

## ACTIONS TAKEN TO ADDRESS HATCHERY CHUM SALMON PRODUCTION ISSUES

### BACKGROUND

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It is generally acknowledged that Alaska's hatcheries have met the goals set in the 1970s when the program was developed. However, recent instability in Western Alaska chum salmon production has raised new questions and concerns about the role of hatchery salmon production in the ocean ecosystem and whether hatchery chums unfairly compete for market share with some Western Alaska wild stocks. Concerns have also been raised regarding impacts of future sockeye salmon production. In recent years the Board of Fisheries and the Department of Fish and Game have worked to understand and address these and other hatchery program issues. Commissioner Rue stated in a recent letter that ADF&G scientists believe the primary cause of weak production of western Alaska chum salmon is poor early marine survival. Harvest is the next most significant contributing factor to survival. While the data indicate there may be competitive interactions between the multitude of hatchery and wild stocks rearing in the North Pacific Ocean, there is no scientific evidence demonstrating that competition with hatchery fish is a significant factor in the collapse of western Alaska wild chum stocks. Generally, when few fish return from a good spawning escapement, the cause is unfavorable freshwater conditions (e.g., floods, freezing, habitat degradation) or poor early marine conditions (low plankton abundance, unfavorable temperatures, predation). Although studies have shown that competition for food in the open ocean between different salmon species and different stocks occurs, this competition is believed to manifest itself primarily in reduced growth and smaller-sized fish at a given age rather than reduced survival.

Production goals for the chum salmon hatchery programs in Southeast Alaska and Prince William Sound were established through the Regional Comprehensive Salmon Planning process. The production goals established in these plans have generally been achieved or exceeded in recent years. Higher than normal marine survivals for chum salmon appear to be the primary reason for the above average, and in some cases, record recent-year returns. However, there are strong indications that marine survival has turned downward and that hatchery chum returns, at least to some Southeast Alaska facilities, could decline significantly in the next few years. In fact, the 2001 hatchery chum forecast for Southeast Alaska is about 50 percent of the 2000 overall return. This may result in overall chum production in Southeast Alaska falling below the 10 million fish goal established in the current Southeast Regional Comprehensive Plan. It is possible that this decline in survival to normal or below normal levels could persist for some time.

This background provides the context for actions by the department and the board to address controversial hatchery issues, in the following categories: chum production, research, statewide coordination, loan fund, AYK chum salmon restoration, roles and responsibilities, and sockeye production.

### PRODUCTION

On December 14, 2000, the Southeast Regional Planning Team unanimously recommended a reduction in permitted hatchery capacity for chum salmon in Southeast Alaska of 90 million eggs for a 13 percent reduction in region wide capacity. In making this recommendation, the RPT stressed the fact that permitted chum salmon capacity in Southeast was reduced an additional 119 million eggs over the two year span from 1997 to 1998, for a total reduction of 209 million eggs over the past four years.

Additional reductions of hatchery chum production in Southeast Alaska and Prince William Sound are not justified based on the available scientific evidence. Similarly, increases in production of hatchery chums should not be permitted simply because markets are currently strong and marine survivals are trending downward. The chum salmon hatchery program has reached its intended goals. Stable chum salmon production will allow the department to be sure that management and utilization issues are being addressed.

## **ROLES, RESPONSIBILITIES, AND AUTHORITIES**

The Board of Fisheries has clear authority to regulate access to returning hatchery salmon, but does not have authority to directly regulate hatchery production. Other board responsibilities and authorities are less clear, and there is a need for coordinated department and board interaction on certain aspects of hatchery policy and regulation. For example, the Board may indirectly regulate hatchery production by amending the terms of permits relating to the source and number of salmon eggs, the harvest of fish by hatchery operators, and the specific locations designated for harvest. The department and board will immediately begin development of a concise statement of their separate and joint roles relating to fishery enhancement with the intent of entering into a Joint Protocol dealing with the issue of insuring that there is a statewide perspective brought to the hatchery production process.

