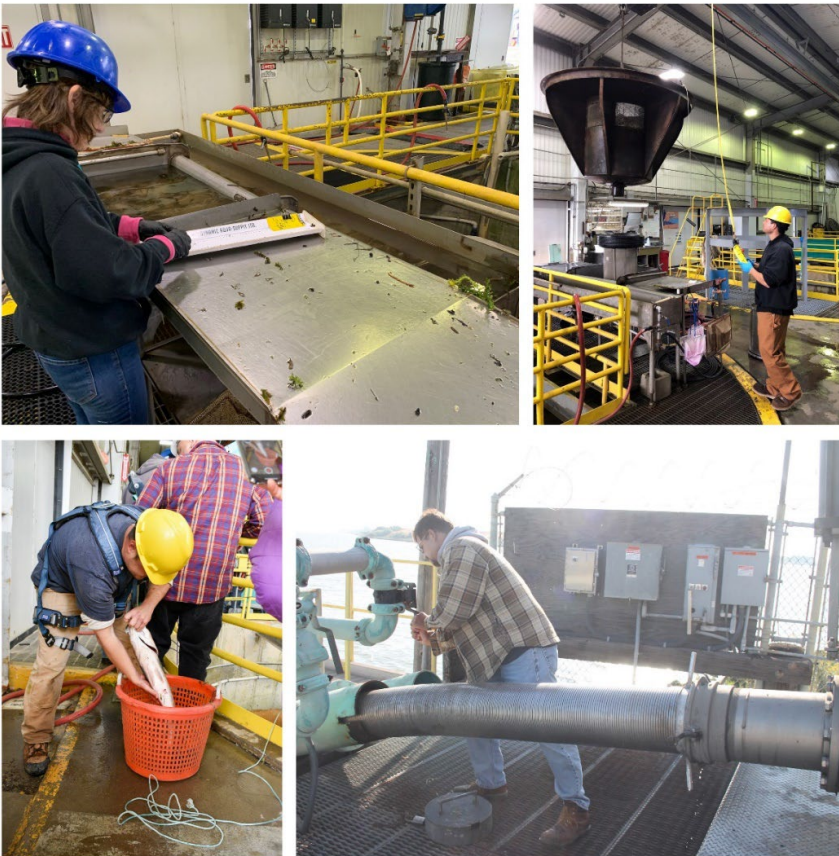




— BUREAU OF —  
RECLAMATION

# Fish Salvage and Operations at the Tracy Fish Collection Facility for Water Year 2022

South-Central California Area Office | Tracy Office  
Interior Region 10 – California-Great Basin



## Mission Statements

The U.S. Department of the Interior protects and manages the Nation's natural resources and cultural heritage; provides scientific and other information about those resources; honors its trust responsibilities or special commitments to American Indians, Alaska Natives, and affiliated Island Communities.

The mission of the Bureau of Reclamation is to manage, develop, and protect water and related resources in an environmentally and economically sound manner in the interest of the American public.

**Cover Photo** – Daily fish salvage process at the Tracy Fish Collection Facility (Bureau of Reclamation/Reyes).

# **Fish Salvage and Operations at the Tracy Fish Collection Facility for Water Year 2022**

**South-Central California Area Office | Tracy Office  
Interior Region 10 – California-Great Basin**

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**Bureau of Reclamation  
Technical Service Center  
Denver, Colorado**



# Acronyms and Abbreviations

AF	acre feet
BO	Biological Opinion
CDFW	California Department of Fish and Wildlife
CWT	Coded Wire Tag
CVP	Central Valley Project
D-1641	State Water Board Revised Decision 1641
Delta	Sacramento-San Joaquin Delta
FL	fork length
ft	feet
JPP	C.W. “Bill” Jones Pumping Plant
mm	millimeters
NOAA	National Oceanic and Atmospheric Administration
O&M	Operation and Maintenance
Reclamation	Bureau of Reclamation
SWP	State Water Project
SWRCB	State Water Resources Control Board
TFCF	Tracy Fish Collection Facility
WY	water year

## Symbols

$\geq$	greater than or equal to
$<$	less than



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# 1.0 Introduction

The Tracy Fish Collection Facility (TFCF) diverts and salvages fish from water being exported from the Sacramento-San Joaquin Delta (Delta) by the C.W. “Bill” Jones Pumping Plant (JPP) into the Delta Mendota Canal. Both the TFCF and JPP are integral parts of the Bureau of Reclamation’s (Reclamation) Central Valley Project (CVP) which provides water for agriculture and municipalities on the western side of the San Joaquin Valley. Salvaged fish are loaded into tanker trucks and released into the western Delta away from the immediate influence of the JPP water exports.

This report summarizes the operational and biological information gathered from the TFCF from October 1, 2021, to September 30, 2022 (Water Year [WY] 2022). Species given individual consideration are Chinook Salmon (*Oncorhynchus tshawytscha*), Steelhead (*O. mykiss*), Striped Bass (*Morone saxatilis*), Largemouth Bass (*Micropterus salmoides*), Delta Smelt (*Hypomesus transpacificus*), Longfin Smelt (*Spirinchus thaleichthys*), Sacramento Splittail (*Pogonichthys macrolepidotus*), Threadfin Shad (*Dorosoma petenense*), Green Sturgeon (*Acipenser medirostris*), and White Sturgeon (*A. transmontanus*).

# 2.0 Methods

Daily volumes of water exported were reported from meter readings at the JPP in Byron, California. Annual water exports from WYs 1981 through 2022 and monthly water exports from WY 2022 were plotted and examined for temporal trends. Salvage data from WYs 1981 through 2022 were examined for long and short-term trends. Diverted fish are subsampled and enumerated at the TFCF. The subsamples are expanded and reported as “estimated salvage” to quantify the fish abundance at the facility. It should be noted that some fish species, including Delta Smelt, may have a low survival rate through the salvage process. The TFCF is only required to enumerate fish greater than or equal to ( $\geq$ ) 20 millimeters (mm) fork length (FL) because salvage efficiency degrades rapidly for fish smaller than this size. Salvage estimates were obtained by multiplying routine sample counts by an expansion factor calculated as salvage 20minutes divided by minutes of the sample count in Equation 1:

$$\text{SALVAGE}_{\text{SAMPLE}} = \text{COUNT}_{\text{SAMPLE}} \times (\text{SALVAGE MINUTES} / \text{MINUTES}_{\text{SAMPLE}}) \quad (\text{Eq. 1})$$

Predator removals were not expanded since they are removed with no salvage minutes:

$$\text{SALVAGE}_{\text{PREDATOR REMOVAL}} = \text{COUNT}_{\text{PREDATOR REMOVAL}} \quad (\text{Eq. 2})$$

Salvage estimates were calculated by the summation of both equations by month and water year. Intra annual abundances were examined by plotting the monthly salvage totals for selected fish species and for all fish taxa combined for WY 2022.

Annual and monthly salvage estimates for Chinook Salmon and Steelhead were calculated for wild and hatchery fish. Salmonid origin was determined by the presence (assumed to be wild) or absence (assumed to be hatchery) of an adipose fin. Race of Chinook Salmon was initially determined by the Delta criteria based on length-at-date of salvage (California Department of Fish and Wildlife [CDFW] 2014). If Coded Wire Tag (CWT) information was available, the race of hatchery Chinook Salmon was updated. If DNA race information was available, the race of wild Chinook Salmon was updated.

Chinook Salmon loss estimates are presented because they are used to measure the fishery impact of the water export operation. Loss is the estimated number of fish encountered by the facility minus the number of fish that survived salvage operations (CDFW 2013). Loss was subcategorized by origin and race. Daily loss estimates are used as a regulatory trigger to protect listed salmonid species by reducing CVP and SWP (State Water Project) water exports. The Biological Opinion (BO) established the use of daily loss densities to trigger mandatory consultation with the National Oceanic and Atmospheric Administration (NOAA) Fisheries and water export reductions.

Larval fish sampling was conducted February 7 through June 7, 2022, to detect the presence of Delta Smelt and Longfin Smelt larvae and post-larval juveniles (< 20 mm FL). During the 04:00, 10:00, 16:00, and 22:00 hour fish counts, the fish screen used at the fish count station was replaced with a 0.5-mm fish screen to retain smaller fish. No changes were made to the screens in the holding tanks during larval sampling. Larval fish were identified to species by TFCF personnel and reported the next working day. On the final day, no larval sampling occurred during the 16:00 and 22:00 fish counts.

## **3.0 Results and Discussion**

### **3.1 Water Exports**

During WY 2022, the CVP exported 1,406,807-acre feet (AF) of water, an increase from the previous year (914,705 AF) that mirrored WYs 2015 and 2016 (Figure 1). Increases in exports in WYs 2017 thru 2019 coincided with increased rainfall following five years of drought conditions in California. The lowest monthly water exports occurred between February 2022 thru June 2022. During these periods, a total of 314,337 AF was exported, accounting for 22 percent of total exports. Monthly exports ranged from 53,626 AF in April 2022 to 231,354 AF in January 2022 (Figure 2).

Fish Salvage and Operations at the Tracy Fish Collection Facility  
for Water Year 2022



Figure 1.—Annual water exports in millions of acre-feet for the Central Valley Project for Water Years 1981–2022.

Fish Salvage and Operations at the Tracy Fish Collection Facility  
for Water Year 2022

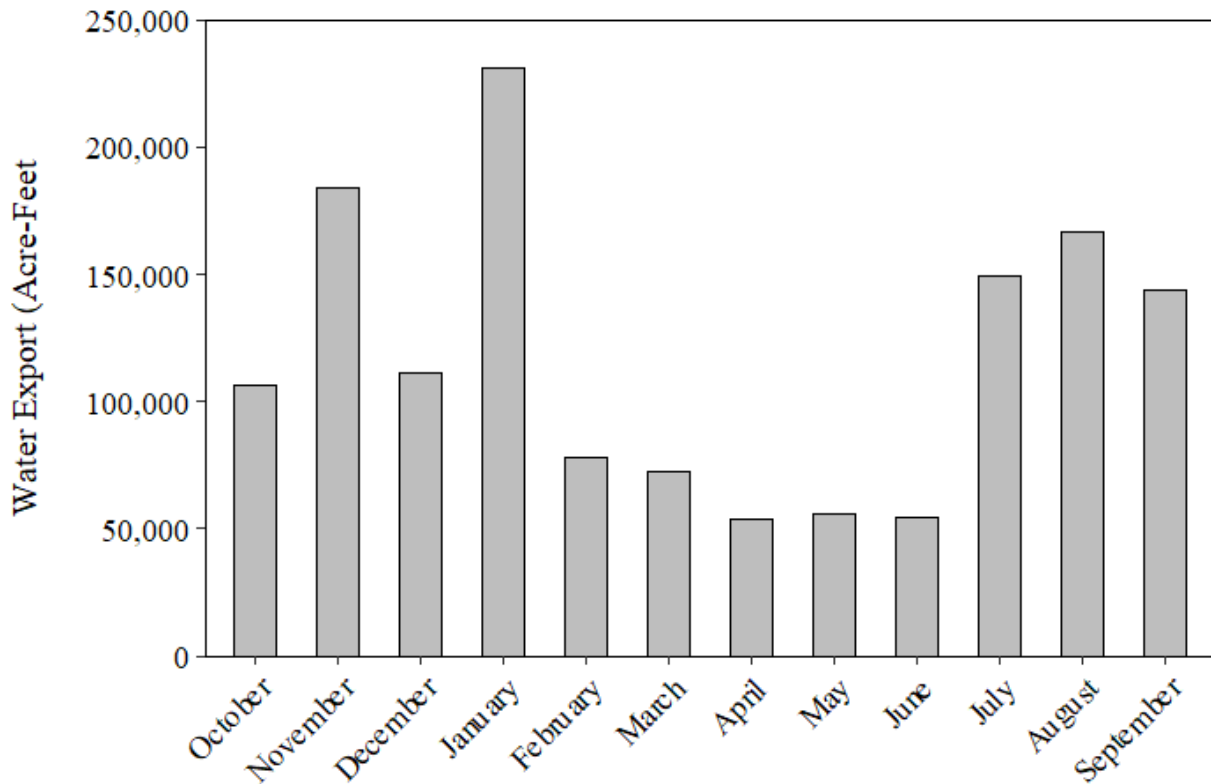


Figure 2.—Monthly water exports (in acre-feet) for the Central Valley Project, Water Year 2022.

### 3.2 Total Salvage and Prevalent Species

Total fish salvage (all fish combined) at the TFCF during WY 2022 was 1,633,165 (Figure 3), which was more than four times the total in WY 2021 (379,690) and less than the record high salvage of 37,659,833 fish in WY 2006, when most of the salvaged fish were Common Carp (*Cyprinus carpio*).

