



# Alaska Department of Fish & Game Finfish Genetic Policy

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## Abstract

In Alaska, wild stocks are the mainstay of the commercial fishing economy, so it is necessary to protect these stocks through careful consideration of the impacts of enhancement activities. The importance of protecting the genetic integrity of wild stocks and implementing successful enhancement activities underlies the need for an effective genetic policy. The policy is designed to minimize gene flow into wild stocks from straying hatchery fish.

Another aspect of the genetic policy is the orientation towards increasing the productivity of enhancement programs in the state. Adherence to the guidelines will help maintain adequate genetic variability ensuring that the enhanced stock will be able to adapt to changing environmental conditions.

## POLICY STATEMENT

### I. Stock Transport

- A. Interstate: Live salmonids, including gametes, will not be imported from sources outside the state. Exceptions may be allowed for trans-boundary rivers.



Eyed salmon eggs

- B. Inter-regional: Stocks will not be transported between major geographic areas: Southeast, Kodiak Island, Prince William Sound, Cook Inlet, Bristol Bay, Arctic-Yukon-Kuskokwim (AYK) and Interior (Alaska).

- C. Regional: Acceptability of transport within regions will be judged on the following criteria.

1. Phenotypic characteristics of the donor stock must be shown to be appropriate for the proposed fish culture regions and the goals set in the management plan.
2. No distance is set or specified for transport within a region. It is recognized that transplants occurring over greater distances may result in increased straying and reduce the likelihood of a successful transplant. Although the risk of failure affects the agency transporting the fish, transplants with high probability of failure will be denied. Proposals for long distance transport should be accompanied by adequate justification for non-local stock.

### II. Protection of Wild Stocks

- A. Gene flow from hatchery fish straying and intermingling with wild stocks may have significant detrimental effects on wild stocks.




Wild sockeye spawners

First priority will be given to protection of wild stocks from possible harmful interactions with introduced stocks. Stocks cannot be introduced to sites where the introduced stock may have significant interaction or impact on significant or unique wild stocks.

- B. Significant or unique wild stocks must be identified on a regional and species basis so as to define sensitive and non-sensitive areas for movement of stocks.
- C. Stock Rehabilitation and Enhancement
  1. A watershed with a significant wild stock can only be stocked with progeny from the indigenous stock.
  2. Gametes may be removed, placed in a hatchery, and subsequently returned to the donor system at the appropriate life history state (eyed egg, fry or fingerling). However, no more than one generation of separation from the donor system to stocking of the progeny will be allowed.
- D. Drainages should be established as wild stock sanctuaries on a regional and species basis. These sanctuaries will be areas in which no enhancement activity is permitted except gamete removal for broodstock development. Use of such reservoirs for broodstock development should be considered on a case-by-case basis, and sliding egg take removal schedules applied to such systems should be conservative.
- E. Fish releases at sites where no interaction with, or impact on significant or unique wild stocks will occur, and which are not for the purposes of developing, rehabilitation of, or enhancement of a stock (e.g., releases for terminal harvest or in landlocked lakes) will not produce a detrimental genetic effect. Such releases need not be restricted by genetic concerns.

### III. Maintenance of Genetic Variance

- A. Genetic diversity among hatcheries
    1. A single donor stock cannot be used to establish or contribute to more than three hatchery stocks.
    2. Off-site releases for terminal harvest rather than development or enhancement of a stock need not be restricted by III.A.1, if such release sites are selected so that they do not impact significant wild stocks, wild stock sanctuaries, or other hatchery stocks.
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- Main Bay Hatchery
- B. Genetic diversity within hatcheries and from donor stocks
    1. A minimum effective population ( $N_e$ ) of 400 should be used for broodstock development and maintained in hatchery stocks. However, small population sizes may be unavoidable with chinook and steelhead.



Hatchery broodstock

2. To ensure all segments of the run have the opportunity to spawn, sliding egg take scales for donor stock transplants will not allocate more than 90% of any segment of the run for broodstock.

## Project Evaluation

Protection of wild stocks in Alaska is a mandate supported by the constitution and State statutes. Alaska's hatchery program was initiated to supplement and enhance wild stock production. The program was never intended to replace wild stocks with hatchery stocks. Evaluation of new projects and periodic evaluation of existing projects is essential to verify that the stocked fish are not straying into wild stock systems at an unacceptable rate. Recommendations for new projects will be to design and implement



Coded wire tagged pink salmon



Thermally marked pink salmon otolith

straying studies for one life cycle. Methods available to the operator to distinguish hatchery fish from wild fish include fin clipping, coded wire tagging, otolith thermal marking and natural marks such as scale patterns. If unacceptable rates of straying are indicated then adjustments in the fish culture and release methods may be appropriate. When the project comes up for re-permitting, review of existing straying data and current hatchery and release practices will determine if straying studies need to be repeated. If unacceptable straying persists then the project will be cancelled.

## Reports of Interest:

Davis, B., Burkett, B. 1989. Background of the Genetic Policy of the Alaska Department of Fish and Game. Alaska Dept. of Fish and Game, Fisheries Rehabilitation Enhancement and Development (F.R.E.D.). Report #95.

McGee, S.G. 2003. Salmon hatcheries in Alaska - plans, permits, and policies that provide protection for wild stocks. Alaska Department of Fish and Game, Commercial Fisheries Division, Juneau, Alaska.

## Alaska Finfish Genetics Policy

<http://www.cf.adfg.state.ak.us/geninfo/research/genetics/genetics.htm>

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