

Central Valley Salmon and Steelhead Marking/Coded-wire Tagging Program

**Fall-run Chinook Salmon
Spring-run Chinook Salmon
Steelhead**

2019 Marking Season



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Abstract

The Central Valley Constant Fractional Marking/Tagging Program (CFM) was initiated in the spring of 2007 following the purchase of four automated fish tagging trailers (AutoFish Systems). Planning studies indicated that the optimal marking/tagging rate for the Central Valley CFM program was 25% of the fall-run Chinook salmon production releases. For each production release (fish released at the same time and location), the program therefore targeted marking with an adipose fin-clip and coded-wire tagging a representative 25% of each release of fall-run Chinook salmon from the Central Valley hatcheries in 2007 through 2019. The program was conducted at Coleman National Fish Hatchery, Feather River Fish Hatchery, Nimbus Fish Hatchery, and Mokelumne River Fish Hatchery in these years. We assisted with the manual tagging operations at Merced River Fish Hatchery during the 2019 tagging season.

The AutoFish Trailers were also used in the 2011 through 2019 seasons to adipose fin-clip and coded-wire tag 100% of the spring-run Chinook salmon reared at the Feather River Fish Hatchery, and adipose fin-clip 100% of the steelhead reared at Coleman National Fish Hatchery, Feather River Fish Hatchery, Mokelumne River Fish Hatchery, and Nimbus Fish Hatchery.

This report includes the marking/tagging activities conducted with the AutoFish Systems and manual marking trailers at the five Central Valley hatcheries in 2019 (Brood Year 2018 fall-run Chinook salmon, spring-run Chinook salmon, and steelhead). The program successfully processed 100% of the production releases of fall-run Chinook salmon through the automated and manual marking trailers, 32,132,173 fish. Of the fall-run Chinook salmon total, approximately 30.21% were coded-wire tagged and adipose fin-clipped (9,706,812 fish). In addition, the program marked and coded-wire tagged 100% of the spring-run Chinook salmon produced at the Feather River Fish Hatchery, a total of 1,853,610 fish. The program also adipose fin-clipped 100% of the steelhead produced at Coleman National Fish Hatchery, Feather River Fish Hatchery, Mokelumne River Fish Hatchery, and Nimbus Fish Hatchery, a total of 1,979,909 fish. The Coleman National Fish Hatchery late-fall-run and winter-run Chinook salmon and steelhead marking/tagging numbers are included in a separate report.

Introduction

In most years, approximately 30 million fall-run Chinook salmon are produced at five hatcheries in California's Central Valley, including Coleman National Fish Hatchery, Feather River Fish Hatchery, Nimbus Fish Hatchery, Merced River Fish Hatchery, and Mokelumne River Fish Hatchery (Figure 1). Production from these hatcheries contributes to major sport and commercial fisheries in ocean and inland areas. Until 2007, only experimental releases of fall-run Chinook were externally marked and coded-wire tagged on a regular basis.

In 2004, the CALFED Ecosystem Restoration Program (ERP) funded a study to design a constant fractional marking/coded-wire tagging program for production releases of fall-run Chinook salmon from Central Valley hatcheries, with the goal of estimating in a statistically valid manner the relative contribution of hatchery production. The study recommended the implementation of a system-wide marking/tagging program for production releases.

In 2006, the ERP Program provided the initial funding to begin implementation of the Central Valley Constant Fractional Marking (CFM) program. The initial contract provided funding to Pacific States Marine Fisheries Commission for the purchase of four automated tagging systems (AutoFish Systems) and the first two years of operating costs for marking/tagging production releases of fall-run Chinook salmon at the five major Central Valley hatcheries (in 2007 and 2008).

This program is a cooperative effort of the California Department of Fish and Wildlife, California Department of Water Resources, U.S. Fish and Wildlife Service, Pacific States Marine Fisheries Commission, U.S. Bureau of Reclamation, and East Bay Municipal Utility District. In 2009 through 2019, funding to conduct tagging operations was provided by the following entities: California Department of Water Resources and California Department of Fish and Wildlife; East Bay Municipal Utility District; and U.S. Bureau of Reclamation.

From 2002 to 2010, 100% of the spring-run Chinook salmon production at Feather River Hatchery was marked and coded-wire tagged using manual techniques. In 2011 through 2019, an AutoFish Trailer was used for the spring-run Chinook salmon marking/tagging. Funding was provided by the California Department of Water Resources.

The overall objectives of the fall and spring-run Chinook salmon tagging programs are:

1. To evaluate the contribution rates of hatchery fish to Central Valley Chinook salmon populations,
2. To evaluate the Central Valley propagation program's genetic and ecological effects on natural Chinook populations,
3. To estimate exploitation rates of hatchery and natural Central Valley Chinook salmon in ocean and inland fisheries,
4. To evaluate the success of restoration actions designed to increase natural production of Central Valley Chinook salmon,
5. To evaluate the relative impacts of water project operations on hatchery and naturally-produced Chinook salmon,
6. To evaluate the recovery of listed stocks of Chinook salmon.

All of the steelhead reared at Central Valley hatcheries were also marked using the AutoFish Trailers in 2019. Marking allows selective harvest of hatchery-reared steelhead in sport fisheries.

This report covers the Thirteenth year of the CFM program's marking/tagging activities at four major Central Valley hatcheries in the spring/summer of 2019 (Brood Year 2018 fall-run Chinook salmon). Also included in this report is the manual tagging operations conducted at Merced River Fish Hatchery fall-run Chinook salmon. The report also includes the marking/tagging of Brood Year 2018 spring-run Chinook salmon reared at the Feather River Fish Hatchery, and marking of steelhead reared at Feather River Fish Hatchery, Mokelumne River Fish Hatchery, and Nimbus Fish Hatchery. Coleman National Fish Hatchery steelhead and late-fall run and winter-run Chinook salmon are included in a separate report.

Methods

The coded-wire tag/adipose fin clip is the method agreed to by the Pacific Salmon Treaty (1999) to monitor Chinook salmon in ocean fisheries along the Pacific Coast. It is a cost-effective method to apply a long-term mark that gives data on hatchery origin and release group, and provides for external identification of tagged fish. The coded-wire tag/adipose fin-clip marking method has been used throughout the West Coast of North America since the 1970's. Currently, over 50 million Chinook and coho salmon are coded-wire tagged each year. This Central Valley program is an integral part of this Coast-wide tagging program; tagged fish are recovered in ocean fisheries throughout the West Coast.

Four state-of-the-art automated tagging trailers were purchased for the Central Valley program in late 2006 and early 2007 from Northwest Marine Technology. The trailers incorporated the latest advanced technology for marking and coded-wire tagging fish. The AutoFish System™ has the capacity to mark and implant coded-wire tags very rapidly without any use of anesthetic or human contact. These systems have been in use for many years in the Pacific Northwest, but the Central Valley trailers were the first to be purchased for use in California.

Planning studies indicated that the optimal marking/tagging rate for the Central Valley CFM program was 25% of the fall-run Chinook production releases. For each production release (fish released at the same time and location), the program therefore targeted marking/tagging a representative 25% in 2007 through 2019. Coded-wire tags for the 2019 season were ordered from Northwest Marine Technology in November 2018. Tags used in the program were all 1.1 mm standard length tags.

The program was conducted at Coleman National Fish Hatchery, Feather River Fish Hatchery, Nimbus Fish Hatchery, and Mokelumne River Fish Hatchery (Figure 1). A manual tagging trailer was used for the fall-run Chinook salmon at Merced River Fish Hatchery.

The automated marking trailers have the ability to process fish that are a minimum length of 57 mm and a maximum length of 142 mm. With this in mind, timing of AutoFish Trailer operations at each facility was critical to maximize efficiency and productivity while meeting hatchery release deadlines. Double shifts were often used to maximize efficiency and output of the AutoFish Trailers. Trailers were moved as needed when fish at each hatchery reached the appropriate marking size. The fall-run Chinook salmon marking/tagging season began the last week of February at Coleman National Fish Hatchery and ended at Nimbus Fish Hatchery the third week of May. Marking/tagging of hatchery-produced fall-run Chinook salmon in 2019 therefore spanned an 11-week period. The spring-run Chinook salmon marking/tagging season began the third week of February and was completed at Feather River Hatchery the fourth week of March for a total of five weeks. The Central Valley steelhead marking was conducted intermittently based on the number of fish that were the appropriate size to process through the AutoFish Trailers, from the third week of May through the second week of August for a total of thirteen weeks.

Throughout the season, fin-clipping rate and tag retention studies were conducted for fall and spring-run Chinook salmon to determine actual marking/tagging rates for each coded-wire tag code. Except as otherwise noted below, approximately 800-900 marked/tagged fish per tag code were retained and held separately for a period of approximately 21 days following the completion of each tag code. At Coleman National Fish Hatchery and Mokelumne River Fish Hatchery, approximately 400 fish were held for retention purposes for each tag code. A lower number of fish was used in studies at these facilities due to the large number of tag codes used. Study fish were sampled from throughout the tagging period for each tag code. Fish were electronically tested for tag

retentions and visually inspected for fin-clip quality at the end of the study period. During these quality checks, for a fish to be counted as successfully retaining a tag, 60% or more of the adipose fin must be removed and a coded-wire tag must be present. A partial clip resulted in 10-40% of the adipose fin still present but was not counted against the successful clipping rate. If more than 40% of the adipose fin was still intact, it was classified as unclipped and therefore counts against the successful tagging rate (i.e. it likely would not be checked for a CWT since the adipose fin is intact or mostly intact). In some instances, fish were held for less than the standard 21-day time period due to specific hatchery release strategies. For some smaller tag codes, tag retention studies were not feasible; for these tag groups, retention rates were extrapolated from larger groups tagged at the same hatchery during similar time periods.

Following the tagging season, coded-wire tag data were summarized for submission to [the Regional Mark Processing Center \(RMPC\)](http://www.rmipc.org), operated by the Pacific States Marine Fisheries Commission (<http://www.rmipc.org>). The RMPC provides regional coordination of salmon tagging and fin marking programs, and maintenance of coastwide databases for coded-wire tag releases, recoveries, and associated catch/sample information, in the Regional Mark Information System (RMIS).

Figure 2 summarizes the annual project work flow.

Results

Daily tagging rates, tag codes, and results of retention studies for the 2019 tagging season are shown in Appendix Tables 1 – 7 for each of the hatcheries. The technology allowed an accurate count of all production fish, and the marking/tagging of an exact percentage of those fish.

The program successfully processed 100% of the 2019 production releases of fall-run Chinook salmon from the Central Valley hatcheries (totaling 32,132,173 fish). The 25% target rate for marking/tagging was achieved for Brood Year 2018 (approximately 30.21% were CWT/ad-clipped, 9,706,812 fish). The AutoFish Trailers also marked and tagged Brood Year 2018 spring-run Chinook salmon reared at the Feather River Fish Hatchery 1,853,610 fish.

The AutoFish Trailers marked 100% of the steelhead reared at Coleman National Fish Hatchery, Feather River Fish Hatchery, Mokelumne River Fish Hatchery, and Nimbus Fish Hatchery.

Tag retention studies for the fall-run Chinook salmon indicated very high rates of tag/mark retention. Retention rates ranged as follows:

- Coleman National Fish Hatchery: 98.19% - 100% with an average of 99.60%
- Feather River Fish Hatchery: 93.46% - 99.75% with an average of 98.58%
- Mokelumne River Fish Hatchery: 98.50% - 100% with average of 99.56%
- Nimbus Fish Hatchery: 99.45% - 100% with an average of 99.71%
- Merced River Fish Hatchery: 98.30% - 99.88% with an average of 99.23%

Tag retention studies for the spring-run Chinook salmon also indicated high rates of tag/mark retention. Retention rates ranged as follows:

- Feather River Hatchery: 97.32% - 99.89% with an average of 99.12%

The steelhead from each facility are generally released during the winter months and clip quality will be checked just prior to release.

The numbers of fish included in this report were those processed and returned to the raceways during the tagging process. The actual numbers of fish released may differ. Please refer to the RMIS website, <http://www.rmipc.org>, for the number of fish that were successfully clipped, tagged, and then released.

Discussion

Similar to past tagging seasons, finding and retaining qualified technical personnel for program operations continued to be a challenge during the 2019 tagging season. At the northern four hatcheries, the program had eight Trailer Operators and eight Trailer Assistants employed at the start of the 2019 season. At Merced River Hatchery, one crew leader and four Trailer Assistants were employed for the duration of the project. Multiple crewmembers left prior to the end of the season for the Northern tagging crew but we were able to complete the marking/tagging with a short crew.

There was an issue at Coleman National Fish Hatchery on the fall-run Chinook salmon where a water valve was left unlocked and the PSMFC Trailer Operator turned it off to move the tote and AutoFish Trailer water supply pump. The Trailer Operator forgot to turn the water back on which resulted in a significant fish die off in raceway 11. New protocols have been put in place in hopes of preventing the possibility of this ever happening again.

There was another issue with Coleman National Fish Hatchery steelhead. An AutoFish Trailer was disinfected then immediately moved to the steelhead bank to start the adipose fin-clipping. There were two PSMFC Trailer Operators present which this was their first year of AutoFish Trailer experience. It appears that the trailer was not sufficiently flushed which resulted in the die off of approximately 4,000 steelhead.