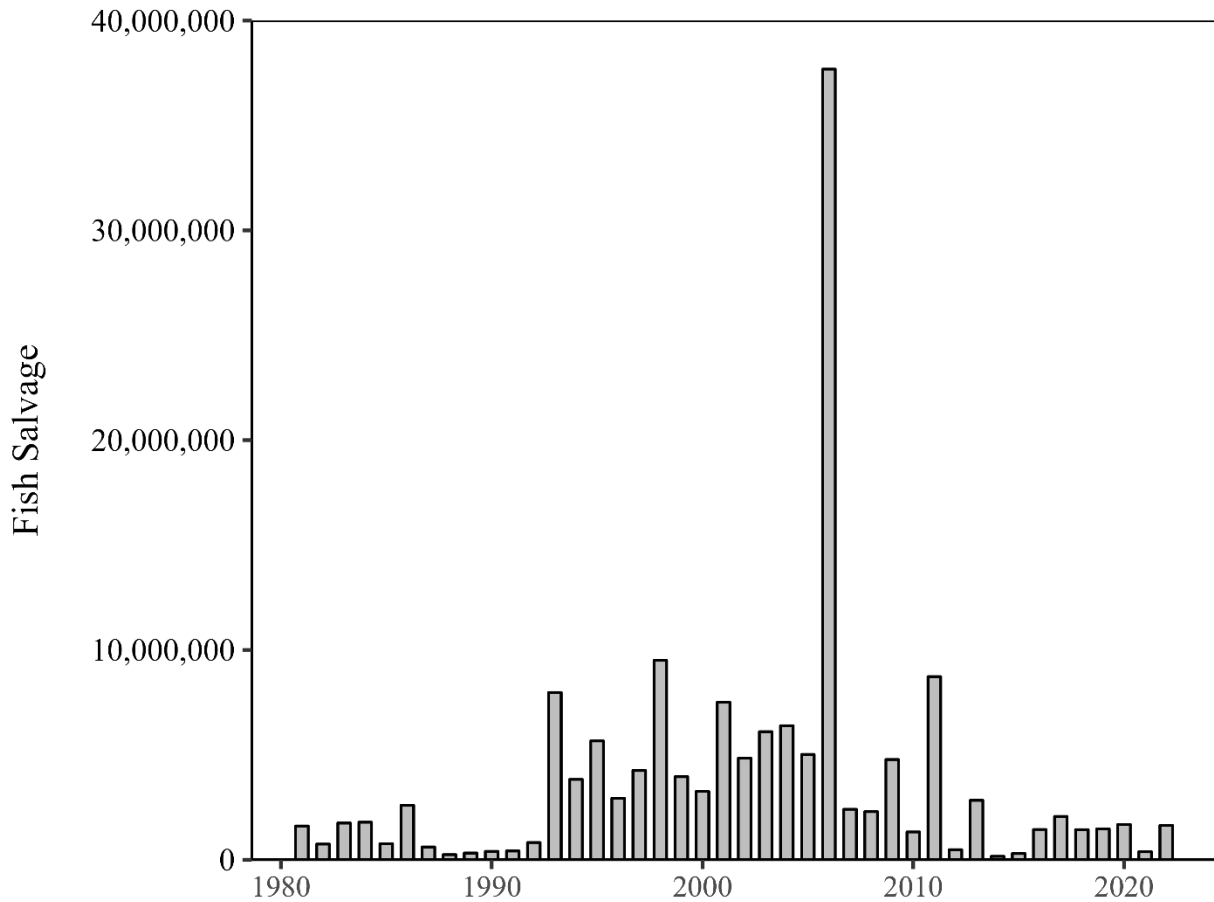


Figure 3.—Annual salvage (by water year) of all fish taxa combined at the Tracy Fish Collection Facility.

Threadfin Shad accounted for 83.21 percent of the total salvage in WY 2022 (Figure 4 and Appendix 1). Threadfin Shad make up the bulk of salvage most years, although an exception was when Common Carp accounted for 81.8 percent (30,495,481) of salvage in WY 2006. The second to fifth most salvaged species were Bluegill (*Lepomis macrochirus*, 6.46 percent), Largemouth Bass, (3.22 percent), Striped Bass (1.82%) and American Shad (*Alosa sapidissima*, 1.12 percent), respectively. Native species comprised 0.94 percent of total fish salvage. Listed species (including Chinook Salmon, Steelhead, Longfin Smelt, and Delta Smelt) accounted for 0.28 percent of salvage.

Fish Salvage and Operations at the Tracy Fish Collection Facility  
for Water Year 2022

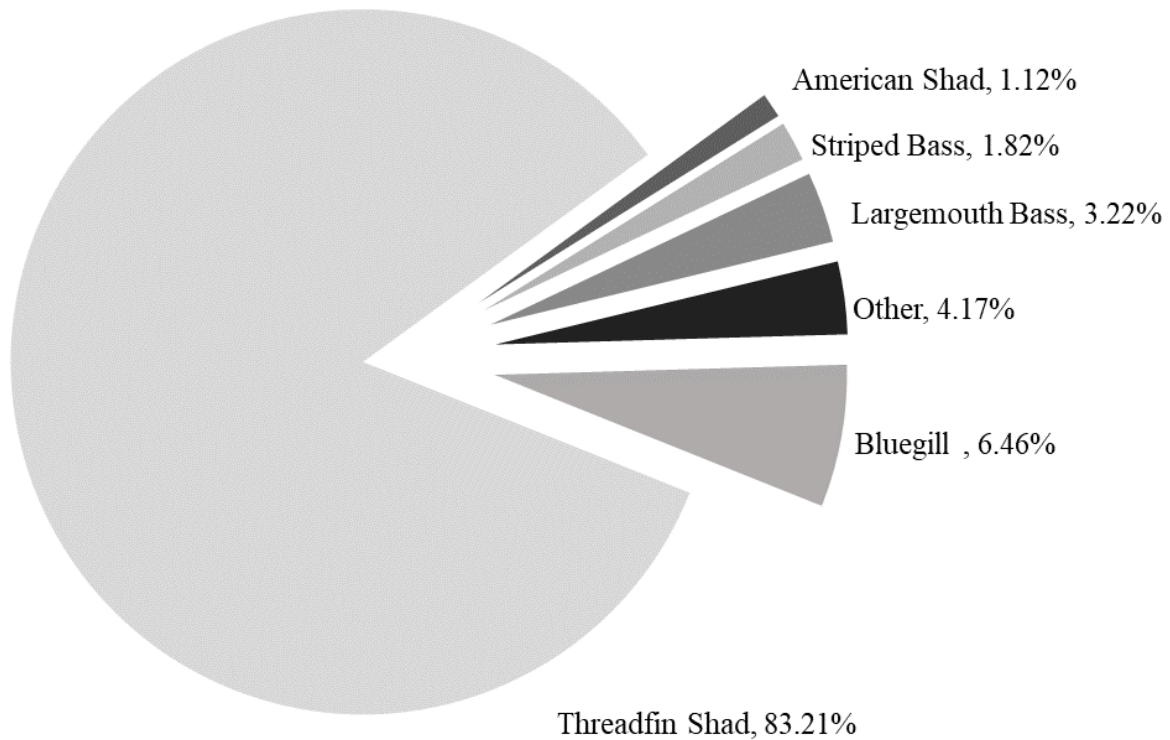


Figure 4.—Percentages of the annual salvage for the most prevalent (> 1.0%) species at the Tracy Fish Collection Facility for Water Year 2022.

### 3.3 Chinook Salmon

The total annual salvage during WY 2022 of juvenile (< 300 mm FL) Chinook Salmon was 1,142 for all races and origins combined (Figure 5; Appendix 1). This is the fifth lowest salvage year since WY 1981. Average annual salvage for the last 10 years was 5,410 fish (WYs 2013 to 2022, which is 17 percent of the average salvage of Chinook Salmon for WYs 1981 to 2012 (32,634).



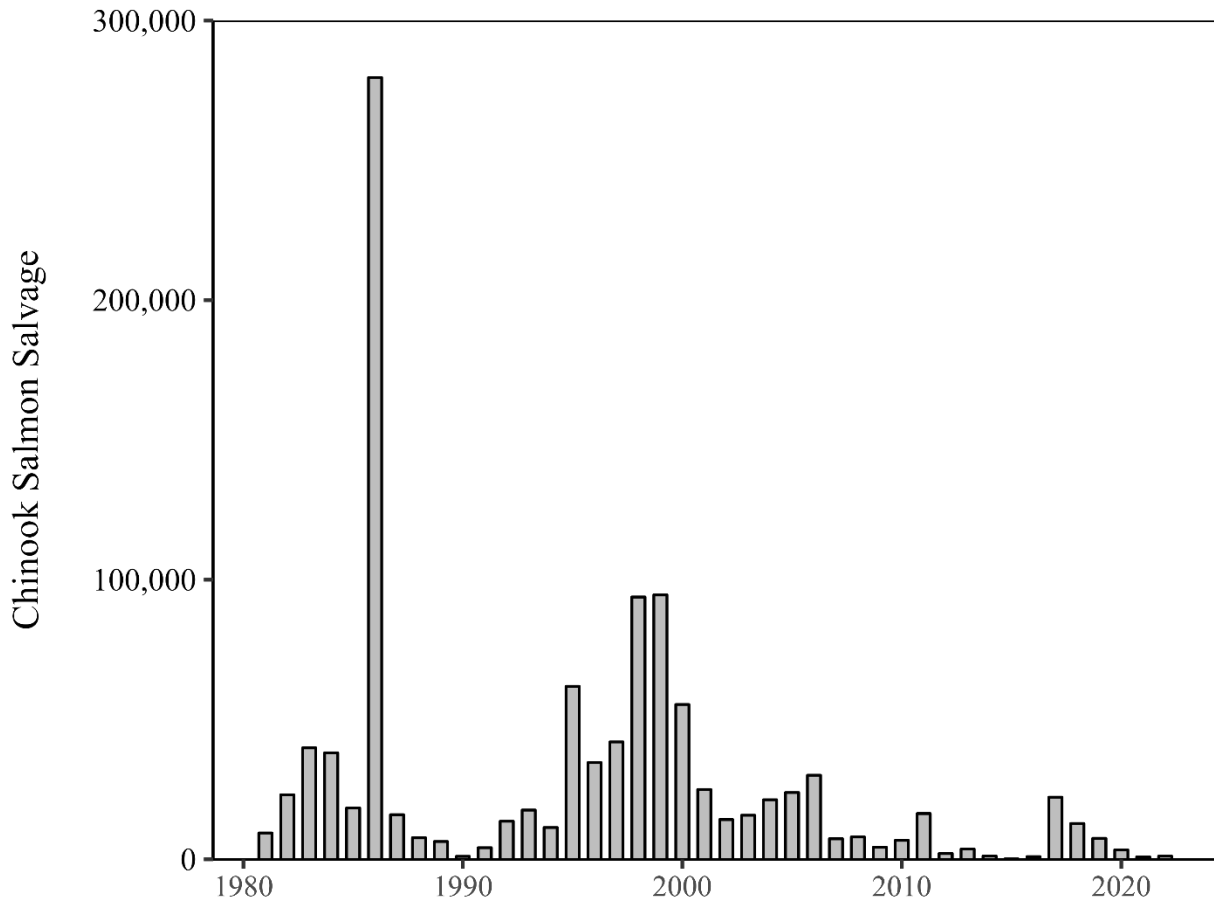


Figure 5.—Annual salvage (by Water Year) of Chinook Salmon (all races and origins combined) at the Tracy Fish Collection Facility, Water Years 1981–2022.

Wild Chinook Salmon were sampled from December – May with the majority (87.33 percent) being sampled from April through May (Figure 6). Genetic samples were analyzed for 21 wild Chinook in WY 2022, and none were determined to be wild Winter Run. All known Spring Run wild Chinook Salmon were sampled in January and April. The majority (47.06 percent) of wild Fall Run Chinook Salmon were sampled in December. Analyzed genetic samples consisted of 80.95 percent Fall Run, 14.29 percent Spring Run and 4.76 percent unassigned. Group loss estimated by length-at-date is reported in Table 1.

