

## 2003 Feather River Salmon Spawning Escapement Survey Summary

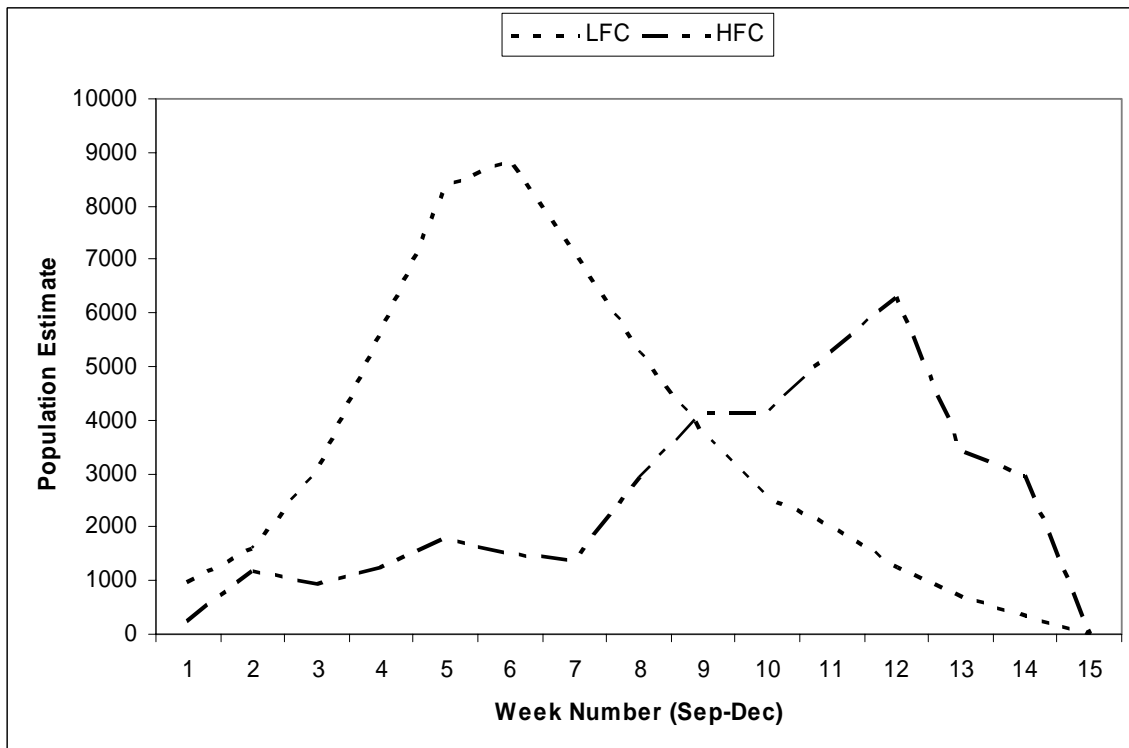
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*California Department of Water Resources  
 Division of Environmental Services*

The 2003 salmon spawning escapement survey began September 2 and continued through December 17.

### Population Estimate:

Salmon carcass mark recapture resulted in a population estimate for the Low Flow Channel (LFC) of 51,689 salmon, 49,156 adults and 2,533 grilse. The LFC includes the Feather River from the Fish Barrier Dam to the Thermalito Outlet. The population estimate for the High Flow Channel (HFC) of the Feather River was 37,408 salmon, 35,612 adults and 1,796 grilse. The HFC surveyed extended from the Thermalito Outlet downstream to the Gridley Bridge. The heavier spawning activity in the LFC is consistent with previous years (63% of spawning in the LFC is the long term average). The total in-river spawning for the Feather River (LFC + HFC) was 89,097 consisting of 84,769 adults and 4,328 grilse (Figure 1). These estimates include spring and fall-run salmon since their spawning does not appear to be spatially or temporally segregated on the Feather River.

