Summary of 2007 Feather River Hatchery Spring-run Chinook Fish Ladder Investigations (**Draft**)

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Recent genetic studies on Chinook salmon in the Feather River (University of California at Davis, Bodega Marine Laboratory, 2002) indicate that a small, but potentially significant difference exists between spring-run Chinook and fall-run Chinook salmon. Considering Central Valley spring-run Chinook salmon are listed as threatened under both the California Endangered Species Act and the Federal Endangered Species Act, it is exceedingly important to conserve spring-run Chinook life history. Restoring reproductive isolation between spring and fall Chinook would maintain the current genetic differences between runs as well as provide a means for restoring former, ostensibly greater, genetic disparity. Assuming the earliest arriving salmon more closely reflect spring-run genetic characteristics, continually capturing and spawning these fish separate from later arriving salmon could maintain and likely increase genetic differentiation between Feather River spring-run and fall-run salmon.

A program was implemented to mark spring-run Chinook salmon entering the hatchery in May and June of 2004. The marking process involves inserting two Hallprint dart tags, one on either side of the dorsal fin. Once marked, fish are released and allowed to over-summer naturally in deep pools of the lower Feather River. During the hatchery spawning season, the mark enables the FRH to spawn early arriving spring-run separately from fall-run Chinook. Beginning in 2006 some of the salmon were given one "reward tag" instead of two regular Hallprint dart tags. This was done to encourage the public to become involved with our program by calling in the Hallprint tag numbers when they recovered a fish with tags. This gives us an idea of the percentage of spring run salmon that were caught by anglers, whether they were kept or released back into the river, and where in the river they were recovered. The following brief summarizes the preliminary results of this program for 2007.

Between May 3 and July 9, 2007, 9,756 "Spring-run" Chinook salmon were marked with individually numbered Hallprint dart tags for identification purposes at the Feather River Fish Hatchery. There were a total of 67 mortalities during the marking period. During the marking period, 1,527 Spring-run were recaptured in the FRH released again before the marking period concluded on July 9th. When spawning commenced in the fall, a total of 2,873 fish were recaptured: 1,849 at the FRH, 773 in the river escapement survey and 251 by anglers or recreators. The FRH successfully spawned 1,403 (76%) spring-run that returned to the hatchery. Forty-eight (48.5%) of the 99 female salmon recovered in the river escapement survey were classified as spent and are thus assumed to have spawned successfully. The majority of spawned females were recovered between the fourth week of September and the second week of October,

assuming that these fish spawned one to two weeks prior to recovery, the majority of spring run salmon spawned in September.

Table 1. Recovery and spawning status of female tagged spring run salmon from the escapement survey.

	Females	
WEEK	Unspent	Spent
4-Sep	3	0
10-Sep	0	0
17-Sep	0	0
24-Sep	6	24
1-Oct	4	10
8-Oct	6	12
15-Oct	1	2
22-Oct	0	0
29-Oct	0	0

The majority (99%) of the salmon recovered in the escapement survey were found above the Thermalito Afterbay Outlet (TAO) (Figure 1). Eighty-nine percent of the salmon caught by anglers were caught above the TAO (Figure 2). The high percentage of marked salmon recovered in the low flow channel (Figure 3) is typical for the spring run salmon. Over the past 3 years (2004-2006) there have been no spawned female salmon recovered below the TAO. This pattern suggests that the spawning habitat above the TAO is preferred by the spring run salmon. While spawning habitat appears to be superior above the TAO, our telemetry surveys show that some spring run salmon will migrate throughout the river after being tagged in the hatchery and then return to the upper reaches of the low flow channel to spawn.

