

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

Fall-run Chinook Salmon  
Spring-run Chinook Salmon  
Steelhead

2016 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 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 2016. The program was conducted at Coleman National Fish Hatchery, Feather River Fish Hatchery, Nimbus Fish Hatchery, and Mokelumne River Fish Hatchery in these years.

The AutoFish Trailers were also used in the 2011 through 2016 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, and Nimbus Fish Hatchery. Mokelumne River Fish Hatchery manually clipped their steelhead due to the low numbers of fish that they had at the hatchery.

This report includes the marking/tagging activities conducted with the AutoFish Systems at the four Central Valley hatcheries in 2016 (Brood Year 2015 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 marking trailers, 32,098,260 fish. Of the fall-run Chinook total, approximately 27.78% were coded-wire tagged and adipose fin-clipped (8,915,336 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 2,289,556 fish, and adipose fin-clipped 100% of the steelhead produced at Coleman National Fish Hatchery, Feather River Fish Hatchery, and Nimbus Fish Hatchery, a total of 1,113,093 fish. The Coleman National Fish Hatchery steelhead marking numbers are included in separate report.

## **Introduction**

In most years, approximately 30 million fall-run Chinook salmon are produced at four hatcheries in California's Central Valley, including Coleman National Fish Hatchery, Feather River Fish Hatchery, Nimbus 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 2016, 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 2016, the AutoFish Trailers were used for the spring-run Chinook 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 2016 with the exception of Mokelumne River Fish Hatchery which manually clipped their steelhead due to the low numbers fish. Marking allows selective harvest of hatchery-reared steelhead in sport fisheries.

This report covers the tenth year of the CFM program's marking/tagging activities at the four major Central Valley hatcheries in the spring/summer of 2016 (Brood Year 2015 fall-run Chinook). The report also includes the marking/tagging of Brood Year 2015 spring-run Chinook salmon reared at the Feather River Fish Hatchery, and marking of steelhead reared at Feather River Fish Hatchery, and Nimbus Fish Hatchery. Coleman National Fish Hatchery steelhead and late-fall run Chinook 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 2016. Coded-wire tags for the 2016 season were ordered from Northwest Marine Technology in November 2015. Tags used in the program were all 1.1 mm standard length tags with the exception of the Knagg's Ranch Chinook tagging, which half-length tags were used.

The program was conducted at Coleman National Fish Hatchery, Feather River Fish Hatchery, Nimbus Fish Hatchery, and Mokelumne River Fish Hatchery (Figure 1). Fall-run Chinook coded-wire tagged and released for experimental purposes were not included in the program. The Merced River Hatchery therefore was not included in the Constant Fractional Marking Program, as the fall-run Chinook at this hatchery were marked and coded-wire tagged using manual techniques in 2016.

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 marking/tagging season began the third 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 in 2016 therefore spanned a 13-week period. The spring-run Chinook marking/tagging season began the third week of February at Feather River Fish Hatchery and was completed the third week of March for a total of five weeks. The Knagg's Ranch marking/tagging at Feather River Fish Hatchery started the third week of January and was completed the first week of February for a total of three 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 third week of June.

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.rmpc.org), operated by the Pacific States Marine Fisheries Commission (<http://www.rmpc.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 2016 tagging season are shown in Appendix Tables 1 – 5 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 2016 production releases of fall-run Chinook salmon from the Central Valley hatcheries (totaling 32,098,260 fish). The 25% target rate for marking/tagging was achieved for Brood Year 2015 (approximately 27.78% were CWT/ad-clipped, 8,915,336 fish). The AutoFish Trailers also marked and tagged 100% of the Brood Year 2015 spring-run Chinook salmon reared at the Feather River Fish Hatchery, 2,289,556 fish.

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

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

- Coleman National Fish Hatchery: 99.15 - 100% with an average of 99.88%
- Feather River Hatchery: 98.72% - 100% with an average of 99.63%
- Mokelumne River Hatchery: 98.99% - 100% with average of 99.82%
- Nimbus Hatchery: 100% with an average of 100%

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

- Feather River Hatchery: 98.78% – 99.44% with an average of 99.31%

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 and 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 2016 tagging season. The program had seven Trailer Operators and seven Trailer Assistants employed at the start of the 2016 season. We hired an eighth Trailer Assistant that worked only at Mokelumne River Fish Hatchery. A couple of crew members left prior to the end of the season but we were able to complete the marking/tagging with a short crew.

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 and steelhead, Merced River fall-run Chinook, 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 ten 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 Heather McIntire, 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) and Kevin Niemela, U.S. Fish and Wildlife Service (USFWS).

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. Kurtis Brown (USFWS - Coleman National Fish Hatchery), Penny Booth-Crawshaw (CDFW - Feather River Fish Hatchery), Anna Kastner (CDFW - Feather River Fish Hatchery), Paula Hoover (CDFW - Nimbus Fish Hatchery), Gary Novak (CDFW - Nimbus Fish 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 Scott Merlette and Nathan Peterson (PSMFC) for their work on the data. I want to thank Chad Dale and TJ Wilson (PSMFC) for all of their 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 tenth 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 Chris Childers (PSMFC), Chad Dale (PSMFC),

Brittany Furlong (PSMFC), Scott Merlette (PSMFC), Dan O'Connor (PSMFC), Nathan Peterson (PSMFC), and TJ Wilson (PSMFC). Tagging Trailer Assistants included seasonal PSMFC staff members Katie Carmody, Brianne Gooding, Natasha Knight, Lisa Le, Matt O'Neil, Nic Peters, Tyler Smithhart, and Phillip Warner.

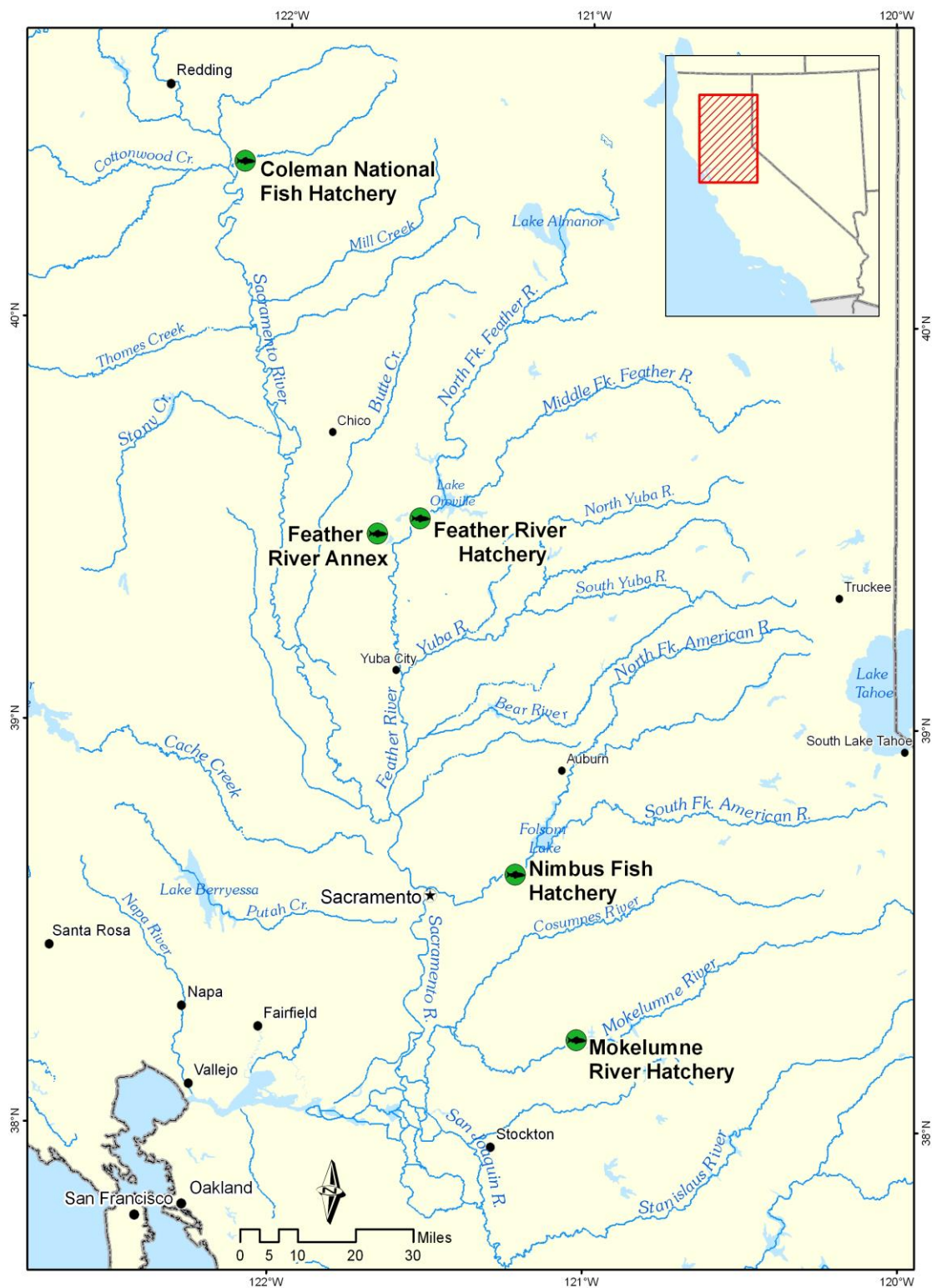
The IEP Central Valley Salmonid Project Work Team provided the initial guidance in the development of the project. Members included Jim Smith (USFWS), Russell Bellmer (CDFW), Kenneth Lentz (USBR retired), John Hannon (USBR), Rich Dixon (CDFW retired), Brad Cavallo (formerly DWR), Pete Adams (NOAA Fisheries retired), Stan Allen (PSMFC) and Joseph Miyamoto (EBMUD retired).