Fish Salvage and Operations at the Tracy Fish Collection Facility  
for Water Year 2022

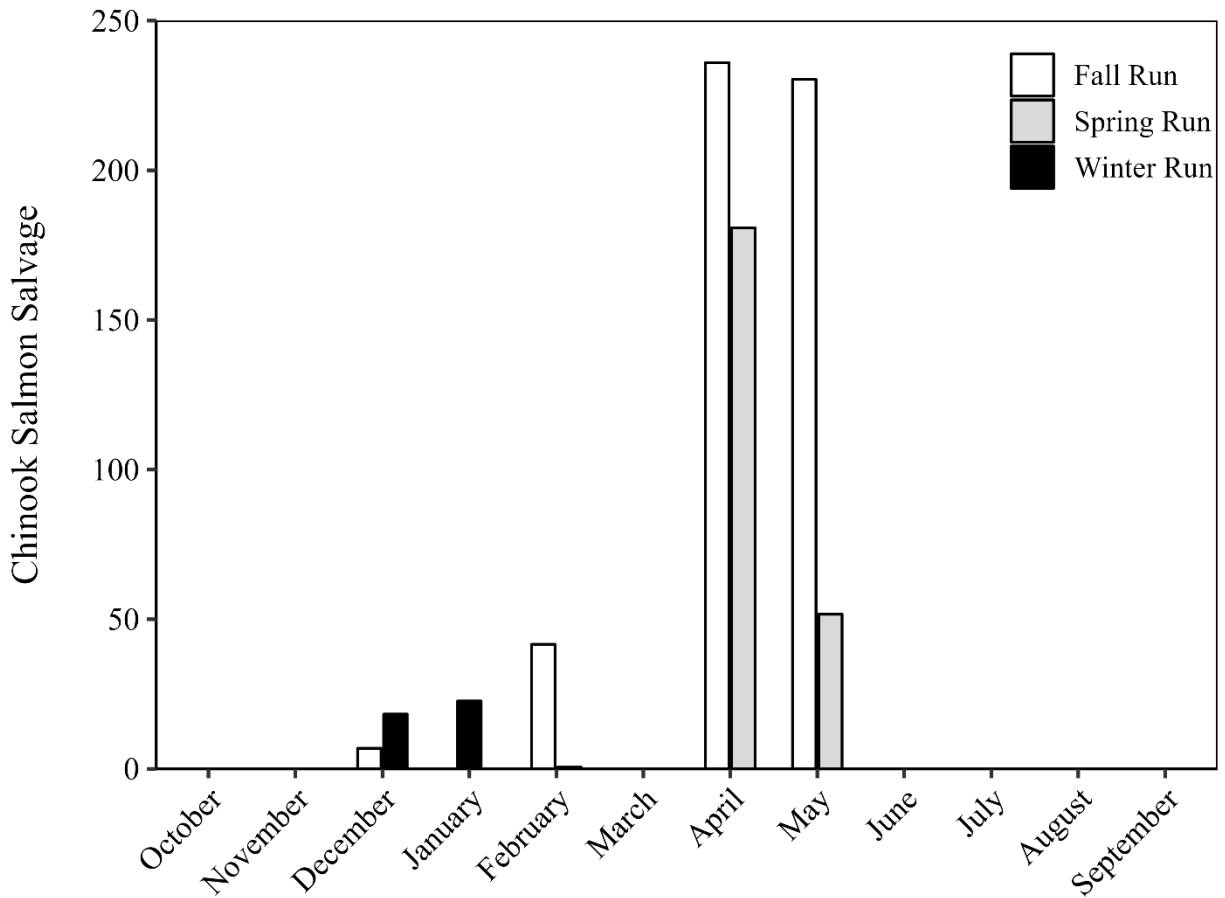


Figure 6.—Monthly salvage of Wild Chinook Salmon for three different runs (Spring, Winter, Fall) at the Tracy Fish Collection Facility, Water Year 2022.

Table 1.—Chinook Salmon annual salvage, percentages of annual salvage, and losses

Origin	Race*	Salvage	Percentage	Loss
Wild	Fall	332	64.72	271
	Late fall	4	0.78	4
	Spring	148	28.85	123
	Winter	29	5.65	21
<b>Total wild</b>		<b>513</b>		<b>418</b>
Hatchery	Fall	32	5.09	24
	Late fall	305	48.49	224
	Spring	44	7.00	36
	Winter	248	39.43	178
<b>Total hatchery</b>		<b>617</b>		<b>462</b>
<b>Grand total</b>		<b>1,142</b>		<b>880</b>

\* Race determined by Salmon Length-Date Criteria.

### 3.4 Steelhead

The annual salvage of wild and hatchery Steelhead was 394 during WY 2022 (Figure 7). Although salvage increased from WY 2021 (197), Steelhead salvage in WY 2022 was lower than the average salvage of the last ten years (440 fish; WYs 2013 to 2022). The number of Steelhead salvaged at the TFCF during WY 2022 was the tenth lowest since WY 1981.

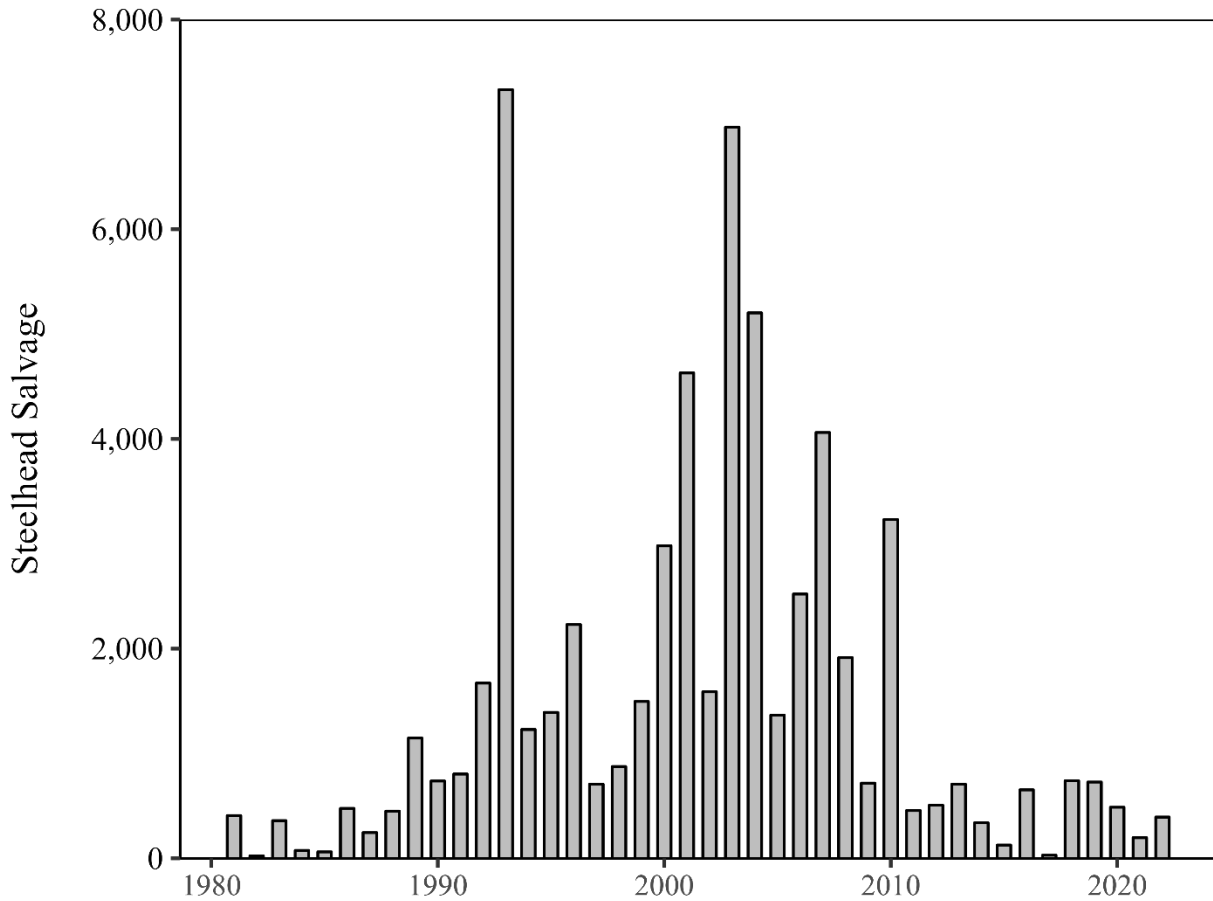


Figure 7.—Annual salvage (by Water Year) of Steelhead (all origins combined) at the Tracy Fish Collection Facility, Water Years 1981–2022.

Salvaged juvenile Steelhead were primarily of hatchery origin (69.29 percent; Figure 8). The salvage composition was 121 wild and 273 hatchery fish. Wild Steelhead were salvaged from October through May, with most wild Steelhead being salvaged in March (Figure 8).

Fish Salvage and Operations at the Tracy Fish Collection Facility  
for Water Year 2022

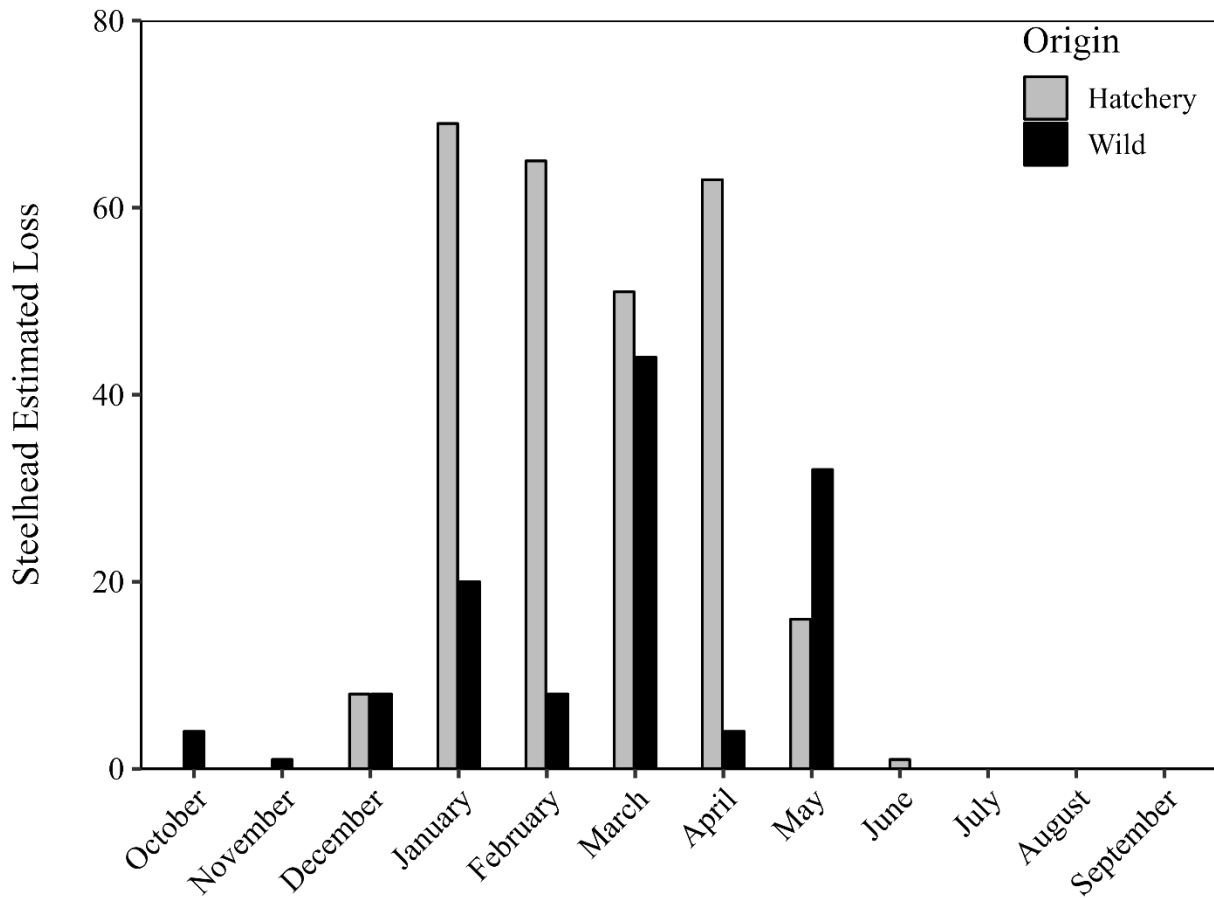


Figure 8.—Monthly salvage of hatchery and wild Steelhead at the Tracy Fish Collection Facility, Water Year 2022.

### 3.5 Striped Bass

The annual salvage of Striped Bass was 29,737 during WY 2022 (Figure 9). An increase from the previous year (12,541 fish; WY 2021), but still less than the 10-year average (44,774 fish; WYs 2013 to 2022). This also continued the generally reduced salvage trend observed for this species since WY 1994. Since WY 1994, annual Striped Bass salvage has not been above 1,000,000 except for WY 2001 (Figure 9). Most Striped Bass were salvaged in June (16,066 fish) and July (7,442 fish; Figure 10), with salvage of Striped Bass during these months accounting for 79% of total Striped Bass salvage. Striped Bass were salvaged in every month of the year, although the lowest salvage occurred in April (8; Figure 10).