## **RESEARCH**

The Commissioner will direct the Regional Planning Teams to critically evaluate marking and recovery programs being conducted by hatcheries around the state to ensure that the hatcheries are doing all they can to assist in evaluating the impacts and benefits of hatchery production. Some hatcheries, like DIPAC and PSWAC, thermally mark 100 percent of their hatchery chum salmon production. As the department and National Marine Fisheries Service develop research plans for studies on ocean productivity and salmon survivals, the department will determine, based on research and management needs, if other hatcheries should increase their marking and evaluation projects. Hatcheries may be able to contribute a great deal to our knowledge about salmon distribution and survival and competition by marking more fish.

## **STATEWIDE CHUM SALMON FORUM**

One of the recommendations of the hatchery forums the department convened a few years ago was to establish a Statewide Regional Planning Team. This recommendation was not implemented primarily because of a lack of funding. In addition, there were many concerns raised over what the mission and objectives of a Statewide RPT would be. There was and still is support for an effort aimed at sharing information and expertise among people from different regions of the state on hatchery and wild chum salmon production, research, and marketing. As a result, the department will be working on a draft proposal for a statewide hatchery chum salmon meeting.

## **LOAN FUND**

Hatchery operators have identified a number of problems with the use of hatchery loan forgiveness as a tool to allow reductions in production. There may be some merit in further exploring debt forgiveness coupled with cuts in production. At this time, however, it would be more productive to work with DCED to determine if the revolving loan fund can be used to help finance infrastructure that would help AYK salmon or other salmon fisheries around the state be more competitive on the world market.

## **AYK CHUM SALMON RESTORATION**

The Division of Commercial Fisheries will work with hatchery operators and AYK representatives to determine if there are wild chum salmon rehabilitation techniques that can be applied efficiently and effectively in AYK. Hatchery operators have offered their expertise in assisting in any rehabilitation and restoration efforts in western Alaska.

## **SOCKEYE PRODUCTION**

Sockeye production from hatcheries has been relatively low and stable for the past ten years and is expected to remain so for the foreseeable future. Enhanced returns have averaged three million fish for the last ten years.

The total permitted incubation capacity for sockeye salmon is approximately 140 million eggs. The department has included conditions in the permits for some facilities that limit production to less than what is otherwise permitted, until fishery management issues are resolved. (See attachment)

### CONCLUSION

Based on the foregoing, the Board's Hatchery Committee recommends No Action on proposal 99-358. Further, the Committee requests the Board's continuing authority to negotiate the Joint Protocol with the Department and report back to the full Board at its initial work session in the fall of 2001.

Dated at Anchorage, Alaska this 19<sup>th</sup> day of January, 2001.

Standing Hatchery Committee  
Board of Fisheries

By:  
Dan K. Coffey, Committee Chairman

Concur:

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Virgil Umphenour, Committee Member

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Grant Miller, Committee Member

## Summary of Alaska's Sockeye Salmon Enhancement Program

The Alaska Department of Fish and Game has permitted ten private non-profit hatcheries in Alaska for production of sockeye salmon. Eight of these facilities were constructed and originally operated by the Alaska Department of Fish and Game. Four of the sockeye production facilities are located in Southeast Alaska (Burnett Inlet, Klawock, Haines/Chilkat Lake, and Snettisham), there are two in Prince William Sound (Main Bay and Gulkana River), two in Cook Inlet (Trail Lakes and Port Graham), and two are in the Kodiak region (Pillar Creek and Kitoi Bay).