### **Schedule of Mark Events**

- November 2<sup>nd</sup>, 2015-December 9<sup>th</sup>, 2015 Manually clipping/tagging late-fall-run Chinook at Coleman National Fish Hatchery (the remaining Brood Year 2014 fish that were not tagged in the Spring/Summer of 2015 due to extremely warm water temperatures)
- January 19<sup>th</sup>-February 6<sup>th</sup> Clipping/Tagging Knaggs Ranch spring-run Chinook at Feather River Fish Hatchery
- February 16<sup>th</sup>-March 20<sup>th</sup> Clipping/Tagging spring-run Chinook at Feather River Fish Hatchery
- February 24<sup>th</sup>-April 21<sup>st</sup> Clipping/Tagging fall-run Chinook at Coleman National Fish Hatchery
- March 16<sup>th</sup>-May 12<sup>th</sup> Clipping/Tagging fall-run Chinook at Feather River Fish Hatchery
- March 21<sup>th</sup>-May 9<sup>th</sup> Clipping/Tagging fall-run Chinook at Mokelumne River Fish Hatchery
- April 12<sup>th</sup>-May 19<sup>th</sup> Clipping/Tagging fall-run Chinook at Nimbus Fish Hatchery
- May 16<sup>th</sup>-June 13<sup>th</sup> Clipping steelhead at Coleman National Fish Hatchery
- May 23<sup>rd</sup>-June 25<sup>th</sup> Clipping/tagging late-fall-run Chinook at Coleman National Fish Hatchery
- May 31<sup>th</sup>-June 8<sup>th</sup> Clipping steelhead at Feather River Fish Hatchery
- June 6<sup>th</sup>-June 17<sup>th</sup> Clipping/Tagging steelhead at Nimbus Fish Hatchery

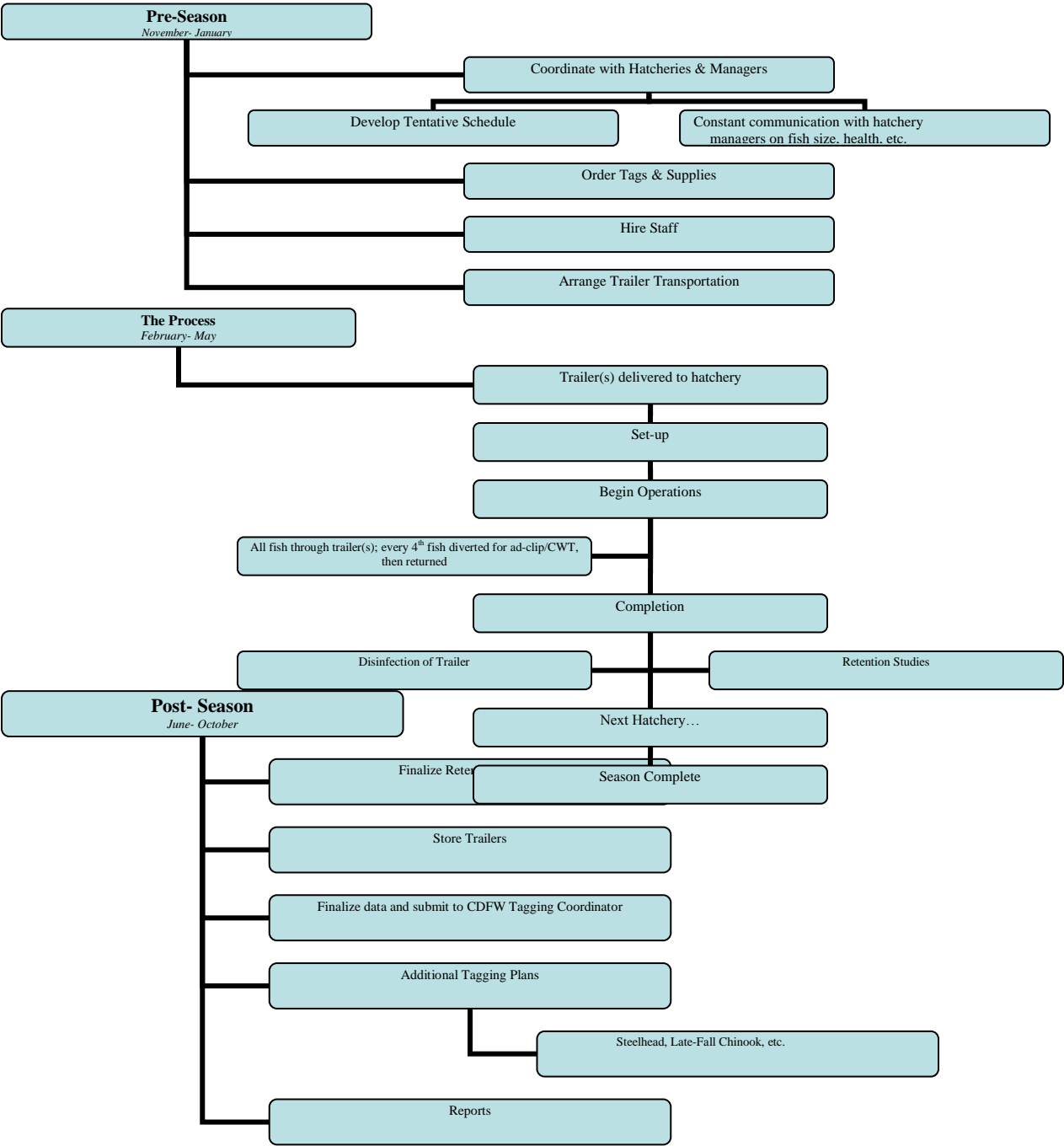


**Figure 1. Hatchery Locations: Central Valley Constant Fractional Marking Program (2016)**





**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**

<b>Coleman National Fish Hatchery- Fall Run Chinook Salmon</b>							
<b>Tag Code: 05/59/52</b>			<b>Size: 105K</b>			<b>Trailer # CA2</b>	
<b>Tagging Date</b>	<b>Raceway Prior to Tagging</b>	<b>Raceway Following Tagging</b>	<b>Daily Tagged Total</b>	<b>Cumulative Tagged Total</b>	<b>Daily Untagged Total</b>	<b>Cumulative Untagged Total</b>	<b>Raceway Total</b>
2/24/2016	1	1	26,933	-	80,943	-	107,876
2/24/2016	1	1	25,702	52,635	77,211	158,154	210,789
2/25/2016	1	1	6,586	59,221	19,794	177,948	237,169
2/25/2016	1	1	33,390	92,611	100,263	278,211	370,822
2/25/2016	1	1	8,832	101,443	26,502	304,713	406,156
<b>Tag Code Totals:</b>			-	<b>101,443</b>	-	<b>304,713</b>	<b>406,156</b>

<b>Coleman National Fish Hatchery- Fall Run Chinook Salmon</b>							
<b>Tag Code: 05/59/53</b>			<b>Size: 105K</b>			<b>Trailer # CA2</b>	
<b>Tagging Date</b>	<b>Raceway Prior to Tagging</b>	<b>Raceway Following Tagging</b>	<b>Daily Tagged Total</b>	<b>Cumulative Tagged Total</b>	<b>Daily Untagged Total</b>	<b>Cumulative Untagged Total</b>	<b>Raceway Total</b>
2/26/2016	2	2	31,851	-	95,676	-	127,527
2/26/2016	2	2	37,256	69,107	111,840	207,516	276,623
2/29/2016	2	2	35,028	104,135	105,183	312,699	416,834
<b>Tag Code Totals:</b>			-	<b>104,135</b>	-	<b>312,699</b>	<b>416,834</b>

<b>Coleman National Fish Hatchery- Fall Run Chinook Salmon</b>							
<b>Tag Code: 05/59/54</b>			<b>Size: 105K</b>			<b>Trailer # CA2</b>	
<b>Tagging Date</b>	<b>Raceway Prior to Tagging</b>	<b>Raceway Following Tagging</b>	<b>Daily Tagged Total</b>	<b>Cumulative Tagged Total</b>	<b>Daily Untagged Total</b>	<b>Cumulative Untagged Total</b>	<b>Raceway Total</b>
2/29/2016	4	4	28,598	-	85,860	-	114,458
3/1/2016	4	4	39,964	68,562	120,012	205,872	274,434
3/1/2016	4	4	32,987	101,549	99,024	304,896	406,445
<b>Tag Code Totals:</b>			-	<b>101,549</b>	-	<b>304,896</b>	<b>406,445</b>

Coleman National Fish Hatchery- Fall Run Chinook Salmon							
Tag Code: 05/59/55			Size: 105K			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
3/2/2016	3	3	38,144	-	114,522	-	152,666
3/2/2016	3	3	39,319	77,463	118,125	232,647	310,110
3/3/2016	3	3	39,429	116,892	118,785	351,432	468,324
Tag Code Totals:			-	116,892	-	351,432	468,324

Coleman National Fish Hatchery- Fall Run Chinook Salmon							
Tag Code: 05/59/56			Size: 105K			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
3/3/2016	5	5	22,477	-	67,503	-	89,980
3/4/2016	5	5	40,674	63,151	122,184	189,687	252,838
3/4/2016	5	5	20,565	83,716	61,782	251,469	335,185
3/7/2016	5	5	30,663	114,379	92,193	343,662	458,041
Tag Code Totals:			-	114,379	-	343,662	458,041