Fish Salvage and Operations at the Tracy Fish Collection Facility  
for Water Year 2022

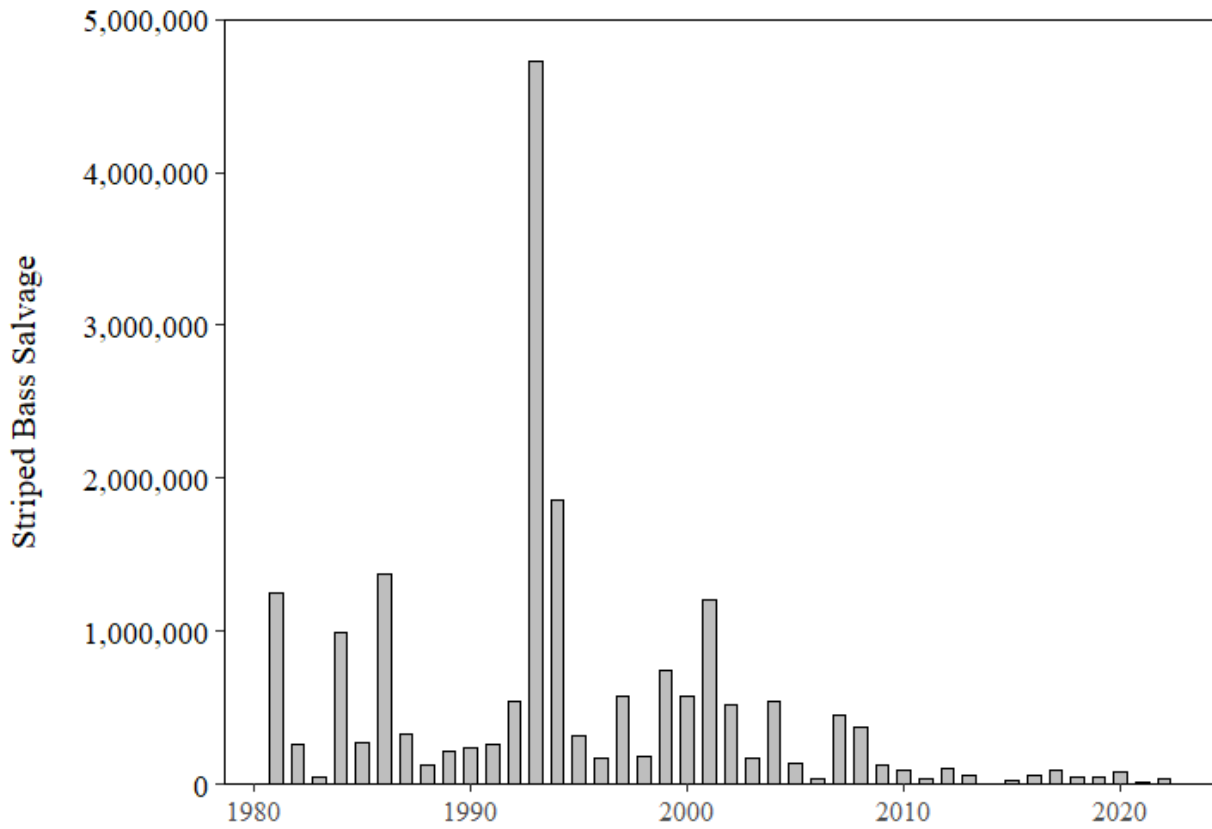


Figure 9.—Annual salvage (by Water Year) of Striped Bass at the Tracy Fish Collection Facility, Water Years 1981–2022.

Fish Salvage and Operations at the Tracy Fish Collection Facility  
for Water Year 2022

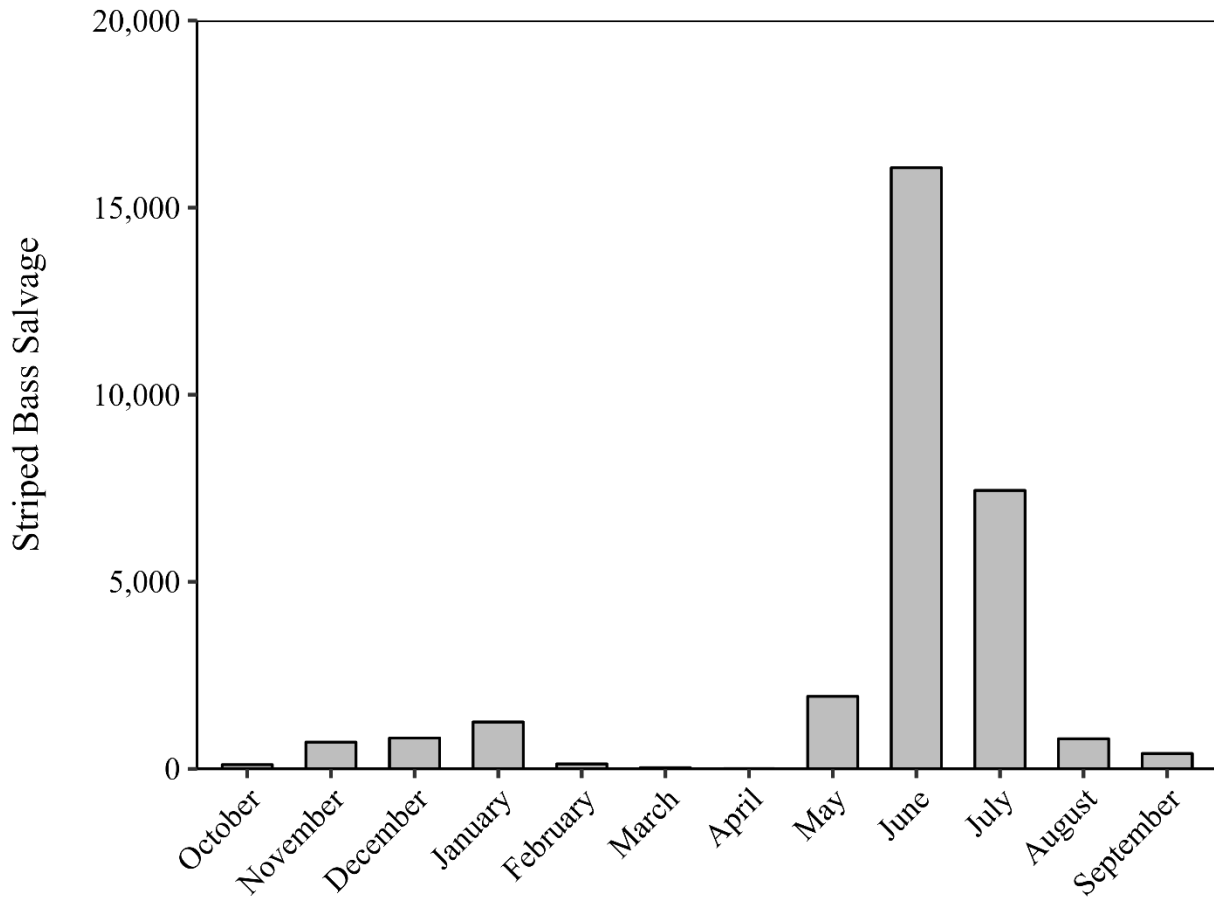


Figure 10.—Monthly salvage of Striped Bass at the Tracy Fish Collection Facility, Water Year 2022.

### 3.6 Largemouth Bass

The annual salvage of Largemouth Bass was 52,527 in WY 2022 (Figure 11). Prior to 1993, annual salvage of Largemouth Bass did not exceed 1,000 fish. Average annual salvage in the last ten years (WYs 2013 to 2022) of Largemouth Bass (47,149) was greater than Striped Bass (44,774). However, in the prior ten years (WYs 2003 to 2012), average annual salvage of Striped Bass (207,953) was much greater than Largemouth Bass (48,666). Largemouth Bass were salvaged during all months of WY 2022, but 58.59 percent of the annual salvage occurred during June (Figure 12).

Fish Salvage and Operations at the Tracy Fish Collection Facility  
for Water Year 2022

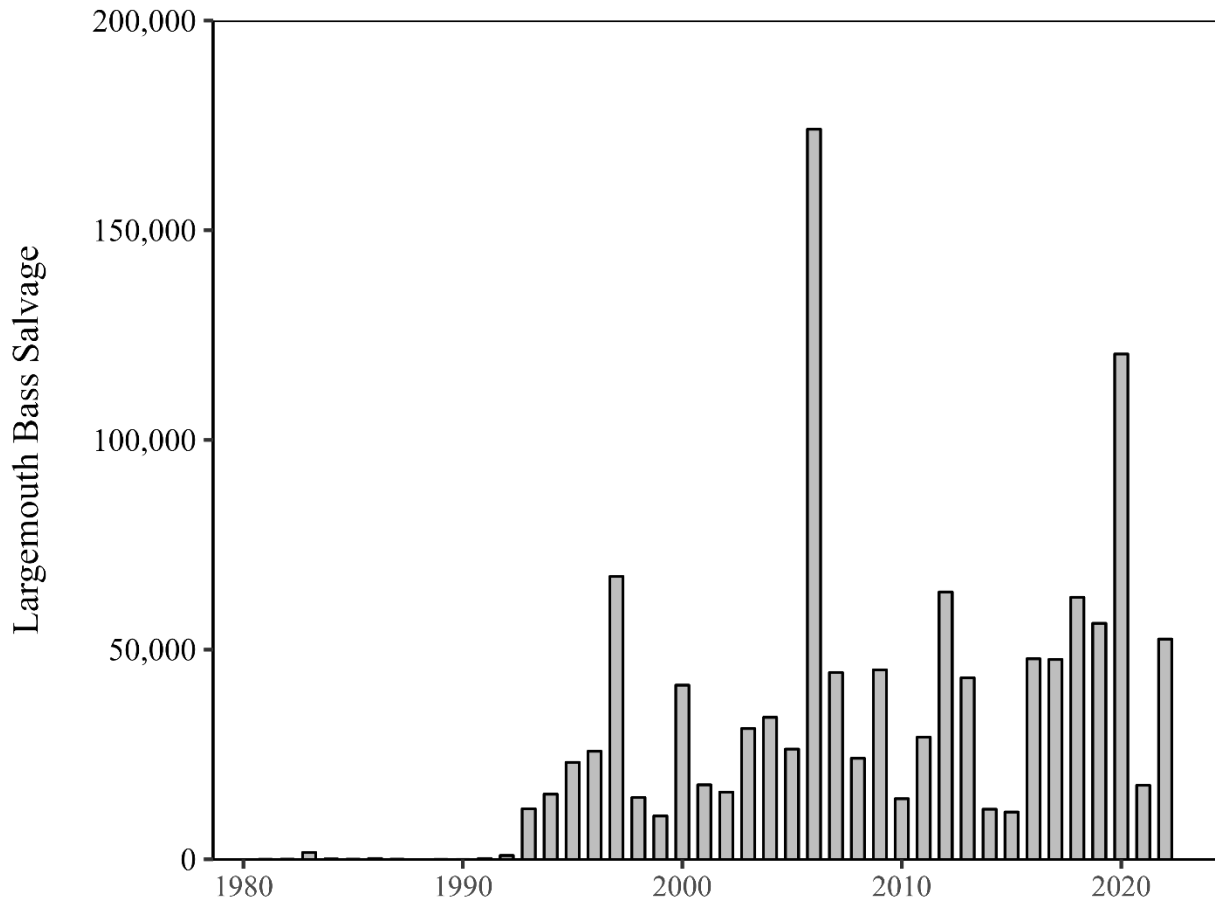


Figure 11.—Annual salvage (by Water Year) of Largemouth Bass at the Tracy Fish Collection Facility, Water Years 1981–2022.

Fish Salvage and Operations at the Tracy Fish Collection Facility  
for Water Year 2022

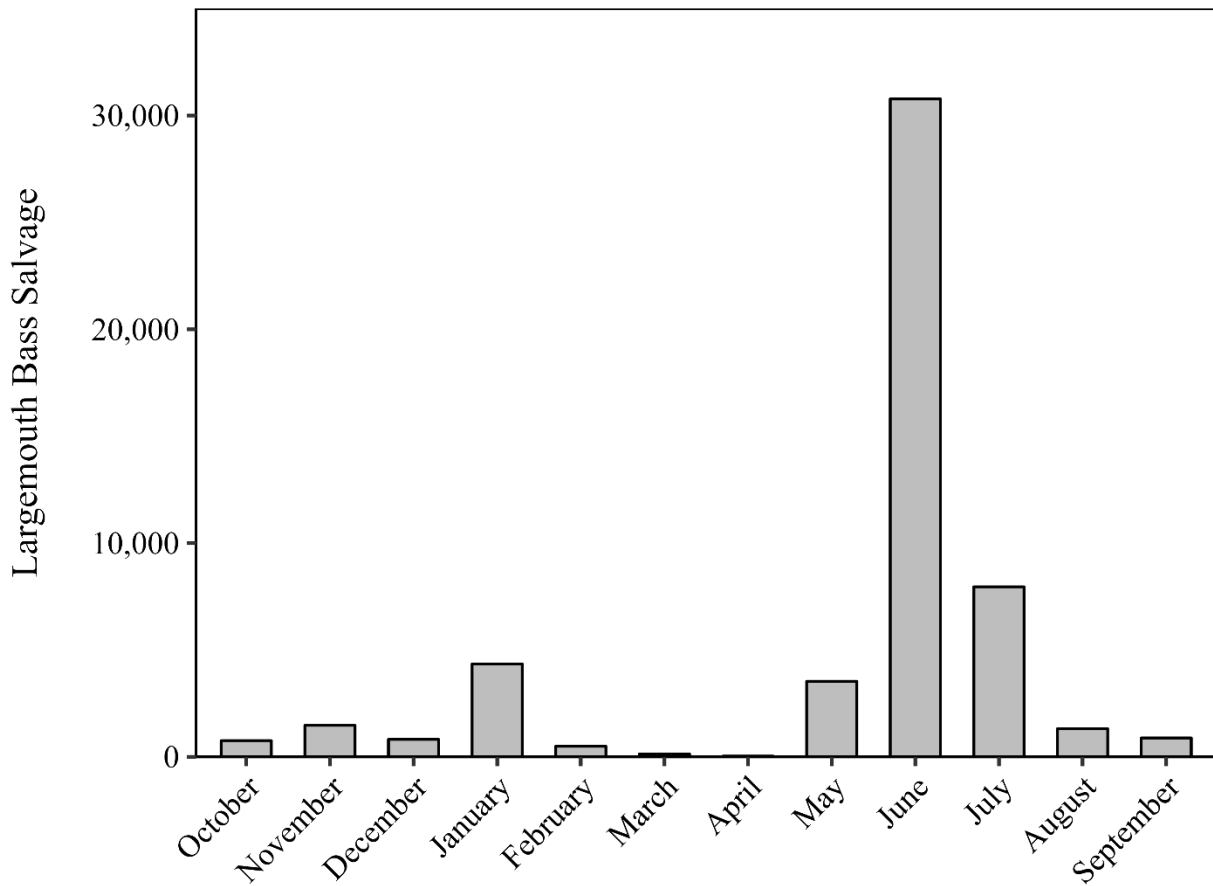


Figure 12.—Annual salvage (by Water Year) of Largemouth Bass at the Tracy Fish Collection Facility, Water Years 1981–2022.

