

**14. COLUMBIA RIVER SELECT AREA FISHERIES EVALUATION
(S.A.F.E.) PROJECT HISTORY AND WILLAPA BAY S.A.F.E.
PROJECT – BRIEFING:**

TABLE OF CONTENTS

	Page
Decision Page (Green Sheet) – Columbia River SAFE	1
Decision Page (Green Sheet) – Willapa Bay SAFE	5
Willapa Bay SAFE Project Memo	8

“GREEN SHEET”

Meeting dates: August 8-9, 2008 Meeting (briefing) **#14**

Agenda item #: Columbia River SAFE Program - briefing

Staff Contact: Pat Frazier, Region 5 Fish Program Manager (Fish Program)

Presenter(s): Pat Frazier, Region 5 Fish Program Manager (Fish Program)

Background:

The origin of the Select Area Fisheries Evaluation (SAFE) Project can be traced back to a Mitchell Act funded study that was initiated in 1970 and focused on coho production into Youngs Bay, located near Astoria Oregon, under the guidance of Clatsop Economic Development Committee (CEDC) staff. The initial funds were used to build a small hatchery facility on the South Fork Klaskanine River, a tributary to Youngs Bay, which CEDC began operating in 1977. Incorporation of the net pen rearing concept was initiated in Youngs Bay in 1987, which greatly expanded the production capabilities of the project.

Beginning in 1993, Bonneville Power Administration (BPA) assumed funding of this project, and this has remained the case to date. The goal of this BPA-funded project is to determine the feasibility of creating and expanding known stock commercial and sport fisheries in the Columbia River Basin to allow harvest of strong anadromous salmonid stocks while providing protection for depressed stocks. The project is an extension of the existing hatchery system that utilizes existing hatchery facilities to spawn, hatch, and conduct initial rearing for subsequent out-planting to net-pen facilities. In some cases hatchery facilities produce full-term smolts to maintain broodstock programs.

The project includes three distinct stages: 1) initial research phase to investigate potential sites, salmon stocks, and methodologies; 2) a second phase of expansion in Youngs Bay and other areas exhibiting the greatest potential for success; and 3) a final phase of establishment of all terminal fisheries at full capacity at all acceptable sites. To date no site has reached full capacity and several potential sites have not been thoroughly evaluated. While funding is the primary factor limiting progression to the final phase, the project is also somewhat constrained by stock and facility availability.

Upon its initiation in 1993, the BPA-funded SAFE project reviewed a large number sites in the lower Columbia River and identified eight possible sites for inclusion into the program. The sites were surveyed and classified based on rearing potential, access, capacity for fishers, and potential impacts to stocks listed under the Endangered Species Act (ESA). Test fishing operations were initiated and bio-monitoring occurred at five sites in Oregon and three sites in Washington to establish baseline conditions and differences between sites. All eight sites were deemed as adequate locations for inclusion in this project; however, due to funding limitations only two sites in Washington (Deep River and Steamboat Slough) and three sites in Oregon (Youngs Bay, Tongue Point and Blind Slough) were included for further expansion.

The Youngs Bay site has been the most successful to date, due in large part to the fact that it is the largest body of water included in the program. The size of Youngs Bay allows for both increased rearing potential and participation levels in fisheries. Current production goals for Youngs Bay include 450,000 spring Chinook, 1,250,000 coho and 1,500,000 bright fall Chinook. Actual releases during 2005-2007 averaged 422,500 spring Chinook, 1,143,000 coho and 1,100,000 bright fall Chinook.

Tongue Point has been less successful due to poor survival rates, increased stray rates and higher impacts on listed species. The Tongue Point site is a side channel to the Columbia River and therefore acts as a migration route for listed species. Current production goals for Tongue Point include 100,000 spring Chinook and 200,000 coho. Actual releases during 2005-2007 averaged 80,000 spring Chinook and 191,000 coho.

Blind Slough has shown some success, but has been limited due to poor survival rates of some species and its smaller size. Current production goals for Blind Slough include 450,000 spring Chinook and 300,000 coho. Actual releases during 2005-2007 averaged 385,000 spring Chinook and 307,000 coho.