Coleman National Fish Hatchery- Fall Run Chinook Salmon							
Tag Code: 05/59/57			Size: 105K			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
3/7/2016	6	6	32,428	-	97,815	-	130,243
3/8/2016	6	6	39,410	71,838	118,449	216,264	288,102
3/8/2016	6	6	23,751	95,589	71,385	287,649	383,238
Tag Code Totals:			-	95,589	-	287,649	383,238

Coleman National Fish Hatchery- Fall Run Chinook Salmon							
Tag Code: 05/59/58			Size: 105K			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
3/9/2016	7	7	34,735	-	104,442	-	139,177
3/9/2016	7	7	34,528	69,263	103,662	208,104	277,367
3/10/2016	7	7	38,509	107,772	113,667	321,771	429,543
Tag Code Totals:			-	107,772	-	321,771	429,543

Coleman National Fish Hatchery- Fall Run Chinook Salmon							
Tag Code: 05/59/59			Size: 105K			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
3/10/2016	8	8	33,754	-	101,349	-	135,103
3/11/2016	8	8	37,081	70,835	111,360	212,709	283,544
3/11/2016	8	8	52,238	123,073	158,769	371,478	494,551
Tag Code Totals:			-	123,073	-	371,478	494,551

Coleman National Fish Hatchery- Fall Run Chinook Salmon							
Tag Code: 05/59/60			Size: 105K			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
3/14/2016	9	9	21,080	-	63,300	-	84,380
3/14/2016	9	9	38,424	59,504	115,389	178,689	238,193
3/15/2016	9	9	30,950	90,454	92,898	271,587	362,041
Tag Code Totals:			-	90,454	-	271,587	362,041

Coleman National Fish Hatchery- Fall Run Chinook Salmon							
Tag Code: 05/59/61			Size: 105K			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
3/15/2016	10	4	32,301	-	96,996	-	129,297
3/16/2016	10	4	36,531	68,832	109,647	206,643	275,475
3/16/2016	10	4	32,954	101,786	98,916	305,559	407,345
3/17/2016	10	4	9,931	111,717	29,826	335,385	447,102
Tag Code Totals:			-	111,717	-	335,385	447,102

Coleman National Fish Hatchery- Fall Run Chinook Salmon							
Tag Code: 05/59/62			Size: 105K			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
3/17/2016	11	5	19,623	-	58,890	-	78,513
3/17/2016	11	5	29,567	49,190	88,749	147,639	196,829
3/18/2016	11	5	44,236	93,426	132,768	280,407	373,833
Tag Code Totals:			-	93,426	-	280,407	373,833

Coleman National Fish Hatchery- Fall Run Chinook Salmon							
Tag Code: 05/59/63			Size: 105K			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
3/18/2016	12	10	17,725	-	53,205	-	70,930
3/21/2016	12	10	32,859	50,584	98,655	151,860	202,444
3/21/2016	12	10	36,586	87,170	109,785	261,645	348,815
3/22/2016	12	10	27,607	114,777	82,857	344,502	459,279
3/23/2016	12	10	1,740	116,517	5,223	349,725	466,242
Tag Code Totals:			-	116,517	-	349,725	466,242

Coleman National Fish Hatchery- Fall Run Chinook Salmon							
Tag Code: 05/59/64			Size: 105K			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
3/22/2016	13	7	17,530	-	52,686	-	70,216
3/23/2016	13	7	34,503	52,033	103,605	156,291	208,324
3/23/2016	13	7	40,191	92,224	120,651	276,942	369,166
Tag Code Totals:			-	92,224	-	276,942	369,166



Coleman National Fish Hatchery- Fall Run Chinook Salmon							
Tag Code: 05/59/66			Size: 105K			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
3/22/2016	15	15	25,053	-	75,264	-	100,317
3/22/2016	15	15	28,081	53,134	84,291	159,555	212,689
3/23/2016	15	15	39,683	92,817	119,118	278,673	371,490
3/23/2016	15	15	20,343	113,160	61,074	339,747	452,907
Tag Code Totals:			-	113,160	-	339,747	452,907

Coleman National Fish Hatchery- Fall Run Chinook Salmon							
Tag Code: 05/59/65			Size: 105K			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
3/24/2016	14	8	35,214	-	105,699	-	140,913
3/24/2016	14	8	41,497	76,711	124,596	230,295	307,006
3/25/2016	14	8	39,457	116,168	118,434	348,729	464,897
Tag Code Totals:			-	116,168	-	348,729	464,897

Coleman National Fish Hatchery- Fall Run Chinook Salmon							
Tag Code: 05/59/67			Size: 105K			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
3/24/2016	16	16	33,401	-	100,266	-	133,667
3/24/2016	16	16	32,409	65,810	97,257	197,523	263,333
3/25/2016	16	16	31,404	97,214	94,245	291,768	388,982
Tag Code Totals:			-	97,214	-	291,768	388,982

Coleman National Fish Hatchery- Fall Run Chinook Salmon							
Tag Code: 05/59/71			Size: 105K			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
3/25/2016	20	20	14,577	-	43,893	-	58,470
3/28/2016	20	20	34,715	49,292	104,238	148,131	197,423
3/28/2016	20	20	37,496	86,788	112,587	260,718	347,506
3/29/2016	20	20	30,001	116,789	90,078	350,796	467,585
Tag Code Totals:			-	116,789	-	350,796	467,585

Coleman National Fish Hatchery- Fall Run Chinook Salmon							
Tag Code: 05/59/68			Size: 105K			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
3/28/2016	17	17	27,022	-	81,165	-	108,187
3/29/2016	17	17	31,111	58,133	93,390	174,555	232,688
3/30/2016	17	17	41,070	99,203	123,246	297,801	397,004
3/31/2016	17	17	19,970	119,173	59,946	357,747	476,920
Tag Code Totals:			-	119,173	-	357,747	476,920

Coleman National Fish Hatchery- Fall Run Chinook Salmon							
Tag Code: 05/59/72			Size: 105K			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
3/29/2016	21	21	22,648	-	68,046	-	90,694
3/30/2016	21	21	32,276	54,924	96,903	164,949	219,873
3/30/2016	21	21	30,155	85,079	90,600	255,549	340,628
3/31/2016	21	21	12,716	97,795	38,181	293,730	391,525
Tag Code Totals:			-	97,795	-	293,730	391,525

Coleman National Fish Hatchery- Fall Run Chinook Salmon							
Tag Code: 05/59/73			Size: 105K			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
3/31/2016	22	22	40,780	-	122,469	-	163,249
4/1/2016	22	22	30,362	71,142	91,161	213,630	284,772
4/1/2016	22	22	28,678	99,820	86,145	299,775	399,595
4/4/2016	22	22	18,221	118,041	54,738	354,513	472,554
Tag Code Totals:			-	118,041	-	354,513	472,554

Coleman National Fish Hatchery- Fall Run Chinook Salmon							
Tag Code: 05/59/69			Size: 105K			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
3/31/2016	18	18	7,936	-	23,808	-	31,744
4/1/2016	18	18	30,586	38,522	91,797	115,605	154,127
4/4/2016	18	18	34,855	73,377	104,622	220,227	293,604
4/5/2016	18	18	37,528	110,905	112,623	332,850	443,755
4/6/2016	18	18	9,076	119,981	27,252	360,102	480,083
Tag Code Totals:			-	119,981	-	360,102	480,083

Coleman National Fish Hatchery- Fall Run Chinook Salmon							
Tag Code: 05/59/74			Size: 105K			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
4/4/2016	23	23	32,663	-	98,034	-	130,697
4/5/2016	23	23	38,497	71,160	115,551	213,585	284,745
4/5/2016	23	23	24,048	95,208	72,204	285,789	380,997
Tag Code Totals:			-	95,208	-	285,789	380,997

Coleman National Fish Hatchery- Fall Run Chinook Salmon							
Tag Code: 05/59/70			Size: 105K			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
4/6/2016	19	19	14,255	-	42,855	-	57,110
4/6/2016	19	19	25,413	39,668	76,320	119,175	158,843
4/7/2016	19	19	37,307	76,975	111,972	231,147	308,122
4/7/2016	19	19	22,144	99,119	66,552	297,699	396,818
Tag Code Totals:			-	99,119	-	297,699	396,818

Coleman National Fish Hatchery- Fall Run Chinook Salmon							
Tag Code: 05/59/75			Size: 105K			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
4/6/2016	24	24	34,271	-	102,894	-	137,165
4/7/2016	24	24	27,000	61,271	81,075	183,969	245,240
4/8/2016	24	24	34,656	95,927	104,100	288,069	383,996
4/8/2016	24	24	15,529	111,456	46,608	334,677	446,133
Tag Code Totals:			-	111,456	-	334,677	446,133

Coleman National Fish Hatchery- Fall Run Chinook Salmon							
Tag Code: 05/59/76			Size: 105K			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
4/11/2016	25	25	26,456	-	79,470	-	105,926
4/11/2016	25	25	31,389	57,845	94,212	173,682	231,527
4/12/2016	25	25	39,216	97,061	117,744	291,426	388,487
4/12/2016	25	25	18,769	115,830	56,355	347,781	463,611
Tag Code Totals:			-	115,830	-	347,781	463,611