This report includes all of the anadromous marking/tagging activities in the Central Valley with the exception of the Coleman National Fish Hatchery late-fall-run Chinook salmon and steelhead, and Coleman National Fish Hatchery and Livingston Stone National Fish Hatchery winter-run Chinook. These groups of fish are included in separate annual reports.

Acknowledgements

The Constant Fractional Marking Program would not have existed or successfully completed thirteen years of tagging without significant contributions from a number of people and agencies. I would like to thank the following individuals for their support, dedication and cooperation in this program:

Management, administration, problem solving, and the existence of this program would not have been possible without Keri Miles and Jay Rowan, California Department of Fish and Wildlife (CDFW); Stan Allen and Amy Roberts, Pacific States Marine Fisheries Commission (PSMFC); John Hannon, Bureau of Reclamation (USBR), Jose Setka East Bay Municipal Utility District (EBMUD); Kevin Niemela, U.S. Fish and Wildlife Service (USFWS) and Sabrina Bell, Eric See, and Jason Kindopp (CDWR).

In particular, I want to thank the managers and staff working at the hatcheries where we conduct the marking/tagging program. Without your help, cooperation and support, this program would not be possible. Your willingness to work with us in adjusting the agendas and scheduling is critical in meeting the goals of all of the facilities. Ron Stone (USFWS - Coleman National Fish Hatchery), Penny Booth-Crawshaw (CDFW - Feather River Fish Hatchery), Anna Kastner (CDFW - Feather River Fish Hatchery), Gary Novak (CDFW - Nimbus Fish Hatchery), Darrick Baker (CDFW- Mokelumne River Hatchery), William Smith (CDFW - Mokelumne River Fish Hatchery), and their very professional hatchery staff did a significant amount of work to accommodate the trailers at their hatcheries, and made us feel welcome while we were on-site. I look forward to continuing to work with you all.

I also want to thank Chris Childers (PSMFC) for his work on the data and all of his maintenance work on the AutoFish Trailers to ensure that everything was operational. I also want to thank the rest of the professional and hardworking CFM crew that made this thirteenth season a great success. They each spent many long days away from home to accomplish the goals of this very demanding program. Trailer Operators included Mitchell Barrerras (PSMFC), Chris Childers (PSMFC), Andrew Grette (PSMFC), Tarah Mayes (PSMFC), Jenna Shikuzawa (PSMFC), James Shipp (PSMFC), and Alex Reich (PSMFC). Tagging Trailer Assistants included seasonal PSMFC staff members Steve Akana, Nathan Bailey, Stephanie Caudill, Kaycee Coonen, Casey Ellarson, Seth Lucks, Nallely Orozco, and Jesse McNiel.

Schedule of Mark Events

- January 2nd - January 17th Clipping/Tagging winter-run Chinook at Livingston Stone National Fish Hatchery
- January 28th - February 25th Clipping/Tagging winter-run Chinook at Coleman National Fish Hatchery
- February 19th - March 25th Clipping/Tagging spring-run Chinook at Feather River Fish Hatchery
- February 26th - May 2nd Clipping/Tagging fall-run Chinook at Coleman National Fish Hatchery
- March 26th - May 13th Clipping/Tagging fall-run Chinook at Feather River Fish Hatchery
- March 19th - May 15th Clipping/Tagging fall-run Chinook at Mokelumne River Fish Hatchery
- March 4th - April 23rd Clipping/Tagging fall-run Chinook at Merced Fish Hatchery
- April 8th - May 16th Clipping/Tagging fall-run Chinook at Nimbus Fish Hatchery
- May 21st - June 21st Clipping steelhead at Coleman National Fish Hatchery
- May 28th - July 1st Clipping/Tagging late-fall-run Chinook at Coleman National Fish Hatchery
- June 11th - August 13th Clipping steelhead at Feather River Fish Hatchery
- June 25th - July 2nd Clipping steelhead at Mokelumne River Fish Hatchery
- May 28th - June 28th Clipping steelhead at Nimbus Fish Hatchery

Figure 1. Hatchery Locations: Central Valley Constant Fractional Marking Program (2019)

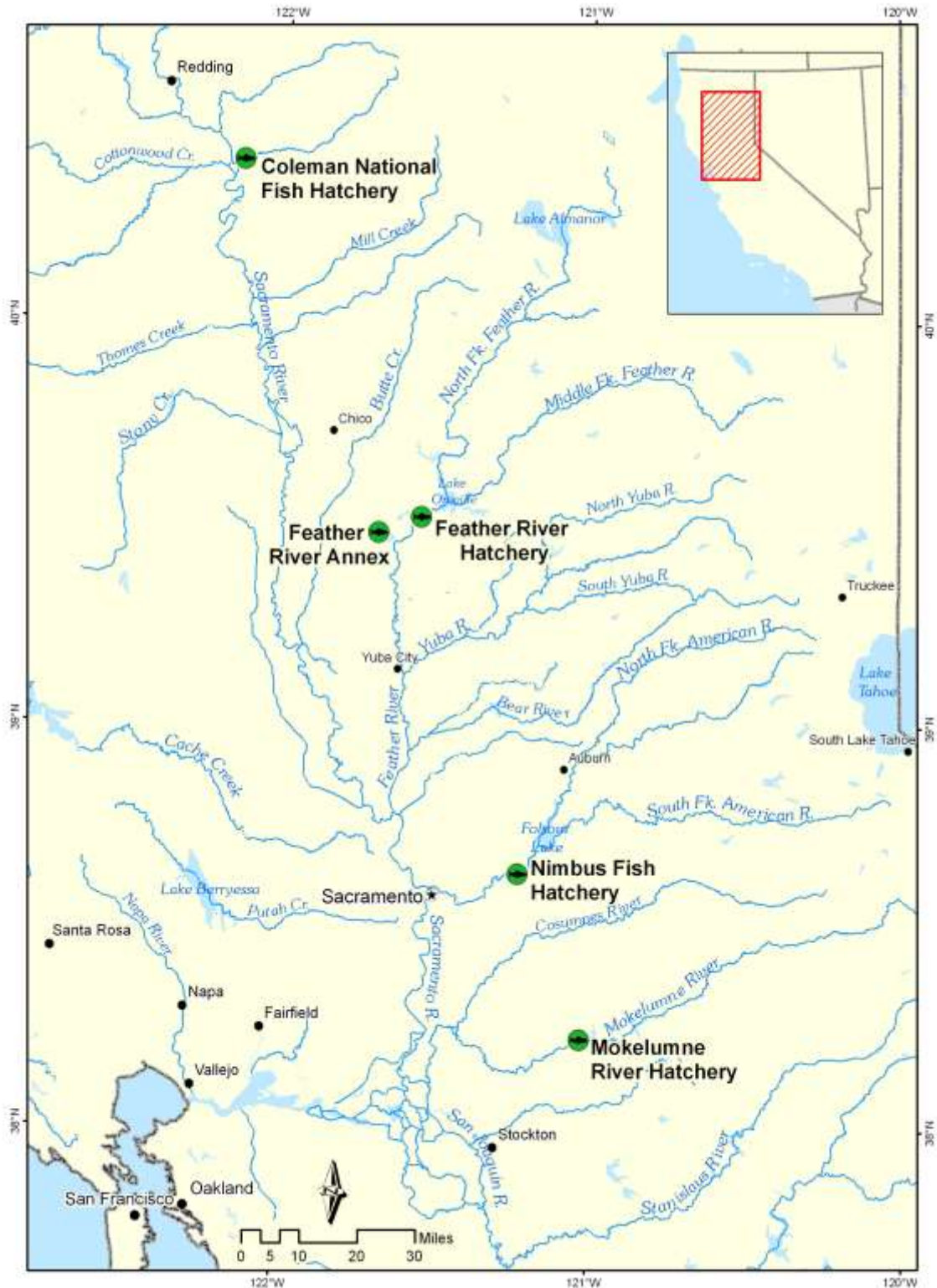
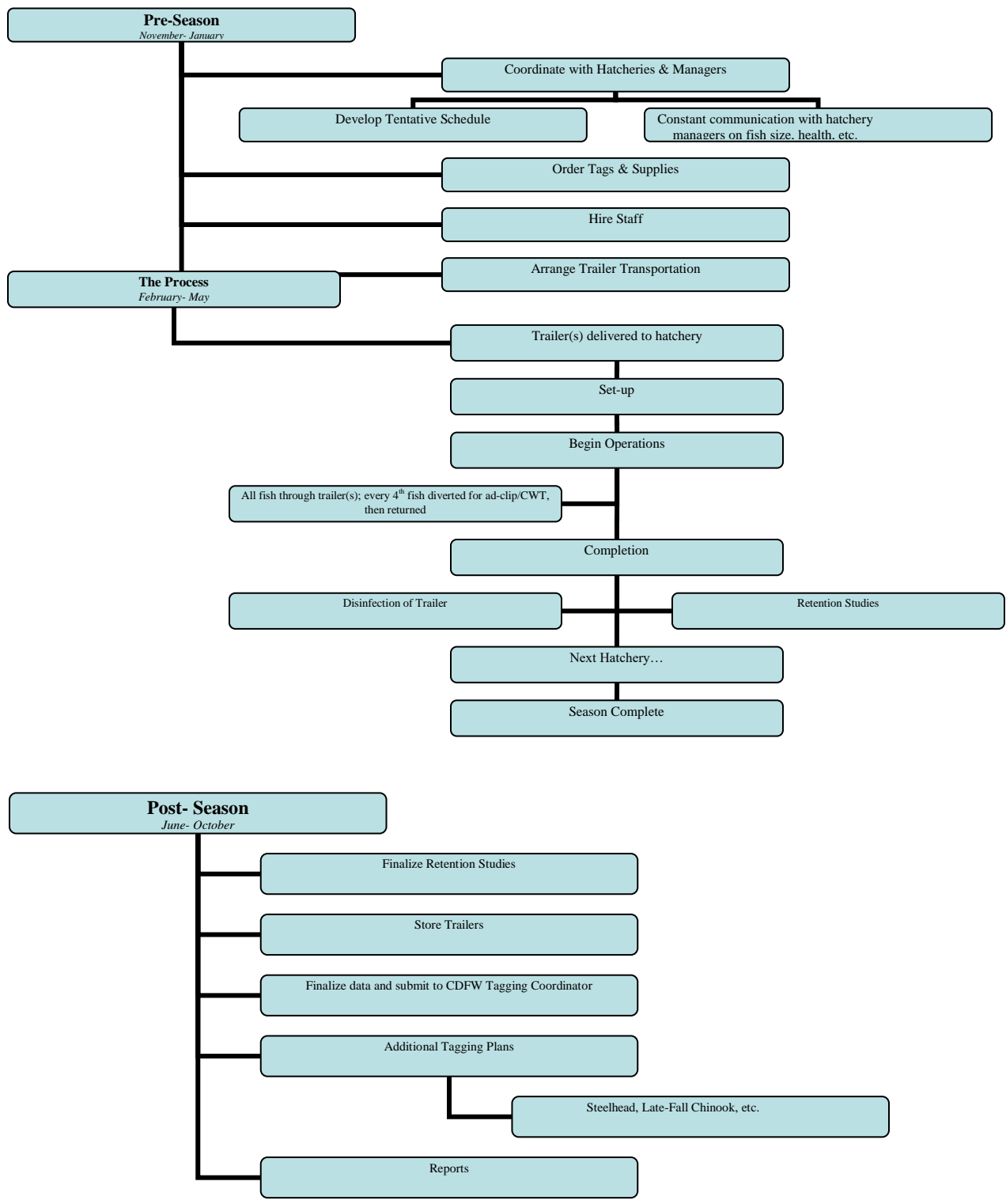


Figure 2. Constant Fractional Marking Program Annual Work Flow Summary



Appendix

Coleman National Fish Hatchery



Table 1a. Daily Tagging Rates at Coleman National Fish Hatchery

Coleman National Fish Hatchery - Fall Run Chinook							
Tag Code: 05/62/95			Size: 110K			Trailer # CA3	
Tagging Date	Raceway Prior to Tagging	Raceway Following Tagging	Daily Tagged Total	Cumulative Tagged Total	Daily Untagged Total	Cumulative Untagged Total	Raceway Total
2/26/2019	1	1	19,227	-	57,858	-	77,085
2/26/2019	1	1	28,937	48,164	86,892	144,750	192,914
2/27/2019	1	1	3,490	51,654	10,542	155,292	206,946
2/27/2019	1	1	31,210	82,864	93,660	248,952	331,816
2/28/2019	1	1	27,201	110,065	81,690	330,642	440,707
2/28/2019	1	1	4,984	115,049	15,042	345,684	460,733
Tag Code Totals			-	115,049	-	345,684	460,733

Coleman National Fish Hatchery - Fall Run Chinook							
Tag Code: 05/62/87			Size: 110K			Trailer # CA3	
Tagging Date	Raceway Prior to Tagging	Raceway Following Tagging	Daily Tagged Total	Cumulative Tagged Total	Daily Untagged Total	Cumulative Untagged Total	Raceway Total
2/28/2019	2	2	20,478	-	61,485	-	81,963
3/1/2019	2	2	34,657	55,135	104,061	165,546	220,681
3/1/2019	2	2	22,265	77,400	66,855	232,401	309,801
3/4/2019	2	2	17,176	94,576	51,600	284,001	378,577
3/4/2019	2	2	18,467	113,043	55,530	339,531	452,574
3/5/2019	2	2	254	113,297	792	340,323	453,620
Tag Code Totals			-	113,297	-	340,323	453,620

