



Weekly Assessment of CVP and SWP Delta Operations on ESA-listed Species

May 30, 2023

Executive Summary

Operational Conditions

See Weekly Fish and Water Operation Outlook document for May 30 – June 5 which includes the initial CVP and SWP operational intent and biological justification for the next seven days. Any recommended changes or alternatives to those operations made by either monitoring team is captured herein.

Winter-run Chinook Salmon

Loss of natural winter-run Chinook Salmon (by length at date, LAD) has not occurred in the past week at the State and Federal fish salvage facilities (WY 2023 total loss = 109.88 fish, as of 5/25/2023). Loss of natural winter-run Chinook Salmon at the Central Valley Project (CVP) and State Water Project (SWP) fish collection facilities may occur over the next week. 0-2% of juvenile natural winter-run Chinook Salmon from brood year (BY) 2022 are estimated to be present in the Delta. The Delta Cross Channel (DCC) gates closure for the season reduces exposure of winter-run Chinook Salmon juveniles that are present in the Sacramento River near the DCC gates into the interior Delta.

Spring-run Chinook salmon

Loss of natural spring-run Chinook Salmon (by length at date, LAD) has occurred in the past week at the State or Federal fish salvage facilities (WY 2023 total loss = 6,816.65 fish as of 5/25/2023). Loss of spring-run Chinook salmon at the CVP and SWP fish collection facilities may occur over the next week. 5-20% of juvenile natural spring-run Chinook Salmon from brood year (BY) 2022 are estimated to be present in the Delta. The genetic data from salvage for WY 2023 indicates majority LAD spring-run Chinook are fall-run Chinook. The DCC gates closure for the season reduces exposure of spring-run Chinook Salmon juveniles that are present in the Sacramento River near the DCC gates into the interior Delta.

Central Valley Steelhead

Loss of natural California Central Valley (CCV) steelhead has occurred in the past week at the State and Federal fish salvage facilities (WY 2023 December 1 - March 31 total loss = 1015.16 fish, April 1 – June 15 total loss = 284.78 fish, as of 5/25/2023). Loss of Central Valley steelhead at the CVP and SWP fish collection facilities is likely to occur over the next week. 10-25% of

juvenile natural CCV Steelhead from brood year (BY) 2022 are estimated to be present in the Delta. DCC closure for the season reduces exposure to Central Valley steelhead juveniles that are potentially present in the Sacramento River near the DCC gates.

Green Sturgeon

Loss of green sturgeon has not occurred in the past week at the State and Federal fish salvage facilities (WY 2023 total loss = 0 fish, as of 5/25/2023). Loss of green sturgeon is unlikely to occur over the next week due to their rare presence in the South Delta.

Delta Smelt

Based on recent detection data and distribution patterns over the past decade, Delta Smelt are spawning and larval Delta Smelt are present. No adult Delta Smelt have been detected since 3/21/2023. Thirty-four larval Delta Smelt have been detected since 3/13/2023. No Delta Smelt have been detected in Salvage since 3/2/2023. Due to positive QWEST and OMRI, and average secchi depths over 1m in the South Delta, overall risk for entrainment is low for all life stages of Delta Smelt throughout the Delta.

Delta Cross Channel Gates

The DCC gates were closed on 11/28/2022 to meet LTO Proposed Action and are expected to remain closed until May. DCC gates may only be opened to maintain water quality under D-1641 between November and January.

Monitoring Teams summary

There were no non-consensus issues to report from the Salmon Monitoring Team.

There were no non-consensus issues to report from the Smelt Monitoring Team.

Operational and Regulatory Conditions

See current Weekly Fish and Water Operation Outlook document.

Biology, Distribution, and Evaluation Winter-run Chinook salmon, Spring-run Chinook salmon, Central Valley Steelhead

Population Status

Winter-run Chinook Salmon

- Delta Life Stages:
 - Juveniles, Adults
- Brood Year 2022 Productivity:
 - Natural winter-run Chinook salmon: Draft Juvenile production estimate (JPE) calculations have been established for brood year (BY) 2022 winter-run Chinook salmon. The final BY 2022 JPE is 49,924 natural origin juvenile winter run Chinook salmon.
 - Mean cumulative weekly passage of winter-run Chinook salmon through 5/20/2023 at Red Bluff Diversion Dam (RBDD) for the last 20 years of passage data is 100.0% (one SD of 0.0%). By 5/20/2023, 240,060 winter-run Chinook salmon were estimated to have passed RBDD compared to the cumulative passage last year of 572,568 winter-run Chinook salmon.
 - Hatchery winter-run Chinook salmon:
 - Approximately 432,458 Livingston Stone NFH brood year 2022 winter Chinook salmon were released at dusk on 1/26-1/27/2023 into the Sacramento River at John F. Reginato River Access boat ramp, Redding, CA. This is the first release of LSNFH brood year 2022 hatchery winter Chinook salmon comprising of approximately 58% of the total hatchery production for the Sacramento River supplementation program. The release group is 100% marked (adipose-fin clip and CWT) with an overall estimated average fork length of 85mm. There has been no loss so far this water year with this release group.
 - Approximately 299,866 Livingston Stone NFH brood year 2022 winter Chinook salmon were released at dusk on 3/1/2023 into the Sacramento River at John F. Reginato River Access boat ramp, Redding, CA. This is the final release for the Livingston Stone NFH brood year 2022 winter Chinook Salmon supplementation program. This release group 100% marked (with an adipose-fin clip and CWT) and has an overall estimated

average fork length of 85 mm. There has been no loss so far this water year with this release group.

- Approximately 97,134 Coleman NFH Complex brood year 2022 winter Chinook Salmon were released on March 17, 2023. The release took place on the North Fork Battle Creek at Wilson Hill Bridge near Manton, CA. This is the first release of the brood year 2022 Jumpstart winter Chinook Salmon, and the only release of fish reared at the Mount Lassen Trout Farm, a private aquaculture facility located on North Fork Battle Creek. This group is 100% marked (with an adipose-fin and a left pelvic-fin clip and CWT).
- Approximately 77,416 Coleman NFH Complex brood year 2022 winter Chinook Salmon were released on April 24, 2023. The release took place on the North Fork Battle Creek at Wilson Hill Bridge near Manton, CA. This is the final release of the brood year 2022 Jumpstart winter Chinook Salmon. This group is 100% marked (with an adipose-fin and a left pelvic-fin clip and CWT) and has an overall estimated average fork length of 85 mm.

Spring-run Chinook Salmon

- Delta Life Stages:
 - Young-of-year (YOY) and Yearlings
- Brood Year 2022 Productivity:
 - Natural spring-run Chinook salmon: No JPE has been established for spring-run Chinook salmon.
 - Hatchery spring-run Chinook salmon surrogates associated with the Proposed Action (PA 4.10.5.10.2 Additional Real-Time OMR Restrictions and Performance Objectives):
 - Approximately 71,057 late-fall Chinook salmon from Coleman National Fish Hatchery were released at Battle Creek on 12/5/2022. This group is 100% marked with adipose-fin clip and CWT and have an estimated average fork length of 145mm. This is the first spring-run Chinook salmon surrogates release group associated with the Proposed Action. There has been no loss this water year of fish associated with the first surrogate release group.
 - Approximately 66,735 late-fall Chinook salmon from Coleman National Fish Hatchery were released at Battle Creek on 12/23/2022. This group is 100% marked with adipose-fin clip and CWT and have an estimated average fork length of 145mm.

- Approximately 60,712 Coleman NFH brood year 2022 late-fall Chinook Salmon on January 13, 2023 into Battle Creek at Coleman NFH. This group is 100% marked (with an adipose-fin clip and CWT) and has an overall estimated average fork length of 145 mm.
- There has been loss this water year of fish associated with the first, second, and third surrogate release groups.
- The agencies in the SaMT discussed the thiamine vitamin deficiency that was observed in winter run Chinook salmon broodstock at the Livingston Stone National Fish Hatchery (LSNFH) in BY 2022. Last year the thiamine deficiency appeared to negatively affect survival of juvenile fish as they migrate downstream towards the Delta. The thiamine deficiency issue is also likely impacting spring-run Chinook salmon.

Central Valley Steelhead

- Delta Life Stages:
 - Spawning Adults, Kelts, Juveniles
- Brood Year 2022 Productivity:
 - Spawner abundance: There is limited information about the adult steelhead population. It is estimated to be small, contributing to the limited productivity of the population.
 - Natural steelhead: No JPE has been established for steelhead. Data are limited.
 - Hatchery steelhead: Reclamation’s Proposed Action has no hatchery steelhead triggers.

Distribution

Winter-run Chinook Salmon

Current Distribution:

- For Winter-run Chinook Salmon observations reported to SaMT since previous meeting, see Table 1.
- For SaMT distribution estimates, see Table 2.
- There is uncertainty in the identification of some untagged salmonids potentially due to either tag loss or poor quality adipose clipping from hatchery releases made in the South Delta. Lower rates of tagging success were confirmed for by hatchery staff for some releases. Confirmation of origin of these fish will be through genetic identification.

- For fish observed in salvage and genetically analyzed through 5/9/2023, one has been genetically identified as Winter-run Chinook Salmon (see attachment A). The single winter-run LAD Chinook Salmon observed at the CVP facility on 2/23/2023 was genetically identified as a winter-run for a loss of 2.88.

Historic Trends

- For historical winter-run Chinook salmon trends in salvage, see Table 3.
- Loss of natural winter-run Chinook salmon at the CVP and SWP fish collection facilities may occur over the next week based on life history and detections in real-time monitoring locations in the Delta. However, if historic trends in salvage were to continue, winter-run Chinook salmon loss is expected to decrease over the next week.

Forecasted Distribution within Central Valley and Delta regions

- Movement of winter-run Chinook salmon juveniles into the lower reaches of the Sacramento River and upper Delta may continue over the next week.
- The STARS model projects route-specific proportion of entrainment, survival, and travel times (Table 5). This model does not estimate entrainment into the lower Sacramento River sloughs (i.e., Three-Mile Slough).
- The DCC gates were closed 11/28/22 and are expected to remain closed due to high flows in the system.

Spring-run Chinook salmon

Current Distribution

- For Spring-run Chinook salmon observations reported to SaMT since previous meeting, see Table 1.
- For SaMT distribution estimates, see Table 2.

Historical Trends

- For historical spring-run Chinook salmon trends in salvage, see Table 3. If historic trends in salvage were to continue YOY spring-run Chinook salmon loss is unlikely to increase over the next week.

Forecasted Distribution within Central Valley and Delta regions

- Yearling spring-run Chinook are thought to be migrating through the Delta.

Central Valley Steelhead

Current Distribution

- For CCV Steelhead observations reported to SaMT since previous meeting, see Table 1.

- For SaMT distribution estimates, see Table 2.

Historical Trends

- For historical CCV steelhead trends in salvage, see Table 2. If historic trends in salvage were to continue, juvenile CCV steelhead loss may occur over the next week.

Forecasted Distribution within Central Valley and Delta regions

- The entrainment tool estimates of CCV steelhead loss to be moderate (Table 6, Fig. 1).
- Closure of the DCC gates for the season will reduce exposure and possible entrainment of juvenile CCV steelhead from the Sacramento River into the interior Delta via the DCC gates.

Table 1. Fish observation reported since the previous SaMT meeting. NAs represent no data reported. See Operations Outlook for notes on interruptions in any surveys.

Locations	Reporting Period	SR Chinook	WR Chinook	LFR Chinook	Steelhead (Wild)	Green Sturgeon
GCID RST	N/A	N/A	N/A	N/A	N/A	N/A
Butte Creek RST	5/13-5/21	20	0	0	1	0
Tisdale RST	5/19-5/25	0	0	0	0	0
Knights Landing RST	5/23/5/29	0	0	0	0	0
Lower Sacramento RST	5/8-5/13	0	0	0	0	0
Beach Seines	5/21-5/27	0	0	0	0	0
Sac. Trawl	5/21-5/27 5/27-5/14-5/20	0	0	0	0	0
Chippis Island Midwater Trawl	5/21-5/27	12	0	0	0	0
Mossdale Kodiak Trawl	5/21-5/27	N/A	N/A	N/A	N/A	N/A
EDSM	5/21-5/27	0	0	0	0	0
Feather River Herringer RST	5/12-5/18	0	0	0	0	0
Feather River Eye Side RST	5/15-5/18	0	0	0	1	0
Lower Feather River	5/20-5/26	0	0	0	0	0

Table 2. Salmonid distribution estimates

Location	Yet to Enter Delta (%)	In the Delta (%)	Exited Delta past Chipps Island (%)
Young-of-year (YOY) winter-run Chinook salmon	Current: 0% Last Week: 0%	Current: 0-2% Last Week: 1-2%	Current: 98-100% Last Week: 98-99%
YOY spring-run Chinook salmon	Current: 5-10% Last Week: 5-10%	Current: 5-20 % Last Week: 15-30%	Current: 75-85% Last Week: 70-80%
YOY hatchery winter-run Chinook salmon	Current: 0% Last Week: 0%	Current: 0% Last Week: 0%	Current: 100% Last Week: 100%
Natural origin steelhead	Current: 5-10% Last Week: 5-10%	Current: 10-25% Last Week: 15-30%	Current: 70-80% Last Week: 65-75%

Table 3. Historic migration and salvage patterns. Last updated 5/29/2023.

Species	Red Bluff Diversion Dam	Tisdale Rst	Knights Landing Rst	SacTrawl Sherwood Catch Index	Chipps Island Trawl Catch Index	Salvage
Chinook, Winter-run, Unclipped	100.0%(100.0%,100.0%) BY: 2013 - 2021	100.0%(100.0%,100.0%) BY: 2013 - 2021	100.0%(100.0%,100.0%) BY: 2013 - 2021	100.0%(100.0%,100.0%) BY: 2013 - 2021	100.0%(100.0%,100.0%) BY: 2013 - 2021	100.0%(100.0%,100.0%) WY: 2013 - 2022
Chinook, Spring-run, Unclipped	99.9%(99.8%,100.0%) BY: 2013 - 2021	100.0%(100.0%,100.0%) BY: 2013 - 2021	100.0%(100.0%,100.0%) BY: 2013 - 2021	100.0%(100.0%,100.0%) BY: 2013 - 2021	99.8%(99.4%,100.1%) BY: 2013 - 2021	99.0%(97.2%,100.7%) WY: 2013 - 2022
Steelhead, Unclipped (January-December)	35.5%(20.4%,50.7%) BY: 2013 - 2022	83.5%(60.5%,106.5%) BY: 2014 - 2022	83.7%(65.5%,101.9%) BY: 2014 - 2022	94.7%(84.9%,104.6%) BY: 2013 - 2022	96.7%(92.2%,101.1%) BY: 2013 - 2022	N/A
Steelhead, Unclipped (December-March)	N/A	N/A	N/A	N/A	N/A	100.0%(100.0%,100.0%) WY: 2014 - 2023

Species	Red Bluff Diversion Dam	Tisdale Rst	Knights Landing Rst	SacTrawl Sherwood Catch Index	Chippis Island Trawl Catch Index	Salvage
Steelhead, Unclipped (April-June)	N/A	N/A	N/A	N/A	N/A	93.8%(85.9%,101.6%) WY: 2013 - 2022

Table 4. Mean daily flow and percent change (Wilkins Slough, Deer Creek, Mill Creek; cfs from CDEC) and temperature and percent change (Knights Landing; °F from RST).

