

## Chinook Salmon Catch and Escapement

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The following information was taken from the February 1999 report "Review of the 1998 Ocean Salmon Fisheries" by the Pacific Coast Fishery Management Council (PFMC). Copies of the report can be obtained by calling (503) 326-6352. In the report, note that the spawning escapement estimate for the Feather River as shown in Appendix Table B-1 is incorrect. The correct estimate is 43,000.

As in the past few years, in 1998 the PFMC took actions to reduce the ocean harvest of winter-run chinook salmon and Klamath River fall-run chinook salmon. These actions had the ancillary effect of reducing landings of non-target runs.

### Figure 1--Central Valley Chinook Salmon Annual Abundance Index

The index consists of estimated ocean harvest plus total Central Valley escapement. The index does not include inland harvest, which may be up to 25% of the salmon leaving the ocean. The 1998 abundance index of 565.3 was below the 1970-1998 average of 665.3.

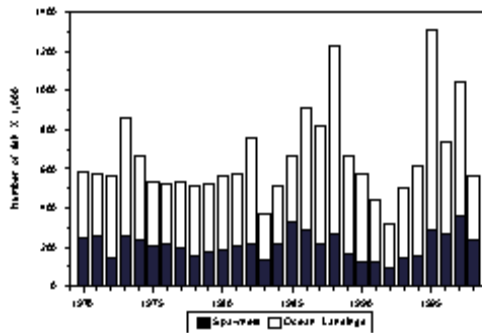


Figure 1 Central Valley chinook salmon annual abundance index, 1970-1998

The low index may be in part due to less-than-average ocean fishing effort. The ocean recreational effort was estimated to be about 150,000 angler trips compared to a 1982-1997 average of 205,000 trips. Commercial fishermen fished an estimated 12,000 days in 1998 compared to an average of 41,000 days from 1982 through 1997.

### Figure 2--Ocean Commercial and Recreational Catch

In 1998, commercial fishermen landed about 65% of the total number of chinook caught in the ocean, which is slightly below the 1970-1997 average of 71%.

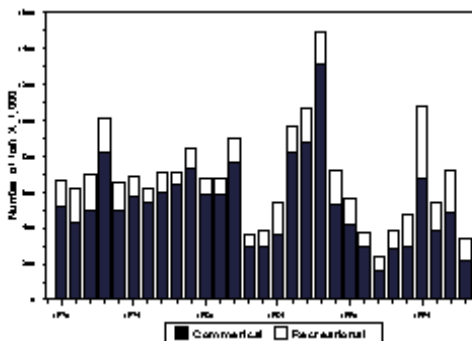


Figure 2 Annual California commercial and recreational chinook salmon ocean catch

**Figure 3--Ocean Harvest Index**

The ocean harvest was significantly less than preseason predictions. The ocean harvest index consists of the estimated ocean harvest divided by the sum of the ocean harvest and total Central Valley escapement. It does not include inland harvest. The 1998 ocean harvest index of 57% is the third lowest during the period of record and is significantly lower than the indices in from about 74% to 79% seen from about 1985 through 1995.

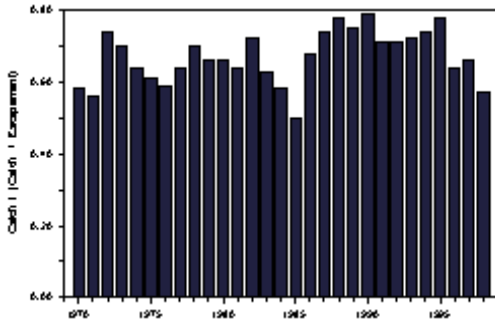


Figure 3 Central Valley chinook salmon ocean harvest index, 1970-1998

As mentioned earlier, the lower ocean harvest is likely due to harvest regulations to protect winter-run chinook and Klamath fall-run chinook. Some economic factors may be coming into play as pen-reared Atlantic salmon make up a larger portion of the fresh salmon market.

**Figure 4--Sacramento Valley Escapement**

In contrast to ocean harvest and total Central Valley escapement in 1998, the natural and hatchery chinook runs to Sacramento River mainstem and tributary streams and hatcheries was among the strongest seen since 1970.