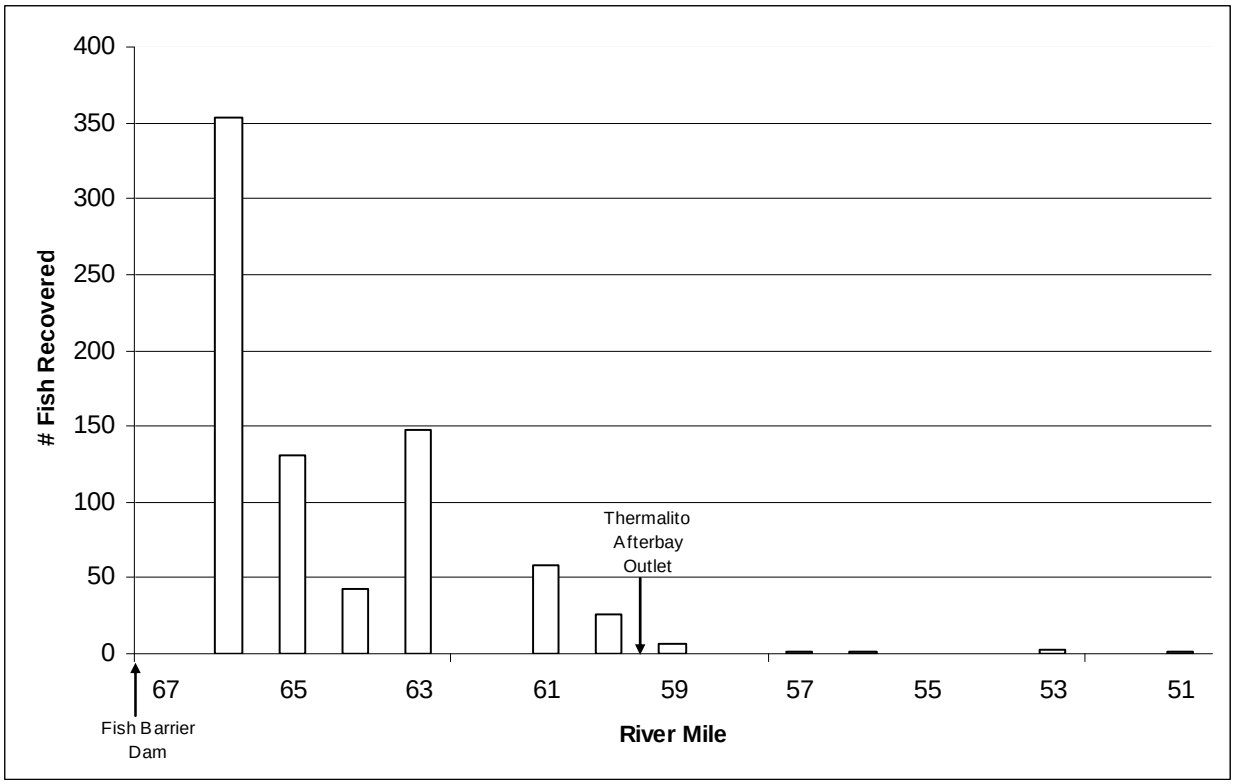

Figure 1. Number of salmon recovered by River Mile in the escapement survey.