Date	Mill Creek (MLM): mean daily flow (cfs)	Mill Creek (MLM): flow percent change	Mill Creek (MLM): Alert	Deer Creek (DCV): mean daily flow (cfs)	Deer Creek (DCV): flow percent change	Deer Creek (DCV): Alert	Wilkins Slough (WLK): mean daily flow (cfs)	Knights Landing RST: water temperature (f)	Alert Triggered
5/28/2023	824.9	6.2%	Flow>95cfs	577.5	-5.5%	Flow>95 cfs	11,985.8	51.1	WLK>7500 cfs and KNL<56.3F
5/27/2023	776.8	-2.6%	Flow>95cfs	611.1	-6.9%	Flow>95 cfs	12,475.0	50.9	WLK>7500 cfs and KNL<56.3F
5/26/2023	797.1	-3.1%	Flow>95cfs	656.0	-5.6%	Flow>95 cfs	12,566.6	50.5	WLK>7500 cfs and KNL<56.3F
5/25/2023	822.7	-11.2%	Flow>95cfs	694.9	-8.0%	Flow>95 cfs	13,439.3	50.4	WLK>7500 cfs and KNL<56.3F
5/24/2023	927.0	-6.2%	Flow>95cfs	755.8	-6.6%	Flow>95 cfs	14,682.9	50.6	WLK>7500 cfs and KNL<56.3F
5/23/2023	988.3	-2.5%	Flow>95cfs	809.0	-4.2%	Flow>95 cfs	14,717.7	50.7	WLK>7500 cfs and KNL<56.3F
5/22/2023	1,013.2	-5.7%	Flow>95cfs	844.4	-5.5%	Flow>95 cfs	14,485.0	50.8	WLK>7500 cfs and KNL<56.3F

Table 5. STARS model simulations for route-specific entrainment, travel times, and survival. Travel time is calculated in days.

Stock	Date	Route	Median Travel Time	Survival	Routing Probability
Winter Chinook	2023-05-28	Overall	5.01	0.28	N/A
Winter Chinook	2023-05-28	Sacramento River	4.69	0.30	0.66
Winter Chinook	2023-05-28	Yolo Bypass	9.50	0.56	0.00
Winter Chinook	2023-05-28	Sutter Slough	5.01	0.26	0.13
Winter Chinook	2023-05-28	Steamboat Slough	4.60	0.28	0.10
Winter Chinook	2023-05-28	Interior Delta	7.30	0.21	0.11
Late-fall Chinook	2023-05-28	Overall	4.81	0.63	N/A
Late-fall Chinook	2023-05-28	Delta Cross Channel	N/A	N/A	0.00
Late-fall Chinook	2023-05-28	Georgiana Slough	7.61	0.35	0.19
Late-fall Chinook	2023-05-28	Sacramento River	4.09	0.70	0.47
Late-fall Chinook	2023-05-28	Sutter and Steamboat Slough	4.77	0.69	0.34

The entrainment tool estimates a median and maximum loss of winter-run Chinook Salmon and juvenile CCV Steelhead each week (Table 6a).

Table 6a-b. WY 2023 loss and salvage predictor data: Environmental details, current and forecast. Model results from 5/29/2023.

- a) WY 2023 loss and salvage predictor data: Predicted weekly loss of winter-run Chinook salmon and steelhead at CVP and SWP facilities.

Parameter	Modeled Current Week	Modeled Next Week
Predicted Steelhead, Median %	26	26
Predicted Steelhead, High %	165	165
Predicted Chinook Winter Run, Median %	0	0
Predicted Chinook Winter Run, High %	17	17

- b) Environmental details, current and forecast.

Parameter	Data	Forecast
Temperature (Mallard Island, C)	18.9	18.9
Precipitation (5-d running sum, inches)	0	0
Old and Middle River Flows (cfs)	2438	2438
Sacramento River Flow (Freeport, cfs)	51797	51797
DCC Gates	closed	closed

Parameter	Data	Forecast
San Joaquin River Flow (Vernalis, cfs)	26085	26085
Export	10282	10282

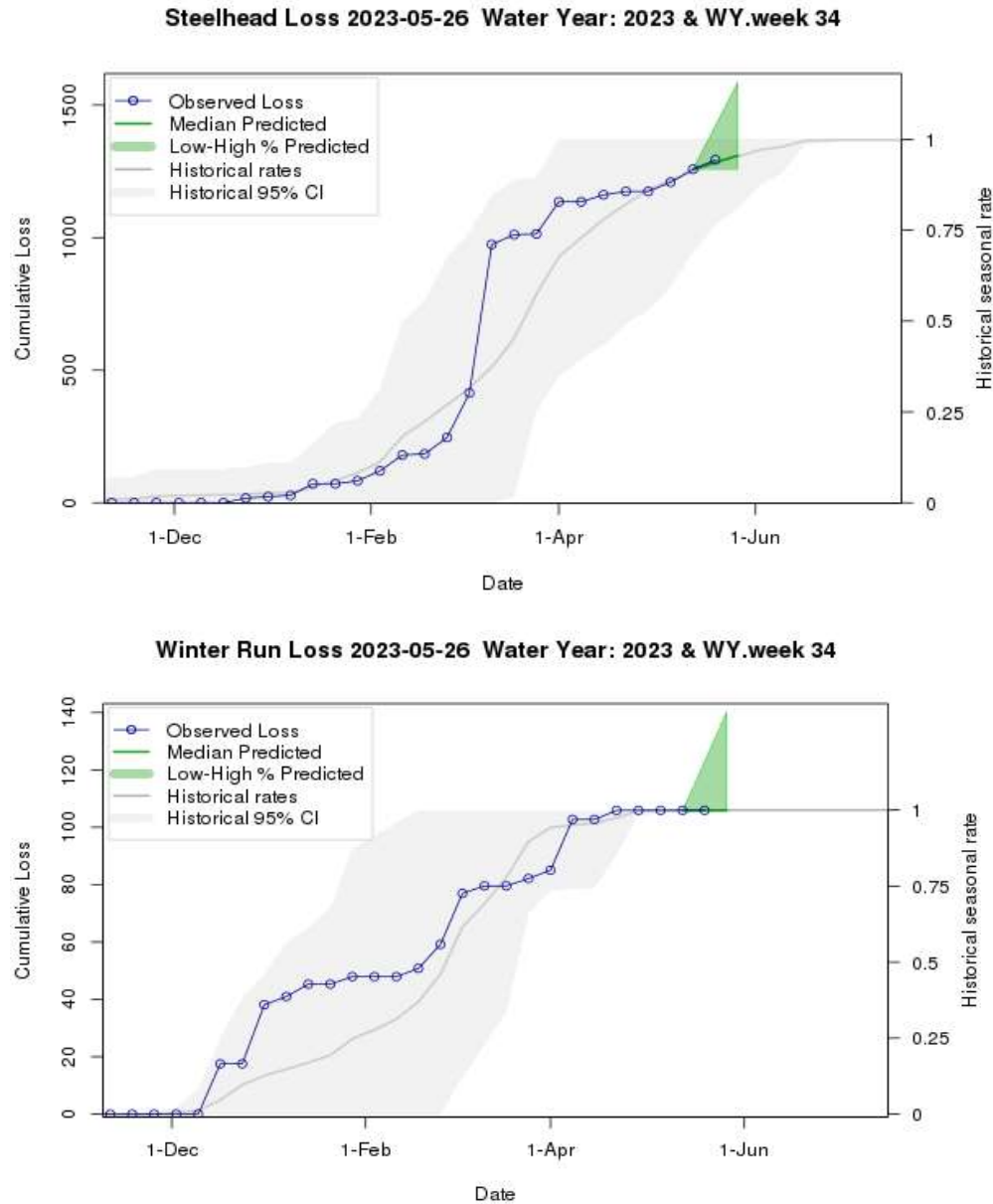


Figure 1. Predicted weekly loss of steelhead and winter-run Chinook salmon at the CVP and SWP facilities

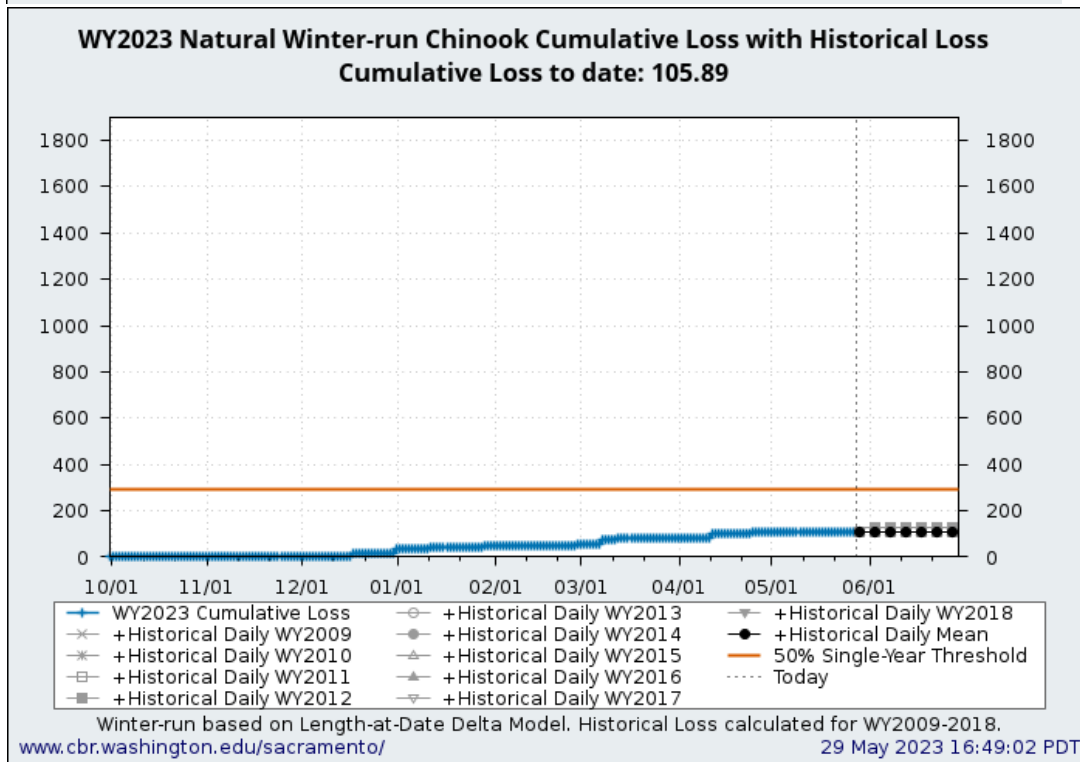
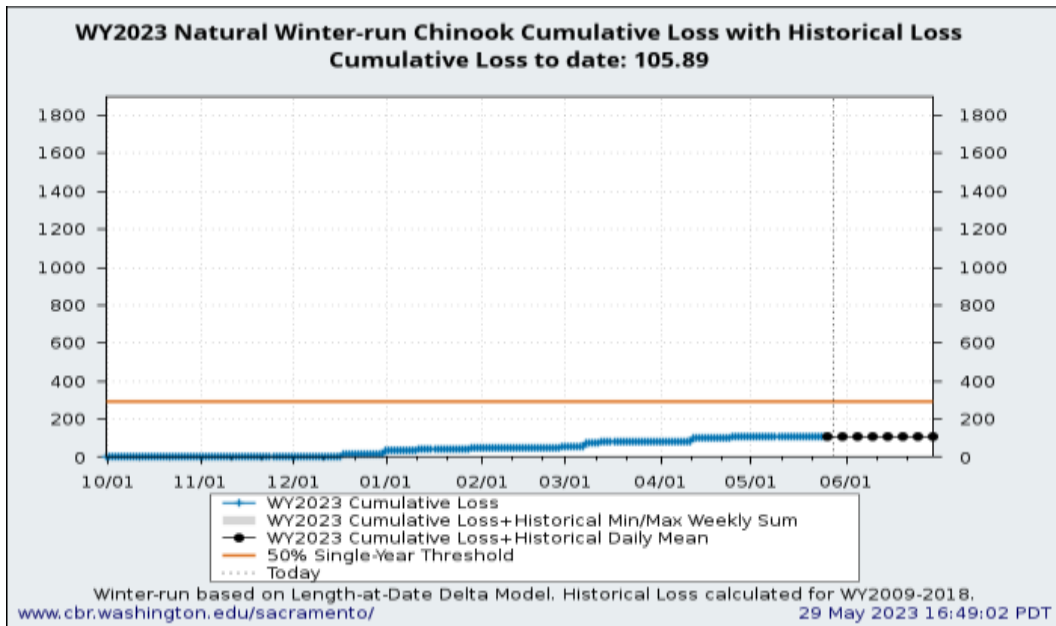


Figure 2. Predicted weekly loss of winter-run Chinook salmon at the CVP and SWP facilities based on historical loss

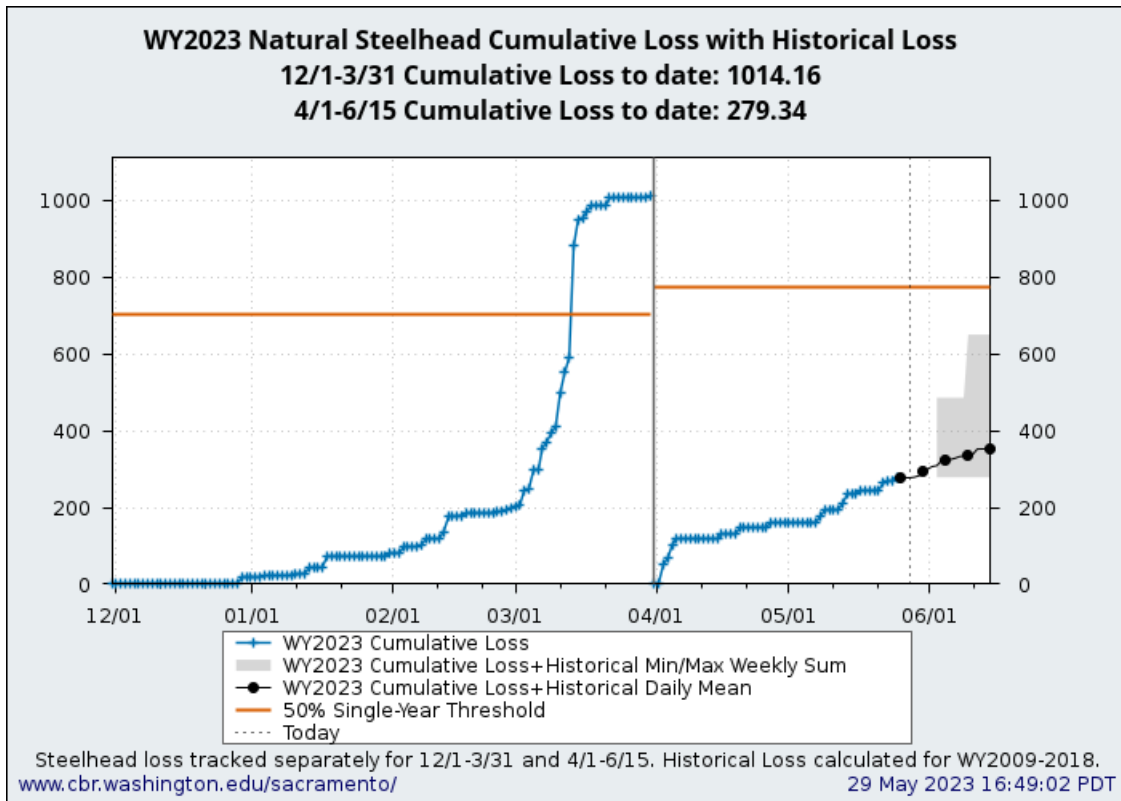


Figure 3. Cumulative natural steelhead loss for the year (blue) and 2009 – 2018 historic cumulative loss (gray, different symbols). Historic daily mean plotted in black circles

Evaluation

1. After January 1, are more than 5% of juveniles from one or more salmonid species present in the Delta?

Greater than 5% of all juvenile salmonids are present in the Delta.

2. Does the operational outlook's ranges impact fish movement and change the potential distribution of fish?

Potential effects within the 7 days (near-term) in the operations outlook.

