ADDRESS: REGION 6 905 E. HERON, ABERDEEN, WA 98520
PROJECT: CHEHALIS TRIBUTARIES SEA-RUN CUTTHROAT OUTPLANTS
PURPOSE: PROVIDE FOR FISHERY ONGOING: Y
EVALUATION: QA : FEELS THAT GOOD NUMBERS RETURN TO THE FISHERY
SURVIVAL:
STOCKING DETAILS: RAISED TO SMOLTS, AND RELEASED TO STREAM FROM TRUCK
ACCLIMATION DETAILS: N/A
OTHER PRE STOCKING INFO: N/A
IMPACTS; RESEARCH:
IMPACTS; OPINION: NO IMPACTS ON WILD RUN, NO DATA
CONTROL DETAILS: MOST AD CLIPPED TO IDENTIFY HATCHERY FISH FOR MANAG. PURPOSE
OTHER COMMENTS: DEPARTMENT IS CONCERNED FOR WILD FISH
WILD BROOD STOCK REGULARLY INTRODUCED TO HATCHERY PROGRAM

207. SPECIES: CU RACE: SEA STOCK(S): CO
MAJOR DRAINAGE: WC SUB DRAINAGE: QUILLAYUTE RIVER
CONTACT: BILL FREYMOND PHONE: (206)533-9335
AGENCY: WDW ADDRESS: REGION 6 905 E. HERON, ABERDEEN, WA 98520
PROJECT: QUILLAYUTE CUTTHROAT RELEASES
PURPOSE: PROVIDE FOR FISHERY ONGOING: N
EVALUATION: QA : FEELS THAT GOOD NUMBERS RETURN TO THE FISHERY
SURVIVAL:
STOCKING DETAILS: RAISED TO SMOLTS, AND RELEASED TO STREAM FROM TRUCK
ACCLIMATION DETAILS: N/A
OTHER PRE STOCKING INFO: EXCELLENT CREEL CENSUS DATA
IMPACTS; RESEARCH:
IMPACTS; OPINION: NO IMPACTS ON WILD RUN, NO DATA
CONTROL DETAILS: MOST AD CLIPPED TO IDENTIFY HATCHERY FISH FOR MANAG. PURPOSE
OTHER COMMENTS: DEPARTMENT IS CONCERNED FOR WILD FISH

208. SPECIES: CU RACE: SEA STOCK(S): RW
MAJOR DRAINAGE: CC SUB DRAINAGE: REDWOOD CREEK
CONTACT: STEVE SANDERS PHONE: (707)488-2253
AGENCY: HBCO ADDRESS: PRARIE CREEK FISH HATCHERY, ORICK, CA 95555
PROJECT: PRARIE CREEK FISH HATCHERY
PURPOSE: ENHANCE WILD STOCKS ONGOING: Y
EVALUATION: QA:
SURVIVAL:
STOCKING DETAILS: RELEASE WITH NEW MOON PHASE
ACCLIMATION DETAILS:
OTHER PRE STOCKING INFO:
IMPACTS; RESEARCH:
IMPACTS; OPINION: INCREASE IN ABUNDANCE OF COASTAL CUTTHROAT IN LOST MAN CREEK
CONTROL DETAILS:
OTHER COMMENTS:

209. SPECIES: CU RACE: SEA STOCK(S): SH
MAJOR DRAINAGE: PS SUB DRAINAGE: PUGET SOUND (SOUTH)
CONTACT: BILL FREYMOND PHONE: (206)533-9335
AGENCY: WDW ADDRESS: REGION 6 905 E. HERON, ABERDEEN, WA 98520
PROJECT: GOLDSBOROUGH CR. SEA RUN CUTT. PLANT
PURPOSE: PROVIDE FOR FISHERY ONGOING: Y
EVALUATION: QA : FEELS THAT GOOD NUMBERS RETURN TO THE FISHERY
SURVIVAL:
STOCKING DETAILS: RAISED TO SMOLTS, AND RELEASED TO STREAM FROM TRUCK
ACCLIMATION DETAILS: N/A
OTHER PRE STOCKING INFO: N/A
IMPACTS; RESEARCH:
IMPACTS; OPINION: NO IMPACTS ON WILD RUN, NO DATA
CONTROL DETAILS: MOST AD CLIPPED TO IDENTIFY HATCHERY FISH FOR MANAG. PURPOSE
OTHER COMMENTS: DEPARTMENT IS CONCERNED FOR WILD FISH

210. SPECIES: CU RACE: SEA STOCK(S): SH
MAJOR DRAINAGE: PS SUB DRAINAGE: HOOD CANAL
CONTACT: BILL FREYMOND PHONE: (206)533-9335
AGENCY: WDW ADDRESS: REGION 6 905 E. HERON, ABERDEEN, WA 98520
PROJECT: HOOD CANAL SEA RUN CUTTHROAT RELEASES
PURPOSE: PROVIDE FOR FISHERY ONGOING: Y
EVALUATION: QA : FEELS THAT GOOD NUMBERS RETURN TO THE FISHERY
SURVIVAL:
STOCKING DETAILS: RAISED TO SMOLTS, AND RELEASED TO STREAM FROM TRUCK
ACCLIMATION DETAILS: N/A
OTHER PRE STOCKING INFO: N/A
IMPACTS; RESEARCH:
IMPACTS; OPINION: NO IMPACTS ON WILD RUN, NO DATA
CONTROL DETAILS: MOST AD CLIPPED TO IDENTIFY HATCHERY FISH FOR MANAG. PURPOSE
OTHER COMMENTS: DEPARTMENT IS CONCERNED FOR WILD FISH

211. SPECIES: CU RACE: SEA STOCK(S): SH
MAJOR DRAINAGE: PS SUB DRAINAGE: SKOKOMISH RIVER
CONTACT: BILL FREYMOND PHONE: (206)533-9335
AGENCY: WDW ADDRESS: REGION 6 905 E. HERON, ABERDEEN, WA 98520
PROJECT: HOOD CANAL SEA RUN CUTTHROAT OUTPLANTS
PURPOSE: PROVIDE FOR FISHERY ONGOING: Y
EVALUATION: QA : FEELS THAT GOOD NUMBERS RETURN TO THE FISHERY
SURVIVAL:
STOCKING DETAILS: RAISED TO SMOLTS, AND RELEASED TO STREAM FROM TRUCK
ACCLIMATION DETAILS: N/A
OTHER PRE STOCKING INFO: N/A
IMPACTS; RESEARCH:
IMPACTS; OPINION: NO IMPACTS ON WILD RUN, NO DATA
CONTROL DETAILS: MOST AD CLIPPED TO IDENTIFY HATCHERY FISH FOR MANAG. PURPOSE
OTHER COMMENTS: DEPARTMENT IS CONCERNED FOR WILD FISH
MANY FISH ALSO RELEASED AS FINGERLINGS AT 35-150/LB

212. SPECIES: CU RACE: SEA STOCK(S): SO
MAJOR DRAINAGE: CC SUB DRAINAGE: STONE LAGOON
CONTACT: ERIC LOUDENSLAGER PHONE: (707)826-3445
AGENCY: HSU ADDRESS: HSU FISH HATCHERY, ARCATA, CA 95521
PROJECT: CUTTHROAT TROUT BROODSTOCK DEVELOPMENT PROGRAM
PURPOSE: ESTABLISH FISHERY ONGOING: Y
EVALUATION: QN : PLANNED-->ADULT TRAPPING; GROWTH STUDIES; ANNUAL HARVEST
SURVIVAL:
STOCKING DETAILS:
ACCLIMATION DETAILS:
OTHER PRE STOCKING INFO: SIGNIFICANT GENETIC CHANGES ARE NOT EXPECTED
IMPACTS; RESEARCH:
IMPACTS; OPINION: INTERSPECIFIC IMPACTS EXPECTED
CONTROL DETAILS:
OTHER COMMENTS: THIS PROJECT IS JUST BEGINNING, THERE HAVE BEEN NO RELEASES AS
YET

213. SPECIES: PK RACE: STOCK(S): ST
MAJOR DRAINAGE: PS SUB DRAINAGE: STILLAGUAMISH RIVER
CONTACT: KIP KILLEBREW PHONE: (206)435-8770
AGENCY: STIL ADDRESS: 3439 STOLUCKQUAMISH LN, ARLINGTON, WA 98223
PROJECT: STILLAQUAMISH PINK
PURPOSE: ENHANCE FISHERIES ONGOING: N
EVALUATION: QN : WEAK PINK RUNS, NO RETURNS NOTED
SURVIVAL: 0.004% IN 1981
STOCKING DETAILS: FRY DUMP-PLANTED INTO HARVEY CK.
ACCLIMATION DETAILS: N/A
OTHER PRE STOCKING INFO: MATCH TIME OF RELEASES TO WILD OUTMIGRANTS
IMPACTS; RESEARCH:
IMPACTS; OPINION: NO RETURNS NOTED
CONTROL DETAILS: N/A
OTHER COMMENTS: PROGRAM DROPPED DUE TO CHANGE IN ECONOMIC FOCUS

214. SPECIES: PK RACE: STOCK(S): TU

MAJOR DRAINAGE: AC SUB DRAINAGE: DIRECT OCEAN RELEASE

CONTACT: NICK DUDIAK PHONE: (907)235-8191

AGENCY: ADFG ADDRESS: 3298 DOUGLAS ST., HOMER, AK 99603

PROJECT: HOMER SPIT CHINOOK, COHO AND PINK SALMON ENHANCEMENT

PURPOSE: ENHANCE FISHERY ONGOING: Y

EVALUATION: QN :

SURVIVAL: 1 TO 3% SURVIVAL FROM 1987 TO PRESENT

STOCKING DETAILS: BOAT TRANSPORT

ACCLIMATION DETAILS: USED NET PENS, STOCKED 5/10/88 (RELEASED 5/16,5/20,6/1)

OTHER PRE STOCKING INFO: REARING PERIOD 20-30 DAYS

IMPACTS; RESEARCH:
IMPACTS; OPINION: GOOD PROJECT

CONTROL DETAILS:
OTHER COMMENTS:

215. SPECIES: SH RACE: STOCK(S):

MAJOR DRAINAGE: BC SUB DRAINAGE: VANCOUVER, ISLAND & MAINLAND

CONTACT: JEREMY HUME PHONE:

AGENCY: MEBC ADDRESS:

PROJECT: EFFECTS OF VAR. STOCKING STRATEGIES & GROWTH OF HEADWATER STOCKED SH
PURPOSE: HATCHERY EVLAUATION ONGOING: N

EVALUATION: ON:

SURVIVAL: SURVIVAL TO 2+ SMOLTS WAS HIGHER FOR LATER REL & LARGER FRY

STOCKING DETAILS: STOCK ABOUT 0.1 FRY/SQ METER

ACCLIMATION DETAILS:

OTHER PRE STOCKING INFO: ABOVE 0.7 FRY/SQ M. THERE WILL BE NO INCREASE IN PROD.

IMPACTS; RESEARCH: FRY FROM HIGH DENSITY GROUPS SMALLER THAN THOSE IN LOW, MED GROUPS

IMPACTS; OPINION:

CONTROL DETAILS:

OTHER COMMENTS: ASSUME WILD/NATURAL BROODSTOCK

216. SPECIES: SH RACE: STOCK(S):
MAJOR DRAINAGE: CC SUB DRAINAGE: GUALALA RIVER
CONTACT: DON MCDONALD PHONE: (707)884-3884
AGENCY: GRSP ADDRESS: PO BOX 226, GUALALA, CA 95445
PROJECT: GUALALA RIVER STEELHEAD PROJECT
PURPOSE: ENHANCE WILD STOCKS ONGOING: Y
EVALUATION: NA : NO FORMAL EVALUATION
SURVIVAL:
STOCKING DETAILS: TRANSPORT TRUCKS, TAILED OUT RELEASE
ACCLIMATION DETAILS: N/A
OTHER PRE STOCKING INFO:
IMPACTS; RESEARCH: ESTIMATE THAT 40% OF THE RUN MAY BE HATCHERY ORIGIN
IMPACTS; OPINION: PROGRAM HAS MAINTAINED RUN BY INCREASING NUMBERS TO RIVER
CONTROL DETAILS: N/A
OTHER COMMENTS: STRAYING INTO GARCIA RIVER, BUT DEGREE OF STRAYING UNKNOWN

217. SPECIES: SH RACE: STOCK(S): AC
MAJOR DRAINAGE: CC SUB DRAINAGE: PETALUMA RIVER
CONTACT: TOM FURRE PHONE: (707)778-4703
AGENCY: PSD ADDRESS: 333 CASA GRANDE RD., PETALUMA, CA 94952
PROJECT: UNITED ANGLERS CASA GRANDE HIGH SCHOOL STEELHEAD HATCHERY
PURPOSE: REESTABLISH RUNS ONGOING: Y
EVALUATION: NA : SPAWNING SURVEYS IN FUTURE YEARS
SURVIVAL:
STOCKING DETAILS: 5 GALLLON BUCKETS, STOCKED BY HAND, ICE CHESTS, ETC..
ACCLIMATION DETAILS: TEMPERATURE AND SALT
OTHER PRE STOCKING INFO: ICED & PUT IN BUCKETS, MS-222 DURING STRESS SITUATIONS
IMPACTS; RESEARCH: UNKNOWN UNTIL FIN CLIPPED FISH RETURN
IMPACTS; OPINION: ESTIMATE 50% INCREASE IN RUN MAGNITUDE
CONTROL DETAILS: N/A
OTHER COMMENTS: NEW HATCHERY UNDER CONSTRUCTION

218. SPECIES: SH RACE: STOCK(S): AL
MAJOR DRAINAGE: OC SUB DRAINAGE: SILETZ, SIUSLAW, YAQUINA, SMITH RIVERS, COOS BAY
CONTACT: KEN KENASTON PHONE: (503)737-4431
AGENCY: ODFW ADDRESS: 28655 HWY 34, CORVALLIS, OR 97330
PROJECT: STEELHEAD STRAYING STUDY
PURPOSE: RESEARCH ONGOING: N
EVALUATION: QN : FIN-CLIPPED FISH FOR 3 YEARS; EVALUATED ADULT RETURNS
SURVIVAL:
STOCKING DETAILS: TRUCKED TO DIFFERENT DRAINAGES FOR RELEASE
ACCLIMATION DETAILS:
OTHER PRE STOCKING INFO:
IMPACTS; RESEARCH: VARIABLE STRAYING RATE
IMPACTS; OPINION:
CONTROL DETAILS: RATES CALCULATED AS RETURN TO REARING NOT RELEASE SITE
OTHER COMMENTS: ANNUAL PROGRESS REPORT. 1986. K.KENASTON, N.MCHUGH. COASTAL
STEELHEAD PRODUCTION FACTORS. ODFW.

219. SPECIES: SH RACE: STOCK(S): AM
MAJOR DRAINAGE: SR SUB DRAINAGE: AMERICAN RIVER
CONTACT: RON DUCEY PHONE: (916)355-0666
AGENCY: CDFG ADDRESS: 2001 NIMBUS RD., RANCHO CORDOVA, CA 95670
PROJECT: NIMBUS FISH HATCHERY
PURPOSE: MITIGATION ONGOING: Y
EVALUATION: QN : CWT PROGRAM; ANNUAL REDD COUNTS; SOME CREEL CENSUS
SURVIVAL:
STOCKING DETAILS: TRUCKED; DAYTIME RELEASES
ACCLIMATION DETAILS:
OTHER PRE STOCKING INFO:
IMPACTS; RESEARCH: HIGH LEVEL OF RETURNS MAINTAINED; SOME STRAYING
IMPACTS; OPINION:
CONTROL DETAILS: SPLIT RELEASE CWT STRATEGY
OTHER COMMENTS: BEST SURVIVAL IS FROM BERKELEY RELEASE AT 30 FISH/LB

220. SPECIES: SH RACE: STOCK(S): AR

MAJOR DRAINAGE: AC SUB DRAINAGE: ANCHOR RIVER
CONTACT: NICK DUDIAK PHONE: (907)235-8191
AGENCY: ADFG ADDRESS: 3298 DOUGLAS ST., HOMER, AK 99603
PROJECT: BRIDGE CREEK RESERVOIR
PURPOSE: ENHANCE FISHERY
EVALUATION: SURVIVAL:
STOCKING DETAILS:
ACCLIMATION DETAILS:
OTHER PRE STOCKING INFO:
IMPACTS; RESEARCH:
IMPACTS; OPINION:
CONTROL DETAILS:
OTHER COMMENTS: IN LANDLOCK SITUATION, PUT AND TAKE FISHERY

221. SPECIES: SH RACE: STOCK(S): BC,ST

MAJOR DRAINAGE: CC SUB DRAINAGE: SCOTT RIVER

CONTACT: DAVE STREIG PHONE: (408)458-3095

AGENCY: MBSTP ADDRESS: 324 SWANTON RD., DAVENPORT, CA 95017

PROJECT: MONTEREY BAY SALMON AND TROUT PROJECT

PURPOSE: ENHANCE WILD RUNS ONGOING: Y

EVALUATION: QN : ADULT ESCAPEMENT STUDIES; SIZE OF RELEASE STUDIES

SURVIVAL:

STOCKING DETAILS: TRUCKED; 100% FIN-CLIPPED

ACCLIMATION DETAILS:

OTHER PRE STOCKING INFO:

IMPACTS; RESEARCH: INCREASE IN ADULT RETURNS—

IMPACTS; OPINION: ATTEMPT TO USE ONLY MARKED ADULTS FOR BROODSTOCK

CONTROL DETAILS:

OTHER COMMENTS:

222. SPECIES: SH RACE: STOCK(S): CM
MAJOR DRAINAGE: CR SUB DRAINAGE: METHOW RIVER
CONTACT: JOE FOSTER PHONE: (506)754-4624
AGENCY: WDW ADDRESS: P.O.BOX 850, EPHRATA, WA 98823
PROJECT: WELLS HATCHERY OFF-STATION RELEASES
PURPOSE: MITIGATION ONGOING: Y
EVALUATION: QN : CWT PROGRAM; AGE STRUCTURE; WILD: HATCHERY RATIOS; TIME OF RELEASE
SURVIVAL:
STOCKING DETAILS: TRUCKED
ACCLIMATION DETAILS:
OTHER PRE STOCKING INFO:
IMPACTS; RESEARCH: INCREASE IN ADULTS i.e. 1960-1,500 AVG., 1982-15,000 AVG.
IMPACTS; OPINION:
CONTROL DETAILS:
OTHER COMMENTS: THE WILD COMPONENT HAS ALWAYS BEEN SMALL (5-7%), THE REST ARE
HATCHERY FISH; EXTENSIVE ADULT MONITORING IS JUST BEGINNING

223. SPECIES: SH RACE: STOCK(S): CR
MAJOR DRAINAGE: CC SUB DRAINAGE: CARMEL RIVER
CONTACT: ROY THOMAS PHONE: (408)625-2255
AGENCY: CRSA ADDRESS: 26535 CARMEL RANCHO BLVD., SUITE 5, CARMEL, CA 93921
PROJECT: CARMEL RIVER STEELHEAD RESCUE AND PEN REARING PROJECT
PURPOSE: ENHANCE WILD STOCKS ONGOING: Y
EVALUATION: NA : TETRACYCLINE FEED BUT NO MONITORING
SURVIVAL:
STOCKING DETAILS: VARIOUS METHODS, HAVE RELEASED INTO OCEAN DUE TO NO WATER
ACCLIMATION DETAILS: N/A
OTHER PRE STOCKING INFO: 5 REARING FACILITIES DEPENDENT UPON WATER AVAILABILITY
IMPACTS; RESEARCH:
IMPACTS; OPINION:
CONTROL DETAILS: N/A
OTHER COMMENTS:

224. SPECIES: SH RACE: STOCK(S): ER

MAJOR DRAINAGE: CC SUB DRAINAGE: EEL RIVER

CONTACT: JIM JOHNSON PHONE: (707)923-2293

AGENCY: GRC ADDRESS: 601 HILLCREST, GARBERVILLE, CA 95440

PROJECT: GARBERVILLE ROTARY STHEELHEAD REARING PROGRAM

PURPOSE: REESTABLISH RUNS ONGOING: Y

EVALUATION: CDFG ANNUAL SPAWNING COUNTS

SURVIVAL:

STOCKING DETAILS: NIGHT RELEASE, TRUCK TRANSPORT, TAIL RELEASE

ACCLIMATION DETAILS: N/A

OTHER PRE STOCKING INFO: AGUMENTATION WITHIN ENTIRE SOUTH FORK EEL R DRAINAGE

IMPACTS; RESEARCH:

IMPACTS; OPINION: PROGRAM HAS CONTRIBUTED TO INCREASED ADULT RETURNS

CONTROL DETAILS: N/A

OTHER COMMENTS: ANGLER HARVEST EXCESSIVE FOR STEELHEAD

225. SPECIES: SH RACE: STOCK(S): ER
MAJOR DRAINAGE: CC SUB DRAINAGE: REDWOOD CREEK
CONTACT: STEVE SANDERS PHONE: (707)488-2253
AGENCY: HBCO ADDRESS: PRARIE CREEK FISH HATCHERY, ORICK, CA 95555
PROJECT: PRARIE CREEK FISH HATCHERY
PURPOSE: ENHANCE IN-RIVER FISHERY
EVALUATION: QN : FIN-CLIP PROGRAM
SURVIVAL: 4% RETURN ON MARKED FISH
STOCKING DETAILS: RELEASE WITH NEW MOON PHASE; 100% FIN-CLIPPED
ACCLIMATION DETAILS:
OTHER PRE STOCKING INFO: NATIVE ENDEMIC STOCKS WERE NOT KNOWN TO LOST MAN CRK.
IMPACTS; RESEARCH: HATCHERY STOCKS GREW AT A FASTER RATE THAN WILD STOCKS
IMPACTS; OPINION: RUN NOW ESTABLISHED IN LOST MAN CREEK
CONTROL DETAILS:
OTHER COMMENTS: MAD RIVER HATCH. STOCKS WERE USED TO ESTABLISH LOST MAN CREEK RUN