**Figure 1. Weekly population estimates in the LFC and HFC of the lower Feather River during the 2003 Chinook salmon escapement survey.**



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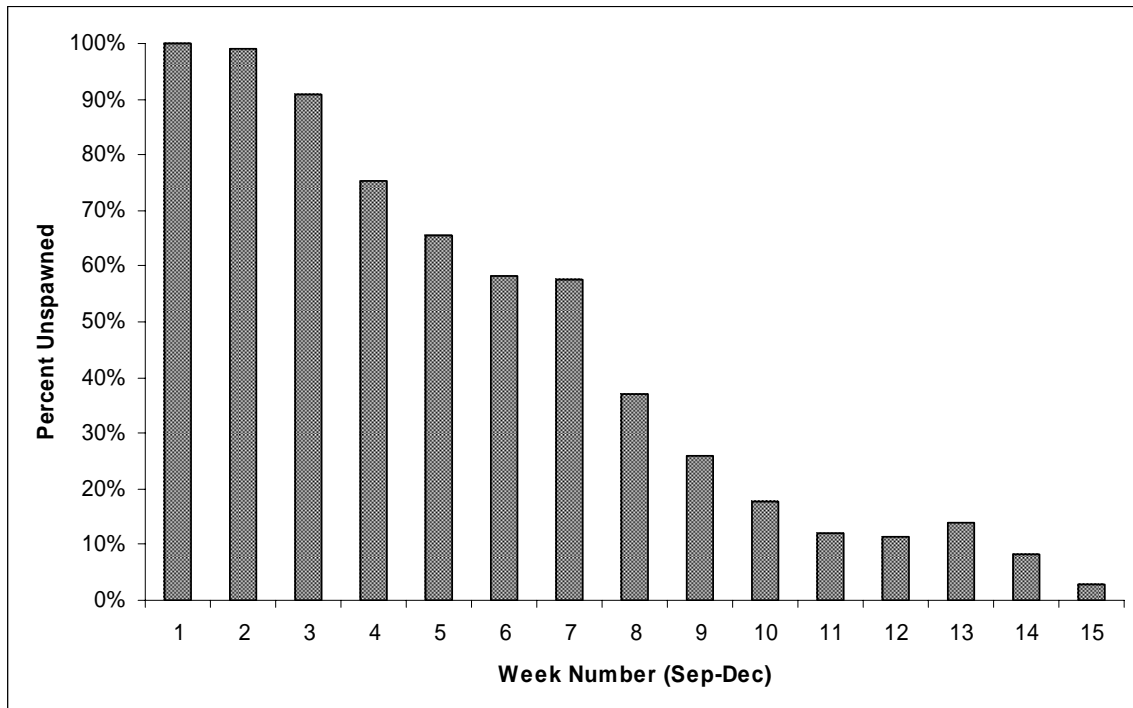
Pre-spawning Mortality:

4,027 female salmon were examined to determine if they had successfully deposited their eggs (Table 1). On average, 40.5% had died before depositing most of their eggs. Pre-spawning mortality was generally higher early in the survey (September-October), and in the LFC (Figure 2 and Table 1). Since we began monitoring pre-spawn mortality in 2000, we have observed similarly high levels. The cause for pre-spawning mortality is unclear, but it probably results from stress associated with upstream migration, water temperatures, angling pressure, and intense competition for limited spawning habitat.

**Table 1. Spawning status of female Chinook salmon examined during the 2003 escapement survey in the lower Feather River.**

River Section	Spawned	Unspawned	Total	% Unspawned
LFC (Sect. 1-23)	1629	1402	3031	46.26
HFC (Sect. 24-46)	751	245	996	24.60

**Figure 2. Weekly percentage of unspawned females in the lower Feather River during the 2003 Chinook salmon escapement survey.**