OMR flow is expected to remain at or more positive than -5,000 cfs this upcoming week. OMR flows more positive than -5,000 cfs are hypothesized to have minimal impact on movement and distribution of salmonids in the South Delta.

Potential effects longer than the 7 days (longer-term) in the operations outlook.

Not applicable, see response above.

3. What is the likelihood of increased loss exceeding the next annual loss threshold (50%, 75% or 90% of threshold) resulting in OMR management actions based on population distribution, abundance, and behavior of fish in the Delta?

Winter-run Chinook salmon

Total juvenile natural winter-run Chinook salmon (LAD) loss is 109.88 fish (as of 5/25/2023). Loss of juvenile winter-run LAD Chinook salmon has not occurred in the past week at the CVP and SWP fish salvage facilities. Final JPE calculations have been established for brood year (BY) 2022 winter-run Chinook salmon. The agencies in the SaMT assessed the likelihood of exceeding the next annual loss threshold and believe that loss occurring in the next week is unlikely to lead to exceedance of the 50% single-year loss threshold (see Figures 1 and 2). Based on historical data, >99% of salvage for winter-run LAD Chinook salmon should have occurred at this time of the year (Table 3).

Spring-run Chinook salmon

Total natural young of year spring-run Chinook salmon (LAD) loss is 6,816.65 fish (as of 5/25/2023). Loss of natural juvenile spring-run LAD Chinook salmon has occurred in the past week at the CVP and SWP fish salvage facilities. 9 genetically confirmed older spring-run have been caught in salvage this WY with a total loss of 62.79. Loss for yearling spring-run surrogate has not exceeded the 0.5 % threshold for any release group (refer to Ops Outlook Table 2). The agencies in the SaMT assessed the likelihood of exceeding annual loss threshold and believe that loss occurring in the next week is unlikely to lead to exceeding the hatchery spring-run surrogate threshold.

Central Valley Steelhead

Total natural juvenile steelhead loss (April 1 through June 15) is 284.78 fish (as of 5/25/2023). Loss of natural juvenile steelhead has not occurred in the past week at the CVP and SWP fish salvage facilities. See table 6a for predicted weekly loss of steelhead at the CVP and SWP facilities. The agencies in the SaMT assessed the likelihood of exceeding the 50% annual loss threshold and believe that loss occurring in the next week is unlikely to lead to the exceedance of 50% annual loss threshold (see Figures 1 and 3).

Total natural juvenile steelhead loss for the December 1 through March 31 period was 1015.16 fish. The December-March 50% annual loss threshold (707) was exceeded on 3/15/2023. See table 6a for predicted weekly loss of steelhead at the CVP and SWP facilities. Information is limited on steelhead population, so it is not possible to assess the effects on steelhead at a population level.

4. If an annual loss threshold has been exceeded, do continued OMR restrictions benefit fish movement and survival based on real-time information?

Winter-run Chinook salmon

The annual loss threshold for winter-run Chinook salmon has not been exceeded in WY 2023.

Spring-run Chinook salmon

The annual loss threshold for spring-run Chinook salmon has not been exceeded in WY 2023.

Central Valley Steelhead

The April 1 – June 15 50% annual loss threshold for steelhead has not been exceeded in WY 2023.

The December 1 – March 31 50% annual loss threshold for steelhead (December 1 – March 31) was exceeded in WY 2023 and the 75% annual loss threshold was nearly exceeded; however, the December-March season for steelhead is over.

5. If OMR is more negative than -5,000 cfs, are there changes in spawning, rearing, foraging, sheltering, or migration behavior beyond those anticipated to occur under OMR management at -5,000 cfs?

Expected OMR flows are 2,500 to 6,000 cfs for the next week. Under OMR flows more negative than -5,000 cfs the SaMT expects impacts to rearing, foraging, sheltering, or migration of salmonids present in the south Delta. Salmonid presence in the south Delta is difficult to assess because of limited observations and there is uncertainty in how much of the population might be impacted.

Biology Distribution and Evaluation of Green Sturgeon

Population Status

- Delta Life Stages:
 - Adults and Juveniles

Distribution

Current Distribution

- Adults: Most abundant during spring spawning migration period of March through May, and post spawning out-migration periods May through June; October through January

depending on first winter storm event resulting in significant Sacramento River flow increases. Adult presence year-round to a lesser extent mainly in San Pablo Bay.

- Juveniles: Age-1 through Age-3 juveniles present year-round and widely distributed. Juveniles tagged with acoustic tags in the main channel Sacramento River near Sherman Island detected in the Sacramento River as far upstream as the Cache Slough complex, in the San Joaquin River at the Antioch Bridge, in Threemile, Horseshoe Bend, and Montezuma Sloughs. Seasonal abundance at the primary sampling site (near Sherman Island) appears to be highest during summer in based on capture and telemetry data. Residence time at the primary sampling site for individual fish ranges from one day to over one year but telemetry data show outmigration from the primary sampling site to the Pacific Ocean ranges from 27 to 552 days. Recent capture data shows diurnal depth preference in the main channel of the Sacramento River. No recent documentation of shallow water habitat presence or foraging but likely.

Historical Trends

- Juvenile and adult green sturgeon are historically present in the San Joaquin and Sacramento rivers and Delta

Forecasted Distribution within Central Valley and Delta regions

- Juvenile and adult green sturgeon are present in the San Joaquin and Sacramento rivers and Delta during the next week.

Evaluation

1. Is there likely to be salvage that may exceed the annual loss limit?

Green sturgeon salvage is 0 fish (as of 5/25/2023). The agencies in the SaMT assessed the likelihood of salvage occurring in the next week is unlikely to occur.

Biology, Distribution, and Evaluation of Delta Smelt

Population Status

- Delta Smelt Life Stages:
 - Adults, larvae, juveniles
- Brood Year 2022:
- Abundance estimate:
 - The most recent abundance estimate for postlarval/juvenile Delta Smelt is from May 12, 2023, and was 599,217 (95% CI: 64,737 to 2,380,828).
- Biological Conditions:

- Delta Smelt are spawning and larval Delta Smelt are present. Adult Delta Smelt have not been detected since 3/21/2023. Larval Delta Smelt are expected to be present in the Lower and Upper Sacramento, Suisun Marsh, Suisun Bay, Cache Slough/Liberty Island, and Sacramento Deep Water Shipping Channel based on the most recent survey detections. The Smelt Monitoring Team discussed the most recent monitoring data (Table 4) and considered published literature and professional judgement on the historical trends in regional distribution.

Distribution

Current Distribution

- Real time detection data are currently limited to EDSM, Chipps Island Trawl and 20mm survey; Bay Study provides data as available.
- No adult Delta Smelt have been detected since 3/21/2023.
- Thirty-four confirmed larval Delta Smelt have been detected by surveys in Suisun Bay, Suisun Marsh, the Lower and Upper Sacramento River, the Lower San Joaquin River Cache Slough/Liberty Island, and the Sacramento Deep Water Shipping Channel between 3/13/2023-5/8/2023.
- No Delta Smelt have been detected in salvage at the SWP and CVP since 3/2/2023. Cumulative seasonal salvage is 52.
- Experimental release of hatchery Delta Smelt occurred at Rio Vista on 11/30/2022, and 1/18/2023-1/19/2023, and in the Deep Water Shipping Channel on 1/25/2023-1/26/2023. Forty-two fish from the experimental release have been caught or salvaged since 12/14/2022.
- Larval sampling at the Skinner Fish Facility (SFF) and the Tracy Fish Collection Facility (TFCF) was initiated by the SMT at 0400 on March 1.
- COA 8.5.2: Larvae are present, and the most recent average 12-station Secchi depth is 124 cm.

Table 7. Summary of newly reported detections of Delta Smelt by Region and Salvage Facilities since the last assessment. Regions are those defined by EDSM sampling. Delta Smelt >58mm FL are considered adults. Subadult fish are considered by the SMT to be fish from the previous year’s cohort based on size and timing of collection. Young of year are considered juveniles and larvae.

Life Stage	North	South	West	Far West	Salvage
Adult	0	0	0	0	0
Subadult	0	0	0	0	0

Life Stage	North	South	West	Far West	Salvage
Larvae/Juvenile	0	0	0	0	0

Table 8. Summary of recent Delta Smelt detections reported since last assessment and the total detections for the current water year. Notes reflect latest information on reported detections or completion of survey for the water year and include both larval and adult detections. Total Fish counts do not distinguish between hatchery origin and wild Delta Smelt. Table indicates new detections and previously reported detections that have undergone preliminary ID, QA/QC, and genetic confirmation. Numbers are updated as QA/QC and genetic confirmation become available.

Sampling Method	Frequency	New Detections	Preliminary Detections	QA/QC Detections	Genetically Confirmed to Date	Total WY2023	Notes
EDSM	Weekly	0	N/A	39	1	40	Phase 2 began 4/4/23 Phase 1 ended 4/28/23
SKT	Monthly	0	N/A	4	N/A	4	Complete
SLS	Biweekly	0	0	4	N/A	4	Complete
20-mm	Biweekly	0	N/A	18	N/A	18	Ongoing
Summer Townet	Biweekly	0	N/A	N/A	N/A	0	Begins: June
Bay Study	Monthly	0	N/A	N/A	N/A	0	Ongoing
FMWT	Monthly	0	N/A	N/A	N/A	0	Complete
Chippis Island Trawl	Weekly	0	N/A	2	N/A	2	Ongoing
FCCL Brood Stock Collections	Weekly	0	N/A	2	N/A	2	Ongoing
LEPS	As available	0	N/A	N/A	N/A	0	Complete
FRP	Daily	0	N/A	N/A	N/A	0	Ongoing

Sampling Method	Frequency	New Detections	Preliminary Detections	QA/QC Detections	Genetically Confirmed to Date	Total WY2023	Notes
Tracy Fish Collection Facility (CVP)	Daily	0	N/A	9	N/A	9	Ongoing
Skinner Fish Facility (SWP)	Daily	0	N/A	4	N/A	4	Ongoing
Total	N/A	N/A	N/A	N/A	N/A	83	Sum of all Delta Smelt observed during the OMR Management Season

Cultured Delta Smelt Experimental Releases

- Experimental releases included:
 - 13,140 fish on November 30, 2022,
 - 17,570 fish on January 18-19, 2023, both at Rio Vista,
 - 12,995 in the Sacramento Deep Water Ship Channel.
- Experimental releases are complete.
- Details of Delta Smelt releases are available at: [Columbia Basin Research Delta Smelt](#)

Table 9. Weekly summary of the origin of Delta Smelt. These identifications are considered tentative and additional genetic testing will confirm the identity of individuals. Individuals with no tags are provided alive to the FCCL as potential additions to the FCCL Broodstock.

Date	Survey	Stratum/Station	Total Caught	Ad. Clipped	VIE	No Tag
N/A	N/A	N/A	N/A	N/A	N/A	N/A

Historical Trends

- Upstream migration for Delta Smelt occurs between September and December and in response to “first flush” conditions (Sommer et al. 2011, Grimaldo et al. 2009). Migration typically ranges one to four weeks after flow and turbidity increases, based on salvage data (Sommer et al. 2011).
- Historically, detections of ripe Delta Smelt began in January and peaked in February and March and the majority of Delta Smelt spawning occurs within a temperature range of 9-18°C (Figure 4; Table 12; Damon et al. 2016).
- Based on historical monitoring data from the past few years ([Delta Stewardship Council GitHub](#)), first detection of larvae in the Central and South Delta has typically occurred by mid to late March ([Columbia Basin Research](#))
- Salvage data as presented on SacPas indicates that adult Delta Smelt salvage in recent years has reached the 50th percentile at the end of February – beginning of March.
- Historically, the highest peak in salvage is in May and the second highest is in June (Grimaldo et al 2009).

Forecasted Distribution within Central Valley and Delta regions

- Predicting the distribution of Delta Smelt is currently difficult because detection data is limited to a few wild individuals and historic patterns may not be representative of the low population levels.
- The SMT uses turbidity as a surrogate for Delta Smelt presence and in making assessments of the likelihood of entrainment for larval Delta Smelt after spawning begins.
- The potential of experimentally released Delta Smelt to distribute from their release site is unknown at this time and SMT cannot predict their distribution beyond the original release site and subsequent recaptures. There is a high degree of uncertainty regarding the response of cultured fish to environmental cues typically applied to wild Delta Smelt.

Abiotic Conditions

Turbidity

- Sunny and clear. Winds at Stockton are forecast to be W ranging 8-13 mph with gusts up to 18 mph. In Antioch, winds are forecast to be W today changing to SW tomorrow ranging 14-21 mph with gusts up to 26 mph.
- Turbidity is below 12 FNU at OBI and at other stations in the central and south Delta. Turbidity is expected to remain stable over the next week.

Table 10. Relevant Environmental Factors to the current management actions for Delta Smelt.

Date Reported	SJJ 3-day Average Water temperature (°C)	20 mm 6 Avg Secchi Depth (m)	Water temperature Clifton Court (°C)
5/29/2023	19.7	1.24*	19.4

*Data from 5/22/2023-5/23/2023

X2 Conditions

- As of 5/29/2023, X2 is estimated to be at 59 km and may increase slightly this week.
- When X2 is above 81 km, the SMT uses the X2_EC_Graph.xlsx tool to estimate the position of X2 for both the Sacramento and San Joaquin Rivers and assumes the average of the two is representative of an approximate X2 position.

Other Environmental Conditions

- The Fish and Water Operation Outlook OMR Index values are expected to range between +2,500 to +6,000 cfs this week.
- QWEST was estimated at 27,600 cfs on 5/29/2023 and is expected to remain stable this week.
- Water temperature at Rio Vista was 16.7°C and at Antioch was 19.5°C on 5/29/2023.
- Real time tracking of environmental conditions, relevant thresholds and Delta Smelt catch data are updated daily at: [Columbia Basin Research Delta Smelt](#)

Evaluation

USBR and DWR Proposed Operations:

- 5/30/2023-6/5/2023:

- COA 8.17 of the ITP, Export Curtailments for Spring Outflow, is in effect, with a 4:1 Vernalis flow/export ratio, due to a Wet Year classification. However, because the three-day averaged Delta Outflow is greater than 44,500 cfs, the export restriction is “off-ramped”.
- The Bay/Delta is in “excess” conditions and no ESA biological protections are “controlling” water project operations.
- Interim Operations have been adopted. USBR will be adhering to ITP Protections for Larval & Juvenile Delta Smelt (COA 8.5.2) or the PA's Larval and Juvenile Smelt Protections, whichever is more protective.

1. Between December 1 and January 31, has any first flush condition been exceeded?

First flush conditions based on running 3-day average flow and running 3-day average turbidity at Freeport were met on December 31, 2022, triggering IEWPP regulations. The CVP and SWP reduced exports beginning on 1/3/2023 through 1/16/2023.

2. Do DSM have a high risk of migration and dispersal into areas at high risk of future entrainment? (December 1- January 31)

This is no longer applicable.

3. Has a spent female been collected?

A spent female has not been collected, but two cultured ripe females were caught by SKT on 2/8/2023. Some of the fish released in January were observed to be ripe and releasing eggs upon release. This could be due to warmer water temperatures at culture facilities, or due to stress from releases.

4. If OMR of -2000 cfs does not reduce OBI turbidity below 12NTU/FNU, what OMR target is deemed protective between -2000 and -5000 cfs?

This question is not applicable as the turbidity bridge avoidance action was off-ramped starting 2/9/2023 with the capture of two ripe, marked female Delta Smelt.

5. If OBI is 12 NTU/FNU, what do other station locations show?

This question is not applicable as the action was off-ramped starting 2/9/2023 with the capture of two ripe, marked female Delta Smelt.

6. If OBI is 12 NTU/FNU, is a turbidity bridge avoidance action not warranted? What is the supporting information?

This question is not applicable as the action was off-ramped starting 2/9/2023 with the capture of two ripe, marked female Delta Smelt.