Coleman National Fish Hatchery- Fall Run Chinook Salmon							
Tag Code: 05/59/77			Size: 105K			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
4/13/2016	27	24	23,914	-	71,880	-	95,794
4/14/2016	27	24	33,842	57,756	101,577	173,457	231,213
4/14/2016	27	24	33,841	91,597	101,601	275,058	366,655
4/15/2016	27	24	21,436	113,033	64,419	339,477	452,510
Tag Code Totals:			-	113,033	-	339,477	452,510

Coleman National Fish Hatchery- Fall Run Chinook Salmon							
Tag Code: 05/59/78			Size: 105K			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
4/15/2016	26	27	28,398	-	85,296	-	113,694
4/18/2016	26	27	31,301	59,699	93,957	179,253	238,952
4/18/2016	26	27	35,717	95,416	107,214	286,467	381,883
4/19/2016	26	27	21,663	117,079	65,064	351,531	468,610
Tag Code Totals:			-	117,079	-	351,531	468,610

Coleman National Fish Hatchery- Fall Run Chinook Salmon							
Tag Code: 05/59/79			Size: 105K			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
4/19/2016	28	26	34,628	-	103,950	-	138,578
4/20/2016	28	26	35,203	69,831	105,714	209,664	279,495
4/20/2016	28	26	27,524	97,355	82,659	292,323	389,678
4/21/2016	28	26	14,067	111,422	43,240	335,563	446,985
Tag Code Totals:			-	111,422	-	335,563	446,985

Coleman National Fish Hatchery- Fall Run Chinook Salmon							
Tag Code: 05/24/89			Size: 10k			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
4/12/2016	25	25	1,722	-	5,166	-	6,888
4/21/2016	28	26	10,593	12,315	31,779	36,945	49,260
Tag Code Totals:			-	12,315	-	36,945	49,260

Hatchery Totals: 3,042,953 9,138,940 12,181,893

Retention Range: 99.15 - 100%

Retention Average: 99.88%

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

<b>Coleman National Fish Hatchery- Fall Run Chinook</b>										
<b>Tag Code Size and Location</b>			<b>Tag Code Totals</b>			<b>Retention Calculations</b>				
<b>Tag Code</b>	<b>Size</b>	<b>Raceway</b>	<b>Total Tagged</b>	<b>Number Untagged</b>	<b>Total Processed</b>	<b># of Fish Held</b>	<b>Days Held</b>	<b>% Retention</b>	<b># Retaining Tags</b>	<b>Calculated Untagged</b>
05/59/52	105K	1	101,443	304,713	406,156	379	35	100.00%	101,443	304,713
05/59/53	105K	2	104,135	312,699	416,834	398	31	100.00%	104,135	312,699
05/59/54	105K	4	101,549	304,896	406,445	355	30	99.15%	100,686	305,759
05/59/55	105K	3	116,892	351,432	468,324	374	28	100.00%	116,892	351,432
05/59/56	105K	5	114,379	343,662	458,041	280	24	100.00%	114,379	343,662
05/59/57	105K	6	95,589	287,649	383,238	344	23	100.00%	95,589	287,649
05/59/58	105K	7	107,772	321,771	429,543	62	21	100.00%	107,772	321,771
05/59/59	105K	8	123,073	371,478	494,551	386	20	100.00%	123,073	371,478
05/59/60	105K	9	90,454	271,587	362,041	110	23	100.00%	90,454	271,587
05/59/61	105K	4	111,717	335,385	447,102	397	21	100.00%	111,717	335,385
05/59/62	105K	5	93,426	280,407	373,833	394	20	100.00%	93,426	280,407
05/59/63	105K	10	116,517	349,725	466,242	386	30	99.74%	116,214	350,028
05/59/64	105K	7	92,224	276,942	369,166	397	29	99.50%	91,763	277,403
05/59/66	105K	15	113,160	339,747	452,907	403	29	100.00%	113,160	339,747
05/59/65	105K	8	116,168	348,729	464,897	395	27	100.00%	116,168	348,729
05/59/67	105K	16	97,214	291,768	388,982	345	27	99.71%	96,932	292,050
05/59/71	105K	20	116,789	350,796	467,585	379	23	99.74%	116,485	351,100
05/59/68	105K	17	119,173	357,747	476,920	377	21	99.73%	118,851	358,069
05/59/72	105K	21	97,795	293,730	391,525	391	21	100.00%	97,795	293,730
05/59/73	105K	22	118,041	354,513	472,554	349	22	100.00%	118,041	354,513
05/59/69	105K	18	119,981	360,102	480,083	363	22	99.72%	119,645	360,438
05/59/74	105K	23	95,208	285,789	380,997	359	21	100.00%	95,208	285,789
05/59/70	105K	19	99,119	297,699	396,818	390	21	100.00%	99,119	297,699
05/59/75	105K	24	111,456	334,677	446,133	300	20	99.33%	110,709	335,424
05/59/76	105K	25	115,830	347,781	463,611	307	30	100.00%	115,830	347,781
05/59/77	105K	24	113,033	339,477	452,510	303	28	100.00%	113,033	339,477
05/59/78	105K	27	117,079	351,531	468,610	311	24	100.00%	117,079	351,531
05/59/79	105K*	26	111,422	335,563	446,985	333	21	100.00%	111,422	335,563
05/24/89	10K*	25/26	12,315	36,945	49,260	333	21	100.00%	12,315	36,945
<b>Hatchery Totals</b>			<b>3,042,953</b>	<b>9,138,940</b>	<b>12,181,893</b>	<b>Retention Average</b>		<b>99.88%</b>	<b>3,039,336</b>	<b>9,142,557</b>

\* = Fish held with other tag code fish from same raceway. Retention percentage applied to all tag codes in one raceway.

NOTE: Some raceways of fish were released earlier than normal, which allowed the CFM Program to discharge some groups into the empty raceways and thus, some raceways are listed twice.

## Feather River Fish Hatchery





**Table 2a. Daily Tagging Rates at Feather River Hatchery**

<b>Feather River Fish Hatchery – Knagg’s Ranch - 100% Mark/Tag (Half Tags)</b>					
<b>Tag Code: 06/08/00/09/04</b>		<b>Size: 10K</b>		<b>Trailer # Manual Trailer</b>	
<b>Tagging Date</b>	<b>Raceway Prior to Tagging</b>	<b>Raceway Following Tagging</b>	<b>Daily Tagged Total</b>	<b>Cumulative Tagged Total</b>	<b>Raceway Total</b>
1/19/2016	F2	Tank	1,308	-	1,308
1/20/2016	F2	Tank	4,855	-	6,163
<b>Tag Code Total</b>			<b>-</b>	<b>-</b>	<b>6,163</b>

<b>Feather River Fish Hatchery – Knagg’s Ranch - 100% Mark/Tag (Half Tags)</b>					
<b>Tag Code: 06/01/02/09/04</b>		<b>Size: 50K</b>		<b>Trailer # Manual Trailer</b>	
<b>Tagging Date</b>	<b>Raceway Prior to Tagging</b>	<b>Raceway Following Tagging</b>	<b>Daily Tagged Total</b>	<b>Cumulative Tagged Total</b>	<b>Raceway Total</b>
1/21/2016	F2	C5	5,997	-	5,997
1/22/2016	F2	C5	5,886	-	11,883
1/25/2016	F2	C5	5,766	-	17,649
1/26/2016	F2	C5	8,507	-	26,156
1/27/2016	F2	C5	7,948	-	34,104
1/28/2016	F2	C5	7,977	-	42,081
1/29/2016	F2	C5	5,289	-	47,370
<b>Tag Code Total</b>			<b>-</b>	<b>-</b>	<b>47,370</b>

<b>Feather River Fish Hatchery – Knagg’s Ranch - 100% Mark/Tag (Half Tags)</b>					
<b>Tag Code: 06/01/02/09/05</b>		<b>Size: 50K</b>		<b>Trailer # Manual Trailer</b>	
<b>Tagging Date</b>	<b>Raceway Prior to Tagging</b>	<b>Raceway Following Tagging</b>	<b>Daily Tagged Total</b>	<b>Cumulative Tagged Total</b>	<b>Raceway Total</b>
2/1/2016	F2	C6	6,824	-	6,824
2/2/2016	F2	C6	8,966	-	15,790
2/3/2016	F2	C6	9,291	-	25,081
2/4/2016	F2	C6	7,575	-	32,656
2/8/2016	F2	C6	8,944	-	41,600
2/9/2016	F2	C6	6,061	-	47,661
<b>Tag Code Total</b>			<b>-</b>	<b>-</b>	<b>47,661</b>

**Hatchery Total:**

**101,194**

<b>Feather River Fish Hatchery - Spring Run -San Joaquin - 100% Mark/Tag</b>					
<b>Tag Code: 06/05/21</b>		<b>Size: 60K</b>		<b>Trailer # CA4</b>	
<b>Tagging Date</b>	<b>Raceway Prior to Tagging</b>	<b>Raceway Following Tagging</b>	<b>Daily Tagged Total</b>	<b>Cumulative Tagged Total</b>	<b>Raceway Total</b>
2/16/2016	Vats	Top H	44,225	-	44,225
2/17/2016	Vats	Top H	14,979	-	59,204
<b>Tag Code Total</b>			-	-	<b>59,204</b>