The total permitted incubation capacity for sockeye salmon in Alaska is approximately 140 million eggs. Many hatcheries in Alaska have not reached full permitted production levels, in part because of slow broodstock development. In addition, the department has included conditions in the permits for some facilities that limit production to lower than permitted capacities until fishery management issues are resolved. For example, although the permitted capacity for the Snettisham hatchery for smolt releases is 12.5 million eggs, no more than 9.0 million eggs may be taken until an adequate evaluation of survival rates, migratory behavior, and manageability of adult returns is completed. Only then, can production increase to the full capacity of 12.5 million eggs.

The number of eggs taken at each hatchery facility for the last five years is listed in the following table. Total numbers of eggs taken and numbers of juveniles released are shown in Figure 1.

Table 1. Permitted capacity at Alaska sockeye hatcheries

Facility capacity (millions)	Eggs Taken				
	1995	1996	1997	1998	1999
Burnett Inlet (2.7)	2.87	1.26	0.00	0.31	0.94
Klawock (5)	1.00	1.33	1.10	1.21	0.71
Chilkat Lake (2)	0.60	0.62	0.12	0.46	0.00
Snettisham (33.5) <sup>1</sup>	14.49	23.75	14.47	14.25	12.08
Main Bay (10.2)	7.68	3.22	10.68	9.25	9.11
Gulkana (35)	37.82	37.35	37.51	37.35	36.74
Trail Lakes (30)	34.23	37.15	24.23	23.46	21.16
Port Graham (1.35)	2.21	1.59	1.33	1.33	1.46
Kitoi Bay (0.3)	0.19	1.13	0.00	0.00	0.00
Pillar Creek (20)	10.05	12.29	8.55	7.46	8.32

<sup>1</sup> The overall capacity at Snettisham is 33.5 million eggs; 21 million eggs are dedicated to fry stocking programs in lakes in Lynn Canal and in Canada that depend on remote egg-takes and annual limnological evaluations to determine actual production levels.

Sockeye production from hatcheries in Alaska has been relatively stable for the last 10 years (Fig. 1), and is expected to remain near current levels for the immediate future. Enhanced returns have averaged three million fish for the last 10 years. Increases in the number of returning adults are expected, particularly from smolt production programs, as broodstock development is completed and all age-classes are fully represented. For example, at full production, the Snettisham hatchery is expected to produce approximately 800,000 adults annually. Production from Main Bay hatchery could approach similar levels when it reaches full capacity. Annual returns from hatchery production could reach 4.5 million sockeye annually. Additional production from lake fertilization projects and fish-pass construction could add another 0.5 million fish annually.

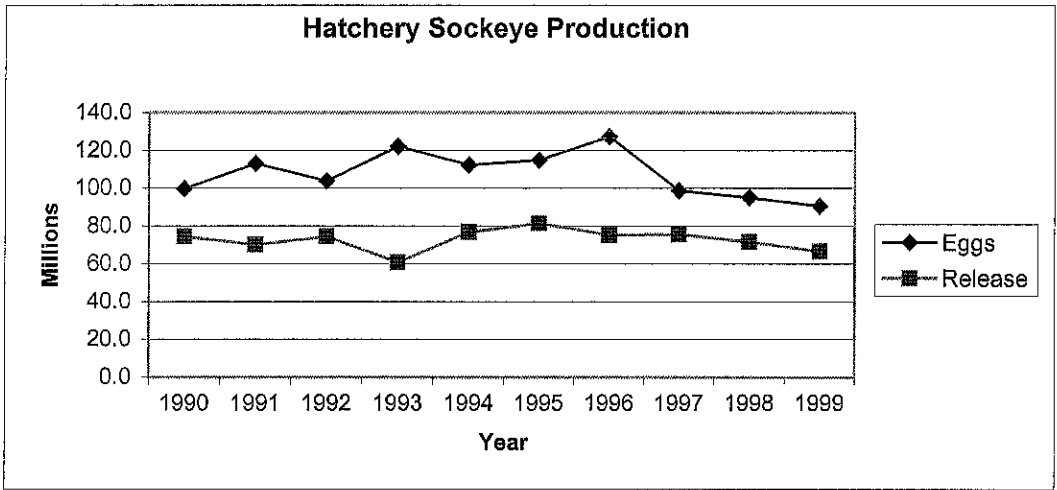


Figure 1. Alaskan hatchery sockeye egg-takes and releases, 1990-1999.