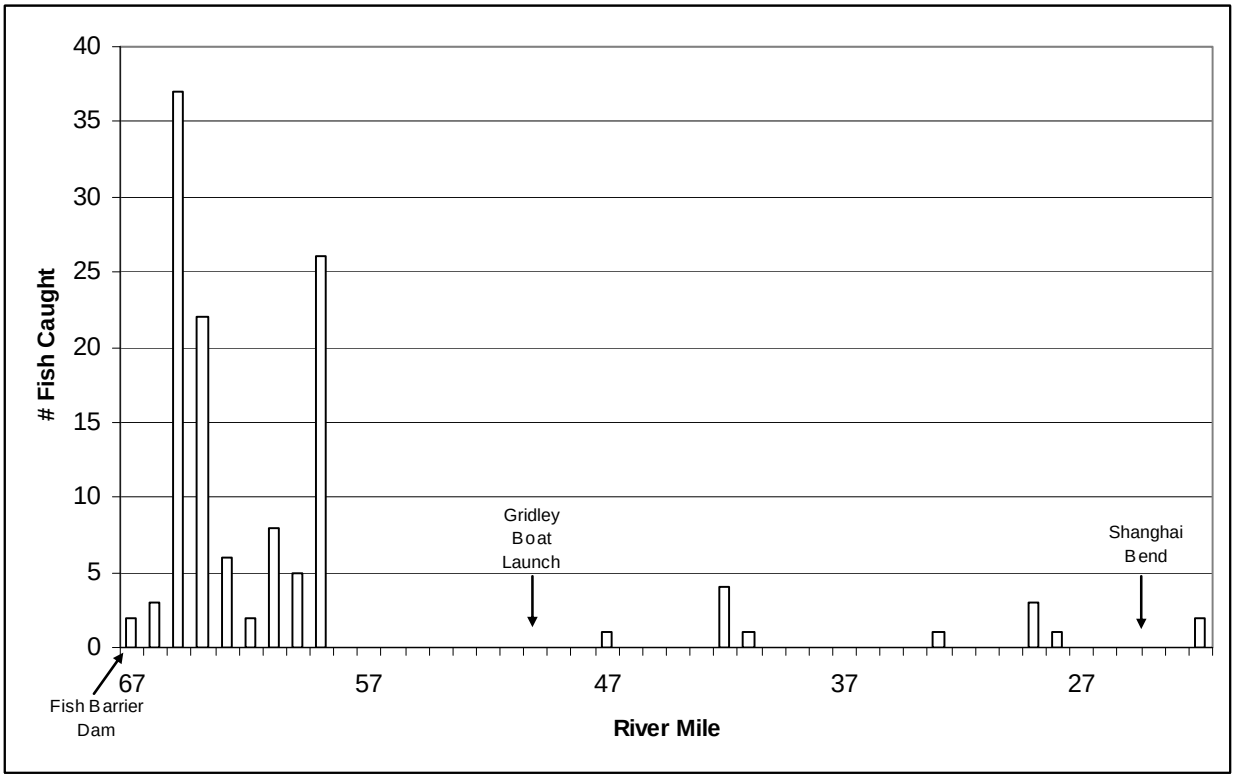

Figure 2. Number of salmon recaptured by anglers per River Mile.

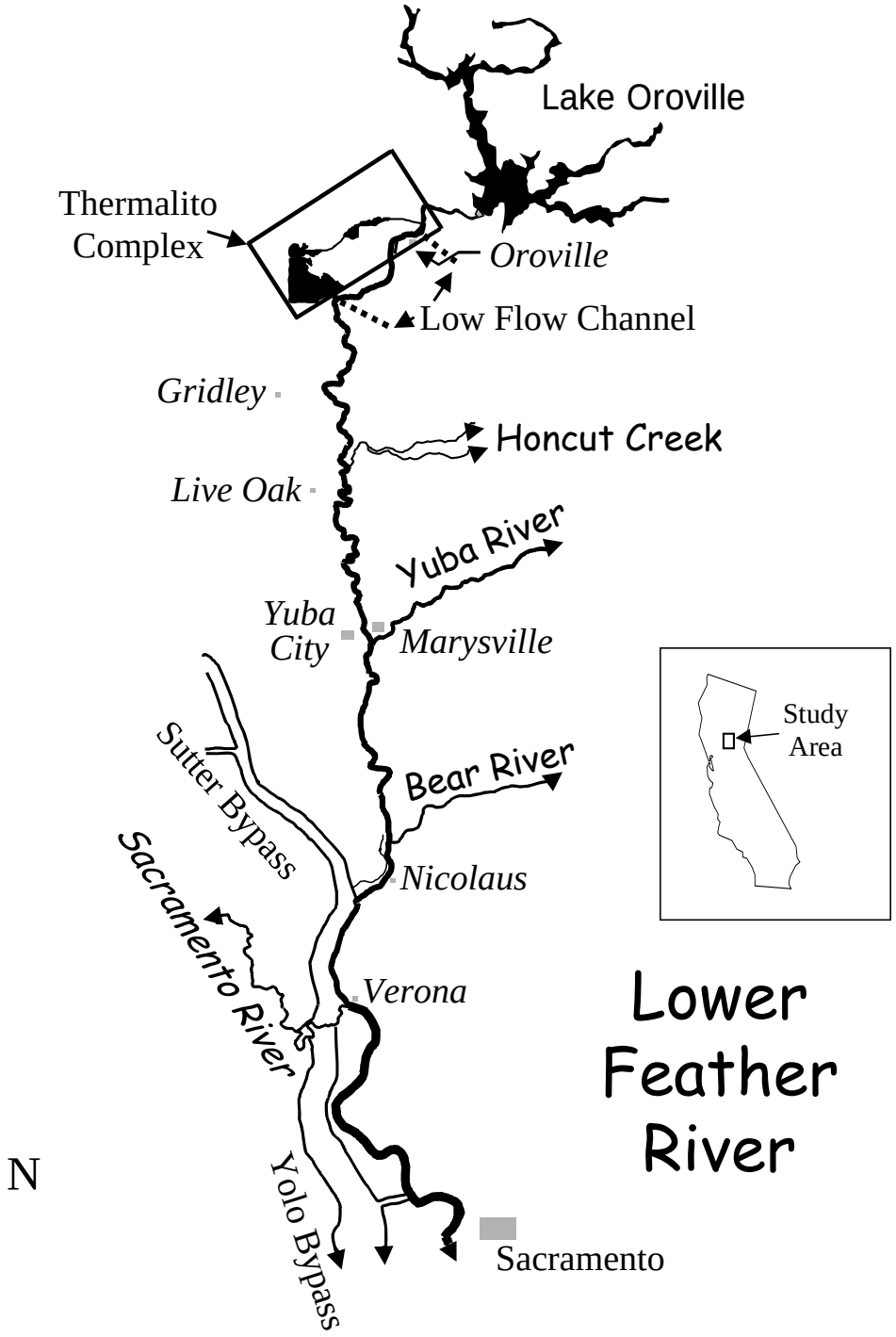

Figure 3. Map of the Lower Feather River.

