Controlling Age and Seasonal Timing of Reproduction in Cultured Pacific Salmon

Penny Swanson and Karl Shearer
Integrative Fish Biology Program
Northwest Fisheries Science Center
2725 Montlake Boulevard East
Seattle, WA. 98112
penny.swanson@noaa.gov 206-860-3282 (F) 206-860-3467
karl.d.shearer@noaa.gov 206-860-3393 (F) 206-860-3467

B. Campbell
School of Aquatic and Fishery Sciences
University of Washington
Seattle, WA.
briony.Campbell@noaa.gov 206-860-3463 (F) 206-860-3467

A number of reproductive problems have been observed in wild stocks of Pacific salmon when reared in captive broodstock programs for recovery of endangered stocks. These include: highly variable survival of embryos to the eyed stage, early age of maturation of male fish, asynchronous timing of spawning of males and females, seasonally delayed maturation of captively-reared adults compared to wild parent stocks, and poor reproductive success of captively reared adults when released into their native habitat. The degree and incidence of these problems varies considerably from year to year, and between species and stocks. Although the programs have successfully produced offspring for reintroduction to their native habitat, the persistence of these reproductive problems limits their success. In this paper examples of each of these problems and approaches that have been taken to either solve the problem or understand the underlying causes will be presented. Our research has focused on three major areas: 1) evaluating the role of growth in determining the age of maturation, fecundity, and egg size, 2) refining methods to advance and synchronize spawning time of captively-reared fish with GnRHa or photoperiod, and 3) determining the effects of rearing environment on age of maturity, seasonal timing of spawning and gamete quality.