<b>Feather River Fish Hatchery - Spring Run - 100% Mark/Tag</b>					
<b>Tag Code: 06/07/31</b>		<b>Size: 470K</b>		<b>Trailer # CA4</b>	
<b>Tagging Date</b>	<b>Raceway Prior to Tagging</b>	<b>Raceway Following Tagging</b>	<b>Daily Tagged Total</b>	<b>Cumulative Tagged Total</b>	<b>Raceway Total</b>
2/17/2016	G2	G6	11,892	-	11,892
2/18/2016	G2	G6	37,851	-	49,743
2/18/2016	G2	G6	24,389	-	74,132
2/19/2016	G2	G6	49,911	-	124,043
2/22/2016	G2	G6	36,409	-	160,452
2/22/2016	G2	G6	41,689	-	202,141
2/23/2016	G2	G6	43,711	-	245,852
2/23/2016	G2	G6	44,932	-	290,784
2/24/2016	G2	G6	40,044	-	330,828
2/24/2016	G2	G6	41,215	-	372,043
2/25/2016	G2	G6	47,127	-	419,170
2/25/2016	G2	G6	48,557	-	467,727
2/26/2016	G2	G6	42,487	-	510,214
2/26/2016	G2	G6	18,416	-	528,630
2/29/2016	G4	G6	8,566	-	537,196
<b>Tag Code Total</b>			-	-	<b>537,196</b>

<b>Feather River Fish Hatchery - Spring Run - 100% Mark/Tag</b>					
<b>Tag Code: 06/07/32</b>		<b>Size: 470K</b>		<b>Trailer # CA4</b>	
<b>Tagging Date</b>	<b>Raceway Prior to Tagging</b>	<b>Raceway Following Tagging</b>	<b>Daily Tagged Total</b>	<b>Cumulative Tagged Total</b>	<b>Raceway Total</b>
2/29/2016	G4	G1	15,532	-	15,532
2/29/2016	G4	G1	48,699	-	64,231
3/1/2016	G4	G1	49,366	-	113,597
3/1/2016	G4	G1	54,248	-	167,845
3/2/2016	G4	G1	53,786	-	221,631
3/2/2016	G4	G1	53,616	-	275,247
3/3/2016	G4	G1	52,780	-	328,027
3/3/2016	G4	G1	52,669	-	380,696
3/4/2016	G4	G1	48,634	-	429,330
3/4/2016	G4	G1	28,306	-	457,636
3/7/2016	G4	G1	8,021	-	465,657
<b>Tag Code Total</b>			-	-	<b>465,657</b>

<b>Feather River Fish Hatchery - Spring Run - 100% Mark/Tag</b>					
<b>Tag Code: 06/07/33</b>		<b>Size: 470K</b>		<b>Trailer # CA4</b>	
<b>Tagging Date</b>	<b>Raceway Prior to Tagging</b>	<b>Raceway Following Tagging</b>	<b>Daily Tagged Total</b>	<b>Cumulative Tagged Total</b>	<b>Raceway Total</b>
3/7/2016	H4	H6	47,624	-	47,624
3/8/2016	H4	H6	53,105	-	100,729
3/8/2016	H4	H6	51,180	-	151,909
3/9/2016	H4	H6	52,918	-	204,827
3/9/2016	H4	H6	54,289	-	259,116
3/10/2016	H4	H6	56,494	-	315,610
3/10/2016	H4	H6	58,629	-	374,239
3/11/2016	H4	H6	53,062	-	427,301
3/11/2016	H4	H6	46,434	-	473,735
3/14/2016	H4	H6	43,178	-	516,913
3/14/2016	H4	H6	23,462	-	540,375
<b>Tag Code Total</b>			-	-	<b>540,375</b>

Feather River Fish Hatchery - Spring Run - 100% Mark/Tag					
Tag Code: 06/07/34		Size: 470K		Trailer # CA4	
Tagging Date	Raceway Prior to Tagging	Raceway Following Tagging	Daily Tagged Total	Cumulative Tagged Total	Raceway Total
3/14/2016	H2	H1	26,513	-	26,513
3/15/2016	H2	H1	61,346	-	87,859
3/15/2016	H2	H1	65,208	-	153,067
3/16/2016	H2	H1	21,322	-	174,389
3/16/2016	H2	H1	35,093	-	209,482
3/16/2016	H2	H1	63,163	-	272,645
3/17/2016	H2	H1	61,948	-	334,593
3/17/2016	H2	H1	64,533	-	399,126
3/18/2016	H2	H1	60,368	-	459,494
3/18/2016	H2	H1	62,155	-	521,649
3/19/2016	H2	H1	35,065	-	556,714
Tag Code Total			-	-	556,714

Feather River Fish Hatchery - Spring Run - 100% Mark/Tag					
Tag Code: 06/04/53		Size: 30K		Trailer # CA4	
Tagging Date	Raceway Prior to Tagging	Raceway Following Tagging	Daily Tagged Total	Cumulative Tagged Total	Raceway Total
3/20/2016	H2	H1	29,216	-	29,216
Tag Code Totals			-	-	29,216

Hatchery Total: 2,289,556

Retention Range: 98.78 - 99.44%

Retention Average: 99.31%

**Table 2b. Summary of Hatchery Spring-Run Tag Codes and Retention Study**

Feather River Fish Hatchery - Spring Run Chinook - 100% Mark/Tag										
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
06/05/21	60K**	Top H	59,204	-	59,204	-	-	99.31%	58,795	409
06/07/31	470K	G6	537,196	-	537,196	900	23	98.78%	530,642	6,554
06/07/32	470K	G1	465,657	-	465,657	900	16	99.44%	463,049	2,608
06/07/33	470K	H6	540,375	-	540,375	900	22	99.44%	537,349	3,026
06/07/34	470K*	H1	556,714	-	556,714	900	19	99.44%	553,596	3,118
06/04/53	30K*	H1	29,216	-	29,216	900	20	99.44%	29,052	164
Hatchery Totals			2,188,362	-	2,188,362	Retention Average		99.31%	2,172,485	15,877
* = Fish held with other tag code fish from same raceway. Retention percentage applied to all tag codes in one raceway.										
** = Retention fish not checked. Used retention average to obtain retention rate.										

Note: Retention checks were not conducted on the Knagg's Ranch and San Joaquin groups due to them be moved or released shortly after the completion of marking/tagging.

Feather River Fish Hatchery- Fall Run Chinook Salmon							
Tag Code: 06/07/35			Size: 220K			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
3/16/2016	F2	Channel 3	22,286	-	66,939	-	89,225
3/17/2016	F2	Channel 3	20,788	43,074	62,403	129,342	172,416
3/18/2106	F2	Channel 3	17,069	60,143	51,252	180,594	240,737
3/21/2016	F2	Channel 3	6,627	66,770	19,926	200,520	267,290
3/22/2106	F2	Channel 3	27,132	93,902	81,447	281,967	375,869
3/23/2016	F2	Channel 3	43,626	137,528	131,004	412,971	550,499
3/24/2016	F2/F4	Channel 3	38,499	176,027	116,004	528,975	705,002
3/28/2016	F4	Channel 3	35,486	211,513	106,536	635,511	847,024
3/28/2016	F4	Channel 3	28,592	240,105	85,818	721,329	961,434
3/29/2016	F4	Channel 3	5,919	246,024	17,778	739,107	985,131
Tag Code Totals:			-	246,024	-	739,107	985,131

Feather River Fish Hatchery- Fall Run Chinook Salmon							
Tag Code: 06/07/36			Size: 220K			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
3/29/2016	F4	Channel 2	19,580	-	58,746	-	78,326
3/29/2016	F6	Channel 2	35,933	55,513	107,841	166,587	222,100
3/30/2016	F6	Channel 2	37,134	92,647	111,450	278,037	370,684
3/30/2016	F6	Channel 2	33,414	126,061	100,281	378,318	504,379
3/31/2016	F6/E2	Channel 2	38,640	164,701	115,980	494,298	658,999
4/1/2016	E2	Channel 2	38,512	203,213	115,584	609,882	813,095
4/1/2016	E2	Channel 2	30,911	234,124	92,763	702,645	936,769
4/4/2016	E2	Channel 2	14,962	249,086	44,928	747,573	996,659
Tag Code Totals:			-	249,086	-	747,573	996,659

Feather River Fish Hatchery- Fall Run Chinook Salmon							
Tag Code: 06/07/37			Size: 220K			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
4/4/2016	E2/E4	Channel 1	40,905	-	122,760	-	163,665
4/5/2016	E4	Channel 1	35,786	76,691	107,394	230,154	306,845
4/5/2016	E4	Channel 1	36,869	113,560	110,637	340,791	454,351
4/6/2016	E4	Channel 1	37,610	151,170	112,872	453,663	604,833
4/6/2016	E6	Channel 1	32,876	184,046	98,697	552,360	736,406
4/7/2016	E6	Channel 1	38,543	222,589	115,662	668,022	890,611
4/7/2016	E6	Channel 1	31,901	254,490	95,754	763,776	1,018,266
Tag Code Totals:			-	254,490	-	763,776	1,018,266

Feather River Fish Hatchery- Fall Run Chinook Salmon							
Tag Code: 06/07/38			Size: 120K			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
4/8/2016	E6/D2	F4-6	35,673	-	107,064	-	142,737
4/8/2016	D2	F4-6	36,252	71,925	108,792	215,856	287,781
4/11/2016	D2	F4-6	33,513	105,438	100,593	316,449	421,887
4/11/2016	D2	F4-6	29,820	135,258	89,493	405,942	541,200
Tag Code Totals:			-	135,258	-	405,942	541,200