Deep River is Washington's only successful location to date. The Deep River site is somewhat limited due to size. The spring Chinook program has struggled with poor survival rates due to a later than normal release timing (May) required to protect listed juvenile chum salmon. Recently the net pens have been towed to the Columbia River to allow for a more normal March release time, which is expected to significantly increase survival rates. Adults from the March releases are just now beginning to return. Current production goals for Deep River include 250,000 spring Chinook and 350,000 coho. Actual releases during 2005-2007 averaged 285,000 spring Chinook and 255,000 coho.

The Steamboat Slough location was operated for several years with only limited success. Stray rates at this location were very high with the majority of the adults returning to Elochoman Hatchery. Additionally, Steamboat Slough is a side channel of the Columbia River, which results in higher impact rates to listed species using this slough as an upstream migration corridor. Coho survival rates at this site were very good; however, due primarily to the high stray rates this site was deemed unacceptable and is no longer included in the SAFE Program.

The primary purpose of Select Area sites is to fuel commercial and sport fisheries in these terminal areas; however, production does contribute to Columbia River and Ocean fisheries also. Coded-Wire tag (CWT) recovery data for spring Chinook indicate that on average 73% of the run is caught in SAFE commercial fisheries, 7% are caught in Columbia River commercial fisheries, 7% are caught in Ocean commercial fisheries, 4% are caught in sport fisheries and 9% return to freshwater escapement areas. Coded-Wire tag (CWT) recovery data for coho indicate that on average 67% of the run is caught in SAFE commercial fisheries, 21% are caught in Columbia River fisheries, 10% are caught in Ocean fisheries and 2% return to freshwater escapement areas.

Historically spring Chinook have provided the largest economic benefit to commercial fisheries due to their high value; however, in recent years the ESA listing of coho has resulted in less mainstem commercial fishing opportunity and that has increased the value of coho. Preliminary landings for all Select Areas combined during 2005-2007 ranged from a low of 2,535 to a high of 7,257 for spring Chinook and from a low of 10,413 to high of 64,326 for coho. Prices paid to the fishers (ex-vessel price) for spring Chinook ranged between \$2.91-\$5.14 and produced total ex-vessel values of \$109,220-502,252 and for coho ranged between \$1.01-\$1.54 and produced total ex-vessel values of \$131,223-\$704,668.

Spring Chinook landings during 2005-2007 averaged 4,033 for Youngs Bay, 1,454 for Blind Slough and 35 for Deep River and resulted in an ex-vessel value of \$255,000 for Youngs Bay, \$82,000 for Blind Slough and \$2,000 for Deep River. Coho landings during 2005-2007 averaged 21,175 for Youngs Bay, 2,534 for Blind Slough, 11,040 for Tongue Point and 2,534 for Deep River and resulted in an ex-vessel value of \$250,000 for Youngs Bay, \$31,000 for Blind Slough, \$131,000 for Tongue Point and \$31,000 for Deep River.

In November 2006 a private economic analysis firm (The Research Group) was contracted to complete a full economic evaluation of the current SAFE program. Estimates of the Regional

Economic Impact (REI) resulting from the SAFE program were produced as part of this evaluation. The REI accounts for additional monetary input to communities resulting from trip expenditures by recreational anglers and income associated with processing commercially harvested fish. The total estimated REI from all ocean and freshwater fisheries harvesting salmon produced by the SAFE project is estimated to total \$3,400,000 with 51% resulting from commercial fisheries and 49% resulting from recreational fisheries.

For the 2008 contract year BPA provided a total of \$1.8 million to operate this program. WDFW received \$543,568, of which 89% (\$483,776) of the funds paid for fish production related facilities and tasks while the remaining 11% (\$59,792) paid for fishery sampling and population monitoring duties. In addition to funding net pen sites in Deep River, Youngs Bay, Tongue Point and Blind Slough; the projects also fully funds Grays River Hatchery in Washington, fully funds Gnat Creek Hatchery in Oregon and partially funds Klaskanine Hatchery in Oregon.

As discussed previously in this document not all sites have been thoroughly evaluated; therefore, opportunities to expand the spring Chinook program may still exist. The vast majority of the potential locations identified in the initial phase of this project are located in sloughs or mouths of major Columbia River tributaries and would not be acceptable sites for spring Chinook because fisheries harvesting adults returning from net pen releases would occur in locations where SAFE fish commingle with listed spring Chinook. The most likely new location for expansion is Coal Creek Slough, which enters the Columbia River about 10 miles downstream of Longview at river mile 56. Coal Creek Slough was projected to have a medium likelihood of success and was given numerical rating of 14 (total possible score of 30).