Coleman National Fish Hatchery - Fall Run Chinook							
Tag Code: 05/62/88			Size: 110K			Trailer # CA3	
Tagging Date	Raceway Prior to Tagging	Raceway Following Tagging	Daily Tagged Total	Cumulative Tagged Total	Daily Untagged Total	Cumulative Untagged Total	Raceway Total
3/5/2019	3	3	43,729	-	131,331	-	175,060
3/6/2019	3	3	31,754	75,483	95,445	226,776	302,259
3/6/2019	3	3	24,350	99,833	73,080	299,856	399,689
3/7/2019	3	3	22,708	122,541	68,223	368,079	490,620
Tag Code Totals			-	122,541	-	368,079	490,620

Coleman National Fish Hatchery - Fall Run Chinook							
Tag Code: 05/62/89			Size: 110K			Trailer # CA4	
Tagging Date	Raceway Prior to Tagging	Raceway Following Tagging	Daily Tagged Total	Cumulative Tagged Total	Daily Untagged Total	Cumulative Untagged Total	Raceway Total
3/4/2019	4	4	8,442	-	25,542	-	33,984
3/4/2019	4	4	22,182	30,624	66,642	92,184	122,808
3/5/2019	4	4	28,372	58,996	85,206	177,390	236,386
3/5/2019	4	4	33,891	92,887	101,748	279,138	372,025
3/6/2019	4	4	15,803	108,690	47,502	326,640	435,330
3/7/2019	3	4	5,131	113,821	15,495	342,135	455,956
Tag Code Totals			-	113,821	-	342,135	455,956

Coleman National Fish Hatchery - Fall Run Chinook							
Tag Code: 05/62/90			Size: 110K			Trailer # CA3	
Tagging Date	Raceway Prior to Tagging	Raceway Following Tagging	Daily Tagged Total	Cumulative Tagged Total	Daily Untagged Total	Cumulative Untagged Total	Raceway Total
3/7/2019	5	5	4,692	-	14,082	-	18,774
3/8/2019	5	5	29,241	33,933	87,807	101,889	135,822
3/8/2019	5	5	22,272	56,205	66,843	168,732	224,937
3/11/2019	5	5	21,711	77,916	65,220	233,952	311,868
3/11/2019	5	5	29,273	107,189	87,885	321,837	429,026
3/12/2019	5	5	4,138	111,327	12,459	334,296	445,623
Tag Code Totals			-	111,327	-	334,296	445,623

Coleman National Fish Hatchery - Fall Run Chinook							
Tag Code: 05/62/91			Size: 110K			Trailer # CA4	
Tagging Date	Raceway Prior to Tagging	Raceway Following Tagging	Daily Tagged Total	Cumulative Tagged Total	Daily Untagged Total	Cumulative Untagged Total	Raceway Total
3/6/2019	6	6	33,302	-	100,047	-	133,349
3/7/2019	6	6	35,477	68,779	106,518	206,565	275,344
3/7/2019	6	6	24,767	93,546	74,388	280,953	374,499
Tag Code Totals			-	93,546	-	280,953	374,499

Coleman National Fish Hatchery - Fall Run Chinook							
Tag Code: 05/62/92			Size: 110K			Trailer # CA4	
Tagging Date	Raceway Prior to Tagging	Raceway Following Tagging	Daily Tagged Total	Cumulative Tagged Total	Daily Untagged Total	Cumulative Untagged Total	Raceway Total
3/8/2019	7	7	20,395	-	61,275	-	81,670
3/8/2019	7	7	21,635	42,030	64,959	126,234	168,264
3/11/2019	7	7	22,210	64,240	66,738	192,972	257,212
3/11/2019	7	7	34,973	99,213	105,000	297,972	397,185
3/12/2019	7	7	18,075	117,288	54,324	352,296	469,584
Tag Code Totals			-	117,288	-	352,296	469,584

Coleman National Fish Hatchery - Fall Run Chinook							
Tag Code: 05/62/93			Size: 110K			Trailer # CA3	
Tagging Date	Raceway Prior to Tagging	Raceway Following Tagging	Daily Tagged Total	Cumulative Tagged Total	Daily Untagged Total	Cumulative Untagged Total	Raceway Total
3/12/2019	8	8	15,904	-	47,739	-	63,643
3/12/2019	8	8	24,399	40,303	73,251	120,990	161,293
3/13/2019	8	8	29,000	69,303	87,075	208,065	277,368
3/13/2019	8	8	35,940	105,243	107,928	315,993	421,236
3/14/2019	8	8	7,429	112,672	22,356	338,349	451,021
Tag Code Totals			-	112,672	-	338,349	451,021

Coleman National Fish Hatchery - Fall Run Chinook							
Tag Code: 05/62/94			Size: 110K			Trailer # CA4	
Tagging Date	Raceway Prior to Tagging	Raceway Following Tagging	Daily Tagged Total	Cumulative Tagged Total	Daily Untagged Total	Cumulative Untagged Total	Raceway Total
3/12/2019	9	9	33,312	-	100,260	-	133,572
3/13/2019	9	9	31,569	64,881	94,809	195,069	259,950
3/13/2019	9	9	30,716	95,597	92,295	287,364	382,961
Tag Code Totals			-	95,597	-	287,364	382,961

Coleman National Fish Hatchery - Fall Run Chinook							
Tag Code: 05/62/96			Size: 110K			Trailer # CA4	
Tagging Date	Raceway Prior to Tagging	Raceway Following Tagging	Daily Tagged Total	Cumulative Tagged Total	Daily Untagged Total	Cumulative Untagged Total	Raceway Total
3/14/2019	10	10	31,013	-	93,150	-	124,163
3/14/2019	10	10	37,878	68,891	113,703	206,853	275,744
3/15/2019	10	10	39,304	108,195	117,981	324,834	433,029
3/15/2019	10	10	18,397	126,592	55,242	380,076	506,668
Tag Code Totals			-	126,592	-	380,076	506,668

Coleman National Fish Hatchery - Fall Run Chinook							
Tag Code: 05/62/97			Size: 110K			Trailer # CA4	
Tagging Date	Raceway Prior to Tagging	Raceway Following Tagging	Daily Tagged Total	Cumulative Tagged Total	Daily Untagged Total	Cumulative Untagged Total	Raceway Total
3/18/2019	11	5	7,277	-	21,882	-	29,159
3/18/2019	11	5	10,505	17,782	31,557	53,439	71,221
3/19/2019	11	5	14,174	31,956	42,621	96,060	128,016
3/19/2019	11	5	28,129	60,085	84,468	180,528	240,613
3/20/2019	11	5	26,096	86,181	78,336	258,864	345,045
3/20/2019	11	5	27,482	113,663	82,491	341,355	455,018
3/21/2019	11	5	3,692	117,355	11,112	352,467	469,822
Tag Code Totals			-	117,355	-	352,467	469,822

Coleman National Fish Hatchery - Fall Run Chinook							
Tag Code: 05/62/98			Size: 110K			Trailer # CA4	
Tagging Date	Raceway Prior to Tagging	Raceway Following Tagging	Daily Tagged Total	Cumulative Tagged Total	Daily Untagged Total	Cumulative Untagged Total	Raceway Total
3/21/2019	12	11	20,666	-	62,043	-	82,709
3/22/2019	12	11	17,938	38,604	53,865	115,908	154,512
3/25/2019	12	11	15,516	54,120	46,656	162,564	216,684
3/25/2019	12	11	27,444	81,564	82,389	244,953	326,517
3/26/2019	12	11	32,668	114,232	98,067	343,020	457,252
3/26/2019	12	11	4,734	118,966	14,235	357,255	476,221
Tag Code Totals			-	118,966	-	357,255	476,221

Coleman National Fish Hatchery - Fall Run Chinook							
Tag Code: 05/62/99			Size: 110K			Trailer # CA4	
Tagging Date	Raceway Prior to Tagging	Raceway Following Tagging	Daily Tagged Total	Cumulative Tagged Total	Daily Untagged Total	Cumulative Untagged Total	Raceway Total
3/26/2019	13	12	5,240	-	15,753	-	20,993
3/27/2019	13	12	30,661	35,901	92,109	107,862	143,763
3/27/2019	13	12	31,175	67,076	93,582	201,444	268,520
3/28/2019	13	12	32,908	99,984	98,817	300,261	400,245
3/28/2019	13	12	24,240	124,224	72,780	373,041	497,265
Tag Code Totals			-	124,224	-	373,041	497,265

Coleman National Fish Hatchery - Fall Run Chinook							
Tag Code: 05/63/03			Size: 110K			Trailer # CA3	
Tagging Date	Raceway Prior to Tagging	Raceway Following Tagging	Daily Tagged Total	Cumulative Tagged Total	Daily Untagged Total	Cumulative Untagged Total	Raceway Total
3/26/2019	14	10	26,351	-	79,269	-	105,620
3/27/2019	14	10	27,870	54,221	83,724	162,993	217,214
3/27/2019	14	10	27,027	81,248	81,210	244,203	325,451
3/28/2019	14	10	17,426	98,674	52,404	296,607	395,281
Tag Code Totals			-	98,674	-	296,607	395,281

Coleman National Fish Hatchery - Fall Run Chinook							
Tag Code: 05/63/04			Size: 110K			Trailer # CA3	
Tagging Date	Raceway Prior to Tagging	Raceway Following Tagging	Daily Tagged Total	Cumulative Tagged Total	Daily Untagged Total	Cumulative Untagged Total	Raceway Total
3/28/2019	15	14	8,654	-	26,157	-	34,811
3/29/2019	15	14	25,472	34,126	76,479	102,636	136,762
3/29/2019	15	14	29,533	63,659	88,689	191,325	254,984
4/1/2019	15	14	19,539	83,198	58,683	250,008	333,206
4/1/2019	15	14	28,436	111,634	85,392	335,400	447,034
4/2/2019	15	14	7,514	119,148	22,602	358,002	477,150
Tag Code Totals			-	119,148	-	358,002	477,150

Coleman National Fish Hatchery - Fall Run Chinook							
Tag Code: 05/63/05			Size: 110K			Trailer # CA4	
Tagging Date	Raceway Prior to Tagging	Raceway Following Tagging	Daily Tagged Total	Cumulative Tagged Total	Daily Untagged Total	Cumulative Untagged Total	Raceway Total
3/29/2019	16	13	22,205	-	66,651	-	88,856
4/1/2019	16	13	22,716	44,921	68,280	134,931	179,852
4/1/2019	16	13	24,768	69,689	74,424	209,355	279,044
4/2/2019	16	13	37,409	107,098	112,278	321,633	428,731
Tag Code Totals			-	107,098	-	321,633	428,731

Coleman National Fish Hatchery - Fall Run Chinook							
Tag Code: 05/63/06			Size: 110K			Trailer # CA3	
Tagging Date	Raceway Prior to Tagging	Raceway Following Tagging	Daily Tagged Total	Cumulative Tagged Total	Daily Untagged Total	Cumulative Untagged Total	Raceway Total
4/2/2019	17	15	19,428	-	58,326	-	77,754
4/2/2019	17	15	27,721	47,149	83,202	141,528	188,677
4/3/2019	17	15	33,207	80,356	99,693	241,221	321,577
4/3/2019	17	15	24,589	104,945	73,833	315,054	419,999
4/4/2019	17	15	14,188	119,133	42,624	357,678	476,811
Tag Code Totals			-	119,133	-	357,678	476,811

Coleman National Fish Hatchery - Fall Run Chinook							
Tag Code: 05/63/07			Size: 110K			Trailer # CA4	
Tagging Date	Raceway Prior to Tagging	Raceway Following Tagging	Daily Tagged Total	Cumulative Tagged Total	Daily Untagged Total	Cumulative Untagged Total	Raceway Total
4/2/2019	18	16	25,365	-	76,155	-	101,520
4/3/2019	18	16	38,192	63,557	114,636	190,791	254,348
4/3/2019	18	16	26,085	89,642	78,312	269,103	358,745
4/4/2019	18	16	26,053	115,695	78,237	347,340	463,035
Tag Code Totals			-	115,695	-	347,340	463,035

Coleman National Fish Hatchery - Fall Run Chinook							
Tag Code: 05/63/08			Size: 110K			Trailer # CA4	
Tagging Date	Raceway Prior to Tagging	Raceway Following Tagging	Daily Tagged Total	Cumulative Tagged Total	Daily Untagged Total	Cumulative Untagged Total	Raceway Total
4/4/2019	19	18	42,385	-	127,260	-	169,645
4/5/2019	19	18	31,883	74,268	95,709	222,969	297,237
4/5/2019	19	18	35,648	109,916	107,016	329,985	439,901
4/8/2019	19	18	12,422	122,338	37,371	367,356	489,694
Tag Code Totals			-	122,338	-	367,356	489,694