### 3.7 Delta Smelt

In WY 2022, the annual salvage of Delta Smelt was four, estimated from the salvage of one hatchery individual on January 16th. Delta Smelt salvage has steadily declined since 2005 (Figure 13) and has generally followed the same declining annual population trend for this species. WYs 2005 to 2022 represented the lowest 17-year period of annual salvage for Delta Smelt on record (range= 0 to 1,009; Figure 13). No Delta Smelt were detected during larval sampling in WY 2022 and no Delta Smelt were salvaged in WYs 2020 and 2021.



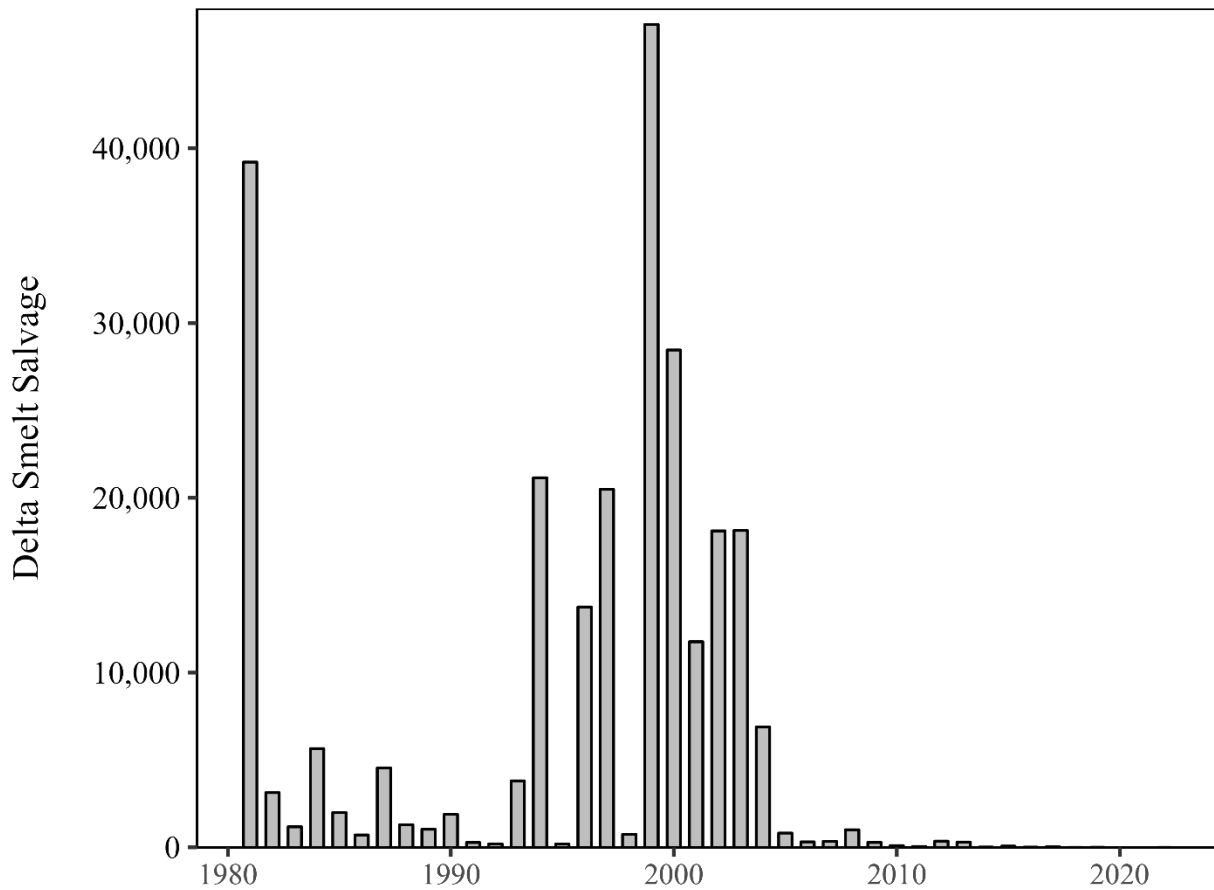


Figure 13.—Annual salvage (by Water Year) of Delta Smelt at the Tracy Fish Collection Facility, Water Years 1981–2022.

### 3.8 Longfin Smelt

The annual salvage of Longfin Smelt was 2,962 during WY 2022, the eighth highest salvage year on record (Figure 14). Longfin Smelt were only salvaged from March to May, with 85.69 percent of salvage occurring in April (2,538 fish). In WY 2022, 186 Longfin Smelt less than 20 mm FL were detected during larval sampling.

Fish Salvage and Operations at the Tracy Fish Collection Facility  
for Water Year 2022

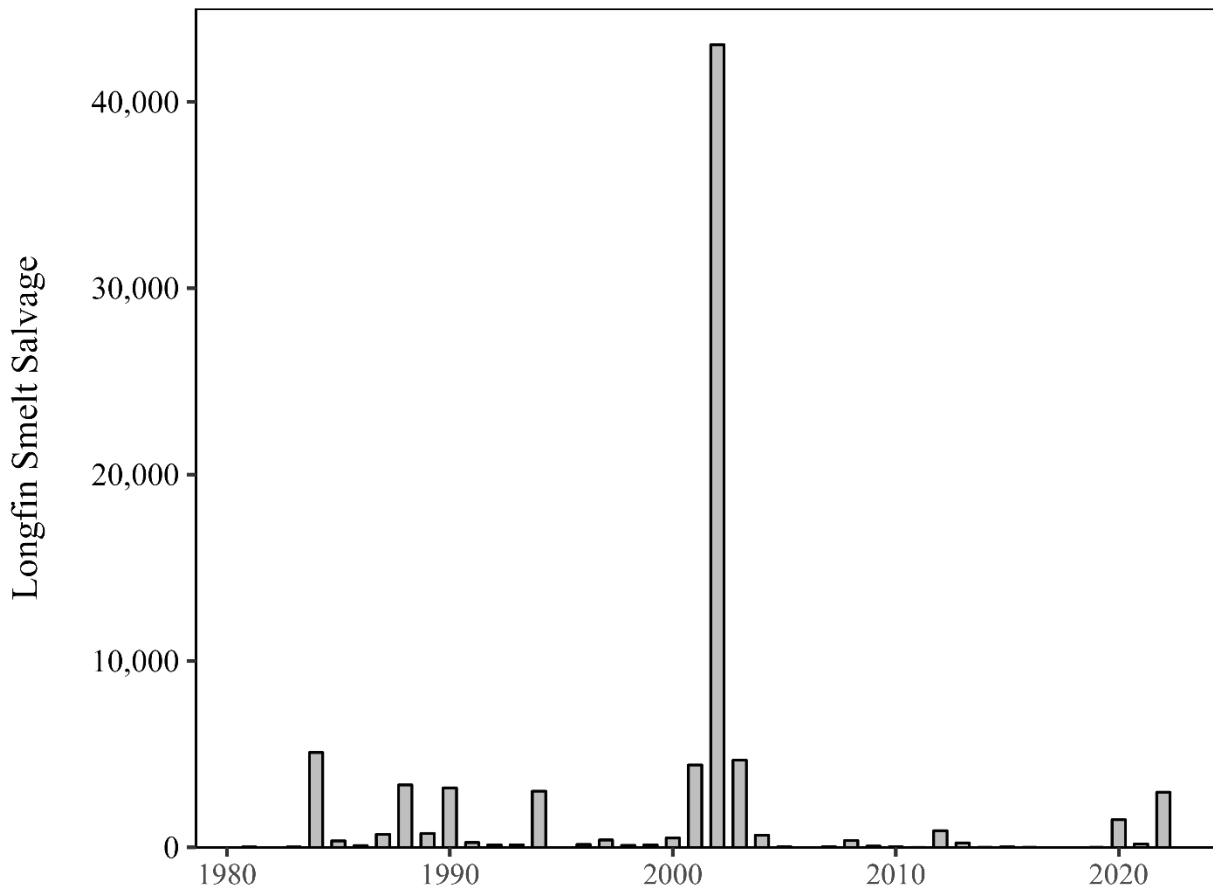


Figure 14.—Annual salvage (by Water Year) of Longfin Smelt at the Tracy Fish Collection Facility, Water Years 1981–2022.

### 3.9 Sacramento Splittail

The annual salvage of juvenile and adult Sacramento Splittail was nearly identical between WY 2022 (31 fish) and WY 2021 (32 fish; Figure 15). Annual salvage of Sacramento Splittail has fluctuated annually, with annual salvage less than 5,000 during 19 of 42 sampling years (45.24 percent) and surpassing 2 million four times (9.52 percent). Historically, salvage of Sacramento Splittail was greatest during May and June months, with a maximum of 5,487,606 fish (May WY 2011), but in WY 2022 Splittail were only salvaged in November and January.

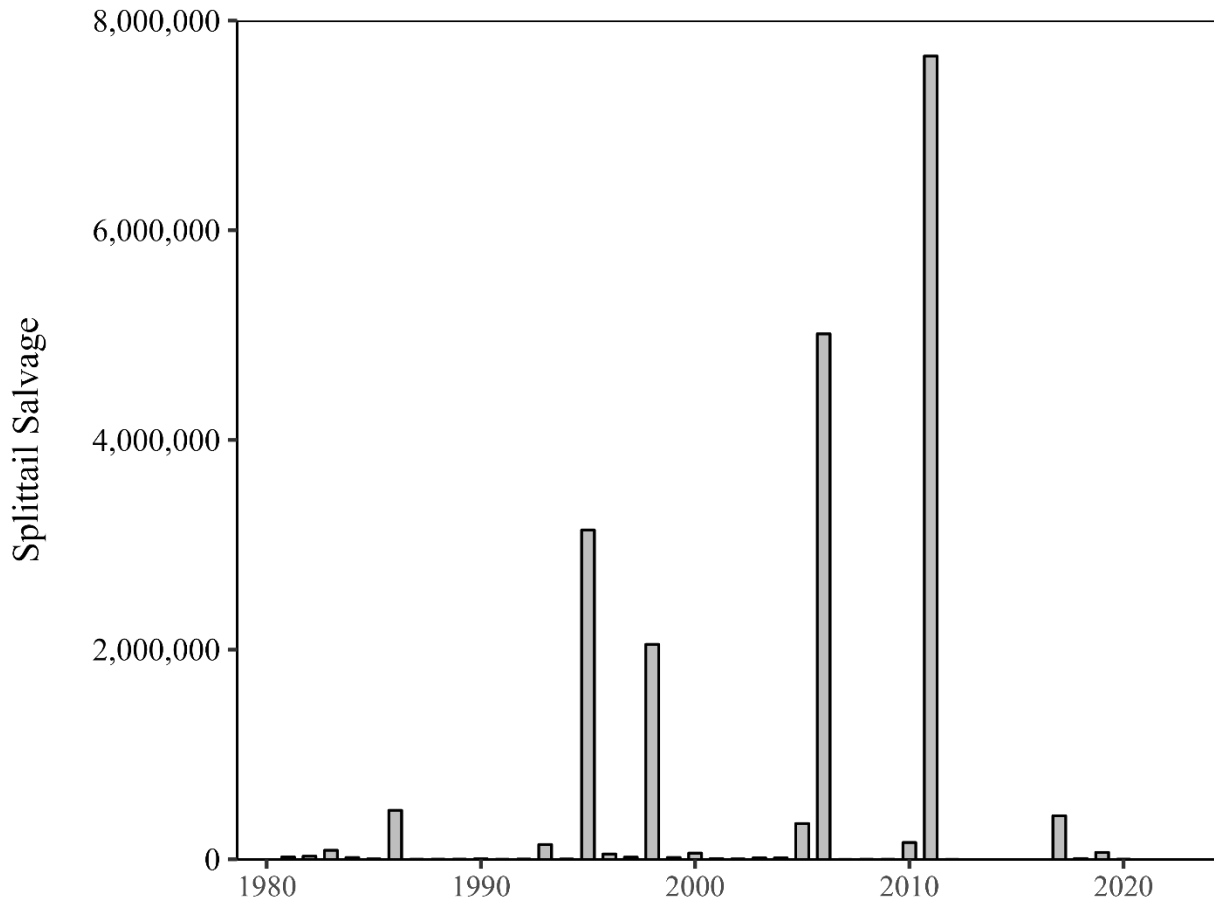


Figure 15.—Annual salvage (by Water Year) of Sacramento Splittail at the Tracy Fish Collection Facility, Water Years 1981–2022. Note: Splittail were salvaged all sampling years (42), but annual salvage was less than 5,000 fish during 19 water years.