As was previously discussed, SAFE sites are primarily short-term rearing and acclimation sites that are dependant on other facilities to conduct the majority of the fish rearing activities. Lower Columbia River hatcheries that can support spring Chinook production are limited to a maximum of three facilities due to lack of adequate water quality or space. The rearing capacity for each individual facility is 105,000-130,000, depending on the facility and annual costs would be about \$30,000 per facility for two of the facilities and about \$100,000 at the remaining facility. Facility availability may be impacted by other rearing priorities or contractual agreements with a private entity.

Establishing a new site requires one-time costs of diving pilings to hold pens in place plus purchasing additional net pen structures and nets. Annual operating costs would primarily consist of staff to rear the fish and fish food. Expansion of an existing site would be more economical because additional staffing would not be necessary to accommodate the increased production. The two most likely opportunities for expansion in the lower Columbia River are establishing a new site in Coal Creek Slough or expanding the existing site at Deep River, and both sites could likely support the total production capability of \$350,000-400,000 spring Chinook. Additional testing would be required to ensure that Coal Creek Slough would have adequate water quality for rearing purposes and to determine if listed spring Chinook use Coal Creek Slough during their upstream migration.

Acclimation of 105,000-130,000 spring Chinook would require a single 4-pen structure at a current cost of \$25,000. An array of four pilings will be necessary to secure the 4-pen structure and the current cost of purchasing and installing these pilings is \$10,000. Annual fish food costs would total about \$14,000 per 105,000-130,000 fish, regardless of which site was selected. Additional staffing costs for Coal Creek Slough would total about \$35,000 per year, regardless of number of fish reared, while no additional staffing costs would be required at Deep River.

Policy issue(s) you are bringing to the Commission for consideration:

N/A

Public involvement process used and what you learned:

- Initiation of project was closely coordinated with commercial fishing representatives to determine appropriate net pen sites, species of salmon used, and number of salmon produced. WDFW also coordinated with the sportfishing public to develop sportfishing seasons in Select Area sites.
- WDFW also held joint agency (WDFW and ODFW) public meetings twice a year to review past seasons activities, expectations for upcoming seasons, and receive input regarding improvements to ongoing program
- Worked with landowner to develop a good working relationship that allows for the use of property to site net pens
- WDFW engages with public representatives on an ad-hoc basis to discuss the SAFE project and related issues

Action requested:

None. Briefing Only.

Draft motion language:

N/A

Justification for Commission action:

N/A

Form revised 10/25/07

“GREEN SHEET”

Meeting dates:	August 8-9, 2008 Meeting (briefing)	#14
Agenda item #:	Willapa Bay SAFE Project – briefing	
Staff Contact:	Kirt Hughes, Region 6 Fish Program Manager (Fish Program)	
Presenter(s):	Kirt Hughes, Region 6 Fish Program Manager (Fish Program)	

Background:

In June 2008, WDFW staff received an official request from the Washington Fish and Wildlife Commission, to investigate the benefits, risk, logistics and costs associated with the development of a hatchery spring Chinook (SAFE type project) program to provide additional fishery opportunity in Willapa Bay. Staff has discussed the merits of this type of program and outlined the details associated with developing such a program in the Willapa Bay watershed. The following is a brief synopsis of those discussions.

Meaningful Fishery

The first item to consider is whether a meaningful fishery would be created. From a commercial perspective the threshold for a meaningful fishery was measured in terms of ex-vessel value a range of program sizes were determined by back-calculating price/pound, average weight of returning adults, contribution to fisheries and smolt release to adult survival rates. Assumptions utilized in these calculations are an average 15 pounds per fish, \$7.50 per pound with 72.9% of the adult return contributing to the local commercial fishery. An average of 0.88% smolt to adult return rate was used to estimate the number of fish available to the fishery. The contribution to fisheries and return rate are averages for similar programs in the lower Columbia River. A pilot or proof-of-concept program with a 50K yearling smolt release would provide a projected return of 440 adults and approximately \$36,000 ex-vessel value annually after the third release year; a full production level release of 300K – similar to Deep River net-pens – would yield 2,640 adults with a projected ex-vessel value \$217,000. Defining a meaningful fishery in recreational terms is a bit more abstract although availability of returning adults in abundance that support commercial harvest generally provides for recreational opportunity at some level.