Coleman National Fish Hatchery - Fall Run Chinook							
Tag Code: 05/63/09			Size: 110K			Trailer # CA4	
Tagging Date	Raceway Prior to Tagging	Raceway Following Tagging	Daily Tagged Total	Cumulative Tagged Total	Daily Untagged Total	Cumulative Untagged Total	Raceway Total
4/8/2019	20	19	25,622	-	76,929	-	102,551
4/9/2019	20	19	34,028	59,650	102,183	179,112	238,762
4/9/2019	20	19	33,626	93,276	100,935	280,047	373,323
4/10/2019	20	19	23,437	116,713	70,407	350,454	467,167
Tag Code Totals			-	116,713	-	350,454	467,167

Coleman National Fish Hatchery - Fall Run Chinook							
Tag Code: 05/63/10			Size: 110K			Trailer # CA4	
Tagging Date	Raceway Prior to Tagging	Raceway Following Tagging	Daily Tagged Total	Cumulative Tagged Total	Daily Untagged Total	Cumulative Untagged Total	Raceway Total
4/10/2019	21	20	35,333	-	106,062	-	141,395
4/11/2019	21	20	35,507	70,840	106,593	212,655	283,495
4/11/2019	21	20	34,252	105,092	102,807	315,462	420,554
4/12/2019	21	20	14,061	119,153	42,432	357,894	477,047
Tag Code Totals			-	119,153	-	357,894	477,047

Coleman National Fish Hatchery - Fall Run Chinook							
Tag Code: 05/63/11			Size: 110K			Trailer # CA4	
Tagging Date	Raceway Prior to Tagging	Raceway Following Tagging	Daily Tagged Total	Cumulative Tagged Total	Daily Untagged Total	Cumulative Untagged Total	Raceway Total
4/12/2019	22	21	44,768	-	134,385	-	179,153
4/15/2019	22	21	27,642	72,410	82,977	217,362	289,772
4/15/2019	22	21	36,750	109,160	110,283	327,645	436,805
4/16/2019	22	21	6,741	115,901	20,247	347,892	463,793
Tag Code Totals			-	115,901	-	347,892	463,793

Coleman National Fish Hatchery - Fall Run Chinook							
Tag Code: 05/63/12			Size: 110K			Trailer # CA4	
Tagging Date	Raceway Prior to Tagging	Raceway Following Tagging	Daily Tagged Total	Cumulative Tagged Total	Daily Untagged Total	Cumulative Untagged Total	Raceway Total
4/16/2019	23	22	13,591	-	40,812	-	54,403
4/16/2019	23	22	36,578	50,169	109,764	150,576	200,745
4/17/2019	23	22	30,247	80,416	90,783	241,359	321,775
4/17/2019	23	22	34,480	114,896	103,470	344,829	459,725
4/18/2019	23	22	11,703	126,599	35,175	380,004	506,603
Tag Code Totals			-	126,599	-	380,004	506,603

Coleman National Fish Hatchery - Fall Run Chinook							
Tag Code: 05/63/13			Size: 110K			Trailer # CA4	
Tagging Date	Raceway Prior to Tagging	Raceway Following Tagging	Daily Tagged Total	Cumulative Tagged Total	Daily Untagged Total	Cumulative Untagged Total	Raceway Total
4/18/2019	24	23	38,952	-	116,919	-	155,871
4/19/2019	24	23	26,802	65,754	80,487	197,406	263,160
4/19/2019	24	23	31,199	96,953	93,636	291,042	387,995
4/22/2019	24	23	6,797	103,750	20,436	311,478	415,228
Tag Code Totals			-	103,750	-	311,478	415,228

Coleman National Fish Hatchery - Fall Run Chinook							
Tag Code: 05/63/14			Size: 110K			Trailer # CA4	
Tagging Date	Raceway Prior to Tagging	Raceway Following Tagging	Daily Tagged Total	Cumulative Tagged Total	Daily Untagged Total	Cumulative Untagged Total	Raceway Total
4/22/2019	25	24	45,035	-	135,150	-	180,185
4/23/2019	25	24	29,551	74,586	88,695	223,845	298,431
4/23/2019	25	24	34,055	108,641	102,216	326,061	434,702
4/24/2019	25	24	15,422	124,063	46,305	372,366	496,429
Tag Code Totals			-	124,063	-	372,366	496,429

Coleman National Fish Hatchery - Fall Run Chinook							
Tag Code: 05/63/15			Size: 110K			Trailer # CA4	
Tagging Date	Raceway Prior to Tagging	Raceway Following Tagging	Daily Tagged Total	Cumulative Tagged Total	Daily Untagged Total	Cumulative Untagged Total	Raceway Total
4/24/2019	26	25	36,765	-	110,343	-	147,108
4/25/2019	26	25	25,926	62,691	77,820	188,163	250,854
4/25/2019	26	25	30,261	92,952	90,825	278,988	371,940
4/26/2019	26	25	24,649	117,601	73,992	352,980	470,581
Tag Code Totals			-	117,601	-	352,980	470,581

Coleman National Fish Hatchery - Fall Run Chinook							
Tag Code: 05/63/16			Size: 110K			Trailer # CA4	
Tagging Date	Raceway Prior to Tagging	Raceway Following Tagging	Daily Tagged Total	Cumulative Tagged Total	Daily Untagged Total	Cumulative Untagged Total	Raceway Total
4/26/2019	27	26	18,349	-	55,074	-	73,423
4/29/2019	27	26	24,422	42,771	73,359	128,433	171,204
4/29/2019	27	26	33,517	76,288	100,590	229,023	305,311
4/30/2019	27	26	29,375	105,663	88,179	317,202	422,865
4/30/2019	27	26	12,145	117,808	36,468	353,670	471,478
Tag Code Totals			-	117,808	-	353,670	471,478

Coleman National Fish Hatchery - Fall Run Chinook							
Tag Code: 05/63/17			Size: 110K			Trailer # CA4	
Tagging Date	Raceway Prior to Tagging	Raceway Following Tagging	Daily Tagged Total	Cumulative Tagged Total	Daily Untagged Total	Cumulative Untagged Total	Raceway Total
4/30/2019	28	27	7,702	-	23,118	-	30,820
5/1/2019	28	27	26,738	34,440	80,238	103,356	137,796
5/1/2019	28	27	31,712	66,152	95,181	198,537	264,689
5/2/2019	28	27	25,770	91,922	77,352	275,889	367,811
5/2/2019	28	27	22,323	114,245	67,008	342,897	457,142
Tag Code Totals			-	114,245	-	342,897	457,142

Coleman National Fish Hatchery - Fall Run Chinook - 100% Mark/Tag					
Tag Code: 05/63/18		Size: 85K		Trailer # CA3	
Tagging Date	Raceway Prior to Tagging	Raceway Following Tagging	Daily Tagged Total	Cumulative Tagged Total	Raceway Total
3/15/2019	29	33	50,893	-	50,893
3/18/2019	29	33	5,715	-	56,608
3/18/2019	29	33	21,694	-	78,302
3/19/2019	29	33	11,292	-	89,594
Tag Code Total			-	-	89,594

Coleman National Fish Hatchery - Fall Run Chinook - 100% Mark/Tag					
Tag Code: 05/63/19		Size: 85K		Trailer # CA3	
Tagging Date	Raceway Prior to Tagging	Raceway Following Tagging	Daily Tagged Total	Cumulative Tagged Total	Raceway Total
3/19/2019	30	34	35,571	-	35,571
3/20/2019	30	34	33,719	-	69,290
3/20/2019	30	34	15,154	-	84,444
Tag Code Total			-	-	84,444

Coleman National Fish Hatchery - Fall Run Chinook - 100% Mark/Tag					
Tag Code: 05/63/20		Size: 85K		Trailer # CA3	
Tagging Date	Raceway Prior to Tagging	Raceway Following Tagging	Daily Tagged Total	Cumulative Tagged Total	Raceway Total
3/21/2019	31	35	40,071	-	40,071
3/21/2019	31	35	47,951	-	88,022
Tag Code Total			-	-	88,022

Coleman National Fish Hatchery - Fall Run Chinook - 100% Mark/Tag					
Tag Code: 05/63/21		Size: 85K		Trailer # CA3	
Tagging Date	Raceway Prior to Tagging	Raceway Following Tagging	Daily Tagged Total	Cumulative Tagged Total	Raceway Total
3/22/2019	32	36	48,135	-	48,135
3/22/2019	32	36	39,971	-	88,106
Tag Code Total			-	-	88,106

Hatchery Totals

3,570,360

9,670,569

13,240,929

Retention Range: 98.19% - 100.00%

Retention Average: 99.60%

Table 1b. Summary of Hatchery Tag Codes and Tag Retention Study

Coleman National Fish Hatchery - Fall Run Chinook										
Tag Code Size and Location			Tag Code Totals			Retention Calculations				
Tag Code	Size	Raceway	Total Tagged	Number Untagged	Total Processed	# of Fish Held	Days Held	% Retention	# Retaining Tags	Calculated Untagged
05/62/87	110K	2	113,297	340,323	453,620	377	22	99.73%	112,991	340,629
05/62/88	110K	3	122,541	368,079	490,620	409	20	100.00%	122,541	368,079
05/62/89	110K	4	113,821	342,135	455,956	388	20	99.48%	113,229	342,727
05/62/90	110K	5	111,327	334,296	445,623	382	22	99.48%	110,748	334,875
05/62/91	110K	6	93,546	280,953	374,499	394	20	99.75%	93,312	281,187
05/62/92	110K	7	117,288	352,296	469,584	378	22	100.00%	117,288	352,296
05/62/93	110K	8	112,672	338,349	451,021	427	20	100.00%	112,672	338,349
05/62/94	110K	9	95,597	287,364	382,961	398	21	99.75%	95,358	287,603
05/62/95	110K	1	115,049	345,684	460,733	468	21	99.57%	114,554	346,179
05/62/96	110K	10	126,592	380,076	506,668	427	24	99.77%	126,301	380,367
05/62/97	110K	5	117,355	352,467	469,822	400	28	98.75%	115,888	353,934
05/62/98	110K	11	118,966	357,255	476,221	321	23	99.38%	118,228	357,993
05/62/99	110K	12	124,224	373,041	497,265	400	21	100.00%	124,224	373,041
05/63/03	110K	10	98,674	296,607	395,281	375	21	98.67%	97,362	297,919
05/63/04	110K	14	119,148	358,002	477,150	436	23	98.85%	117,778	359,372
05/63/05	110K	13	107,098	321,633	428,731	221	23	98.19%	105,160	323,571
05/63/06	110K	15	119,133	357,678	476,811	382	21	99.74%	118,823	357,988
05/63/07	110K	16	115,695	347,340	463,035	288	21	100.00%	115,695	347,340
05/63/08	110K	18	122,338	367,356	489,694	398	25	99.75%	122,032	367,662
05/63/09	110K	19	116,713	350,454	467,167	395	23	99.75%	116,421	350,746
05/63/10	110K	20	119,153	357,894	477,047	394	21	100.00%	119,153	357,894
05/63/11	110K	21	115,901	347,892	463,793	397	31	100.00%	115,901	347,892
05/63/12	110K	22	126,599	380,004	506,603	347	29	99.71%	126,232	380,371
05/63/13	110K	23	103,750	311,478	415,228	340	25	100.00%	103,750	311,478
05/63/14	110K	24	124,063	372,366	496,429	452	23	99.78%	123,790	372,639
05/63/15	110K	25	117,601	352,980	470,581	396	21	99.49%	117,001	353,580
05/63/16	110K	26	117,808	353,670	471,478	381	23	99.48%	117,195	354,283
05/63/17	110K	27	114,245	342,897	457,142	379	21	100.00%	114,245	342,897
05/63/18	85K	33	89,594	-	89,594	200	23	99.50%	89,146	448
05/63/19	85K	34	84,444	-	84,444	200	22	100.00%	84,444	0
05/63/20	85K	35	88,022	-	88,022	200	21	99.00%	87,142	880
05/63/21	85K	36	88,106	-	88,106	200	20	99.50%	87,665	441
Hatchery Totals			3,570,360	9,670,569	13,240,929	Retention Average		99.60%	3,556,270	9,684,659

Feather River Fish Hatchery



Table 2a. Daily Tagging Rates at Feather River Hatchery

Feather River Fish Hatchery - Spring Run Chinook - 100% Mark/Tag					
Tag Code: 06/19/72		Size: 310K		Trailer # CA2	
Tagging Date	Raceway Prior to Tagging	Raceway Following Tagging	Daily Tagged Total	Cumulative Tagged Total	Raceway Total
2/19/2019	H2	H6	16,345	-	16,345
2/20/2019	H2	H6	31,751	-	48,096
2/20/2019	H2	H6	28,952	-	77,048
2/21/2019	H2	H6	40,854	-	117,902
2/21/2019	H2	H6	46,948	-	164,850
2/22/2019	H2	H6	21,348	-	186,198
2/22/2019	H2	H6	38,681	-	224,879
2/25/2019	H2	H6	630	-	225,509
2/25/2019	H2	H6	36,888	-	262,397
2/25/2019	H2	H6	44,712	-	307,109
2/26/2019	H2	H6	26,335	-	333,444
Tag Code Total			-	-	333,444

