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February 13, 2015

Via Email: *Rich.Satkowski@waterboards.ca.gov*

State Water Resources Control Board
c/o Rick Satkowski
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Subject: **Objections to Order Approving In Part And Denying In Part A Petition For Temporary Urgency Changes To License And Permit Terms And Conditions Requiring Compliance With Delta Water Quality Objectives In Response To Drought Conditions** (In the Matter of Specified License and Permits of the Department of Water Resources and U.S. Bureau of Reclamation for the State Water Project and Central Valley Project) (herein "Order")

Dear State Water Resources Control Board Members and Agency Staff:

The State Water Contractors ("SWC"),[1] and San Luis & Delta Mendota Water Authority ("Water Authority")[1] object to the State Water Resources Control Board ("Water Board") Executive Director's Order to the extent it is a partial denial of the Petition For Temporary Urgency Changes To License And Permit Terms And Conditions Requiring Compliance With The Delta Water Quality Objectives In Response To Drought Conditions (February 3, 2015) (herein "TUCP"). Specifically, the SWC and the Water Authority object to three conditions the Executive Director imposed on the temporary diversion and use:

- Condition 1.d., which modifies maximum Export Limits in a manner that precludes intermediate pumping levels; and

- Condition 1.e., which addresses the application of export limitations to water transfers.

- Condition 3, which purports to vest with Executive Director or his representative the authority to allocate SWP and CVP water.

The Water Board shall give prompt consideration to these objections. (Wat. Code, § 1428, subd. (e).)

[1] See Attachment A.

Facing a fourth year of drought, DWR and Reclamation filed the TUCP after significant consultation with and, ultimately, the support of the California Department of Fish and Wildlife ("DFW"), United States Fish and Wildlife Service ("FWS") and National Marine Fisheries Service ("NMFS"). As the Water Board's Executive Director wrote in his Order at page 2, DWR and Reclamation requested the changes to:

> 1) conserve storage in upstream reservoirs for use later in the year if the drought continues; 2) ensure that salinity levels in the Delta are maintained at levels that protect public health and safety; and 3) lessen critical economic losses to agricultural, municipal, and industrial uses due to water shortages through project water deliveries and by facilitating voluntary water transfers and exchanges to the extent possible, while balancing the needs of upstream storage, fishery and wildlife resource protection, and operational flexibility.

Through the Order, the Executive Director approved those changes that were intended to conserve storage and protect salinity levels. Those changes included a significant 1,500 cfs limitation on the ability of DWR and Reclamation to pump water to the member agencies of the SWC and Water Authority. He denied, however, a change intended to lessen critical economic losses by providing some minor relief from that pumping limitation. He denied the change in spite of the request being made by DWR and Reclamation and supported by DFW, FWS, and NMFS. He also potentially compounded the effects of the drought by including an ambiguous provision on transfers – a provision not part of the TUCP. The Executive Director's decision will impact the 26 million people and approximately two million acres of irrigated agriculture within areas served by the SWC and Water Authority member agencies. These decisions by the Executive Director must be reversed.

The Executive Director approved the portions of the TUCP that were intended to protect Chinook salmon, actions that successfully brought a measure of cold water relief to Chinook salmon last year. Through the TUCP and Order, a policy decision was made that balances spring outflow with the need to provide cold water pool protection for Chinook salmon spawning later in the year. This balancing of needs is similar to the decision made in 2014, which was a success, as even though a significant portion of the Chinook salmon population was impacted by the drought; it would have been worse without the TUCP. The 2014 TUCP Order modified the water rights of the United States and the State of California to reduce the obligation for Delta outflow standards, reducing the need to release approximately 400 TAF of water from upstream storage between March and July. This water was stored in upstream reservoirs and used for salmon protection. In spring and summer 2014, no releases were made from Shasta Reservoir specifically for urban, agricultural or wildlife refuge use. Stored water at Shasta was released to meet water quality and fishery requirements, and only after those requirements were met was the water available for other uses.

The fishery information that the Executive Director appears to have relied on is outdated, incomplete, and (in some cases) incorrect. It further appears that the Executive Director either did not have or did not fully consider information regarding the effect that the drought has had, and continues to have, on agricultural and urban water users. In this letter, the SWC and Water Authority provide information that should lead to more appropriate balancing of beneficial uses that better reflects the best available science and the dire conditions within the State of California. The intermediate pumping level must be authorized immediately, and the Water Board must

establish a process to ensure that it considered and is giving proper weight to all relevant information when making these types of critical decisions.

Further, the Executive Director included a term that excluded transfers of non-SWP and non-CVP water from the 1,500 cfs pumping limitation. (Order, Condition 1(e).) However, he was silent on the effect of the pumping limitation on transfer of SWP and CVP water. That silence creates an ambiguity that is harmful and potentially frustrates state and federal laws that encourage the transfer of water from willing seller to willing buyers. To the extent the 2015 TUCP Order addresses transfer, it must be amended consistent with the 2014 TUCP order and explicitly exclude from the limitations water transfers "between SWP and CVP contractors." (See 2014 TUCP Order at Condition 1(b).) This clarification is important because the member agencies of the SWC and Water Authority are seeking water to purchase, including from SWP and CVP, in order to mitigate the effects of the drought. The existing ambiguity may impede the ability to enter into purchase agreements, if there are willing sellers of SWP or CVP water.

Finally, in Condition 3, the Executive Director purports to authorize himself or his representative to control the SWP and CVP. Condition 3 provides that use of water conserved as a result of the Order "shall be determined by the Executive Director or his representative…." That condition is imposed without discussion of the basis for or citation to legal authority to impose it. It is contrary to law. Through the TUCP and Order, the executive Director cannot assume the authorities vested with DWR and Reclamation in operation of the SWP and CVP, respectively.

1) The partial denial did not adequately consider impacts on agricultural and urban communities.

The Order's partial denial failed to consider highly relevant information regarding the water supply needs of agricultural and urban water contractors. The Order appears to discount the effects of the drought, stating at page 19, "…the water supply tradeoffs are not clear given the water contract allocations that will occur this year." The water supply trade-offs are clear and are as described below.

a) Impacts to agricultural water supplies.

Going into this fourth year of drought, agriculture communities south of the Delta have already experienced substantial adverse impacts. These losses have been incurred despite the laudable efforts that our state's farmers have made in significantly increasing water use efficiencies.[2] California's farmers are feeding healthier food to more people with less water, and continue to find ways to increase food production efficiencies. In spite of these accomplishments, the agricultural communities within the Central Valley have had to fallow hundreds of thousands of acres each year of the drought, groundwater levels have dropped, agricultural businesses have gone bankrupt, and unemployment, gang related violence, and hunger have increased sharply, and the communities are suffering from environmental degradation.

[2] *See, e.g.*, California Water Plan Update 2013, Vol. 3, Ch. 2 Agricultural Water Use Efficiency at p. 2-7 – 2-10, 2-20 – 2-24, available online at http://www.waterplan.water.ca.gov/docs/cwpu2013/Final/Vol3_Ch02_AgWUE.pdf (discussing agricultural water use efficiency efforts in California).

CVP water allocations to agricultural water service contractors are at an all-time low. In 2014, agricultural water service contractors south of the Delta received no allocation of CVP supply.[3] An initial allocation of zero percent for south-of-Delta agricultural water service contractors is certain to occur again in 2015. Under a 90 percent exceedance forecast, the zero percent initial allocation will continue throughout the year. Even under a 50 percent exceedance forecast, CVP agricultural water service contractors expect a final (May) allocation of between 5 and 10 percent.

The impacts from these low allocations are well documented. In the recent Economic Analysis of the 2014 Drought for California Agriculture prepared by Richard Howitt and others from the U.C. Davis Center for Watershed Science, the authors found that in 2014 alone, the net water shortage of 1.5 million acre-feet would cause direct losses to agriculture of $1.5 billion from lost crop revenue and lost dairy and livestock value.[4] The most direct loss from agricultural water shortages should be obvious: the loss of a consumable product – food – that feeds people throughout the state and around the world. In addition, as more and more crops are lost and land is fallowed,[5] the farm economy suffers with the loss of farm worker jobs, loss of income to suppliers of agricultural equipment, fertilizers, petroleum and other inputs, and loss of tax revenue to local counties. The number of bankruptcies in the Central Valley has increased dramatically over the course of the drought, topping 2,000 bankruptcies in a 12-month period for several counties within the Water Authority's service area. And unemployment in agricultural areas south-of-the-Delta, which is already very high, is creeping higher. In some areas served by the Water Authority, unemployment topped 30 percent in December 2014.[6] The number of people living below the poverty level in the Central Valley has risen 1.3% since 2011.[7] The number of people receiving food stamps in the Central Valley has risen nearly 2% since 2012.[8] The Community Food Bank in the San Joaquin Valley is serving over 2,000 families impacted by the drought every month, and has delivered over 86,000 food boxes and an additional million pounds of produce, dry goods, and bread to drought impacted families since May 2014.[9]

The drought has also caused, and will continue to cause, adverse environmental impacts to agricultural communities. Environmental injury includes long-term damage to orchard trees, other crops, and soil associated with increased use of low quality groundwater, subsidence, and adverse impacts to air quality from fallowing.

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[3] *See* Summary of Water Supply Allocations, available online at http://www.usbr.gov/mp/cvo/vungvari/water_allocations_historical.pdf (showing final allocations to agricultural contractors south-of-the Delta of 0% in 2014, 20% in 2013, and 40% in 2012.)

[4] Howitt, R. et al., Economic Analysis of the 2014 Drought for California Agriculture at p. ii; report available online at https://watershed.ucdavis.edu/files/biblio/DroughtReport_23July2014_ 0.pdf.

[5] In the Westlands Water District service area alone, farmers were forced to fallow 220,000 acres (330 square miles) in 2014. Westlands Water District 2014 Crop Acreage Report, available online at http://wwd.ca.gov/wp-content/uploads/2014/10/croprpt14.pdf.

[6] California Employment Development Department, Monthly Labor Force Data for Cities and Census Designated Places, December 2014 – Preliminary, available online at http://www.labormarketinfo.edd.ca.gov/Content.asp?pageid=1006 (identifying 31.0% unemployment in Mendota, 19.6% in Firebaugh, 25.1% in Huron, and 27.5% in San Joaquin).

[7] California Center for Jobs & the Economy, Economic Indicators for the Central Valley Region, available online at http://www.centerforjobs.org/indicators/regions/central-valley/#disparity.

[8] *Id*.

[9] Feb. 9, 2015 personal communication from Andy Souza, President/CEO of Community Food Bank, Fresno, California.

In 2014, Howitt *et al.* estimate that a 62% increase in groundwater pumping occurred throughout the Central Valley.[10] This increase, which is expected to worsen unless more surface water is made available, will amplify the negative effects associated with increased groundwater pumping. In some locations, increased groundwater pumping causes subsidence, which in turn causes negative effects including changes in elevation and the slope of streams, canals, and drains. Subsidence can additionally damage water conveyance facilities and other infrastructure, as has been documented throughout California.[11] Furthermore, land subsidence leads to the failure of well casings, which will require additional well drilling and attendant environmental impacts. Additionally, areas where groundwater levels have declined, surface streams generally lose flow to adjacent groundwater systems. These known environmental impacts will be amplified by continued water shortages, which will in turn escalate pumping costs, land subsidence, and drying up of wells.

In Kern County, there has been a reduction in irrigated acreage, crop damage, and significantly increased groundwater pumping. On average, groundwater accounts for approximately 37% of the water supplies available to Kern County's valley floor. However, during recent drought periods, groundwater accounted for as much as 69% of the annual water supply. As the drought has continued, Kern County's groundwater supplies have diminished significantly as evidenced by dropping groundwater levels. As of 2014, many growers of permanent crops, which account for over 50% of Kern County's irrigated acreage, were reporting that only minimal irrigation was occurring in many orchards. Preliminary information from water districts and growers indicates that both quality and quantity of 2014 permanent crop production was significantly impacted due to under-irrigation or a complete lack of irrigation. Although the full impact of fallowing and damage to crops from under-irrigation will not be known until later in the year, it is anticipated that the economic loss will be significant.

The 2014 economic impacts to Kern County were further compounded, as local growers continued to pay their share of the SWP's fixed costs (nearly $90 million to receive just a 5 percent allocation from the SWP), as well as seek out dry year water supplies at ever-increasing prices. For one dry year program alone, Kern County interests spent over $90 million. As dry conditions continue in 2015, it is anticipated that crop production will be further impacted due to the lack of surface water supplies, groundwater levels will continue to decline and local growers will be impacted financially as they continue to seek out increasingly scarce surface water supplies.

Every additional acre foot of surface water that agricultural areas are able to obtain will help alleviate the impacts of water shortage described above. *See, e.g., San Luis & Delta-Mendota Water Authority v. Jewell*, 969 F. Supp. 2d 1211, 1223 (E.D. Cal. 2013). Without more water moving south, conditions will worsen.

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[10] Howitt, R.E., Medellin-Azuara, J., MacEwan, D., Lund, J.R. and Sumner, D.A. (2014). Economic Analysis of the 2014 Drought for California Agriculture. Center for Watershed Sciences, University of California, Davis, California. 20p. Available at <http://watershed.ucdavis.edu>., p. 2.

[11] *See, e.g.*, Faunt, C.C. ed., 2009. Groundwater Availability of the Central Valley Aquifer, California: U.S. Geological Survey Professional Paper 1766, 225 p.

b) Impacts to urban water supplies.

The state's urban water supply districts dedicate significant resources to planning for droughts, utilizing Integrated Water Management Plans with multiple strategies for conserving water, developing a suite of available supplies, and re-operating and optimizing their distribution systems. However, in the fourth year of a drought, potentially headed for a fifth year, even the best planning cannot avoid dwindling storage supplies and groundwater impacts. Dry conditions have resulted in an initial SWP allocation of 15% and will likely yield very low M&I allocations from the CVP.

Three examples of the types of drought impacts being experienced in urban areas are included below, as follows:

i) Alameda Flood Control and Water Conservation District, Zone 7 ("Zone 7")

Zone 7 has experienced significant environmental and economic impacts as a result of the drought and reduced SWP contract allocations. Zone 7 depends on the SWP for over 80% of its water supply. All of Zone 7's imported supplies (including any transfer water or exchanges) are delivered through the Delta via the South Bay Aqueduct. Therefore, any reduction in Zone 7's contract allocation has a significant effect on its available water supply. In 2014, Zone 7 received the lowest SWP allocation in its history, receiving a 5% contract allocation, with that allocation only available after September 1st. In response, Zone 7 adopted an emergency drought declaration in January 2014 and, in April 2014, it imposed a 25% mandatory water supply reduction on its retailers, as well as implemented a variety of voluntary conservation actions. In 2014 Zone 7 successfully reduced its treated water production to 71% of its production in 2013, thereby exceeding its goal.

Zone 7 met, and then exceeded its water conservation goals, through significant expenditures. In addition to mandatory reductions, Zone 7 adopted a public outreach and education campaign, and worked with retailers together developing local drought ordinances with warnings and penalties; gave credits for low-water users; increased drought rates for parts of the service area; and supported water patrols, a water use violation hotline, and a recycled water filling station. Zone 7 also undertook emergency construction projects including drilling a new well and installing an intertie between Cope Lake and Lake I to allow the capture of mining water recovery for groundwater recharge. These efforts took a financial toll on Zone 7, resulting in significantly lower financial reserves entering 2015 and the deferral of other planned public works projects.

Despite these extraordinary efforts, Zone 7's water supply outlook continues to be uncertain in 2015. During the drought, groundwater pumping increased in Zone 7, which is an area with historic overdraft. The groundwater basin has enjoyed periods of recovery, but there was increased pumping in 2014. The effect of that increased pumping, and any additional groundwater pumping that could occur in 2015, is well managed to remain within established operating ranges but ultimate impacts are nevertheless uncertain. Zone 7 also has water quality concerns as it has a limited ability to blend Delta water to avoid maximum contaminant levels ("MCL") exceedances. High salinity (Bromide) and total organic carbon (TOCs) contributed to MCL exceedance of the Trihalomethane limit in February 2014. Blending of Delta water from the South Bay Aqueduct to meet water quality targets would require further draw down of Lake Del Valle, having both economic and recreational impacts and resulting in the closure of a major area park. As a result,

Zone 7 will continue to advocate for the proposed salinity barriers, as well as water quality monitoring.

In 2014, if water had not been allowed to move through the Delta to the SWP in February and March, Zone 7 would likely have experienced even greater water supply impacts, which highlights the importance of allowing an intermediate level of pumping if conditions get drier and outflows drop off in 2015. There are urban areas that depend greatly on Delta water supplies, and these are areas that have already taken highly commendable and historic measures to stretch their remaining water supplies to serve cities and towns.

ii) Santa Clara Valley Water District's ("SCVWD")

Groundwater impacts are often linked to insufficient deliveries from the SWP and CVP. For example, in Santa Clara County, on average, 40% of the county's annual water supply is conveyed through the Delta by the SWP and CVP. In critically dry years, more than 90% of the supply for SCVWD three drinking water treatment plants comes through the Delta. If Santa Clara County loses a significant portion of its SWP and CVP supplies, demands on the county's groundwater basin increases, and the county's ability to recharge the basin to prevent environmental and economic impacts decreases.