### 3.10 Threadfin Shad

The annual salvage of juvenile and adult Threadfin Shad was 1,358,971 during WY 2022, a six-fold increase from WY 2021 (228,678; Figure 16). Threadfin Shad salvage at the TFCF during WY 2021 was the 14<sup>th</sup> highest since operations began. Annual salvage of Threadfin Shad has varied greatly throughout time (Figure 16).

Fish Salvage and Operations at the Tracy Fish Collection Facility  
for Water Year 2022

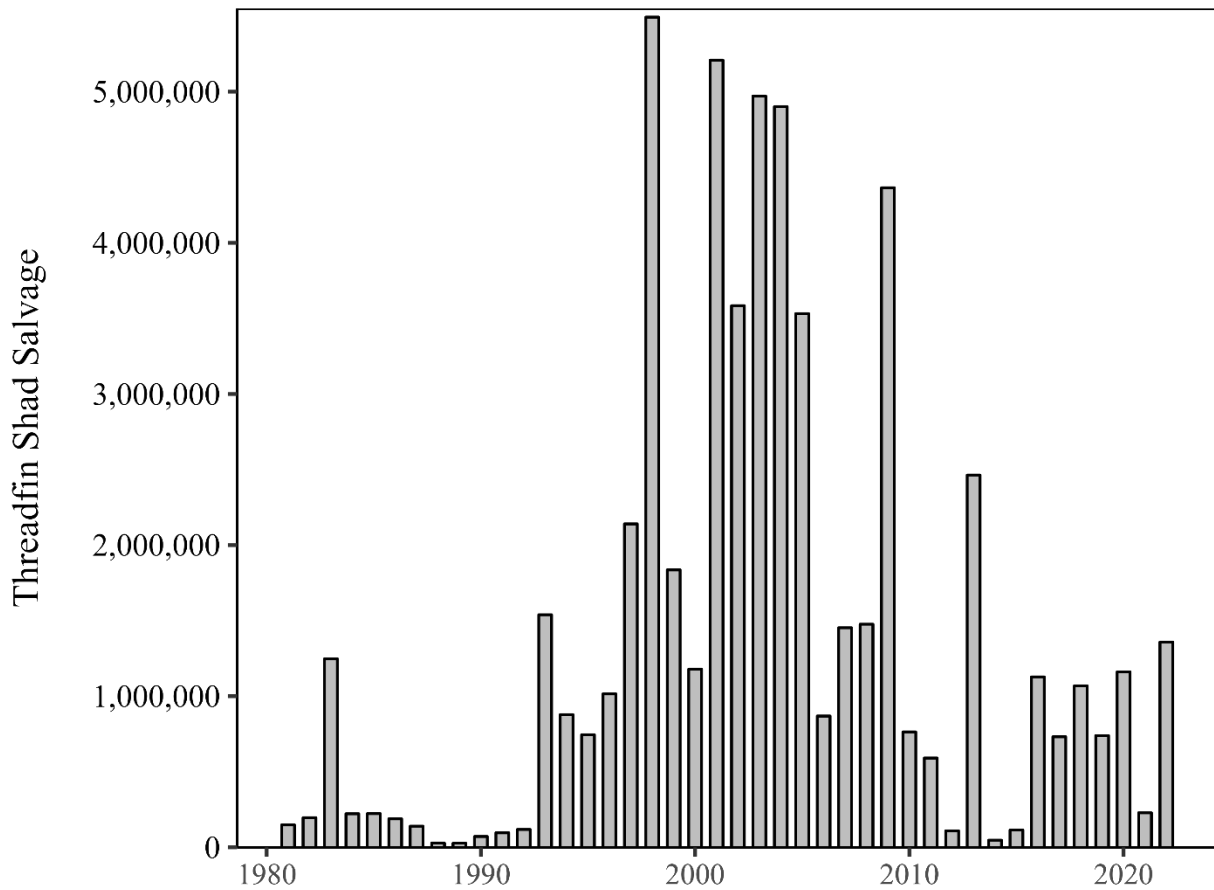


Figure 16.—Annual salvage (by Water Year) of Threadfin Shad at the Tracy Fish Collection Facility, Water Years 1981–2022.

The monthly salvage of Threadfin Shad during WY 2022 followed a similar seasonal trend to previous years. Threadfin Shad were salvaged every month, with notably higher densities in July and August (Figure 17).

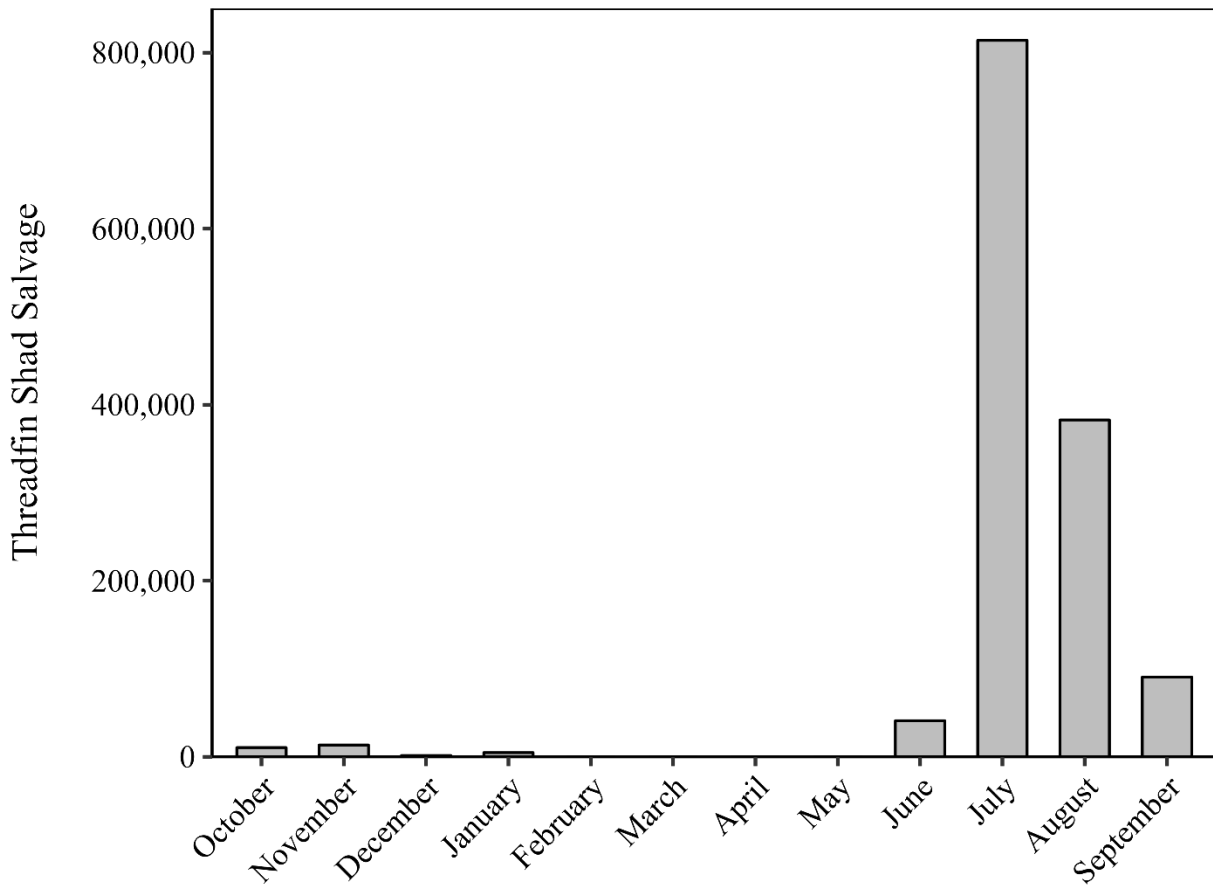


Figure 17.—Monthly salvage of Threadfin Shad at the Tracy Fish Collection Facility, Water Year 2022.

### 3.11 Green Sturgeon

No Green Sturgeon were salvaged during WY 2022 and have only been detected in half the WYs on record (21 of 42, Figure 18). Green Sturgeon were last detected in WY 2021, which was the lowest annual salvage on record (tied with WY 2017). Annual salvage last surpassed 150 fish in WY 2007 (168 fish).

Fish Salvage and Operations at the Tracy Fish Collection Facility  
for Water Year 2022

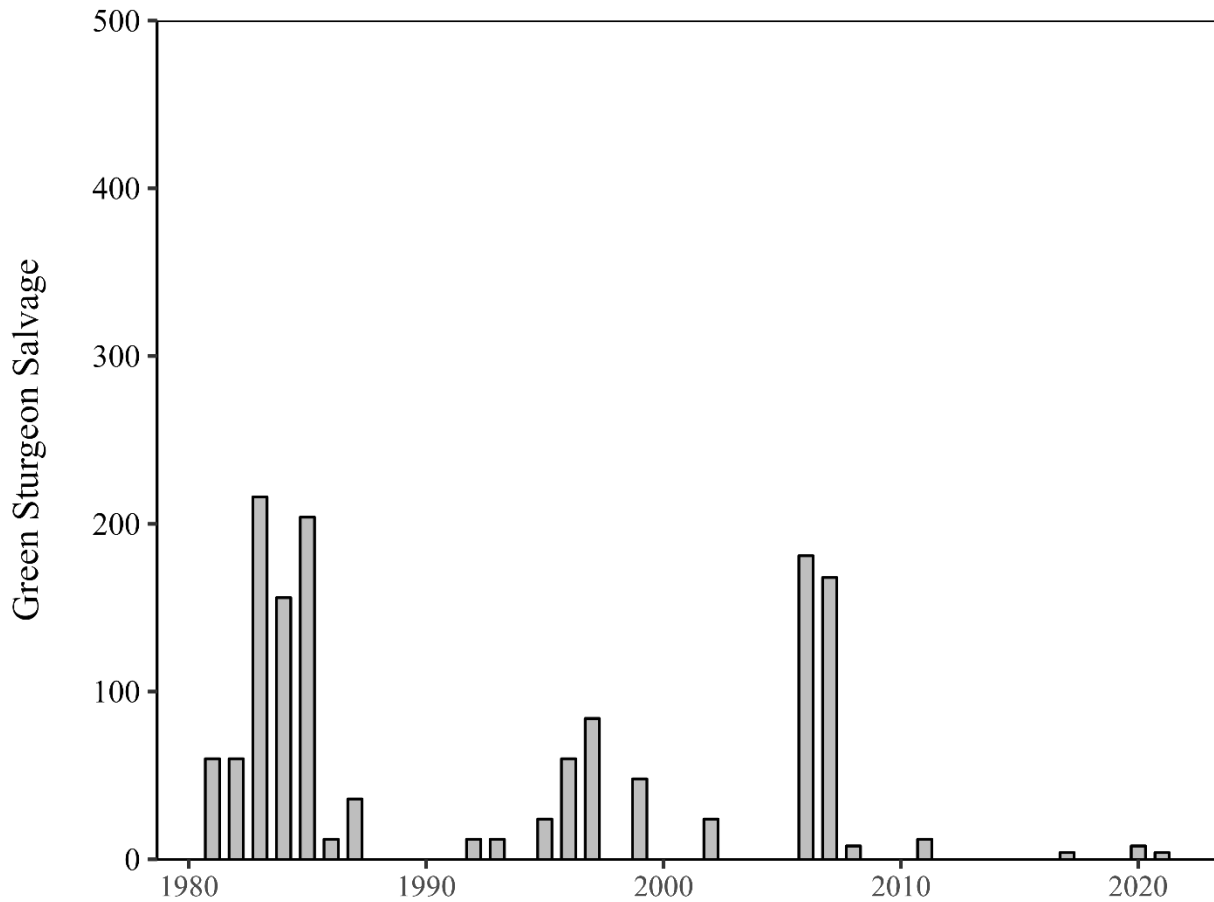


Figure 18.—Annual salvage (by Water Year) of Green Sturgeon at the Tracy Fish Collection Facility, Water Year 1981–2022.

### 3.12 White Sturgeon

No White Sturgeon were salvaged since WY 2019 and this species has only been salvaged 66.67 percent of WYs since WY 1981 (28 of 42 WYs, Figure 19). Between WYs 2000 and 2022, average annual salvage was 14.50 percent of the annual salvage in prior years (19 fish and 131 fish, respectively), and the frequency of years with no White Sturgeon salvaged doubled.