Feather River Fish Hatchery - Spring Run Chinook - 100% Mark/Tag					
Tag Code: 06/19/73		Size: 310K		Trailer # CA2	
Tagging Date	Raceway Prior to Tagging	Raceway Following Tagging	Daily Tagged Total	Cumulative Tagged Total	Raceway Total
2/26/2019	H2	H1	33,033	-	33,033
2/27/2019	H2	H1	45,915	-	78,948
2/27/2019	H2	H1	29,153	-	108,101
2/28/2019	H4	H2	39,008	-	147,109
2/28/2019	H4	H2	18,680	-	165,789
3/1/2019	H4	H2	33,535	-	199,324
3/1/2019	H4	H2	21,529	-	220,853
3/4/2019	H4	H2	38,399	-	259,252
3/4/2019	H4	H2	34,447	-	293,699
3/5/2019	H4	H2	43,054	-	336,753
Tag Code Total			-	-	336,753

Feather River Fish Hatchery - Spring Run Chinook - 100% Mark/Tag					
Tag Code: 06/19/74		Size: 310K		Trailer # CA2	
Tagging Date	Raceway Prior to Tagging	Raceway Following Tagging	Daily Tagged Total	Cumulative Tagged Total	Raceway Total
3/5/2019	H3	H4	11,656	-	11,656
3/6/2019	H3	H4	48,470	-	60,126
3/6/2019	H3	H4	35,053	-	95,179
3/7/2019	H3	H4	41,183	-	136,362
3/7/2019	H3	H4	39,276	-	175,638
3/8/2019	G2	H4	37,655	-	213,293
3/8/2019	G2	H4	27,781	-	241,074
3/11/2019	G2	H4	34,770	-	275,844
3/11/2019	G2	H4	48,065	-	323,909
3/12/2019	G2	H4	9,533	-	333,442
Tag Code Total			-	-	333,442

Feather River Fish Hatchery - Spring Run Chinook - 100% Mark/Tag					
Tag Code: 06/19/75		Size: 310K		Trailer # CA2	
Tagging Date	Raceway Prior to Tagging	Raceway Following Tagging	Daily Tagged Total	Cumulative Tagged Total	Raceway Total
3/12/2019	G2	G6	14,542	-	14,542
3/12/2019	G2	G6	45,552	-	60,094
3/13/2019	G2	G6	52,299	-	112,393
3/13/2019	G2	G6	63,709	-	176,102
3/14/2019	G2	G6	51,055	-	227,157
3/14/2019	G2	G6	55,944	-	283,101
3/15/2019	G2	G6	49,591	-	332,692
Tag Code Total			-	-	332,692

Feather River Fish Hatchery - Spring Run Chinook - 100% Mark/Tag					
Tag Code: 06/19/76		Size: 310K		Trailer # CA2	
Tagging Date	Raceway Prior to Tagging	Raceway Following Tagging	Daily Tagged Total	Cumulative Tagged Total	Raceway Total
3/15/2019	G2	G1	38,510	-	38,510
3/18/2019	G2/G3	G2/G1	37,620	-	76,130
3/18/2019	G4	G2	42,608	-	118,738
3/19/2019	G4	G2	41,894	-	160,632
3/19/2019	G4	G2	59,067	-	219,699
3/20/2019	G4	G2	50,138	-	269,837
3/20/2019	G4	G2	50,231	-	320,068
3/21/2019	G4	G2	12,827	-	332,895
Tag Code Total			-	-	332,895

Feather River Fish Hatchery - Spring Run Chinook - 100% Mark/Tag					
Tag Code: 06/15/34		Size: 125K		Trailer # CA2	
Tagging Date	Raceway Prior to Tagging	Raceway Following Tagging	Daily Tagged Total	Cumulative Tagged Total	Raceway Total
3/21/2019	G3	G4	61,062	-	61,062
3/22/2019	G3	G4	46,422	-	107,484
3/22/2019	G3	G4	34,856	-	142,340
Tag Code Total			-	-	142,340

Feather River Fish Hatchery - Spring Run Chinook - 100% Mark/Tag					
Tag Code: 06/20/04		Size: 10K		Trailer # CA2	
Tagging Date	Raceway Prior to Tagging	Raceway Following Tagging	Daily Tagged Total	Cumulative Tagged Total	Raceway Total
3/25/2019	G3	G4	11,445	-	11,445
Tag Code Total			-	-	11,445

Feather River Fish Hatchery - Spring Run Chinook - 100% Mark/Tag					
Tag Code: 06/16/07		Size: 20K		Trailer # CA2	
Tagging Date	Raceway Prior to Tagging	Raceway Following Tagging	Daily Tagged Total	Cumulative Tagged Total	Raceway Total
3/25/2019	G3	G4	22,890	-	22,890
Tag Code Total			-	-	22,890

Feather River Fish Hatchery - Spring Run Chinook - 100% Mark/Tag					
Tag Code: 06/87/88		Size: 10K		Trailer # CA2	
Tagging Date	Raceway Prior to Tagging	Raceway Following Tagging	Daily Tagged Total	Cumulative Tagged Total	Raceway Total
3/25/2019	G3	G4	7,709	-	7,709
Tag Code Total			-	-	7,709

Hatchery Total

1,853,610

Retention Range: 97.32% - 99.89%

Retention Average: 99.12%

Table 2b. Summary of Hatchery Fall-run Tag Codes and Tag Retention Study

Feather River Fish Hatchery - Spring Run Chinook										
Tag Code Size and Location			Tag Code Totals			Retention Calculations				
Tag Code	Size	Raceway	Total Tagged	Number Untagged	Total Processed	# of Fish Held	Days Held	% Retention	# Retaining Tags	Calculated Untagged
06/19/72	310K	H6	333,444	-	333,444	884	14	98.87%	329,676	3,768
06/19/73	310K	H1/H2	336,753	-	336,753	932	7	97.32%	327,728	9,025
06/19/74	310K	H4	333,442	-	333,442	887	21	99.55%	331,942	1,500
06/19/75	310K	G6	332,692	-	332,692	889	20	99.89%	332,326	366
06/19/76	310K	G1/G2	332,895	-	332,895	888	21	99.32%	330,631	2,264
06/15/34	125K	G4	142,340	-	142,340	894	21	99.78%	142,027	313
06/20/04	10K	G4	11,445	-	11,445	894	21	99.78%	11,420	25
06/16/07	20K	G4	22,890	-	22,890	894	21	99.78%	22,840	50
06/87/88	10K	G4	7,709	-	7,709	894	21	99.78%	7,692	17
Hatchery Totals			1,853,610	0	1,853,610	Retention Average		99.12%	1,836,281	17,329

Feather River Fish Hatchery - Fall Run Chinook							
Tag Code: 06/19/78			Size: 225K			Trailer # CA2	
Tagging Date	Raceway Prior to Tagging	Raceway Following Tagging	Daily Tagged Total	Cumulative Tagged Total	Daily Untagged Total	Cumulative Untagged Total	Raceway Total
3/26/2019	F2	CH3	30,535	-	91,743	-	122,278
3/27/2019	F2	CH3	30,043	60,578	90,219	181,962	369,843
3/27/2019	F2	CH3	31,801	92,379	95,502	277,464	467,644
3/28/2019	F2	CH3	24,415	116,794	73,386	350,850	584,236
3/28/2019	F2/F4	CH3	29,136	145,930	87,456	438,306	684,658
3/29/2019	F4	CH3	25,074	171,004	75,348	513,654	734,825
3/29/2019	F4	CH3	12,517	183,521	37,650	551,304	805,760
4/1/2019	F4/F6	CH3	17,706	201,227	53,229	604,533	920,775
4/1/2019	F6	CH3	28,732	229,959	86,283	690,816	1,000,783
4/2/2019	F6/E2	CH3	19,954	249,913	60,054	750,870	1,000,783
Tag Code Totals			-	249,913	-	750,870	1,000,783

Feather River Fish Hatchery - Fall Run Chinook							
Tag Code: 06/19/79			Size: 225K			Trailer # CA2	
Tagging Date	Raceway Prior to Tagging	Raceway Following Tagging	Daily Tagged Total	Cumulative Tagged Total	Daily Untagged Total	Cumulative Untagged Total	Raceway Total
4/2/2019	E2	CH2	15,200	-	45,726	-	60,926
4/3/2019	E2	CH2	25,319	40,519	76,116	121,842	162,361
4/3/2019	E2	CH2	28,592	69,111	85,860	207,702	276,813
4/4/2019	E2	CH2	28,658	97,769	86,073	293,775	391,544
4/4/2019	E2	CH2	31,256	129,025	93,873	387,648	516,673
4/5/2019	E4	CH2	37,996	167,021	114,138	501,786	668,807
4/8/2019	E4/E6	CH2	40,985	208,006	123,147	624,933	832,939
4/9/2019	E6	CH2	25,087	233,093	75,345	700,278	933,371
4/9/2019	E6	CH2	17,914	251,007	53,850	754,128	1,005,135
Tag Code Totals			-	251,007	-	754,128	1,005,135

Feather River Fish Hatchery - Fall Run Chinook							
Tag Code: 06/19/80			Size: 225K			Trailer # CA2	
Tagging Date	Raceway Prior to Tagging	Raceway Following Tagging	Daily Tagged Total	Cumulative Tagged Total	Daily Untagged Total	Cumulative Untagged Total	Raceway Total
4/10/2019	E6/D2	CH1	22,218	-	66,732	-	88,950
4/10/2019	D2	CH1	38,343	60,561	115,194	181,926	242,487
4/11/2019	D2	CH1	37,879	98,440	113,742	295,668	394,108
4/11/2019	D2	CH1	43,596	142,036	130,854	426,522	568,558
4/12/2019	D2/D4	CH1	31,798	173,834	95,514	522,036	695,870
4/12/2019	D4	CH1	31,514	205,348	94,713	616,749	822,097
4/15/2019	D4/D6	CH1	28,508	233,856	85,665	702,414	936,270
4/15/2019	D6	CH1	16,763	250,619	50,427	752,841	1,003,460
Tag Code Totals			-	250,619	-	752,841	1,003,460

Feather River Fish Hatchery - Fall Run Chinook							
Tag Code: 06/19/81			Size: 75K			Trailer # CA2	
Tagging Date	Raceway Prior to Tagging	Raceway Following Tagging	Daily Tagged Total	Cumulative Tagged Total	Daily Untagged Total	Cumulative Untagged Total	Raceway Total
4/16/2019	D6	D6	32,778	-	98,454	-	131,232
4/16/2019	D6/C2	D6	35,441	68,219	106,446	204,900	273,119
4/17/2019	C2	D6	15,473	83,692	46,467	251,367	335,059
Tag Code Totals			-	83,692	-	251,367	335,059

Feather River Fish Hatchery - Fall Run Chinook							
Tag Code: 06/19/82			Size: 75K			Trailer # CA2	
Tagging Date	Raceway Prior to Tagging	Raceway Following Tagging	Daily Tagged Total	Cumulative Tagged Total	Daily Untagged Total	Cumulative Untagged Total	Raceway Total
4/17/2019	C2	D4	42,463	-	127,533	-	169,996
4/18/2019	C2	D4	29,467	71,930	88,503	216,036	287,966
4/18/2019	C2	D4	11,413	83,343	34,323	250,359	333,702
Tag Code Totals			-	83,343	-	250,359	333,702

Feather River Fish Hatchery - Fall Run Chinook							
Tag Code: 06/19/83			Size: 75K			Trailer # CA2	
Tagging Date	Raceway Prior to Tagging	Raceway Following Tagging	Daily Tagged Total	Cumulative Tagged Total	Daily Untagged Total	Cumulative Untagged Total	Raceway Total
4/19/2019	C2/C4	D2	21,545	-	64,707	-	86,252
4/19/2019	C4	D2	31,225	52,770	93,834	158,541	211,311
4/22/2019	C4/C6	D2	29,979	82,749	90,033	248,574	331,323
Tag Code Totals			-	82,749	-	248,574	331,323

Feather River Fish Hatchery - Fall Run Chinook							
Tag Code: 06/19/84			Size: 75K			Trailer # CA2	
Tagging Date	Raceway Prior to Tagging	Raceway Following Tagging	Daily Tagged Total	Cumulative Tagged Total	Daily Untagged Total	Cumulative Untagged Total	Raceway Total
4/22/2019	C6	C6	16,040	-	48,231	-	64,271
4/23/2019	C6	C6	28,331	44,371	85,080	133,311	177,682
4/23/2019	C6/B2	C6	32,925	77,296	98,940	232,251	309,547
4/24/2019	B2	C6	6,271	83,567	18,870	251,121	334,688
Tag Code Totals			-	83,567	-	251,121	334,688

Feather River Fish Hatchery - Fall Run Chinook							
Tag Code: 06/19/85			Size: 75K			Trailer # CA2	
Tagging Date	Raceway Prior to Tagging	Raceway Following Tagging	Daily Tagged Total	Cumulative Tagged Total	Daily Untagged Total	Cumulative Untagged Total	Raceway Total
4/24/2019	B2	C4	14,756	-	44,277	-	59,033
4/24/2019	B2	C4	40,772	55,528	122,568	166,845	222,373
4/25/2019	B2	C4	27,085	82,613	81,387	248,232	330,845
Tag Code Totals			-	82,613	-	248,232	330,845