Historically, Santa Clara County has experienced significant land subsidence, up to 14 feet in some places, resulting in sea water intrusion and significant community costs to prevent flooding and to repair infrastructure. The importation of Delta water supplies to the County lead to a recovery of groundwater levels and halted permanent subsidence. As a result of past subsidence, residential communities, major business campuses, and major wastewater treatment facilities are currently below sea level and are protected from flooding from Levees. One example is the San Jose-Santa Clara regional Wastewater facilities, which clean and treat the wastewater of more than 1.5 million people and serves a business section with more than 17,000 main sewer connections. Sewer lines, water supply pipelines and storm drains all operate based on gravity flow and can be compromised by localized and regional subsidence. The valley's dense network of buildings and roads are also susceptible to infrastructure damage from land subsidence. Preventing additional subsidence in the heart of the Silicon Valley is a priority for SCVWD, one that relies heavily on allocations from both the State Water Project and Central Valley Project to offset groundwater pumping.

As a result of the extended drought and because of historically low CVP and SWP water contract allocations, groundwater storage in Santa Clara County was reduced by nearly 80,000 acre-feet (AF) in 2014 and groundwater levels exceeded the subsidence threshold in one area of the County. Currently, groundwater levels are approaching subsidence thresholds at several locations, and most creeks and recharge ponds are dry, with managed recharge limited to critical needs. As the drought persists and groundwater reserves are further tapped, SCVWD is increasingly concerned that permanent land subsidence may resume.

Significant depletion of groundwater reserves has occurred even though SCVWD has been funding enhanced conservation efforts. In 2014, the SCVWD added $11 million to their water conservation budget to support higher rebates to encourage widespread conservation, and SCVWD will provide these rebates again in 2015. The SCVWD Board also approved $2.3 million for additional drought related outreach and $500,000 for a new water inspector program to prevent water waste. In the fall of 2014, the District Board extended into 2015 its call for a countywide

reduction of water use by 20 percent with the recommendation that retail water agencies, local municipalities, and the county of Santa Clara implement mandatory measures as needed to achieve the target.

iii) Metropolitan Water District of Southern California ("Metropolitan")

Metropolitan has also experienced drought related water supply impacts. As explained in detail in its opposition letter dated February 13, 2015, Metropolitan spent approximately $40 million dollars in 2014 to aggressively support water conservation, with additional costs to re-operate the system. Despite taking those measures, Metropolitan's in-region storage reserves dropped by 1,000,000 AF in 2014. There have been groundwater impacts as well. Metropolitan surveyed the 25 largest basins and sub-basins in its service area and estimates that there has been a 1,000,000 AF drop in groundwater supplies. This year, in addition to significant water conservation efforts that have already been implemented, certain areas of the Metropolitan service area will likely be faced with some level of mandatory rationing even if Metropolitan receives 15-20% of its SWP contract allocation. Metropolitan anticipates spending up to $100 million on water conservation in fiscal year 2015.

In addition to the specific examples noted above, there are numerous other urban areas in both the SWP and CVP service areas that depend greatly on Delta water supplies, and these are areas that have already taken highly commendable and historic measures to stretch their remaining water supplies to serve cities and towns.

c) Water transfers

Further, in spite of the TUCP proposing nothing on transfers, the Executive Director included a term that excluded transfers of non-SWP and non-CVP water from the 1,500 cfs pumping limitation.[12] However, he was silent on the effect of the pumping limitation on transfer of SWP and CVP water. That silence creates an ambiguity that is harmful and potentially frustrates state and federal laws that encourage the transfer of water from willing seller to willing buyers. To the extent the 2015 TUCP Order addresses transfer, it must be amended consistent with the 2014 TUCP order and explicitly exclude from the limitations water transfers "between SWP and CVP contractors."[13] This clarification is important because the member agencies of the SWC and Water Authority are seeking water to purchase, including from SWP and CVP, in order to mitigate the effects of the drought. The existing ambiguity may impede the ability to enter into purchase agreements, if there are willing sellers of SWP or CVP water.

d) Allocation of Stored Water

Without discussion or citation to any policy or legal basis, the Order purports to authorize the Executive Director or his representative to control the SWP and CVP. Condition 3 of the order provides:

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[12]Order at Condition 1(e).

[13] Order at Condition 1(b).

> DWR and Reclamation shall calculate and maintain a record of the amount of water conserved through the changes authorized by this Order, as well as a record of where that water was conserved, and shall submit such records on a monthly basis to the State water Board and fisheries agencies within 20 working days after the first day of the following month. **The use of such water shall be determined by the Executive Director or his representative, taking into consideration input from DWR, Reclamation, the fishery agencies, and other interested persons**. [emphasis added.]

The emphasized text is contrary to law. DWR and Reclamation are authorized to operate the SWP and CVP, respectively, pursuant to numerous laws, regulations, and contractual obligations, and to serve multiple often competing purposes. Nowhere do those laws authorize the Executive Director or his representative to assume the authorities vested with DWR and Reclamation. The emphasized text must be removed.

2) The partial denial is largely based on a perceived heightened risk of species entrainment that is not supported by the facts.

In the Order, the Executive Director concluded that he had insufficient information to find that pumping at 3,500 cfs as opposed to 1,500 cfs would not have unreasonable impacts on fish and wildlife. And, as a result, the Executive Director denied the request for the 3,500 cfs intermediate pumping rate. The Executive Director's conclusion runs counter to available technical information and the opinions of the state and federal fishery agencies. The Order at page 17 attempts to reconcile its conclusion to partially deny the TUCP due to concerns over fishery protection even though the state and federal fishery agencies supported it by saying that the fishery agencies are applying ESA standards and not the "unreasonably affect fish and wildlife standard" being applied in the Order. The problem is that the Order does not provide any facts that support its conclusion, other than the outdated and incorrect statements and unsupported assumptions discussed below.

a) Delta Smelt.

The Order incorrectly describes an elevated risk of entrainment and then uses it as a basis for denying the intermediate 3,500 cfs level of pumping.

Contrary to the statements in the Order which reflected conditions in December 2014 rather than end of January 2015 conditions, the Delta Smelt population at the end of January 2015 was in its standard geographic arc from Cache Slough down the Sacramento River through Suisun Bay and Marsh. Based on the Spring Kodiak Trawls and the Jersey Point and Prisoners Point Trawls, the nearest presence of significant numbers of Delta Smelt appeared to be in the lower San Joaquin River, perhaps 20 miles from the from the CVP and SWP pumping facilities. In addition, turbidity levels in the Delta at the early warning monitoring locations had dropped sharply since the December storm events and were well below the 12 NTU level of concern. Then, and now, there has not been any salvage of Delta Smelt at the water projects since January 7, 2015.

Conditions are continuing to change as a result of runoff from the recent storm (February 7-8, 2015). Turbidity in the early warning monitoring stations will likely continue to rise, and Delta Smelt are moving into the Jersey Point and Prisoners Point region, which is still 15 miles from the pumping facilities. However, current (February 12th) outflow is around 40,000 cfs, therefore the currently changing conditions are not reflective of the conditions that would exist if outflow

dropped below 7,100 cfs, which is when the intermediate level of pumping would have been in effect. Conditions when outflows are below 7,100 cfs would be like those that existed when the Order was issued at the end of January and in early February, turbidities at the early warning stations would be under 12 NTU and the Delta Smelt population would be centered in the western Delta.

However, whether conditions in the Delta are changing should not be a concern for the Water Board or its Executive Director because the FWS has already established early warning monitoring. When recent rain events (and hopefully future events) cause turbidity to increase in the Delta, which could cause Delta Smelt to once again move upstream, the FWS monitoring system (with daily trawls when storm events are predicted) would identify this movement. The FWS maintains the ability to limit pumping if conditions warrant, and the SWP-CVP have more ability to manage turbidity intrusion in the south and central Delta. As an example, during the December 2014 storm events, export reductions to target OMR flows were implemented based on real-time fish and turbidity monitoring data. This action was sufficient to keep storm driven turbidity levels below the concern level in the south Delta. OMR flows under the intermediate pumping level proposed in the TUCP would be less negative than those that successfully prevented turbidity intrusion during much larger storms in December 2014.

In the last paragraph of the Delta Smelt section on page 10, the Order acknowledges that the Biological Review concluded that the risk of entrainment is low as long as Delta Smelt are not drawn into the San Joaquin River in the vicinity of Prisoner's Point[14] and proposed monitoring to determine if and when that low risk were to increase. Despite that acknowledgment, the Order describes the entrainment risk for Delta Smelt (at a time when Delta Smelt were not in the vicinity of Prisoners Point) as high. It is not clear what information was used to counter the assessment in the Biological Review. The only attempt to reconcile the Order with the Biological Review is a statement that it is unclear if the proposed monitoring would be effective, Order p. 19, but no information is provided that would seriously question the effectiveness and apparently no effort was made to suggest improvements to the monitoring.

i.) The Order relied on a number of outdated and unsupported conclusions.

- The Order incorrectly states at page 9 that Delta Smelt have not been identified in Cache Slough, stating:

  Further, according to the Biological reviews submitted with the TUCP, monitoring has not detected any Delta Smelt in the Cache Slough and Liberty Island complex, a location that in previous years has been considered a spatial refuge for delta smelt, especially from the effects of entrainment and the Project pumping facilities.

Contrary to the statements in the Order, the Delta Smelt population is widely distributed from Cache Slough through Suisun Bay, with presence no farther upstream than Jersey Island in the

[14] The Biological Review was quite conservative in its characterization of when entrainment risk is high. Prisoners Point is still pretty far from the pumping facilities and Delta Smelt would not be expected to move toward the pumping facilities unless a turbidity bridge were created down to the south Delta, which is the condition that Reclamation and DWR were trying to avoid with their voluntary early pumping curtailment at the end of December.

lower San Joaquin River so the concern that Delta Smelt do not have spatial refuge from the pumping facilities is not supported. See Figure 1.

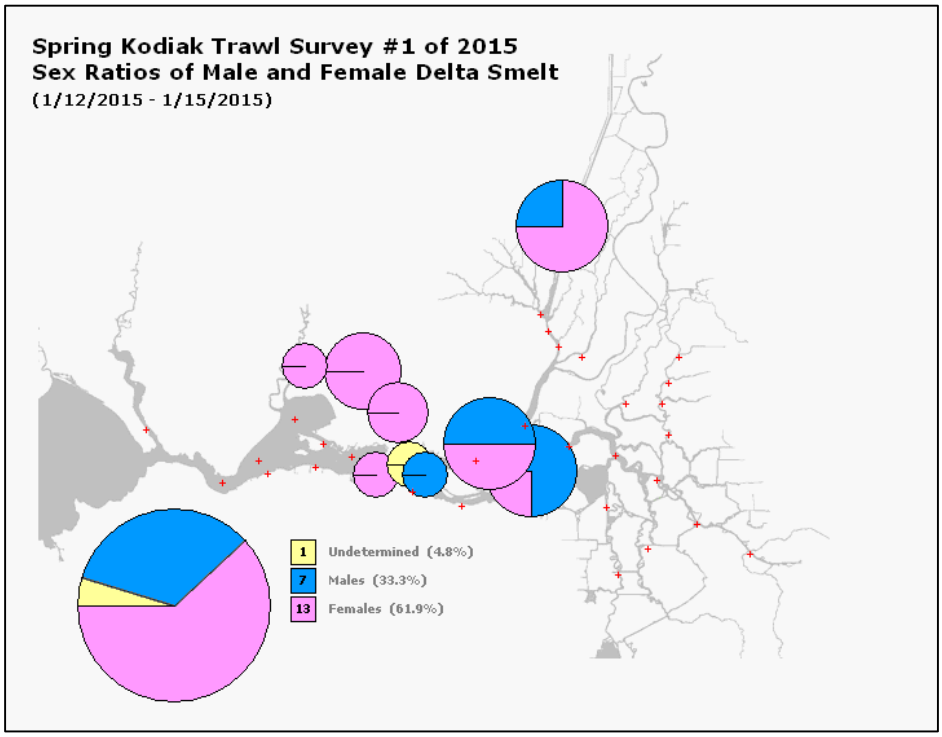

Figure 1. Spring Kodiak Trawl Survey #1, January 12-15, 2015.

The uppermost circle in Figure 1 represents the Delta Smelt located in Cache Slough. The December survey also showed that Delta Smelt were in Cache Slough, although in smaller numbers. There are no regular surveys in Liberty Island so there is no basis for conclusions regarding presence or absence in Liberty Island.

- The Order incorrectly states at p. 9 that the Delta Smelt population has moved closer to the export facilities, thereby increasing the potential for entrainment stating:

  According to the Biological Reviews, this has shifted the centroid of the delta smelt population distribution south and closer to the Project export facilities, making the condition of and risks to the delta smelt in the lower Sacramento River and San Joaquin River of greater importance to the overall status of the species.

Contrary to the Order, the Delta Smelt population at the end of January (when the Order was issued) was centered in the western Delta so the concern that the population was distributed near the south Delta pumping plants was not supported. Figure 1, above, shows conditions at the end of January and into early February, and the Delta Smelt population was located west of Jersey Point, away from the project pumping facilities. The FWS early warning monitoring surveys indicated that Delta Smelt had not shifted their distribution south, closer to the pumps, as stated in the Order.

The FWS early warning monitoring data shown in Figure 2 indicates that Delta Smelt moved toward Jersey Point in December, presumably in response to the December storm events; but by

the end of January, Delta Smelt had shifted away from Jersey Point. Figure 3 shows a similar pattern at Prisoner's Point, indicating that the movement away from Jersey Point was not in the direction of Prisoner's Point. Turbidity in these areas had dropped off significantly by the end of January.

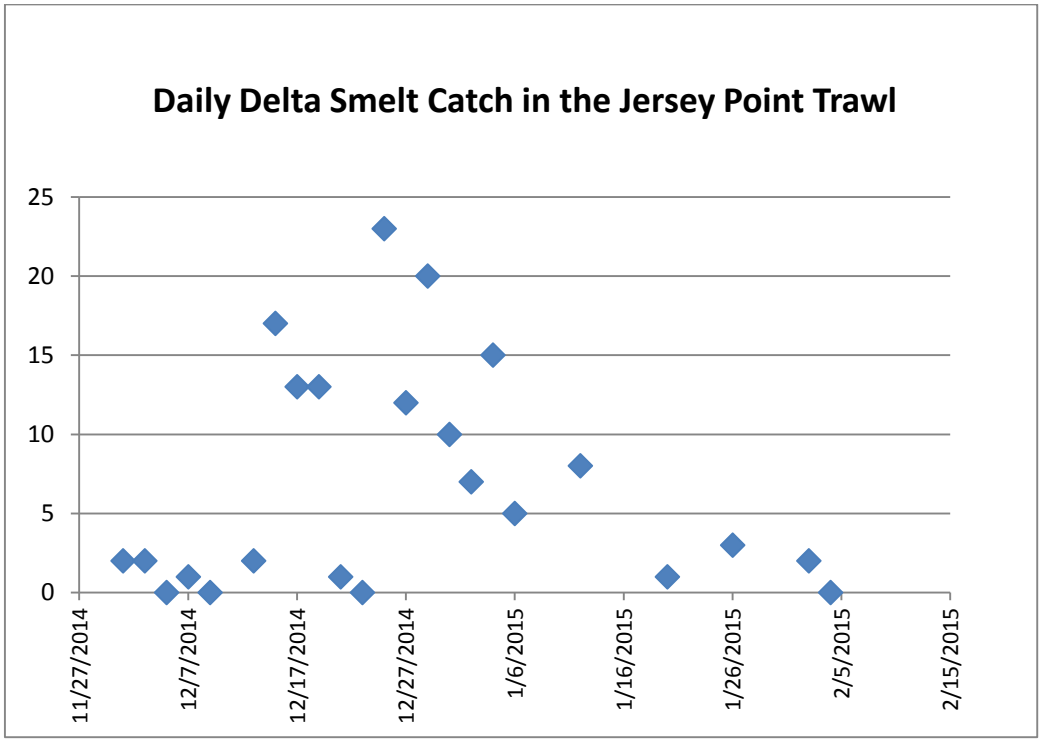

Figure 2. Daily Delta Smelt catch in the Jersey Trawl.