Feather River Fish Hatchery- Fall Run Chinook Salmon							
Tag Code: 06/07/39			Size: 120K			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
4/12/2016	D4	E4-6	40,695	-	122,121	-	162,816
4/12/2016	D4	E4-6	38,139	78,834	114,456	236,577	315,411
4/13/2016	D4	E4-6	42,557	121,391	127,704	364,281	485,672
4/13/2016	D4/D6	E4-6	16,220	137,611	48,687	412,968	550,579
Tag Code Totals:			-	137,611	-	412,968	550,579



Feather River Fish Hatchery- Fall Run Chinook Salmon							
Tag Code: 06/07/40			Size: 120K			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
4/13/2016	D6	E1-3	8,267	-	24,807	-	33,074
4/14/2016	D6	E1-3	38,763	47,030	116,319	141,126	188,156
4/14/2016	D6	E1-3	31,608	78,638	94,854	235,980	314,618
4/15/2016	D6/C2	E1-3	35,382	114,020	106,191	342,171	456,191
4/15/2016	C2	E1-3	22,137	136,157	66,423	408,594	544,751
Tag Code Totals:			-	136,157	-	408,594	544,751

Feather River Fish Hatchery- Fall Run Chinook Salmon							
Tag Code: 06/07/41			Size: 120K			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
4/18/2016	C2	D1-3	34,676	-	104,070	-	138,746
4/18/2016	C2	D1-3	40,321	74,997	121,044	225,114	300,111
4/19/2016	C2	D1-3	38,143	113,140	114,465	339,579	452,719
4/19/2016	C2	D1-3	24,756	137,896	74,280	413,859	551,755
Tag Code Totals:			-	137,896	-	413,859	551,755

Feather River Fish Hatchery- Fall Run Chinook Salmon							
Tag Code: 06/07/42			Size: 120K			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
4/20/2016	C4	D4-6	37,620	-	112,905	-	150,525
4/20/2016	C4	D4-6	37,396	75,016	112,218	225,123	300,139
4/21/2016	C4	D4-6	39,231	114,247	117,741	342,864	457,111
4/21/2016	C4/C6	D4-6	22,290	136,537	66,906	409,770	546,307
Tag Code Totals:			-	136,537	-	409,770	546,307

Feather River Fish Hatchery- Fall Run Chinook Salmon							
Tag Code: 06/07/43			Size: 120K			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
4/22/2016	C6	C1-3	41,288	-	123,915	-	165,203
4/22/2016	C6	C1-3	37,417	78,705	112,296	236,211	314,916
4/25/2016	C6	C1-3	45,994	124,699	138,081	374,292	498,991
4/26/2016	C6	C1-3	9,834	134,533	29,550	403,842	538,375
Tag Code Totals:			-	134,533	-	403,842	538,375

Feather River Fish Hatchery- Fall Run Chinook Salmon							
Tag Code: 06/07/44			Size: 120K			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
4/26/2016	B2	C4-6	38,375	-	115,263	-	153,638
4/27/2016	B2	C4-6	32,689	71,064	98,118	213,381	284,445
4/27/2016	B2	C4-6	34,977	106,041	104,985	318,366	424,407
4/28/2016	B2	C4-6	27,512	133,553	82,584	400,950	534,503
Tag Code Totals:			-	133,553	-	400,950	534,503

Feather River Fish Hatchery- Fall Run Chinook Salmon							
Tag Code: 06/07/45			Size: 120K			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
4/28/2016	B2/B4	B1-3	28,182	-	84,600	-	112,782
4/29/2016	B4	B1-3	30,262	58,444	90,831	175,431	233,875
4/29/2016	B4	B1-3	22,796	81,240	68,439	243,870	325,110
5/2/2016	B4	B1-3	30,193	111,433	90,618	334,488	445,921
5/2/2016	B4	B1-3	20,571	132,004	61,731	396,219	528,223
Tag Code Totals:			-	132,004	-	396,219	528,223

Feather River Fish Hatchery- Fall Run Chinook Salmon							
Tag Code: 06/07/46			Size: 120K			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
5/3/2016	B4/B6	G4-6	44,801	-	134,457	-	179,258
5/4/2016	B6	G4-6	47,352	92,153	142,107	276,564	368,717
5/5/2016	B6	G4-6	45,539	137,692	136,659	413,223	550,915
Tag Code Totals:			-	137,692	-	413,223	550,915

Feather River Fish Hatchery- Fall Run Chinook Salmon							
Tag Code: 06/07/47			Size: 120K			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
5/6/2016	A2	G1-3	34,032	-	102,129	-	136,161
5/7/2016	A2	G1-3	29,200	63,232	87,633	189,762	252,994
5/9/2016	A2	G1-3	32,015	95,247	96,087	285,849	381,096
5/9/2016	A2	G1-3	35,065	130,312	105,237	391,086	521,398
5/10/2016	A2	G1-3	7,354	137,666	22,095	413,181	550,847
Tag Code Totals:			-	137,666	-	413,181	550,847

Feather River Fish Hatchery- Fall Run Chinook Salmon							
Tag Code: 06/07/07			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
5/10/2016	A2/A4	H1-3	25,753	-	77,268	-	103,021
5/10/2016	A4	H1-3	36,654	62,407	110,022	187,290	249,697
5/11/2016	A4	H1-3	37,297	99,704	111,939	299,229	398,933
5/11/2016	A4	H1-3	36,681	136,385	110,070	409,299	545,684
5/12/2016	A4	H1-3	10,035	146,420	30,135	439,434	585,854
Tag Code Totals:			-	146,420	-	439,434	585,854

Feather River Fish Hatchery- Fall Run Chinook Salmon							
Tag Code: 06/07/93			Size: 35K			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
5/12/2016	A4	H4	33,124	-	99,441	-	132,565
Tag Code Totals:			-	33,124	-	99,441	132,565

Hatchery Totals: 2,288,051 6,867,879 9,155,930

Retention Range: 98.72 - 100%

Retention Average: 99.63%

**Table 2c. Summary of Hatchery Fall-run Tag Codes and Tag 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
06/07/35	220K	Channel 3	246,024	739,107	985,131	678	21	99.85%	245,655	739,476
06/07/36	220K	Channel 2	249,086	747,573	996,659	900	21	99.56%	247,990	748,669
06/07/37	220K	Channel 1	254,490	763,776	1,018,266	862	21	98.72%	251,233	767,033
06/07/38	120K	F4-6	135,258	405,942	541,200	888	18	99.44%	134,501	406,699
06/07/39	120K	E4-6	137,611	412,968	550,579	900	21	99.67%	137,157	413,422
06/07/40	120K	E1-3	136,157	408,594	544,751	932	19	99.46%	135,422	409,329
06/07/41	120K	D1-3	137,896	413,859	551,755	899	21	99.66%	137,427	414,328
06/07/42	120K	D4-6	136,537	409,770	546,307	893	22	99.22%	135,472	410,835
06/07/43	120K	C1-3	134,533	403,842	538,375	900	22	99.44%	133,780	404,595
06/07/44	120K	C4-6	133,553	400,950	534,503	874	19	99.77%	133,246	401,257
06/07/45	120K	B1-3	132,004	396,219	528,223	885	16	99.77%	131,700	396,523
06/07/46	120K	G4-6	137,692	413,223	550,915	893	13	100.00%	137,692	413,223
06/07/47	120K	G1-3	137,666	413,181	550,847	904	8	100.00%	137,666	413,181
06/07/07	125K	H1-3	146,420	439,434	585,854	900	19	99.89%	146,259	439,595
06/07/93	35K	H4-6	33,124	99,441	132,565	200	19	100.00%	33,124	99,441
Hatchery Totals			2,288,051	6,867,879	9,155,930	Retention Average		99.63%	2,278,323	6,877,607

<b>Feather River Fish Hatchery- Steelhead- 100% Mark only</b>					
<b>Trailer # CA3</b>					
<b>Marking Date</b>	<b>Raceway Prior to Marking</b>	<b>Raceway Following Marking</b>	<b>Daily Marked Total</b>	<b>Cumulative Marked Total</b>	<b>Raceway Total</b>
5/31/2016	F2	F1	34,275	-	34,275
6/1/2016	F2	F1	15,188	-	<b>49,463</b>
6/8/2016	Tanks	F2	22,734	-	<b>22,734</b>
<b>Marked Total</b>			-	-	<b>72,197</b>

**Hatchery Total:**

**72,197**

# Mokelumne River Hatchery





**Table 4a. Daily Tagging Rates at Mokelumne River Hatchery**

<b>Mokelumne River Fish Hatchery- Fall Run Chinook Salmon</b>							
<b>Tag Code: 06/07/54</b>			<b>Size: 100K</b>			<b>Trailer # CA1</b>	
<b>Tagging Date</b>	<b>Raceway Prior to Tagging</b>	<b>Raceway Following Tagging</b>	<b>Daily Tagged Total</b>	<b>Cumulative Tagged Total</b>	<b>Daily Untagged Total</b>	<b>Cumulative Untagged Total</b>	<b>Raceway Total</b>
3/21/2016	B	A	26,529	-	79,674	-	106,203
3/22/2016	B	A	29,193	55,722	87,633	167,307	223,029
3/22/2016	B	A	30,724	86,446	92,217	259,524	345,970
3/23/2016	B	A	26,163	112,609	78,522	338,046	450,655
<b>Tag Code Totals:</b>			<b>-</b>	<b>112,609</b>	<b>-</b>	<b>338,046</b>	<b>450,655</b>