226. SPECIES: SH RACE: STOCK(S): FT

MAJOR DRAINAGE: SR SUB DRAINAGE: FEATHER RIVER
CONTACT: DON SCHLICTING PHONE: (916)538-2222

AGENCY: CDFG ADDRESS: 5 TABLE MTN. BLVD., OROVILLE, CA 95965

PROJECT: FEATHER RIVER FISH HATCHERY
PURPOSE: MITIGATION ONGOING: Y

EVALUATION: QN : ANNUAL AERIAL SPAWNING SURVEY
SURVIVAL:
STOCKING DETAILS: DAYTIME RELEASES
ACCLIMATION DETAILS:
OTHER PRE STOCKING INFO:
IMPACTS; RESEARCH: INCREASE IN ADULTS, MOST ARE BELIEVED TO BE HATCHERY FISH
IMPACTS; OPINION:
CONTROL DETAILS:
OTHER COMMENTS:

227. SPECIES: SH RACE: STOCK(S): GR
MAJOR DRAINAGE: CC SUB DRAINAGE: GARCIA RIVER
CONTACT: CRAIG BELL PHONE: (707)882-2150
AGENCY: FOG ADDRESS: P.O.BOX 202, POINT ARENA, CA 90468
PROJECT: FRIENDS OF GARCIA
PURPOSE: ENHANCE WILD STOCKS ONGOING: Y
EVALUATION: NA:
SURVIVAL:
STOCKING DETAILS: WILL TRUCK WITH ATTENTION TO LUNAR PHASE, FLOWS AND FISH SIZE
ACCLIMATION DETAILS:
OTHER PRE STOCKING INFO:
IMPACTS; RESEARCH:
IMPACTS; OPINION: EXPECT GENETIC IMPACTS BUT WILL TRY AND MINIMIZE THEM BY SELECTION
CONTROL DETAILS:
OTHER COMMENTS: THIS PROGRAM IS JUST BEGINNING- ANTICIPATE ADULT COLLECTIONS
THIS YEAR

228. SPECIES: SH RACE: STOCK(S): IC
MAJOR DRAINAGE: CC SUB DRAINAGE: KLAMATH RIVER
CONTACT: BILL BEMIS PHONE: (916)842-6131
AGENCY: USFS ADDRESS: KLAMATH NF, 1215 S.MAIN ST., YREKA, CA 96097
PROJECT: INDIAN CREEK SPAWNING CHANNEL
PURPOSE: PROVIDE SPAWNING HABITAT ONGOING: Y
EVALUATION: QN : REDD COUNTS
SURVIVAL:
STOCKING DETAILS: VOLUNTARY MIGRATION OUT OF CHANNEL
ACCLIMATION DETAILS:
OTHER PRE STOCKING INFO: 1987: 9 ADULT SH USED CHANNEL; 1989 10 REDDS COUNTED
IMPACTS; RESEARCH: ADULTS USE CHANNEL
IMPACTS; OPINION:
CONTROL DETAILS:
OTHER COMMENTS:

229. SPECIES: SH RACE: STOCK(S): JC
MAJOR DRAINAGE: CC SUB DRAINAGE: HUMBOLDT BAY
CONTACT: DAVID HULL PHONE: (707)822-5957
AGENCY: COAPW ADDRESS: 736 F ST., ARCATA, CA 95521
PROJECT: ARCATA WASTEWATER AQUACULTURE PROJECT
PURPOSE: REESTABLISH RUNS, RESEARCH
EVALUATION: QN : CWT PROGRAM; REDD COUNTS; OUT-MIGRANT TRAPPING
SURVIVAL:
STOCKING DETAILS: DIRECT BUCKET OR TRUCKED; 100% CWT/CLIP/FREEZE BRANDED
ACCLIMATION DETAILS:
OTHER PRE STOCKING INFO:
IMPACTS; RESEARCH: CONTRIBUTES TO OVERALL HUMBOLDT BAY ESCAPEMENT
IMPACTS; OPINION:
CONTROL DETAILS:
OTHER COMMENTS: ASSUME STRAYING INTO OTHER TRIBUTARIES; HAVE DONE RELEASE EXPERIMENTS RELATING TO TIDE AND LUNAR PHASE

230. SPECIES: SH RACE: STOCK(S): KR
MAJOR DRAINAGE: BC SUB DRAINAGE: KEOUGH RIVER
CONTACT: BRUCE WARD PHONE:
AGENCY: MEBC ADDRESS: 2204 MAIN MALL, U.B.C., VANCOUVER, BC V6T 1W5
PROJECT: PEN-REARED STEELHEAD FROM RIVERINE, ESTUARINE & MARINE RELEASES
PURPOSE: ENHANCEMENT ONGOING: N
EVALUATION: QN:
SURVIVAL: RETURNS ARE RIVERINE=7-11%, OCEAN=10%, TIDAL=10%
STOCKING DETAILS: FOUR SITES USED, 2 IN RIVER, 1 IN ESTUARY, 1 IN OCEAN
ACCLIMATION DETAILS: SMOLT RELEASE CONINCIDED WITH MIGRATION OF WILD SMOLTS
OTHER PRE STOCKING INFO: HAT. SM MIGRATING THROUGH WEIR WERE COUNTED W/ WILD SM
IMPACTS; RESEARCH:
IMPACTS; OPINION:
CONTROL DETAILS: WILD FISH
OTHER COMMENTS: WILD FISH WERE SHOCKED FROM KEOUGH R. & PROGENY USED FOR STUDY

231. SPECIES: SH RACE: STOCK(S): MA

MAJOR DRAINAGE: PS SUB DRAINAGE: SOOES RIVER, WAACH RIVER, SAIL RIVER
CONTACT: MARK LARIVIERE PHONE: (206)645-2201
AGENCY: MFM ADDRESS: BOX 115, NEAH BAY, WA 98357
PROJECT: MAKAH STEELHEAD
PURPOSE: ENHANCE FISHERY ONGOING: Y
EVALUATION: : PRELIMINARY EVALUATION OF STOCKING AND EFFECTS
SURVIVAL:
STOCKING DETAILS: FISH ARE DISPERSED IN SMALL PLANTINGS ALONG STREAM
ACCLIMATION DETAILS: N/A
OTHER PRE STOCKING INFO: FLOW AND TEMP DATA TAKEN, STOCKING PRIOR TO 1983
IMPACTS; RESEARCH: N/A
IMPACTS; OPINION: N/A
CONTROL DETAILS: COMPARABLE STREAM SYSTEMS WITHOUT SUPPLEMENTATION
OTHER COMMENTS: RESULTS MEASURED IN NUMBERS OF FRY, EXAMPLE; STOCKED IN SPRING
EVALUATED IN SUMMER

232. SPECIES: SH RACE: STOCK(S): MD
MAJOR DRAINAGE: CC SUB DRAINAGE: MAD RIVER
CONTACT: BRUCE BARNGROVER PHONE: (707)822-0592
AGENCY: CDFG ADDRESS: 1660 HATCHERY RD., ARCATA, CA 95521
PROJECT: MAD RIVER FISH HATCHERY
PURPOSE: ENHANCE RUNS ONGOING: Y
EVALUATION: NA:
SURVIVAL:
STOCKING DETAILS: RELEASED AT NEW MOON PHASE; TRUCKED IN SALT SOLUTION
ACCLIMATION DETAILS:
OTHER PRE STOCKING INFO:
IMPACTS; RESEARCH:
IMPACTS; OPINION: INCREASE IN ADULT RETURNS AND IN NATURAL SPAWNERS
CONTROL DETAILS:
OTHER COMMENTS:

C33. SPECIES: SH RACE: STOCK(S): MO
MAJOR DRAINAGE: CC SUB DRAINAGE: SAN FRANCISCO BAY
CONTACT: DON ESTEY PHONE: (209)759-3383
AGENCY: CDFG ADDRESS: P.O.BOX 158, CLEMENTS, CA 95227
PROJECT: MOKELUMNE RIVER FISH HATCHERY
PURPOSE: MITIGATION, ENHANCEMENT
EVALUATION: NA : ANNUAL CARCASS COUNTS SURVIVAL: STOCKING

DETAILS: DAYTIME RELEASES; BULK RELEASED FOR PUT-AND-TAKE FISHERY ACCLIMATION DETAILS

ONGOING: Y

ONGOING: Y

OTHER PRE STOCKING INFO: EGGS EXCHANGED OCCASIONALLY WITH FEATHER RIV. HATCHERY IMPACTS; RESEARCH: IMPACTS; OPINION: CONTROL DETAILS:

OTHER COMMENTS: ESTUARY RELEASES REDUCE PREDATION

234. SPECIES: SH RACE: STOCK(S): NP
MAJOR DRAINAGE: CC SUB DRAINAGE: SAN PABLO BAY
CONTACT: GEORGE CARL PHONE: (707)252-1440
AGENCY: NRS ADDRESS: P.O.BOX 2726, NAPA, CA 94558
PROJECT: NAPA RIVER STEELHEAD ENHANCEMENT PROJECT
PURPOSE: ENHANCE RUNS
EVALUATION: QN : SPAWNING GROUND SURVEYS
SUPPLYMAL: SURVIVAL: STOCKING DETAILS: TRUCKED; FIN CLIPPING LAST 3 YEARS ACCLIMATION DETAILS: OTHER PRE STOCKING INFO:

IMPACTS; RESEARCH: INCREASE IN ADULT RETURNS IMPACTS; OPINION: CONTROL DETAILS:

OTHER COMMENTS: PLANTING EFFORTS HAVE BROADENED THE DISTRIBUTION OF RETURNING ADULTS TO THE NAPA RIVER BASIN

235. SPECIES: SH RACE: STOCK(S): RC
MAJOR DRAINAGE: CC SUB DRAINAGE: SMITH RIVER
CONTACT: TOM GREENER PHONE: REFER TO TEXT AGENCY: SOC ADDRES
PROJECT: BAR-O-BOYS
PURPOSE: EDUCATION ADDRESS: BAR-O-BOYS RANCH, 15005 HWY 199, GASQUET, CA 95543 ONGOING: Y EVALUATION: : SUMMERTIME SNORKELLING; SPAWNING SURVEYS; ADULT TRAPPING-FUTURE SURVIVAL: STOCKING DETAILS: DIRECT; TRUCKED; SALTED PRIOR TO STALKING ACCLIMATION DETAILS: OTHER PRE STOCKING INFO: SPAWNING HABITAT IS BELOW CARRYING CAPACITY IMPACTS; RESEARCH: IMPACTS; OPINION: POPULATIONS ARE STABLE CONTROL DETAILS: OTHER COMMENTS: PROGRAM WILL CHANGE FROM ROWDY CREEK STOCKS TO MONKEY CREEK STOCKS

236. SPECIES: SH RACE: STOCK(S): RS
MAJOR DRAINAGE: CC SUB DRAINAGE: RUSSIAN RIVER
CONTACT: BILL TOWNSEND PHONE: (707)462-5228
AGENCY: MCFG ADDRESS: 24 LORRAINE ST., UKIAH, CA 93921
PROJECT: TALMADGE PONDS PROJECT
PURPOSE: ENHANCE WILD STOCKS EVALUATION: NA SURVIVAL: STOCKING DETAILS: TRANSPORT TRUCK, TOTAL PRODUCTION RELEASED IN A SHORT TIME ACCLIMATION DETAILS: N/A OTHER PRE STOCKING INFO: RELEASED ON NEW MOON PHASE IMPACTS; RESEARCH:
IMPACTS; OPINION: RETURN INTO VARIOUS UPPER BASIN TRIBS & SPAWN IN UPPER MAINSTEM CONTROL DETAILS: N/A

237. SPECIES: SH RACE: STOCK(S): RS
MAJOR DRAINAGE: CC SUB DRAINAGE: RUSSIAN RIVER
CONTACT: ROYCE GUNTER PHONE: (707)433-6325
AGENCY: CDFG ADDRESS: 3246 SKAGGS SPRINGS RD., GEYSERVILLE, CA 95441
PROJECT: WARM SPRINGS FISH HATCHERY
PURPOSE: MITIGATION ONGOING: Y
EVALUATION: NA:
SURVIVAL:
STOCKING DETAILS: RELEASE WITH LUNAR PHASE
ACCLIMATION DETAILS:
OTHER PRE STOCKING INFO: FISH TAKEN OFF FEED AND SALTED PRIOR TO LOADING
IMPACTS; RESEARCH:
IMPACTS; OPINION: INCREASE IN ADULTS; GENETIC INTEGRITY OF NATURAL STOCKS AFFECTED
CONTROL DETAILS:
OTHER COMMENTS: ORIGINAL STOCKS WERE FROM EEL RIVER

238. SPECIES: SH RACE: STOCK(S): SM
MAJOR DRAINAGE: SC SUB DRAINAGE: SMITH RIVER
CONTACT: DENNIS CONGER PHONE: (707)464-7441
AGENCY: RHSI ADDRESS: 811 G ST., CRESCENT CITY, CA 95531
PROJECT: CLASSROOM INCUBATION PROJECT
PURPOSE: EDUCATION ONGOING: Y
EVALUATION: NA:
SURVIVAL:
STOCKING DETAILS: DIRECT BUCKET RELEASE
ACCLIMATION DETAILS: TEMPERATURE ACCLIMATION
OTHER PRE STOCKING INFO: FOOD WITHHELD 24 HOURS PRIOR TO STOCKING
IMPACTS; RESEARCH:
IMPACTS; OPINION: MINIMAL DUE TO SMALL RELEASES
CONTROL DETAILS:
OTHER COMMENTS:

239. SPECIES: SH RACE: STOCK(S): SMITH RIVER
MAJOR DRAINAGE: CC SUB DRAINAGE: SMITH RIVER
CONTACT: BOB WILLS PHONE: (707)487-3443
AGENCY: SRKC ADDRESS: PO BOX 328, SMITH RIVER, CA 95567
PROJECT: ROWDY CREEK FISH HATCHERY
PURPOSE: ENHANCE FISHERIES ONGOING: Y
EVALUATION: RETURNS TO FACILITY MONITORED
SURVIVAL:
STOCKING DETAILS: TRANSPORT TRUCK
ACCLIMATION DETAILS: N/A
OTHER PRE STOCKING INFO: DISTRIBUTION HAS BEEN EXPANDED INTO BARREN TRIBS
IMPACTS; RESEARCH:
IMPACTS; OPINION: NO GENETIC IMPACTS DUE TO USE OF LOCAL STOCKS
CONTROL DETAILS: N/A
OTHER COMMENTS:

240. SPECIES: SH RACE: STOCK(S): SN
MAJOR DRAINAGE: CC SUB DRAINAGE: MONTEREY BAY
CONTACT: DAVE STREIG PHONE: (408)458-3095
AGENCY: MBSTP ADDRESS: 324 SWANTON RD., DAVENPORT, CA 95017
PROJECT: MONTEREY BAY SALMON AND TROUT PROJECT
PURPOSE: ENHANCE RUNS ONGOING: Y
EVALUATION: QN : OUT-MIGRANT TRAPPING; FIN-CLIP PROGRAM IN 1983
SURVIVAL:
STOCKING DETAILS: TRUCKED; 100% FIN-CLIPPED IN 1983
ACCLIMATION DETAILS:
OTHER PRE STOCKING INFO: ONLY USE NATIVE STEELHEAD FOR BROODSTOCK
IMPACTS; RESEARCH:
IMPACTS; OPINION: STRAYING INTO SOQUEL CREEK
CONTROL DETAILS:
OTHER COMMENTS:

241. SPECIES: SH RACE: STOCK(S): ST

MAJOR DRAINAGE: CC SUB DRAINAGE: KLAMATH RIVER
CONTACT: JACK WEST PHONE: (916)842-6131

AGENCY: USFS ADDRESS: KLAMATH NF, 1215 S.MAIN ST., YREKA, CA 96097

PROJECT: KELSEY CREEK SPAWNING-REARING CHANNEL
PURPOSE: PROVIDE SPAWNING HABITAT ONGOING: Y
EVALUATION: QN : REDD COUNTS; JUVENILE TRAPPING; STANDING CROP ESTIMATES
SURVIVAL:
STOCKING DETAILS: VOLUNTARY MIGRATION OUT OF CHANNEL
ACCLIMATION DETAILS:
OTHER PRE STOCKING INFO:
IMPACTS; RESEARCH: CHANNEL IS USED BY ADULTS
IMPACTS; OPINION:
CONTROL DETAILS:
OTHER COMMENTS:

242. SPECIES: SH RACE: STOCK(S): TU,BC,SL

MAJOR DRAINAGE: CC SUB DRAINAGE: TRINITY RIVER (SOUTH FORK)

CONTACT: DAVID REIELS PHONE: (916)628-5012

AGENCY: ADDRESS: P.O.BOX 331, HAYFORK, CA 96041

PROJECT: STEELHEAD RESCUE-POND REARING PROJECT

PURPOSE: RESCUE STRANDED FISH ONGOING: Y

EVALUATION: QN : SOME SURVEY WORK DONE BY CDFG ON SOME TRIBUTARIES

SURVIVAL:

STOCKING DETAILS: FISH RELEASED-->NEW MOON PHASE WHEN WATER QUALITY IS GOOD ACCLIMATION DETAILS:

OTHER PRE STOCKING INFO: FISH TAKEN OFF FEED AND SALTED PRIOR TO STOCKING IMPACTS; RESEARCH:

IMPACTS; OPINION: ENHANCED SURVIVAL OF STEELHEAD

CONTROL DETAILS:
OTHER COMMENTS:

243. SPECIES: SH RACE: STOCK(S): VA
MAJOR DRAINAGE: OC SUB DRAINAGE: ENTIRE COAST
CONTACT: KEN KENASTON PHONE: (503)737-4431
AGENCY: ODFW ADDRESS: 28655 HWY 34, CORVALLIS, OR 97330
PROJECT: STEELHEAD STRAYING STUDY-COASTAL OREGON
PURPOSE: RESEARCH ONGOING: Y
EVALUATION: QN : WILL LOOK AT FIN CLIPS TO DETERMINE STRAYING IN RETURNING ADULTS
SURVIVAL:
STOCKING DETAILS: 100% FIN-CLIP (ALL STEELHEAD, ALL HATCHERIES)
ACCLIMATION DETAILS:
OTHER PRE STOCKING INFO:
IMPACTS; RESEARCH:
IMPACTS; OPINION:
CONTROL DETAILS: EACH HATCHERY HAS A UNIQUE FIN CLIP FOR IDENTIFICATION
OTHER COMMENTS: THIS PROGRAM IS JUST BEGINING- THE FIRST SMOLT RELEASES WILL
BE IN THE SPRING OF 1990

244. SPECIES: SH RACE: STOCK(S): YK, SK, RI, PR
MAJOR DRAINAGE: CR SUB DRAINAGE: NACHES RIVER
CONTACT: JIM CUMMINS PHONE: (509)575-2740
AGENCY: WDW ADDRESS: 2802 FRUITVALE BLVD., YAKIMA, WA 98902
PROJECT: YAKIMA WDW
PURPOSE: ENHANCE WILD STOCKS ONGOING: Y
EVALUATION: : WILD TO HATCHERY SMOLTS, 80% WILD SINCE 1981, SMOLTS AT DAMS
SURVIVAL:
STOCKING DETAILS: TRUCKED
ACCLIMATION DETAILS: NET OFF SECTIONS OF TOPPENISH CR
OTHER PRE STOCKING INFO: YAKIMA ABOVE ROSA NOT STOCKED
IMPACTS; RESEARCH:
IMPACTS; OPINION: NUMBERS WITHIN THE SYSTEM INCREASING
CONTROL DETAILS: N/A
OTHER COMMENTS: LOOKING AT USING WILD STOCKS IN THE FUTURE

245. SPECIES: SH RACE: SUM STOCK(S):
MAJOR DRAINAGE: CR SUB DRAINAGE: SALMON RIVER, EAST FORK
CONTACT: KENT BALL PHONE: (208)756-2271
AGENCY: IDFG ADDRESS: P.O. BOX 1336, SALMON, ID 83467
PROJECT: EAST FORK SALMON RIVER B STEELHEAD
PURPOSE:

EVALUATION: QN : 210 TO 443 FISH RETURNED TO RACK IN EACH OF THE LAST 4 YEARS
SURVIVAL:
STOCKING DETAILS:
ACCLIMATION DETAILS:
OTHER PRE STOCKING INFO: FISH REARED AT HAGERMAN & RELEASED BACK INTO EAST FORK
IMPACTS; RESEARCH: ESTIMATED 70-80% TAKEN IN FISHERY HARVEST
IMPACTS; OPINION: ESTIMATE 5-10% OF RUN ARE NATURAL FISH
CONTROL DETAILS:
OTHER COMMENTS: 1/3 OF RUN IS RELEASED UPSTREAM (ALL WILD FISH & ADDITIONAL
HATCHERY FISH), MAXIMUM KEEP SIZE OF 31 INCHES IN FISH REGS.

246. SPECIES: SH RACE: SUM STOCK(S):
MAJOR DRAINAGE: CR SUB DRAINAGE: CLEARWATER RIVER, SOUTH FORK
CONTACT: BILL MILLER PHONE: (208)476-7242
AGENCY: FWS ADDRESS: P.O. BOX 18, AHSAHKA, ID 83520
PROJECT: SOUTH FORK CLEARWATER RIVER, B STEELHEAD
PURPOSE: MITIGATION ONGOING: Y
EVALUATION: QN : CWT, RACK COUNTS, ZONE 6 RETURNS, CREEL DATA 1987-88
SURVIVAL:
STOCKING DETAILS: 1,200,000 RELEASED FROM HATCHERY
ACCLIMATION DETAILS: 2-3 WEEKS BEFORE RELEASE FISH ARE ON N. FORK ABIENT WATER
OTHER PRE STOCKING INFO: TIME RELEASES TO MEET SMOLT TRANSPORT/PASSAGE GOALS
IMPACTS; RESEARCH: SPAWNING PERIOD HAS BEEN SHORTEN BY ABOUT 1 MONTH
IMPACTS; OPINION: MAY HAVE ELIMINATED A FALL RUN STEELHEAD
CONTROL DETAILS: ALL HATCHERY STEELHEAD ARE AD CLIPPED SINCE 1984
OTHER COMMENTS: ADULTS UNUSED FRO HATCHERY EGG TAKES ARE OUTPLANTED, THEIR
EFFECTIVENESS IS UNKNOWN

247. SPECIES: SH RACE: SUM STOCK(S):
MAJOR DRAINAGE: CR SUB DRAINAGE: CLEARWATER RIVER
CONTACT: BILL MILLER PHONE: (208)476-7242
AGENCY: FWS ADDRESS: P.O. BOX 18 AHSAHKA, ID 83520
PROJECT: LOLO CREEK ON THE CLEARWATER RIVER
PURPOSE: ENHANCE RUNS ONGOING: Y
EVALUATION: : SNORKLING DATA
SURVIVAL:
STOCKING DETAILS: TRUCKED AND RELEASED
ACCLIMATION DETAILS: SMOLTS ON NF CLEARWATER R. WATER 2-3 WKS PRIOR RO RELEASE
OTHER PRE STOCKING INFO:
IMPACTS; RESEARCH:
IMPACTS; OPINION:
CONTROL DETAILS:
OTHER COMMENTS: ADULTS UNUSED IN HATCHERY EGG TAKES ARE OUTPLANTED THEIR
EFFECTIVENESS IS UNKNOWN

248. SPECIES: SH RACE: SUM STOCK(S): CH
MAJOR DRAINAGE: PS SUB DRAINAGE: NISQUALLY RIVER
CONTACT: BOB LELAND PHONE: (206)753-5700

AGENCY: WDW ADDRESS: 600 NORTH CAPITOL WAY, OLYMPIA, WA 98501

PROJECT: NISQUALLY SUMMER STEELHEAD SMOLT RELEASES
PURPOSE: PROVIDE FOR FISHERY, ENHANCE WILD STOCKS ONGOING: Y
EVALUATION: QA : COMM. HARVEST IN 1987 3.5 TIMES HIGHER THAN PREV. 4YRS.