Facility Location

Any of the three existing Willapa hatchery facilities (Forks Creek, Nemah and Naselle) could rear spring Chinook, however that production should not displace current production. However, because of the additional water needs and pond space required for rearing spring Chinook, current programs would be impacted if this new production was anticipated to occur at existing facilities. With that in mind, a net-pen facility offers the greatest possibility of success. Net-pen production would be developed in a similar fashion to the Columbia River Select Area Fishery Evaluation Projects (SAFE projects) at Deep River, Youngs Bay and other locations in the lower Columbia River. Additionally a net-pen facility would concentrate returning adults in the vicinity of the pens thereby maximizing the contribution to harvest. Net-pen site location requires certain physical conditions such as water depth, high levels of tidal exchange or freshwater flow, and a host of parameters associated with permitting a site. Within Willapa Bay the best locations appear to be near Toke Point or in the lower Willapa River between towns of South Bend and Raymond; other sites continue to be explored.

Broodstock Source

There are no natural spring Chinook stocks in Willapa Bay, therefore a hatchery brood stock would require an out-of-basin source. As with any hatchery program there are disease considerations that must be taken into account. Development of a hatchery Spring Chinook program in Willapa Bay would need to be done consistent with fish health standards and in compliance with the co-managers disease policy. Sources considered in this evaluation:

- Willapa Bay; does not have natural spring Chinook stock.
- Chehalis River springs Chinook; closest stock geographically, however the absence of spring Chinook hatchery programs within the Chehalis system would require brood stock collection from natural spawning stocks within the upper river.
- Sol Duc River spring Chinook, which were historically introduced have integrated genetically with the Sol Duc River summer Chinook and as a result have a later run timing.
- Puget Sound has a number of spring Chinook hatchery programs, however these are recovery projects and as such not available for transfer to out-of-basin locations.
- Cowlitz and Kalama hatcheries in the lower Columbia River basin, both have spring Chinook program; these are considered to be the most viable sources.

The most likely brood stock source would be Kalama Hatchery because of their ability to provide early rearing of juveniles needed to meet program goals. A proof-of-concept size program might represent a first step. Fingerlings would be transferred to the site after initial rearing at a land-based facility in the lower Columbia, again Kalama in the most likely brood source. It is assumed that a proof-of-concept level of production could be absorbed into Kalama's current program. However at the receiving facility on additional hatchery worker would be required to feed and care for the fish while there are in the net-pens. To reduce disease loss due to temperature of the receiving water it is recommended that fingerlings be transferred in September or October and reared to release in May.

Non-target Stock and Species Interactions

Hatchery net-pen operations and fisheries management have the potential to have unintended implications on non-target stocks and species. The full extent of fishery impacts on non-target stock and species are unknown. This is the case for any new fish production project and those which have not operated for the length of time necessary to evaluate through data collection and monitoring. Proper fishery management requires that all fisheries are monitored at some level. Monitoring and evaluation of fisheries targeting a spring Chinook in Willapa Bay would be critical to understanding the impact on non-targeted stocks and species and the success of the program. To facilitate monitoring and evaluation all releases would need to be coded-wire tagged and externally marked. The commercial component would require on-board observer coverage and dockside sampling. Additional spawning ground surveys and hatchery sampling would be needed. This information would provide estimated catch, bycatch, estimated escapement back to the release site and the spawning grounds to obtain survival rates, as well as potential information about interactions with natural spawning stocks.

Enforcement

This fishery would be conducted during spring and early summer, during a time when fisheries had not been previously occurring in Willapa Bay. This would require additional enforcement. It is likely that this would result in some additional enforcement costs and potential conflicts with other enforcement priorities.

Cost

Net-pen and associated cost of set-up are estimated at \$7,000 per net-pen (except permitting); loading densities and size of net-pen evaluated here have a capacity of 50,000 yearling smolts averaging 10 fish/pound. Annual fish food cost currently \$4,300, per year per 50,000 yearling smolts being reared from fingerling to an average of 10 fish/pound at release. Salary and operating costs (vehicle, vessel, etc.) for a temporary worker to care for and feed fish while in the net-pens are approximately \$63,000. The cost of initial rearing at the source facility has not

been evaluated. For the initial acquisition of permits, sighting of the location, installation of required markers, buoys, and other associated hardware, plus the aforementioned actual rearing costs, the pilot projects estimated first year budget impact would be approximately \$120,000; subsequent annual costs would be about \$75,000 at the pilot project level of fish production. The total cost of this program if initiated would require new funding from the legislature. Additional cost will be associated with monitoring and evaluation once adult begin to return and fisheries are initiated.