<b>Mokelumne River Fish Hatchery- Fall Run Chinook Salmon</b>							
<b>Tag Code: 06/07/55</b>			<b>Size: 100K</b>			<b>Trailer # CA1</b>	
<b>Tagging Date</b>	<b>Raceway Prior to Tagging</b>	<b>Raceway Following Tagging</b>	<b>Daily Tagged Total</b>	<b>Cumulative Tagged Total</b>	<b>Daily Untagged Total</b>	<b>Cumulative Untagged Total</b>	<b>Raceway Total</b>
3/23/2016	C	B	43,630	-	130,980	-	174,610
3/24/2016	C	B	37,540	81,170	112,665	243,645	324,815
3/24/2016	C	B	32,223	113,393	96,756	340,401	453,794
<b>Tag Code Totals:</b>			<b>-</b>	<b>113,393</b>	<b>-</b>	<b>340,401</b>	<b>453,794</b>

<b>Mokelumne River Fish Hatchery - 100% Mark/Tag</b>					
<b>Tag Code: 06/07/69</b>		<b>Size: 450K</b>		<b>Trailer # CA1</b>	
<b>Tagging Date</b>	<b>Raceway Prior to Tagging</b>	<b>Raceway Following Tagging</b>	<b>Daily Tagged Total</b>	<b>Cumulative Tagged Total</b>	<b>Raceway Total</b>
3/25/2016	D	C	30,604	-	30,604
3/25/2016	D	C	56,531	-	87,135
3/28/2016	D	C	28,961	-	116,096
3/28/2016	D	C	59,234	-	175,330
3/29/2016	D	C	54,331	-	229,661
3/29/2016	D	C	44,432	-	274,093
3/31/2016	D	C	49,542	-	323,635
4/1/2016	D	C	32,440	-	356,075
4/1/2016	D	C	42,081	-	398,156
4/4/2016	D	C	28,697	-	426,853
4/4/2016	D	C	60,169	-	487,022
<b>Tag Code Total</b>			<b>-</b>	<b>-</b>	<b>487,022</b>

Mokelumne River Fish Hatchery - 100% Mark/Tag					
Tag Code: 06/07/64		Size: 90K		Trailer # CA1	
Tagging Date	Raceway Prior to Tagging	Raceway Following Tagging	Daily Tagged Total	Cumulative Tagged Total	Raceway Total
4/5/2016	E	D1	53,609	-	53,609
4/5/2016	E	D1	47,663	-	101,272
Tag Code Total			-	-	101,272

Mokelumne River Fish Hatchery - 100% Mark/Tag					
Tag Code: 06/07/65		Size: 90K		Trailer # CA1	
Tagging Date	Raceway Prior to Tagging	Raceway Following Tagging	Daily Tagged Total	Cumulative Tagged Total	Raceway Total
4/6/2016	E	D2	52,941	-	52,941
4/6/2016	E	D2	48,239	-	101,180
Tag Code Total			-	-	101,180

Mokelumne River Fish Hatchery - 100% Mark/Tag					
Tag Code: 06/07/66		Size: 90K		Trailer # CA1	
Tagging Date	Raceway Prior to Tagging	Raceway Following Tagging	Daily Tagged Total	Cumulative Tagged Total	Raceway Total
4/7/2016	E/F	D3	55,900	-	55,900
4/7/2016	F	D3	45,040	-	100,940
Tag Code Total			-	-	100,940

Mokelumne River Fish Hatchery- Fall Run Chinook Salmon							
Tag Code: 06/07/56			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
4/8/2016	F	E	23,804	-	71,445	-	95,249
4/8/2016	F	E	28,964	52,768	86,922	158,367	211,135
4/11/2016	F	E	19,624	72,392	58,926	217,293	289,685
4/11/2016	F/G	E	44,870	117,262	134,658	351,951	469,213
Tag Code Totals:			-	117,262	-	351,951	469,213

Mokelumne River Fish Hatchery- Fall Run Chinook Salmon							
Tag Code: 06/07/57			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
4/12/2016	G	F	34,065	-	102,228	-	136,293
4/12/2016	G	F	43,754	77,819	131,322	233,550	311,369
4/13/2016	G	F	34,752	112,571	104,280	337,830	450,401
Tag Code Totals:			-	112,571	-	337,830	450,401

Mokelumne River Fish Hatchery- Fall Run Chinook Salmon							
Tag Code: 06/07/58			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
4/13/2016	H	G	48,908	-	146,775	-	195,683
4/14/2016	H	G	45,515	94,423	136,569	283,344	377,767
4/14/2016	H	G	18,990	113,413	57,027	340,371	453,784
Tag Code Totals:			-	113,413	-	340,371	453,784

Mokelumne River Fish Hatchery- Fall Run Chinook Salmon							
Tag Code: 06/07/59			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
4/14/2016	I	H	6,342	-	19,026	-	25,026
4/15/2016	I	H	20,403	26,745	61,233	80,259	107,004
4/15/2016	I	H	21,384	48,129	64,209	144,468	192,597
4/18/2016	I	H	54,148	102,277	162,606	307,074	409,351
4/19/2016	J	H	10,172	112,449	30,561	337,635	450,084
Tag Code Totals:			-	112,449	-	337,635	450,084

Mokelumne River Fish Hatchery- Fall Run Chinook Salmon							
Tag Code: 06/07/60			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
4/19/2016	J	I	44,871	-	134,664	-	179,535
4/20/2016	J	I	33,947	78,818	101,865	236,529	315,347
4/20/2016	J/K	I	34,435	113,253	103,353	339,882	453,135
Tag Code Totals:			-	113,253	-	339,882	453,135

Mokelumne River Fish Hatchery- Fall Run Chinook Salmon							
Tag Code: 06/07/61			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
4/21/2016	K	J	32,991	-	99,000	-	131,991
4/21/2016	K	J	44,637	77,628	133,947	232,947	310,575
4/22/2016	K/L	J	36,205	113,833	108,696	341,643	455,476
Tag Code Totals:			-	113,833	-	341,643	455,476

Mokelumne River Fish Hatchery- Fall Run Chinook Salmon							
Tag Code: 06/07/62			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
4/25/2016	L	K	45,120	-	135,441	-	180,561
4/26/2016	L	K	23,619	68,739	70,887	206,328	275,067
4/26/2016	L/M	K	35,304	104,043	105,951	312,279	416,322
4/27/2016	M	K	10,274	114,317	30,849	343,128	457,445
Tag Code Totals:			-	114,317	-	343,128	457,445

Mokelumne River Fish Hatchery- Fall Run Chinook Salmon							
Tag Code: 06/07/63			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
4/27/2016	M	L	61,650	-	184,992	-	246,642
4/28/2016	M/N	L	37,342	98,992	112,059	297,051	396,043
4/28/2016	N	L	15,088	114,080	45,354	342,405	456,485
Tag Code Totals:			-	114,080	-	342,405	456,485

Mokelumne River Fish Hatchery- Fall Run Chinook Salmon							
Tag Code: 06/05/23			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
4/28/2016	N	M	12,183	-	36,570	-	48,753
4/29/2016	N	M	52,029	64,212	156,126	192,696	256,908
5/2/2016	N	M	19,875	84,087	59,646	252,342	336,429
5/2/2016	N/O	M	30,392	114,479	91,245	343,587	458,066
Tag Code Totals:			-	114,479	-	343,587	458,066

Mokelumne River Fish Hatchery - 100% Mark/Tag					
Tag Code: 06/05/71		Size: 175K		Trailer # CA1	
Tagging Date	Raceway Prior to Tagging	Raceway Following Tagging	Daily Tagged Total	Cumulative Tagged Total	Raceway Total
5/3/2016	O	N1	101,980	-	101,980
5/4/2016	O	N1	54,982	-	156,962
5/4/2016	O	N1	44,575	-	201,537
Tag Code Total			-	-	201,537

Mokelumne River Fish Hatchery - 100% Mark/Tag					
Tag Code: 06/05/82		Size: 175K		Trailer # CA1	
Tagging Date	Raceway Prior to Tagging	Raceway Following Tagging	Daily Tagged Total	Cumulative Tagged Total	Raceway Total
5/4/2016	O	N2	12,892	-	12,892
5/5/2016	O	N2	51,621	-	64,513
5/5/2016	O	N2	62,981	-	127,494
5/6/2016	O	N2	33, 500	-	160,994
5/6/2016	O	N2	40,530	-	201,524
Tag Code Total			-	-	201,524

Mokelumne River Fish Hatchery- Fall Run Chinook Salmon							
Tag Code: 06/07/09			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
5/9/2016	P	O	52,631	-	158,013	-	210,644
5/9/2016	P	O	26,373	79,004	79,149	237,162	316,166
Tag Code Totals:			-	79,004	-	237,162	316,166

Mokelumne River Fish Hatchery- Fall Run Chinook Salmon							
Tag Code: 06/87/39			Size: 10K			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
5/9/2016	P	O	12,307	-	36,921	-	49,228
Tag Code Totals:			-	12,307	-	36,921	49,228