SURVIVAL:
STOCKING DETAILS: REARED TO SMOLTS AT < 10/LB., AND RELEASED IN APRIL
ACCLIMATION DETAILS: PORTION REARED IN SKYKOMISH, GREEN R, BOGACHIEL PONDS
OTHER PRE STOCKING INFO: SPAWNING SURVEYS, HARVEST DATA AVAILABLE
IMPACTS; RESEARCH:
IMPACTS; OPINION: HATCHERY STOCK TAKES HARVEST PRESSURE FROM WILD STOCK, IMPACTS MINMAL
CONTROL DETAILS: PORTION AD CLIPPED TO AID IN HARVEST MANAG.
OTHER COMMENTS:

249. SPECIES: SH RACE: SUM STOCK(S): DS
MAJOR DRAINAGE: CR SUB DRAINAGE: DESCHUTES RIVER (LOWER)
CONTACT: JIM NEWTON PHONE: (503)296-4628
AGENCY: ODFW ADDRESS: 3701 W. 13TH ST., THE DALLES, OR 97058
PROJECT: DESCHUTES RIVER HATCHERY
PURPOSE: MITIGATION
EVALUATION: ON CORFEL MARK & RECAPTURE TRAP COUNTS ONGOING: Y EVALUATION: QN : CREEL, MARK & RECAPTURE, TRAP COUNTS SURVIVAL: 1,500 OF 7,700 HATCHERY FISH SPAWN IN WILD STOCKING DETAILS: STANDARD ACCLIMATION DETAILS: STANDARD
ACCLIMATION DETAILS: N/A
OTHER PRE STOCKING INFO: STOCKING BASED ON PRE DAM PASSAGE NUMBERS
IMPACTS; RESEARCH: LARGE PERCENTAGE OF STRAYS
IMPACTS; OPINION: POTENTIAL IMPACT OF HATCHERY STEELHEAD ON RESIDENT TROUT
CONTROL DETAILS: N/A
OTHER COMMENTS: OTHER COMMENTS:

250. SPECIES: SH RACE: SUM STOCK(S): DS
MAJOR DRAINAGE: CR SUB DRAINAGE: DESCHUTES RIVER
CONTACT: BOB LINDSAY PHONE: (503)737-4431
AGENCY: ODFW ADDRESS: 28655 HWY 34, CORVALLIS, OR 97330
PROJECT: RETURN TO AREA OF RELEASE STUDY-STEELHEAD
PURPOSE: RESEARCH, ENHANCE FISHERY ONGO:
EVALUATION: QN : EACH GROUP WAS DIFFERENTIALLY MARKED WITH FIN CLIPS ONGOING: N SURVIVAL: STOCKING DETAILS: STUDY GROUPS WERE RELEASED AT A SINGLE SITE EACH YEAR ACCLIMATION DETAILS: OTHER PRE STOCKING INFO: IMPACTS; RESEARCH: RETURNS RANGED FROM 30% HIGHER TO 80% LOWER DEPENDING ON RELEASE SITE IMPACTS; OPINION:
CONTROL DETAILS: CONTROL GROUPS WERE RELEASED BELOW PELTON DAM OTHER COMMENTS: INFORMATION REPORT, ODFW (IN PREPARATION)

251. SPECIES: SH RACE: SUM STOCK(S): MK, SS
MAJOR DRAINAGE: CR SUB DRAINAGE: WILLAMETTE RIVER
CONTACT: SCOTT LUSTED PHONE: (503)896-3513
AGENCY: ODFW ADDRESS: 43863 GREER DR., LEABURG, OR 97489
PROJECT: MCKENZIE SALMON HATCHERY
PURPOSE: MITIGATION ONGOING: Y EVALUATION: QA : AERIAL SURVEYS (EUGENE WATER BOARD); DAM COUNTS; AD-CLIP PROGRAM SURVIVAL: STOCKING DETAILS: 100% AD-CLIPPED FOR FISHERY IDENTIFICATION ACCLIMATION DETAILS: NA OTHER PRE STOCKING INFO: NA IMPACTS; RESEARCH:
IMPACTS; OPINION: INCREASE IN ADULTS
CONTROL DETAILS: NA OTHER COMMENTS:

252. SPECIES: SH RACE: SUM STOCK(S): NR
MAJOR DRAINAGE: BC SUB DRAINAGE: NAMAIMO RIVER
CONTACT: BRAIN BLACKMAN PHONE: AGENCY: ADDRESS: PROJECT: STEELHEAD FRY HEADWATER STOCKING EVALUATION PURPOSE: ENHANCE PRODUCTION ONGOING: Y EVALUATION: ON : EVALUATION OF SCATTER VS. POINT RELEASE INTO BARREN HABITAT SURVIVAL STOCKING DETAILS: SCATTER PLANTED W/ BACKPACK NO MORE THAN 500/ GROUP ACCLIMATION DETAILS: OTHER PRE STOCKING INFO: FRY SCATTERED IN 81 WERE DOUBLE THE WT. OF POINT RELS.
IMPACTS; RESEARCH: POINT STOCKING RESULTED IN POOR DISPERSAL & OVERUSE NEAR REL SITES
IMPACTS; OPINION: CONTROL DETAILS: OTHER COMMENTS: WILD BROODSTOCK CAPTURED FROM NANAIMO R. BY HOOK AND LINE, OPTIMUM STOCKING DENSITIES FOR THIS SYSTEM $= 0.4~{\rm FRY/SQ}$. METER @ 1.5 GMS.

253. SPECIES: SH RACE: SUM STOCK(S): SC
MAJOR DRAINAGE: BC SUB DRAINAGE: SILVERHOPE CREEK
CONTACT: BOB GRIFFITH PHONE: (604)387-3660
AGENCY: ADDRESS: VICTORIA, BC
PROJECT: ENHANCEMENT OF SUMMER RUN STEELHEAD IN SILVERHOPE CREEK
PURPOSE: HATCHERY EVALUATION ONGOING: N
EVALUATION: QN:
SURVIVAL: SINGLE POINT RELEASES = 63%, SUB SATURATION RELEASES = 77%
STOCKING DETAILS: 5,700 SINGLE POINT RELEASE, 5.700 UNIFORMLY DISTRIBUTED
ACCLIMATION DETAILS:
OTHER PRE STOCKING INFO:
IMPACTS; RESEARCH: POINT RELEASES RESULTED IN FRY BIOMASS DENSITY OF 5.87 G/SQ METER
IMPACTS; OPINION:
CONTROL DETAILS:
OTHER COMMENTS: UPSTREAMING OF LARGE FRY & DOWNSTREAMING OF SMALL FRY WAS EVIDENCED
ABOUT POINT RELEASE SITE, LESS DEFINITE MIGRATIONS FOR SCATTER RELEASES

254. SPECIES: SH RACE: SUM STOCK(S): SK
MAJOR DRAINAGE: CR SUB DRAINAGE: WILLAMETTE RIVER
CONTACT: JOHN HOSKINS PHONE: (503)896-3294
AGENCY: ODFW ADDRESS: 90700 FISH HATCHERY RD., LEABURG, OR 97489
PROJECT: LEABURG FISH HATCHERY
PURPOSE: INITIALIZE RUN, ENHANCE RUN ONGOING: Y
EVALUATION: QA : DIRECT OBSERVATION-NO MEASUREMENTS
SURVIVAL:
STOCKING DETAILS: 100% AD-CLIPPED FOR SPORT FISHERY IDENTIFICATION
ACCLIMATION DETAILS: NA
OTHER PRE STOCKING INFO: NA
IMPACTS; RESEARCH: NA
IMPACTS; OPINION: STEADY INCREASE IN ADULTS
CONTROL DETAILS: NA
OTHER COMMENTS:

255. SPECIES: SH RACE: SUM STOCK(S): SK
MAJOR DRAINAGE: OC SUB DRAINAGE: SANTIAM RIVER (SOUTH AND SOME NORTH)
CONTACT: GREG LIPSIEA PHONE: (503)367-3437
AGENCY: ODFW ADDRESS: 43182 N.RIVER DR., SWEET HOME, OR 97386
PROJECT: SOUTH SANTIAM FISH HATHERY
PURPOSE: MITIGATION ONGOING: Y
EVALUATION: SURVIVAL:
STOCKING DETAILS:
ACCLIMATION DETAILS:
OTHER PRE STOCKING INFO:
IMPACTS; RESEARCH:
IMPACTS; OPINION:
CONTROL DETAILS:
OTHER COMMENTS:

256. SPECIES: SH RACE: SUM STOCK(S): SK
MAJOR DRAINAGE: PS SUB DRAINAGE: SKAGIT RIVER
CONTACT: BOB LELAND PHONE: (206)753-5700
AGENCY: WDW ADDRESS: 600 NORTH CAPITOL WAY, OLYMPIA, WA 98501
PROJECT: SKAGIT SUMMER STEELHEAD SMOLT STOCKING
PURPOSE: PROVIDE FOR FISHERY ONGOING: Y
EVALUATION: QA : AVG. SPORT HARVEST=422, AVG. COMMERCIAL TRIBAL=264, BOTH STABLE
SURVIVAL:
STOCKING DETAILS: REARED TO SMOLTS AT PONDS, TRANS. TO SITES & DUMPED
ACCLIMATION DETAILS: REARED TO SMOLTS AT WHITEHORSE AND SKYKOMISH PONDS
OTHER PRE STOCKING INFO:
IMPACTS; RESEARCH:
IMPACTS; OPINION: POTENTIAL FOR SOME GENETIC CROSSING
CONTROL DETAILS: MOST AD CLIPPED TO AID IN HARVEST MANAG.
OTHER COMMENTS:

257. SPECIES: SH RACE: SUM STOCK(S): SR
MAJOR DRAINAGE: CR SUB DRAINAGE: SALMON RIVER
CONTACT: KENT BALL PHONE: (208)756-2271
AGENCY: IDFG ADDRESS: P.O. BOX 1336, SALMON, ID 83467
PROJECT: PAHSIMEROI RIVER STEELHEAD
PURPOSE: REESTABLISH RUN, RELOCATION ONGOING: Y
EVALUATION: QN : CREEL CENSUS, WIER COUNTS, CWT RECOVERIES
SURVIVAL: ESTIMATED 1.18% RETURN
STOCKING DETAILS: SPRING RELEASES, SMOLTS ARE TRUCKED & STOCKED BELOW WIER
ACCLIMATION DETAILS:
OTHER PRE STOCKING INFO: UNFED FRY ARE STOCKED INTO SMALL STREAMS
IMPACTS; RESEARCH: HATCHERY FISH MAKE UP APPROX. 93% OF HARVEST
IMPACTS; OPINION: WILD RAINBOW POPULATION MAY BE DECLINING
CONTROL DETAILS:
OTHER COMMENTS: OTHER SMALL EXPERIMENTS WITHIN THE OVERALL PROJECT ARE CONDUCTED TO
IMPROVE RETURNS

258. SPECIES: SH RACE: WIN STOCK(S):

MAJOR DRAINAGE: CR SUB DRAINAGE: WILLAMETTE RIVER (MID)

CONTACT: WAYNE BOWERS PHONE: (503)657-6822

AGENCY: ODFW ADDRESS: 17330 S.EVELYN ST., CLACKAMAS, OR 97015

PROJECT: STEP PROGRAM MID-WILLAMETTE DISTRICT

PURPOSE: ENHANCE WILD STOCKS

EVALUATION: :

SURVIVAL:

STOCKING DETAILS:

ACCLIMATION DETAILS:

OTHER PRE STOCKING INFO:

IMPACTS; RESEARCH:

IMPACTS; OPINION:

CONTROL DETAILS:

OTHER COMMENTS:

259. SPECIES: SH RACE: WIN STOCK(S):
MAJOR DRAINAGE: OC SUB DRAINAGE: SALMON RIVER
CONTACT: LYLE CURTIS PHONE: (503)994-8606
AGENCY: ODFW ADDRESS: RT. 2. BOX 41, OTIS, OR 97368
PROJECT: SALMON RIVER HATCHERY
PURPOSE: REESTABLISH RUNS ONGOING: Y
EVALUATION: :
SURVIVAL:
STOCKING DETAILS:
ACCLIMATION DETAILS:
OTHER PRE STOCKING INFO:
IMPACTS; RESEARCH:
IMPACTS; OPINION:
CONTROL DETAILS:
OTHER COMMENTS:

260. SPECIES: SH RACE: WIN STOCK(S): AL
MAJOR DRAINAGE: OC SUB DRAINAGE: TENMILE CREEK
CONTACT: PAUL REIMERS PHONE: (503)888-5515
AGENCY: ODFW ADDRESS: PO BOX 5430, CHARLESTON, OR 97420
PROJECT: TENMILE CREEK STEELHEAD PROGRAM
PURPOSE: ENHANCE RUNS ONGOING: Y
EVALUATION: : MARKED FISH & SCALE ANALYSIS FOR HATCHERY TO WILD RATIO
SURVIVAL:
STOCKING DETAILS: TRUCKED
ACCLIMATION DETAILS: POSSIBLY IN FUTURE
OTHER PRE STOCKING INFO:
IMPACTS; RESEARCH: INCREASE IN ADULTS
IMPACTS; OPINION:
CONTROL DETAILS: N/A
OTHER COMMENTS: GOAL IS TO GET STEELHEAD TO RETURN TO EEL LAKE AND REDUCE STRAYING
TO NORTH AND SOUTH TENMILE LAKES

261. SPECIES: SH RACE: WIN STOCK(S): AL,CQ
MAJOR DRAINAGE: OC SUB DRAINAGE: ALSEA RIVER
CONTACT: TERRY FISHER PHONE: (503)487-7240
AGENCY: ODFW ADDRESS: 29050 FISH HATCHERY RD., PHILOMATH, OR 97370
PROJECT: ALSEA RIVER FISH HATCHERY
PURPOSE: ENHANCEMENT
EVALUATION:
SURVIVAL:
STOCKING DETAILS:
ACCLIMATION DETAILS:
OTHER PRE STOCKING INFO:
IMPACTS; RESEARCH:
IMPACTS; OPINION:
CONTROL DETAILS:
OTHER COMMENTS:

262. SPECIES: SH RACE: WIN STOCK(S): BC
MAJOR DRAINAGE: CR SUB DRAINAGE: COLUMBIA RIVER
CONTACT: MEL KELLY PHONE: (503)455-2234
AGENCY: ODFW ADDRESS: RT. 2, BOX 2198, CLATSKANIE, OR 97016
PROJECT: GNAT CREEK HATCHERY
PURPOSE: MITIGATION ONGOING: Y
EVALUATION: SURVIVAL:
STOCKING DETAILS:
ACCLIMATION DETAILS:
OTHER PRE STOCKING INFO:
IMPACTS; RESEARCH:
IMPACTS; OPINION:
CONTROL DETAILS:
OTHER COMMENTS:

263. SPECIES: SH RACE: WIN STOCK(S): BC
MAJOR DRAINAGE: OC SUB DRAINAGE: WILLAMETTE RIVER
CONTACT: DAN BARRETT PHONE: (503)394-2496
AGENCY: ODFW ADDRESS: 42255 FISH HATCHERY DR., SCIO, OR 97374
PROJECT: ROARING RIVER HATCHERY
PURPOSE: ENHANCE RUNS
EVALUATION: :
SURVIVAL:
STOCKING DETAILS:
ACCLIMATION DETAILS:
OTHER PRE STOCKING INFO:
IMPACTS; RESEARCH:
IMPACTS; OPINION:
CONTROL DETAILS:
OTHER COMMENTS:

264. SPECIES: SH RACE: WIN STOCK(S): BC, KL
MAJOR DRAINAGE: CR SUB DRAINAGE: KLASKANINE RIVER
CONTACT: QUENTIN SMITH PHONE: (503)325-3653
AGENCY: ODFW ADDRESS: ROUTE 1, BOX 74, ASTORIA, OR 97103
PROJECT: KLASKANINE FISH HATCHERY
PURPOSE: MITIGATION ONGOING: Y
EVALUATION: QA : STREAM SURVEYS(CEDC)
SURVIVAL:
STOCKING DETAILS: LOSSES DUE TO TRUCKING STRESS
ACCLIMATION DETAILS: NA
OTHER PRE STOCKING INFO: NA
IMPACTS; RESEARCH: NA
IMPACTS; OPINION: NO ADULT INCREASE OBSERVED
CONTROL DETAILS: NA
OTHER COMMENTS:

265. SPECIES: SH RACE: WIN STOCK(S): BG, QN, CH
MAJOR DRAINAGE: WC SUB DRAINAGE: HUMPTULIPS RIVER
CONTACT: BILL FREYMOND PHONE: (206)533-9335
AGENCY: WDW ADDRESS: REGION 6 905 E. HERON, ABERDEEN, WA 98520
PROJECT: HUMPTULIPS
PURPOSE: PROVIDE FOR FISHERY, ENHANCE WILD STOCKS ONGOING: Y
EVALUATION: QN : ESCAPEMENT GOALS ARE BEING EXCEEDED
SURVIVAL: 2-SALT=1.41%, 3-SALT=0.48%
STOCKING DETAILS: PSMOLTS TRUCKED AND SCATTER PLANTED
ACCLIMATION DETAILS:
OTHER PRE STOCKING INFO:
IMPACTS; RESEARCH:
IMPACTS; OPINION: MINIMAL IMPACTS ON WILD FISH DUE TO TIMING DIFFERENCES
CONTROL DETAILS: N/A\
OTHER COMMENTS: NON-TRIBAL HARVEST ESTIMATED FROM PUNCHCARD DATA. NO CREEL CEN
PLAN TO DEVELOP CONDITIONING POND ON SYSTEM

266. SPECIES: SH RACE: WIN STOCK(S): BT, SA
MAJOR DRAINAGE: SR SUB DRAINAGE: BATTLE CREEK
CONTACT: GENE FORBES PHONE: (916)365-8622
AGENCY: FWS ADDRESS: CNFH, ROUTE 1, BOX 2105, ANDERSON, CA 96007
PROJECT: COLEMAN NATIONAL FISH HATCHERY
PURPOSE: MITIGATION ONGOING: Y
EVALUATION: QN : CWT IN THE PAST; SIZE, SITE AND TIME OF RELEASE STUDIES
SURVIVAL: on-site smolt: .10-.25%; off-site smolt: .10-.50%
STOCKING DETAILS: DIRECT AND TRUCKED
ACCLIMATION DETAILS:
OTHER PRE STOCKING INFO:
IMPACTS; RESEARCH: BATTLE CREEK RUNS ARE 100% HATCHERY DERIVED
IMPACTS; OPINION: SOME GENETIC IMPACTS TO UPPER SACRAMENTO RIVER STOCKS BELIEVED
CONTROL DETAILS:
OTHER COMMENTS: CROSSES OF KAMLOOPS AND STEELHEAD WERE MADE IN THE PAST; NOW
THERE IS A SELECTIVE BREEDING PROGRAM FOR STEELHEAD ONLY

267. SPECIES: SH RACE: WIN STOCK(S): CC
MAJOR DRAINAGE: OC SUB DRAINAGE: NECANICUM RIVER, LITTLE NESTUCCA RIVER
CONTACT: CHARLIE STANLEY PHONE: (503)392-3485
AGENCY: ODFW ADDRESS: 33465 HWY 22, HEBO, OR 97122
PROJECT: CEDAR CREEK HATCHERY
PURPOSE: ENHANCE RUN ONGOING: Y
EVALUATION:
SURVIVAL:
STOCKING DETAILS:
ACCLIMATION DETAILS:
OTHER PRE STOCKING INFO:
IMPACTS; RESEARCH:
IMPACTS; OPINION:
CONTROL DETAILS:
OTHER COMMENTS:

268. SPECIES: SH RACE: WIN STOCK(S): CH
MAJOR DRAINAGE: PS SUB DRAINAGE: ELSON CREEK AND SKOOKUM CREEK
CONTACT: JOHN BARR PHONE: (206)426-9783
AGENCY: SQAX ADDRESS: WEST 81 HIGHWAY 108, SHELTON, WA 98584
PROJECT: ELSON CREEK HATCHERY
PURPOSE: ESTABLISH FISHERY ONGOING: N
EVALUATION: QA : NO RETURNS TO HATCHERY OR SKOOKUM CR.; PROJECT DISCONTINUED
SURVIVAL:
STOCKING DETAILS: DUMP-RELEASED ON-STATION, ELSON CR.; OUTPLANTED SKOOKUM CR.
ACCLIMATION DETAILS: N/A
OTHER PRE STOCKING INFO: PROBABLY WAS SMALL NATIVE RUN TO SKOOKUM CREEK
IMPACTS; RESEARCH:
IMPACTS; RESEARCH:
IMPACTS; OPINION: NOT CONSIDERED TO IMPACT WILD FISH/RUN SIZE AS THERE WERE NO RETURNS NOT
CONTROL DETAILS: 95,392 MARKED:LV CLIP TO ELSON CR., RV CLIP TO SKOOKUM CR.
OTHER COMMENTS: HATCHERY/OUTPLANTED FISH MAY HAVE ASCENDED KENNEDY & OTHER CKS
FISH FIN-CLIPPED TO DETERMINE STRAYING BETWEEN STREAMS UPON RETURN

