# SALMON TECHNICAL TEAM REPORT ON KLAMATH RIVER FALL CHINOOK CONSERVATION OBJECTIVE

The current management objective for Klamath fall Chinook, adopted under Amendment 9 in May 1989, is to allow 33%-34% of the potential adult natural spawners in each brood to escape the fisheries, and to spawn, provided that natural spawning escapement does not fall below 35,000 adults in any one year. In May 1994, the 33%-34% brood year escapement rate was modified to permit it to be attained on average, allowing year-to-year variability in individual brood year escapement rates in order to achieve the tribal/nontribal annual allocation.

The form of this objective is consistent with National Marine Fisheries Service (NMFS) National Standard Guidelines, which advocate management for a maximum sustainable yield (MSY) control rule. An MSY control rule is defined in terms of an exploitation rate that will, on average, produce the maximum yield. The National Standard Guidelines also require that the fishery management plan (FMP) establish status determination criteria, or reasonable proxies thereof, that define overfishing and stock depletion. These criteria consist of a maximum fishing mortality threshold defining overfishing and a minimum stock size threshold defining when a stock is depleted.

In the case of Klamath fall Chinook, the harvest rate management objective, with the escapement floor, comprise an MSY control rule. Failure to meet the MSY objectives in three consecutive years has been accepted by NMFS as a reasonable proxy for the status determination criteria for overfishing.

In its analysis, the Salmon Technical Team (STT) presented three estimates of the natural adult spawning escapement that would, on average, produce MSY. The first of these (32,700) was derived from a naïve fit of a Ricker spawner-recruit relationship to natural escapement and subsequent recruitment, the second (40,700) was derived from the fit of a Ricker curve after adjusting for year-to-year variability in smolt-to-adult survival, and the third (70,900) was a habitat-based estimate based on the relationship between management reference points and accessible watershed area for ocean-type Chinook stocks coastwide.

The current escapement floor is well below the estimate of MSY spawning escapement based on watershed area and below the estimate based on the Ricker spawner-recruit relationship adjusted for average smolt-to adult survival. The STT does not believe the current analysis reveals any compelling evidence of problems with the current FMP objective.

A number of assumptions and caveats underlying this S-R analysis are particularly relevant:

*Stationarity* - the S-R data were collected under specific conditions affecting the 1979-2000 broods. The environment is anticipated to change in response to adjustments to flow regulation regimes, which in turn may affect stock productivity.

*Hatchery/Natural Dynamics* – the S-R analysis presumes that the interactions between hatchery and natural fish are stable over time.

*Aggregate Stock* – the S-R analysis was performed using aggregated data for stocks originating in the Trinity and Klamath systems. Available data indicate that stocks from these systems have different biological characteristics (e.g., maturation schedules).

Data Quality concerns. Data to directly relate juvenile production to levels of spawning escapement are not generally available. Instead production is estimated through run-reconstruction methods. These methods involve numerous assumptions to generate estimates of production. First, the age and origin (hatchery vs. natural) of spawners must be estimated; the capacity to do this based on limited sampling during stream surveys is of uncertain and varying accuracy. Estimates of escapement are then expanded for in-river harvest, and expanded a second time to account for ocean fishery impacts using estimates of ocean exploitation rates derived from a combination of fingerling and yearling coded-wire tag release groups.

Because of the above caveats, the STT does not believe that the current analysis provides sufficient new information to warrant any changes in the current FMP objective.

PFMC
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