



F: Rationale for Integrated/Segregated Broodstock Management

The HSRG developed the following text in May 2005, to help clarify what the HSRG meant when it recommended that managers identify each hatchery program as either having an integrated or segregated broodstock management strategy.

- We know from theory and observation that interactions between hatchery- and natural-origin fish will diminish the fitness of naturally-spawning populations, even though this fitness loss is difficult to measure.
- The only way to completely eliminate this fitness loss is to eliminate hatchery programs.
- However, hatcheries can provide harvest benefits.
- Hatcheries have also, in some cases, increased the abundance of populations at risk of extinction.
- Where managers choose to use a hatchery program as part of a strategy to meet harvest and/or conservation goals, there are two ways to manage hatchery broodstocks to address the associated fitness loss.
 1. *Segregated Hatchery Programs*—In these programs, the intent is to manage for two separate gene pools (one adapted to the hatchery, the other to the natural environment) and that hatchery-origin fish do not spawn in the wild.
 2. *Integrated Hatchery Programs*—In these programs, the intent is for the genetic make-up of hatchery-origin fish to be the same as that of the underlying natural population, and that natural selection in the wild drives the fitness of both components of the population. This requires that natural-origin fish be included in the hatchery broodstock and that natural spawning of hatchery-origin fish be minimized.
- In practice, it is in most cases not possible to perfectly achieve either of these strategies.
- It is a reasonable hypothesis that the increased population abundance derived from well-managed integrated or segregated hatchery programs can outweigh the associated fitness losses. Where this hypothesis cannot be supported, a hatchery program may not be appropriate.
- Both integrated and segregated programs can potentially provide fish for conservation purposes, where natural spawning by hatchery-origin fish may be desired.
- When hatchery-origin fish spawn and reproduce successfully in the natural environment, genetic risks of properly-integrated hatchery programs are expected to be less than those from segregated programs for the same level of gene flow from a hatchery program to a natural population.
- Watershed-specific goals and circumstances determine whether a segregated or integrated hatchery program is most appropriate.
- Hatcheries should be used as part of an integrated strategy (alongside harvest management, and habitat protection and restoration) to meet conservation and harvest goals on a sustainable basis.