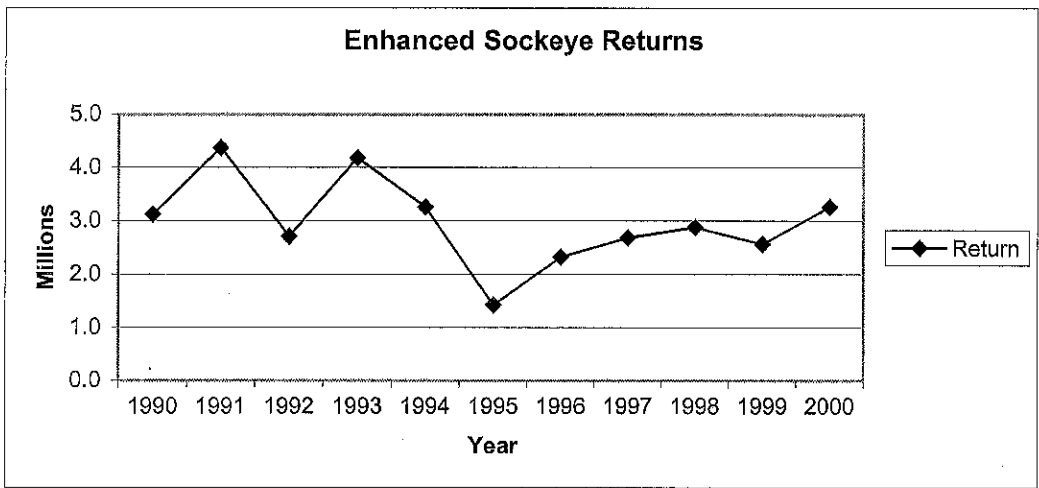


Figure 2. Total returns of sockeye to Alaska enhancement projects, 1990-1999, and projected returns for 2000.

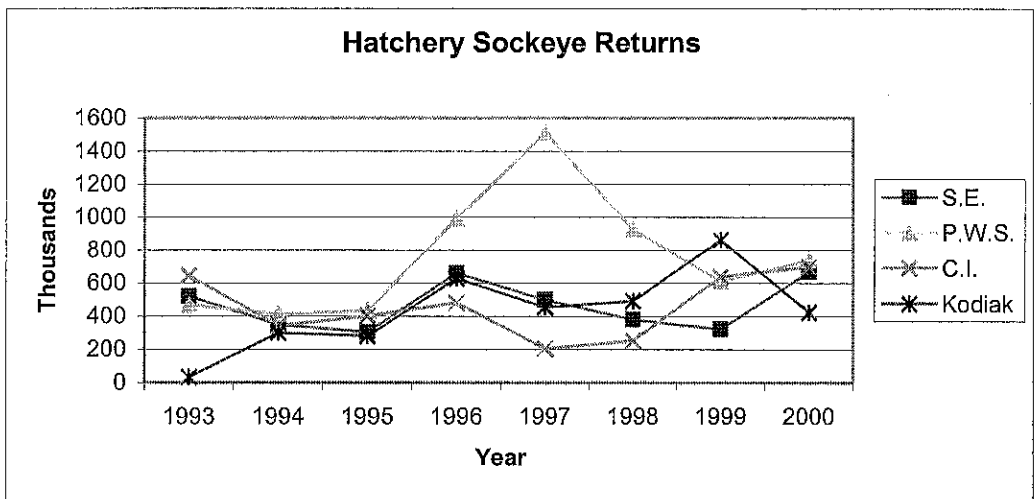


Figure 3. Actual and projected returns of hatchery-produced sockeye, 1993-2000.