269. SPECIES: SH RACE: WIN STOCK(S): CH
MAJOR DRAINAGE: PS SUB DRAINAGE: HOOD CANAL
CONTACT: BILL FREYMOND PHONE: (206)533-9335
AGENCY: WDW ADDRESS: REGION 6 905 E. HERON, ABERDEEN, WA 98520
PROJECT: HOOD CANAL WINTER STEELHEAD SMOLT OUTPLANTS
PURPOSE: PROVIDE FOR FISHERY, ENHANCE WILD STOCKS ONGOING: Y
EVALUATION: QN:
SURVIVAL: DOSEWALLIPS:2-S=1.27%,3-S=0.46%;DUCKABUSH:2-S=1.36,3-S=0.49%
STOCKING DETAILS: REARED TO SMOLTS, AT HATCHERY & PONDS, TRUCKED & DUMPED ACCLIMATION DETAILS: N/A
OTHER PRE STOCKING INFO: AGE, COMPOSITION DETERMINED FROM SCALE READING.
IMPACTS; RESEARCH:
IMPACTS; OPINION: MINIMAL IMPACTS ON WILD FISH DUE TO TIMING DIFFERENCES
CONTROL DETAILS: MOST AD CLIPPED TO DETERMINE HARVEST AND RETURN RATE INFO
OTHER COMMENTS: RETURN OF NATURAL STOCK BASED UPON ASSUMED HARVEST RATE OF 70%

270. SPECIES: SH RACE: WIN STOCK(S): CH
MAJOR DRAINAGE: PS SUB DRAINAGE: SKOKOMISH RIVER
CONTACT: BILL FREYMOND PHONE: (206)533-9335
AGENCY: WDW ADDRESS: REGION 6 905 E. HERON, ABERDEEN, WA 98520
PROJECT: SKOKOMISH WINTER STEELHEAD SMOLT OUTPLANTS
PURPOSE: PROVIDE FOR FISHERY, ENHANCE WILD STOCKS ONGOING: Y
EVALUATION: QN : HARVEST AND ESCAPEMENT ARE INCREASING
SURVIVAL: 2-SALT=1.94%, 3-SALT=0.70%
STOCKING DETAILS: REARED TO SMOLTS, AT HATCHERY & PONDS, TRUCKED & DUMPED ACCLIMATION DETAILS: N/A
OTHER PRE STOCKING INFO: AGE, COMPOSITION DETERMINED FROM SCALE READING.
IMPACTS; RESEARCH:
IMPACTS; OPINION: MINIMAL IMPACTS ON WILD FISH DUE TO TIMING DIFFERENCES CONTROL DETAILS: MOST AD CLIPPED
OTHER COMMENTS:

271. SPECIES: SH RACE: WIN STOCK(S): CH
MAJOR DRAINAGE: PS SUB DRAINAGE: PUYALLUP RIVER
CONTACT: BOB LELAND PHONE: (206)753-5700
AGENCY: WDW ADDRESS: 600 NORTH CAPITOL WAY, OLYMPIA, WA 98501
PROJECT: PUYALLUP WINTER STEELHEAD SMOLT RELEASES
PURPOSE: PROVIDE FOR FISHERY, ENHANCE WILD STOCKS ONGOING: Y
EVALUATION: QN : HARVEST 36% OF AVE. FOR PREV. 4YRS., WILD ESCAPEMENT 35% OF GOAL
SURVIVAL: 2-SALT=2.91%, 3-SALT=0.88%, OTHER AGES=0.14%
STOCKING DETAILS: REARED TO SMOLTS, AT HATCHERIES & PONDS, TRANS. & RELEASED
ACCLIMATION DETAILS: PORTION REARED TO SMOLTS AT GREEN RIVER PONDS
OTHER PRE STOCKING INFO: SPAWNING SURVEYS, HARVEST DATA AVAILABLE
IMPACTS; RESEARCH: ESCAPEMENT OF WILD WINTER STEELHEAD IS CONSIDERABLY (65%) BELOW GOAL
IMPACTS; OPINION: SHOULD BE MINIMAL IMPACT, DUE TO DIFF. IN TIMING OF HATCHERY & WILD RUN
CONTROL DETAILS: MOST AD CLIPPED TO AID HARVEST MANAG.
OTHER COMMENTS: HATCHERY FISH FELT TO REDUCE HARVEST PRESSURE ON WILD STOCKS
LOGGING AND AGRICULTURAL USES DEGRADE WATER QUALITY

272. SPECIES: SH RACE: WIN STOCK(S): CH
MAJOR DRAINAGE: PS SUB DRAINAGE: GREEN RIVER
CONTACT: BOB LELAND PHONE: (206)753-5700

AGENCY: WDW ADDRESS: 600 NORTH CAPITOL WAY, OLYMPIA, WA 98501
PROJECT: GREEN RIVER WINTER STEELHEAD SMOLT RELEASES
PURPOSE: PROVIDE FOR FISHERY, ENHANCE WILD STOCKS ONGOING: Y
EVALUATION: QN : 1987/88 HARVEST 43% OF AVERAGE FOR PREV. 5YRS.
SURVIVAL: 2-SALT=3.97%, 3-SALT=0.92%, OTHER AGES=0.16%
STOCKING DETAILS: REARED TO SMOLTS, AT HATCHERY OR PONDS, TRANS. & DUMPED
ACCLIMATION DETAILS: PORTION REARED TO SMOLTS AT GREEN R, FLAMING GEYSER PONDS
OTHER PRE STOCKING INFO: SPAWNING SURVEYS, HARVEST DATA AVAILABLE
IMPACTS; RESEARCH: WILD RUN OBSERVED ESCAPEMENT GENERALLY MEETS GOALS FOR WILD FISH
IMPACTS; OPINION: HAT. RELEASES FELT TO HAVE MIN. IMPACT ON WILD GENETICS, BENIFIT SURV.
CONTROL DETAILS: MOST AD OR VENT. CLIPPED TO ASSIST IN HARVEST MANAG.
OTHER COMMENTS: WILD AND HATCHERY RUNS SEPARATED SOMEWHAT TEMPORALLY

273. SPECIES: SH RACE: WIN STOCK(S): CH
MAJOR DRAINAGE: PS SUB DRAINAGE: LAKE WASHINGTON
CONTACT: BOB LELAND PHONE: (206)753-5700
AGENCY: WDW ADDRESS: 600 NORTH CAPITOL WAY, OLYMPIA, WA 89501
PROJECT: LAKE WASHINGTON STEELHEAD PLANTS
PURPOSE: PROVIDE FOR FISHERY, ENHANCE WILD STOCKS ONGOING: Y
EVALUATION: QN : COMM. HARVEST 50% OF RECENT AVG., SPORT HARVEST ONLY 25% OF AVG.
SURVIVAL: 2-SALT=2.36%, 3-SALT=0.65%
STOCKING DETAILS: REARED TO SMOLTS, AT HATCHERY OR PONDS, TRANS. & DUMPED
ACCLIMATION DETAILS: PORTION REARED IN GREEN RIVER PONDS
OTHER PRE STOCKING INFO: SPAWNING SURVEYS, HARVEST DATA AVAILABLE
IMPACTS; RESEARCH:
IMPACTS; OPINION: MINIMAL GENETIC IMPACT DUE TO TIMING DIFF., ATTRACTS SEA LION PREDATION
CONTROL DETAILS: SMOLTS AD CLIPPED TO ASSIST IN HARVEST MANAG.
OTHER COMMENTS: TRIBES DO SCALE ANALYSES FOR AGE RATIOS, ETC.

274. SPECIES: SH RACE: WIN STOCK(S): CH
MAJOR DRAINAGE: PS SUB DRAINAGE: SKAGIT RIVER
CONTACT: BOB LELAND PHONE: (206)753-5700
AGENCY: WDW ADDRESS: 600 NORTH CAPITOL WAY, OLYMPIA, WA 98501
PROJECT: SKAGIT WINTER STEELHEAD SMOLT STOCKING
PURPOSE: PROVIDE FOR FISHERY, ENHANCE WILD STOCKS ONGOING: Y
EVALUATION: QN :
SURVIVAL: 2-SALT=2.30%, 3-SALT=0.37%, OTHER AGES=0.12%
STOCKING DETAILS: REARED TO SMOLTS, TRUCKED TO SITES AND DUMP PLANTED
ACCLIMATION DETAILS: PORTION REARED IN WHITEHORSE, SKYKOMISH, SAUK PONDS
OTHER PRE STOCKING INFO: SPAWNING SURVEYS, HARVEST DATA AVAILABLE
IMPACTS; RESEARCH: OBSERVED ESCAPEMENT HAS CONSISTENTLY FALLEN SHORT OF WILD FISH GOALS
IMPACTS; OPINION: SHOULD BE MINIMAL IMPACT, DUE TO DIFF. IN TIMING OF HATCHERY & WILD RUN
CONTROL DETAILS: SMOLTS AD CLIPPED TO ASSIST IN HARVEST MANAG.
OTHER COMMENTS:

275. SPECIES: SH RACE: WIN STOCK(S): CH
MAJOR DRAINAGE: PS SUB DRAINAGE: SAMISH RIVER
CONTACT: BOB LELAND PHONE: (206)753-5700
AGENCY: WDW ADDRESS: 600 NORTH CAPITOL WAY, OLYMPIA, WA 98501
PROJECT: SAMISH WINTER STEELHEAD SMOLT RELEASES
PURPOSE: PROVIDE FOR FISHERY, ENHANCE WILD STOCKS ONGOING: Y
EVALUATION: QN : SPORT HARVEST 39% OF PREV. 4YRS.
SURVIVAL: 2-SALT=1.08%, 3-SALT=0.24%
STOCKING DETAILS: REARED TO SMOLTS AT HATCHERY OR POND, TRANS. TO SITES & DUMP
ACCLIMATION DETAILS: PORTION REARED TO SMOLTS IN WHITEHORSE PONDS
OTHER PRE STOCKING INFO: HARVEST NUMBERS ARE CALCULATED USING AVG RETURNS
IMPACTS; RESEARCH: GENETIC IMPACTS SHOULD BE MINIMAL SINCE TIMING IS DIFFERENT
IMPACTS; OPINION: FISHERIES ARE DIRECTED AT HATCHERY STOCK TO REDUCE TAKE OF WILD FISH
CONTROL DETAILS: AD CLIPPED TO AID IN HARVEST MANAG.
OTHER COMMENTS:

276. SPECIES: SH RACE: WIN STOCK(S): CH
MAJOR DRAINAGE: PS SUB DRAINAGE: TULALIP BAY
CONTACT: CLIFF BENGSTON PHONE: (206)653-7477
AGENCY: TULA ADDRESS: 10610 WATERWORKS ROAD, MARYSVILLE, WA 98270
PROJECT: TULALIP TRIBAL HATCHERY WINTER STEELHEAD RELEASES
PURPOSE: PROVIDE FOR FISHERIES ONGOING: N
EVALUATION: QA : POOR RETURNS. ONLY 10-12 RACK RETURNS FOR 60,000 RELEASED
SURVIVAL:
STOCKING DETAILS: INCUBATED IN HEATH SYSTEM. REARED IN TROUGHS AND PONDS
ACCLIMATION DETAILS: REARED IN PONDS, 7.5/LB
OTHER PRE STOCKING INFO:
IMPACTS; RESEARCH:
IMPACTS; OPINION: UNKNOWN IMPACTS TO WILD STOCKS
CONTROL DETAILS: 100% MARKED WITH AD AND LV CLIPS
OTHER COMMENTS: DISCON. USE OF WDW STOCK FROM WHITEHORSE PONDS, FEAR DISAESE

277. SPECIES: SH RACE: WIN STOCK(S): CH
MAJOR DRAINAGE: PS SUB DRAINAGE: PUGET SOUND (SOUTH)
CONTACT: BOB LELAND PHONE: (206)753-5700
AGENCY: WDW ADDRESS: 600 NORTH CAPITOL WAY, OLYMPIA, WA 98501
PROJECT: SOUTH PUGET SOUND STEELHEAD SMOLT RELEASES.
PURPOSE: PROVIDE FOR FISHERY, ENHANCE WILD STOCKS ONGOING: Y
EVALUATION: QN : 52% HARVEST IN KENNEDY CR.,10% IN GOLDSBOROUGH, OF PREV. 4YRS
SURVIVAL: 2-SALT=1.0%, 3-SALT=0.5%
STOCKING DETAILS: REARED TO SMOLTS (7.5/LB) AT HATCHERY & PONDS, TRUCKED & DUMP
ACCLIMATION DETAILS: REARED IN PONDS, 7.5/LB
OTHER PRE STOCKING INFO: SPORT AND TRIBAL COMMERCIAL HARVEST DATA AVAILABLE
IMPACTS; RESEARCH:
IMPACTS; OPINION: MINIMAL IMPACTS DUE TO TIMING DIFFERENCES
CONTROL DETAILS: FISH IN GOLDSBOROUGH CREEK AD CLIPPED
OTHER COMMENTS: NO DIRECTED COMMERCIAL FISHERY ON GOLDSBOROUGH CREEK

278. SPECIES: SH RACE: WIN STOCK(S): CH
MAJOR DRAINAGE: PS SUB DRAINAGE: DESCHUTES RIVER
CONTACT: BOB LELAND PHONE: (206)753-5700
AGENCY: WDW ADDRESS: 600 NORTH CAPITOL WAY, OLYMPIA, WA 98501
PROJECT: DESCHUTES WINTER STEELHEAD SMOLT PLANTS
PURPOSE: PROVIDE FOR FISHERY, ENHANCE WILD STOCKS ONGOING: Y
EVALUATION: NA : RETURN RATES 2-SALT=1.0%, 3-SALT=0.50%
SURVIVAL:
STOCKING DETAILS: REARED TO SMOLTS (6/LB) AT HATCHERY & PONDS, TRUCKED & DUMPED ACCLIMATION DETAILS:
OTHER PRE STOCKING INFO: SPORT AND TRIBAL COMMERCIAL HARVEST DATA AVAILABLE IMPACTS; RESEARCH:
IMPACTS; RESEARCH:
IMPACTS; OPINION: MINIMAL IMPACTS DUE TO TIMING DIFFERENCES
CONTROL DETAILS: FISH AD CLIPPED TO ASSIST IN HARVEST MANAG.
OTHER COMMENTS: SQUAXIN TRIBE WILL HAVE NO DIR. STEELHEAD FISHERY ON DESCHUTES SPORT HARVEST OF 61 STEELHEAD IN 87-88 WAS 17% OF AVG OF PREVIOUS 4YRS

279. SPECIES: SH RACE: WIN STOCK(S): CH
MAJOR DRAINAGE: PS SUB DRAINAGE: STILLAGUAMISH RIVER
CONTACT: BOB LELAND PHONE: (206)753-5700
AGENCY: WDW ADDRESS: 600 NORTH CAPITOL WAY, OLYMPIA, WA 98501
PROJECT: STILLAGUAMISH WINTER STEELHEAD SMOLT RELEASES
PURPOSE: PROVIDE FOR FISHERY, ENHANCE WILD STOCKS ONGOING: Y
EVALUATION: QA : SPORT HARVEST=2550 FOR 5YRS, TRIBAL HARVEST 37% HIGHER THAN 4YRS
SURVIVAL:
STOCKING DETAILS: REARED TO SMOLTS (5.5/LB) AT HATCHERY & PONDS, TRUCKED & DUMP
ACCLIMATION DETAILS: PORTION OF SMOLTS REARED IN WHITEHORSE & SKYKOMISH PONDS
OTHER PRE STOCKING INFO: SPAWNING SURVEYS HAVE BEEN MADE IN PREVIOUS YEARS
IMPACTS; RESEARCH:
IMPACTS; OPINION: HARVEST DIRECTED TOWARD HATCHERY FISH, MINIMAL IMPACTS DUE TO TIMING
CONTROL DETAILS: MOST SMOLTS AD CLIPPED TO ASSIST IN HARVEST MANAG.
OTHER COMMENTS:
WILD FISH ESCAPEMENT GOALS WOULD BE MET IF HARVEST OF WILD FISH WAS 750

280. SPECIES: SH RACE: WIN STOCK(S): CH
MAJOR DRAINAGE: SJ SUB DRAINAGE: STRAIT OF JUAN DE FUCA
CONTACT: BILL FREYMOND PHONE: (206)533-9335
AGENCY: WDW ADDRESS: REGION 6 905 E. HERON, ABERDEEN, WA 98520
PROJECT: STRAITS
PURPOSE: PROVIDE FOR FISHERY, ENHANCE WILD STOCKS ONGOING: Y
EVALUATION: QN:
SURVIVAL: DUNGENESS:2-S=1.89%,3-S=0.68%; MORSE CR:2-S=2.39%,3-S=0.86%
STOCKING DETAILS: REARED TO SMOLTS AT BOGACHIEL PONDS, TRUCKED TO STREAM & DUMP
ACCLIMATION DETAILS: N/A
OTHER PRE STOCKING INFO: DATA AVAILABLE ON RETURN RATES AND HARVEST
IMPACTS; RESEARCH:
IMPACTS; OPINION: MINIAML IMPACTS ON WILD FISH DUE TO TIMING DIFFERENCES
CONTROL DETAILS: 1/2 HAVE AD OR VENT. CLIPPED TO DETER. HARVEST & RETURN INFO
OTHER COMMENTS:

281. SPECIES: SH RACE: WIN STOCK(S): CH
MAJOR DRAINAGE: SJ SUB DRAINAGE: STRAIT OF JUAN DE FUCA
CONTACT: BILL FREYMOND PHONE: (206)533-9335
AGENCY: WDW ADDRESS: REGION 6 905 E. HERON, ABERDEEN, WA 98520
PROJECT: ELWHA
PURPOSE: PROVIDE FOR FISHERY, MITIGATION ONGOING: Y
EVALUATION: ON : WILD RUN=14.4% OF TOTAL RUN. HARVEST AND RACK DATA AVAILABLE
SURVIVAL: 2-SALT=3.35%, 3-SALT=0.90%
STOCKING DETAILS: TRUCKED FROM PONDS & HATCHERY, DUMPED AT <10/LB TO RIVER
ACCLIMATION DETAILS: REARED TO SMOLTS IN BOGACHIEL & CALAWAH PONDS
OTHER PRE STOCKING INFO: AGE COMPOSITION, ETC. DETERMINED FROM SCALE READINGS
IMPACTS; RESEARCH:
IMPACTS; OPINION: MINIMAL IMPACTS ON WILD FISH DUE TO TIMING DIFFERENCES
CONTROL DETAILS: 90% AD & VENT. CLIPPED TO DETERMINE HARVEST RETURN RATES
OTHER COMMENTS:

282. SPECIES: SH RACE: WIN STOCK(S): CH
MAJOR DRAINAGE: SJ SUB DRAINAGE: STRAIT OF JUAN DE FUCA
CONTACT: BILL FREYMOND PHONE: (206)533-9335
AGENCY: WDW ADDRESS: REGION 6 905 E. HERON, ABERDEEN, WA 98520
PROJECT: STRAITS
PURPOSE: PROVIDE FOR FISHERY, ENHANCE WILD STOCKS ONGOING: Y
EVALUATION: QN : PYSHT RIVER RETURN RATES: 2-SALT=2.37%, 3-SALT=0.86%
SURVIVAL: LYRE, HOKO: 2-S=3.65%, 3-S=1.31%; CLALLAM: 2-S=1.26%, 3-S=0.45%
STOCKING DETAILS: REARED TO SMOLTS AT BOGACHIEL PONDS, TRUCKED TO STREAM & DUMP
ACCLIMATION DETAILS: REARED IN BOGACHIEL AND CALAWAH PONDS
OTHER PRE STOCKING INFO: HARVEST, RETURN DATA & TRENDS, SPAWNING SURVEYS AVAIL.
IMPACTS; RESEARCH:
IMPACTS; OPINION: MINIMAL IMPACTS ON WILD FISH DUE TO TIMING DIFFERENCES
CONTROL DETAILS: 40% AD OR VENT. CLIPPED TO DERTER. HARVEST & RETURN INFO
OTHER COMMENTS:

283. SPECIES: SH RACE: WIN STOCK(S): CH
MAJOR DRAINAGE: WC SUB DRAINAGE: CHEHALIS RIVER
CONTACT: BILL FREYMOND PHONE: (206)533-9335
AGENCY: WDW ADDRESS: REGION 6 905 E. HERON, ABERDEEN, WA 98520
PROJECT: SATSOP RIVER STEELHEAD SMOLT RELEASES
PURPOSE: ENHANCE FISHERY AND WILD STOCKS ONGOING: Y
EVALUATION: QN : WILD ESCAPEMENT HAS NOT BEEN MET RECENTLY
SURVIVAL: RETURN RATE, 1.12%
STOCKING DETAILS: SMOLTS SCATTER-PLANTED < 10/LB. MOST TO E. FORK
ACCLIMATION DETAILS: N/A
OTHER PRE STOCKING INFO: COOPERATIVE SPAWNING SURVEYS RUN WITH QUINAULT TRIBE.
IMPACTS; RESEARCH:
IMPACTS; RESEARCH:
IMPACTS; OPINION: POTENTIAL CONFLICT WITH WILD FISH GENETICS AND TIMING
CONTROL DETAILS: AD OR VENT. CLIPPED FOR HARVEST MANAGEMENT PURPOSES
OTHER COMMENTS: WILD FISH COMPRISE MAJORITY OF THE WINTER STEELHEAD RUN ON SYS
NEED AN IN-SEASON UPDATE FOR TRIBAL AND RECREATIONAL FISHERIES FOR MANAG

284. SPECIES: SH RACE: WIN STOCK(S): CH, BG
MAJOR DRAINAGE: WC SUB DRAINAGE: QUILLAYUTE RIVER
CONTACT: BILL FREYMOND PHONE: (206)533-9335
AGENCY: WDW ADDRESS: REGION 6 905 E. HERON, ABERDEEN, WA 98520
PROJECT: QUILLAYUTE
PURPOSE: ENHANCE WILD STOCKS ONGOING: Y
EVALUATION: QN : WILD BROOD RETURN CALCULATED
SURVIVAL: 1-SALT RETURNS=8.20%, 3-SALT=2.30%, OTHER AGES=.48%
STOCKING DETAILS: +/- 100,000 SMOLTS VOLITIONALLY RELASED FROM PONDS
ACCLIMATION DETAILS: REARED TO SMOLTS IN BOGACHIEL & CALAWAH PONDS
OTHER PRE STOCKING INFO: 10-15,000 TRUCKED FROM BOGACHIEL POND TO CALAWAH DRA.
IMPACTS; RESEARCH:
IMPACTS; RESEARCH:
IMPACTS; OPINION: MINIMAL IMPACTS ON WILD FISH DUE TO TIMING DIFFERENCES
CONTROL DETAILS: 622,696 AD & VENT. CLIPS TO AID IN HARVEST MANAG. DETER.
OTHER COMMENTS: WDW CONCERN OF OVERHARVEST ON EARLY WILD FISH ON SOLEDUCK
MOST SPORT HARVEST IS WITHIN 3 MILES OF RELEASE SITE AT BOGACHIEL PONDS.