Feather River Fish Hatchery - Fall Run Chinook							
Tag Code: 06/19/86			Size: 75K			Trailer # CA2	
Tagging Date	Raceway Prior to Tagging	Raceway Following Tagging	Daily Tagged Total	Cumulative Tagged Total	Daily Untagged Total	Cumulative Untagged Total	Raceway Total
4/25/2019	B2	C2	15,339	-	46,131	-	61,470
4/26/2019	B2	C2	32,247	47,586	96,777	142,908	190,494
4/26/2019	B2/B4	C2	30,384	77,970	91,329	234,237	312,207
4/29/2019	B4	C2	5,278	83,248	15,909	250,146	333,394
Tag Code Totals			-	83,248	-	250,146	333,394

Feather River Fish Hatchery - Fall Run Chinook							
Tag Code: 06/19/87			Size: 75K			Trailer # CA2	
Tagging Date	Raceway Prior to Tagging	Raceway Following Tagging	Daily Tagged Total	Cumulative Tagged Total	Daily Untagged Total	Cumulative Untagged Total	Raceway Total
4/29/2019	B4	B2	42,787	-	128,541	-	171,328
4/30/2019	B4	B2	31,136	73,923	93,456	221,997	295,920
4/30/2019	B4	B2	9,899	83,822	29,805	251,802	335,624
Tag Code Totals			-	83,822	-	251,802	335,624

Feather River Fish Hatchery - Fall Run Chinook							
Tag Code: 06/19/88			Size: 75K			Trailer # CA2	
Tagging Date	Raceway Prior to Tagging	Raceway Following Tagging	Daily Tagged Total	Cumulative Tagged Total	Daily Untagged Total	Cumulative Untagged Total	Raceway Total
4/30/2019	B4	B6	11,544	-	34,743	-	46,287
5/1/2019	B4/A2	B6	29,963	41,507	90,057	124,800	166,307
5/1/2019	A2	B6	31,952	73,459	96,045	220,845	294,304
5/2/2019	A2	B6	9,678	83,137	29,163	250,008	333,145
Tag Code Totals			-	83,137	-	250,008	333,145

Feather River Fish Hatchery - Fall Run Chinook							
Tag Code: 06/19/89			Size: 75K			Trailer # CA2	
Tagging Date	Raceway Prior to Tagging	Raceway Following Tagging	Daily Tagged Total	Cumulative Tagged Total	Daily Untagged Total	Cumulative Untagged Total	Raceway Total
5/2/2019	A2	B4	53,464	-	160,623	-	214,087
5/3/2019	A2	B4	29,938	83,402	89,985	250,608	334,010
Tag Code Totals			-	83,402	-	250,608	334,010

Feather River Fish Hatchery - Fall Run Chinook							
Tag Code: 06/19/90			Size: 75K			Trailer # CA2	
Tagging Date	Raceway Prior to Tagging	Raceway Following Tagging	Daily Tagged Total	Cumulative Tagged Total	Daily Untagged Total	Cumulative Untagged Total	Raceway Total
5/6/2019	A3	A6	30,866	-	92,718	-	123,584
5/6/2019	A3	A6	35,260	66,126	105,966	198,684	264,810
5/7/2019	A3	A6	17,207	83,333	51,711	250,395	333,728
Tag Code Totals			-	83,333	-	250,395	333,728

Feather River Fish Hatchery - Fall Run Chinook							
Tag Code: 06/19/91			Size: 75K			Trailer # CA2	
Tagging Date	Raceway Prior to Tagging	Raceway Following Tagging	Daily Tagged Total	Cumulative Tagged Total	Daily Untagged Total	Cumulative Untagged Total	Raceway Total
5/7/2019	A3	A4	37,100	-	111,417	-	148,517
5/8/2019	A3/A2	A4	32,751	69,851	98,298	209,715	279,566
5/8/2019	A2	A4	13,973	83,824	41,994	251,709	335,533
Tag Code Totals			-	83,824	-	251,709	335,533

Feather River Fish Hatchery - Fall Run Chinook							
Tag Code: 06/19/92			Size: 75K			Trailer # CA2	
Tagging Date	Raceway Prior to Tagging	Raceway Following Tagging	Daily Tagged Total	Cumulative Tagged Total	Daily Untagged Total	Cumulative Untagged Total	Raceway Total
5/8/2019	A2	A1	373	-	1,152	-	1,525
5/8/2019	A2	A1	882	1,255	2,646	3,798	5,053
5/9/2019	A2	A1	33,021	34,276	99,159	102,957	137,233
5/9/2019	A2	A1	34,721	68,997	104,271	207,228	276,225
5/10/2019	A2	A1	14,300	83,297	42,951	250,179	333,476
Tag Code Totals			-	83,297	-	250,179	333,476

Feather River Fish Hatchery - Fall Run Chinook							
Tag Code: 06/19/93			Size: 75K			Trailer # CA2	
Tagging Date	Raceway Prior to Tagging	Raceway Following Tagging	Daily Tagged Total	Cumulative Tagged Total	Daily Untagged Total	Cumulative Untagged Total	Raceway Total
5/10/2019	A2	D2	28,163	-	84,555	-	112,718
5/13/2019	A2	D2	25,476	53,639	76,524	161,079	214,718
Tag Code Totals			-	53,639	-	161,079	214,718

Hatchery Totals

1,805,205

5,423,418

7,228,623

Retention Range: 93.46% - 99.75%

Retention Average: 98.58%

Table 2c. Summary of Hatchery Fall-Run Tag Codes and Retention Study

Feather River Fish Hatchery - Fall Run Chinook										
Tag Code Size and Location			Tag Code Totals			Retention Calculations				
Tag Code	Size	Raceway	Total Tagged	Number Untagged	Total Processed	# of Fish Held	Days Held	% Retention	# Retaining Tags	Calculated Untagged
06/19/78	225K	CH3	249,913	750,870	1,000,783	386	17	99.74%	249,263	751,520
06/19/79	225K	CH2	251,007	754,128	1,005,135	395	21	99.75%	250,379	754,756
06/19/80	225K	CH1	250,619	752,841	1,003,460	390	17	99.23%	248,689	754,771
06/19/81	75K	D6	83,692	251,367	335,059	395	19	99.49%	83,265	251,794
06/19/82	75K	D4	83,343	250,359	333,702	107	19	93.46%	77,892	255,810
06/19/83	75K	D2	82,749	248,574	331,323	296	15	98.65%	81,632	249,691
06/19/84	75K	C6	83,567	251,121	334,688	381	16	96.59%	80,717	253,971
06/19/85	75K	C4	82,613	248,232	330,845	410	21	99.27%	82,010	248,835
06/19/86	75K	C2	83,248	250,146	333,394	393	18	98.47%	81,974	251,420
06/19/87	75K	B2	83,822	251,802	335,624	396	17	99.24%	83,185	252,439
06/19/88	75K	B6	83,137	250,008	333,145	394	15	98.48%	81,873	251,272
06/19/89	75K	B4	83,402	250,608	334,010	404	14	98.76%	82,368	251,642
06/19/90	75K	A6	83,333	250,395	333,728	410	22	98.54%	82,116	251,612
06/19/91	75K	A4	83,824	251,709	335,533	407	21	98.58%	82,634	252,899
06/19/92	75K	A1	83,297	250,179	333,476	414	19	99.52%	82,897	250,579
06/19/93	75K	D2	53,639	161,079	214,718	397	16	99.50%	53,371	161,347
Hatchery Totals			1,805,205	5,423,418	7,228,623	Retention Average		98.58%	1,784,265	5,444,358

Feather River Fish Hatchery - Steelhead - 100% Mark Only					
Trailer # CA2					
Marking Date	Raceway Prior to Marking	Raceway Following Marking	Daily Marked Total	Cumulative Marked Total	Raceway Total
6/11/2019	E2	E1	29,556	-	29,556
6/12/2019	E2	E1	59,033	-	88,589
6/13/2019	E2/F2	E1	48,881	-	137,470
6/14/2019	F2	E1	51,079	-	188,549
6/17/2019	F2	E1	59,821	-	248,370
6/18/2019	F2	F1	51,747	300,117	51,747
6/19/2019	F2	F1	54,320	354,437	106,067
6/20/2019	F2	F1	70,065	424,502	176,132
6/21/2019	F3	F1	55,304	479,806	231,436
6/24/2019	F3	F1	18,584	498,390	250,020
6/24/2019	F3	E3	13,568	511,958	13,568
6/25/2019	F3	E3	27,124	539,082	40,692
8/8/2019	F2	Channel	31,224	570,306	31,224
8/9/2019	F2	Channel	35,554	605,860	66,778
8/12/2019	F2	Channel	36,430	642,290	103,208
8/13/2019	F2	Channel	18,520	660,810	121,728
Hatchery Total			-	-	660,810

Merced Hatchery



Table 3a. Daily Tagging Rates at Merced Hatchery

Merced Fish Hatchery - Fall Run Chinook - 100% Mark/Tag				
Tag Code: 06/15/73		Size: 100K		Trailer #
Tagging Date	Raceway Prior to Tagging	Raceway Following Tagging	Daily Tagged Total	Manual Trailer
				Raceway Total
3/4/2019	1,2,3,4	B10	1523	1,523
3/5/2019	1,2,3,4	B10	2719	4,242
3/6/2019	1,2,3,4	B10	3449	7,691
3/7/2019	1,2,3,4	B10	4687	12,378
3/8/2019	1,2,3,4	B10	4819	17,197
3/11/2019	1,2,3,4	B10	3337	20,534
3/12/2019	1,2,3,4	B10	4104	24,638
3/13/2019	1,2,3,4	B10	3170	27,808
3/14/2019	1,2,3,4	B10	4715	32,523
3/15/2019	1,2,3,4	B10	3790	36,313
3/18/2019	1,2,3,4	B10	2921	39,234
3/19/2019	1,2,3,4	B10	4716	43,950
3/20/2019	5	B10	4568	48,518
3/21/2019	5	B10	4961	53,479
3/22/2019	5	B10	2244	55,723
3/22/2019	6	B10	1569	57,292
3/25/2019	6	B10	6185	63,477
3/26/2019	6	B10	6487	69,964
3/27/2019	6	B10	6398	76,362
3/28/2019	6	B10	3648	80,010
3/28/2019	7	B10	2177	82,187
3/29/2019	7	B10	5931	88,118
4/1/2019	7	B10	5553	93,671
4/2/2019	7	B10	5796	99,467
4/3/2019	7	B10	2030	101,497
*Pond loss:	17	Tag Code Release Total		101,480

Merced Fish Hatchery - Fall Run Chinook - 100% Mark/Tag				
Tag Code: 06/15/25		Size: 50K		Trailer # Manual Trailer
Tagging Date	Raceway Prior to Tagging	Raceway Following Tagging	Daily Tagged Total	Raceway Total
4/3/2019	8	A10	1830	1,830
4/4/2019	8	A10	6925	8,755
4/5/2019	8	A10	6072	14,827
4/8/2019	8	A10	5952	20,779
4/9/2019	8	A10	5384	26,163
4/10/2019	9, 10	A10	6014	32,177
4/11/2019	9, 10	A10	4652	36,829
4/12/2019	9, 10	A10	6365	43,194
4/15/2019	9, 10	A10	4604	47,798
4/16/2019	9, 10	A10	2376	50,174
*Pond Loss:	19	Tag Code Release Total		50,155

Merced Fish Hatchery - Fall Run Chinook - 100% Mark/Tag				
Tag Code: 06/04/51		Size: 100K		Trailer # Manual Trailer
Tagging Date	Raceway Prior to Tagging	Raceway Following Tagging	Daily Tagged Total	Raceway Total
4/16/2019	9,10	A9	1674	1,674
4/17/2019	9, 10	A9	2106	3,780
4/17/2019	11, 12	A9	1030	4,810
4/18/2019	11, 12	A9	3889	8,699
4/19/2019	11, 12	A9	4141	12,840
4/22/2019	11, 12	A9	2239	15,079
4/22/2019	13, 14	A9	1604	16,683
4/23/2019	13, 14	A9	3423	20,106
*Pond loss:	1	Tag Code Release Total		20,105

Hatchery Totals

171740

Retention Range: 98.30% - 99.88%

Retention Average: 99.23%

*Pond loss are morts found in raceway sometime after tagging date. No way to tell which day they came from, ponds typically cleaned by hatchery staff on weekly or bi-weekly basis. Pond loss subtracted from Tag Code Release Totals.