7. After March 15 and if QWEST is negative, are larval or juvenile DSM within the entrainment zone of the CVP and SWP pumps based on surveys?

QWEST is positive and anticipated to remain positive through the week. Thirty-four larval DSM were detected since 3/13/2023, all outside of the entrainment zone.

8. Based on real-time spatial distribution of Delta Smelt and currently available turbidity information, should OMR be managed to no more negative than -3,500?

Turbidity and temperature conditions: On 5/22/2023-5/23/2023, 20 mm Survey #6 mean Secchi depth at the South Delta stations was above 1m (1.24m). The 3-day mean water temperature at Jersey Point exceeded 12°C on 3/18/23.

Real-time biological conditions: All confirmed larval DSM have been detected outside of the entrainment zone.

Current OMRI management: No, Secchi depth is above 1m, and QWEST and OMRI are highly positive due to high flows; thus larval and juvenile entrainment protections are not triggered.

9. What do hydrodynamic models, informed by EDSM or other relevant data, suggest the estimated percentage of larval and juvenile DSM that could be entrained may be?

OMRI values are anticipated to be between +2,500 cfs and +6,000 cfs throughout the week. The majority of spawning typically occurs between 11-14°C but can continue up to 18°C (Damon et al. 2016; Attachment A, Figure 4). Daily and 3-day average water temperatures are greater than 14°C, and at some stations, greater than 18°C. Based on detections in salvage earlier this season, adult fish were in the South Delta and may have spawned there. Spawning is ongoing, and no larvae have been detected inside of the entrainment zone. The likelihood of larval and juvenile DSM entrainment is low, given positive OMRI and QWEST values.

Delta Smelt References

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Attachment A.

Table 11. Salmonid Genetic testing results for WY 2023 as of this assessment. Genetic identification of salmon is not used in calculating loss.

ID	Sample Date	Fork Length	Julian	ots28	sexid	Assignment	PosProb 1	Group	Model	Facility	Original ID
C220127 CVP	12/17/20 22 22:00	185	171	late	male	Non-winter	1.000	Spring	Fall	CVP	C220127 CVP
C220098 SWP	12/18/20 22 13:00	137	172	late	female	Non-winter	1.000	Spring	Winter	SWP	C220098 SWP
C220099 SWP	12/28/20 22 5:00	154	181	late	male	Non-winter	1.000	Spring	Late Fall	SWP	C220099 SWP
C220128 CVP	12/30/20 22 23:59	163	184	late	female	Non-winter	1.000	Fall	Late Fall	CVP	C220128 CVP
C220180 SWP	12/31/20 22 3:00	180	184	late	male	Non-winter	1.000	Fall	Late Fall	SWP	C220180 SWP
C230082 SWP	1/1/2023 10:00	150	185	late	male	Non-winter	1.000	Fall	Winter	SWP	C230082 SWP
C230083 SWP	1/1/2023 11:00	113	185	late	female	Non-winter	1.000	Fall	Winter	SWP	C230083 SWP
C230082 CVP	1/2/2023 14:00	212	187	early	male	Non-winter	1.000	Fall	Fall	CVP	C230082 CVP
C230001 CVP	1/3/2023 10:00	35	187	late	female	Non-winter	1.000	Fall	Fall	CVP	C230001 CVP
C230002 CVP	1/3/2023 10:00	34	187	late	male	Non-winter	1.000	Fall	Fall	CVP	C230002 CVP
C230003 CVP	1/3/2023 10:00	33	187	late	female	Non-winter	1.000	Fall	Fall	CVP	C230003 CVP

ID	Sample Date	Fork Length	Julian	ots28	sexid	Assignment	PosProb 1	Group	Model	Facility	Original ID
C230004 CVP	1/3/2023 10:00	34	187	late	male	Non-winter	1.000	Fall	Fall	CVP	C230004 CVP
C230005 CVP	1/3/2023 12:00	35	188	late	male	Non-winter	1.000	Unassigned	Fall	CVP	C230005 CVP
C230006 CVP	1/4/2023 8:00	38	188	late	female	Non-winter	1.000	Fall	Fall	CVP	C230006 CVP
C230007 CVP	1/4/2023 12:00	36	189	late	female	Non-winter	1.000	Fall	Fall	CVP	C230007 CVP
C230008 CVP	1/4/2023 12:00	38	189	late	female	Non-winter	1.000	Fall	Fall	CVP	C230008 CVP
C230009 CVP	1/4/2023 12:00	36	189	late	female	Non-winter	1.000	Spring	Fall	CVP	C230009 CVP
C230010 CVP	1/4/2023 14:00	38	189	late	male	Non-winter	1.000	Fall	Fall	CVP	C230010 CVP
C230084 SWP	1/4/2023 15:00	162	189	late	male	Non-winter	1.000	Fall	Late Fall	SWP	C230084 SWP
C230012 CVP	1/4/2023 22:00	148	189	late	male	Non-winter	1.000	Spring	Winter	CVP	C230012 CVP
C230011 CVP	1/5/2023 10:00	37	189	late	female	Non-winter	1.000	Fall	Fall	CVP	C230011 CVP
C230013 CVP	1/5/2023 14:00	163	190	late	female	Non-winter	1.000	Fall	Late Fall	CVP	C230013 CVP
C230015 CVP	1/11/202 3 6:00	38	195	late	male	Non-winter	1.000	Fall	Fall	CVP	C230015 CVP
C230016 CVP	1/12/202 3 8:00	166	196	late	female	Non-winter	1.000	Spring	Winter	CVP	C230016 CVP
C230019 CVP	1/12/202 3 10:00	42	196	late	male	Non-winter	1.000	Spring	Fall	CVP	C230019 CVP

ID	Sample Date	Fork Length	Julian	ots28	sexid	Assignment	PosProb 1	Group	Model	Facility	Original ID
C230018 CVP	1/12/202 3 12:00	34	197	late	female	Non-winter	1.000	Fall	Fall	CVP	C230018 CVP
C230020 CVP	1/12/202 3 23:59	31	197	late	male	Non-winter	1.000	Fall	Fall	CVP	C230020 CVP
C230021 CVP	1/13/202 3 6:00	35	197	late	male	Non-winter	1.000	Fall	Fall	CVP	C230021 CVP
C230022 CVP	1/13/202 3 10:00	35	197	late	male	Non-winter	1.000	Spring	Fall	CVP	C230022 CVP
C230023 CVP	1/13/202 3 23:59	38	198	late	male	Non-winter	1.000	Fall	Fall	CVP	C230023 CVP
C230024 CVP	1/14/202 3 2:00	38	198	late	female	Non-winter	1.000	Fall	Fall	CVP	C230024 CVP
C230025 CVP	1/14/202 3 6:00	35	198	late	male	Non-winter	1.000	Fall	Fall	CVP	C230025 CVP
C230026 CVP	1/14/202 3 6:00	195	198	late	male	Non-winter	1.000	Fall	Late Fall	CVP	C230026 CVP
C230027 CVP	1/14/202 3 14:00	36	199	late	female	Non-winter	1.000	Fall	Fall	CVP	C230027 CVP
C230086 SWP	1/17/202 3 7:45	149	201	late	female	Non-winter	1.000	Fall	Winter	SWP	C230086 SWP
C230029 CVP	1/17/202 3 8:00	36	201	late	female	Non-winter	1.000	Fall	Fall	CVP	C230029 CVP
C230031 CVP	1/17/202 3 23:59	36	202	late	male	Non-winter	1.000	Fall	Fall	CVP	C230031 CVP
C230032 CVP	1/17/202 3 23:59	35	202	late	male	Non-winter	1.000	Fall	Fall	CVP	C230032 CVP
C230033 CVP	1/17/202 3 23:59	35	202	late	male	Non-winter	1.000	Fall	Fall	CVP	C230033 CVP

ID	Sample Date	Fork Length	Julian	ots28	sexid	Assignment	PosProb 1	Group	Model	Facility	Original ID
C230034 CVP	1/18/202 3 4:00	35	202	late	male	Non-winter	1.000	Fall	Fall	CVP	C230034 CVP
C230035 CVP	1/18/202 3 4:00	35	202	late	male	Non-winter	1.000	Fall	Fall	CVP	C230035 CVP
C230036 CVP	1/18/202 3 12:00	38	203	late	female	Non-winter	1.000	Fall	Fall	CVP	C230036 CVP
C230037 CVP	1/18/202 3 14:00	37	203	late	male	Non-winter	1.000	Fall	Fall	CVP	C230037 CVP
C230038 CVP	1/18/202 3 16:00	34	203	late	male	Non-winter	1.000	Fall	Fall	CVP	C230038 CVP
C230039 CVP	1/19/202 3 10:00	32	203	late	female	Non-winter	1.000	Fall	Fall	CVP	C230039 CVP
C230040 CVP	1/19/202 3 10:00	37	203	late	male	Non-winter	1.000	Fall	Fall	CVP	C230040 CVP
C230041 CVP	1/19/202 3 14:00	37	204	late	female	Non-winter	1.000	Fall	Fall	CVP	C230041 CVP
C230042 CVP	1/19/202 3 18:00	35	204	late	female	Non-winter	1.000	Fall	Fall	CVP	C230042 CVP
C230043 CVP	1/19/202 3 18:00	30	204	late	male	Non-winter	1.000	Fall	Fall	CVP	C230043 CVP
C230044 CVP	1/19/202 3 18:00	38	204	late	male	Non-winter	1.000	Fall	Fall	CVP	C230044 CVP
C230045 CVP	1/20/202 3 2:00	35	204	late	female	Non-winter	1.000	Fall	Fall	CVP	C230045 CVP
C230046 CVP	1/20/202 3 2:00	35	204	late	female	Non-winter	1.000	Fall	Fall	CVP	C230046 CVP
C230047 CVP	1/20/202 3 2:00	34	204	late	male	Non-winter	1.000	Fall	Fall	CVP	C230047 CVP

ID	Sample Date	Fork Length	Julian	ots28	sexid	Assignment	PosProb 1	Group	Model	Facility	Original ID
C230048 CVP	1/20/202 3 6:00	35	204	late	female	Non-winter	1.000	Fall	Fall	CVP	C230048 CVP
C230049 CVP	1/20/202 3 10:00	37	204	late	female	Non-winter	1.000	Fall	Fall	CVP	C230049 CVP
C230050 CVP	1/20/202 3 18:00	30	205	late	female	Non-winter	1.000	Fall	Fall	CVP	C230050 CVP
C230051 CVP	1/21/202 3 12:00	34	206	late	female	Non-winter	1.000	Fall	Fall	CVP	C230051 CVP
C230052 CVP	1/22/202 3 2:00	38	206	late	male	Non-winter	1.000	Fall	Fall	CVP	C230052 CVP
C230053 CVP	1/22/202 3 12:00	35	207	late	female	Non-winter	1.000	Fall	Fall	CVP	C230053 CVP
C230054 CVP	1/22/202 3 14:00	36	207	late	female	Non-winter	1.000	Fall	Fall	CVP	C230054 CVP
C230055 CVP	1/23/202 3 12:00	37	208	late	male	Non-winter	1.000	Fall	Fall	CVP	C230055 CVP
C230056 CVP	1/24/202 3 14:00	37	209	late	male	Non-winter	1.000	Fall	Fall	CVP	C230056 CVP
C230057 CVP	1/26/202 3 14:00	35	211	late	female	Non-winter	1.000	Fall	Fall	CVP	C230057 CVP
C230058 CVP	1/26/202 3 23:59	37	211	early	male	Non-winter	1.000	Fall	Fall	CVP	C230058 CVP
C230060 CVP	1/27/202 3 8:00	42	211	late	female	Non-winter	1.000	Fall	Fall	CVP	C230060 CVP
C230061 CVP	1/27/202 3 10:00	37	211	early	male	Non-winter	1.000	Fall	Fall	CVP	C230061 CVP
C230062 CVP	1/27/202 3 14:00	35	212	late	male	Non-winter	1.000	Fall	Fall	CVP	C230062 CVP

ID	Sample Date	Fork Length	Julian	ots28	sexid	Assignment	PosProb 1	Group	Model	Facility	Original ID
C230063 CVP	1/27/202 3 18:00	52	212	late	female	Non-winter	1.000	Fall	Spring	CVP	C230063 CVP
C230064 CVP	1/27/202 3 18:00	36	212	late	female	Non-winter	1.000	Fall	Fall	CVP	C230064 CVP
C230065 CVP	1/27/202 3 18:00	30	212	late	female	Non-winter	1.000	Fall	Fall	CVP	C230065 CVP
C230066 CVP	1/28/202 3 12:00	36	213	late	male	Non-winter	1.000	Fall	Fall	CVP	C230066 CVP
C230067 CVP	1/28/202 3 14:00	35	213	late	female	Non-winter	1.000	Fall	Fall	CVP	C230067 CVP
C230068 CVP	1/29/202 3 8:00	37	213	late	female	Non-winter	1.000	Fall	Fall	CVP	C230068 CVP
C230069 CVP	1/29/202 3 8:00	39	213	late	female	Non-winter	1.000	Fall	Fall	CVP	C230069 CVP
C230070 CVP	1/29/202 3 8:00	38	213	late	female	Non-winter	1.000	Fall	Fall	CVP	C230070 CVP
C230071 CVP	1/29/202 3 8:00	39	213	late	male	Non-winter	1.000	Fall	Fall	CVP	C230071 CVP
C230072 CVP	1/29/202 3 8:00	37	213	late	male	Non-winter	1.000	Fall	Fall	CVP	C230072 CVP
C230073 CVP	1/29/202 3 8:00	38	213	late	female	Non-winter	1.000	Fall	Fall	CVP	C230073 CVP
C230074 CVP	1/30/202 3 6:00	38	214	late	female	Non-winter	1.000	Fall	Fall	CVP	C230074 CVP
C230075 CVP	1/30/202 3 6:00	36	214	early	male	Non-winter	1.000	Fall	Fall	CVP	C230075 CVP
C230076 CVP	1/30/202 3 8:00	145	214	late	male	Non-winter	1.000	Spring	Winter	CVP	C230076 CVP

ID	Sample Date	Fork Length	Julian	ots28	sexid	Assignment	PosProb 1	Group	Model	Facility	Original ID
C230077 CVP	1/30/202 3 8:00	36	214	late	male	Non-winter	1.000	Fall	Fall	CVP	C230077 CVP
C230078 CVP	1/30/202 3 18:00	45	215	early	male	Non-winter	1.000	Fall	Fall	CVP	C230078 CVP
C230079 CVP	1/30/202 3 18:00	36	215	late	male	Non-winter	1.000	Fall	Fall	CVP	C230079 CVP
C230080 CVP	1/30/202 3 20:00	37	215	late	female	Non-winter	1.000	Fall	Fall	CVP	C230080 CVP
C230081 CVP	1/30/202 3 22:00	34	215	late	female	Non-winter	1.000	Fall	Fall	CVP	C230081 CVP
C230084 CVP	1/31/202 3 8:00	40	215	late	female	Non-winter	1.000	Fall	Fall	CVP	C230084 CVP
C230085 CVP	1/31/202 3 8:00	40	215	early	female	Non-winter	1.000	Fall	Fall	CVP	C230085 CVP
C230086 CVP	1/31/202 3 16:00	34	216	late	male	Non-winter	1.000	Fall	Fall	CVP	C230086 CVP
C230087 CVP	1/31/202 3 20:00	44	216	early	female	Non-winter	1.000	Fall	Fall	CVP	C230087 CVP
C230088 CVP	2/1/2023 8:00	38	216	late	female	Non-winter	1.000	Fall	Fall	CVP	C230088 CVP
C230089 CVP	2/1/2023 10:00	35	216	late	male	Non-winter	1.000	Fall	Fall	CVP	C230089 CVP
C230090 CVP	2/1/2023 10:00	37	216	late	male	Non-winter	1.000	Fall	Fall	CVP	C230090 CVP
C230091 CVP	2/1/2023 20:00	34	217	late	male	Non-winter	1.000	Fall	Fall	CVP	C230091 CVP
C230092 CVP	2/1/2023 20:00	33	217	late	female	Non-winter	1.000	Fall	Fall	CVP	C230092 CVP