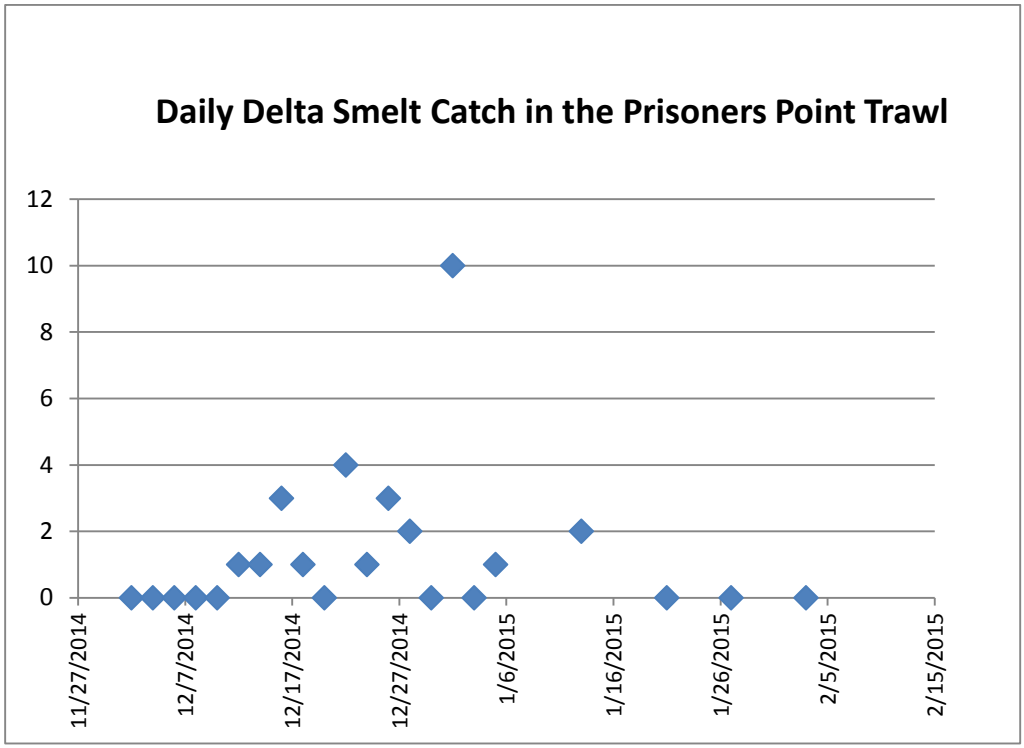

Figure 3. Daily Delta Smelt Catch in the Prisoner Point Trawl.

Further supporting the view that Delta Smelt had moved back to the western Delta, away from the pumping facilities, is the fact that there hadn't been, and there still hasn't been, any salvage in over a month. See Figure 4.

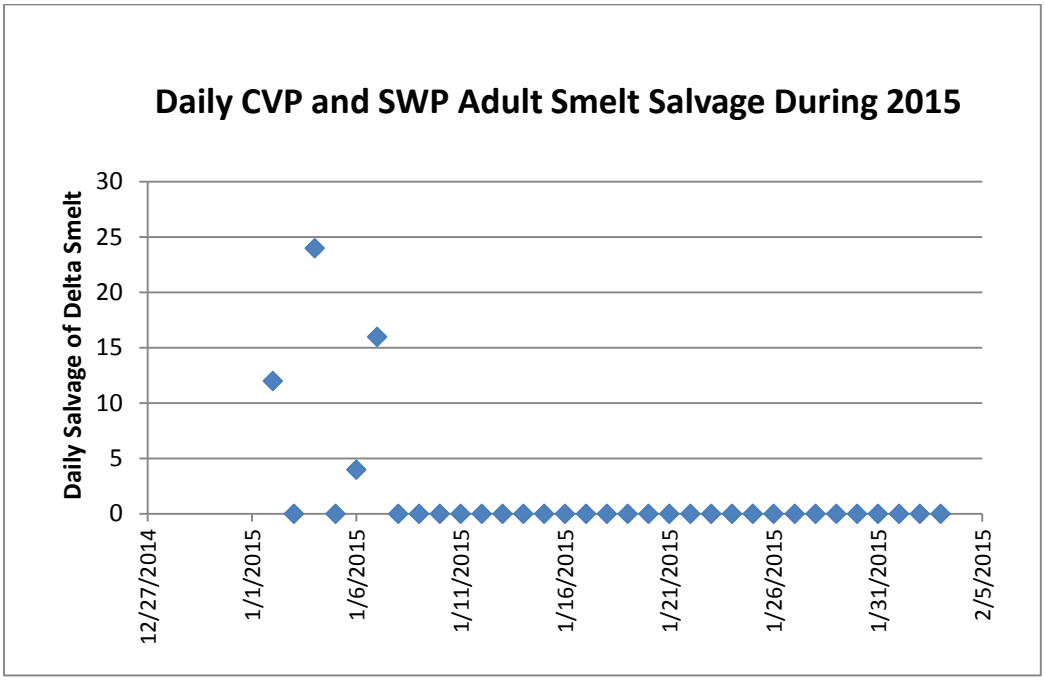

Figure 4. Daily CVP and SWP Adult Smelt Salvage During 2015.

The recent storm does not appear to have changed conditions in the Delta in a manner that would be expected to significantly increase the entrainment risk, at least as of the date of this letter. The turbidity concern level at the early monitoring stations of Victoria Canal, Holland Cut and Prisoner's Point is established at 12 NTU, but as Figures 5-8 indicate the recent storms have not yet increased turbidity to a level of concern at these locations, although turbidity does appear to be increasing. Delta Smelt have been identified at the Jersey Point monitoring station as indicated in Figure 8 but not at the Prisoner's Point monitoring station as indicated in Figure 7, although Delta Smelt may be moving toward Prisoner's Point as turbidity increases.

It is not surprising to find Delta Smelt at Jersey Point, and it is not necessarily an indication of an entrainment event, as evidenced by the FWS' experimental trawling in 2014 which identified large numbers of Delta Smelt at Jersey Point and these Delta Smelt were not drawn into the project facilities. Jersey Point is fifteen miles from the South Delta pumping plants, so the Delta Smelt identified here are not in imminent risk of entrainment.

Currently outflows are in excess of the outflow standard. If and when outflows decrease again to 7,100 cfs and below, turbidity will settle out, Delta Smelt distribution will have shifted west again, and the entrainment risk will be low. The Smelt Working Group's notes indicate that at lower outflows, with conditions like those that existed prior to the most recent storm, the entrainment risk is low at moderate rates of pumping.[15] The SWO and CVP pumping could pump at the

[15] SWG notes from February 2, 2015, indicate a medium risk of entrainment at OMR levels as negative as -5,000 cfs and a low risk of entrainment when OMR levels are as negative as -3,500 cfs.

intermediate level of pumping under the conditions described in the TUCP and the risk of Delta Smelt entrainment would be low.

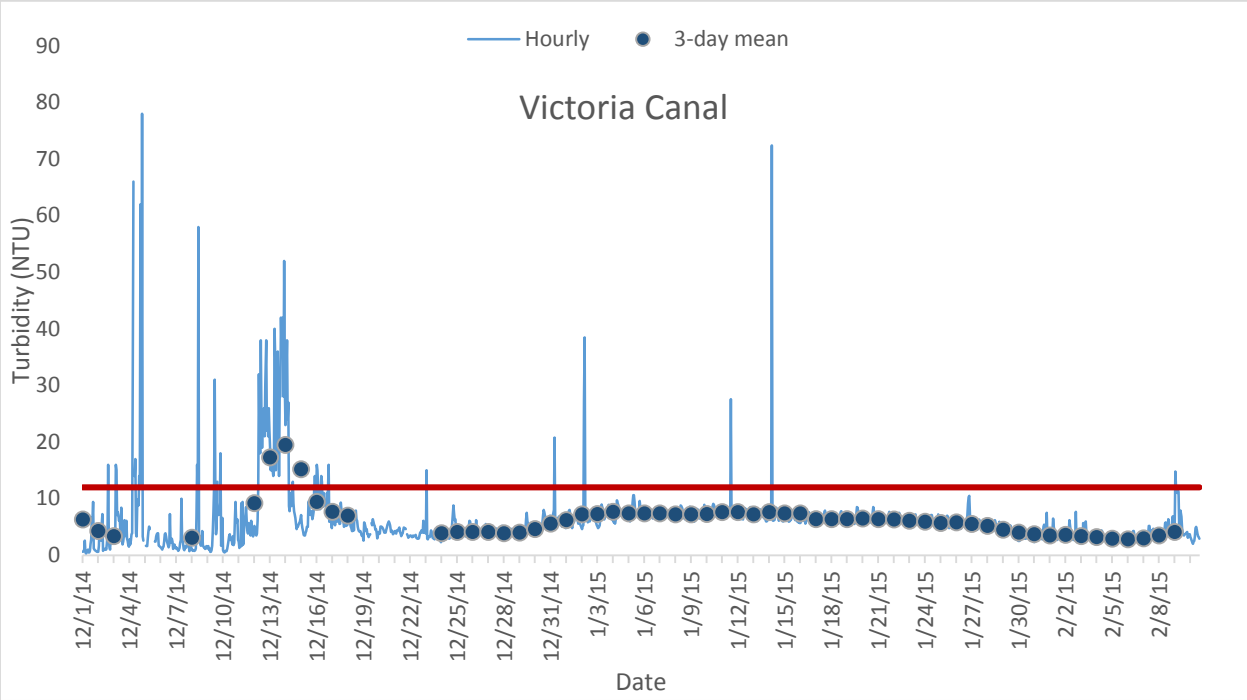

Figure 5. Turbidity at Victoria Canal.

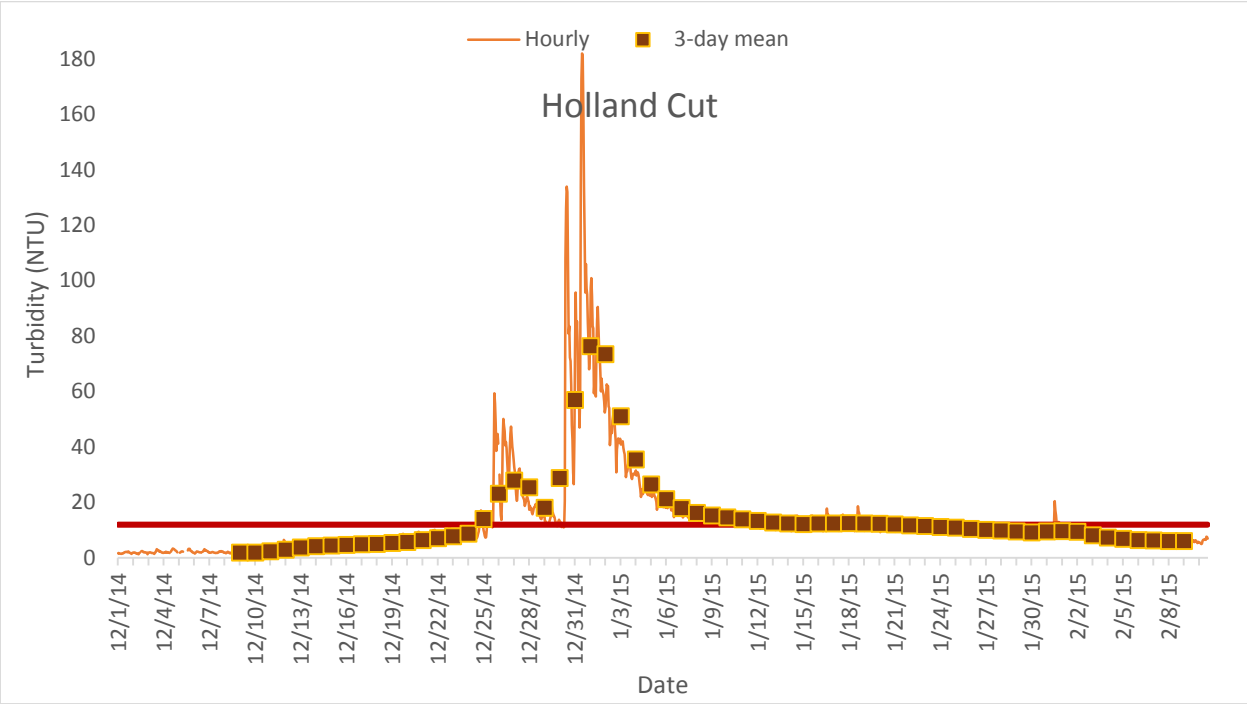

Figure 6. Turbidity at Holland Cut.

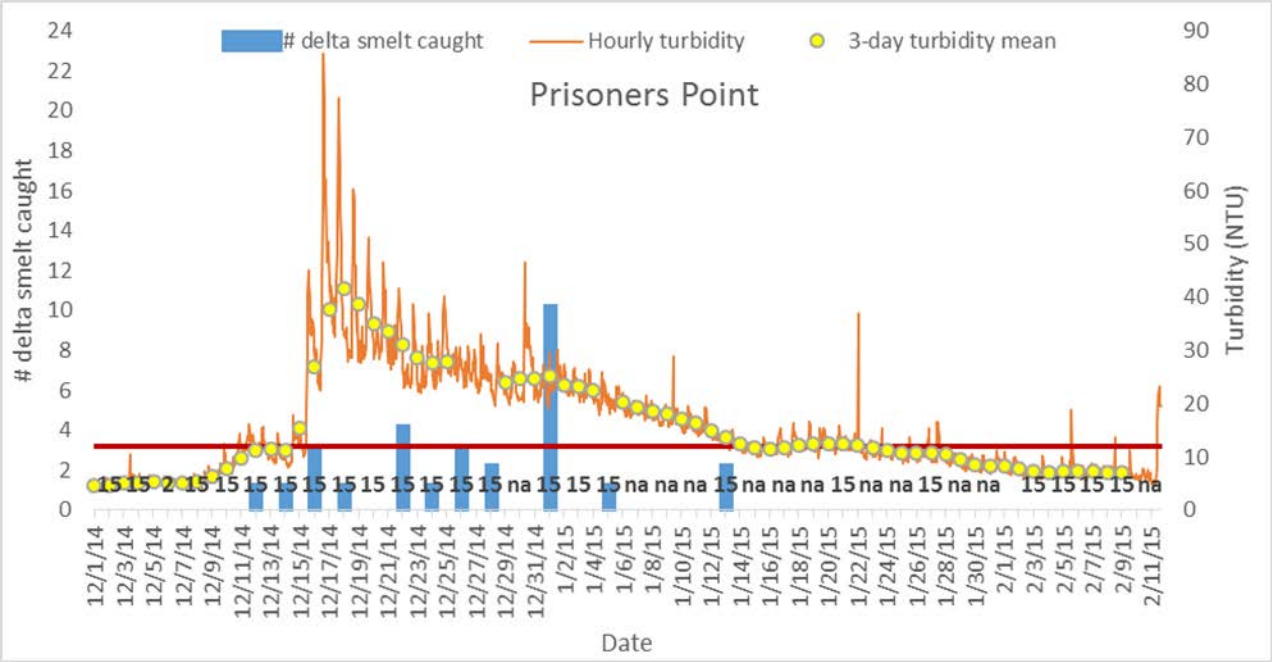

Figure 7. Turbidity and catch of Delta Smelt at Prisoner's Point.

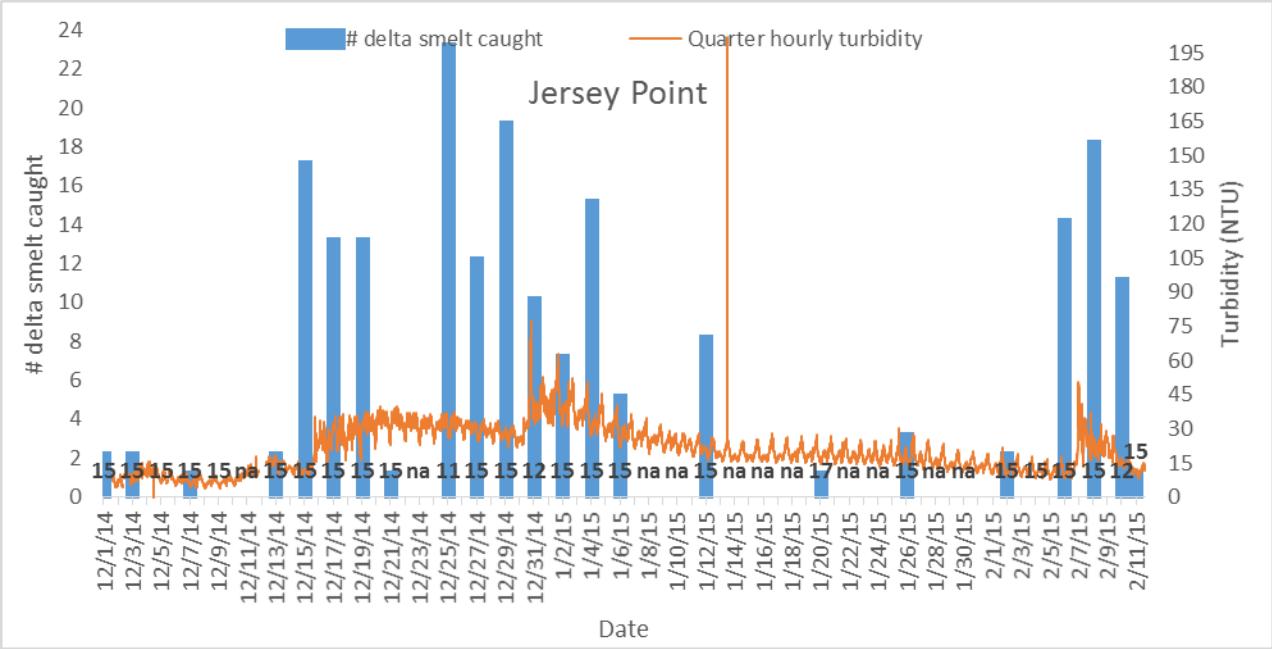

Figure 8. Turbidity and Delta Smelt catch at Jersey Point.