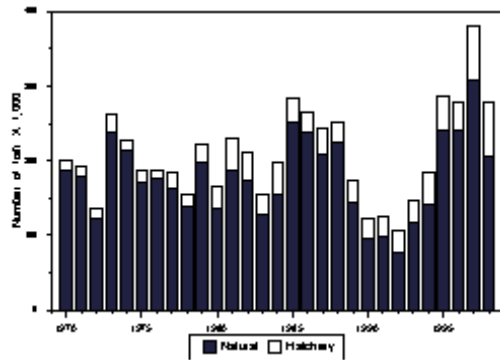


Figure 4 Annual fall-run chinook salmon escapement to the Sacramento River and major tributaries, natural and hatchery contribution

The strong escapement was at least in part due to the reduction in ocean catch. Most of the escapement was to the Feather and American rivers and Battle Creek--streams that have major fall-run hatcheries. The total escapement met the PFMC's spawning escapement goal of between 122,000 and 180,000 adults. This estimate includes hatchery and naturally spawning fish. Note that all production from the Nimbus Hatchery is trucked to near Carquinez Strait for release as smolts.

**Figure 5--American River Escapement**

The 1998 escapement to the American River was the fourth strong year in a row and the fourth highest year in the 1970-1998 period of record.

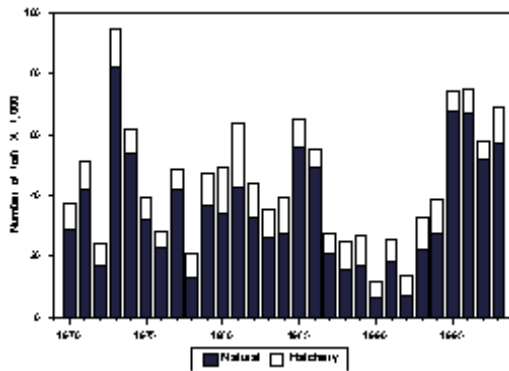


Figure 5 Annual fall-run chinook salmon escapement to the American River, natural and hatchery contribution

**Figure 6--Feather River Escapement**

As on the American River, the 1998 escapement to the Feather River was strong. Similarly, the entire production from the Feather River Hatchery is trucked to near Carquinez Strait for release. DWR continues to tag more than a million Feather River Hatchery juveniles each year to help determine the hatchery's contribution to catch, spawning, and straying. This fall, DWR will contract with a university scientist to begin analyzing the tag returns from these releases. Feather River escapement to the Feather River Hatchery includes what are now called spring-run chinook. Through the use of microsattellites, UC Davis geneticists will soon be able to determine if there is an actual spring run to the hatchery.

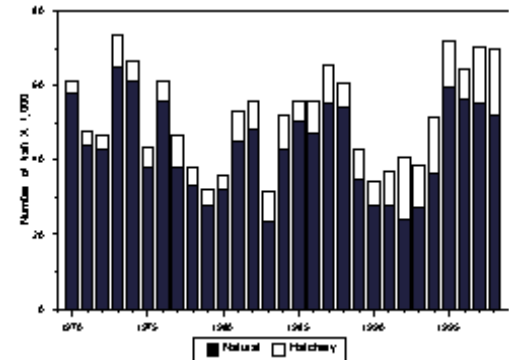


Figure 6 Annual fall-run chinook salmon escapement to the Feather River, natural and hatchery contribution

**Figure 7--Fall-run Chinook Salmon Escapement to the Yuba River**

Earlier data have indicated that Yuba River fall-run chinook are a naturally spawning run with little input from the Feather River Hatchery. The tagging program now underway on the Feather River and the recovery of tagged salmon on the spawning grounds will be used to determine the source of fall-run chinook spawning in the Yuba River. Whatever the source of the fish, the 1998 escapement was the second best for the period of record.