Table 3b. Summary of Hatchery Fall-Run Tag Codes and Retention Study

Merced River Fish Hatchery - Fall Run Chinook										
Tag Code Size and Location			Tag Code Totals			Retention Calculations				
Tag Code	Size	Raceway	Total Tagged	Number Untagged	Total Processed	# of Fish Held	Days Held	% Retention	# Retaining Tags	Calculated Untagged
06/15/73	100K	B10	101,480	303,953	405,433	816	29	98.30%	99,755	305,678
06/15/25	50K	A10	50,155	142,174	192,329	825	21	99.88%	50,095	142,234
06/04/51	20k	A9	20,105	66,358	86,463	400	11	99.50%	20,004	66,459
Hatchery Totals			171,740	512,485	684,225	Retention Average		99.23%	169,854	514,371

Mokelumne River Hatchery



Table 4a. Daily Tagging Rates at Mokelumne River Hatchery

Mokelumne River Fish Hatchery - Fall Run Chinook							
Tag Code: 06/15/86			Size: 100K			Trailer # CA1	
Tagging Date	Raceway Prior to Tagging	Raceway Following Tagging	Daily Tagged Total	Cumulative Tagged Total	Daily Untagged Total	Cumulative Untagged Total	Raceway Total
3/19/2019	C	A	19,675	-	59,205	-	78,880
3/20/2019	C	A	26,295	45,970	79,011	138,216	184,186
3/20/2019	C	A	27,123	73,093	81,456	219,672	292,765
3/21/2019	C/D	A	29,719	102,812	89,223	308,895	411,707
3/21/2019	D	A	10,151	112,963	30,504	339,399	452,362
Tag Code Totals			-	112,963	-	339,399	452,362

Mokelumne River Fish Hatchery - Fall Run Chinook							
Tag Code: 06/15/97			Size: 100K			Trailer # CA1	
Tagging Date	Raceway Prior to Tagging	Raceway Following Tagging	Daily Tagged Total	Cumulative Tagged Total	Daily Untagged Total	Cumulative Untagged Total	Raceway Total
3/21/2019	D	B	7,382	-	22,188	-	
3/22/2019	D	B	14,624	22,006	43,920	66,108	29,570
3/22/2019	D	B	19,589	41,595	58,827	124,935	88,114
3/25/2019	D	B	39,847	81,442	119,628	244,563	166,530
3/25/2019	D/E	B	16,385	97,827	49,236	293,799	326,005
3/26/2019	D	B	12,563	110,390	37,830	331,629	391,626
Tag Code Totals			-	110,390	-	331,629	442,019

Mokelumne River Fish Hatchery - Fall Run Chinook							
Tag Code: 06/15/98			Size: 100K			Trailer # CA1	
Tagging Date	Raceway Prior to Tagging	Raceway Following Tagging	Daily Tagged Total	Cumulative Tagged Total	Daily Untagged Total	Cumulative Untagged Total	Raceway Total
3/27/2019	E	C	14,796	-	44,451	-	59,247
3/27/2019	E	C	41,431	56,227	124,359	168,810	225,037
3/28/2019	E	C	23,174	79,401	69,573	238,383	317,784
3/28/2019	E/F	C	33,868	113,269	101,658	340,141	453,310
Tag Code Totals			-	113,269	-	340,041	453,310

Mokelumne River Fish Hatchery - Fall Run Chinook - 100% Mark/Tag					
Tag Code: 06/15/42		Size: 110K		Trailer # CA1	
Tagging Date	Raceway Prior to Tagging	Raceway Following Tagging	Daily Tagged Total	Cumulative Tagged Total	Raceway Total
3/29/2019	F	D1	31,284	-	31,284
3/29/2019	F	D1	33,372	-	64,656
4/1/2019	F	D1	21,683	-	86,339
4/1/2019	F	D1	34,408	-	120,747
Tag Code Total			-	-	120,747

Mokelumne River Fish Hatchery - Fall Run Chinook - 100% Mark/Tag					
Tag Code: 06/18/01		Size: 650K, 220K in D2		Trailer # CA1	
Tagging Date	Raceway Prior to Tagging	Raceway Following Tagging	Daily Tagged Total	Cumulative Tagged Total	Raceway Total
4/2/2019	F	D2	54,261	-	54,261
4/2/2019	F	D2	55,873	-	110,134
4/3/2019	F	D2	59,954	-	170,088
4/3/2019	F	D2	54,590	-	224,678
4/4/2019	F	D2	25,395	-	250,073
Tag Code Total			-	-	250,073

Mokelumne River Fish Hatchery - Fall Run Chinook - 100% Mark/Tag					
Tag Code: 06/18/01		Size: 650K, 430K in E		Trailer # CA1	
Tagging Date	Raceway Prior to Tagging	Raceway Following Tagging	Daily Tagged Total	Cumulative Tagged Total	Raceway Total
4/4/2019	F/G	E	22,967	-	22,967
4/4/2019	G	E	48,843	-	71,810
4/5/2019	G	E	48,535	-	120,345
4/5/2019	G	E	32,788	-	153,133
4/8/2019	G	E	26,868	-	180,001
4/8/2019	G	E	59,835	-	239,836
4/9/2019	G	E	55,833	-	295,669
4/9/2019	G	E	42,400	-	338,069
4/10/2019	G	E	49,107	-	387,176
4/10/2019	G/H	E	39,314	-	426,490
4/11/2019	H	E	56,512	-	483,002
4/11/2019	H	E	26,240	-	509,242
Tag Code Total			-	-	509,242

Mokelumne River Fish Hatchery - Fall Run Chinook							
Tag Code: 06/15/99			Size: 100K			Trailer # CA1	
Tagging Date	Raceway Prior to Tagging	Raceway Following Tagging	Daily Tagged Total	Cumulative Tagged Total	Daily Untagged Total	Cumulative Untagged Total	Raceway Total
4/11/2019	H	F	12,739	-	38,250	-	50,989
4/12/2019	H	F	31,843	44,582	95,595	133,845	178,427
4/12/2019	H	F	21,107	65,689	63,375	197,220	262,909
4/15/2019	H/I	F	27,674	93,363	83,091	280,311	373,674
4/16/2019	I	F	19,224	112,587	57,741	338,052	450,639
Tag Code Totals			-	112,587	-	338,052	450,639

Mokelumne River Fish Hatchery - Fall Run Chinook							
Tag Code: 06/16/01			Size: 100K			Trailer # CA1	
Tagging Date	Raceway Prior to Tagging	Raceway Following Tagging	Daily Tagged Total	Cumulative Tagged Total	Daily Untagged Total	Cumulative Untagged Total	Raceway Total
4/16/2019	I	G	11,878	-	35,643	-	47,521
4/16/2019	I	G	28,334	40,212	85,050	120,693	160,905
4/17/2019	I/J	G	37,232	77,444	111,768	232,461	309,905
4/17/2019	J	G	35,860	113,304	107,646	340,107	453,411
Tag Code Totals			-	113,304	-	340,107	453,411

Mokelumne River Fish Hatchery - Fall Run Chinook							
Tag Code: 06/16/02			Size: 100K			Trailer # CA1	
Tagging Date	Raceway Prior to Tagging	Raceway Following Tagging	Daily Tagged Total	Cumulative Tagged Total	Daily Untagged Total	Cumulative Untagged Total	Raceway Total
4/18/2019	J	H	34,397	-	103,284	-	137,681
4/18/2019	J	H	26,393	60,790	79,236	182,520	243,310
4/19/2019	K	H	12,011	72,801	36,111	218,631	291,432
4/19/2019	K	H	23,989	96,790	72,000	290,631	387,421
4/22/2019	K	H	15,902	112,692	47,763	338,394	451,086
Tag Code Totals			-	112,692	-	338,394	451,086

Mokelumne River Fish Hatchery - Fall Run Chinook							
Tag Code: 06/16/03			Size: 100K			Trailer # CA1	
Tagging Date	Raceway Prior to Tagging	Raceway Following Tagging	Daily Tagged Total	Cumulative Tagged Total	Daily Untagged Total	Cumulative Untagged Total	Raceway Total
4/22/2019	K	I	34,899	-	104,769	-	139,668
4/23/2019	K/L	I	42,545	77,444	127,749	232,518	309,962
4/23/2019	L	I	35,275	112,719	105,870	338,388	451,107
Tag Code Totals			-	112,719	-	338,388	451,107

Mokelumne River Fish Hatchery - Fall Run Chinook - 100% Mark/Tag					
Tag Code: 06/16/09		Size: 180K		Trailer # CA1	
Tagging Date	Raceway Prior to Tagging	Raceway Following Tagging	Daily Tagged Total	Cumulative Tagged Total	Raceway Total
4/24/2019	L	J1	62,551	-	62,551
4/24/2019	L	J1	63,474	-	126,025
4/25/2019	L/N	J1	60,177	-	186,202
4/25/2019	N	J1	14,057	-	200,259
Tag Code Total			-	-	200,259

Mokelumne River Fish Hatchery - Fall Run Chinook - 100% Mark/Tag					
Tag Code: 06/16/10		Size: 180K		Trailer # CA1	
Tagging Date	Raceway Prior to Tagging	Raceway Following Tagging	Daily Tagged Total	Cumulative Tagged Total	Raceway Total
4/25/2019	N	J2	33,624	-	33,624
4/26/2019	N	J2	58,280	-	91,904
4/26/2019	N	J2	40,009	-	131,913
4/29/2019	N	J2	29,351	-	161,264
4/29/2019	N	J2	39,066	-	200,330
Tag Code Total			-	-	200,330

Mokelumne River Fish Hatchery - Fall Run Chinook - 100% Mark/Tag					
Tag Code: 06/18/02		Size: 90K		Trailer # CA1	
Tagging Date	Raceway Prior to Tagging	Raceway Following Tagging	Daily Tagged Total	Cumulative Tagged Total	Raceway Total
5/1/2019	M1	K1	1,693	-	1,693
5/2/2019	M1	K1	62,323	-	64,016
5/2/2019	M1	K1	37,740	-	101,756
Tag Code Total			-	-	101,756

Mokelumne River Fish Hatchery - Fall Run Chinook - 100% Mark/Tag					
Tag Code: 06/18/03		Size: 90K		Trailer # CA1	
Tagging Date	Raceway Prior to Tagging	Raceway Following Tagging	Daily Tagged Total	Cumulative Tagged Total	Raceway Total
4/29/2019	M2	K2	1,563	-	1,563
4/30/2019	M2	K2	57,760	-	59,323
4/30/2019	M2	K2	41,685	-	101,008
Tag Code Total			-	-	101,008

Mokelumne River Fish Hatchery - Fall Run Chinook - 100% Mark/Tag					
Tag Code: 06/18/04		Size: 90K		Trailer # CA1	
Tagging Date	Raceway Prior to Tagging	Raceway Following Tagging	Daily Tagged Total	Cumulative Tagged Total	Raceway Total
4/30/2019	M3	K3	1,513	-	1,513
5/1/2019	M3	K3	62,955	-	64,468
5/1/2019	M3	K3	38,691	-	103,159
Tag Code Total			-	-	103,159

Mokelumne River Fish Hatchery - Fall Run Chinook - 100% Mark/Tag					
Tag Code: 06/18/05		Size: 90K		Trailer # CA1	
Tagging Date	Raceway Prior to Tagging	Raceway Following Tagging	Daily Tagged Total	Cumulative Tagged Total	Raceway Total
5/2/2019	M4	K4	1,684	-	1,684
5/3/2019	M4	K4	41,478	-	43,162
5/3/2019	M4	K4	40,067	-	83,229
5/6/2019	M4	K4	18,622	-	101,851
Tag Code Total			-	-	101,851

Mokelumne River Fish Hatchery - Fall Run Chinook							
Tag Code: 06/16/04			Size: 100K			Trailer # CA1	
Tagging Date	Raceway Prior to Tagging	Raceway Following Tagging	Daily Tagged Total	Cumulative Tagged Total	Daily Untagged Total	Cumulative Untagged Total	Raceway Total
5/6/2019	M	L	4,363	-	13,185	-	17,548
5/6/2019	N	L	15,184	19,547	45,606	58,791	78,338
5/7/2019	N/O	L	37,599	57,146	112,905	171,696	228,842
5/7/2019	O	L	32,799	89,945	98,484	270,180	360,125
5/8/2019	O	L	22,336	112,281	67,101	337,281	449,562
Tag Code Totals			-	112,281	-	337,281	449,562

Mokelumne River Fish Hatchery - Fall Run Chinook							
Tag Code: 06/16/05			Size: 100K			Trailer # CA1	
Tagging Date	Raceway Prior to Tagging	Raceway Following Tagging	Daily Tagged Total	Cumulative Tagged Total	Daily Untagged Total	Cumulative Untagged Total	Raceway Total
5/8/2019	O	M	41,574	-	124,785	-	166,359
5/9/2019	O/P	M	37,237	78,811	111,795	236,580	315,391
5/9/2019	P	M	34,711	113,522	104,223	340,803	454,325
Tag Code Totals			-	113,522	-	340,803	454,325

Mokelumne River Fish Hatchery - Fall Run Chinook							
Tag Code: 06/16/06			Size: 100K			Trailer # CA1	
Tagging Date	Raceway Prior to Tagging	Raceway Following Tagging	Daily Tagged Total	Cumulative Tagged Total	Daily Untagged Total	Cumulative Untagged Total	Raceway Total
5/10/2019	P	N	26,460	-	79,452	-	105,912
5/10/2019	P	N	25,935	52,395	77,871	157,323	209,718
5/13/2019	P	N	15,680	68,075	47,127	204,450	272,525
5/13/2019	P/Q	N	24,999	93,074	75,057	279,507	372,581
5/14/2019	Q	N	19,773	112,847	59,409	338,916	451,763
Tag Code Totals			-	112,847	-	338,916	451,763

Mokelumne River Fish Hatchery - Fall Run Chinook							
Tag Code: 06/05/83			Size: 70K			Trailer # CA1	
Tagging Date	Raceway Prior to Tagging	Raceway Following Tagging	Daily Tagged Total	Cumulative Tagged Total	Daily Untagged Total	Cumulative Untagged Total	Raceway Total
5/14/2019	Q	O	37,012	-	111,114	-	148,126
5/15/2019	Q	O	40,489	77,501	121,566	232,680	310,181
Tag Code Totals			-	77,501	-	232,680	310,181