- The Order makes unsupported statements about the effect that changes in outflow would have on Delta Smelt distribution.

The Order assumes that flow alone would cause Delta Smelt distribution to change. The Order at p. 10 states, "Continued minimal reservoir releases proposed in the TUCP are expected to cause the centroid of the delta smelt population to shift inland, exposing a greater proportion of the population to entrainment…." The Order provides no basis for this conclusion. Contrary to the

Order, there are multiple factors that influence Delta Smelt distribution. Winter-spring outflows or the location of the low salinity zone (X2) alone is not a good predictor.

As illustrated by Manly *et. al.* (2014),[16] outflow or conductivity alone is not a necessarily the best factor to consider for the prediction of Delta Smelt presence. Using methods similar to Feyrer *et al*. 2011, Manly *et al.* concluded that conductivity alone only explained 2.8% of Delta Smelt presence-absence. Secchi depth (turbidity) alone explained 3.2% and region (physical location) explained 4.7% of presence-absence. Feyrer *et al.* 2011 and Manly *et al.* 2014 agree that secchi depth and conductivity are roughly equal in importance for explaining Delta Smelt presence-absence. The difference is that Manly *et al*. found that the geographic location was also an equally good predictor, regardless of salinity and turbidity levels, suggesting that Delta Smelt distribution may be related more to the physical features of the Bay and Delta regardless of abiotic factors such as salinity.

The Order should not have relied on changes in outflow (X2, conductivity) to make predictions about Delta Smelt behavior.

ii.) The new hypothesis regarding Delta Smelt abundance relationship to spring outflow is too uncertain to be a basis for decision-making.

The MAST report contains a statistical analysis that suggests that during the POD years Delta Smelt have a statistically significant abundance (based on the 20 mm survey) relationship with spring outflow. Even though the FWS consultation letter[17] references the MAST Delta Smelt 20mm survey: spring outflow correlation at pp. 2-3, this analysis is highly uncertain and very preliminary, and therefore should not be used to inform decision-making.

The MAST report agrees with this conclusion and properly cautions against using its modeling results for decisions, stating at p. 152,[18] "**Furthermore, results are preliminary and included for illustrative purposes only; peer-reviewed publications of these analyses need to be completed before they can be used to draw any conclusions.**[emphasis in original]" The MAST Report further cautioned at p. 153:

> As an example, we present preliminary results (Mueller-Solger, USGS, unpublished data) of univariate and multivariate statistical analyses of X2 relationships with annual Delta Smelt abundance indices that follow the approach in Jassby et al. (1995). The purpose is to further explore some of the hypotheses related to hydrology and the size and position of the LSZ included in our conceptual model and to illustrate the importance of considering more than one factor when trying to understand Delta Smelt dynamics. We include this brief exploration in this report because it serves as a useful and relevant example, but as noted above, **we advise readers that these are preliminary results from an analysis that has not yet undergone peer review and should be viewed with caution**….[emphasis added].

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[16] Manly, B.F.J., Fullerton, D., Hendrix, A.N., Burnham, K.P. Comment on Feyrer et al. "Modeling the Effect of Future Outflow on the Abiotic Habitat of the Imperiled Estuarine Fish. *Estuaries and Coasts*, 2004. DOI 10,1007/s12237-014-9405.

[17] United States Fish and Wildlife Service consultation letter on TUCP, dated January 30, 2015.

[18] An Updated Conceptual Model of Delta Smelt biology: Out evolving Understanding of an Estuarine Fish, IEP Technical Report 90, January 2015.

The Delta Science Program's 2014 Delta Outflows and Related Stressors Panel[19] reviewed the draft MAST Report's Delta Smelt correlation analysis and also encouraged caution in interpreting its meaning stating at p. 35:

> Many of the uncertain, but restrictive, assumptions that would need to be stated explicitly in a properly documented full life-cycle model are often implicit, but never evaluated, in simpler analyses. A good example here would be the negative relationship between the trend in the 20 mm tow-net series for Delta Smelt and fall X2 (IEP MAST 2013, as presented by Meuller-Solger at the workshop on say 2). If that relationship alone is used to support increased flows, then decision makers are implicitly assuming that increasing the abundance of larval Delta Smelt will lead to a similar increase in the population of adults. This may not be the case if flow has substantial effects on growth and survival in later life stages or if the effects of environmental factors unrelated to X2 are important in determining the ultimate survival to the adult stage. Life-cycle modeling offers a framework for making explicit the calculations from changes in larvae to population-level responses.

The Delta Science Panel further explained at p. 37 that it is important to identify uncertainty when making predictions regarding the effect that a change in outflow may have on species abundance. To illustrate this point, the Panel critically reviewed the TBI/NRDC Longfin Smelt analysis that was cited in the SWRCB 2010 Flow Report, explaining how that analysis was "over sold" because it did not provide error bars. The Panel explained this error was not unique to the TBI/NRDC analysis stating, "This issue, however, applies to many other analyses reported in the literature, in parts of presentations to the Panel, and in synthesis reports such as the SWRCB (2010) report." The Delta Smelt spring flow correlation in the MAST report also makes this mistake by suggesting an optimum flow range without providing error bars to explain the uncertainty in that prediction.

The cautionary statements contained in the MAST Report are appropriate. The uncertainty extends to interpretation of correlations using the 20 mm index, which is in part related to the unique nature of the survey, and assumptions underlying development of the correlation itself. Examples of this uncertainty include (but are by no means limited to):

- <u>It is not clear that the 20 mm Delta Smelt Index is a good proxy for species abundance</u>.
    - The survey is not computed as an abundance index (measured density of fish multiplied by volume of water) rather it is designed to represent the geometric average of CPUE for the stations that happen to have been chosen for this survey. Some small areas have multiple stations. Some likely key areas have few or no stations. Without methodological consistency, it is impossible to know whether the 20 mm Index really represents the same thing as the FMWT, STN, or SKT Indices.
    - The 20 mm survey does not cover the species range. Many Delta Smelt are downstream of the survey during wet years and many are likely upstream of the survey in dry years (including small tributaries to the Bay). For example, in the one year that the Napa

[19] Reed, D., Hollibaugh, J., Korman, J., Peebbles, E., Rose, K., Smmith, P., Montagna, P. Workshop on Delta Outflows and Related Stressors Panel Summary Report, Delta Stewardship Council, Delta Science Program, May 5, 2014.

River was sampled (2001), all the way to the City of Napa, the CPUE there was between 10 and 100 times higher than any other station in the 20 mm survey. Thus, the locations of the survey stations could explain the curved relationship between the 20 mm Index and X2.

- The 20 mm survey provides only a slice of over-all species abundance. The 20 mm survey gear is efficient over only a relatively small band of fish lengths. The 20 mm Delta Smelt Index does not represent the entire cohort, but only that portion of the cohort within a limited size range over a limited period of time. This point can be illustrated by comparing length frequency curves in the 20 mm survey against other survey programs conducted at the same time. For example, in 2005-2007, if the 20 mm survey is compared to the larval survey (which was conducted during April-July), the results show that the 20 mm survey did not sample very small Delta Smelt effectively. Similarly, if the Summer Townet survey (conducted in June of many years) is compared to the 20 mm survey, the results show that many larger Delta Smelt were missed in the 20 mm survey. The survey does not correct for changing gear efficiency based on length.

- The 20 mm index does not sufficiently correct for life stage. The Index is computed using the two surveys before and after average length reaches 20 mm. This is designed to ensure that the average life-stage is the same in the Index each year. However, the date at which the average length reaches 20 mm can vary by around 30 days. In years when Delta Smelt reach 20 mm later in the season, their small size implies higher mortality rates and lower egg production. Thus, a 20 mm Index made up of many very small smelt late in the spring may get a high index value, but whether that high number is really evidence of a good recruitment year is less clear.

- <u>The statistical correlation is difficult to interpret.</u>

  - The 20 mm-spring outflow relationship identified for the first time in the MAST Report is largely driven by the assumption that there was a step-change indicating a regime change in the Delta at the beginning of the POD. In doing so, many years of Delta Smelt abundance data is ignored. If that data isn't ignored, there is no statistically significant relationship. That assumption needs to be evaluated.

  - The correlation is based on 12 data points. The chance of getting a correlation when any 12 points of data are analyzed is high, indicating a high probability of a spurious relationship.

  - The observed relationship between the 20mm survey and spring outflow is largely driven by two data points from years that had very high spring outflows.

  - The correlation examines only one portion of the Delta smelt lifecycle. The correlation between the 20mm Delta smelt Index value and the upcoming SKT Index value shows no correlation, indicating that even if flow could increase larval abundance in the spring, any benefit wears off by the time the smelt are ready to spawn.

It should be further noted that no other univariate or multivariate analysis has ever identified a statistically significant relationship between spring outflow and Delta Smelt abundance. (See e.g., Maunder and Deriso 2011,[20] Thompson et al. 2010,[21] McNally et al. 2010,[22] Rose et al. (2013),[23] Kimmerer 2002[24], 2009,[25] 2013.[26])

Even if the outflow relationship described in the MAST report is real, the data do not show a measureable difference in survival at the outflow levels being contemplated with or without the intermediate export level. The data do not show a significant difference in survival until outflows averaged over the entire February to June period are in excess of 29,000 cfs (approximately X2<65 km). These outflow levels are not something that can be achieved with reservoir releases or export reductions this year.

As the MAST Report fully acknowledges, its Delta Smelt spring outflow correlation analysis requires further investigation and peer review before it can be properly considered for decision-making.

b. Longfin Smelt

The Order describes an entrainment risk that does not exist and then uses it as a basis for denying the intermediate 3,500 cfs level of pumping. The Order apparently relied on a number of outdated and unsupported conclusions, as follows:

- The Order makes the unsupported assumption that the Longfin Smelt population is centered close enough to the pumping facilities that a large portion of the population, particularly larvae, could be entrained. In reality, the Longfin Smelt larvae are distributed downstream of the confluence, and downstream of the low salinity zone.

There is little or no factual support for the Order's conclusion at p. 10 that, "…reductions in flows associated with the TUCP are expected to shift the centroid of the longfin smelt population inland which will expose a greater proportion of the adult population to entrainment at the Project facilities." The centroid of the Longfin Smelt population is far away from the south Delta pumping

[20] Maunder, M. and Deriso, R. 2011. A state-space multistage life cycle model to evaluate population impacts in the presence of density dependence illustrated with application to delta smelt (*Hyposmesus transpacifics*). *Can. J. Fish. Aquat*. Sci. 68: 1285-1306.
[21] Thomson, J., Kimmerer, W., Brown, L., Newman, K., MacNally, R., Bennett, W., Feyrer, F., Fleishman, E. 2010. Bayesian change point analysis of abundance trends for pelagic fishes in the upper San Francisco Estuary. *Ecological Applications*, 20(5), p. 1431-1448.
[22] MaNally, R., Thomson, J., Kimmerer, W., Feyrer, F., Newman, K., Sih, A., Bennett, W., Brown, L., Fleishman, E., Culberson, S., Castillo, G. 2010. Analysis of pelagic decline in the upper San Francisco Estuary using multivariate autoregressive modeling (MAR). *Ecological Applications*, 20(5), pp. 1417-1430.
[23] Rose, K., Kimmerer, W., Edwards, K., Bennett, W. 2013. Individual-based modeling of delta smelt population dynamics in the upper San Francisco Estuary: II. Alternative baselines and good versus bad years. Transactions of the American Fisheries Society, 142:5. 1260-1272.
[24] Kimmerer, W. 2002. Effects of freshwater flow on abundance of estuarine organisms: physical effects or trophic linkages. *Mar. Prog. Ser*., Vol. 243, p. 39-55.
[25] Kimmerer, W., Gross, E.S., MacWilliams, M.L. 2009. Is the response of estuarine nekton to freshwater flow in the San Francisco Estuary explained by variation in habitat volume? *Estuaries and Coasts*, 32:375-389.
[26] Kimmerer, W., MacWilliams, M., Gross, E.S. 2013. Variation of fish habitat and extent of the low-salinity zone with freshwater flow in the San Francisco estuary. *San Francisco Estuary and Watershed*, 11(4), p. 1-18.

facilities. There is no factual basis for the Order to disagree with the Biological Review and the decision by the state and federal fishery agencies.

As the Biological Review explained, Order at p. 10, the, "…detection of larval longfin smelt in the Cache Slough Complex and the current distribution of adults indicate that the larval population is likely to be widely dispersed during February and March [and therefore project operations are not expected to affect them]." This conclusion is supported by the current surveys; the species is actually much more widely distributed than even acknowledged by the review.

Figure 9 shows the larva trawl distribution results. The Longfin Smelt larvae distribution is centered below the confluence and in the Bay.

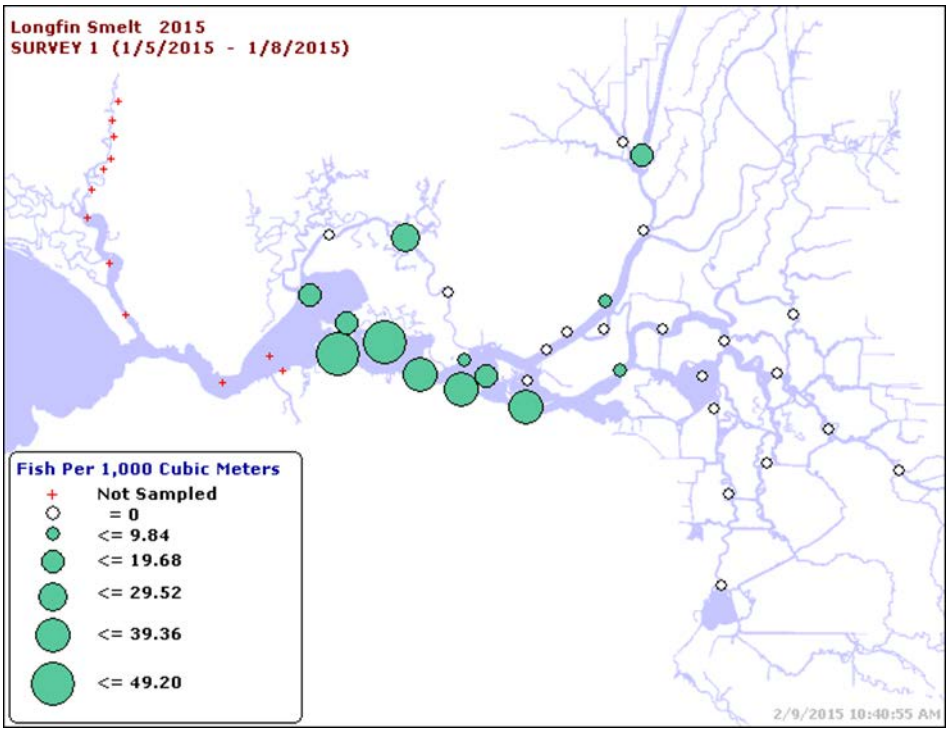

Figure 9. Longfin Smelt larva survey.

The larval Longfin Smelt distribution in the Delta has been unchanged in the two subsequent surveys. Smelt Larva Survey #2 was in the field January 19 through 26. Processing is now complete except for the Napa river stations. A total of 191 larval Longfin Smelt ranging in size from 5-10mm were observed in samples taken from stations generally from the confluence and downstream.[27]

Smelt Larva Survey #3 was in the field February 2 through 4. Data processing is ongoing. A total of 207 larval Longfin Smelt ranging in size from 5 to 10 mm were observed in samples that have been processed to date. Larvae were detected throughout the system, but the greatest densities so far are downstream of the confluence.[28]

[27] Smelt Working Group Notes, January 2015.
[28] Smelt Working Group Notes, February 2015.

The Order apparently assumes that Longfin Smelt only spawn upstream in the Delta. This is an incorrect assumption. The Delta appears to be the eastern edge of their distribution. The most current information suggests that adult Longfin Smelt are spawning near the locations where they are being found in the surveys, out in the tidal marshes surrounding the Bay. Dr. Lenny Grimaldo recently reported at the October 2014 IEP Conference his year-1 survey results. Dr. Grimaldo's team found newly hatched Longfin larvae in the tidal wetlands surrounding Suisun Bay. Newly hatched Longfin Smelt have also been identified in the Napa River,[29] and the Petaluma River.[30] Dr. J. Hobbs also observed Longfin Smelt larvae in the Napa River this year.[31]

The assumption that Longfin Smelt larvae have a low salinity tolerance should also be reconsidered. The larvae that are being counted in the recent surveys are being found in a range of salinities. Dr. Grimaldo, for example, observed the Longfin Smelt larvae are being found in brackish marshes.