ID	Sample Date	Fork Length	Julian	ots28	sexid	Assignment	PosProb 1	Group	Model	Facility	Original ID
C230093 CVP	2/2/2023 10:00	41	217	late	female	Non-winter	1.000	Fall	Fall	CVP	C230093 CVP
C230094 CVP	2/2/2023 12:00	39	218	late	male	Non-winter	1.000	Fall	Fall	CVP	C230094 CVP
C230097 CVP	2/3/2023 6:00	42	218	late	female	Non-winter	1.000	Fall	Fall	CVP	C230097 CVP
C230098 CVP	2/3/2023 6:00	48	218	late	male	Non-winter	1.000	Fall	Fall	CVP	C230098 CVP
C230099 CVP	2/5/2023 6:00	38	220	late	female	Non-winter	1.000	Fall	Fall	CVP	C230099 CVP
C230100 CVP	2/5/2023 6:00	36	220	late	female	Non-winter	1.000	Fall	Fall	CVP	C230100 CVP
C230102 CVP	2/5/2023 14:00	41	221	early	male	Non-winter	1.000	Fall	Fall	CVP	C230102 CVP
C230103 CVP	2/6/2023 8:00	38	221	late	male	Non-winter	1.000	Fall	Fall	CVP	C230103 CVP
C230104 CVP	2/6/2023 8:00	38	221	late	female	Non-winter	1.000	Fall	Fall	CVP	C230104 CVP
C230105 CVP	2/6/2023 8:00	34	221	late	male	Non-winter	1.000	Fall	Fall	CVP	C230105 CVP
C230106 CVP	2/7/2023 6:00	38	222	late	male	Non-winter	1.000	Fall	Fall	CVP	C230106 CVP
C230107 CVP	2/7/2023 18:00	39	223	late	female	Non-winter	1.000	Fall	Fall	CVP	C230107 CVP
C230108 CVP	2/9/2023 12:00	38	225	late	male	Non-winter	1.000	Spring	Fall	CVP	C230108 CVP
C230109 CVP	2/9/2023 12:00	40	225	early	male	Non-winter	1.000	Fall	Fall	CVP	C230109 CVP

ID	Sample Date	Fork Length	Julian	ots28	sexid	Assignment	PosProb 1	Group	Model	Facility	Original ID
C230087 SWP	2/10/202 3 9:00	35	225	late	female	Non-winter	1.000	Fall	Fall	SWP	C230087 SWP
C230110 CVP	2/15/202 3 10:00	53	230	early	male	Non-winter	1.000	Fall	Fall	CVP	C230110 CVP
C230111 CVP	2/16/202 3 23:59	48	232	late	female	Non-winter	1.000	Fall	Fall	CVP	C230111 CVP
C230112 CVP	2/18/202 3 6:00	44	233	late	female	Non-winter	1.000	Spring	Fall	CVP	C230112 CVP
C230113 CVP	2/22/202 3 12:00	48	238	late	male	Non-winter	1.000	Spring	Fall	CVP	C230113 CVP
C230114 CVP	2/23/202 3 18:00	34	239	late	male	Non-winter	1.000	Spring	Fall	CVP	C230114 CVP
C230115 CVP	2/23/202 3 23:59	130	239	early	male	Winter	1.000	Winter	Winter	CVP	C230115 CVP
C230116 CVP	2/28/202 3 10:00	138	243	late	male	Non-winter	1.000	Spring	Winter	CVP	C230116 CVP
C230117 CVP	2/28/202 3 23:59	148	244	late	female	Non-winter	1.000	Spring	Winter	CVP	C230117 CVP
C230118 CVP	3/3/2023 4:00	171	246	late	female	Non-winter	1.000	Late Fall	Winter	CVP	C230118 CVP
C230121 CVP	3/3/2023 20:00	35	247	late	female	Non-winter	1.000	Fall	Fall	CVP	C230121 CVP
C230123 CVP	3/3/2023 20:00	55	247	late	male	Non-winter	1.000	Fall	Fall	CVP	C230123 CVP
C230124 CVP	3/4/2023 4:00	38	247	late	female	Non-winter	1.000	Fall	Fall	CVP	C230124 CVP
C230125 CVP	3/4/2023 16:00	38	248	late	male	Non-winter	1.000	Fall	Fall	CVP	C230125 CVP

ID	Sample Date	Fork Length	Julian	ots28	sexid	Assignment	PosProb 1	Group	Model	Facility	Original ID
C230126 CVP	3/5/2023 2:00	57	248	late	male	Non-winter	1.000	Fall	Fall	CVP	C230126 CVP
C230127 CVP	3/5/2023 2:00	60	248	late	female	Non-winter	1.000	Fall	Fall	CVP	C230127 CVP
C230128 CVP	3/5/2023 6:00	37	248	late	male	Non-winter	1.000	Fall	Fall	CVP	C230128 CVP
C230129 CVP	3/5/2023 8:00	62	248	late	male	Non-winter	1.000	Fall	Spring	CVP	C230129 CVP
C230131 CVP	3/5/2023 10:00	38	248	late	female	Non-winter	1.000	Fall	Fall	CVP	C230131 CVP
C230132 CVP	3/5/2023 12:00	39	249	late	male	Non-winter	1.000	Fall	Fall	CVP	C230132 CVP
C230133 CVP	3/5/2023 14:00	40	249	late	female	Non-winter	1.000	Fall	Fall	CVP	C230133 CVP
C230135 CVP	3/6/2023 8:00	36	249	late	male	Non-winter	1.000	Fall	Fall	CVP	C230135 CVP
C230136 CVP	3/6/2023 20:00	36	250	late	female	Non-winter	1.000	Fall	Fall	CVP	C230136 CVP
C230137 CVP	3/7/2023 2:00	40	250	late	male	Non-winter	1.000	Fall	Fall	CVP	C230137 CVP
C230139 CVP	3/7/2023 10:00	37	250	late	female	Non-winter	1.000	Fall	Fall	CVP	C230139 CVP
C230140 CVP	3/8/2023 4:00	40	251	late	male	Non-winter	1.000	Fall	Fall	CVP	C230140 CVP
C230141 CVP	3/8/2023 12:00	57	252	late	male	Non-winter	1.000	Fall	Fall	CVP	C230141 CVP
C230142 CVP	3/8/2023 14:00	39	252	late	female	Non-winter	1.000	Fall	Fall	CVP	C230142 CVP

ID	Sample Date	Fork Length	Julian	ots28	sexid	Assignment	PosProb 1	Group	Model	Facility	Original ID
C230088 SWP	3/8/2023 15:00	156	252	late	female	Non-winter	1.000	Fall	Winter	SWP	C230088 SWP
C230144 CVP	3/12/202 3 20:00	73	256	late	female	Non-winter	1.000	Fall	Spring	CVP	C230144 CVP
C230145 CVP	3/13/202 3 2:00	60	256	late	female	Non-winter	1.000	Fall	Fall	CVP	C230145 CVP
C230146 CVP	3/13/202 3 8:00	37	256	late	male	Non-winter	1.000	Fall	Fall	CVP	C230146 CVP
C230147 CVP	3/13/202 3 8:00	53	256	late	female	Non-winter	1.000	Fall	Fall	CVP	C230147 CVP
C230148 CVP	3/13/202 3 10:00	38	256	late	male	Non-winter	1.000	Fall	Fall	CVP	C230148 CVP
C230149 CVP	3/13/202 3 16:00	33	257	late	male	Non-winter	1.000	Fall	Fall	CVP	C230149 CVP
C230150 CVP	3/13/202 3 16:00	43	257	late	female	Non-winter	1.000	Fall	Fall	CVP	C230150 CVP
C230152 CVP	3/13/202 3 18:00	137	257	late	female	Non-winter	1.000	Fall	Winter	CVP	C230152 CVP
C230151 CVP	3/13/202 3 18:00	51	257	late	male	Non-winter	1.000	Fall	Fall	CVP	C230151 CVP
C230153 CVP	3/13/202 3 22:00	34	257	late	female	Non-winter	1.000	Fall	Fall	CVP	C230153 CVP
C230154 CVP	3/14/202 3 2:00	35	257	late	female	Non-winter	1.000	Fall	Fall	CVP	C230154 CVP
C230155 CVP	3/14/202 3 8:00	37	257	late	female	Non-winter	1.000	Fall	Fall	CVP	C230155 CVP
C230156 CVP	3/14/202 3 8:00	38	257	late	female	Non-winter	1.000	Fall	Fall	CVP	C230156 CVP

ID	Sample Date	Fork Length	Julian	ots28	sexid	Assignment	PosProb 1	Group	Model	Facility	Original ID
C230157 CVP	3/14/202 3 9:00	35	257	late	male	Non-winter	1.000	Fall	Fall	CVP	C230157 CVP
C230158 CVP	3/14/202 3 9:00	37	257	late	female	Non-winter	1.000	Fall	Fall	CVP	C230158 CVP
C230159 CVP	3/14/202 3 9:00	37	257	late	male	Non-winter	1.000	Fall	Fall	CVP	C230159 CVP
C230160 CVP	3/14/202 3 16:00	36	258	late	male	Non-winter	1.000	Fall	Fall	CVP	C230160 CVP
C230162 CVP	3/14/202 3 20:00	38	258	late	male	Non-winter	1.000	Fall	Fall	CVP	C230162 CVP
C230163 CVP	3/15/202 3 2:00	80	258	late	male	Non-winter	1.000	Fall	Spring	CVP	C230163 CVP
C230164 CVP	3/15/202 3 8:00	38	258	late	female	Non-winter	1.000	Fall	Fall	CVP	C230164 CVP
C230165 CVP	3/15/202 3 8:00	36	258	late	male	Non-winter	1.000	Fall	Fall	CVP	C230165 CVP
C230166 CVP	3/15/202 3 12:00	37	259	late	male	Non-winter	1.000	Fall	Fall	CVP	C230166 CVP
C230168 CVP	3/15/202 3 12:00	37	259	late	male	Non-winter	1.000	Fall	Fall	CVP	C230168 CVP
C230169 CVP	3/16/202 3 8:00	36	259	late	female	Non-winter	1.000	Fall	Fall	CVP	C230169 CVP
C230089 SWP	3/16/202 3 13:00	77	260	late	female	Non-winter	1.000	Fall	Spring	SWP	C230089 SWP
C230170 CVP	3/18/202 3 22:00	36	262	late	female	Non-winter	1.000	Fall	Fall	CVP	C230170 CVP
C230171 CVP	3/18/202 3 23:59	38	262	late	female	Non-winter	1.000	Fall	Fall	CVP	C230171 CVP

ID	Sample Date	Fork Length	Julian	ots28	sexid	Assignment	PosProb 1	Group	Model	Facility	Original ID
C230172 CVP	3/21/202 3 12:00	38	265	late	male	Non-winter	1.000	Late Fall	Fall	CVP	C230172 CVP
C230173 CVP	3/21/202 3 20:00	44	265	late	female	Non-winter	1.000	Fall	Fall	CVP	C230173 CVP
C230174 CVP	3/23/202 3 10:00	47	266	late	female	Non-winter	1.000	Fall	Fall	CVP	C230174 CVP
C230176 CVP	3/26/202 3 4:00	46	269	late	female	Non-winter	1.000	Fall	Fall	CVP	C230176 CVP
C230177 CVP	3/27/202 3 14:00	37	271	late	male	Non-winter	1.000	Fall	Fall	CVP	C230177 CVP
C230178 CVP	3/29/202 3 10:00	33	272	late	male	Non-winter	1.000	Fall	Fall	CVP	C230178 CVP
C230179 CVP	3/30/202 3 23:59	228	274	late	male	Non-winter	1.000	Spring	Winter	CVP	C230179 CVP
C230180 CVP	4/1/2023 4:00	86	275	late	female	Non-winter	1.000	Fall	Spring	CVP	C230180 CVP
C230181 CVP	4/3/2023 22:00	154	278	late	female	Non-winter	1.000	Fall	Winter	CVP	C230181 CVP
C230165 SWP	4/11/202 3 14:00	122	286	early	male	Non-winter	1.000	Spring	Spring	SWP	C230165 SWP
C230092 SWP	4/12/202 3 9:00	135	286	early	female	Non-winter	1.000	Spring	Winter	SWP	C230092 SWP
C230103 SWP	4/18/202 3 16:00	103	293	late	female	Non-winter	1.000	Fall	Spring	SWP	C230103 SWP
C230104 SWP	4/18/202 3 17:00	110	293	late	male	Non-winter	1.000	Fall	Spring	SWP	C230104 SWP
C230105 SWP	4/18/202 3 23:00	100	293	late	male	Non-winter	1.000	Fall	Spring	SWP	C230105 SWP

ID	Sample Date	Fork Length	Julian	ots28	sexid	Assignment	PosProb 1	Group	Model	Facility	Original ID
C230106 SWP	4/20/202 3 9:00	107	294	late	male	Non-winter	1.000	Fall	Spring	SWP	C230106 SWP
C230107 SWP	4/20/202 3 9:00	112	294	late	female	Non-winter	1.000	Fall	Spring	SWP	C230107 SWP
C230108 SWP	4/20/202 3 9:00	106	294	late	female	Non-winter	1.000	Fall	Spring	SWP	C230108 SWP
C230109 SWP	4/20/202 3 9:00	116	294	late	male	Non-winter	1.000	Fall	Spring	SWP	C230109 SWP
C230110 SWP	4/20/202 3 11:00	96	294	late	male	Non-winter	1.000	Fall	Spring	SWP	C230110 SWP
C230204 CVP	4/22/202 3 4:00	130	296	early	female	Non-winter	1.000	Fall	Spring	CVP	C230204 CVP
C230211 CVP	4/23/202 3 4:00	93	297	late	female	Non-winter	1.000	Fall	Spring	CVP	C230211 CVP
C230213 CVP	4/23/202 3 14:00	94	298	late	male	Non-winter	1.000	Fall	Spring	CVP	C230213 CVP
C230224 CVP	4/23/202 3 22:00	122	298	early	female	Non-winter	1.000	Fall	Spring	CVP	C230224 CVP
C230227 CVP	4/23/202 3 22:00	103	298	late	female	Non-winter	1.000	Fall	Spring	CVP	C230227 CVP
C230229 CVP	4/23/202 3 22:00	90	298	early	male	Non-winter	1.000	Fall	Spring	CVP	C230229 CVP
C230231 CVP	4/23/202 3 22:00	104	298	late	female	Non-winter	1.000	Fall	Spring	CVP	C230231 CVP
C230233 CVP	4/23/202 3 22:00	105	298	late	female	Non-winter	1.000	Fall	Spring	CVP	C230233 CVP
C230214 CVP	4/23/202 3 23:59	116	298	late	male	Non-winter	1.000	Fall	Spring	CVP	C230214 CVP