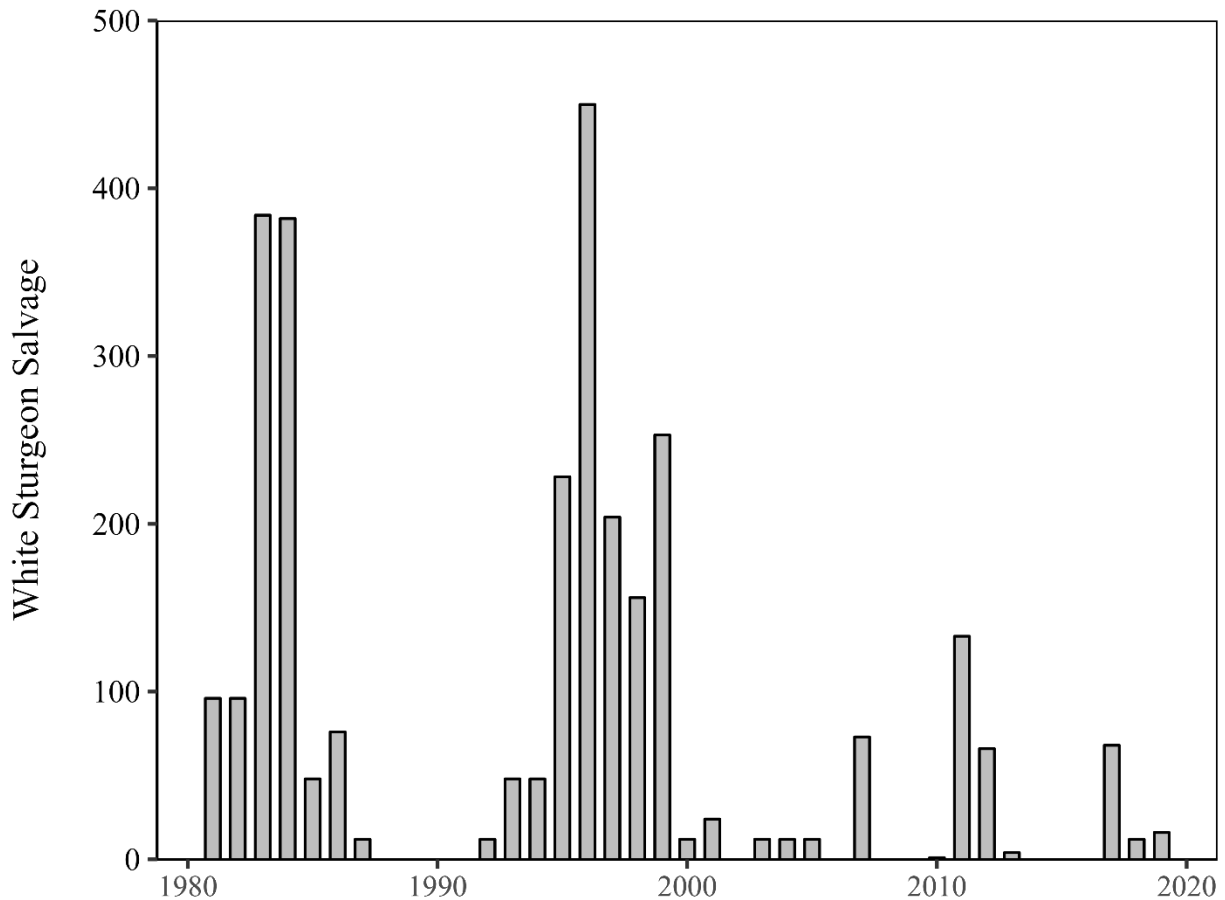


Figure 19.—Annual salvage (by Water Year) of White Sturgeon at the Tracy Fish Collection Facility, Water Years 1981–2022.

## 4.0 Operations Summary

The TFCF was in operation all 365 days of WY 2022, and fish counts were only missed 0.57 percent of the time (25 of 4,380 fish counts). Duration of sample counting, pumping and salvage were standard length (30, 120, and 120 minutes, respectively) in 98.93 percent of fish counts (4,333/4,380). One fish count had pumping minutes that were shortened from the standard 120 minutes. This occurred during the 4:00 fish count on March 13 to accommodate Daylight Savings Time. Salvage counts exceeded 30 minutes two times during the year: for daylight savings time and when a fish count was skipped due to lack of available staff. During five fish counts, one of four bypass channels was accidentally left closed on August 28, 2022. Otherwise, no bypass closures or weight estimations were conducted in WY 2022.

A fish facility outage is defined as the inability to (1) properly screen the entire flow (e.g., due to mechanical breakdown, low water conditions, or excessive debris conditions) or (2) conduct fish

## Fish Salvage and Operations at the Tracy Fish Collection Facility for Water Year 2022

salvage operations according to mandated operational criteria. When a fish facility outage occurs, water exports at JPP may continue and fish counts may be missed. If salvage ceases and it is certain that fish counts will be missed or if salvage inefficiency occurs due to operational issues, the Equipment Operator Supervisor or others designated by the Operation and Maintenance (O&M) Division Chief must follow the outage notification decision tree (Appendix 2) or the notification protocol explained in the CDFW memorandum (Appendix 3). There were ten planned outages and five unplanned outages at the TFCF during WY 2022 (Table 2).

Additionally, although not obligatory, salvage interruptions/no salvage periods due to shutdown of the JPP and/or Decision 1641 (D-1641) requirements are also being reported here. D-1641 provides regulatory rules and orders regarding water quality and water right requirements for the Bay-Delta Estuary (State Water Resources Control Board [SWRCB] 2000). These decisions can lead to disruptions to the TFCF salvage and are reported below (Table 2). There was one planned outage due to shutdown of the JPP and D-1641 requirements (Table 2).



Table 2.—Operation notes for Tracy Fish Collection Facility outages and salvage interruptions due to shutdown of the C.W. “Bill” Jones Pumping Plant and Decision 1641 requirements

Tracy Fish Collection Facility Outages								
Type	Start	End	Time	Duration (day)	Duration (hour)	Salvage interrupted (Y/N)	Export interrupted (Y/N)	# of missed counts
Unplanned	10/27/2021	10/27/2021	11:45–12:15	–	0.5	Y	N	1
Unplanned	10/28/2021	10/28/2021	10:00–16:00	–	6.0	Y	Y	3
Unplanned	11/10/2021	11/10/2021	06:00–14:00	–	8.0	Y	N	4
Unplanned	2/17/2022	2/18/2022	15:30–07:00	–	15.5	N	N	0
Planned	3/23/2022	3/23/2022	08:00–12:00	–	4.0	Y	N	2
Planned	4/13/2022	4/13/2022	08:00–12:00	–	4.0	Y	N	2
Planned	4/14/2022	4/14/2022	08:00–11:30	–	3.5	Y	N	1
Unplanned	6/22/2022	6/22/2022	09:30–10:00	–	0.5	Y	N	0
Planned	6/24/2022	6/24/2022	08:30–09:30	–	1.0	Y	N	0
Planned	6/30/2022	6/30/2022	07:30–13:00	–	5.5	Y	N	2
Planned	7/13/2022	7/13/2022	08:00–10:30	–	2.5	Y	N	1
Planned	7/20/2022	7/20/2022	08:30–10:30	–	2.0	Y	N	0
Planned	7/27/2022	7/27/2022	09:00–10:45	–	1.8	Y	N	1
Planned	9/20/2022	9/20/2022	–	–	–	N	N	0
Planned	9/21/2022	9/21/2022	07:00–13:30	–	6.5	Y	N	2
Shutdown of the C.W. “Bill” Jones Pumping Plant and Decision 1641 requirements								
Type	Start	End	Time	Duration (day)	Duration (hour)	Salvage interrupted (Y/N)	Export interrupted (Y/N)	# counts not conducted
Planned	2/27/2022	2/27/2022	18:00–24:00	0	6	Y	Y	3

## 4.1 Tracy Fish Collection Facility Outages

**10/27/2021** – Delay in turning on air compressors following electrical maintenance caused temporary operational failure of the pneumatic valves to the holding tanks. Salvage was interrupted and the 12:00 fish count and was not completed.

**10/28/2021** – Trash rack debris accumulation. JPP increased from 3 to 5 units at 08:00 causing a differential at the trash rack of about 5 to 6 feet (ft). Primary channel and DMC water levels were approximately 12 to 13 ft deep, resulting in low secondary channel water depth and no water diversion to holding tanks starting at 10:00. JPP stopped pumping at 12:00 and resumed to 3 units at 16:00.

**11/20/2021** – Trash rack and primary louver debris accumulation. Negative tides and the removal of the barriers caused a differential at the trash rack of approximately 3 ft and a primary louver differential of 6 ft. Primary channel and DMC water levels were approximately 12 to 13 ft deep, resulting in low secondary channel water depth and no water diversion to holding tanks starting at 06:00. The secondary channel also became completely clogged with debris and fish. Debris unclogged from the secondary channel and primary louvers accumulated in the holding tanks and required five debris haul outs to the fish release sites. JPP exports reduced to two units at 02:26 and to one unit at 06:00. JPP resumed 3-unit operation at 14:00.

**02/17/2022** – No interruptions to salvage operations or JPP exports. At 15:30 excessive debris accumulation in the holding tanks forced the TFCF to decrease secondary channel velocity below 3 feet per second (fps) (and Salmon Criteria) to limit debris entering the holding tanks. Salmon Criteria requires secondary channel velocity of 3 to 3.5 fps.

**03/23/2022** – Stop log testing for the secondary channel and holding tank discharge lines was completed at the TFCF. Fish salvage at the TFCF resumed at 12:00. Pumping at the Jones Pumping Plant was not affected.

**04/13/2022** – Salvage suspended for four hours (8:00 to 12:00) to dredge the holding tank flapper valve vault. Water export pumping at the JPP was not interrupted.

**04/14/2022** – Salvage suspended for 3.5 hours (8:00 to 11:30) to inspect the holding tank flapper valves. Water export pumping at the JPP was not interrupted.

**06/22/2022** – Fish salvage suspended 9:30 to 10:00 to inspect low pressure pumps in the TFCF secondary channel. Export pumping at the JPP was not interrupted.

**06/24/2022** – Removal of both low-pressure pumps in the TFCF secondary channel. Export pumping at the JPP was not interrupted.

**06/30/2022** – Maintenance to remove sediment from the Velocity Control (VC) valve vault and conduct inspection of the VC flapper valves and hinges. Export pumping at the JPP was not interrupted.

**07/13/2022** – Maintenance to replace traveling screen #2 in the TFCF secondary channel. Water export pumping at the JPP was not interrupted. Salvage suspended for 2.5 hours.

**07/20/2022** – Planned outage to inspect and adjust traveling screen #2 in the TFCF secondary channel. Water export pumping at the JPP was not interrupted. Salvage suspended for 2 hours.

**07/27/2022** – Planned outage to take measurements and collect detailed information for repair of VC pump discharge flap valves in the secondary channel. Total TFCF salvage outage duration was 1 hour and 45 mins, from 09:00–10:45. Water exports at the Jones Pumping Plant continued during this outage, although no salvage of fish occurred. The 10:00 fish-count was not performed due to the planned outage and operator error.

**09/20/2022** – Salvage at the TFCF was not interrupted during the electrical systems inspection portion of the whole facility conditions assessment. Water export pumping at the JPP was not interrupted.

**09/21/2022** – Inspection of the TFCF secondary channel confined spaces as part of the whole facility conditions assessment. Total salvage downtime was 6.5 hours from 7:00 to 13:30. Water export pumping at the JPP was not interrupted.

## **4.2 Salvage Interruptions/No Salvage Periods Due to Shutdown of the C.W. “Bill” Jones Pumping Plant and Decision 1641 Requirements**

**02/27/2022** – No pumping at JPP and no salvage at TFCF from 18:00 to 23:59 PST.



## 5.0 References

California Dept. of Fish and Wildlife. 2013. Salmon loss estimation.

Available at: <ftp://ftp.dfg.ca.gov/salvage/>

California Dept. of Fish and Wildlife. 2014. Delta Model length at date table.

Available at <ftp://ftp.dfg.ca.gov/salvage/>

National Oceanic Atmospheric Administration (NOAA) Fisheries. 2019. Biological Opinion on Long-term Operation of the Central Valley Project and the State Water Project.

U.S. Department of Commerce, National Marine Fisheries Service. October 21, 2019.

State Water Resources Control Board (SWRCB). 2000. Revised Water Right Decision 1641.

March 15, 2000.