Since the majority of Longfin Smelt larvae are downstream of the confluence, the Order's assumption that a change in outflow would impact Longfin Smelt larvae is unfounded.

- The Order's conclusion that Longfin Smelt survival would decrease as a result of a moderate change in outflow is unsupported.

The Order states at p. 10, "The strong and consistent relationship between outflows and survival of juvenile to age-1 longfin smelt, also supports the conclusion that reductions in outflow this year will reduce survival of these fish (Jassby *et al*. 1995)." As Kimmerer 2004[32] pointed out, these X2-abundance relationships are retrospective and not predictive. However, even if the relationship were used predictively, the actual change in abundance (rather than the percent change) would be expected to be quite small.

However, as Kimmerer et al. 2002,[33] at p. 1285 cautioned, "Predicting these responses is contingent on understanding the mechanism underlying the flow relationship." The biological mechanism explaining the Longfin Smelt abundance correlation is unknown. Interpreting the flow correlation is further complicated by the fact that outflow, X2, hydrology, and inflows into local tributaries are all cross correlated, so it is difficult to determine which flow is directly or indirectly biologically relevant. There is recent evidence that suggests that the biologically important flow relationship isn't with X2 or reservoir managed outflow on the Sacramento River. Maunder *et al.* (2014)[34] found Napa River inflow to have greater explanatory power than X2. Moreover, some of the preliminary Longfin Smelt sampling investigations suggest that Longfin Smelt spawn in the tributaries surrounding the Bay, which further supports these modeling results. However, more field research is needed.

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[29] (USCOE 200 study and 20 mm survey in 2001 and larval study from 2005-2007)
[30] Personal communication, J. Hobbs.
[31] Personal communication, J. Hobbs.
[32] Kimmerer, W. 2004. Open water processes of the San Francisco Estuary: from physical forcing to biological responses. *San Francisco Estuary and Watershed*, 2(1), p. 1-142.
[33] Kimmerer, W. 2002. Effects of freshwater flow on abundance of estuarine organisms: physical effects or trophic linkages. *Mar. Prog. Ser.*, Vol. 243, p. 39-55.
[34] Maunder, M.N., Deriso, R.B., Hanson, C.H. Use of state-space population dynamics models in hypothesis testing: advantages over simple log-linear regressions for modeling survival, illustrated with application to longfin smelt (*Spirinchus thaleichthys*). *Fisheries Research* (2015) 164:102-111.

The interpretation of the Longfin Smelt abundance-X2 correlation is too uncertain to be the basis for making regulatory decisions. The risk of entrainment of Longfin Smelt is very low given their current distribution and there has been no observed Longfin Smelt at the pumping facilities this season.[35]

c. Chinook salmon

The Order describes an entrainment risk that does not exist and then uses it as a basis for denying the intermediate 3,500 cfs level of pumping.

- The Order's conclusion that the denial of the intermediate level of pumping was necessary because of the heightened risk of entrainment is unsupported by facts.

The Order at p. 18 states that winter-run, spring-run and steelhead are at an increased risk of entrainment, and this heightened concern is the reason why the intermediate level of pumping was rejected. However, the Order does not provide support for this conclusion. The Order also fails to recognize that the NMFS biological opinion will continue to manage entrainment at the project facilities and none of the species identified are anywhere near their incidental take levels. (See salvage results, Attachment B.)

As of February 8, 2015, take of winter-run Chinook salmon at the pumping facilities is only at 4% of the incidental take level ("ITL"), which is set at 2% of the Juvenile Production Estimate. In other words, loss of winter-run Chinook salmon at the pumping facilities this season represents approximately 0.08% of the population. Similarly, take of spring-run Chinook salmon is at 4.5 – 5.8% of the ITL, and take of steelhead is at 0.1% of the ITL, both of which represent insignificant amounts of the total population levels.

In addition, while NMFS estimates that >95% of juvenile winter-run are within the Delta, there has only been 1 winter-run sized salmon caught at any of the central or south Delta locations that were sampled[36] during FWS trawls and beach seines between September 2014 and February 2015 (See survey results, Attachment C.)[37] As indicated above, there have been some low levels of salvage at the project facilities, and this suggests that there are some salmonids in the central and south Delta but that densities in the central and south Delta are very low, particularly as compared to the densities observed in the northern and western Delta.

Further, the small increment of additional pumping that would occur under the TUCP would not be expected to increase entrainment at the projects' pumping facilities. Salmonids do not detect

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[35] Only 40 Longfin Smelt were salvaged at the SWP and CVP pumping facilities during the entire 2014 Water year, when outflows were similarly low.

[36] Although no winter-run length Chinook were caught in the central or south Delta or San Joaquin beach seines, many of the beach seine sites in the south Delta were not sampled due to physical limitations of lack of beach and overgrowth of vegetation.

[37] The distribution maps include late-fall run and winter-run length Chinook in the older juvenile Chinook classification. The two older juvenile Chinook noted in the Jersey/Prisoners Point Trawl on the distribution maps for the weeks of 12/7/14 and 12/21/14 were late-fall run length Chinook salmon, and the one older juvenile Chinook noted the week of 12/14/12 was a winter run length Chinook salmon.

"flow" rather they can detect the velocity associated with flow.[38] New science developed since 2009, including recommendations of independent science review panels, indicate that instantaneous velocities (rather than tidally averaged flows) provide the most appropriate basis for assessing the effect of exports (or OMR management) on hydrodynamics relevant to juvenile salmonids. Due to the size of the Delta, and the complexity and multitude of influencing factors, field-observations cannot be used to evaluate how exports can affect water velocities. Simulations provided by DSM2 Hydro provide the best and most readily accessible means for assessing the influence of exports on water velocities and flow directions in the Delta.

Though not identical to export conditions currently being considered, DSM2 Hydro simulations for exports at 2,333 cfs vs. exports at 3,622 cfs (San Joaquin River inflows at 1,500 cfs) demonstrate that the effect of exports on velocities is dramatically different than is commonly expected or understood (See, Attachment D). Increasing exports produces changes in instantaneous velocities only in the South Delta and is thus unlikely to influence routing or survival for fish outside of this area. For migratory fishes that do reach the South Delta, the effect of exports on velocities is still relatively modest- with most velocities still well within the sustained swimming speeds of juvenile Chinook salmon and steelhead. Since the observed densities of salmonids in the central and south Delta are very low, the likelihood that salmonids would be negatively affected by the proposed intermediate level of pumping is also low.

In addition, as stated in NMFS' letter of support for the TUCP, NMFS expects to work closely with Reclamation and DWR "to track and assess the real-time distribution of both wild and hatchery winter-run Chinook salmon and continually assess whether additional measures may be implemented to minimize adverse effects of operations to this critically imperiled species." (NMFS letter at p. 7.)

The evidence does not support a conclusion that approving the intermediate level of project pumping would heighten the risk of salmonid entrainment.

- The Order is inconsistent in its discussion of the facts, including at times discounting the fundamental importance of the reduced outflow for the protection of Chinook salmon.

The most important statement the Order makes in terms of the TUCP's effect on salmon is at p. 12:

> The Biological Review conclude that without the changes to outflows, the low reservoir storage conditions are likely to result in extremely high egg mortality or even complete failure of natural BY 2015 spring—run Chinook and winter-run Chinook below Keswick Dam due to high water temperatures. Relaxation of Delta outflow requirements and San Joaquin River flow requirements, while still continuing to meet required tributary releases from Oroville, Folsom, and New Melones, is projected to enhance the opportunities for summertime cold water management across Project reservoirs in 2015.

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[38]Monismith, S., M. Fabrizio, M. Healey, J. Nestler, K. Rose, and J. Van Sickle. 2014. Workshop on the interior delta flows and related stressors panel summary report. Delta Stewardship Council. July 2014. Available:http://deltacouncil.ca.gov/sites/default/files/documents/files/Int-Flows-and-Related-Stressors-Report.pdf

The TUCP is intended to provide vital protections for Chinook salmon by balancing the needs for outflow with the need for temperature protection. It is unconscionable that the Order at p. 17 attempts to discount the importance of this relief by stating:

> While the Projects' ability to maintain temperature control for fish and salinity control in the Delta may be improved by the changes, there are existing regulatory requirements that would likely ensure that these minimal requirements are met regardless of the changes.

This statement in the Order is unsupported by the facts and ignores the reality of the water constraints that exist in a fourth year of drought. If water is released for outflow, it would not be available to protect the cold water pool later in the year when it is needed for salmon. The biological opinions cannot provide temperature protection if the WQCP requires that the water be released as outflow. This statement also ignores the NMFS conclusion in their letter supporting the TUCP stating at p. 6 that, "Most of the adverse effects to the species identified in the Biological Review…are the consequences of actions intended to result in conditions…that will preempt more severe adverse impacts to the species."

3.) Conclusion

The Water Board should immediately reconsider the Order. The intermediate level of pumping should be included in the Order as described in the TUCP. The Order should be clarified to specifically provide that SWP and CVP pumping limits under the TUCP do not apply to water transfers between SWP and CVP water contractors. And, the Order should remove the final sentence of Condition 3, through which the Executive Director seeks to control the allocation of SWP and CVP water. The Water Board should make these decisions because they achieve a more appropriate balance among beneficial uses that results in no unreasonable impact on fish and wildlife and are strongly in the public interest.

Sincerely Yours,

Daniel G. Nelson	Terry L. Erlewine
Executive Director	General Manager
San Luis & Delta-Mendota Water Authority	State Water Contractors

Attachment

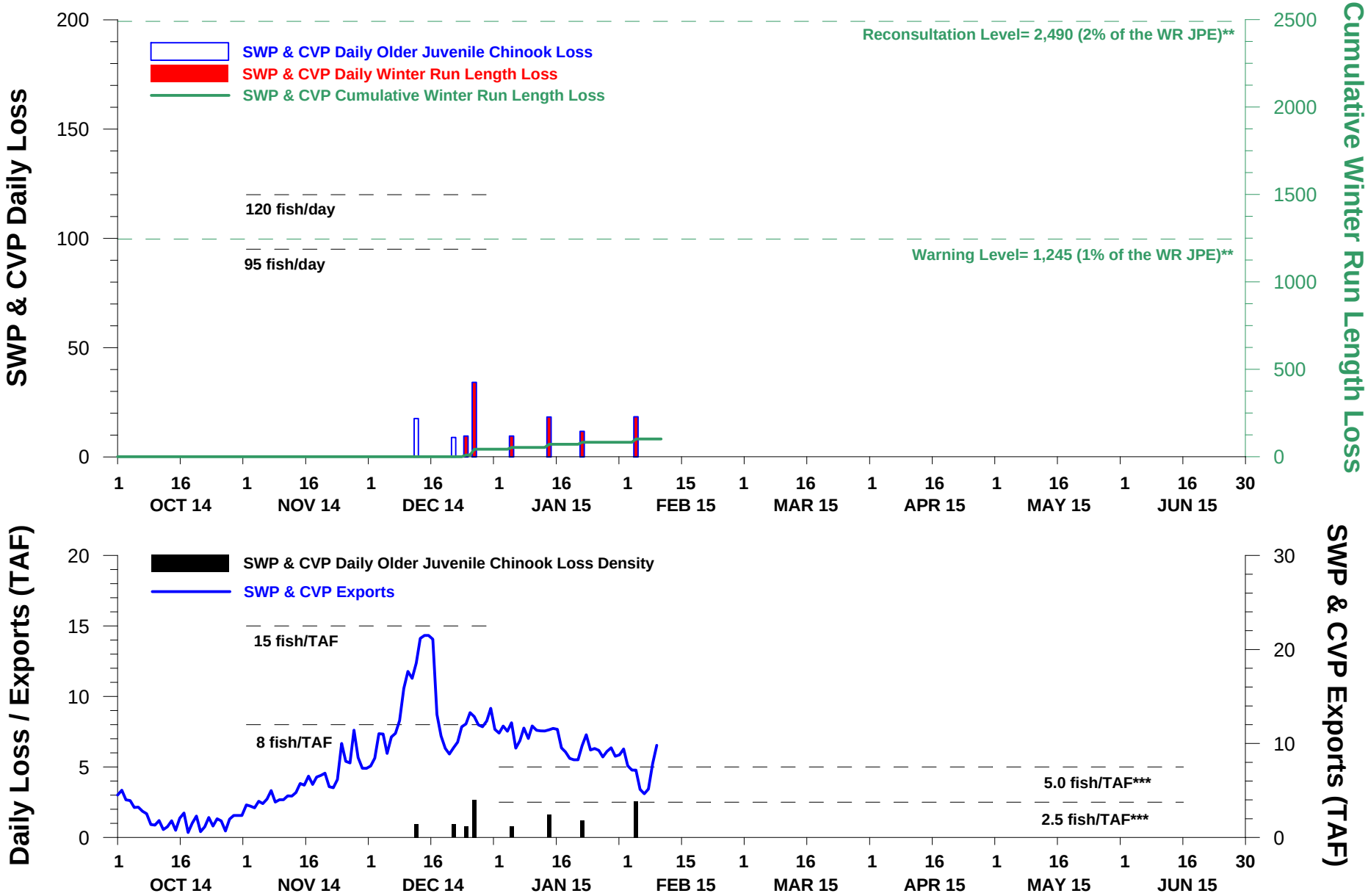
Attachment A

The SWC organization is a nonprofit mutual benefit corporation that represents and protects the common interests of its 27 member public agencies in the vital water supplies provided by California's State Water Project ("SWP"). Each of the member agencies of the State Water Contractors holds a contract with the California Department of Water Resources ("DWR") to receive water supplies from the SWP. Collectively, the SWC members deliver water to more than 25 million residents throughout the state and more than 750,000 acres of agricultural lands. SWP water is served from the San Francisco Bay Area, to the San Joaquin Valley and the Central Coast, to Southern California. The SWC's members are: Alameda County Flood Control and Water Conservation District Zone 7; Alameda County Water District; Antelope Valley-East Kern Water Agency; Casitas Municipal Water District; Castaic Lake Water Agency; Central Coastal Water Authority; City of Yuba City; Coachella Valley Water District; County of Kings; Crestline-Lake Arrowhead Water Agency; Desert Water Agency; Dudley Ridge Water District; Empire-West Side Irrigation District; Kern County Water Agency; Littlerock Creek Irrigation District; Metropolitan Water District of Southern California; Mojave Water Agency; Napa County Flood Control and Water Conservation District; Oak Flat Water District; Palmdale Water District; San Bernardino Valley Municipal Water District; San Gabriel Valley Municipal Water District; San Gorgonio Pass Water Agency; San Luis Obispo County Flood Control & Water Conservation District; Santa Clara Valley Water District; Solano County Water Agency; and Tulare Lake Basin Water Storage District.

The Authority is a joint powers authority, established under California's Joint Exercise of Powers Act. (Gov. Code, § 6500 et seq.) The Authority is comprised of 28 member agencies, 26 of which hold contractual rights to water from the federal Central Valley Project ("CVP"). The Authority member agencies have historically received up to 3,100,000 acre-feet annually of CVP water for the irrigation of highly productive farm land primarily along the San Joaquin Valley's Westside, for municipal and industrial uses, including within California's Silicon Valley, and for publicly and privately managed wetlands situated in the Pacific Flyway. The areas served by the Authority's member agencies span portions of seven counties encompassing about 3,300 square miles, an area roughly the size of Rhode Island and Delaware combined. The Authority's members are: Banta-Carbona Irrigation District, Broadview Water District, Byron Bethany Irrigation District (CVPSA), Central California Irrigation District, City of Tracy, Del Puerto Water District, Eagle Field Water District, Firebaugh Canal Water District, Fresno Slough Water District, Grassland Water District, Henry Miller Reclamation District #2131, James Irrigation District, Laguna Water District, Mercy Springs Water District, Oro Loma Water District, Pacheco Water District, Panoche Water District, Patterson Irrigation District, Pleasant Valley Water District, Reclamation District 1606, San Benito County Water District, San Luis Water District, Santa Clara Valley Water District, Tranquility Irrigation District, Turner Island Water District, West Side Irrigation District, West Stanislaus Irrigation District, and Westlands Water District.".