ID	Sample Date	Fork Length	Julian	ots28	sexid	Assignment	PosProb 1	Group	Model	Facility	Original ID
C230215 CVP	4/24/202 3 2:00	117	298	late	male	Non-winter	1.000	Spring	Spring	CVP	C230215 CVP
C230219 CVP	4/24/202 3 6:00	118	298	late	female	Non-winter	1.000	Fall	Spring	CVP	C230219 CVP
C230220 CVP	4/24/202 3 6:00	122	298	late	male	Non-winter	1.000	Fall	Spring	CVP	C230220 CVP
C230111 SWP	4/24/202 3 7:00	129	298	late	male	Non-winter	1.000	Fall	Spring	SWP	C230111 SWP
C230222 CVP	4/24/202 3 8:00	63	298	late	female	Non-winter	1.000	Fall	Fall	CVP	C230222 CVP
C230223 CVP	4/24/202 3 8:00	120	298	late	male	Non-winter	1.000	Fall	Spring	CVP	C230223 CVP
C230243 CVP	4/24/202 3 14:00	104	299	late	female	Non-winter	1.000	Fall	Spring	CVP	C230243 CVP
C230112 SWP	4/24/202 3 15:00	123	299	late	male	Non-winter	1.000	Spring	Spring	SWP	C230112 SWP
C230234 CVP	4/24/202 3 20:00	125	299	late	female	Non-winter	1.000	Fall	Spring	CVP	C230234 CVP
C230235 CVP	4/24/202 3 22:00	116	299	late	male	Non-winter	1.000	Fall	Spring	CVP	C230235 CVP
C230236 CVP	4/24/202 3 22:00	110	299	late	female	Non-winter	1.000	Fall	Spring	CVP	C230236 CVP
C230237 CVP	4/24/202 3 22:00	115	299	late	male	Non-winter	1.000	Fall	Spring	CVP	C230237 CVP
C230238 CVP	4/24/202 3 23:59	120	299	late	female	Non-winter	1.000	Fall	Spring	CVP	C230238 CVP
C230239 CVP	4/25/202 3 2:00	124	299	early	male	Non-winter	1.000	Fall	Spring	CVP	C230239 CVP

ID	Sample Date	Fork Length	Julian	ots28	sexid	Assignment	PosProb 1	Group	Model	Facility	Original ID
C230241 CVP	4/25/202 3 6:00	109	299	late	male	Non-winter	1.000	Fall	Spring	CVP	C230241 CVP
C230245 CVP	4/25/202 3 12:00	132	300	late	male	Non-winter	1.000	Fall	Spring	CVP	C230245 CVP
C230246 CVP	4/25/202 3 12:00	125	300	early	female	Non-winter	1.000	Fall	Spring	CVP	C230246 CVP
C230247 CVP	4/25/202 3 12:00	121	300	late	female	Non-winter	1.000	Fall	Spring	CVP	C230247 CVP
C230250 CVP	4/25/202 3 12:00	111	300	early	male	Non-winter	1.000	Fall	Spring	CVP	C230250 CVP
C230249 CVP	4/25/202 3 14:00	176	300	late	male	Non-winter	1.000	Fall	Winter	CVP	C230249 CVP
C230251 CVP	4/25/202 3 16:00	93	300	late	female	Non-winter	1.000	Fall	Spring	CVP	C230251 CVP
C230256 CVP	4/25/202 3 22:00	130	300	late	female	Non-winter	1.000	Fall	Spring	CVP	C230256 CVP
C230262 CVP	4/25/202 3 22:00	97	300	late	female	Non-winter	1.000	Fall	Spring	CVP	C230262 CVP
C230258 CVP	4/26/202 3 2:00	111	300	late	female	Non-winter	1.000	Fall	Spring	CVP	C230258 CVP
C230260 CVP	4/26/202 3 6:00	127	300	early	male	Non-winter	1.000	Fall	Spring	CVP	C230260 CVP
C230113 SWP	4/26/202 3 7:00	131	300	early	female	Non-winter	1.000	Fall	Spring	SWP	C230113 SWP
C230114 SWP	4/26/202 3 7:00	108	300	late	female	Non-winter	1.000	Fall	Spring	SWP	C230114 SWP
C230115 SWP	4/26/202 3 9:00	100	300	late	male	Non-winter	1.000	Fall	Spring	SWP	C230115 SWP

ID	Sample Date	Fork Length	Julian	ots28	sexid	Assignment	PosProb 1	Group	Model	Facility	Original ID
C230263 CVP	4/26/202 3 12:00	119	301	late	female	Non-winter	1.000	Fall	Spring	CVP	C230263 CVP
C230264 CVP	4/26/202 3 12:00	124	301	late	female	Non-winter	1.000	Fall	Spring	CVP	C230264 CVP
C230116 SWP	4/26/202 3 17:00	112	301	late	female	Non-winter	1.000	Fall	Spring	SWP	C230116 SWP
C230265 CVP	4/26/202 3 22:00	113	301	late	male	Non-winter	1.000	Fall	Spring	CVP	C230265 CVP
C230266 CVP	4/26/202 3 22:00	103	301	late	female	Non-winter	1.000	Fall	Spring	CVP	C230266 CVP
C230267 CVP	4/26/202 3 22:00	94	301	late	male	Non-winter	1.000	Fall	Spring	CVP	C230267 CVP
C230268 CVP	4/26/202 3 23:59	96	301	late	female	Non-winter	1.000	Fall	Spring	CVP	C230268 CVP
C230270 CVP	4/27/202 3 2:00	116	301	late	male	Non-winter	1.000	Fall	Spring	CVP	C230270 CVP
C230271 CVP	4/27/202 3 2:00	112	301	late	female	Non-winter	1.000	Fall	Spring	CVP	C230271 CVP
C230274 CVP	4/27/202 3 10:00	96	301	late	female	Non-winter	1.000	Fall	Spring	CVP	C230274 CVP
C230275 CVP	4/27/202 3 12:00	92	302	late	male	Non-winter	1.000	Fall	Spring	CVP	C230275 CVP
C230276 CVP	4/27/202 3 14:00	94	302	late	female	Non-winter	1.000	Fall	Spring	CVP	C230276 CVP
C230277 CVP	4/27/202 3 16:00	120	302	late	female	Non-winter	1.000	Fall	Spring	CVP	C230277 CVP
C230283 CVP	4/28/202 3 2:00	114	302	late	female	Non-winter	1.000	Fall	Spring	CVP	C230283 CVP

ID	Sample Date	Fork Length	Julian	ots28	sexid	Assignment	PosProb 1	Group	Model	Facility	Original ID
C230284 CVP	4/28/202 3 4:00	120	302	late	female	Non-winter	1.000	Fall	Spring	CVP	C230284 CVP
C230287 CVP	4/28/202 3 6:00	134	302	early	male	Non-winter	1.000	Fall	Spring	CVP	C230287 CVP
C230288 CVP	4/28/202 3 18:00	101	303	late	female	Non-winter	1.000	Fall	Spring	CVP	C230288 CVP
C230289 CVP	4/28/202 3 20:00	93	303	late	female	Non-winter	1.000	Fall	Spring	CVP	C230289 CVP
C230290 CVP	4/28/202 3 20:00	112	303	late	female	Non-winter	1.000	Fall	Spring	CVP	C230290 CVP
C230291 CVP	4/28/202 3 20:00	99	303	late	male	Non-winter	1.000	Fall	Spring	CVP	C230291 CVP
C230293 CVP	4/28/202 3 22:00	96	303	late	male	Non-winter	1.000	Fall	Spring	CVP	C230293 CVP
C230294 CVP	4/28/202 3 22:00	86	303	late	male	Non-winter	1.000	Fall	Fall	CVP	C230294 CVP
C230295 CVP	4/28/202 3 22:00	82	303	late	female	Non-winter	1.000	Fall	Fall	CVP	C230295 CVP
C230296 CVP	4/28/202 3 22:00	116	303	late	male	Non-winter	1.000	Fall	Spring	CVP	C230296 CVP
C230297 CVP	4/28/202 3 22:00	97	303	late	male	Non-winter	1.000	Fall	Spring	CVP	C230297 CVP
C230298 CVP	4/28/202 3 22:00	106	303	late	male	Non-winter	1.000	Fall	Spring	CVP	C230298 CVP
C230299 CVP	4/28/202 3 22:00	98	303	late	male	Non-winter	1.000	Fall	Spring	CVP	C230299 CVP
C230300 CVP	4/28/202 3 22:00	100	303	late	female	Non-winter	1.000	Fall	Spring	CVP	C230300 CVP

ID	Sample Date	Fork Length	Julian	ots28	sexid	Assignment	PosProb 1	Group	Model	Facility	Original ID
C230301 CVP	4/28/202 3 22:00	87	303	late	male	Non-winter	1.000	Fall	Fall	CVP	C230301 CVP
C230302 CVP	4/28/202 3 23:59	100	303	late	male	Non-winter	1.000	Fall	Spring	CVP	C230302 CVP
C230303 CVP	4/28/202 3 23:59	103	303	late	male	Non-winter	1.000	Fall	Spring	CVP	C230303 CVP
C230304 CVP	4/28/202 3 23:59	121	303	late	male	Non-winter	1.000	Fall	Spring	CVP	C230304 CVP
C230305 CVP	4/28/202 3 23:59	135	303	early	male	Non-winter	1.000	Fall	Spring	CVP	C230305 CVP
C230306 CVP	4/28/202 3 23:59	102	303	late	male	Non-winter	1.000	Fall	Spring	CVP	C230306 CVP
C230307 CVP	4/28/202 3 23:59	94	303	late	female	Non-winter	1.000	Fall	Spring	CVP	C230307 CVP
C230308 CVP	4/28/202 3 23:59	120	303	late	female	Non-winter	1.000	Fall	Spring	CVP	C230308 CVP
C230309 CVP	4/28/202 3 23:59	84	303	late	male	Non-winter	1.000	Fall	Fall	CVP	C230309 CVP
C230310 CVP	4/29/202 3 2:00	72	303	late	female	Non-winter	1.000	Fall	Fall	CVP	C230310 CVP
C230311 CVP	4/29/202 3 16:00	96	304	late	female	Non-winter	1.000	Fall	Spring	CVP	C230311 CVP
C230312 CVP	4/29/202 3 20:00	92	304	late	female	Non-winter	1.000	Fall	Spring	CVP	C230312 CVP
C230313 CVP	4/29/202 3 20:00	79	304	late	male	Non-winter	1.000	Fall	Fall	CVP	C230313 CVP
C230314 CVP	4/29/202 3 20:00	101	304	late	male	Non-winter	1.000	Fall	Spring	CVP	C230314 CVP

ID	Sample Date	Fork Length	Julian	ots28	sexid	Assignment	PosProb 1	Group	Model	Facility	Original ID
C230315 CVP	4/29/202 3 22:00	100	304	late	female	Non-winter	1.000	Fall	Spring	CVP	C230315 CVP
C230316 CVP	4/29/202 3 23:59	85	304	late	female	Non-winter	1.000	Fall	Fall	CVP	C230316 CVP
C230317 CVP	4/29/202 3 23:59	82	304	late	male	Non-winter	1.000	Fall	Fall	CVP	C230317 CVP
C230318 CVP	4/29/202 3 23:59	121	304	late	female	Non-winter	1.000	Fall	Spring	CVP	C230318 CVP
C230319 CVP	4/29/202 3 23:59	77	304	late	female	Non-winter	1.000	Fall	Fall	CVP	C230319 CVP
C230320 CVP	4/30/202 3 2:00	126	304	early	female	Non-winter	1.000	Fall	Spring	CVP	C230320 CVP
C230321 CVP	4/30/202 3 4:00	132	304	late	female	Non-winter	1.000	Fall	Spring	CVP	C230321 CVP
C230322 CVP	4/30/202 3 4:00	125	304	late	female	Non-winter	1.000	Fall	Spring	CVP	C230322 CVP
C230323 CVP	4/30/202 3 6:00	101	304	late	female	Non-winter	1.000	Fall	Spring	CVP	C230323 CVP
C230324 CVP	4/30/202 3 8:00	90	304	late	male	Non-winter	1.000	Fall	Spring	CVP	C230324 CVP
C230325 CVP	4/30/202 3 14:00	102	305	late	female	Non-winter	1.000	Fall	Spring	CVP	C230325 CVP
C230326 CVP	4/30/202 3 14:00	90	305	late	female	Non-winter	1.000	Fall	Spring	CVP	C230326 CVP
C230327 CVP	4/30/202 3 16:00	109	305	late	female	Non-winter	1.000	Fall	Spring	CVP	C230327 CVP
C230328 CVP	4/30/202 3 18:00	105	305	late	female	Non-winter	1.000	Fall	Spring	CVP	C230328 CVP

ID	Sample Date	Fork Length	Julian	ots28	sexid	Assignment	PosProb 1	Group	Model	Facility	Original ID
C230329 CVP	4/30/202 3 20:00	111	305	late	male	Non-winter	1.000	Fall	Spring	CVP	C230329 CVP
C230330 CVP	4/30/202 3 20:00	61	305	late	male	Non-winter	1.000	Fall	Fall	CVP	C230330 CVP
C230331 CVP	4/30/202 3 20:00	100	305	late	male	Non-winter	1.000	Fall	Spring	CVP	C230331 CVP
C230332 CVP	4/30/202 3 22:00	106	305	late	male	Non-winter	1.000	Fall	Spring	CVP	C230332 CVP
C230333 CVP	4/30/202 3 22:00	91	305	late	female	Non-winter	1.000	Fall	Spring	CVP	C230333 CVP
C230334 CVP	4/30/202 3 22:00	127	305	late	female	Non-winter	1.000	Fall	Spring	CVP	C230334 CVP
C230335 CVP	4/30/202 3 22:00	115	305	late	male	Non-winter	1.000	Fall	Spring	CVP	C230335 CVP
C230336 CVP	4/30/202 3 22:00	93	305	late	female	Non-winter	1.000	Fall	Spring	CVP	C230336 CVP
C230337 CVP	4/30/202 3 22:00	99	305	late	female	Non-winter	1.000	Fall	Spring	CVP	C230337 CVP
C230338 CVP	4/30/202 3 23:59	100	305	late	male	Non-winter	1.000	Fall	Spring	CVP	C230338 CVP
C230339 CVP	4/30/202 3 23:59	118	305	late	female	Non-winter	1.000	Fall	Spring	CVP	C230339 CVP
C230340 CVP	4/30/202 3 23:59	96	305	late	male	Non-winter	1.000	Fall	Spring	CVP	C230340 CVP
C230341 CVP	4/30/202 3 23:59	96	305	late	female	Non-winter	1.000	Fall	Spring	CVP	C230341 CVP
C230342 CVP	5/1/2023 2:00	97	305	late	female	Non-winter	1.000	Fall	Spring	CVP	C230342 CVP

ID	Sample Date	Fork Length	Julian	ots28	sexid	Assignment	PosProb 1	Group	Model	Facility	Original ID
C230343 CVP	5/1/2023 2:00	91	305	late	male	Non-winter	1.000	Fall	Spring	CVP	C230343 CVP
C230117 SWP	5/1/2023 5:00	128	305	late	female	Non-winter	1.000	Fall	Spring	SWP	C230117 SWP
C230344 CVP	5/1/2023 6:00	100	305	late	male	Non-winter	1.000	Fall	Spring	CVP	C230344 CVP
C230118 SWP	5/1/2023 7:00	110	305	late	male	Non-winter	1.000	Fall	Spring	SWP	C230118 SWP
C230119 SWP	5/1/2023 9:00	116	305	late	female	Non-winter	1.000	Fall	Spring	SWP	C230119 SWP
C230120 SWP	5/1/2023 9:00	121	305	late	female	Non-winter	1.000	Fall	Spring	SWP	C230120 SWP
C230121 SWP	5/1/2023 9:00	98	305	late	female	Non-winter	1.000	Fall	Spring	SWP	C230121 SWP
C230122 SWP	5/1/2023 11:00	100	305	late	female	Non-winter	1.000	Fall	Spring	SWP	C230122 SWP
C230123 SWP	5/1/2023 11:00	126	305	late	female	Non-winter	1.000	Fall	Spring	SWP	C230123 SWP
C230124 SWP	5/1/2023 11:00	104	305	late	male	Non-winter	1.000	Fall	Spring	SWP	C230124 SWP
C230345 CVP	5/1/2023 12:00	123	306	early	female	Non-winter	1.000	Fall	Spring	CVP	C230345 CVP
C230346 CVP	5/1/2023 12:00	118	306	late	male	Non-winter	1.000	Fall	Spring	CVP	C230346 CVP
C230125 SWP	5/1/2023 13:00	96	306	late	male	Non-winter	1.000	Fall	Spring	SWP	C230125 SWP
C230126 SWP	5/1/2023 15:00	79	306	late	female	Non-winter	1.000	Fall	Fall	SWP	C230126 SWP