Mokelumne River Fish Hatchery - Fall Run Chinook							
Tag Code: 06/15/84			Size: 40K			Trailer # CA1	
Tagging Date	Raceway Prior to Tagging	Raceway Following Tagging	Daily Tagged Total	Cumulative Tagged Total	Daily Untagged Total	Cumulative Untagged Total	Raceway Total
5/15/2019	Q	O	24,711	-	74,214	-	98,925
Tag Code Totals			-	24,711	-	74,214	98,925

Hatchery Totals: 2,917,211 3,689,904 6,607,115

Retention Range: 98.50% - 100%

Retention Average: 99.56%

Table 4b. Summary of Hatchery Tag Codes and Tag Retention Studies

Mokelumne River Fish Hatchery - Fall Run Chinook										
Tag Code Size and Location			Tag Code Totals			Retention Calculations				
Tag Code	Size	Raceway	Total Tagged	Number Untagged	Total Processed	# of Fish Held	Days Held	% Retention	# Retaining Tags	Calculated Untagged
06/15/86	100K	A	112,963	339,399	452,362	408	26	99.26%	112,127	340,235
06/15/97	100K	B	110,390	331,629	442,019	403	21	98.76%	109,021	332,998
06/15/98	100K	C	113,269	340,041	453,310	402	21	99.00%	112,136	341,174
06/15/42	110K	D1	120,747	-	120,747	400	21	99.25%	119,841	906
06/18/01	220K	D2	250,073	-	250,073	400	21	99.75%	249,448	625
06/18/01	430K	E	509,242	-	509,242	400	22	99.25%	505,423	3,819
06/15/99	100K	F	112,587	338,052	450,639	410	21	100.00%	112,587	338,052
06/16/01	100K	G	113,304	340,107	453,411	401	20	100.00%	113,304	340,107
06/16/02	100K	H	112,692	338,394	451,086	443	16	100.00%	112,692	338,394
06/16/03	100K	I	112,719	338,388	451,107	399	21	100.00%	112,719	338,388
06/16/09	180K	J1	200,259	-	200,259	400	19	99.50%	199,258	1,001
06/16/10	180K	J2	200,330	-	200,330	400	15	99.75%	199,829	501
06/18/02	90K	K1	101,756	-	101,756	400	13	99.50%	101,247	509
06/18/03	90K	K2	101,008	-	101,008	400	15	100.00%	101,008	-
06/18/04	90K	K3	103,159	-	103,159	400	14	98.50%	101,612	1,547
06/18/05	90K	K4	101,851	-	101,851	400	9	99.50%	101,342	509
06/16/04	100K	L	112,281	337,281	449,562	397	21	100.00%	112,281	337,281
06/16/05	100K	M	113,522	340,803	454,325	395	20	100.00%	113,522	340,803
06/16/06	100K	N	112,847	338,916	451,763	399	15	99.75%	112,565	339,198
06/05/83	70K	O	77,501	232,680	310,181	400	14	99.50%	77,113	233,068
06/15/84	40K	O	24,711	74,214	98,925	400	14	99.50%	24,587	74,338
Hatchery Totals			2,917,211	3,689,904	6,607,115	Retention Average		99.56%	2,903,662	3,703,453

Mokelumne River Fish Hatchery - Steelhead - 100% Mark Only					
Trailer # CA1					
Marking Date	Raceway Prior to Marking	Raceway Following Marking	Daily Marked Total	Cumulative Marked Total	Raceway Total
6/25/2019	M	N	18,966	-	18,966
6/26/2019	M	N	31,199	50165	50,165
6/26/2019	M	O	7,655	57,820	7,655
6/27/2019	M	O	41,992	99,812	49,647
6/28/2019	M	O	531	100,343	50,178
6/28/2019	INSIDE	P	29,622	129,965	29,622
7/1/2019	INSIDE	P	19,902	149,867	49,524
7/2/2019	INSIDE	Q	38,882	188,749	38,882
7/2/2019	INSIDE	R	22,710	211,459	22,710
Hatchery Total			-	-	211,459

Nimbus Hatchery



Table 5a. Daily Tagging Rates at Nimbus Hatchery

Nimbus Fish Hatchery - Fall Run Chinook - 100% Mark/Tag					
Tag Code: 06/19/94		Size: 180K		Trailer # CA3	
Tagging Date	Raceway Prior to Tagging	Raceway Following Tagging	Daily Tagged Total	Cumulative Tagged Total	Raceway Total
4/8/2019	Inside	B2	11,834	-	11,834
4/8/2019	Inside	B2	34,128	-	45,962
4/9/2019	Inside	B2	47,876	-	93,838
4/9/2019	Inside	B2	36,338	-	130,176
4/10/2019	Inside	B2	46,934	-	177,110
4/10/2019	Inside	B2	22,855	-	199,965
Tag Code Total			-	-	199,965

Nimbus Fish Hatchery - Fall Run Chinook							
Tag Code: 06/19/95			Size: 180K			Trailer # CA3	
Tagging Date	Raceway Prior to Tagging	Raceway Following Tagging	Daily Tagged Total	Cumulative Tagged Total	Daily Untagged Total	Cumulative Untagged Total	Raceway Total
4/10/2019	A2	A1	984	-	2,955	-	3,939
4/11/2019	A2	A1	27,500	28,484	82,572	85,527	114,011
4/11/2019	A2	A1	35,263	63,747	105,819	191,346	255,093
4/12/2019	A2	A1	25,820	89,567	77,514	268,860	358,427
4/12/2019	A2	A1	25,449	115,016	76,380	345,240	460,256
4/15/2019	A2	A1	34,248	149,264	102,810	448,050	597,314
4/16/2019	A2	A1	30,794	180,058	92,478	540,528	720,586
4/17/2019	A2	A1	20,434	200,492	61,344	601,872	802,364
Tag Code Totals			-	200,492	-	601,872	802,364

Nimbus Fish Hatchery - Fall Run Chinook							
Tag Code: 06/19/53			Size: 125K			Trailer # CA3	
Tagging Date	Raceway Prior to Tagging	Raceway Following Tagging	Daily Tagged Total	Cumulative Tagged Total	Daily Untagged Total	Cumulative Untagged Total	Raceway Total
4/17/2019	B2	B1	1,951	-	5,853	-	7,804
4/18/2019	B2	B1	36,603	38,554	109,857	115,710	154,264
4/19/2019	B2	B1	28,872	67,426	86,682	202,392	269,818
4/22/2019	B2	B1	28,302	95,728	84,960	287,352	383,080
4/23/2019	B2	B1	37,427	133,155	112,371	399,723	532,878
4/24/2019	B2	B1	6,777	139,932	20,385	420,108	560,040
Tag Code Totals			-	139,932	-	420,108	560,040

Nimbus Fish Hatchery - Fall Run Chinook							
Tag Code: 06/15/75			Size: 20K			Trailer # CA3	
Tagging Date	Raceway Prior to Tagging	Raceway Following Tagging	Daily Tagged Total	Cumulative Tagged Total	Daily Untagged Total	Cumulative Untagged Total	Raceway Total
4/24/2019	B2	B1	11,905	-	35,748	-	47,653
Tag Code Totals			-	11,905	-	35,748	47,653

Nimbus Fish Hatchery - Fall Run Chinook							
Tag Code: 06/19/96			Size: 180K			Trailer # CA3	
Tagging Date	Raceway Prior to Tagging	Raceway Following Tagging	Daily Tagged Total	Cumulative Tagged Total	Daily Untagged Total	Cumulative Untagged Total	Raceway Total
4/24/2019	C2	C1	2,592	-	7,809	-	10,401
4/25/2019	C2	C1	27,161	29,753	81,576	89,385	119,138
4/26/2019	C2	C1	25,078	54,831	75,306	164,691	219,522
4/29/2019	C2	C1	32,919	87,750	98,829	263,520	351,270
4/30/2019	C2	C1	38,838	126,588	116,565	380,085	506,673
5/1/2019	C2	C1	40,518	167,106	121,587	501,672	668,778
5/2/2019	C2	C1	33,218	200,324	99,699	601,371	801,695
Tag Code Totals			-	200,324	-	601,371	801,695

Nimbus Fish Hatchery - Fall Run Chinook							
Tag Code: 06/19/97			Size: 180K			Trailer # CA3	
Tagging Date	Raceway Prior to Tagging	Raceway Following Tagging	Daily Tagged Total	Cumulative Tagged Total	Daily Untagged Total	Cumulative Untagged Total	Raceway Total
5/3/2019	D2	D1	33,600	-	100,854	-	134,454
5/6/2019	D2	D1	32,796	66,396	98,457	199,311	265,707
5/6/2019	D2	D1	36,356	102,752	109,155	308,466	411,218
5/7/2019	D2	D1	35,144	137,896	105,474	413,940	551,836
5/7/2019	D2	D1	40,546	178,442	121,698	535,638	714,080
5/8/2019	D2	D1	21,824	200,266	65,514	601,152	801,418
Tag Code Totals			-	200,266	-	601,152	801,418

Nimbus Fish Hatchery - Fall Run Chinook							
Tag Code: 06/19/98			Size: 125K			Trailer # CA3	
Tagging Date	Raceway Prior to Tagging	Raceway Following Tagging	Daily Tagged Total	Cumulative Tagged Total	Daily Untagged Total	Cumulative Untagged Total	Raceway Total
5/8/2019	E2	E1	35,892	-	107,703	-	143,595
5/9/2019	E2	E1	30,380	66,272	91,170	198,873	265,145
5/9/2019	E2	E1	22,363	88,635	67,152	266,025	354,660
5/13/2019	E2	E1	26,804	115,439	80,508	346,533	461,972
5/14/2019	E2	E1	25,010	140,449	75,099	421,632	562,081
Tag Code Totals			-	140,449	-	421,632	562,081

Nimbus Fish Hatchery - Fall Run Chinook							
Tag Code: 06/19/99			Size: 125K			Trailer # CA3	
Tagging Date	Raceway Prior to Tagging	Raceway Following Tagging	Daily Tagged Total	Cumulative Tagged Total	Daily Untagged Total	Cumulative Untagged Total	Raceway Total
5/14/2019	F2	F1	16,166	-	48,507	-	64,673
5/15/2019	F2	F1	35,283	51,449	105,903	154,410	205,859
5/15/2019	F2	F1	35,775	87,224	107,376	261,786	349,010
5/16/2019	F2	F1	26,806	114,030	80,454	342,240	456,270
5/16/2019	F2	F1	25,795	139,825	77,442	419,682	559,507
Tag Code Totals			-	139,825	-	419,682	559,507

Table 5b. Summary of Fall-Run Tag Codes and Tag Retention Studies

Nimbus Fish Hatchery - Fall Run Chinook										
Tag Code Size and Location			Tag Code Totals			Retention Calculations				
Tag Code	Size	Raceway	Total Tagged	Number Untagged	Total Processed	# of Fish Held	Days Held	% Retention	# Retaining Tags	Calculated Untagged
06/19/94	180K	B2	199,965	-	199,965	-	-	Use Avg	199,385	580
06/19/95	180K	A1	200,492	601,872	802,364	900	16	99.78%	200,051	602,313
06/19/53	125K	B1	139,932	420,108	560,040	900	15	100.00%	139,932	420,108
06/15/75	20K	B1	11,905	35,748	47,653	900	15	100.00%	11,905	35,748
06/19/96	180K	C1	200,324	601,371	801,695	905	12	99.78%	199,883	601,812
06/19/97	180K	D1	200,266	601,152	801,418	902	17	99.56%	199,385	602,033
06/19/98	125K	E1	140,449	421,632	562,081	904	17	99.45%	139,677	422,404
06/19/99	125K	F1	139,825	419,682	559,507	898	15	99.67%	139,364	420,143
06/19/09	30K	F1	9,138	27,420	36,558	898	15	99.67%	9,108	27,450
Hatchery Totals			1,242,296	3,128,985	4,371,281	Retention Average		99.71%	1,238,690	3,132,591

Nimbus Fish Hatchery - Steelhead - 100% Mark Only					
Trailer # CA3					
Marking Date	Raceway Prior to Marking	Raceway Following Marking	Daily Marked Total	Cumulative Marked Total	Raceway Total
5/28/2019	Lot 1,2	A	46,474	-	46,474
5/29/2019	Lot 2,3	A	46,521	92,995	92,995
5/30/2019	Lot 3	B	42,180	135,175	42,180
5/31/2019	Lot 3	B	2,928	138,103	45,108
6/10/2019	Lot 4	B	31,341	169,444	76,449
6/10/2019	Lot 4	C	1,266	170,710	1,266
6/11/2019	Lot 4,5	C	40,855	211,565	42,121
6/12/2019	Lot 5	C	43,376	254,941	85,497
6/13/2019	Lot 5,6	D	41,841	296,782	41,841
6/14/2019	Lot 6	D	40,156	336,938	81,997
6/24/2019	Lot 6,7	E	19,420	356,358	19,420
6/25/2019	Lot 7	E	46,488	402,846	65,908
6/26/2019	Lot 8	E	11,138	413,984	77,046
6/26/2019	Lot 10	F	19,537	433,521	19,537
6/27/2019	Lot 9,8	F	46,743	480,264	66,280
6/28/2019	Lot 8	F	13,522	493,786	79,802
Hatchery Total			-	-	493,786