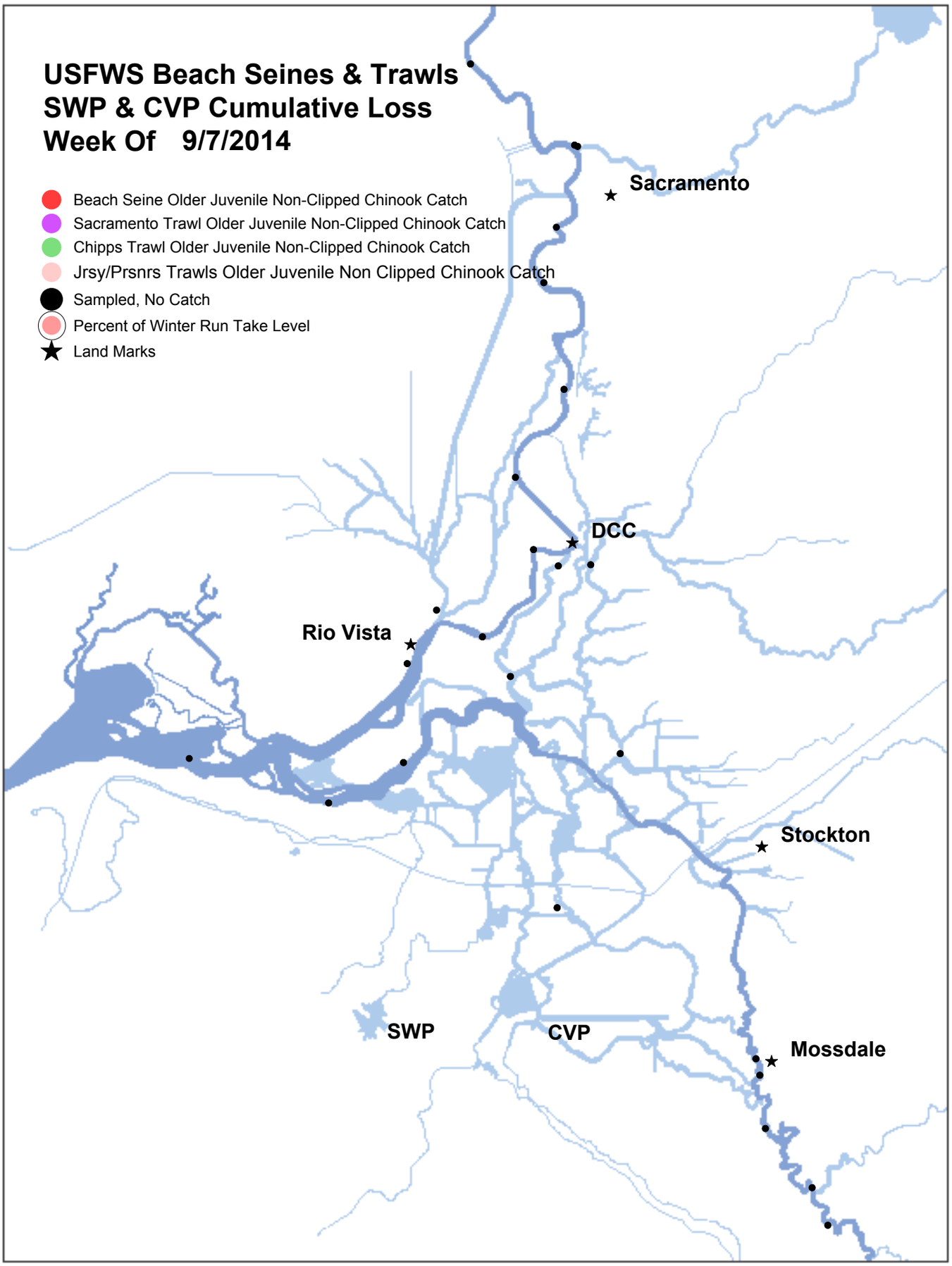
The SWC and Authority filed the objections to the 2015 TUCP Order on behalf of their member agencies.

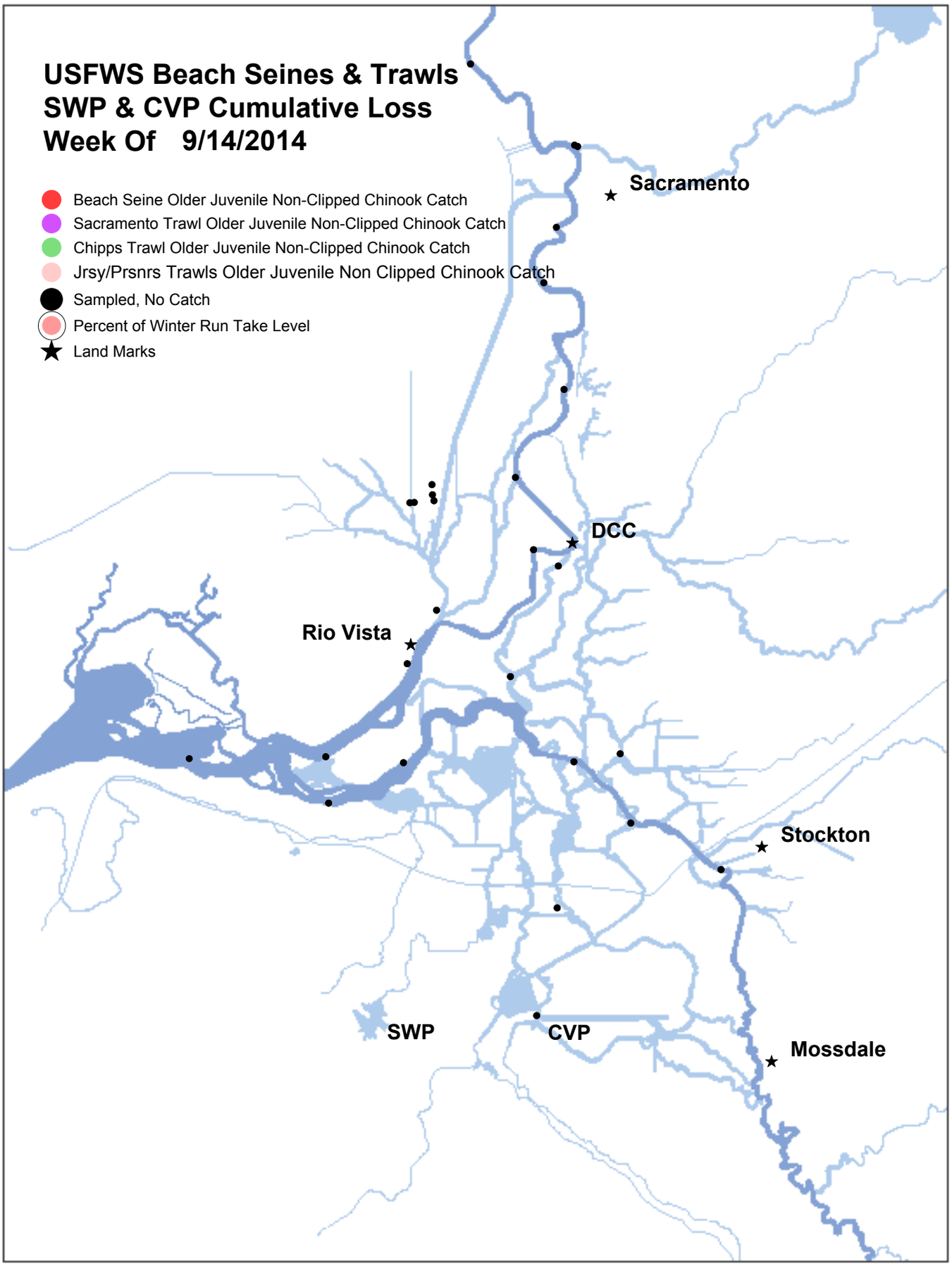
NON-CLIPPED WINTER RUN & OLDER JUVENILE CHINOOK LOSS AT THE DELTA FISH FACILITIES 01 OCT 2014 THROUGH 8 FEB 2015

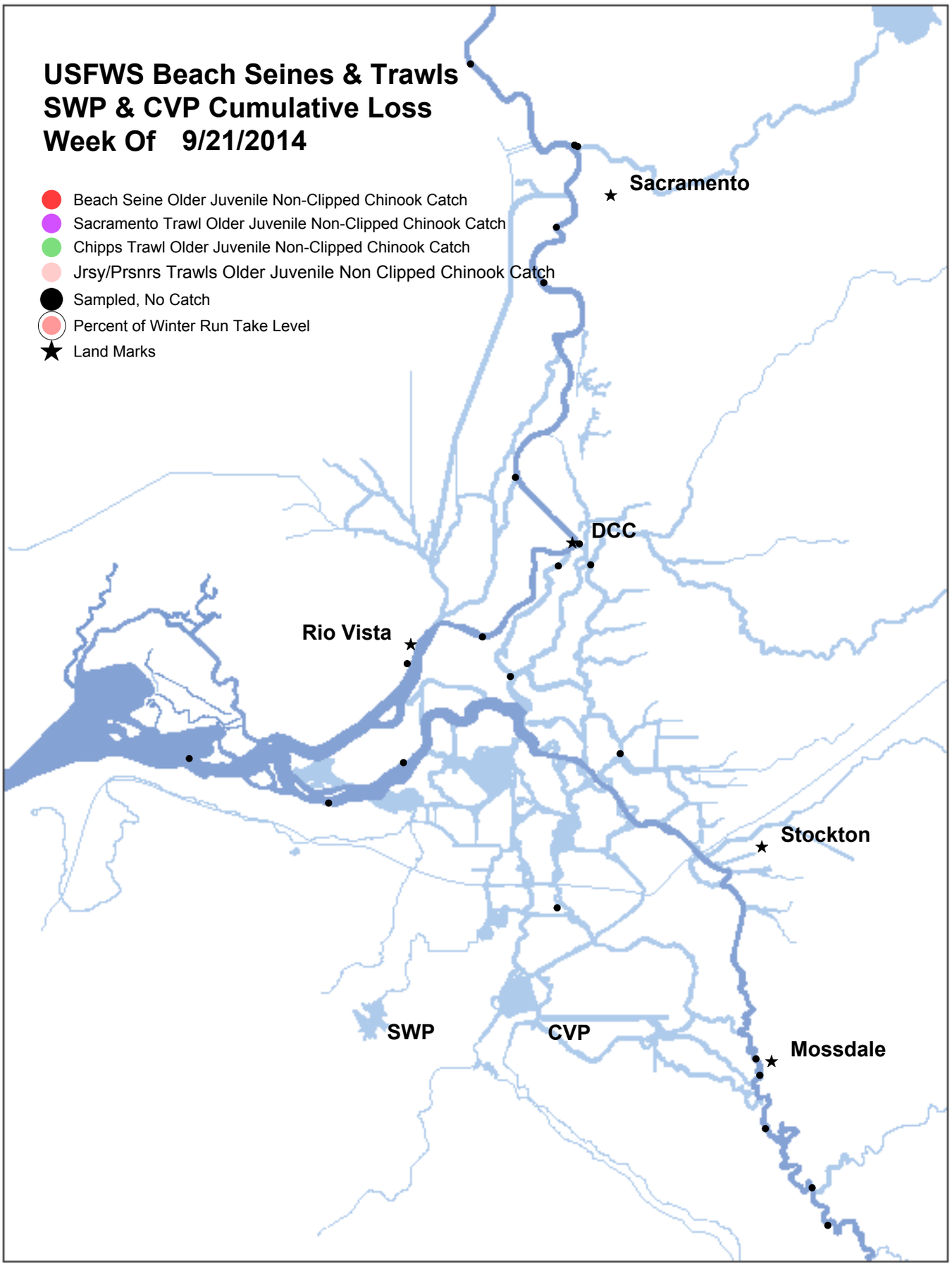


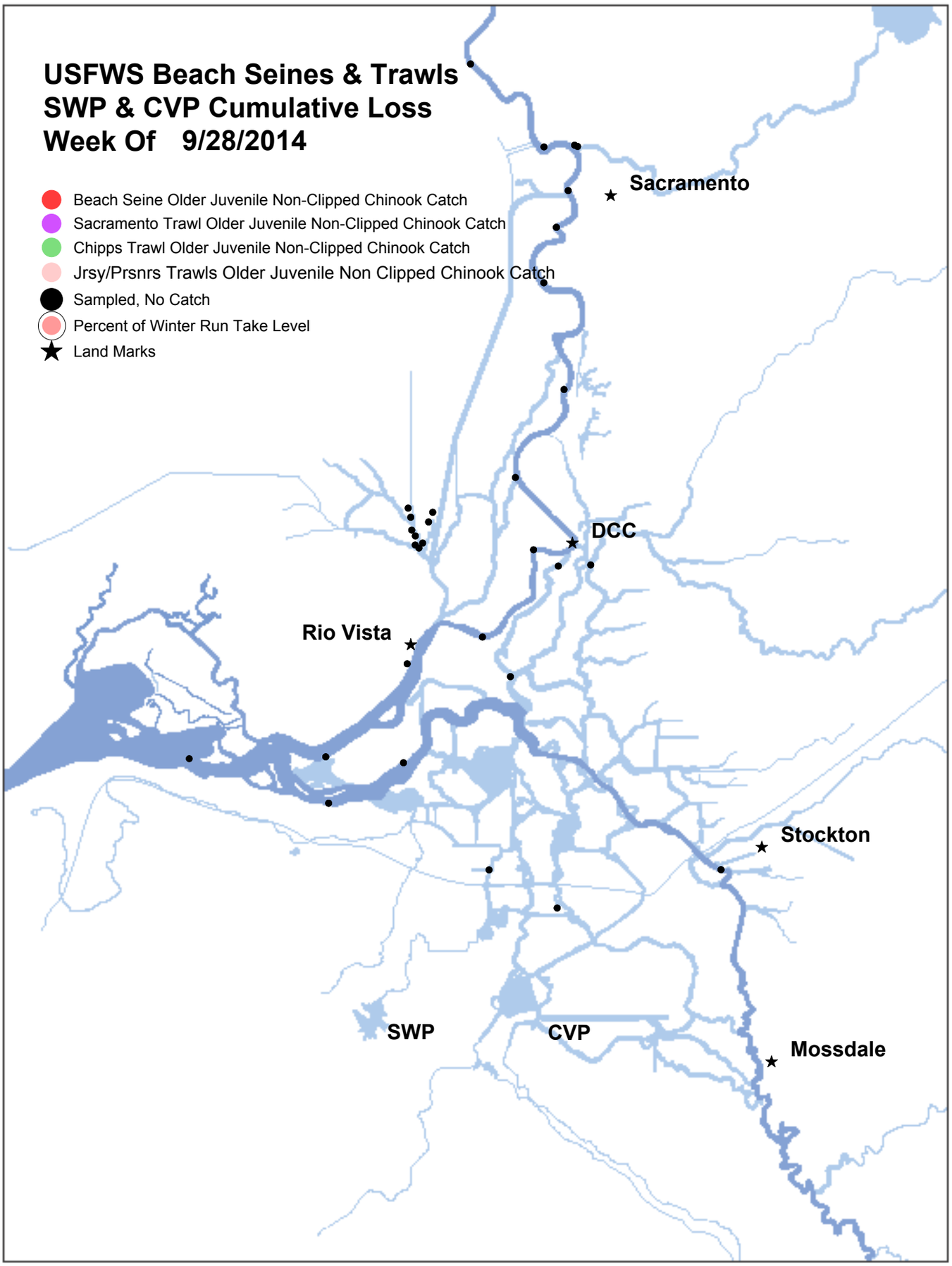
DWR-DES 9 FEB 2015
Preliminary data from DFW; subject to revision.
*Older juvenile Chinook defined as all Chinook greater than or equal to the minimum winter run length-at-date criteria and less than the maximum size included in the length-at-date criteria (Delta model) for which a race is assigned on a given sampling date.