ID	Sample Date	Fork Length	Julian	ots28	sexid	Assignment	PosProb 1	Group	Model	Facility	Original ID
C230127 SWP	5/1/2023 15:00	89	306	late	male	Non-winter	1.000	Fall	Spring	SWP	C230127 SWP
C230128 SWP	5/1/2023 15:00	112	306	early	male	Non-winter	1.000	Fall	Spring	SWP	C230128 SWP
C230129 SWP	5/1/2023 15:00	107	306	late	female	Non-winter	1.000	Fall	Spring	SWP	C230129 SWP
C230130 SWP	5/1/2023 15:00	121	306	late	female	Non-winter	1.000	Fall	Spring	SWP	C230130 SWP
C230347 CVP	5/1/2023 18:00	99	306	late	male	Non-winter	1.000	Fall	Spring	CVP	C230347 CVP
C230348 CVP	5/1/2023 22:00	90	306	late	female	Non-winter	1.000	Fall	Spring	CVP	C230348 CVP
C230349 CVP	5/1/2023 22:00	126	306	late	male	Non-winter	1.000	Fall	Spring	CVP	C230349 CVP
C230350 CVP	5/1/2023 23:59	120	306	late	female	Non-winter	1.000	Fall	Spring	CVP	C230350 CVP
C230351 CVP	5/1/2023 23:59	121	306	early	female	Non-winter	1.000	Fall	Spring	CVP	C230351 CVP
C230352 CVP	5/2/2023 2:00	117	306	late	male	Non-winter	1.000	Fall	Spring	CVP	C230352 CVP
C230353 CVP	5/2/2023 4:00	101	306	late	male	Non-winter	1.000	Fall	Spring	CVP	C230353 CVP
C230354 CVP	5/2/2023 4:00	90	306	late	male	Non-winter	1.000	Fall	Spring	CVP	C230354 CVP
C230355 CVP	5/2/2023 4:00	73	306	late	female	Non-winter	1.000	Fall	Fall	CVP	C230355 CVP
C230356 CVP	5/2/2023 10:00	107	306	late	male	Non-winter	1.000	Fall	Spring	CVP	C230356 CVP

ID	Sample Date	Fork Length	Julian	ots28	sexid	Assignment	PosProb 1	Group	Model	Facility	Original ID
C230357 CVP	5/2/2023 12:00	101	307	late	female	Non-winter	1.000	Fall	Spring	CVP	C230357 CVP
C230136 SWP	5/2/2023 13:00	120	307	late	female	Non-winter	1.000	Fall	Spring	SWP	C230136 SWP
C230137 SWP	5/2/2023 13:00	90	307	late	male	Non-winter	1.000	Fall	Spring	SWP	C230137 SWP
C230138 SWP	5/2/2023 13:00	115	307	late	female	Non-winter	1.000	Fall	Spring	SWP	C230138 SWP
C230139 SWP	5/2/2023 15:00	126	307	late	male	Non-winter	1.000	Fall	Spring	SWP	C230139 SWP
C230358 CVP	5/2/2023 16:00	98	307	late	male	Non-winter	1.000	Fall	Spring	CVP	C230358 CVP
C230359 CVP	5/2/2023 22:00	120	307	late	male	Non-winter	1.000	Fall	Spring	CVP	C230359 CVP
C230360 CVP	5/3/2023 2:00	101	307	late	female	Non-winter	1.000	Fall	Spring	CVP	C230360 CVP
C230361 CVP	5/3/2023 2:00	95	307	late	male	Non-winter	1.000	Fall	Spring	CVP	C230361 CVP
C230362 CVP	5/3/2023 4:00	104	307	late	male	Non-winter	1.000	Fall	Spring	CVP	C230362 CVP
C230363 CVP	5/3/2023 6:00	100	307	late	male	Non-winter	1.000	Fall	Spring	CVP	C230363 CVP
C230140 SWP	5/3/2023 7:00	87	307	early	female	Non-winter	1.000	Fall	Fall	SWP	C230140 SWP
C230141 SWP	5/3/2023 9:00	91	307	late	male	Non-winter	1.000	Fall	Spring	SWP	C230141 SWP
C230365 CVP	5/3/2023 14:00	105	308	late	female	Non-winter	1.000	Fall	Spring	CVP	C230365 CVP

ID	Sample Date	Fork Length	Julian	ots28	sexid	Assignment	PosProb 1	Group	Model	Facility	Original ID
C230366 CVP	5/3/2023 14:00	85	308	late	female	Non-winter	1.000	Fall	Fall	CVP	C230366 CVP
C230367 CVP	5/3/2023 16:00	107	308	late	male	Non-winter	1.000	Fall	Spring	CVP	C230367 CVP
C230368 CVP	5/3/2023 16:00	116	308	early	female	Non-winter	1.000	Fall	Spring	CVP	C230368 CVP
C230369 CVP	5/3/2023 18:00	125	308	late	male	Non-winter	1.000	Fall	Spring	CVP	C230369 CVP
C230370 CVP	5/3/2023 22:00	100	308	late	male	Non-winter	1.000	Fall	Spring	CVP	C230370 CVP
C230371 CVP	5/4/2023 4:00	96	308	late	male	Non-winter	1.000	Fall	Spring	CVP	C230371 CVP
C230372 CVPa	5/4/2023 8:00	112	308	late	male	Non-winter	1.000	Fall	Spring	CVP	C230372 CVP
C230372 CVPb	5/4/2023 8:00	112	308	late	male	Non-winter	1.000	Fall	Spring	CVP	C230372 CVP
C230373 CVP	5/4/2023 8:00	101	308	late	male	Non-winter	1.000	Fall	Spring	CVP	C230373 CVP
C230142 SWP	5/4/2023 8:20	97	308	late	female	Non-winter	1.000	Fall	Spring	SWP	C230142 SWP
C230143 SWP	5/4/2023 9:00	112	308	late	female	Non-winter	1.000	Fall	Spring	SWP	C230143 SWP
C230144 SWP	5/4/2023 19:00	95	309	late	female	Non-winter	1.000	Fall	Spring	SWP	C230144 SWP
C230374 CVP	5/4/2023 22:00	95	309	late	male	Non-winter	1.000	Fall	Spring	CVP	C230374 CVP
C230375 CVP	5/4/2023 22:00	110	309	late	male	Non-winter	1.000	Fall	Spring	CVP	C230375 CVP

ID	Sample Date	Fork Length	Julian	ots28	sexid	Assignment	PosProb 1	Group	Model	Facility	Original ID
C230376 CVP	5/4/2023 22:00	105	309	late	female	Non-winter	1.000	Fall	Spring	CVP	C230376 CVP
C230377 CVP	5/5/2023 2:00	111	309	late	female	Non-winter	1.000	Fall	Spring	CVP	C230377 CVP
C230145 SWP	5/5/2023 5:00	105	309	late	male	Non-winter	1.000	Fall	Spring	SWP	C230145 SWP
C230378 CVP	5/5/2023 10:00	113	309	late	male	Non-winter	1.000	Fall	Spring	CVP	C230378 CVP
C230379 CVP	5/5/2023 12:00	97	310	late	male	Non-winter	1.000	Fall	Spring	CVP	C230379 CVP
C230380 CVP	5/5/2023 12:00	103	310	late	female	Non-winter	1.000	Fall	Spring	CVP	C230380 CVP
C230146 SWP	5/5/2023 17:00	115	310	late	female	Non-winter	1.000	Fall	Spring	SWP	C230146 SWP
C230381 CVP	5/5/2023 18:00	98	310	late	female	Non-winter	1.000	Fall	Spring	CVP	C230381 CVP
C230382 CVP	5/5/2023 18:00	115	310	late	male	Non-winter	1.000	Fall	Spring	CVP	C230382 CVP
C230383 CVP	5/5/2023 18:00	90	310	late	male	Non-winter	1.000	Fall	Fall	CVP	C230383 CVP
C230384 CVP	5/5/2023 18:00	109	310	late	male	Non-winter	1.000	Fall	Spring	CVP	C230384 CVP
C230385 CVP	5/5/2023 20:00	105	310	late	female	Non-winter	1.000	Fall	Spring	CVP	C230385 CVP
C230386 CVP	5/5/2023 20:00	91	310	late	male	Non-winter	1.000	Fall	Fall	CVP	C230386 CVP
C230387 CVP	5/5/2023 20:00	106	310	early	female	Non-winter	1.000	Fall	Spring	CVP	C230387 CVP

ID	Sample Date	Fork Length	Julian	ots28	sexid	Assignment	PosProb 1	Group	Model	Facility	Original ID
C230388 CVP	5/5/2023 20:00	105	310	late	male	Non-winter	1.000	Fall	Spring	CVP	C230388 CVP
C230389 CVP	5/5/2023 22:00	91	310	late	male	Non-winter	1.000	Fall	Fall	CVP	C230389 CVP
C230390 CVP	5/5/2023 22:00	108	310	late	male	Non-winter	1.000	Fall	Spring	CVP	C230390 CVP
C230391 CVP	5/5/2023 22:00	105	310	late	male	Non-winter	1.000	Fall	Spring	CVP	C230391 CVP
C230392 CVP	5/5/2023 22:00	97	310	late	male	Non-winter	1.000	Fall	Spring	CVP	C230392 CVP
C230393 CVP	5/5/2023 23:59	105	310	late	male	Non-winter	1.000	Fall	Spring	CVP	C230393 CVP
C230394 CVP	5/5/2023 23:59	99	310	late	male	Non-winter	1.000	Fall	Spring	CVP	C230394 CVP
C230395 CVP	5/5/2023 23:59	104	310	late	female	Non-winter	1.000	Fall	Spring	CVP	C230395 CVP
C230396 CVP	5/5/2023 23:59	91	310	late	female	Non-winter	1.000	Fall	Fall	CVP	C230396 CVP
C230397 CVP	5/5/2023 23:59	95	310	late	male	Non-winter	1.000	Fall	Spring	CVP	C230397 CVP
C230398 CVP	5/5/2023 23:59	87	310	late	male	Non-winter	1.000	Fall	Fall	CVP	C230398 CVP
C230147 SWP	5/6/2023 1:00	112	310	late	male	Non-winter	1.000	Fall	Spring	SWP	C230147 SWP
C230399 CVP	5/6/2023 2:00	124	310	late	male	Non-winter	1.000	Fall	Spring	CVP	C230399 CVP
C230400 CVP	5/6/2023 2:00	94	310	late	female	Non-winter	1.000	Fall	Spring	CVP	C230400 CVP

ID	Sample Date	Fork Length	Julian	ots28	sexid	Assignment	PosProb 1	Group	Model	Facility	Original ID
C230401 CVP	5/6/2023 2:00	78	310	late	female	Non-winter	1.000	Fall	Fall	CVP	C230401 CVP
C230402 CVP	5/6/2023 2:00	108	310	early	male	Non-winter	1.000	Fall	Spring	CVP	C230402 CVP
C230403 CVP	5/6/2023 2:00	109	310	late	male	Non-winter	1.000	Fall	Spring	CVP	C230403 CVP
C230404 CVP	5/6/2023 4:00	103	310	late	female	Non-winter	1.000	Fall	Spring	CVP	C230404 CVP
C230405 CVP	5/6/2023 4:00	100	310	late	male	Non-winter	1.000	Fall	Spring	CVP	C230405 CVP
C230406 CVP	5/6/2023 6:00	96	310	late	male	Non-winter	1.000	Fall	Spring	CVP	C230406 CVP
C230407 CVP	5/6/2023 6:00	95	310	late	female	Non-winter	1.000	Fall	Spring	CVP	C230407 CVP
C230408 CVP	5/6/2023 6:00	93	310	late	female	Non-winter	1.000	Fall	Spring	CVP	C230408 CVP
C230409 CVP	5/6/2023 6:00	110	310	late	male	Non-winter	1.000	Fall	Spring	CVP	C230409 CVP
C230410 CVP	5/6/2023 8:00	93	310	late	female	Non-winter	1.000	Fall	Spring	CVP	C230410 CVP
C230411 CVP	5/6/2023 10:00	90	310	late	male	Non-winter	1.000	Fall	Fall	CVP	C230411 CVP
C230412 CVP	5/6/2023 12:00	110	311	late	female	Non-winter	1.000	Fall	Spring	CVP	C230412 CVP
C230413 CVP	5/6/2023 18:00	108	311	late	female	Non-winter	1.000	Fall	Spring	CVP	C230413 CVP
C230414 CVP	5/6/2023 22:00	82	311	late	female	Non-winter	1.000	Fall	Fall	CVP	C230414 CVP

ID	Sample Date	Fork Length	Julian	ots28	sexid	Assignment	PosProb 1	Group	Model	Facility	Original ID
C230415 CVP	5/6/2023 22:00	108	311	late	male	Non-winter	1.000	Fall	Spring	CVP	C230415 CVP
C230416 CVP	5/6/2023 23:59	120	311	late	male	Non-winter	1.000	Fall	Spring	CVP	C230416 CVP
C230417 CVP	5/6/2023 23:59	96	311	late	male	Non-winter	1.000	Fall	Spring	CVP	C230417 CVP
C230418 CVP	5/7/2023 4:00	98	311	late	female	Non-winter	1.000	Fall	Spring	CVP	C230418 CVP
C230148 SWP	5/7/2023 5:00	119	311	early	female	Non-winter	1.000	Fall	Spring	SWP	C230148 SWP
C230419 CVP	5/7/2023 6:00	108	311	late	female	Non-winter	1.000	Fall	Spring	CVP	C230419 CVP
C230420 CVP	5/7/2023 6:00	115	311	late	female	Non-winter	1.000	Fall	Spring	CVP	C230420 CVP
C230422 CVP	5/7/2023 8:00	94	311	late	male	Non-winter	1.000	Fall	Spring	CVP	C230422 CVP
C230423 CVP	5/7/2023 10:00	84	311	late	female	Non-winter	1.000	Fall	Fall	CVP	C230423 CVP
C230424 CVP	5/7/2023 10:00	100	311	late	male	Non-winter	1.000	Fall	Spring	CVP	C230424 CVP
C230425 CVP	5/7/2023 10:00	104	311	late	female	Non-winter	1.000	Fall	Spring	CVP	C230425 CVP
C230426 CVP	5/7/2023 16:00	81	312	late	female	Non-winter	1.000	Fall	Fall	CVP	C230426 CVP
C230427 CVP	5/7/2023 16:00	111	312	late	male	Non-winter	1.000	Fall	Spring	CVP	C230427 CVP
C230428 CVP	5/7/2023 16:00	118	312	late	male	Non-winter	1.000	Fall	Spring	CVP	C230428 CVP