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285. SPECIES: SH RACE: WIN STOCK(S): CH,NO
MAJOR DRAINAGE: PS SUB DRAINAGE: NOOKSACK RIVER
CONTACT: BOB LELAND PHONE: (206)753-5700
AGENCY: WDW ADDRESS: 600 NORTH CAPITOL WAY, OLYMPIA, WA 98501
PROJECT: NOOKSACK WINTER STEELHEAD SMOLT RELEASES
PURPOSE: PROVIDE FOR FISHERY, ENHANCE WILD STOCKS ONGOING: Y
EVALUATION: QN : SPORT HARVEST 50% OF PREV. 4YRS.
SURVIVAL: 2-SALT=1.50%, 3-SALT=0.40%
STOCKING DETAILS: REARED TO SMOLTS TRANSPORTED TO SITES AND DUMPED
ACCLIMATION DETAILS: N/A
OTHER PRE STOCKING INFO: SCALE ANALYSES ON COMMERCIAL HARVEST AVAILABLE
IMPACTS; RESEARCH:
IMPACTS; OPINION: FISHERIES ARE DIRECTED AT HATCHERY STOCK TO REDUCE TAKE OF WILD FISH
CONTROL DETAILS: AD CLIPPED TO AID IN HARVEST MANAG.
OTHER COMMENTS: TRIBAL HATCHERIES RELEASE SOME WILD STOCK WINTER STEELHEAD SM

286. SPECIES: SH RACE: WIN STOCK(S): CH, SK
MAJOR DRAINAGE: PS SUB DRAINAGE: SKAGIT RIVER
CONTACT: JIM GIBSON PHONE: (206)466-3163
AGENCY: SKAG ADDRESS: SKAGIT SYS COOP, PO BOX 368, LA CONNER, WA 98257
PROJECT: SKAGIT RIVER
PURPOSE: ENHANCE FISHERY
ONGOING: Y
EVALUATION: QA : 50,000 PRE-SMOLTS RELEASED CONTRIBUTES 1,200 FISH TO FISHERY
SURVIVAL: 1200/50,000 = 2.40%
STOCKING DETAILS: DUMP-PLANTED INTO SKAGIT AT HAMILTON (6/LB)
ACCLIMATION DETAILS: N/A
OTHER PRE STOCKING INFO: N/A
IMPACTS; RESEARCH:
IMPACTS; RESEARCH:
IMPACTS; OPINION: HATCHERY AND WILD RUNS SEPARATED TEMPORALLY AND PHYSICALLY
CONTROL DETAILS: AD CLIPPED TO ALLOW SELECTIVE HARVEST OF HATCHERY STOCK
OTHER COMMENTS: CONCERED ABOUT ENHANCEMENT EFFECTS ON WILD STOCKS
WILD STOCKING PORTION OF PROGRAM, INEFFECTIVE, AND DROPPED

287. SPECIES: SH RACE: WIN STOCK(S): CH, SN
MAJOR DRAINAGE: PS SUB DRAINAGE: SNOHOMISH RIVER
CONTACT: BOB LELAND PHONE: (206)753-5700
AGENCY: WDW ADDRESS: 600 NORTH CAPITOL WAY, OLYMPIA, WA 98501
PROJECT: SNOHOMISH RIVER WINTER STEELHEAD SMOLT RELEASES
PURPOSE: PROVIDE FOR FISHERY, ENHANCE WILD STOCKS ONGOING: Y
EVALUATION: QA : ESCAPEMENT GOALS FOR WILD WINTER STEELHEAD HAVE BEEN MET/EXCEEDED
SURVIVAL:
STOCKING DETAILS: REARED TO SMOLTS (5.5/LB) AT HATCHERY & PONDS, TRUCKED & DUMP
ACCLIMATION DETAILS: PORTION OF SMOLTS REARED IN PONDS
OTHER PRE STOCKING INFO: SPAWNING SURVEY, HARVEST DATA AVAILABLE
IMPACTS; RESEARCH:
IMPACTS; RESEARCH:
IMPACTS; OPINION: HARVEST DIRECTED TOWARD HATCHERY FISH, MINIMAL IMPACTS DUE TO TIMING
CONTROL DETAILS: MOST SMOLTS AD CLIPPED TO ASSIST IN HARVEST MANAG.
OTHER COMMENTS: NUMBERS RELEASED & HARVEST COMBINED FOR ENTIRE SNOHOMISH SYS
SPORT HARVEST HAS AVG 11,000 WINTER STEELHEAD IN SYS FOR PAST 5YRS

288. SPECIES: SH RACE: WIN STOCK(S): CH, SN
MAJOR DRAINAGE: PS SUB DRAINAGE: SNOHOMISH RIVER
CONTACT: BOB LELAND PHONE: (206)753-5700
AGENCY: WDW ADDRESS: 600 NORTH CAPITOL WAY, OLYMPIA, WA 98501
PROJECT: SNOHOMISH RIVER WINTER STEELHEAD SMOLT RELEASES
PURPOSE: PROVIDE FOR FISHERY, ENHANCE WILD STOCKS ONGOING: Y
EVALUATION: QA : ESCAPEMENT GOALS FOR WILD WINTER STEELHEAD HAVE BEEN MET/EXCEEDED
SURVIVAL:
STOCKING DETAILS: REARED TO SMOLTS (5.5/LB) AT HATCHERY & PONDS, TRUCKED & DUMP
ACCLIMATION DETAILS: PORTION OF SMOLTS REARED IN PONDS
OTHER PRE STOCKING INFO: SPAWNING SURVEY, HARVEST DATA AVAILABLE
IMPACTS; RESEARCH:
IMPACTS; OPINION: HARVEST DIRECTED TOWARD HATCHERY FISH, MINIMAL IMPACTS DUE TO TIMING
CONTROL DETAILS: MOST SMOLTS AD CLIPPED TO ASSIST IN HARVEST MANAG.
OTHER COMMENTS: NUMBERS RELEASED & HARVEST COMBINED FOR ALL SUB-DRAIN. IN SYS

289. SPECIES: SH RACE: WIN STOCK(S): CH, SN
MAJOR DRAINAGE: PS SUB DRAINAGE: SNOHOMISH RIVER
CONTACT: BOB LELAND PHONE: (206)753-5700
AGENCY: WDW ADDRESS: 600 NORTH CAPITOL WAY, OLYMPIA, WA 98501
PROJECT: SNOHOMISH SYSTEM WINTER STEELHEAD SMOLT RELEASES
PURPOSE: PROVIDE FOR FISHERY, ENHANCE WILD STOCKS ONGOING: Y
EVALUATION: QA : ESCAPEMENT GOALS FOR WINTER STEELHEAD HAVE BEEN MET/EXCEEDED
SURVIVAL:
STOCKING DETAILS: REARED TO SMOLTS (5.5/LB) AT HATCHERY & PONDS, TRUCKED & DUMP
ACCLIMATION DETAILS: PORTION OF SMOLTS REARED IN PONDS
OTHER PRE STOCKING INFO: SPAWNING SURVEY, HARVEST DATA AVAILABLE
IMPACTS; RESEARCH:
IMPACTS; OPINION: HARVEST DIRECTED TOWARD HATCHERY FISH, MINIMAL IMPACTS DUE TO TIMING
CONTROL DETAILS: MOST SMOLTS AD CLIPPED TO ASSIST IN HARVEST MANAG.
OTHER COMMENTS: NUMBERS RELEASED & HARVEST COMBINED FOR SNOHOMISH SYS

290. SPECIES: SH RACE: WIN STOCK(S): CH, SO
MAJOR DRAINAGE: WC SUB DRAINAGE: CHEHALIS RIVER
CONTACT: BILL FREYMOND PHONE: (206)533-9335
AGENCY: WDW ADDRESS: REGION 6 905 E. HERON, ABERDEEN, WA 98520
PROJECT: SKOOKUMCHUCK WINTER STEELHEAD SMOLT RELEASES
PURPOSE: PROVIDE FOR FISHERY, ENHANCE WILD STOCKS, MITIGATION ONGOING: Y
EVALUATION: QN : GOOD INFO ON RETURN RATES, TOTAL HARVEST IS INCREASING
SURVIVAL: RETURN RATES 2-SALT=2.22%, 3-SALT=0.40%, COMBINED,1.43%
STOCKING DETAILS: VOLITIONALLY RELEASED AT < 10/LB
ACCLIMATION DETAILS: REARED IN PONDS, VOLITIONALLY RELEASED
OTHER PRE STOCKING INFO: SPAWING SURVEY DATA AVAILABLE
IMPACTS; RESEARCH:
IMPACTS; OPINION: POTENTIAL CONFLICT WITH WILD FISH GENETICS AND TIMING
CONTROL DETAILS: AD AND MAX. CLIPPING DONE TO DETER. HARVEST & RETURN RATES
OTHER COMMENTS: NO SPECIFIC DATA ON TRIBAL HARVEST ON SKOOKUMCHUCK FISH
RECENTLY, HAVE BEEN USING NATIVE BROOD STOCK

291. SPECIES: SH RACE: WIN STOCK(S): CH,VW
MAJOR DRAINAGE: WC SUB DRAINAGE: CHEHALIS RIVER
CONTACT: BILL FREYMOND PHONE: (206)533-9335
AGENCY: WDW ADDRESS: REGION 6 905 E. HERON, ABERDEEN, WA 98520
PROJECT: ABERDEEN ON-STATION WINT. STEELHEAD SMOLT RELEASES
PURPOSE: PROVIDE FOR FISHERY, ENHANCE WILD STOCKS ONGOING: Y
EVALUATION: QN : SPORT/TREATY HARVEST DATA FOR MAINSTREAM CHEHALIS
SURVIVAL: RETURN RATES 0.83%
STOCKING DETAILS: VOLITIONALLY RELEASED AS SMOLTS < 10/LB
ACCLIMATION DETAILS: REARED IN PONDS, VOLITIONALLY RELEASED AT SMOLT < 10/LB
OTHER PRE STOCKING INFO: N/A
IMPACTS; RESEARCH:
IMPACTS; OPINION: POTENTIAL IMPACTS WITH WILD FISH, MINIMAL, DUE TO TIMING DIFFERENCES
CONTROL DETAILS: SMOLTS AD & VENT. CLIPPED TO DETER. HARVEST RETURN INFO
OTHER COMMENTS: NATIVE BROODSTOCK HAS UNDETERMINED AMOUNT OF CHAMBERS CR STOCK

292. SPECIES: SH RACE: WIN STOCK(S): CH, WK
MAJOR DRAINAGE: WC SUB DRAINAGE: CHEHALIS RIVER
CONTACT: BILL FREYMOND PHONE: (206)533-9335
AGENCY: WDW ADDRESS: REGION 6 905 E. HERON, ABERDEEN, WA 98520
PROJECT: WISHKAH STEELHEAD SMOLT RELEASES
PURPOSE: PROVIDE FOR FISHERY, ENHANCE WILD STOCKS ONGOING: Y
EVALUATION: QN : RETURNS LOW FOR NUMBER OF SMOLTS RELEASED
SURVIVAL: RETURN RATES, 1.31%
STOCKING DETAILS: RELEASED AT < 10/LB UP TO RIVER MI 25.
ACCLIMATION DETAILS: SINCE 83- 5000 FROM HAT. TO HOLDING PONDS ALONG R.
OTHER PRE STOCKING INFO: SPAWNING SURVEY INFO COLLECTED.
IMPACTS; RESEARCH:
IMPACTS; RESEARCH:
IMPACTS; OPINION: IMPACT MINIMAL DUE TO TIMING DIFFERENCES ON SPAWNING GROUND
CONTROL DETAILS: ACCLIMATED FISH ARE AD-CLIP SEPARATELY TO DETER. RETURN RATES
OTHER COMMENTS: ACCLIMATION IS EXPECTED TO IMPROVE RETURN RATES TO WISHKAH.
NEED FOR IN-SEASON UPDATES ON SPORT AND TREATY FISHERIES FOR MANAG.

293. SPECIES: SH RACE: WIN STOCK(S): CH,WY
MAJOR DRAINAGE: WC SUB DRAINAGE: CHEHALIS RIVER
CONTACT: BILL FREYMOND PHONE: (206)533-9335
AGENCY: WDW ADDRESS: REGION 6 905 E. HERON, ABERDEEN, WA 98520
PROJECT: WYNOOCHEE WINTER STEELHEAD SMOLT RELEASES
PURPOSE: PROVIDE FOR FISHERY, ENHANCE WILD STOCKS, MITIGATION ONGOING: Y
EVALUATION: QN : SPORT/TREATY HARVEST DATA FOR WYNOOCHEE, WILD ESCAPEMENT FOR SYS.
SURVIVAL: RETURN RATE 0.97%
STOCKING DETAILS: SMOLTS < 10/LB, SCATTER-PLANTED FROM ABERDEEN AT BLACK CR
ACCLIMATION DETAILS: N/A
OTHER PRE STOCKING INFO: SPAWNING SURVEYS ARE COMPLETED
IMPACTS; RESEARCH:
IMPACTS; RESEARCH:
IMPACTS; OPINION: POTENTIAL CONFLICT WITH WILD FISH GENETICS AND TIMING, DUE TO HARVEST
CONTROL DETAILS: SOME ARE AD &/OR VENT. CLIPPED FOR HARVEST MANAG. PURPOSES
OTHER COMMENTS: NEED TO START SURVEYS EARLIER TO BETTER EST. HATCHERY CONTRIB.
MARCH 15 IS CUTOFF FOR HATCHERY/WILD REDDS ON SPAWNING GROUNDS.

294. SPECIES: SH RACE: WIN STOCK(S): CL
MAJOR DRAINAGE: CR SUB DRAINAGE: CLACKAMAS RIVER
CONTACT: GEORGE NANDOR PHONE: (503)630-7210
AGENCY: ODFW ADDRESS: 24500 S.ENTRANCE RD., ESTACADA, OR 97023
PROJECT: CLACKAMAS FISH HATCHERY
PURPOSE: MITIGATION ONGOING: Y
EVALUATION:
STOCKING DETAILS:
ACCLIMATION DETAILS:
OTHER PRE STOCKING INFO:
IMPACTS; RESEARCH:
IMPACTS; OPINION:
CONTROL DETAILS: Y
OTHER COMMENTS:

295. SPECIES: SH RACE: WIN STOCK(S): CO, CH
MAJOR DRAINAGE: CR SUB DRAINAGE: SKAMANIA RIVER
CONTACT: ULF RASSMUSSEN PHONE: (206)837-3131
AGENCY: WDW ADDRESS: SKAMANIA HATCHERY, MOP 39 L STEELHEAD RD., WASHOUGAL, WA 98671
PROJECT: SKAMNIA STEELHEAD HATCHERY
PURPOSE: ENHANCE FISHERY
ONGOING: Y
EVALUATION: NA : NO EVALUATION
SURVIVAL:
STOCKING DETAILS: SALT IN TRUCK
ACCLIMATION DETAILS: EXTENDED REARING IN MERWIN NET PENS ALSO KALAMA DIRTPOND
OTHER PRE STOCKING INFO: FAIRLY NEW BROODSTOCK
IMPACTS; RESEARCH:
IMPACTS; OPINION: SELECT FOR 3 OCEANS, SO THERE IS SUSPECT OF IHN SUSEPTABILITY
CONTROL DETAILS: N/A
OTHER COMMENTS:

296. SPECIES: SH RACE: WIN STOCK(S): EL
MAJOR DRAINAGE: PS SUB DRAINAGE: SKOKOMISH RIVER
CONTACT: CHRIS WELLER PHONE: (206)297-3422
AGENCY: PNPT ADDRESS: 7850 NE LITTLE BOSTON RD, KINGSTON, WA 98346
PROJECT: SKOKOMISH
PURPOSE: ENHANCE RUN AND FISHERY, HATCHERY EVALUATION ONGOING: N
EVALUATION: QA : COMPARISONS OF HATCH/WILD FISH COULDN'T BE MADE DUE TO BRAND LOSS
SURVIVAL:
STOCKING DETAILS: DUMP-PLANTED FROM TRUCK TO MAINSTEM, SO FORK, AND TRIBS
ACCLIMATION DETAILS: N/A
OTHER PRE STOCKING INFO:
IMPACTS; RESEARCH: UNKNOWN
IMPACTS; OPINION: NO EFFECT WAS NOTED ON RUN SIZE
CONTROL DETAILS: FREEZE-BRANDING FISH BUT BRANDS DISAPPEARED BEFORE SMOLTING
OTHER COMMENTS: PROGRAM DROPPED BY THE COUNCIL AFTER 7 YEARS

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297. SPECIES: SH RACE: WIN STOCK(S): GR,GS
MAJOR DRAINAGE: PS SUB DRAINAGE: GREEN RIVER
CONTACT: DENNIS MOORE PHONE: (206)939-3311
AGENCY: MUCK ADDRESS: TRIBAL ADMIN, 39015 172ND AVE SE, AUBURN, WA 98002
PROJECT: GREEN RIVER - KETA CR. HATCHERY
PURPOSE: PROVIDE FOR FISHERY, UTILIZE HABITAT ONGOING: Y
EVALUATION: NA : SPAWNING SURVEYS RUN FROM DAM TO KENT AREA: AERIAL SURVEY
SURVIVAL:
STOCKING DETAILS: LIVE SPAWN MALES
ACCLIMATION DETAILS: N/A
OTHER PRE STOCKING INFO: WILD RUN SPAWNS 6-8 WEEKS EARLIER THAN HATCHERY FISH.
IMPACTS; RESEARCH:
IMPACTS; OPINION: USING NATIVE STOCK SHOULD NOT ADVERSELY AFFECT WILD RUNS
CONTROL DETAILS: FREEZE BRAND ON 2 YEARS FISH TO ESTIMATE RETURN
OTHER COMMENTS: NO TRIBAL COMMERCIAL HARVEST TARGETED ON WILD RUN.
FISH REARED TO 250-600 PER POUND, AND RELEASED ABOVE DAM

298. SPECIES: SH RACE: WIN STOCK(S): GS, CH, GR
MAJOR DRAINAGE: PS SUB DRAINAGE: GREEN RIVER
CONTACT: DENNIS MOORE PHONE: (206)939-3311
AGENCY: MUCK ADDRESS: TRIBAL ADMIN, 39015 172ND AVE SE, AUBURN, WA 98002
PROJECT: KETA CR. HATCHERY ON-STATION STEELHEAD RELEASES
PURPOSE: PROVIDE FOR FISHERY ONGOING: Y
EVALUATION: QN : 98% OF HATCHERY FISH ARE HARVESTED IN SPORT/TRIBAL COMM. FISHERY
SURVIVAL: 0.06% RETURN, (HIGHEST .18%)
STOCKING DETAILS: REARED TO SMOLTS +/- 6 PER POUND, DUMP-RELEASED
ACCLIMATION DETAILS: N/A
OTHER PRE STOCKING INFO: AERIAL SPAWNING SURVEYS RUN ANNUALLY,& FOOT & BOAT SUR
IMPACTS; RESEARCH:
IMPACTS; OPINION: SHOULD BE INSIGNIFICANT DUE TO 6-8 WK TIMING DIFFERENCE
CONTROL DETAILS: % OF FISH ARE VENT. CLIPPED FOR MANAGEMENT PURPOSES
OTHER COMMENTS: NO TRIBAL HARVEST ON WILD STOCK

299. SPECIES: SH RACE: WIN STOCK(S): KR
MAJOR DRAINAGE: BC SUB DRAINAGE: KEOGH RIVER
CONTACT: PAT A. SLANEY PHONE: (604)228-1158
AGENCY: CFSO ADDRESS: INS AN RES ECO, 2204 MAIN MALL, UBC, VANCOUVER, BC V6T 1W5
PROJECT: NUTRIENT CONC. AS A LIMITATION TO SH SM PRODUCTION IN THE KEOGH R
PURPOSE: ENHANCE PRODUCTION ONGOING: Y
EVALUATION: QN : STREAM FERT. INCREASED SM PRODUCTION 25%
SURVIVAL:
STOCKING DETAILS: N/A
ACCLIMATION DETAILS: N/A
OTHER PRE STOCKING INFO: N/A
IMPACTS; RESEARCH: AGE 2 SM LENGTH INCREASED FROM MEAN 153 TO 165MM AFTER FERT
IMPACTS; OPINION:
CONTROL DETAILS: HEADWATERS WERE NOT ENRICHED FOR COMPARSION
OTHER COMMENTS: PRIOR TO ENRICHMENT, SMOLT YEILD MEAN 0.026/M2 TO 0.032/M2
SIG < RESIDENT TIME REQUIRED FOR SM MIGRATION PRODUCED LARGER SM

300. SPECIES: SH RACE: WIN STOCK(S): MA
MAJOR DRAINAGE: PS SUB DRAINAGE: SOOES RIVER
CONTACT: DAVID ZAJAC PHONE: (206)753-9460
AGENCY: FWS ADDRESS: FAO-OLYMPIA, 2625 PARKMONT LN, OLYMPIA, WA 98502
PROJECT: MAKAH NATIONAL FISH HATCHERY
PURPOSE: ENHANCE RUNS ONGOING:
EVALUATION: QN : FIN-CLIPPING PROGRAM; SPORT CATCH DATA
SURVIVAL:
STOCKING DETAILS: TRUCKED; 100% FIN-CLIPPED
ACCLIMATION DETAILS: NA
OTHER PRE STOCKING INFO: NA
IMPACTS; RESEARCH: EARLY RETURN OF RUN IS SUCCESSFUL; WILD EARLY RUN ABSORBED BY HATCHER
IMPACTS; OPINION:
CONTROL DETAILS: NA
OTHER COMMENTS:

301. SPECIES: SH RACE: WIN STOCK(S): MF
MAJOR DRAINAGE: CR SUB DRAINAGE: WILLAMETTE RIVER
CONTACT: DENNIS WISE PHONE: (503)378-6925
AGENCY: ODFW ADDRESS: 2487 LANCASTER DR., SALEM, OR 97305
PROJECT: STEP- MID-WILLAMETTE DISTRICT
PURPOSE: EDUCATION, ENHANCEMENT ONGOING: Y
EVALUATION: QN : SOME CARCASS COUNTS
SURVIVAL:
STOCKING DETAILS: DIRECT RELEASE FROM HATCHBOX
ACCLIMATION DETAILS: NA
OTHER PRE STOCKING INFO: NA
IMPACTS; RESEARCH: NA
IMPACTS; OPINION: SAW ADULT SPAWNERS BUT COULDN'T ATTRIBUTE THEM TO RELEASES
CONTROL DETAILS: NA
OTHER COMMENTS:

302. SPECIES: SH RACE: WIN STOCK(S): NSMAJOR DRAINAGE: CR SUB DRAINAGE: WILLAMETTE RIVER
CONTACT: DENNIS WISE PHONE: (503)378-6925
AGENCY: ODFW ADDRESS: 2487 LANCASTER DR., SALEM, OR 97305
PROJECT: STEP- MID-WILLAMETTE DISTRICT
PURPOSE: EDUCATION, ENHANCEMENT ONGOING: Y
EVALUATION: QN : SOME CARCASS COUNTS
SURVIVAL:
STOCKING DETAILS: DIRECT FROM HATCHBOX
ACCLIMATION DETAILS: NA
OTHER PRE STOCKING INFO: NA
IMPACTS; RESEARCH: NA
IMPACTS; OPINION: SAW ADULT SPAWNERS, BUT COULDN'T ATTRIBUTE THEM TO PROGRAM
CONTROL DETAILS: NA
OTHER COMMENTS: SOME SILT AND FREEZING PROBLEMS

303. SPECIES: SH RACE: WIN STOCK(S): NS
MAJOR DRAINAGE: OC SUB DRAINAGE: SANTIAM RIVER (NORTH)
CONTACT: RANDY WINTERS PHONE: (503)854-3522
AGENCY: ODFW ADDRESS: STAR RT., BOX 71, IDANHA, OR 97350
PROJECT: MARION FORKS HATCHERY
PURPOSE: MITIGATION ONGOING: Y
SURVIVAL:
STOCKING DETAILS:
ACCLIMATION DETAILS:
OTHER PRE STOCKING INFO:
IMPACTS; RESEARCH:
IMPACTS; OPINION:
CONTROL DETAILS:
OTHER COMMENTS:

304. SPECIES: SH RACE: WIN STOCK(S): PU,QN
MAJOR DRAINAGE: PS SUB DRAINAGE: PUYALLUP RIVER
CONTACT: RUSSELL LADLEY PHONE: (206)593-0254
AGENCY: PUT ADDRESS: 6824 PIONEER WAY WEST, PUYALLUP, WA 98371
PROJECT: PUYALLUP TRIBAL STEELHEAD
PURPOSE: ENHANCE RUN AND FISHERIES ONGOING: Y
EVALUATION: QA : POOR RUNS-BUT CAUSES UNDETERMINED
SURVIVAL:
STOCKING DETAILS: DUMP PLANTINGS: REARING PONDS TO TRUCK TO RELEASE SITES
ACCLIMATION DETAILS: N/A, WILL BE USING OXBOW LAKE FOR ACCLIMATION IN 1989
OTHER PRE STOCKING INFO: CARRYING CAP. NOT ESTABLISHED. SPAWNING SURV. UNRELIA.
IMPACTS; RESEARCH:
IMPACTS; OPINION: NO IMPACT TO NATURAL STOCKS DUE TO TIMING DIFFERENCES
CONTROL DETAILS: ALL STEELHEAD RELEASES HAVE BEEN VENTRAL CLIP SINCEC 1986
OTHER COMMENTS: STEELHEAD NOT RELEASED FOR PROPAGATION, JUST HARVEST
MUCKLESHOOT TRIBAL HATCHERY MAY LEAD TO DISPUTES OVER HARVEST ALLOCATION

.

305. SPECIES: SH RACE: WIN STOCK(S): QN,GV
MAJOR DRAINAGE: PS SUB DRAINAGE: KITSAP PENINSULA
CONTACT: PAUL DORN PHONE: (206)598-3311
AGENCY: SUQ ADDRESS: PO BOX 498, SUQUAMISH, WA 98392
PROJECT: SUQUAMISH ON STATION STEELHEAD SMOLT RELEASES
PURPOSE: DEVELOP SURPLUS FOR STOCKING ONGOING: Y
EVALUATION: QN : POOR RETURNS
SURVIVAL: < 0.1% TO RACK
STOCKING DETAILS: REAR TO SMOLTS, DUMP RELEASE AT HATCHERY OR TRUCK SHORT DIST
ACCLIMATION DETAILS: N/A
OTHER PRE STOCKING INFO: N/A
IMPACTS; RESEARCH:
IMPACTS; OPINION: MINIMAL IMPACT DUE TO TIMING DIFFERENCES
CONTROL DETAILS: N/A
OTHER COMMENTS:
UNDETERMINED AMOUNT OF STRAYING WHEN USING QUINAULT STOCK

306. SPECIES: SH RACE: WIN STOCK(S): WI
MAJOR DRAINAGE: PS SUB DRAINAGE: PUGET SOUND
CONTACT: TOM JOHNSON PHONE: (206)765-3979
AGENCY: WDW ADDRESS: 8594 HWY 101, PORT TOWNSEND, WA 98368
PROJECT: ANADROMOUS GAME FISH INVESTIGATIONS
PURPOSE: RESEARCH
ONGOING: N
EVALUATION: QN : PRE-EVALUATION/STOCKED FISH/TRAPPED SMOLTS AFTER 2 YEARS
SURVIVAL:
STOCKING DETAILS: AVERAGE OF 200 FRY/METER SQUARED STOCKED; SCATTER PLANT
ACCLIMATION DETAILS: NA
OTHER PRE STOCKING INFO: NA
IMPACTS; RESEARCH: INCREASE IN FRY DENSITIES, NO CHANGE IN PARR, STREAMS AT CAPACITY
IMPACTS; OPINION:
CONTROL DETAILS:
OTHER COMMENTS: RESULTS ABOVE WERE FOR SUMMER AND FALL SEASONS; EXACT STOCKING
DENSITIES ARE AVAILABLE FOR EACH CREEK

307. SPECIES: SO RACE: STOCK(S):
MAJOR DRAINAGE: AC SUB DRAINAGE: KACHEMAK BAY
CONTACT: NICK DUDIAK PHONE: (907)235-8191
AGENCY: ADFG ADDRESS: 3298 DOUGLAS ST., HOMER, AK 99603
PROJECT: CHINA POOT BAY SOCKEYE SALMON SPORT FISHERY
PURPOSE: ENHANCE FISHERY ONGOING: Y
EVALUATION: QN:
SURVIVAL:
STOCKING DETAILS: LAKE FERTILIZATION & FRY STOCKING IN LAKE W/ ADULT BARRIERS
ACCLIMATION DETAILS:
OTHER PRE STOCKING INFO:
IMPACTS; RESEARCH:
IMPACTS; OPINION:
CONTROL DETAILS:
OTHER COMMENTS: STARTED PROJECT WITH FINGERLING RELEASE
1980 STARTED WITH DIRECT FRY RELEASE

308. SPECIES: SO RACE: STOCK(S):
MAJOR DRAINAGE: AC SUB DRAINAGE: KENAI RIVER
CONTACT: DAVID LITCHFIELD PHONE: (907)262-9369
AGENCY: ADFG ADDRESS: 34828 KALIFORSKY BEACH RD, SUITE B, SOLDOTNA, AK 99669
PROJECT: HIDDEN LAKE SOCKEYE SALMON INVESTIGATIONS, 1983-84
PURPOSE: ENHANCE RUN ONGOING: Y
EVALUATION: ON:
SURVIVAL: FINGERLING TO SMOLT = 20%, SMOLT TO ADULT = 15%
STOCKING DETAILS: STOCKED FINGERLING FROM HATCHERY, ADULTS TAKEN AT LAKE
ACCLIMATION DETAILS:
OTHER PRE STOCKING INFO:
IMPACTS; RESEARCH:
IMPACTS; OPINION: INCREASE PRODUCTION AND ADULT RUN BY PLANTING FINGERLINGS
CONTROL DETAILS:
OTHER COMMENTS: LAKE LACKED ADEQUATE SPAWNING AREA

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TECHNICAL REPORT 90-2

DRAFT

Part 3 CONCEPTS FOR A MODEL TO EVALUATE SUPPLEMENTATION

OF NATURAL SALMON AND STEELHEAD STOCKS

WITH HATCHERY FISH

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¹ T.C. Bjornn is an employee of the U.S. Fish and Wildlife Service assigned to the Idaho Cooperative Fish and Wildlife Research Unit. The Unit is jointly supported by the U.S. Fish and Wildlife Service, University of Idaho, Idaho Department of Fish and Game, and Wildlife Management Institute.

Abstract.-Concepts and the basic components for a model that could be used to evaluate supplementation of native or naturally produced salmon and steelhead stocks with hatchery fish are discussed. The model should be similar in form and function to the life-history model being used for system planning, except that additional genetic groups of fish must be tracked through multiple generations. The number of genetic groups monitored should be held to less than 10, we suggest 6. Coefficients used for the system planning model will provide a basis for selecting coefficients for individual stocks. Managers should participate in determining the level of resolution desired from the model.

Supplementation of native stocks of salmon and steelhead with hatchery fish has occurred, and will occur more frequently in the Columbia River drainage with increased efforts to increase the size of the fish runs. The benefits and costs associated with supplementation are not easily assessed, in part because of our incomplete knowledge of the outcome of the many interactions that can occur between native and hatchery fish. There are numerous examples of large numbers of adult salmon and steelhead being produced from hatchery operations. In some cases, however, hatchery fish have been shown to be less fit in natural systems than the local native fish (Reisenbichler and McIntyre 1977; Chilcote et al. 1986), leading to offspring of native X hatchery crosses that may have reduced fitness (Kapuscinski and Lannan 1986) relative to native fish. The challenge is to maintain or improve the genetic quality of hatchery fish and determine the best ways to use natural and hatchery production to increase the abundance

of anadromous fish in the Columbia River basin.

There are a number of terms used to describe groups of salmon and steelhead. Listed below are our definitions of most of the terms and their use in this report:

Species: a taxonomic unit that may be further divided into subspecies, races, demes, or stocks. Examples, chinook salmon Oncorhynchus tschawytscha, and steelhead Oncorhynchus mykiss.

Subspecies, race, deme, and stock: terms that we use synonymously to identify groups of fish that are reproductively isolated in space or time and that may have developed a unique genome. We prefer the term stock. Examples, the Lemhi River stock of the spring-run of Columbia River chinook salmon, and the Grande Rhonde stock of group-A steelhead.

Population and run: terms used to describe a group of fish usually of the same species that are together in a specific time or place.

Examples, the spring-run of chinook salmon and the group-A run of steelhead as they migrate up the Columbia River, and a population of juveniles in a stream or in the ocean. Note that populations or runs may be made up of individuals from one or more stocks.

Native, indigenous, and endemic: terms often used synonymously to identify the groups of fish that naturally colonized stream or lake systems and were present when man began to alter the habitat and biota of the Columbia River drainage in the 19th and 20th centuries. Examples, the native Warm River stock(s) (Deschutes

produced (parents spawned naturally and fish grew up in streams or lakes and eventually the ocean) without regard to ancestry (native or alien or hatchery stock). The term wild is often used synonymously with native, and for that reason we will avoid use of the term wild, and use the term natural to describe naturally produced fish where that is the only distinction we wish to make, or where we are unsure of ancestry. Examples, the natural steelhead in the South Fork of the Clearwater River that may be offspring of: (1) adults from prior releases of hatchery smolts, (2) hatchery adults released to spawn naturally, or (3) crosses of hatchery and natural adults.

Hatchery: a term we will apply to fish that have spent any part of their life in a hatchery. On one end of the spectrum of hatchery fish is a fish that resulted from gametes taken from native parents, incubated in a hatchery only to the eyed-stage, and then placed back in its stream to complete its life cycle. The other extreme could be a hatchery program started with an alien stock where the fish were selected to perform best in the given hatchery environment or to meet other management goals, the fish are reared in the hatchery till the smolt stage, adults return to the hatchery, and the program has continued for many generations.

Examples, steelhead returning to the Lochsa River that originally were stocked in the stream as fry or as smolts would be hatchery adults, perhaps with different abilities to produce viable offspring, but still hatchery fish as we define them.

To supplement the native stocks of salmon and steelhead with hatchery fish is to add production to, or make up for a deficiency in production of native fish. In general, the goal is to produce more adult fish that will be available in fisheries in preferred areas. More adults can be produced by more fully using the capacity of freshwater production areas (reduce the deficiency), and by releasing smolts to exceed that capacity (add production to that naturally possible). Natural production in freshwater could be limited in various habitats and life stages; the number of fry produced may be limited by the amount and quality of spawning and incubation areas rather than by the number of spawners, the number of smolts produced could be limited by habitat used in summer by feeding juveniles or by habitat used in winter by juveniles seeking security. If production by the native fish is significantly below capacity because there are too few spawners or too few juveniles produced, then supplementation by stocking hatchery adults, eggs, fry, or sub-smolts should increase the number of smolts produced. Supplementation by stocking smolts could insure full use of the natural production capacity and could result in more adults produced than would be possible with full natural production because the number of hatchery smolts stocked is constrained by hatchery capacity and not that of a stream system.

Unfortunately, supplementation is not simply an additive process whereby the number of fish produced is equal to the normal native production plus

Unfortunately, supplementation is not simply an additive process whereby the number of fish produced is equal to the normal native production plus the hatchery fish stocked. For the species that spend months or years in freshwater before going to the ocean, hatchery juveniles (and naturally produced offspring of hatchery origin) will compete with and displace some native juveniles. The number of fish displaced will depend on the proportion of the capacity that is unused, abundance of native fish, number of hatchery fish stocked or produced from hatchery adults, the size and time of stocking, and fitness (relative measure of adaptation to a particular environment) of the hatchery fish.

If there is little or no difference in fitness and other important characteristics between the stock of fish to be supplemented and the hatchery stock, then displacement of the native fish may be of little consequence. If there are differences between the native and hatchery fish, however, then supplementation may lead to reduced production of native fish, an overall reduced fitness of naturally produced fish, and less production of adults than anticipated.

A modelling approach to assessing the long-term effects of supplementation on genetic makeup and productivity of salmon and steelhead stocks has utility because the field studies to evaluate supplementation will be difficult to conduct (replication and length of time). Concepts, factors, and variables that should be included in a multi-generation, multi-genetic group model that can be used to predict the outcome and evaluate various supplementation scenarios are presented below. A

discussion should be held with managers to decide which variables to include in a model and the degree of stock definition that is necessary.

Concepts for Consideration

Groups to Follow in Model

The number of groups of fish of various genetic ancestries can become large when there is mating overlap and interbreeding between hatchery and native fish and the offspring are followed for more than a few generations. For example, if we started in generation 0 with spawning by native adults (N_0) , and a release of hatchery fry at the time progeny from the N_0 spawners entered the stream, there would be two groups of spawners at the next generation $(N_1$ and $H_1)$, assuming the hatchery fish survived and returned as adults. With continued stocking of fry, and interbreeding between the various genetic groups, there would be four groups by the generation 2, 11 by the third, 67 by the fourth (Table 1), 2,271 by the fifth, and 2,577,585 by the sixth (Figure 1). The foregoing numbers were calculated with sex of the native or hatchery fish ignored in interbreeding. If sex and genetic ancestry must be considered in the matings, the number of groups at each generation would be nearly double those presented.

The foregoing numbers also assume that all fish resulting from a brood year mature and spawn in the same year, which is not true. For example, adult chinook salmon from a single brood year usually return in three subsequent years after spending 1, 2, or 3 years in the ocean (Table 2). Steelhead adults from a single brood year could return in as many as 7

Table 1. List of groups of adults available to spawn and their relative fitness in each generation with native (N) and hatchery (H) fish spawning in the first generation. Fitness of native fish = 1.0, first generation hatchery spawners = 0.5, and the gap in fitness between native and hatchery fish, or their crosses, is reduced by half with each generation of natural reproduction.

Generations	Generations								
Genetic groups	1	2	3	4					
Generation 1 N ₁ H ₁₁	1.00		/						
Generation 2 N ₂ H ₁₂ H ₂₁ N ₁ X H ₁₁		1.00 0.75 0.50 0.88							
Generation 3 N ₃ H ₁₃ H ₂₂ (N ₁ X H ₁₁)2 N ₂ X H ₁₂ N ₂ X H ₂₁ N ₂ X (N ₁ X H ₁₁) H ₁₂ X H ₂₁ H ₁₂ X (N ₁ X H ₁₁) H ₂₁ X (N ₁ X H ₁₁) H ₃₁			1.00 0.88 0.75 0.94 0.94 0.88 0.97 0.81 0.91 0.84 0.50						
Generation 4 N ₄ H ₁₄ H ₂₃ (N ₁ X H ₁₁)3 (N ₁ X H ₁₂)2 (N ₂ X H ₂₁)2 (N ₂ X (N ₁ X H ₁₁))2 (H ₁₂ X H ₂₁)2 (H ₁₂ X (N ₁ X H ₁₁))2 (H ₂₁ X (N ₁ X H ₁₁))2 (H ₂₁ X (N ₁ X H ₁₁))2 H ₃₂ N ₃ X H ₁₃ N ₃ X H ₂₂ N ₃ X (N ₁ X H ₁₁) N ₃ X (N ₂ X H ₁₂) N ₃ X (N ₂ X H ₂₁) N ₃ X (N ₂ X (N ₁ X H ₁₁)) N ₃ X (H ₁₂ X (N ₁ X H ₁₁)) N ₃ X (H ₁₂ X (N ₁ X H ₁₁))				1.00 0.94 0.88 0.97 0.97 0.94 0.98 0.91 0.95 0.92 0.75 0.97 0.94 0.98 0.98 0.97					

Table 1. continued

Generations	Generations							
Genetic groups 1	2 3	4						
N ₃ X (H ₂₁ X (N ₁ X H ₁₁)) N ₃ X H ₃₁ H ₁₃ X (N ₂ X H ₁₂) H ₁₃ X (N ₂ X H ₂₁) H ₁₃ X (N ₂ X H ₂₁) H ₁₃ X (N ₂ X (N ₁ X H ₁₁)) H ₁₃ X (H ₁₂ X H ₂₁) H ₁₃ X (H ₁₂ X (N ₁ X H ₁₁)) H ₁₃ X (H ₁₂ X (N ₁ X H ₁₁)) H ₁₃ X (H ₂₁ X (N ₁ X H ₁₁)) H ₁₃ X (H ₂₁ X (N ₁ X H ₁₁)) H ₁₃ X (H ₂₁ X (N ₁ X H ₁₁)) H ₂₂ X (N ₂ X H ₂₂) H ₂₂ X (N ₂ X H ₂₂) H ₂₂ X (N ₂ X (N ₁ X H ₁₁)) H ₂₂ X (H ₁₂ X (N ₁ X H ₁₁)) H ₂₂ X (H ₁₂ X (N ₁ X H ₁₁)) H ₂₂ X (H ₁₂ X (N ₁ X H ₁₁)) H ₂₂ X (H ₁₂ X (N ₁ X H ₁₁)) H ₂₂ X (H ₂₁ X (N ₁ X H ₁₁)) H ₂₂ X (H ₂₁ X (N ₁ X H ₁₁)) H ₂₂ X (H ₂₁ X (N ₁ X H ₁₁)) (N ₁ X H ₁₁) 2 X (N ₂ X (N ₁ X H ₁₁)) (N ₁ X H ₁₁) 2 X (N ₂ X (N ₁ X H ₁₁)) (N ₁ X H ₁₁) 2 X (H ₁₂ X (N ₁ X H ₁₁)) (N ₁ X H ₁₁) 2 X (H ₁₂ X (N ₁ X H ₁₁)) (N ₁ X H ₁₁) 2 X (H ₁₂ X (N ₁ X H ₁₁)) (N ₁ X H ₁₁) 2 X (H ₁₂ X (N ₁ X H ₁₁)) (N ₁ X H ₁₂) X (N ₂ X (N ₁ X H ₁₁)) (N ₁ X H ₁₂) X (H ₁₂ X (N ₁ X H ₁₁)) (N ₂ X H ₁₂) X (H ₁₂ X (N ₁ X H ₁₁)) (N ₂ X H ₁₂) X (H ₂₁ X (N ₁ X H ₁₁)) (N ₂ X H ₁₂) X (H ₂₁ X (N ₁ X H ₁₁)) (N ₂ X H ₂₁) X (H ₂₁ X (N ₁ X H ₁₁)) (N ₂ X H ₂₁) X (H ₂₁ X (N ₁ X H ₁₁)) (N ₂ X H ₂₁) X (H ₂₁ X (N ₁ X H ₁₁)) (N ₂ X H ₂₁) X (H ₂₁ X (N ₁ X H ₁₁)) (N ₂ X H ₂₁) X (H ₂₁ X (N ₁ X H ₁₁)) (N ₂ X H ₂₁) X (H ₂₁ X (N ₁ X H ₁₁)) (N ₂ X H ₂₁) X (H ₂₁ X (N ₁ X H ₁₁)) (N ₂ X (N ₁ X H ₁₁)) X (H ₂₁ X (N ₁ X H ₁₁)) (N ₂ X (N ₁ X H ₁₁)) X (H ₂₁ X (N ₁ X H ₁₁)) (N ₂ X (N ₁ X H ₁₁)) X (H ₂₁ X (N ₁ X H ₁₁)) (N ₂ X (N ₁ X H ₁₁)) X (H ₂₁ X (N ₁ X H ₁₁)) (N ₂ X (N ₁ X H ₁₁)) X (H ₂₁ X (N ₁ X H ₁₁)) (N ₂ X (N ₁ X H ₁₁)) X (H ₂₁ X (N ₁ X H ₁₁)) (N ₂ X (N ₁ X H ₁₁)) X (H ₂₁ X (N ₁ X H ₁₁)) (N ₂ X (N ₁ X H ₁₁)) X (H ₂₁ X (N ₁ X H ₁₁)) (N ₂ X (N ₁ X H ₁₁)) X (H ₂₁ X (N ₁ X H ₁₁)) (N ₂ X (N ₁ X H ₁₁)) X (H ₂₁ X (N ₁ X H ₁₁)) (N ₁ X (N ₁ X H ₁₁)) X (H ₂₁ X (N ₁ X H ₁₁)) (N ₁ X (N ₁ X H ₁₁)) X (H ₂₁ X (N ₁ X H ₁₁)) (N ₁ X (N ₁ X H ₁₁)) X		0.96 0.88 0.91 0.95 0.95 0.95 0.96 0.92 0.92 0.93 0.84 0.92 0.91 0.93 0.89 0.91 0.90 0.81 0.97 0.98 0.94 0.96 0.95 0.86 0.95 0.98 0.94 0.96 0.95 0.86 0.95 0.98 0.91 0.95 0.86 0.95 0.86 0.95 0.86 0.95 0.86 0.95 0.86 0.95 0.86 0.95 0.86 0.95 0.86 0.95 0.86 0.95 0.86 0.95 0.86 0.95 0.86 0.95 0.86 0.95 0.86 0.95						

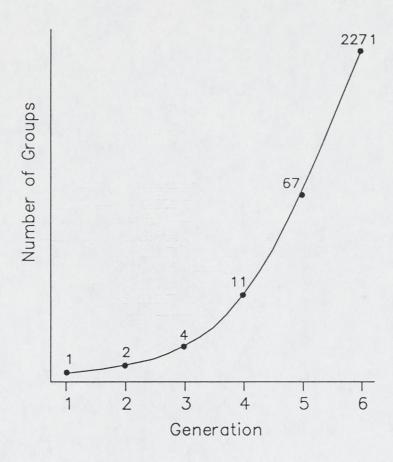


Figure 1. The number of genetic groups that could be present in each generation, starting with only native fish spawning in the first generation, hatchery adults spawning naturally at start of the second generation, and all potential crosses occurring in subsequent generations. Sex and age at spawning ignored.

subsequent years, because they spend 1-4 years in fresh water before becoming smolts, and up to 4 years in the ocean (Table 3). If we tried to keep track of the groups resulting from interbreeding, by sex of spawners, and by the age of the spawners, the number of groups would be larger still.