Policy issue(s) you are bringing to the Commission for consideration:

Should WDFW staff continue to pursue this activity?

Public involvement process used and what you learned:

It will be important to involve the public should WDFW Regional Fish Program staff be asked to move forward with investigating this concept further. As part of that staff would look to the Willapa Bay Fishery Advisory Group to gain initial insight and comments from both recreational and commercial interests and from the local Regional Fisheries Enhancement Group. Staff would also request that the Hatchery Scientific Review Group review and comment. Should those discussions result in a favorable outcome relative to this concept; staff would begin discussing logistical aspects of this program with other agencies at both the state and federal level, such as: Washington State Department of Ecology, United States Army Corps of Engineers, and NOAA Fisheries to name a few.

Action requested:

None. Briefing Only.

Draft motion language:

N/A

Justification for Commission action:

N/A

Form revised 10/25/07



STATE OF WASHINGTON

DEPARTMENT OF FISH AND WILDLIFE

48 Devonshire Road • Montesano, Washington 98563-9618 • (360) 246-4628 FAX (360) 664-0689

27 June 2008

**TO: Susan Yeager, Executive Assistant
Fish and Wildlife Commission**

**FROM: Kirt Hughes
Region 6 Fish Program Manager**

**SUBJECT: Commissioner Wecker blue sheet request regarding Willapa Bay – Spring
Chinook**

At the request of Commissioner Wecker, the Department has discussed the benefits, risk, logistics and costs associated with the development of a hatchery spring Chinook (SAFE type project) program to provide additional fishery opportunity in Willapa Bay. An initial meeting between fish management and hatchery staff in the Region was held to outline the details associated with developing such a program in the Willapa Bay watershed. Subsequent to that, three meetings have occurred which have involved, at various levels, Deputy Director Phil Anderson, Fish Program Assistant Director Lew Atkins, Deputy Assistant Director Jo Wadsworth, Salmon and Steelhead Division Manager Heather Bartlett, Hatchery Division Manager Ron Warren, and Region 5 and 6 Fish Program Managers Pat Frazier and Kirt Hughes respectively. The following is a brief synopsis of those discussions.

Meaningful Fishery

The first item of discussion was; what would it take to create a meaningful fishery? After identifying meaningful fishery threshold in terms of ex-vessel value a range of program sizes were determined by back-calculating price/pound, average weight of returning adults, contribution to fisheries and smolt release to adult survival rates. Assumptions utilized in these calculations are an average 15 pounds per fish, \$7.50 per pound with 72.9% of the adult return contributing to the local commercial fishery. An average of 0.88% smolt to adult return rate was used to estimate the number of fish available to the fishery. The contribution to fisheries and return rate are averages for similar programs in the lower Columbia River. A pilot or proof-of-concept program with a 50K yearling smolt release would provide a projected return of 440 adults and approximately \$36,000 ex-vessel value annually after the third release year; a full production level release of 300K – similar to Deep River net-pens – would yield 2,640 adults with a projected ex-vessel value \$217,000.

Facility Location

Any of the three existing Willapa hatchery facilities (Forks Creek, Nemah and Naselle) could rear spring Chinook, however that production should not displace current production. However, because of the additional water needs and pond space required for rearing spring Chinook, current programs would be impacted if this new production was anticipated to occur at existing facilities. With that in mind, a net-pen facility offers the greatest possibility of success. Net-pen

production would be developed in a similar fashion to the Columbia River Select Area Fishery Evaluation Projects (SAFE projects) at Deep River, Youngs Bay and other locations in the lower Columbia River. Additionally a net-pen facility would concentrate returning adults in the vicinity of the pens thereby maximizing the contribution to harvest.

Net-pen site location requires certain physical conditions such as water depth, high levels of tidal exchange or freshwater flow, and a host of parameters associated with permitting a site. Within Willapa Bay the best locations appear to be near Toke Point or in the lower Willapa River between towns of South Bend and Raymond; other sites continue to be explored.