ID	Sample Date	Fork Length	Julian	ots28	sexid	Assignment	PosProb 1	Group	Model	Facility	Original ID
C230429 CVP	5/7/2023 18:00	99	312	late	male	Non-winter	1.000	Fall	Spring	CVP	C230429 CVP
C230430 CVP	5/7/2023 20:00	112	312	late	female	Non-winter	1.000	Fall	Spring	CVP	C230430 CVP
C230431 CVP	5/7/2023 22:00	119	312	late	female	Non-winter	1.000	Fall	Spring	CVP	C230431 CVP
C230432 CVP	5/7/2023 22:00	92	312	late	female	Non-winter	1.000	Fall	Fall	CVP	C230432 CVP
C230433 CVP	5/7/2023 22:00	118	312	late	male	Non-winter	1.000	Fall	Spring	CVP	C230433 CVP
C230434 CVP	5/7/2023 22:00	99	312	late	male	Non-winter	1.000	Fall	Spring	CVP	C230434 CVP
C230435 CVP	5/7/2023 22:00	100	312	late	female	Non-winter	1.000	Fall	Spring	CVP	C230435 CVP
C230436 CVP	5/7/2023 22:00	97	312	late	male	Non-winter	1.000	Fall	Spring	CVP	C230436 CVP
C230437 CVP	5/7/2023 23:59	104	312	late	male	Non-winter	1.000	Fall	Spring	CVP	C230437 CVP
C230438 CVP	5/7/2023 23:59	108	312	late	male	Non-winter	1.000	Fall	Spring	CVP	C230438 CVP
C230439 CVP	5/7/2023 23:59	86	312	late	female	Non-winter	1.000	Fall	Fall	CVP	C230439 CVP
C230440 CVP	5/7/2023 23:59	105	312	late	female	Non-winter	1.000	Fall	Spring	CVP	C230440 CVP
C230441 CVP	5/7/2023 23:59	105	312	late	male	Non-winter	1.000	Fall	Spring	CVP	C230441 CVP
C230442 CVP	5/8/2023 2:00	116	312	late	female	Non-winter	1.000	Fall	Spring	CVP	C230442 CVP

ID	Sample Date	Fork Length	Julian	ots28	sexid	Assignment	PosProb 1	Group	Model	Facility	Original ID
C230443 CVP	5/8/2023 2:00	109	312	early	male	Non-winter	1.000	Fall	Spring	CVP	C230443 CVP
C230444 CVP	5/8/2023 2:00	104	312	late	female	Non-winter	1.000	Fall	Spring	CVP	C230444 CVP
C230445 CVP	5/8/2023 2:00	100	312	late	male	Non-winter	1.000	Fall	Spring	CVP	C230445 CVP
C230446 CVP	5/8/2023 2:00	91	312	late	female	Non-winter	1.000	Fall	Fall	CVP	C230446 CVP
C230447 CVP	5/8/2023 4:00	85	312	late	female	Non-winter	1.000	Fall	Fall	CVP	C230447 CVP
C230448 CVP	5/8/2023 4:00	105	312	late	male	Non-winter	1.000	Fall	Spring	CVP	C230448 CVP
C230449 CVP	5/8/2023 4:00	121	312	late	female	Non-winter	1.000	Fall	Spring	CVP	C230449 CVP
C230450 CVP	5/8/2023 4:00	97	312	late	male	Non-winter	1.000	Fall	Spring	CVP	C230450 CVP
C230451 CVP	5/8/2023 4:00	100	312	late	female	Non-winter	1.000	Fall	Spring	CVP	C230451 CVP
C230452 CVP	5/8/2023 4:00	95	312	late	male	Non-winter	1.000	Fall	Spring	CVP	C230452 CVP
C230149 SWP	5/8/2023 5:00	97	312	late	male	Non-winter	1.000	Fall	Spring	SWP	C230149 SWP
C230453 CVP	5/8/2023 6:00	115	312	late	female	Non-winter	1.000	Fall	Spring	CVP	C230453 CVP
C230454 CVP	5/8/2023 6:00	110	312	late	male	Non-winter	1.000	Fall	Spring	CVP	C230454 CVP
C230455 CVP	5/8/2023 6:00	109	312	late	male	Non-winter	1.000	Fall	Spring	CVP	C230455 CVP

ID	Sample Date	Fork Length	Julian	ots28	sexid	Assignment	PosProb 1	Group	Model	Facility	Original ID
C230456 CVP	5/8/2023 6:00	85	312	late	female	Non-winter	1.000	Fall	Fall	CVP	C230456 CVP
C230457 CVP	5/8/2023 8:00	105	312	late	female	Non-winter	1.000	Fall	Spring	CVP	C230457 CVP
C230458 CVP	5/8/2023 8:00	75	312	late	female	Non-winter	1.000	Fall	Fall	CVP	C230458 CVP
C230459 CVP	5/8/2023 8:00	110	312	late	male	Non-winter	1.000	Fall	Spring	CVP	C230459 CVP
C230460 CVP	5/8/2023 8:00	115	312	late	female	Non-winter	1.000	Fall	Spring	CVP	C230460 CVP
C230461 CVP	5/8/2023 8:00	98	312	early	female	Non-winter	1.000	Fall	Spring	CVP	C230461 CVP
C230462 CVP	5/8/2023 8:00	100	312	late	male	Non-winter	1.000	Fall	Spring	CVP	C230462 CVP
C230463 CVP	5/8/2023 10:00	100	312	late	female	Non-winter	1.000	Fall	Spring	CVP	C230463 CVP
C230150 SWP	5/8/2023 11:00	100	312	late	female	Non-winter	1.000	Fall	Spring	SWP	C230150 SWP
C230151 SWP	5/8/2023 11:00	83	312	late	female	Non-winter	1.000	Fall	Fall	SWP	C230151 SWP
C230464 CVP	5/8/2023 12:00	104	313	late	female	Non-winter	1.000	Fall	Spring	CVP	C230464 CVP
C230465 CVP	5/8/2023 12:00	76	313	late	male	Non-winter	1.000	Fall	Fall	CVP	C230465 CVP
C230466 CVP	5/8/2023 12:00	101	313	late	female	Non-winter	1.000	Fall	Spring	CVP	C230466 CVP
C230467 CVP	5/8/2023 12:00	109	313	late	female	Non-winter	1.000	Fall	Spring	CVP	C230467 CVP

ID	Sample Date	Fork Length	Julian	ots28	sexid	Assignment	PosProb 1	Group	Model	Facility	Original ID
C230468 CVP	5/8/2023 12:00	89	313	late	female	Non-winter	1.000	Fall	Fall	CVP	C230468 CVP
C230469 CVP	5/8/2023 14:00	85	313	late	male	Non-winter	1.000	Fall	Fall	CVP	C230469 CVP
C230470 CVP	5/8/2023 14:00	84	313	late	female	Non-winter	1.000	Fall	Fall	CVP	C230470 CVP
C230471 CVP	5/8/2023 14:00	87	313	late	male	Non-winter	1.000	Fall	Fall	CVP	C230471 CVP
C230472 CVP	5/8/2023 18:00	108	313	late	male	Non-winter	1.000	Fall	Spring	CVP	C230472 CVP
C230473 CVP	5/8/2023 18:00	97	313	late	female	Non-winter	1.000	Fall	Spring	CVP	C230473 CVP
C230474 CVP	5/8/2023 18:00	96	313	late	female	Non-winter	1.000	Fall	Spring	CVP	C230474 CVP
C230475 CVP	5/8/2023 20:00	111	313	late	female	Non-winter	1.000	Fall	Spring	CVP	C230475 CVP
C230476 CVP	5/8/2023 20:00	97	313	late	female	Non-winter	1.000	Fall	Spring	CVP	C230476 CVP
C230477 CVP	5/8/2023 20:00	105	313	late	female	Non-winter	1.000	Fall	Spring	CVP	C230477 CVP
C230478 CVP	5/8/2023 20:00	100	313	late	female	Non-winter	1.000	Fall	Spring	CVP	C230478 CVP
C230479 CVP	5/8/2023 20:00	105	313	late	male	Non-winter	1.000	Fall	Spring	CVP	C230479 CVP
C230480 CVP	5/8/2023 22:00	105	313	late	male	Non-winter	1.000	Fall	Spring	CVP	C230480 CVP
C230481 CVP	5/8/2023 22:00	80	313	late	male	Non-winter	1.000	Fall	Fall	CVP	C230481 CVP

ID	Sample Date	Fork Length	Julian	ots28	sexid	Assignment	PosProb 1	Group	Model	Facility	Original ID
C230482 CVP	5/8/2023 22:00	124	313	early	female	Non-winter	1.000	Fall	Spring	CVP	C230482 CVP
C230483 CVP	5/8/2023 22:00	96	313	late	male	Non-winter	1.000	Fall	Spring	CVP	C230483 CVP
C230484 CVP	5/8/2023 22:00	116	313	early	female	Non-winter	1.000	Fall	Spring	CVP	C230484 CVP
C230485 CVP	5/8/2023 22:00	107	313	late	male	Non-winter	1.000	Fall	Spring	CVP	C230485 CVP
C230486 CVP	5/8/2023 22:00	97	313	late	male	Non-winter	1.000	Fall	Spring	CVP	C230486 CVP
C230487 CVP	5/8/2023 22:00	111	313	late	male	Non-winter	1.000	Fall	Spring	CVP	C230487 CVP
C230488 CVP	5/8/2023 22:00	86	313	late	male	Non-winter	1.000	Fall	Fall	CVP	C230488 CVP
C230489 CVP	5/8/2023 22:00	88	313	late	female	Non-winter	1.000	Fall	Fall	CVP	C230489 CVP
C230490 CVP	5/8/2023 22:00	107	313	late	female	Non-winter	1.000	Fall	Spring	CVP	C230490 CVP
C230491 CVP	5/8/2023 22:00	105	313	late	female	Non-winter	1.000	Fall	Spring	CVP	C230491 CVP
C230492 CVP	5/8/2023 22:00	114	313	late	male	Non-winter	1.000	Fall	Spring	CVP	C230492 CVP
C230493 CVP	5/8/2023 22:00	87	313	late	male	Non-winter	1.000	Fall	Fall	CVP	C230493 CVP
C230494 CVP	5/8/2023 23:59	104	313	late	female	Non-winter	1.000	Fall	Spring	CVP	C230494 CVP
C230495 CVP	5/8/2023 23:59	106	313	late	female	Non-winter	1.000	Fall	Spring	CVP	C230495 CVP

ID	Sample Date	Fork Length	Julian	ots28	sexid	Assignment	PosProb 1	Group	Model	Facility	Original ID
C230496 CVP	5/8/2023 23:59	107	313	late	male	Non-winter	1.000	Fall	Spring	CVP	C230496 CVP
C230497 CVP	5/8/2023 23:59	93	313	late	female	Non-winter	1.000	Fall	Fall	CVP	C230497 CVP
C230498 CVP	5/8/2023 23:59	88	313	late	female	Non-winter	1.000	Fall	Fall	CVP	C230498 CVP
C230499 CVP	5/8/2023 23:59	87	313	late	male	Non-winter	1.000	Fall	Fall	CVP	C230499 CVP
C230500 CVP	5/9/2023 2:00	126	313	late	male	Non-winter	1.000	Fall	Spring	CVP	C230500 CVP
C230501 CVP	5/9/2023 2:00	105	313	late	male	Non-winter	1.000	Fall	Spring	CVP	C230501 CVP
C230502 CVP	5/9/2023 2:00	93	313	late	male	Non-winter	1.000	Fall	Fall	CVP	C230502 CVP
C230503 CVP	5/9/2023 2:00	92	313	late	male	Non-winter	1.000	Fall	Fall	CVP	C230503 CVP
C230152 SWP	5/9/2023 3:00	128	313	early	male	Non-winter	1.000	Fall	Spring	SWP	C230152 SWP
C230153 SWP	5/9/2023 3:00	106	313	late	male	Non-winter	1.000	Fall	Spring	SWP	C230153 SWP
C230154 SWP	5/9/2023 3:45	116	313	late	male	Non-winter	1.000	Fall	Spring	SWP	C230154 SWP
C230504 CVP	5/9/2023 4:00	116	313	late	male	Non-winter	1.000	Fall	Spring	CVP	C230504 CVP
C230505 CVP	5/9/2023 4:00	120	313	late	female	Non-winter	1.000	Fall	Spring	CVP	C230505 CVP
C230506 CVP	5/9/2023 4:00	105	313	late	female	Non-winter	1.000	Fall	Spring	CVP	C230506 CVP

ID	Sample Date	Fork Length	Julian	ots28	sexid	Assignment	PosProb 1	Group	Model	Facility	Original ID
C230507 CVP	5/9/2023 4:00	113	313	late	female	Non-winter	1.000	Fall	Spring	CVP	C230507 CVP
C230508 CVP	5/9/2023 4:00	114	313	late	male	Non-winter	1.000	Fall	Spring	CVP	C230508 CVP
C230509 CVP	5/9/2023 4:00	98	313	late	male	Non-winter	1.000	Fall	Spring	CVP	C230509 CVP
C230510 CVP	5/9/2023 4:00	86	313	late	male	Non-winter	1.000	Fall	Fall	CVP	C230510 CVP
C230511 CVP	5/9/2023 4:00	109	313	late	male	Non-winter	1.000	Fall	Spring	CVP	C230511 CVP
C230512 CVP	5/9/2023 6:00	120	313	late	female	Non-winter	1.000	Fall	Spring	CVP	C230512 CVP
C230513 CVP	5/9/2023 6:00	110	313	late	male	Non-winter	1.000	Fall	Spring	CVP	C230513 CVP
C230515 CVP	5/9/2023 6:00	87	313	late	male	Non-winter	1.000	Fall	Fall	CVP	C230515 CVP
C230516 CVP	5/9/2023 8:00	110	313	late	female	Non-winter	1.000	Fall	Spring	CVP	C230516 CVP
C230517 CVP	5/9/2023 8:00	100	313	late	female	Non-winter	1.000	Fall	Spring	CVP	C230517 CVP

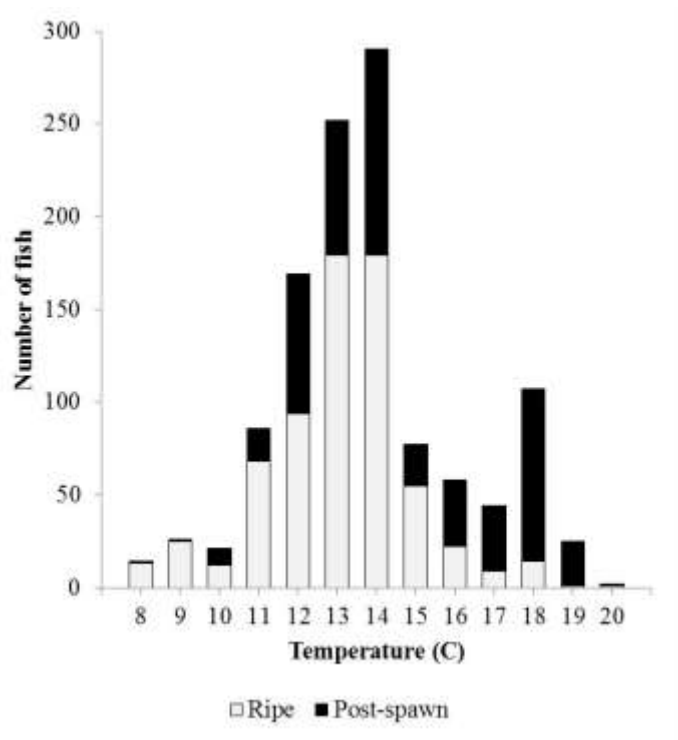


Figure 4. The number of ripe (grey) or post-spawn (black) delta smelt caught in a specific temperature range during routine monthly sampling in the upper San Francisco Estuary during January-May for years 2002-2015 (Figure 8 from Damon et al. 2016).

Table 12. Number and size range (mm FL) of near-ripe female delta smelt on their first or subsequent clutch of eggs by month of collection. Delta smelt were used in this study's fecundity analysis and collected during routine monthly sampling during January-May for years 2012-2015 (Table 3 from Damon et al. 2016).

Month	First	Subsequent	Total
January	2 (72-73)	0	2 (72-73)
February	41 (56-84)	2 (65-85)	43 (56-85)
March	37 (63-77)	5 (63-81)	42 (63-81)
April	6 (62-82)	9 (65-90)	15 (62-90)
May	7 (68-78)	20 (69-83)	27 (68-83)