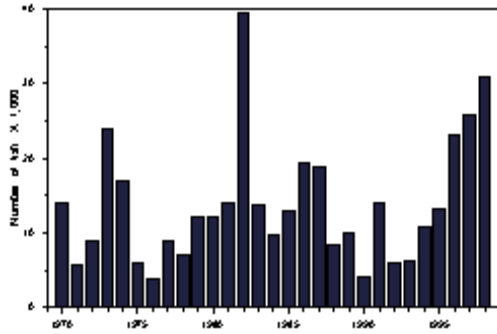


Figure 7 Annual natural fall-run chinook salmon escapement to the Yuba River

Although 1998 was the third consecutive year with reasonably good escapement to San Joaquin tributaries, it was not as good as might be expected from past records (Figure 8). The relatively low numbers are in spite of the lower ocean harvest. Preliminary genetic information indicates that San Joaquin fall-run chinook can not be distinguished from other Central Valley fall runs. DFG received a CALFED grant to further investigate the genetics of San Joaquin stocks spawning in the main tributaries.

**Figure 8--Escapement to the San Joaquin System**

In 1998, the California Fish and Game Commission listed spring-run chinook as threatened. NMFS will announce their decision whether to list spring-run chinook (as well as fall-run and late fall-run) sometime this summer.

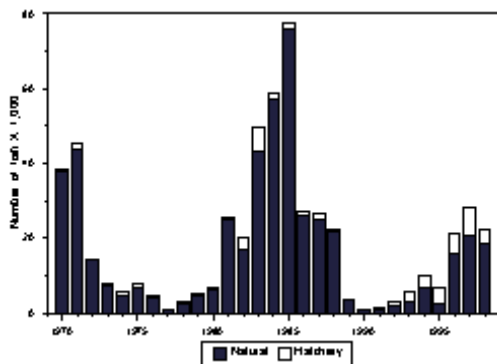


Figure 8 Annual fall-run chinook salmon escapement to the San Joaquin River system, natural and hatchery contribution

**Figure 9--Spring-run Chinook Salmon Escapement**

Most of the spring-run chinook spawn in Deer, Mill, and Butte creeks. The 1998 escapement was the second highest on record.

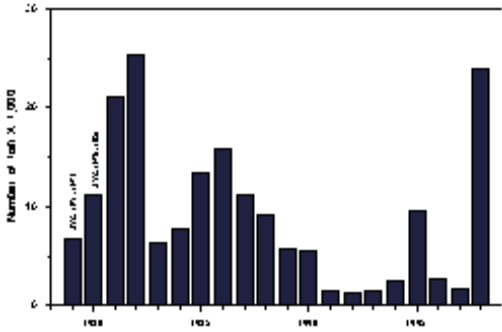


Figure 9 Annual spring-run chinook salmon escapement to the upper Sacramento River

As shown in Figure 10, in 1998 most of the spring-run chinook spawned on Butte Creek.

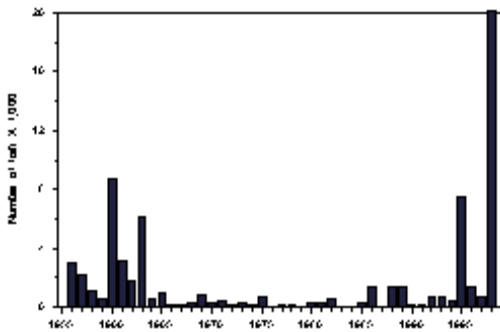


Figure 10 Annual spring-run chinook salmon escapement to Butte Creek

Genetic analysis has shown that the Butte Creek spring-run chinook are "true" spring-run but are different from those in Mill and Deer creeks. (There have been concerns that spring-run chinook on Butte Creek originated from Feather River Hatchery plants.)

**Figure 11--Winter-run Chinook Salmon Escapement**

The 1998 spawning estimate was more than 2,600 fish, the highest escapement in the past decade.

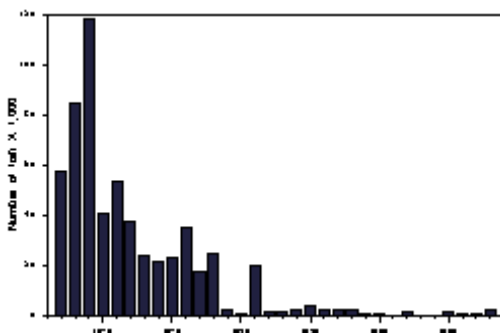


Figure 11 Annual winter-run chinook salmon escapement to the upper Sacramento River