## **Appendix 1**

Annual Salvages and Percentages of Annual Salvage (%) for Fish





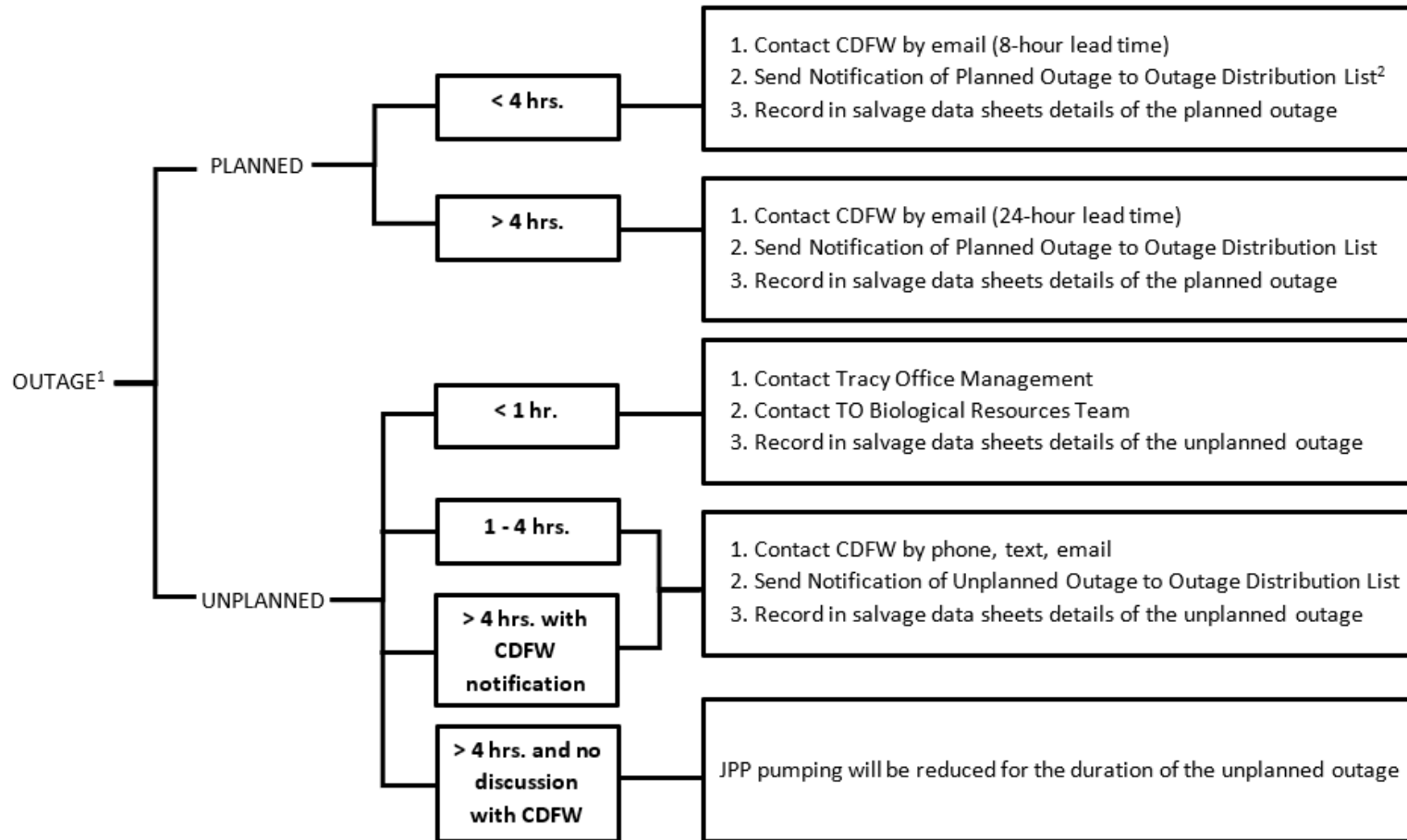
<b>Species</b>	<b>2022 salvage</b>	<b>% composition</b>	<b>2021 salvage</b>	<b>% composition</b>
Threadfin Shad	1,358,971	83.21	228,678	60.23
Bluegill	105,527	6.46	58,718	15.46
Largemouth Bass	52,527	3.22	17,647	4.65
Striped Bass	29,737	1.82	12,541	3.30
American Shad	18,247	1.12	4,990	1.31
White Catfish	15,088	0.92	12,486	3.29
Inland Silverside	9,043	0.55	10,531	2.77
Prickly Sculpin	7,957	0.49	7,367	1.94
Shimomura Goby	7,816	0.48	13,819	3.64
Rainwater Killifish	5,492	0.34	2,545	0.67
Yellowfin Goby	4,949	0.30	1,667	0.44
Longfin Smelt	2,962	0.18	188	0.05
Redear Sunfish	2,890	0.18	874	0.23
Golden Shiner	2,787	0.17	776	0.20
Lamprey Unknown	1,612	0.10	1,768	0.47
Black Crappie	1,311	0.08	536	0.14
Western Mosquitofish	1,234	0.08	1,456	0.38
Channel Catfish	1,205	0.07	879	0.23
Chinook Salmon	1,142	0.07	892	0.23
Pacific Lamprey	1,048	0.06	560	0.15
Rainbow / Steelhead Trout	394	0.02	197	0.05
Bigscale Logperch	261	0.02	140	0.04
Warmouth	248	0.02	48	0.01
Brown Bullhead	236	0.01	54	0.01
Threespine Stickleback	128	0.01	76	0.02
Red Shiner	106	0.01	144	0.04
Wakasagi	68	< 0.01	4	< 0.01
Black Bullhead	54	< 0.01	24	0.01
Splittail	31	< 0.01	32	0.01
Tule Perch	28	< 0.01	8	< 0.01
Common Carp	4	< 0.01	5	< 0.01
Sacramento Sucker	4	< 0.01	4	< 0.01
Spotted Bass	4	< 0.01	4	< 0.01
Blue Catfish	0	0	13	< 0.01
Fathead Minnow	0	0	4	< 0.01
Green Sturgeon	0	0	4	< 0.01
Green Sunfish	0	0	4	< 0.01
Sheikhas Goby	0	0	4	< 0.01
Smallmouth Bass	0	0	4	< 0.01



## **Appendix 2**

Notification Decision Tree





<sup>1</sup>An outage is defined as the inability to (1) properly screen the entire flow (e.g., due to mechanical breakdown, low water conditions, or excessive debris conditions) and (2) conduct fish salvage operations according to mandated operational criteria.

<sup>2</sup> Outage Distribution List includes contacts for Reclamation (TO, TO Bio Res, BDO, CVO), CDFW, NMFS and USFWS.



## **Appendix 3**

State of California Department of Fish and Wildlife State Water Project  
and Central Valley Project Delta Fish Facility Notification Procedures  
for Planned and Unplanned Outages Memorandum







State of California – Natural Resources Agency  
DEPARTMENT OF FISH AND WILDLIFE  
Bay Delta Region  
2825 Cordelia Road, Suite 100  
Fairfield, CA 94534  
(707) 428-2002  
[www.wildlife.ca.gov](http://www.wildlife.ca.gov)

GAVIN NEWSOM, Governor  
CHARLTON H. BONHAM, Director



July 12, 2022

Mr. John Mercado  
U.S. Bureau of Reclamation  
16650 Kelso Road  
Byron, CA 94514  
[JMercado@usbr.gov](mailto:JMercado@usbr.gov)

Subject: Central Valley Project Delta Fish Facility Notification Procedures for Planned and Unplanned Outages

The California Department of Fish and Wildlife (CDFW) is providing this letter to outline the interagency contact procedures for planned and unplanned outages at the Central Valley Project (CVP) fish salvage facilities. This replaces the previous memorandum distributed on January 17, 2019.

A fish facility outage is defined as inability to (1) properly screen the entire export flow (e.g., due to mechanical breakdown, low water conditions, or excessive debris conditions) and (2) conduct fish salvage operations according to protocol.

#### **Planned Outages**

For all *planned outages* conducted for *normal maintenance and repair work* (e.g., predator clean-outs, normal maintenance procedures, repairs to valves and controls) contact Virginia Afentoulis, or any other CDFW Fish Salvage Monitoring staff listed below, by email at least 24 hours in advance of outages of any duration.

To minimize impact of outages on salvage and the take of listed species, it is best to consult with the CDFW Fish Salvage Monitoring staff before scheduling outages with as much advance notice as possible.

#### **Unplanned/Emergency Outages**

The procedure and contact list for *unplanned outages or emergencies* will be as follows:

For unplanned outages, pumping should be reduced as soon as feasible for the duration of the outage. Please notify one of the staff below by phone, text, or email immediately, and within 24 hours at the latest. If discussion by phone, text, or email is not possible, leave a message detailing the source, was pumping continued, and estimated duration of the outage.

*Conserving California's Wildlife Since 1870*

Fish Salvage and Operations at the Tracy Fish Collection Facility  
for Water Year 2022 – Appendix 3

DocuSign Envelope ID: 0442A32D-EEB5-44C5-A1A0-F8D159DB06CC

Mr. John Mercado  
U.S. Bureau of Reclamation  
July 12, 2022  
Page 2

For outages occurring during business hours, please contact:

Virginia Afentoulis: (916) 247-7739  
[Virginia.Afentoulis@wildlife.ca.gov](mailto:Virginia.Afentoulis@wildlife.ca.gov)

For outages occurring outside of normal business hours, please contact:

Lauren Damon (209) 639-2686  
[Lauren.Damon@wildlife.ca.gov](mailto:Lauren.Damon@wildlife.ca.gov)

**Fish Facilities Unit Staff**

Geir Aasen (209) 639-2750  
[Geir.Aasen@wildlife.ca.gov](mailto:Geir.Aasen@wildlife.ca.gov)

Walter (Kyle) Griffiths (209) 443-4166  
[Walter.Griffiths@wildlife.ca.gov](mailto:Walter.Griffiths@wildlife.ca.gov)

Tim Keopadubsy (707) 416-7951  
[Tim.Keopadubsy@wildlife.ca.gov](mailto:Tim.Keopadubsy@wildlife.ca.gov)

Please post this information for all parties to read or incorporate this information into your agency's posted emergency notification procedures and contact list.

Thank you for your cooperation. If you have questions or require further information, please contact Ms. Afentoulis, Fish Salvage Monitoring Senior Environmental Scientist, at (916) 247-7739 or [Virginia.Afentoulis@wildlife.ca.gov](mailto:Virginia.Afentoulis@wildlife.ca.gov).

Sincerely,

DocuSigned by:  
  
B77E9A6211EF486  
Erin Chappell  
Regional Manager  
Bay Delta Region

ec:

Lauren Damon, CDFW Bay Delta Region – [Lauren.Damon@wildlife.ca.gov](mailto:Lauren.Damon@wildlife.ca.gov)  
Virginia Afentoulis, CDFW Bay Delta Region – [Virginia.Afentoulis@wildlife.ca.gov](mailto:Virginia.Afentoulis@wildlife.ca.gov)  
Geir Aasen, CDFW Bay Delta Region – [Geir.Aasen@wildlife.ca.gov](mailto:Geir.Aasen@wildlife.ca.gov)  
W. Kyle Griffiths, CDFW Bay Delta Region – [Walter.Griffiths@wildlife.ca.gov](mailto:Walter.Griffiths@wildlife.ca.gov)  
James Hobbs, CDFW Bay Delta Region – [James.Hobbs@wildlife.ca.gov](mailto:James.Hobbs@wildlife.ca.gov)  
Carl Dealy, U. S. Bureau of Reclamation – [JCDealy@usbr.gov](mailto:JCDealy@usbr.gov)  
Bradley Kaufman, U. S. Bureau of Reclamation – [BKaufman@usbr.gov](mailto:BKaufman@usbr.gov)  
Rene Reyes, U. S. Bureau of Reclamation – [RReyes@usbr.gov](mailto:RReyes@usbr.gov)

## PEER REVIEW DOCUMENTATION

### PROJECT AND DOCUMENT INFORMATION

Project Name: Tracy Fish Collection Salvage Database Annual Report

WOID F403A

Document: Fish Salvage and Operations at the Tracy Fish Collection Facility for Water Year 2022

Document Date December 2022

Team Leader Meghan White

Document Author(s)/Preparer(s) Meghan White

Peer Reviewer Mike Horn

### REVIEW REQUIREMENT

Part A: Document Does Not Require Peer Review

Explain \_\_\_\_\_

Part B: Document Requires Peer Review: SCOPE OF PEER REVIEW

Peer Review restricted to the following Items/Section(s):

Reviewer:

Entire document subject to review

Mike Horn

### REVIEW CERTIFICATION

Peer Reviewer - I have reviewed the assigned Items/Section(s) noted for the above document and believe them to be in accordance with the project requirements, standards of the profession, and Reclamation policy.

Reviewer: Mike Horn

Review Date: December 2022

Signature: MICHAEL HORN

MICHAEL

Digitally signed by  
MICHAEL HORN  
Date: 2022.12.27 09:30:22  
-07'00'

I have discussed the above document and review requirements with the Peer Reviewer and believe that this review is completed, and that the document will meet the requirements of the project.

Team Leader: Meghan White

Date: December 2022

Signature: MEGHAN WHITE

MEGHAN

Digitally signed by  
MEGHAN WHITE  
Date: 2022.12.29  
07:47:52 -07'00'