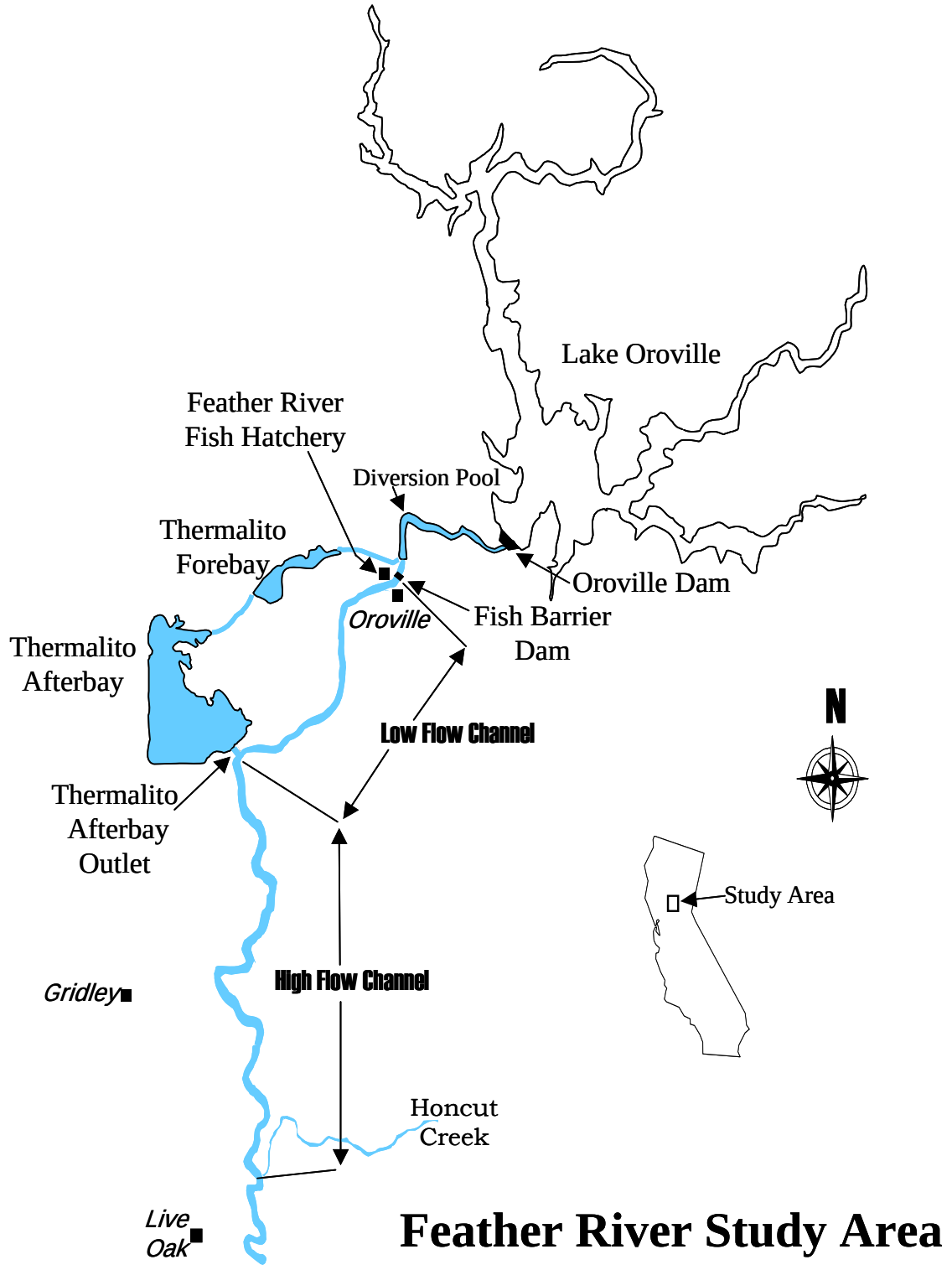

Figure 4. Map of the Feather River Study Area.