Broodstock Source

There are no natural spring Chinook stocks in Willapa Bay, therefore a hatchery brood stock would require an out-of-basin source. As with any hatchery program there are disease considerations that must be taken into account. Development of a hatchery Spring Chinook program in Willapa Bay would need to be done consistent with fish health standards and in compliance with the co-managers disease policy. Sources considered in this evaluation:

- Willapa Bay; does not have natural spring Chinook stock.
- Chehalis River springs Chinook; closest stock geographically, however the absence of spring Chinook hatchery programs within the Chehalis system would require brood stock collection from natural spawning stocks within the upper river.
- Sol Duc River spring Chinook, which were historically introduced have integrated genetically with the Sol Duc River summer Chinook and as a result have a later run timing.
- Puget Sound has a number of spring Chinook hatchery programs, however these are recovery projects and as such not available for transfer to out-of-basin locations.
- Cowlitz and Kalama hatcheries in the lower Columbia River basin, both have spring Chinook program; these are considered to be the most viable sources.

The most likely brood stock source would be Kalama Hatchery because of their ability to provide early rearing of juveniles needed to meet program goals. A proof-of-concept size program might represent a first step. Fingerlings would be transferred to the site after initial rearing at a land-based facility in the lower Columbia, again Kalama in the most likely brood source. It is assumed that a proof-of-concept level of production could be absorbed into Kalama's current program. However at the receiving facility on additional hatchery worker would be required to feed and care for the fish while there are in the net-pens. To reduce disease loss due to temperature of the receiving water it is recommended that fingerlings be transferred in September or October and reared to release in May.

Non-target Stock and Species Interactions

Hatchery net-pen operations and fisheries management have the potential to have unintended implications on non-target stocks and species. For example, release timing could present a potential conflict with Willapa Bay chum salmon fry emigrating from tributaries to Willapa Bay. A similar situation was identified in the lower Columbia River where yearling spring Chinook smolt were preying upon chum fry. The solution at Deep River was to tow the net pens to the mainstem for release rather than delay the chinook release. The alternative was to delay the release which in the case of Deep River, resulted in significant mortality in the production as a result of a disease outbreak due to warming water conditions. In Willapa Bay, the potential for this type of interaction could be evaluated by fry-trapping streams to inform decision making

relative to release strategies. Additional information may be collected by implanting a series of release groups with acoustic tags and monitoring their post release behavior.

The full extent of fishery impacts on non-target stock and species are unknown. This is the case for any new fish production project and those which have not operated for the length of time necessary to evaluate through data collection and monitoring. Proper fishery management requires that all fisheries are monitored at some level. Monitoring and evaluation of fisheries targeting a spring Chinook in Willapa Bay would be critical to understanding the impact on non-targeted stocks and species and the success of the program. To facilitate monitoring and evaluation all releases would need to be coded-wire tagged and externally marked. The commercial component would require on-board observer coverage and dockside sampling. Additional spawning ground surveys and hatchery sampling would be needed. This information would provide estimated catch, bycatch, estimated escapement back to the release site and the spawning grounds to obtain survival rates, as well as potential information about interactions with natural spawning stocks.

Enforcement

This fishery would be conducted during spring and early summer, during a time when fisheries had not been previously occurring in Willapa Bay. This would require additional enforcement. It is likely that this would result in some additional enforcement costs and potential conflicts with other enforcement priorities.

Cost

Net-pen and associated cost of set-up are estimated at \$7,000 per net-pen (except permitting); loading densities and size of net-pen evaluated here have a capacity of 50,000 yearling smolts averaging 10 fish/pound. Annual fish food cost currently \$4,300, per year per 50,000 yearling smolts being reared from fingerling to an average of 10 fish/pound at release. Salary and operating costs (vehicle, vessel, etc.) for a temporary worker to care for and feed fish while in the net-pens are approximately \$63,000. The cost of initial rearing at the source facility has not been evaluated. For the initial acquisition of permits, sighting of the location, installation of required markers, buoys, and other associated hardware, plus the aforementioned actual rearing costs, the pilot projects estimated first year budget impact would be approximately \$120,000; subsequent annual costs would be about \$75,000 at the pilot project level of fish production. The total cost of this program if initiated would require new funding from the legislature.

Cc: Jeff Koenings, Director
Phil Anderson, Deputy Director
Lew Atkins, Fish Program Assistant Director
Jo Wadsworth, Deputy Assistant Director
Heather Bartlett, Salmon and Steelhead Division Manager
Ron Warren, Hatchery Division Manager
Pat Frazier, Region 5 Fish Program Manager