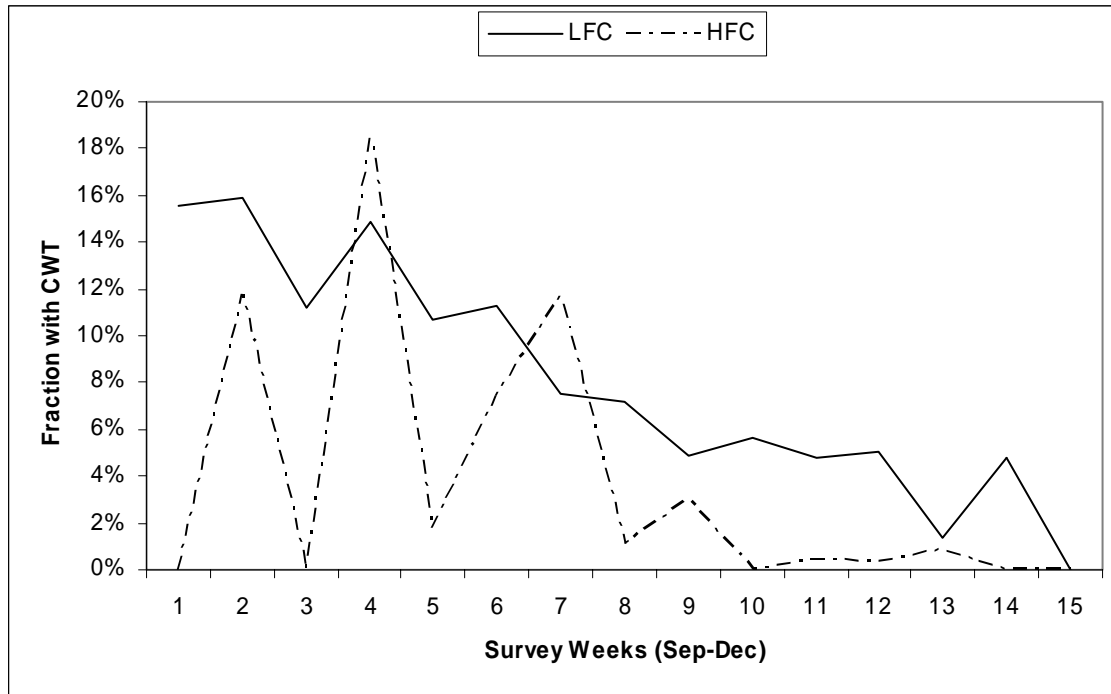
Coded Wire Tag (CWT) Sampling:

6,047 salmon were checked for the presence of an adipose fin clip (the external mark which indicates a CWT is present). 414 heads with CWTs were collected, resulting in an average occurrence rate of 6.8% (Table 2). CWTs were more common early in the survey than later (Figure 3). CWT salmon also appeared to occur at a higher rate in the LFC than in the HFC (Figure 3).

**Table 2. Adipose fin presence/absence on Chinook salmon examined during the 2003 Feather River escapement survey.**

River Section	Clipped	Non-clipped	CWT Rate
LFC (Sect. 1-23)	382	4116	8.5
HFC (Sect. 24-46)	32	1517	2.1
Overall	414	5633	6.8

**Figure 3. Weekly percentage of Chinook salmon with CWTs in the LFC and HFC of lower Feather River during the 2004 Chinook salmon escapement survey.**