Table 2. Examples of the age groups of chinook salmon that would contribute to spawning runs from each brood year.

Brood Year	1985	Years 1986	of return a	nd age of a	<u>dults</u> 1989	1990
Fall and some	summer chinoo	k salmon,	age O smolt:	S		
1980 1981 1982 1983 1984 1985 1986 1987 1988	5 4 3 2	5 4 3 2	5 4 3 2	5 4 3 2	5 4 3 2	5 4 3 2
Spring and som	e summer chin	ook salmo	n, age 1 smo	lts		
1980 1981 1982 1983 1984 1985 1986 1987	6 5 4 3	6 5 4 3	6 5 4 3	6 5 4 3	6 5 4 3	6 5 4 3

In our opinion, it is not necessary to follow each and every group that could be identified through a number of generations in order to evaluate the outcomes of supplementation. Our present knowledge of the fitness of offspring of hatchery or native X hatchery crosses would not allow us to distinguish between anything but general groups. The primary issues of general overall fitness, changes in fitness over time, and the number of fish with reduced fitness can be monitored and evaluated if the offspring from given matings were placed into general groups based on initial fitness generation, and then followed as a groups over time.

Table 3. An example of the age groups of steelhead that could contribute to spawning runs from each brood year, and the number of years in which contributions would occur.

	1987	1988	1989	1990	1991	1992
_					*	
6	_					
6	7	0				
6		8	q			
5	6					
5	6	7				
-5	6		8	0		
	6	/	8	9		
4	5	6				
4	5	6	7			
	5	6		8		
		6	7	8	9	
2	1		6			
3	4	5	6	7		
		5	6	7	8	
			6	7	8	9
	3	4	5	6	7	
		4	5	6	7	8
			3	6	7	8
		3	4	5	6	
			4	5	6	7
				5	6	7 7
					0	,
			3	4	5	6
				4	5	6
					5	6 6 6
						6
				3	4	5
				3	4	5 5 5
						5
	6 6 6 5 5 5 5 3 3	6 7 5 6 5 6 5 6 6 4 5 4 5 5	6 7 8 5 6 5 6 7 5 6 7 6 7 4 5 6 4 5 6 5 6 5 6 3 4 5 5 5	6 7 8 9 5 6 7 8 5 6 7 8 6 7 8 4 5 6 7 5 6 7 7 6 7 7 7 3 4 5 6 5 6 6 6 5 6 6 6 3 4 5 6 4 5 5 6 5 5 5 5	6 7 8 9 5 6 7 8 9 5 6 7 8 9 4 5 6 7 8 4 5 6 7 8 5 6 7 8 3 4 5 6 7 5 6 7 7 6 7 7 8 3 4 5 6 7 3 4 5 6 6 5 6 7 6 7 3 4 5 6 6 5 6 6 7 6 7 3 4 5 6 6 6 3 4 5 5 6 6 5 6 7 6 7 6 7 6 7 6 7 6 7 6 6 7 6 7 6 6 6 6	6 7 8 9 5 6 7 8 9 4 5 6 7 8 9 4 5 6 7 8 9 3 4 5 6 7 8 9 3 4 5 6 7 8 9 3 4 5 6 7 8 9 3 4 5 6 7 8 9 3 4 5 6 7 8 9 3 4 5 6 7 8 9 3 4 5 6 7 8 9 9 3 4 5 6 7 8 9

generation 1.

When adults from the stocking of hatchery fry return to spawn they are placed in fitness groups based on their fitness and on the fitness of the fish they may mate with; sibling hatchery fish and native fish were the only options in generation 2 of the example. We assigned a fitness of 0.55 to the returning hatchery adults. If they mated with siblings, their

Table 4. Frequency distribution of genetic groups by fitness groupings in each generation from Table 1 with fitness of native fish = 1.0, first generation hatchery spawners = 0.5, and the gap in fitness between native and hatchery fish or their crosses reduced by half with each generation of natural reproduction, and where the gap is reduced by one-fourth.

Generations Groups	Fitness range	Gap reduced by half (Table 1)	
Generation 1 Group 1 Group 2 Group 3 Group 4 Group 5 Group 6	1.00 0.90-0.99 0.80-0.89 0.70-0.79 0.60-0.69 0.50-0.59	1 0 0 0 0	1 0 0 0 0 0
Generation 2 Group 1 Group 2 Group 3 Group 4 Group 5 Group 6	1.00 0.90-0.99 0.80-0.89 0.70-0.79 0.60-0.69 0.50-0.59	1 0 1 1 0 1	1 0 1 0 1 1
Generation 3 Group 1 Group 2 Group 3 Group 4 Group 5 Group 6	1.00 0.90-0.99 0.80-0.89 0.70-0.79 0.60-0.69 0.50-0.59	1 4 4 1 0	1 1 5 2 1
Generation 4 Group 1 Group 2 Group 3 Group 4 Group 5 Group 6	1.00 0.90-0.99 0.80-0.89 0.70-0.79 0.60-0.69 0.50-0.59	1 52 12 1 0	1 10 35 17 3 1

offspring would have a fitness of (0.55+0.55)/2 = 0.55. If they mated with native fish, their offspring would have a fitness of (1.0+0.55)/2 = 0.775.

The number of adults involved in each type of mating (native X hatchery, etc.) depends on the number of adults in each group and the amount of mating overlap (full overlap in our example). At the end of generation 1, there were 1214 adults produced, 821 (67.63%) native adults and 393 (32.37%) adults from the stocking of hatchery fry. The number of native X native matings equal (0.6763*0.6763)*1214 = 555 spawners placed at the top of the native fish column of the spreadsheet for generation 2. The number of hatchery X hatchery matings equal (0.3237*0.3237)*1214 = 127 spawners placed in the fitness group 0.55 column. The number of hatchery X native matings equals (0.3237*0.6763)*1214 = 532 spawners placed in the fitness group 0.75 column. Sex ratios for native and hatchery fish were similar.

Fitness values for each life stage of the fish represented in the model, must be set so that the product of the individual values is equal to the overall fitness (spawners to adult progeny) value for the group (0.55, 0.65, etc.). In the example, we selected values for each stage that represented our perception of where the largest fitness gap might exist.

In the spreadsheet example, we allowed fitness to increase by 10 units (from 0.55 to 0.65 for example) for each full generation of natural spawning and rearing. Fish that originated as hatchery fish became the same as native fish in terms of fitness when their combination of generations of natural reproduction and matings with fish of higher fitness resulted in fitness values of 1.

Table 5. An example of a spreadsheet model with life history stages and the necessary coefficients for each stage to estimate the numbers of fish produced by each fitness group in each generation.

Parameters: Proportion females	0.67	Symbols pf f		Gene B-H parame	ration 1 eters						
Eggs/female Egg-fry survival Parr capacity Parr prod rate Smolt capacity Smolt prod rate Smolt-rec survival Recr-spawn survival	6000 0.5 1000000 0.2 500000 0.1 0.112 0.33	f Ef Cp Po Cs So Sr Ra		1.0E-06 : 5 : 2.0E-06 : 10 :	=b1 =a2						
Life stages Variables	Symbol	Native	Stocked hatchery	0.95	0.85	Natural 0.75	fish fitne 0.65	ess groups 0.55	0.45	0.35	
Spawners-eggs deposited Number of spawners Fitness-spawners Eggs deposited	A Fs E	1000 1 4020000	0	1 0	0.98	0.97	0.96	0.95	0	0	
Eggs-fry emerged Fitness-eggs Fry emerged/stocked	Fe F	2010000	2010000	0.99	0.98	0.96	0.95	0.9	0.	0	
Fry-parr Fitness-fry Adjusted fry number Parr produced/stkd	Ff P	2010000 238802	0.7 1407000 167162	0.98	0.95	0.92	0.88	0.85	.0	0 0	
Parr-smolt Fitness-parr Adjusted parr number Smolts produced/stkd	Fp S	1 238802 22224	0.8 133729 12446	0.99	0.96	0.93	0.9	0.89	0	0	
Smolt-recruit Fitness-smolts Adjusted smolt number Recruits produced	Fs R	1 22224 2489	0.9 11201 1255	0.99	0.98	0.96	0.94	0.9	0	0	
Recruit-spawner Fitness-recruits Adjusted recruit no. Spawners produced	Fr	2489 821	0.95 1192 393	1 0 0	0.99	0.98	0.97 0 0	0.94	0	0	
Relative overall of Adult to adult Fry to adult Smolt to adult		0.82 0.0004 0.0370	0.4788 0.8550	ERR ERR ERR	ERR ERR ERR	ERR ERR ERR	ERR ERR ERR	ERR ERR ERR	ERR ERR ERR	ERR ERR ERR	
Total smolts p Total adults p		33,425 1215		nt native nt native	66 68						

Table 5. Continued.

6) 5

Parameters:		Combala	B-H param		ation 2						
Proportion females	0.67	pf	b-n param	eters							
Eggs/female	6000	f									
Egg-fry survival	0.5	Ef									
Parr capacity	1000000	Ср	1.0E-06	=a1							
Parr prod rate	0.2	Po		=b1							
Smolt capacity	500000	Cs	2.0E-06								
Smolt prod rate	0.1	So	10								
Smolt-rec survival	0.112	Sr	10	- 00							
Recr-spawn survival	0.33	Ra									
Reci spanii sai vivat	0.55	Na									
Life stages			Stocked			-Natural	fish fitn	ess groups	3		
Variables	Symbol	Native	hatchery	0.95	0.85	0.75	0.65	0.55	0.45	0.35	0.25
Spawners-eggs deposited											
Number of spawners	A	555		0	0	532	0	127	. 0	0	0
Fitness-spawners	Fs	1		1	0.98	0.97	0.96	0.95			
Eggs deposited	E	2232946	0	0	0	2074121	0	486307	0	0	0
Eggs-fry emerged											
Fitness-eggs	Fe	1		0.99	0.98	0.96	0.95	0.9			
Fry emerged/stocked	F	1116473	2010000	0	0	995578	0	218838	0	0	0
Fry-parr											
Fitness-fry	Ff	1	0.7	0.98	0.95	0.92	0.88	0.85			
Adjusted fry number		1116473	1407000	0	0	915932	0	186012	0 .	0	0
Parr produced/stkd	P	129440	163123	0	0	106190	0	21566	0	0	0
Parr-smolt											
Fitness-parr	Fp	1	0.8	0.99	0.96	0.93	0.9	0.89			
Adjusted parr number		129440	130498	0	0	98757	0	19193	0	0	0
Smolts produced/stkd	S	12034	12133	0	0	9182	0	1784	0	0	0
Smolt-recruit											
Fitness-smolts	Fs	1	0.9	0.99	0.98	0.96	0.93	0.9			
Adjusted smolt number		12034	10920	0	0	8814	0	1606	0	0	0
Recruits produced	R	1348	1223	0	0	987	0	180	0	0	0
Recruit-spawner			0.05		0.00	0.00	0.97	0.94			
Fitness-recruits	Fr	1	0.95	1	0.99	0.98	0.97	169	0	0	0
Adjusted recruit no.		1348	1162	0	0	967 319	0	56	0	0	0
Spawners produced	Α	445	383	U	U	319	U	70	· ·	· ·	0
Relative overall	fitness										
Adult to adult	t	0.80		ERR	ERR	0.75	ERR	0.55	ERR	ERR	ERR
Fry to adult		0.0004	0.4788	ERR	ERR	0.8049	ERR	0.6400	ERR	ERR	ERR
Smolt to adult	t	0.0370	0.8550	ERR	ERR	0.9408	ERR	0.8460	ERR	ERR	ERR
Total omalta	anadused	33374	Darcon	t native	36						
Total smolts p		1203		t native	37						
iotat additis p	Ji Judeed	1203	, ci celi	CHACTE	3,						

Table 5. Continued.

Parameters:		0	D 11		eration 3						
Proportion females Eggs/female Egg-fry survival	0.67 6000 0.5	symbols pf f Ef	B-H param	eters							
Parr capacity Parr prod rate	1000000	Cp Po	1.0E-06	=a1 =b1							
Smolt capacity Smolt prod rate	500000	Cs So	2.0E-06 10	=a2							
Smolt-rec survival Recr-spawn survival	0.112	Sr Ra	10	-52							
Life stages			Stocked			-Natural	fish fitn	ess groups			
Variables	Symbol	Native	hatchery	0.95	0.85	0.75	0.65	0.55	0.45	0.35	0.25
Spawners-eggs deposited Number of spawners	A	555		218	70	544	40	405			
Fitness-spawners	Fs	1		1	0.98	511 0.97	18 0.96	125 0.95	0	0	0
Eggs deposited	E	2232946	0	876154	150060	1994430	70382	478591	0	0	0
Eggs-fry emerged	r.			0.00	0.00						
Fitness-eggs Fry emerged/stocked	Fe F	1116473	2010000	0.99 433696	0.98 73529	0.96 957327	0.95 33432	0.9 215366	0	0	0
Fry-parr											
Fitness-fry	Ff	1	0.7	0.98	0.95	0.92	0.88	0.85			
Adjusted fry number Parr produced/stkd	Р	1116473 122534	1407000 154419	425022 46646	69853 7666	880740 96662	29420 3229	183061 20091	0	0	0
Parr-smolt											
Fitness-parr Adjusted parr number	Fp	122534	0.8 123535	0.99	0.96	0.93	0.9	0.89			
Smolts produced/stkd	S	11324	11417	46180 4268	7360 680	89895 8308	2906 269	17881 1653	0	0	0
Smolt-recruit											
Fitness-smolts Adjusted smolt number	Fs	11324	0.9 10275	0.99 4225	0.98	0.96	0.93	0.9			
Recruits produced	R	1268	1151	473	75	7976 893	250 28	1487 167	0	0	0
Recruit-spawner											
Fitness-recruits Adjusted recruit no.	Fr	1268	0.95	1	0.99	0.98	0.97	0.94			
Spawners produced	A	419	1093 361	473 156	74 24	875 289	27 9	157 52	0	0	0
Relative overall fi	itness										
Adult to adult		0.75	0 /700	0.95	0.85	0.75	0.65	0.55	ERR	ERR	ERR
Fry to adult Smolt to adult		0.0004	0.4788 0.8550	0.9605	0.8848	0.8049 0.9408	0.7145 0.9021	0.6400 0.8460	ERR ERR	ERR ERR	ERR ERR
Total smolts pr Total adults pr		36203 1309	Percent	native native	31 32						

Table 5. Continued.

					eration 4					
Parameters: Proportion females Eggs/female Egg-fry survival Parr capacity Parr prod rate Smolt capacity Smolt prod rate Smolt-rec survival Recr-spawn survival	0.67 6000 0.5 1000000 0.2 500000 0.1 0.112 0.33	Symbols pf f Ef Cp Po Cs So Sr Ra	1.0E-06 5 2.0E-06 10	=a1 =b1 =a2						
Life stages Variables	Symbol	Native	Stocked hatchery	0.95	0.85	-Natural 0.75	fish fitn 0.65	ess groups 0.55	0.45	0.35
Spawners-eggs deposited										
Number of spawners	A	653		197	85	446	18	108	0	0
Fitness-spawners	Fs	2626764	0	790028	0.98	0.97	0.96 70275	0.95 413849	0	0
Eggs deposited	-	2020104	0	190028	334020	1739070	10213	413047	0	0
Eggs-fry emerged Fitness-eggs Fry emerged/stocked	Fe F	1 1313382	2010000	0.99	0.98	0.96 835044	0.95	0.9 186232	0	0
Fry-parr Fitness-fry Adjusted fry number Parr produced/stkd	Ff P	1 1313382 142522	0.7 1407000 152681	0.98 383243 41588	0.95 155766 16903	0.92 768241 83366	0.88 29375 3188	0.85 158297 17178	0	0
Parr-smolt Fitness-parr	Fp	1	0.8	0.99	0.96	0.93	0.9	0.89		
Adjusted parr number		142522	122145	41172	16227	77530	2869	15288	0	0
Smolts produced/stkd	S	13153	11273	3800	1498	7155	265	1411	0	0
Smolt-recruit										
Fitness-smolts	Fs	1	0.9	0.99	0.98	0.96	0.93	0.9		
Adjusted smolt number		13153	10145	3762	1468	6869	246	1270	0	0
Recruits produced	R	1473	1136	421	164	769	28	142	0	0
Recruit-spawner										
Fitness-recruits	Fr	1	0.95	1	0.99	0.98	0.97	0.94		
Adjusted recruit no. Spawners produced	A	1473 486	1079 356	421 139	163 54	754 249	27	134	0	0
spawners produced	. ^	400	330	137	34				· ·	
Relative overall f		. 7/		0.05	0.05		0.45	0.55		
Adult to adult		0.74	0.4788	0.95	0.85	0.75	0.65	0.55	ERR ERR	ERR ERR
Fry to adult Smolt to adult		0.0370	0.8550	0.9900	0.9702	0.9408	0.9021	0.8460	ERR	ERR
Total smolts p Total adults p		36913 1337		t native t native	36 36					

Table 5. Continued.

				Gene	ration 5						
Parameters:		Symbols	B-H param	eters							
Proportion females	0.67	pf									
Eggs/female	6000	f									
Egg-fry survival	0.5	Ef									
Parr capacity	1000000	Ср	1.0E-06	=a1							
Parr prod rate	0.2	Po	5	=b1							
Smolt capacity	500000	Cs	2.0E-06	=a2							
Smolt prod rate	0.1	So	10	=b2							
Smolt-rec survival	0.112	Sr									
Recr-spawn survival	0.33	Ra									
Life stages			Stocked			-Natural	fish fitn	ess groups			
Variables	Symbol	Native	hatchery	0.95	0.85	0.75	0.65	0.55	0.45	0.35	0.25
Spawners-eggs deposited											
Number of spawners	A	641		186	73	451	16	105	0	0	0
Fitness-spawners	Fs	1		1	0.98	0.97	0.96	0.95			
Eggs deposited	E	2576365	0	747193	289301	1758214	60111	400228	0	0	0
Eggs-fry emerged											
Fitness-eggs	Fe	1		0.99	0.98	0.96	0.95	0.9			
Fry emerged/stocked	F	1288183	2010000	369861	141758	843943	28553	180103	0	0	0
Fry-parr											
Fitness-fry	Ff	1	0.7	0.98	0.95	0.92	0.88	0.85			
Adjusted fry number		1288183	1407000	362463	134670	776427	25126	153087	0	0	0
Parr produced/stkd	Р	140832	153822	39627	14723	84884	2747	16736	0	0	0
Parr-smolt											
Fitness-parr	Fp	1	0.8	0.99	0.96	0.93	0.9	0.89			
Adjusted parr number		140832	123057	39230	14134	78942	2472	14895	0	0	0
Smolts produced/stkd	S	13007	11366	3623	1305	7291	228	1376	0	0	0
Smolt-recruit											
Fitness-smolts	Fs	1	0.9	0.99	0.98	0.96	0.93	0.9			
Adjusted smolt number		13007	10229	3587	1279	6999	212	1238	0	0	0
Recruits produced	R	1457	1146	402	143	784	24	139	0	0	0
Recruit-spawner											
Fitness-recruits	Fr	1	0.95	1	0.99	0.98	0.97	0.94			
Adjusted recruit no.		1457	1088	402	142	768	23	130	0	0	0
Spawners produced	Α	481	359	133	47	254	8	43	0	0	0
Relative overall f	itness										
Adult to adult		0.75		0.95	0.85	0.75	0.65	0.55	ERR	ERR	ERR
Fry to adult		0.0004	0.4788	0.9605	0.8848	0.8049	0.7145	0.6400	ERR	ERR	ERR
Smolt to adult		0.0370	0.8550	0.9900	0.9702	0.9408	0.9021	0.8460	ERR	ERR	ERR
Total smolts p	roduced	36553	Percent	t native	36						
	produced	1323		t native	36						

Table 5. Continued.