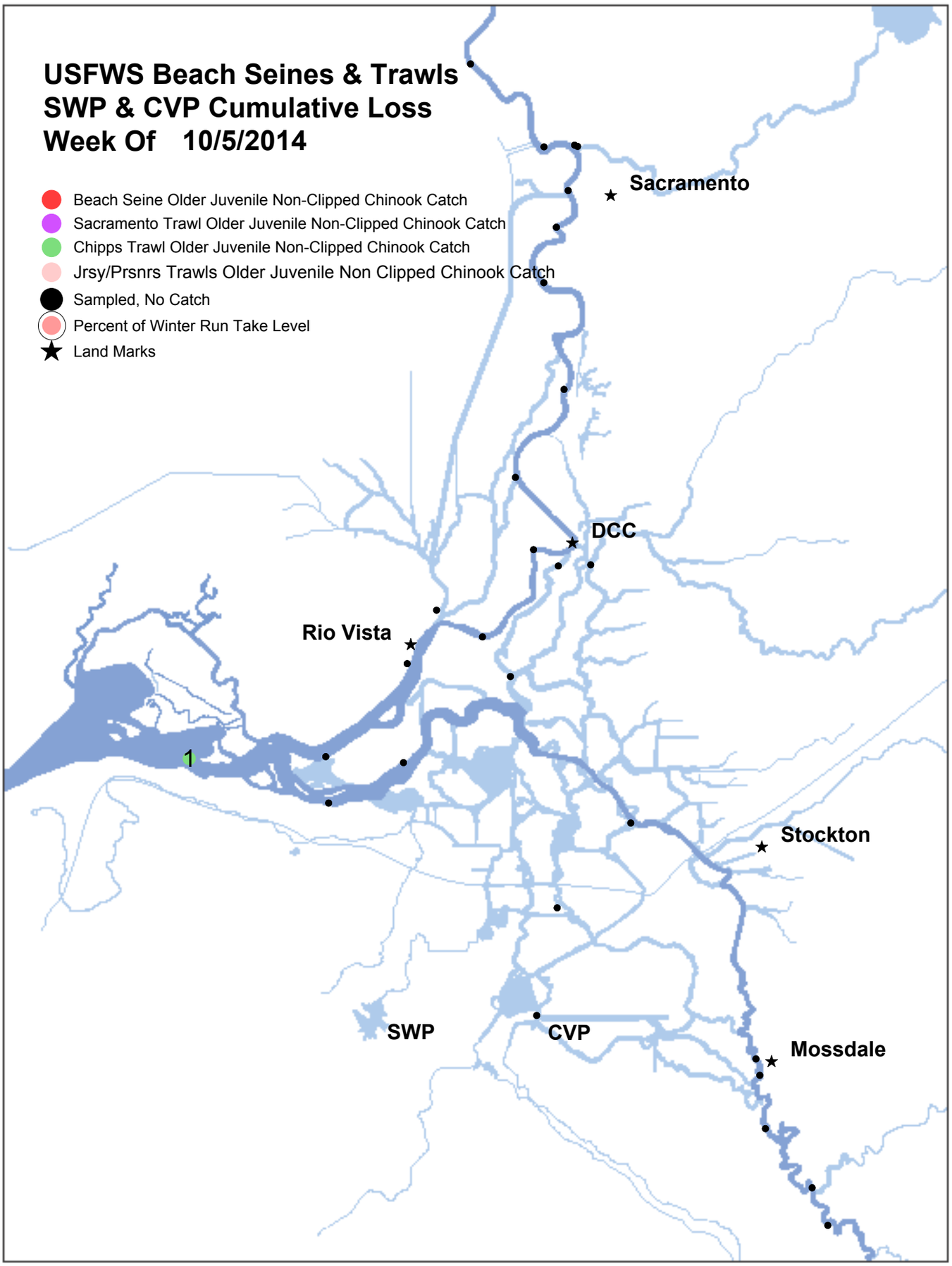
Attachment C




USFWS Beach Seines & Trawls
SWP & CVP Cumulative Loss
Week Of 9/14/2014
Beach Seine Older Juvenile Non-Clipped Chinook Catch
Sacramento Trawl Older Juvenile Non-Clipped Chinook Catch
Chipps Trawl Older Juvenile Non-Clipped Chinook Catch
Jrsy/Prsnrs Trawls Older Juvenile Non Clipped Chinook Catch
Sampled, No Catch
Percent of Winter Run Take Level
Land Marks
Sacramento
DCC
Rio Vista
Stockton
SWP
CVP
Mossdale


USFWS Beach Seines & Trawls
SWP & CVP Cumulative Loss
Week Of 9/21/2014
Beach Seine Older Juvenile Non-Clipped Chinook Catch
Sacramento Trawl Older Juvenile Non-Clipped Chinook Catch
Chipps Trawl Older Juvenile Non-Clipped Chinook Catch
Jrsy/Prsnrs Trawls Older Juvenile Non Clipped Chinook Catch
Sampled, No Catch
Percent of Winter Run Take Level
Land Marks
Sacramento
DCC
Rio Vista
Stockton
SWP
CVP
Mossdale


USFWS Beach Seines & Trawls
SWP & CVP Cumulative Loss
Week Of 9/28/2014
Beach Seine Older Juvenile Non-Clipped Chinook Catch
Sacramento Trawl Older Juvenile Non-Clipped Chinook Catch
Chipps Trawl Older Juvenile Non-Clipped Chinook Catch
Jrsy/Prsnrs Trawls Older Juvenile Non Clipped Chinook Catch
Sampled, No Catch
Percent of Winter Run Take Level
Land Marks
Sacramento
DCC
Rio Vista
Stockton
SWP
CVP
Mossdale


USFWS Beach Seines & Trawls
SWP & CVP Cumulative Loss
Week Of 10/5/2014
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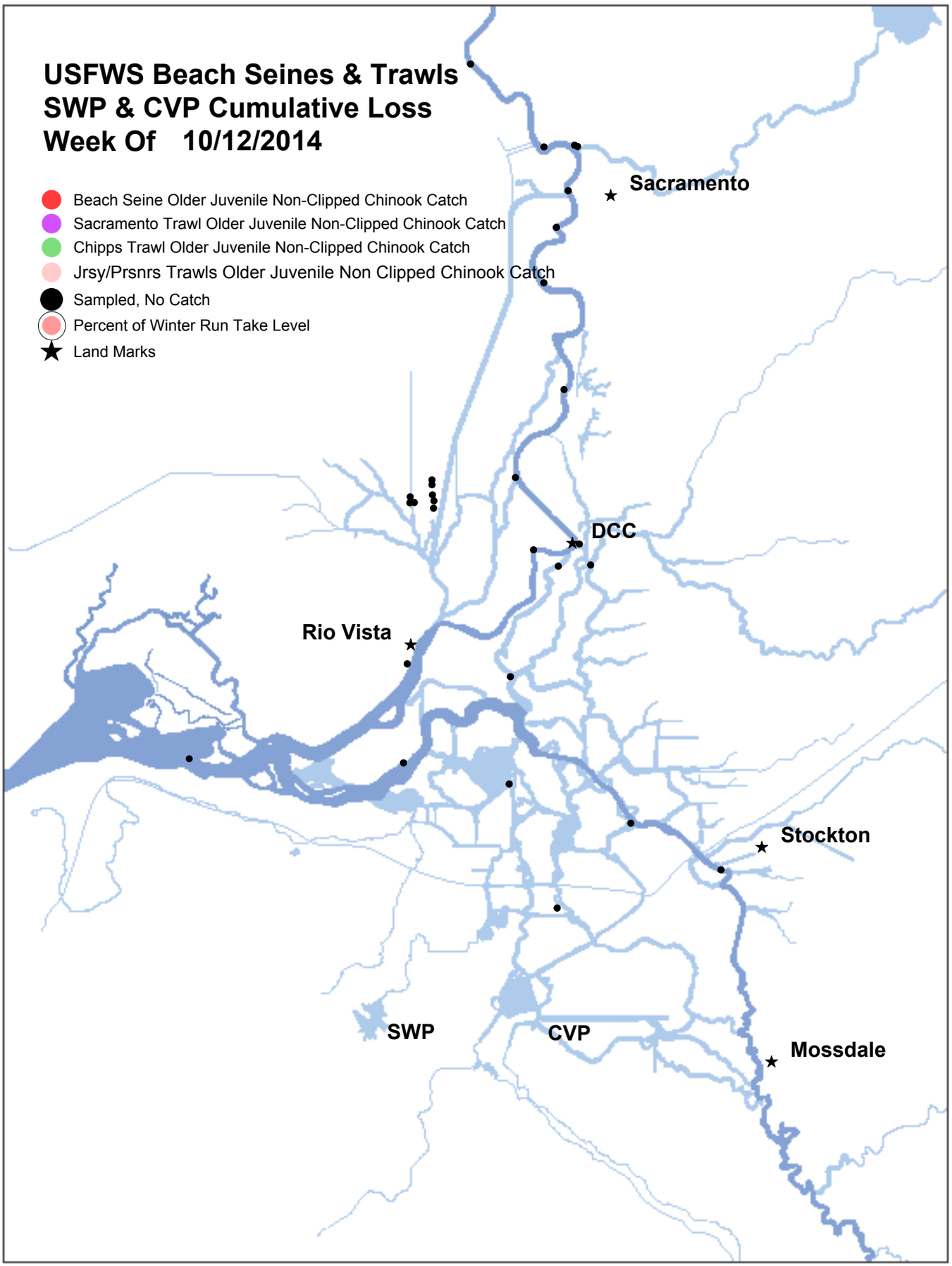
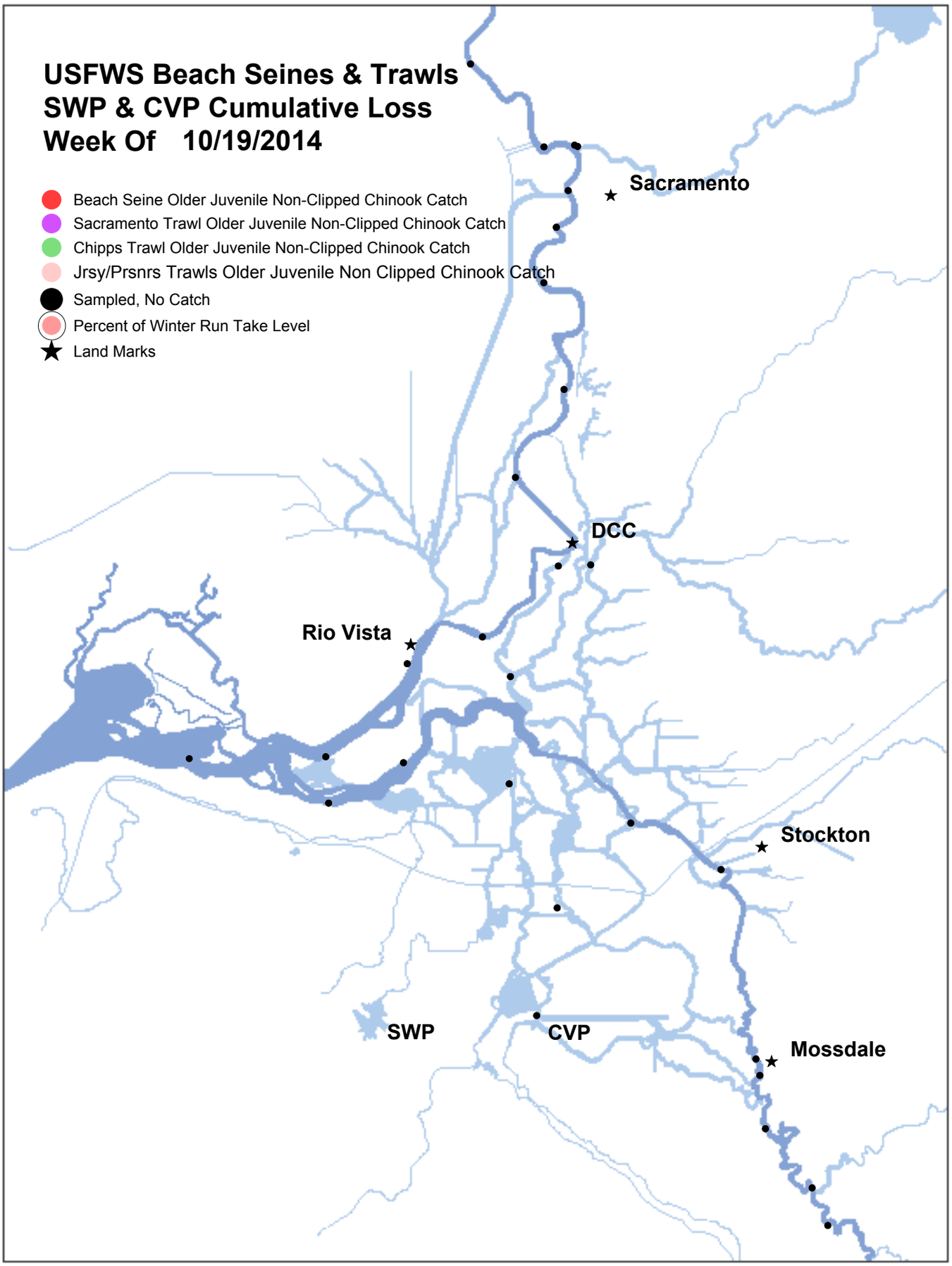
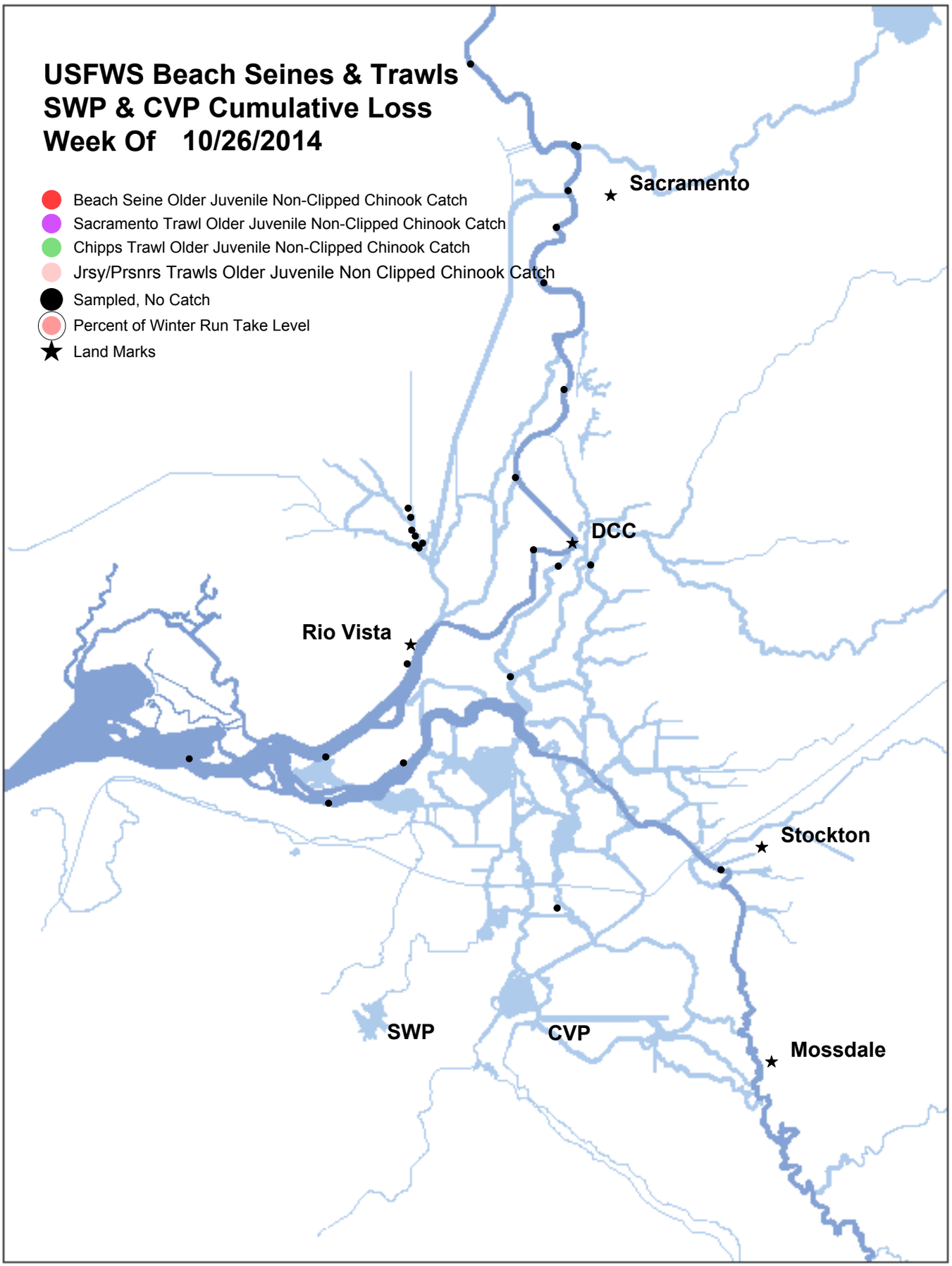
Sacramento Trawl Older Juvenile Non-Clipped Chinook Catch
Chipps Trawl Older Juvenile Non-Clipped Chinook Catch
Jrsy/Prsnrs Trawls Older Juvenile Non Clipped Chinook Catch
Sampled, No Catch
Percent of Winter Run Take Level
Land Marks
Sacramento
DCC
Rio Vista
1
Stockton
SWP
CVP
Mossdale


USFWS Beach Seines & Trawls
SWP & CVP Cumulative Loss
Week Of 10/12/2014
Beach Seine Older Juvenile Non-Clipped Chinook Catch
Sacramento Trawl Older Juvenile Non-Clipped Chinook Catch
Chipps Trawl Older Juvenile Non-Clipped Chinook Catch
Jrsy/Prsnrs Trawls Older Juvenile Non Clipped Chinook Catch
Sampled, No Catch
Percent of Winter Run Take Level
Land Marks
Sacramento
DCC
Rio Vista
Stockton
SWP
CVP
Mossdale


USFWS Beach Seines & Trawls
SWP & CVP Cumulative Loss
Week Of 10/19/2014
Beach Seine Older Juvenile Non-Clipped Chinook Catch
Sacramento Trawl Older Juvenile Non-Clipped Chinook Catch
Chipps Trawl Older Juvenile Non-Clipped Chinook Catch
Jrsy/Prsnrs Trawls Older Juvenile Non Clipped Chinook Catch
Sampled, No Catch
Percent of Winter Run Take Level
Land Marks
Sacramento
DCC
Rio Vista
Stockton
SWP
CVP
Mossdale