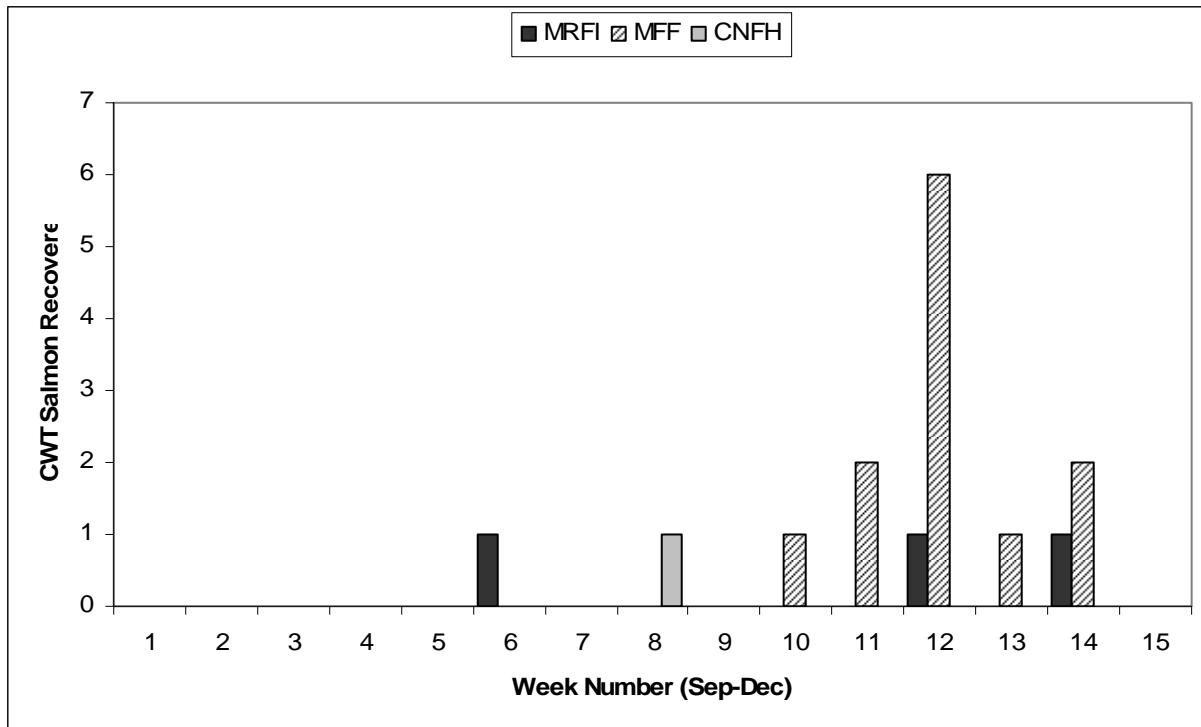
CWTs from fish recovered at the Feather River Hatchery, LFC, and HFC, which were of Feather River Hatchery origin were used to assess age composition of the spawning population. Age 4 and age 3 salmon dominated the spawning population, 41.7% and 50.6% respectively (Table 3). Age 2 fish were also fairly common (7.4%) while age 1 and age 5 fish were rare (Table 3).

**Table 3. Age composition of Feather River Hatchery origin Chinook salmon recovered during the 2003 escapement survey.**

Age	CWTs Recovered	%
5	3	0.1
4	2200	41.7
3	2669	50.6
2	391	7.4
1	11	0.2

Of the tagged Chinook that returned to the Feather River in 2003, the majority (95%) were of Feather River Hatchery (FRH) Origin. Six percent of these FRH origin fish were fish released from mobile net pens at Tiburon, California (i.e., the Tiburon Net Pens). The remaining five percent of the tagged Chinook that returned to the Feather River consisted of strays from the Mokelumne River Fish Instillation, Merced Fish Facility, and the Coleman National Fish Hatchery (Figure 4).

**Figure 4. Weekly stray recoveries from the Feather River during the 2003 Chinook salmon spawning season. Note: MRFI = Mokelumne River Fish Instillation, MFF = Merced Fish Facility, and CNFH = Coleman National Fish Hatchery.**



Spring and Fall Chinook CWT Composition:

Salmon tagged as spring and fall Chinook demonstrated considerable overlap in their temporal distribution, although the occurrence of spring Chinook CWTs did peak about two weeks before the fall Chinook CWTs, as shown in Figure 5 of Feather River Hatchery origin CWT returns.

Figure 5. Weekly CWT Chinook salmon recoveries by run of Feather River Hatchery origin fish from the 2003 Feather River spawning season.