				Gene	eration 6						
Parameters:			B-H param	eters							
Proportion females	0.67	pf									
Eggs/female	6000	f									
Egg-fry survival	0.5	Ef									
Parr capacity	1000000	Ср	1.0E-06								
Parr prod rate	0.2	Ро		=b1							
Smolt capacity	500000	Cs	2.0E-06								
Smolt prod rate	0.1	So	10	=b2							
Smolt-rec survival	0.112	Sr									
Recr-spawn survival	0.33	Ra									
Life stages			Stocked			-Natural	fish fitn	ess groups			
Variables	Symbol	Native	hatchery	0.95	0.85	0.75	0.65	0.55	0.45	0.35	0.25
											0125
Spawners-eggs deposited		/70									
Number of spawners	A	638		186	71	455	15	107	0	0	0
Fitness-spawners	Fs	1		1	0.98	0.97	0.96	0.95			
Eggs deposited	E	2563737	0	749352	279013	1774354	58065	407612	0	0	0
Eggs-fry emerged											
Fitness-eggs	Fe	1		0.99	0.98	0.96	0.95	0.9			
Fry emerged/stocked	F	1281869	2010000	370929	136716	851690	27581	183425	0	0	0
Fry-parr											
Fitness-fry	Ff	1	0.7	0.98	0.95	0.92	0.88	0.85			
Adjusted fry number		1281869	1407000	363510	129881	783555	24271	155911	0	0	0
Parr produced/stkd	Р	140156	153838	39745	14201	85672	2654	17047	0	0	0
Parr-smolt											
Fitness-parr	Fp	1	0.8	0.99	0.96	0.93	0.9	0.89			
Adjusted parr number	1,5	140156	123070	39348	13633	79675	2388	15172	0	0	0
Smolts produced/stkd	S	12945	11367	3634	1259	7359	221	1401	0	0	0
ometro produced, serva		12,43	11301	3034	1237	1337	221	1401	0	U	0
Smolt-recruit											
Fitness-smolts	Fs	1	0.9	0.99	0.98	0.96	0.93	0.9			
Adjusted smolt number		12945	10230	3598	1234	7065	205	1261	0	0	0
Recruits produced	R	1450	1146	403	138	791	23	141	0	0	0
Recruit-spawner											
Fitness-recruits	Fr	1	0.95	1	0.99	0.98	0.97	0.01			
Adjusted recruit no.	r.	1450	1089	403	137	775	22	0.94	•	•	•
Spawners produced	A	478	359	133	45	256	7	133 44	0	0	0
Spanner's produced	^	4/0	337	133	45	250	,	44	U	U	U
Relative overall f	itness										
Adult to adult		0.75		0.95	0.85	0.75	0.65	0.55	ERR	ERR	ERR
Fry to adult		0.0004	0.4788	0.9605	0.8848	0.8049	0.7145	0.6400	ERR	ERR	ERR
Smolt to adult		0.0370	0.8550	0.9900	0.9702	0.9408	0.9021	0.8460	ERR	ERR	ERR
T-1-1		7/570									
Total smolts p		36538		native	35						
Total adults p	roduced	1323	Percent	native	36						

Table 5. Continued.

				Gene	ration 7						
Parameters:		Symbols	B-H param	eters							
Proportion females	0.67	pf									
Eggs/female	6000	f									
Egg-fry survival	0.5	Ef									
Parr capacity	1000000	Ср	1.0E-06								
Parr prod rate	0.2	Po	-5 :	=b1							
Smolt capacity	500000	Cs	2.0E-06	=a2							
Smolt prod rate	0.1	So	10	=b2							
Smolt-rec survival	0.112	Sr									
Recr-spawn survival	0.33	Ra									
Life stages			Stocked			-Natural	fish fitn	ess groups			
Variables	Symbol	Native	hatchery	0.95	0.85	0.75	0.65	0.55	0.45	0.35	0.25
Spawners-eggs deposited											
Number of spawners	A	638		187	71	455	15	107	0	0	0
Fitness-spawners	Fs	1		1	0.98	0.97	0.96	0.95			
Eggs deposited	E	2564887	0	751445	280933	1773431	58712	407851	0	0	0
Eggs-fry emerged											
Fitness-eggs	Fe	1		0.99	0.98	0.96	0.95	0.9			
Fry emerged/stocked	F	1282444	2010000	371965	137657	851247	27888	183533	0	0	0
Fry-parr											
Fitness-fry	Ff	1	0.7	0.98	0.95	0.92	0.88	0.85			
Adjusted fry number		1282444	1407000	364526	130774	783147	24542	156003	0	0	0
Parr produced/stkd	Р	140182	153797	39846	14295	85604	2683	17052	0	0	0
Parr-smolt											
Fitness-parr	Fp	1	0.8	0.99	0.96	0.93	0.9	0.89			
Adjusted parr number		140182	123037	39447	13723	79612	2414	15177	0	0	0
Smolts produced/stkd	S	12947	11364	3643	1267	7353	223	1402	0	0	0
Smolt-recruit											
Fitness-smolts	Fs	1	0.9	0.99	0.98	0.96	0.93	0.9			
Adjusted smolt number Recruits prod		12947	10227	3607	1242	7059	207	1262	0	0	0

Fitness of Native and Hatchery Fish

Differences in fitness, the ability to live and develop under normal conditions, between native and hatchery fish can be large or small depending on the origin of the hatchery stock, number of generations of domestication, and the type and intensity of selection in the hatchery. For a given spawning and nursery area, the native stock would have the highest fitness, the result of generations of adaptation to environmental conditions in the natal area and the migration paths. In areas where the environment has been changed significantly, the fitness of native fish may be reduced, but would still be higher than non-native stocks that might be introduced, unless the environmental changes were so drastic that past adaptations were of no value or were even maladaptive.

Hatchery stocks developed from the stock to be supplemented would likely have the least difference in fitness, initially at least, from the native stock. Theoretically, the size of the gap in fitness between the native stock and the hatchery stock would depend on the type and severity of selection in the hatchery, the frequency of native stock additions to the hatchery stock that would improve the fitness of the hatchery stock, and the additions of hatchery fish to the native stock that may lower the fitness of the native stock. Hatchery stocks developed from nearby stocks with similar characteristics and environments would appear to be next in preference to use of the local stock for development of hatchery stocks used for supplementation because they would likely have less difference in fitness than distant stocks from different types of environments (Reisenbichler 1984).

To date, the difference in fitness between native or natural and hatchery stocks of salmon and steelhead has been only partially assessed in a few cases (Reisenbichler and McIntyre 1977; Chilcote et al. 1986). The results of these studies have raised the concern about supplementing native stocks of fish with hatchery stocks if the fitness of the hatchery fish is significantly less than the native stock. In the examples we provide, we have assigned the native stock a fitness of 1.0 and a lesser rate to the hatchery fish. The fitness of the progeny of native X hatchery matings depends primarily on the fitness of the parents.

Changes in Fitness over Time

If the fitness of hatchery fish used to supplement a native stock is less than the native fish, then one of the questions that arises is the rate at which the fitness of natural progeny of hatchery fish (or crosses) converges on the fitness of native fish. Theoretically, with each succeeding generation that progeny of hatchery fish reproduce naturally their fitness should increase through natural selection (Figure 2).

In the example provided in Table 1, we assumed that half the gap in fitness between native fish and hatchery or crosses with hatchery fish had been closed with each generation completed in the natural environment. Thus hatchery fry stocked in the example and returning to spawn as adults (group H_{11} in Table 1) had a fitness of 0.5 at the start of the first generation, a fitness of 0.75 (group H_{12}) at the start of the second generation if they were the progeny of a H_{11} X H_{11} mating, a fitness of 0.88 (group H_{13}) at the start of the third generation if they were the progeny of a H_{12} X H_{12} mating, and a fitness of 0.94 (group H_{14}) at the

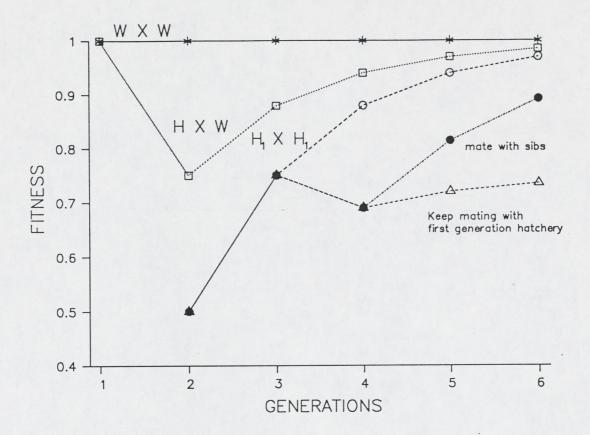


Figure 2. Examples of fitness values for fish with various genetic backgrounds and changes over time depending on parentage and rate of improvement in fitness with each succeeding generation of natural reproduction. In this example, the assumptions are as listed for groups in Table 1.

start of generation 4 if they were the progeny of a H_{13} X H_{13} mating. In a model to evaluate supplementation, a procedure to adjust the fitness coefficients (overall and for each life stage) must be included to account for changes due to cross breeding, repeated natural reproduction, and changes that may occur in the hatchery stock.

Operational Time Frame for Model

Models to evaluate supplementation could be set up to operate on yearto-year or generation-to-generation time frames. If it were important to track the contribution of each age group in every brood year, then the year by year approach would be necessary. If we can assume, for modeling purposes, a relatively constant age and sex ratio at maturity, a generation-to-generation model could be used. The model should probably be able to monitor all groups for 20 or more generations, to allow ample time to reach equilibrium levels for given conditions, and the opportunity to evaluate mid period changes in conditions.

Life-Stage Compartments of Model

A life-history type model appears to be the most logical approach to estimating the abundance of salmon and steelhead resulting from supplementation, because hatchery fish of more than one life stage will be added to streams. Relations can be developed for each of the life stages to allow estimation of fish numbers of each type (native, hatchery, and those from each fitness group) at each stage and to incorporate the effects of various conditions through stage-specific coefficients, including those for fitness. With life stage modeling, an assessment of the effects of supplementation can be made for any stage, including number of fish produced and overall fitness.

For the salmon and steelhead stocks of the Columbia River, the life cycle can be divided into many stages, but the stages listed below are probably the ones needed to evaluate supplementation:

 Adult to deposited egg: the stage that incorporates the number, sex ratio, fecundity, and fitness of the spawners, mating overlap between groups, and the limitation, if any, of available spawning supplementation is done with hatchery adults.

2. Deposited egg to emergent fry: the stage that includes the number and fitness of the eggs deposited and quality of the redd environment (survival rate) to estimate the number of fry of each group that would emerge from the redds. The initial generation for hatchery fish would start with this stage if supplementation was done with newly fertilized or eyed eggs.

stage for all naturally produced fish and the start when

3. Fry to fingerling pre-smolt: the number and fitness of emergentfry is related to the carrying capacity, density dependent, and
density independent mortality factors of the environment to
estimate the number of fish that reach the fingerling pre-smolt
(parr) stage. The pre-smolt stage is a user defined point in the
life cycle between emergent fry and smolt, that would correspond
with the time when pre-smolts might be stocked to supplement the
native stock. For spring chinook salmon that migrate to the sea
as yearlings in the spring, a pre-smolt stage might be the middle
or end of the first summer. For steelhead, it might be the end
of the first, second, or third summer, depending primarily on the
time pre-smolts are stocked and on the age of fish at smolting.
When supplementation is done with fry, this stage would be the
start of the initial generation for the hatchery fish.

each type of mating (native X native, hatchery X native, etc.), the amount of mating overlap, and of such factors as size and health of fish used for supplementation would be developed for each life stage (see example in Table 5 spreadsheet). Native fish might be assigned a fitness coefficient of 1.0, for example, and hatchery fish a lower value if less fit or a higher value if more fit for survival than the native fish. Relative fitness of the hatchery fish or progeny of hatchery X native matings may vary by life stage.

Incorporating survival relations for each of the life stages provides the flexibility to take into account the special conditions that might be present in spawning areas, streams used for rearing, river and reservoir migration routes, and fisheries for each stock. For example, survival to the smolt stage of spring chinook salmon rearing in headwater streams appears to be a density-dependent asymptotic relation, whereas the relation for fall chinook rearing in mainstem reservoirs could be a linear relation if density-independent predation was the major cause of mortality.

Probability of Mating

The probability of mating between native and hatchery fish depends on the number of native and hatchery adults, the sex ratio of both groups, and the degree of overlap in time and location of spawning. Other factors could affect the probability of mating, such as size of fish, general

health, and willingness to compete for mates, but we have assumed such factors will be similar for both native and hatchery fish.

If only native fish were present, then the probability of mating between two native fish would be 1.0 X 1.0 = 1.0. If equal numbers of native and hatchery fish were present, the age and sex ratios were equal for both groups, and there was full overlap in time and location of spawning the probability for each of the four possible matings would be 0.25 (example 2, Table 6). If all else stayed equal, but the numbers of each group changed, to say, three-fourths native females and one-fourth hatchery, the probabilities would change to 0.563 for the NF X NM cross, 0.188 for the NF X HM and HF X NM crosses, and 0.063 for the HF X HM cross (example 3, Table 6). As long as the sex ratios were similar for each of the groups being considered, the proportion of the population of males used in the calculations would be the same as for females. It would not matter if there were more or less males than females, as long as the ratio was the same for both groups.

If there were differences in the sex or age ratios between native and hatchery groups, the probabilities of mating would be affected as illustrated in example 4 in Table 6. In this example, native females continued to make up 75% of the females, but the sex ratio of the native fish was set at 0.667 females and 0.333 males, and that of hatchery fish at 0.5 females and 0.5 males. In the total population of males then, native fish made up 0.6 and hatchery fish 0.4. The proportion of N X H crosses increased relative to example 3, because there were more hatchery males available to spawn.

If the degree of overlap in time or location of spawning is less than complete, the probabilities of N X H crosses decreases because the fish are not all together when spawning occurs. In example 5 (Table 6), we setoverlap at 50%; only half of the native and hatchery fish were spawning at the same time or place. The matings between native females and native males includes those from the half of the population that did not spawn at the same time or place as the hatchery fish (probability 0.375) and those from fish that had the opportunity to mate with hatchery fish, but didn't because of chance (0.281).

Methods of Supplementation

The methods of supplementation will be dictated by each manager's perception of the best way to increase production, and by the factors regulating the availability of fish from hatcheries. Unless the native stock has been reduced to low levels of abundance, the best way to minimize the potential for genetic damage to the supplemented stock is to use the local stock as the source for the hatchery stock, add native/natural fish to the hatchery broodstock periodically, avoid hatchery practices that select for a segment of the population, and do not overwhelm the native stock with hatchery fish. Hatchery fish from a genetically sound supplementation program should have higher fitness values than those from hatchery stocks that are not so managed.

Hatchery fish at many life stages have been used to supplement or restore salmon and steelhead populations. Adults from hatcheries have been released in streams or spawning channels to spawn naturally, newly fertilized and eyed eggs have been placed in streams or incubation

Table 6. Probabilities of mating for native and hatchery fish with varying degrees of overlap in spawning time and location.

Exa	mple	<u>Proportion</u> Female		Over- Non- lap overlap	Prob- abilities
1.	NF X	or all hatch NM = 1.00 X HM = 1.00 X	1.00 X		1.000 1.000
2.	NF X NF X HF X	e and half ham NM = 0.50 X HM = 0.50 X NM = 0.50 X HM = 0.50 X	0.50 X 0.50 X 0.50 X	1.00	full overlap) 0.250 0.250 0.250 0.250
3.	NF X NF X HF X	/4 native and NM = 0.75 X HM = 0.75 X NM = 0.25 X HM = 0.25 X	0.75 X 0.25 X 0.75 X	1.00	full overlap) 0.563 0.188 0.188 0.063
4.	hatchery, NF X NF X HF X	.75 native and (full overlap NM = 0.75 X HM = 0.75 X NM = 0.25 X HM = 0.25 X	0.60 X 0.40 X 0.60 X	1.00 1.00 1.00 1.00 1.00	0.450 0.300 0.150 0.100
5.	NF X NF X HF X HF X	NM = 0.75 X NM = 0.75 X HM = 0.75 X	0.75 X 0.25 X 0.75 X	0.50 0.50	0.375 0.281 0.094 0.094 0.031
6.	Females and NF X NF X NF X HF X HF X		0.75 X 0.25 X 0.75 X 0.75 X 0.25 X	d 0.25 hatchery (10% 0.9 0.10 0.10	

channels, unfed fry and other pre-smolt juveniles have been released in streams to continue rearing, and smolts have been released to migrate seaward and then return to spawn in the stream of release. The model must accommodate the addition of hatchery fish at all of these life stages, which is a reason for the recommended life-stage compartments.

The size and health of hatchery fish relative to the natural fish, season and location of supplementation, and the effect of other species on the hatchery fish can be accounted for in the fitness coefficient. If the hatchery fish are more vulnerable to predation or angling, or less able to secure favorable living space than their native counterparts, the reduced survival could be expressed in a lower fitness coefficient.

Supplementation and the Carrying Capacity of Streams

For all forms of supplementation where the hatchery fish are expected to spend a significant period of time in the natural environment before spawning or becoming a smolt, the concept of a carrying capacity for fish must be considered. There may be a limited number of spawning sites in a stream or lake shore. Most streams and perhaps some large rivers or reservoirs have an upper limit on the number (or biomass) of fish that can be supported during the summer. The winter carrying capacity of streams may be different than that in summer because of the factors involved.

Carrying capacities become important for species like chinook and coho salmon and steelhead that spend a significant period of time in streams before migrating to the ocean. During the freshwater phase density-dependent forms of mortality limit the number of smolts that can be

produced in a given natural environment. If a habitat is fully seeded by native fish and hatchery fish are added, there will be a reduction in the number of native smolts produced to compensate for the number of hatchery fish that compete successfully and become smolts. A more critical concern is the case where there is a relatively small number of native fish, a large number of hatchery fish are added, and the native fish become further depressed because of the added competition they must endure.

In a supplementation model the number of native, hatchery, and other genetic types of smolts produced is a function of the initial numbers of each type of fish, their relative fitness, and the carrying capacity of the environment. Non-native fish can be equated to native fish by multiplying their abundance by their fitness coefficients. This adjusted initial number of non-native fish would then be added to the number of native fish to obtain the effective initial number of fish at the beginning of a life stage. The number of native and non-native fish produced at the end of the life stage would then be the total number produced multiplied by the proportion of each type at the beginning.

Effects of Supplementation on Other Species

x, 9, . ,

Hatchery fish released in a stream to supplement one species may affect Hother species. To assess the effect of supplementation on non-target species the model must be able to track each of the species of interest through each life stage and generation, and there must be a way to express the results of the interactions that occur between the species. The severity of the interaction effect would depend on the degree of niche overlap between two or more species, what factors limit production, and the

abundance of the fish relative to the carrying capacity. A coefficient could be attached to each of the relations for each life stage to modify the survival rate according to the effect of interspecific interactions. Deterministic versus Stochastic Models

A deterministic model would be used to evaluate the effects of supplementation without the confounding effects of environmental variability. A stochastic model would be useful to determine if environmental variability would affect the outcome of supplementation, or to determine the likelihood of extermination of stocks with marginal levels of abundance.

General Model Structure

A model (as described above) to evaluate supplementation of salmon and steelhead stocks could be designed and constructed on a computer spreadsheet (as the preliminary example in Table 5), or it could be a model constructed with program code in the manner of the system planning model. In either case, the basic components (life stages) of the model would be similar to those of the system planning model, but the model would differ in the need to keep track of selected genetic groups over time. At present, the system planning model used by the NPPC keeps track of hatchery and native fish throughout their life cycle, but only for the first generation. A spreadsheet model used by Byrne and Bjornn (1988) to evaluate supplementation for a steelhead population was constructed to keep track of hatchery and native fish for many generations, but all fish with a hatchery origin were combined in a single group regardless of the length of time since coming from the hatchery.

The ultimate model to evaluate supplementation would be able to track each genetic group generated by matings between native, hatchery, and hatchery X native parents; with age and sex of spawners considered. With such a model, we would have more than 5,000 groups to monitor by the sixth generation, and more than 5 million by the seventh generation. We might be able to program present-day computers to monitor that many groups, but we would likely have trouble providing coefficients that would be sufficiently discriminating for each of the groups. From a practical viewpoint, it is probably not necessary to monitor a large number of genetic groups to adequately assess the success of a supplementation program.

Outputs of the model must include the number of fish of each genetic group at the end of each life stage for each generation.

Coefficients for Variables

The coefficients provided with the documentation for the NPPC's system planning model (Monitoring and Evaluation Group 1989) are a good starting point in providing values needed for a supplementation model. Additional information has been developed for many of the subbasins in the Columbia River drainage as part of the system planning process. It will probably be necessary to develop stock specific coefficients, which may or may not be readily available, for use in a supplementation model. The coefficients developed for the system planning process will at least be helpful in selecting coefficients that are reasonable and similar to those found or used for other stocks of fish.

In addition to survival rates for each life stage, fitness values for each of the genetic groups must be assigned as a modifier of the survival rates. Unfortunately there are few measures of relative fitness for the various stocks of native and hatchery salmon and steelhead. In most cases, the progeny of hatchery or hatchery X native parents would likely have a fitness coefficient equal to or less than 1.0 if native fish were assigned a value of 1.0. Theoretically, the fitness values for the introduced fish could range from 0.0 to larger than 1.0. There have been cases where introduced fish did not survive and reproduce. Conceivably, excellent hatchery smolts could have a higher fitness coefficient than native fish for the first generation, if for example, the larger size they attained in the hatchery allowed them to survive at a higher rate than native smolts. Such benefits would not continue into succeeding generations when their offspring would be limited in the same ways as other naturally produced fish. We have not discussed heterosis or the breakdown of coadapted genetic systems that might affect fitness in complex ways, because we do not know how they might operate or how to include them in the model at this stage.

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