Hatchery Totals: 2,536,445 4,030,962 6,567,407

Retention Range: 98.99% - 100% Retention Average: 99.82%

**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
06/07/54	100K	A	112,609	338,046	450,655	400	21	100.00%	112,609	338,046
06/07/55	100K	B	113,393	340,401	453,794	398	21	98.99%	112,248	341,546
06/07/69	450K	C	487,022	-	487,022	400	22	99.75%	485,804	1,218
06/07/64	90K	D1	101,272	-	101,272	400	21	99.75%	101,019	253
06/07/65	90K	D2	101,180	-	101,180	400	27	100.00%	101,180	0
06/07/66	90K	D3	100,940	-	100,940	400	26	99.75%	100,688	252
06/07/56	100K	E	117,262	351,951	469,213	400	15	100.00%	117,262	351,951
06/07/57	100K	F	112,571	337,830	450,401	400	20	100.00%	112,571	337,830
06/07/58	100K	G	113,413	340,371	453,784	400	21	100.00%	113,413	340,371
06/07/59	100K	H	112,449	337,635	450,084	400	21	99.25%	111,606	338,478
06/07/60	100K	I	113,253	339,882	453,135	400	20	100.00%	113,253	339,882
06/07/61	100K	J	113,833	341,643	455,476	400	18	100.00%	113,833	341,643
06/07/62	100K	K	114,317	343,128	457,445	400	13	100.00%	114,317	343,128
06/07/63	100K	L	114,080	342,405	456,485	414	21	100.00%	114,080	342,405
06/05/23	100K	M	114,479	343,587	458,066	395	17	99.75%	114,193	343,873
06/05/71	175K	N1	201,537	-	201,537	400	15	99.50%	200,529	1,008
06/05/82	175K	N2	201,524	-	201,524	400	13	99.75%	201,020	504
06/07/09	70K*	O	79,004	237,162	316,166	525	9	100.00%	79,004	237,162
06/87/39	10K*	O	12,307	36,921	49,228	525	9	100.00%	12,307	36,921
<b>Hatchery Totals</b>			<b>2,536,445</b>	<b>4,030,962</b>	<b>6,567,407</b>	<b>Retention Average</b>		<b>99.82%</b>	<b>2,530,936</b>	<b>4,036,471</b>

\* = Fish held with other tag code fish from same raceway. Retention percentage applied to all tag codes in one raceway.

# Nimbus Hatchery





**Table 5a. Daily Tagging Rates at Nimbus Hatchery**

<b>Nimbus Fish Hatchery- Fall Run Chinook Salmon</b>							
<b>Tag Code: 06/07/49</b>			<b>Size: 155K</b>			<b>Trailer # CA4</b>	
<b>Tagging Date</b>	<b>Raceway Prior to Tagging</b>	<b>Raceway Following Tagging</b>	<b>Daily Tagged Total</b>	<b>Cumulative Tagged Total</b>	<b>Daily Untagged Total</b>	<b>Cumulative Untagged Total</b>	<b>Raceway Total</b>
4/12/2016	A	A	39,375	-	118,245	-	157,620
4/13/2016	A	A	40,605	79,980	121,857	240,102	320,082
4/14/2016	A	A	49,175	129,155	147,573	387,675	516,830
4/15/2016	A	A	44,289	173,444	132,906	520,581	694,025
<b>Tag Code Totals:</b>			-	<b>173,444</b>	-	<b>520,581</b>	<b>694,025</b>

<b>Nimbus Fish Hatchery- Fall Run Chinook Salmon</b>							
<b>Tag Code: 06/07/50</b>			<b>Size: 155K</b>			<b>Trailer # CA4</b>	
<b>Tagging Date</b>	<b>Raceway Prior to Tagging</b>	<b>Raceway Following Tagging</b>	<b>Daily Tagged Total</b>	<b>Cumulative Tagged Total</b>	<b>Daily Untagged Total</b>	<b>Cumulative Untagged Total</b>	<b>Raceway Total</b>
4/18/2016	B	B	23,113	-	69,411	-	92,524
4/19/2016	B	B	42,628	65,741	127,923	197,334	263,075
4/20/2016	B	B	44,214	109,955	132,681	330,015	439,970
4/21/2016	B	B	45,677	155,632	137,082	467,097	622,729
4/22/2016	B	B	18,177	173,809	54,561	521,658	695,467
<b>Tag Code Totals:</b>			-	<b>173,809</b>	-	<b>521,658</b>	<b>695,467</b>

<b>Nimbus Fish Hatchery- Fall Run Chinook Salmon</b>							
<b>Tag Code: 06/07/51</b>			<b>Size: 155K</b>			<b>Trailer # CA4</b>	
<b>Tagging Date</b>	<b>Raceway Prior to Tagging</b>	<b>Raceway Following Tagging</b>	<b>Daily Tagged Total</b>	<b>Cumulative Tagged Total</b>	<b>Daily Untagged Total</b>	<b>Cumulative Untagged Total</b>	<b>Raceway Total</b>
4/25/2016	C	C	21,266	-	63,846	-	85,112
4/26/2016	C	C	43,213	64,479	129,678	193,524	258,003
4/27/2016	C	C	43,957	108,436	131,919	325,443	433,879
4/28/2016	C	C	40,496	148,932	121,530	446,973	595,905
4/29/2016	C/D	C	23,640	172,572	70,953	517,926	690,498
<b>Tag Code Totals:</b>			-	<b>172,572</b>	-	<b>517,926</b>	<b>690,498</b>

Nimbus Fish Hatchery- Fall Run Chinook Salmon							
Tag Code: 06/07/52			Size: 155K			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
5/2/2016	D	D	25,120	-	75,450	-	100,570
5/3/2016	D	D	32,800	57,920	98,439	173,889	231,809
5/4/2016	D	D	47,628	105,548	142,965	316,854	422,402
5/5/2016	D	D	49,952	155,500	149,946	466,800	622,300
5/6/2016	D	D	10,321	165,821	30,987	497,787	663,608
5/10/2016	D	D	7,775	173,596	23,376	521,163	694,759
Tag Code Totals:			-	173,596	-	521,163	694,759

Nimbus Fish Hatchery- Fall Run Chinook Salmon							
Tag Code: 06/07/53			Size: 155K			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
5/10/2016	E	E	12,918	-	38,757	-	51,675
5/11/2016	E	E	47,412	60,330	142,290	181,047	241,377
5/12/2016	E	E	37,462	97,792	112,440	293,487	391,279
5/13/2016	E	E	22,970	120,762	68,970	362,457	483,219
5/16/2016	E	E	20,693	141,455	62,133	424,590	566,045
5/16/2016	E	E	32,478	173,933	97,467	522,057	695,990
Tag Code Totals:			-	173,933	-	522,057	695,990

Nimbus Fish Hatchery- Fall Run Chinook Salmon							
Tag Code: 06/07/48			Size: 155K			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
5/17/2016	E/F	F	37,499	-	112,554	-	150,053
5/17/2016	F	F	40,806	78,305	122,430	234,984	313,289
5/18/2016	F	F	42,071	120,376	126,276	361,260	481,636
5/18/2016	F	F	44,947	165,323	134,844	496,104	661,427
5/19/2016	F	F	15,210	180,533	45,654	541,758	722,291
Tag Code Totals:			-	180,533	-	541,758	722,291

Hatchery Totals: 1,047,887 3,145,143 4,193,030

Retention Range: 100%

Retention Average: 100%

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

<b>Nimbus Fish Hatchery - Fall Run Chinook</b>										
<b>Tag Code Size and Location</b>			<b>Tag Code Totals</b>				<b>Retention Calculations</b>			
<b>Tag Code</b>	<b>Size</b>	<b>Raceway</b>	<b>Total Tagged</b>	<b>Number Untagged</b>	<b>Total Processed</b>	<b># of Fish Held</b>	<b>Days Held</b>	<b>% Retention</b>	<b># Retaining Tags</b>	<b>Calculated Untagged</b>
06/07/49	155K	A	173,444	520,581	694,025	957	21	100.00%	173,444	520,581
06/07/50	155K	B	173,809	521,658	695,467	898	20	100.00%	173,809	521,658
06/07/51	155K	C	172,572	517,926	690,498	893	18	100.00%	172,572	517,926
06/07/52	155K	D	173,596	521,163	694,759	779	8	100.00%	173,596	521,163
06/07/53	155K	E	173,933	522,057	695,990	898	21	100.00%	173,933	522,057
06/07/48	155K	F	180,533	541,758	722,291	903	19	100.00%	180,533	541,758
<b>Hatchery Totals</b>			<b>1,047,887</b>	<b>3,145,143</b>	<b>4,193,030</b>	<b>Retention Average</b>		<b>100.00%</b>	<b>1,047,887</b>	<b>3,145,143</b>

<b>Nimbus Fish Hatchery- Steelhead- 100% Mark only</b>					
<b>Trailer # CA4</b>					
<b>Marking Date</b>	<b>Raceway Prior to Marking</b>	<b>Raceway Following Marking</b>	<b>Daily Marked Total</b>	<b>Cumulative Marked Total</b>	<b>Raceway Total</b>
6/6/2016	Vats 1-4	A	25,705	-	25,705
6/7/2016	Vats 4-5	A	40,717	-	66,422
6/8/2016	Vat 5	A	4,053	-	<b>70,475</b>
6/8/2016	Vat 5	B	47,357	117,832	47,357
6/9/2016	Vat 5-6	B	23,672	141,504	<b>71,029</b>
6/9/2016	Vat 6	C	19,044	160,548	19,044
6/10/2016	Vat 6	C	20,881	181,429	39,925
6/13/2016	Vat 7	C	31,782	213,211	<b>71,707</b>
6/13/2016	Vat 7	D	11,263	224,474	11,263
6/14/2016	Vat 6-8	D	61,035	285,509	<b>72,298</b>
6/15/2016	Vat 8	E	60,611	346,120	60,611
6/16/2016	Vat 8	E	15,375	361,495	<b>75,986</b>
6/16/2016	Vat 8,10	F	54,756	416,251	54,756
6/17/2016	Vat 10	F	42,414	458,665	<b>97,170</b>
<b>Marked Totals</b>			<b>-</b>	<b>-</b>	<b>458,665</b>