USFWS Beach Seines & Trawls
SWP & CVP Cumulative Loss
Week Of 10/26/2014
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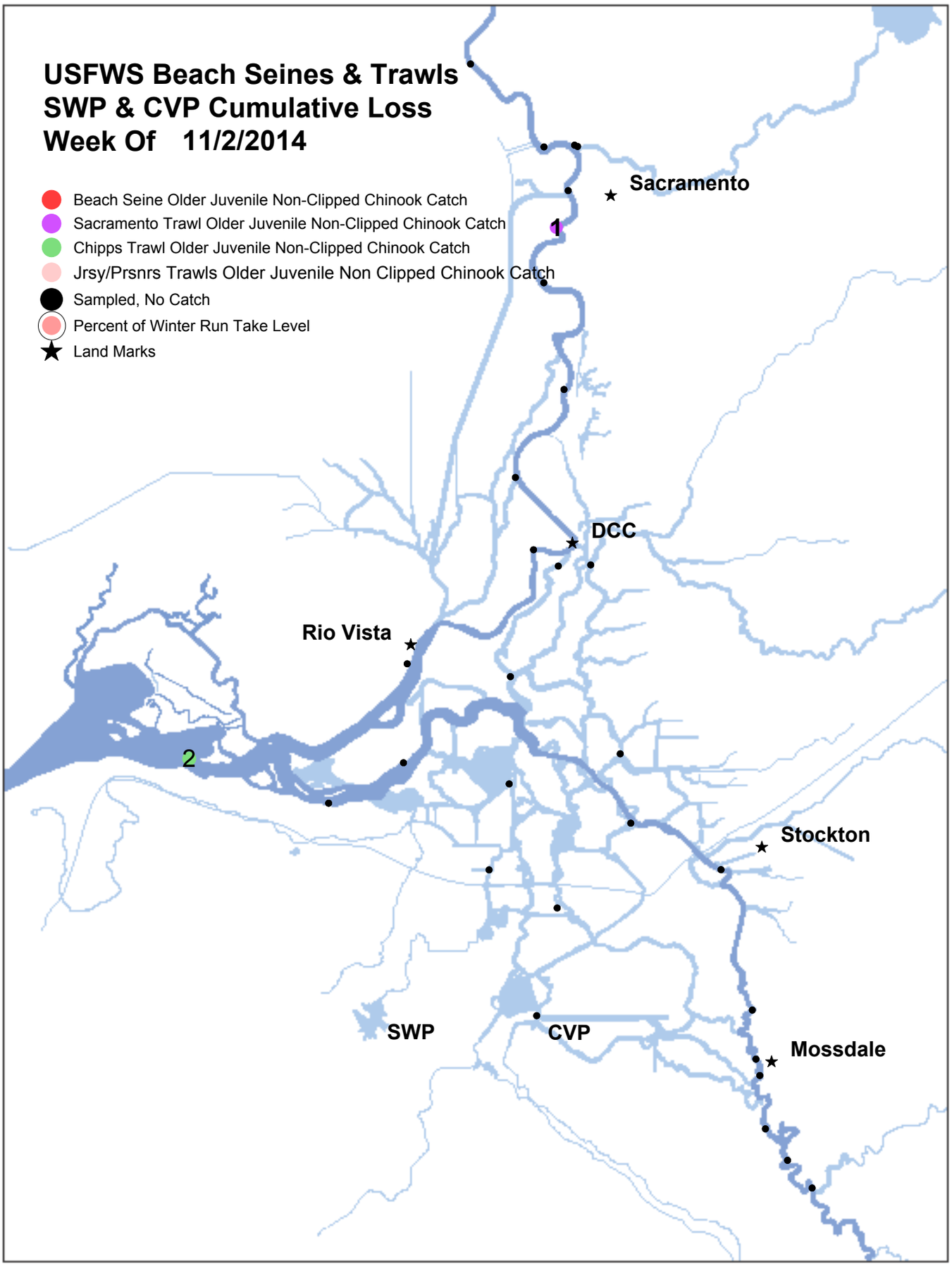
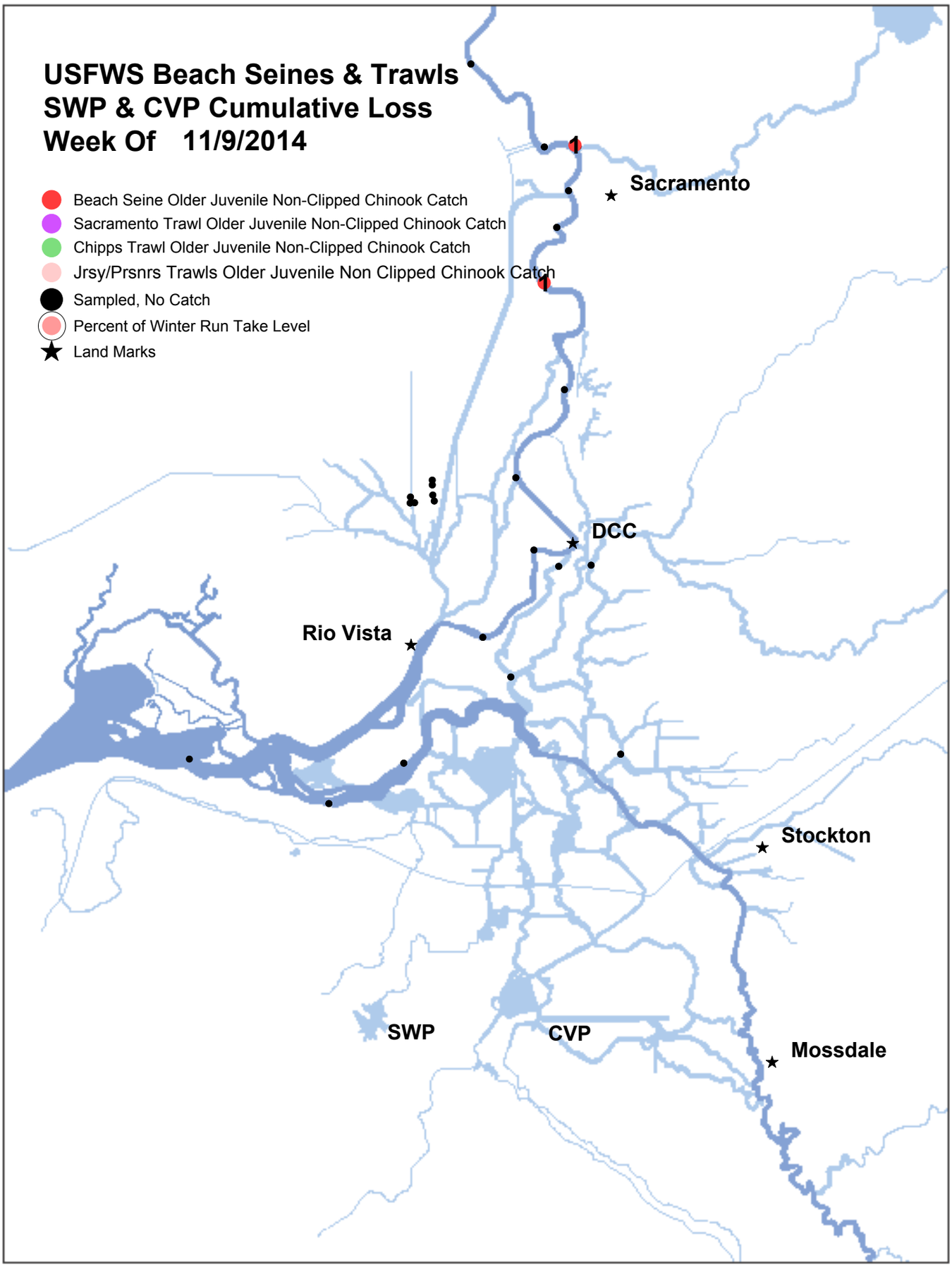
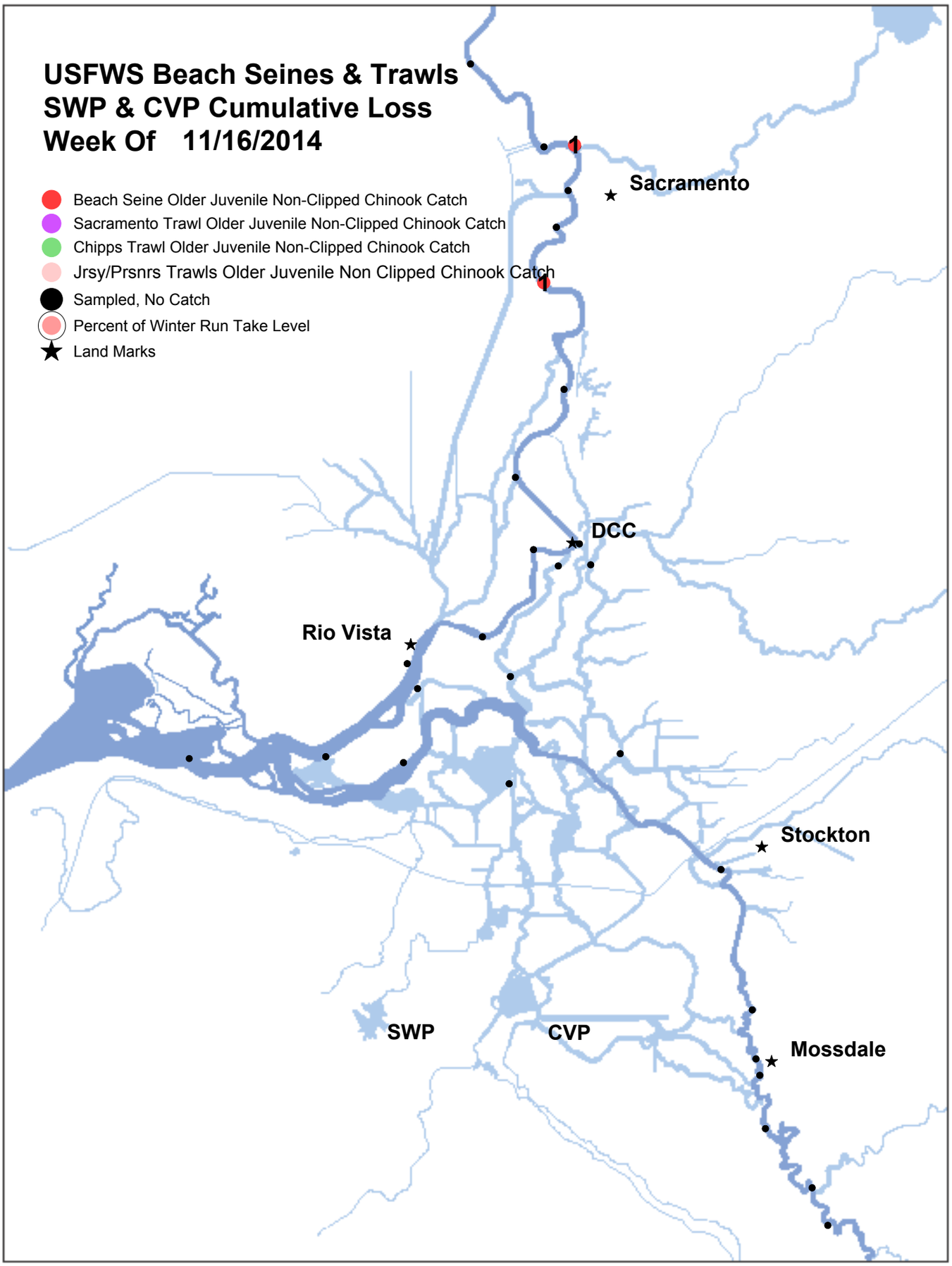
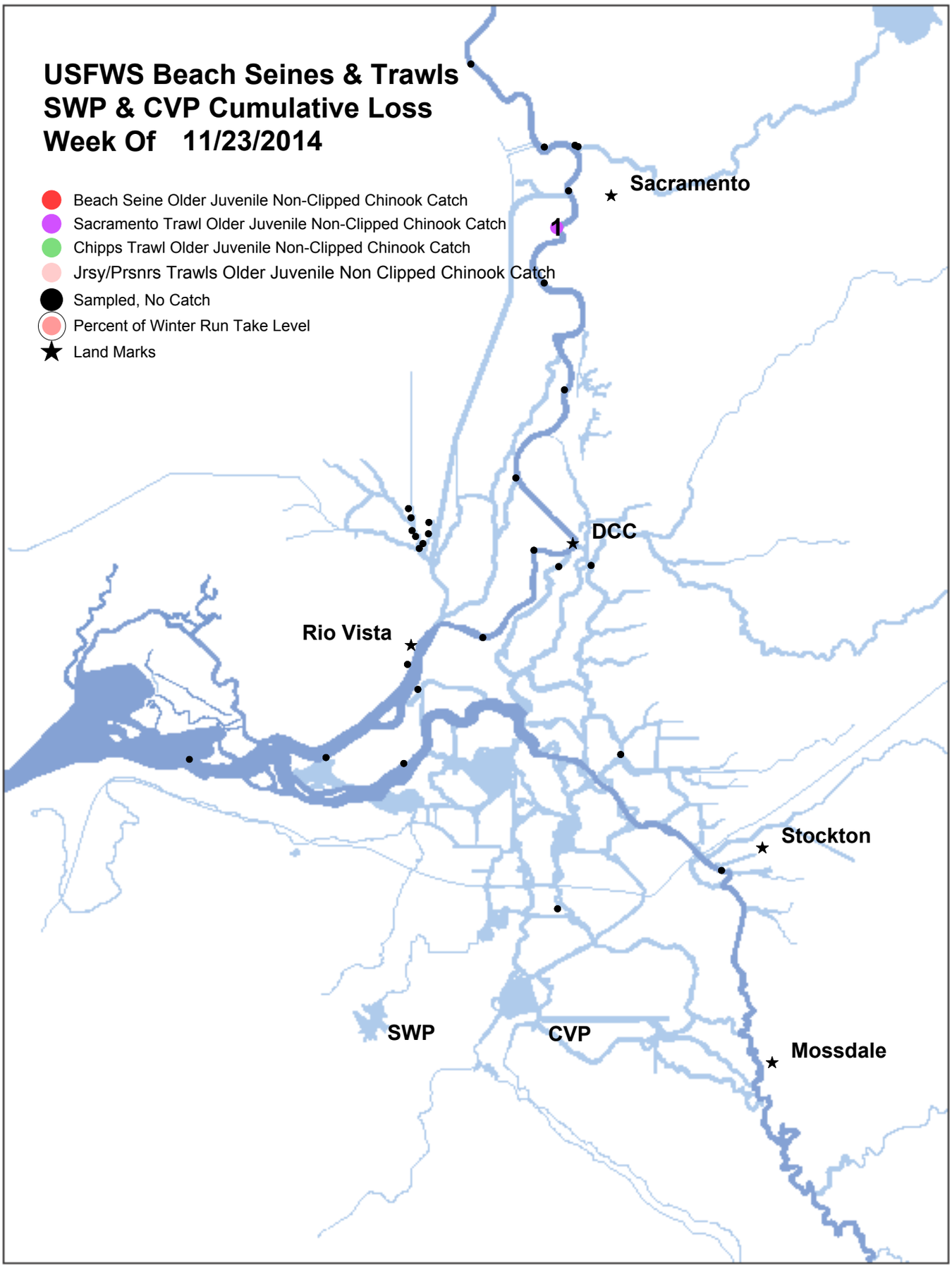
Sacramento Trawl Older Juvenile Non-Clipped Chinook Catch
Chipps Trawl Older Juvenile Non-Clipped Chinook Catch
Jrsy/Prsnrs Trawls Older Juvenile Non Clipped Chinook Catch
Sampled, No Catch
Percent of Winter Run Take Level
Land Marks
Sacramento
DCC
Rio Vista
Stockton
SWP
CVP
Mossdale


USFWS Beach Seines & Trawls
SWP & CVP Cumulative Loss
Week Of 11/2/2014
Beach Seine Older Juvenile Non-Clipped Chinook Catch
Sacramento Trawl Older Juvenile Non-Clipped Chinook Catch
Chipps Trawl Older Juvenile Non-Clipped Chinook Catch
Jrsy/Prsnrs Trawls Older Juvenile Non Clipped Chinook Catch
Sampled, No Catch
Percent of Winter Run Take Level
Land Marks
Sacramento
1
DCC
Rio Vista
2
Stockton
SWP
CVP
Mossdale


USFWS Beach Seines & Trawls
SWP & CVP Cumulative Loss
Week Of 11/9/2014
Beach Seine Older Juvenile Non-Clipped Chinook Catch
Sacramento Trawl Older Juvenile Non-Clipped Chinook Catch
Chipps Trawl Older Juvenile Non-Clipped Chinook Catch
Jrsy/Prsnrs Trawls Older Juvenile Non Clipped Chinook Catch
Sampled, No Catch
Percent of Winter Run Take Level
Land Marks
1
1
Sacramento
DCC
Rio Vista
Stockton
SWP
CVP
Mossdale


USFWS Beach Seines & Trawls
SWP & CVP Cumulative Loss
Week Of 11/16/2014
Beach Seine Older Juvenile Non-Clipped Chinook Catch
Sacramento Trawl Older Juvenile Non-Clipped Chinook Catch
Chipps Trawl Older Juvenile Non-Clipped Chinook Catch
Jrsy/Prsnrs Trawls Older Juvenile Non Clipped Chinook Catch
Sampled, No Catch
Percent of Winter Run Take Level
Land Marks
1
1
Sacramento
DCC
Rio Vista
Stockton
SWP
CVP
Mossdale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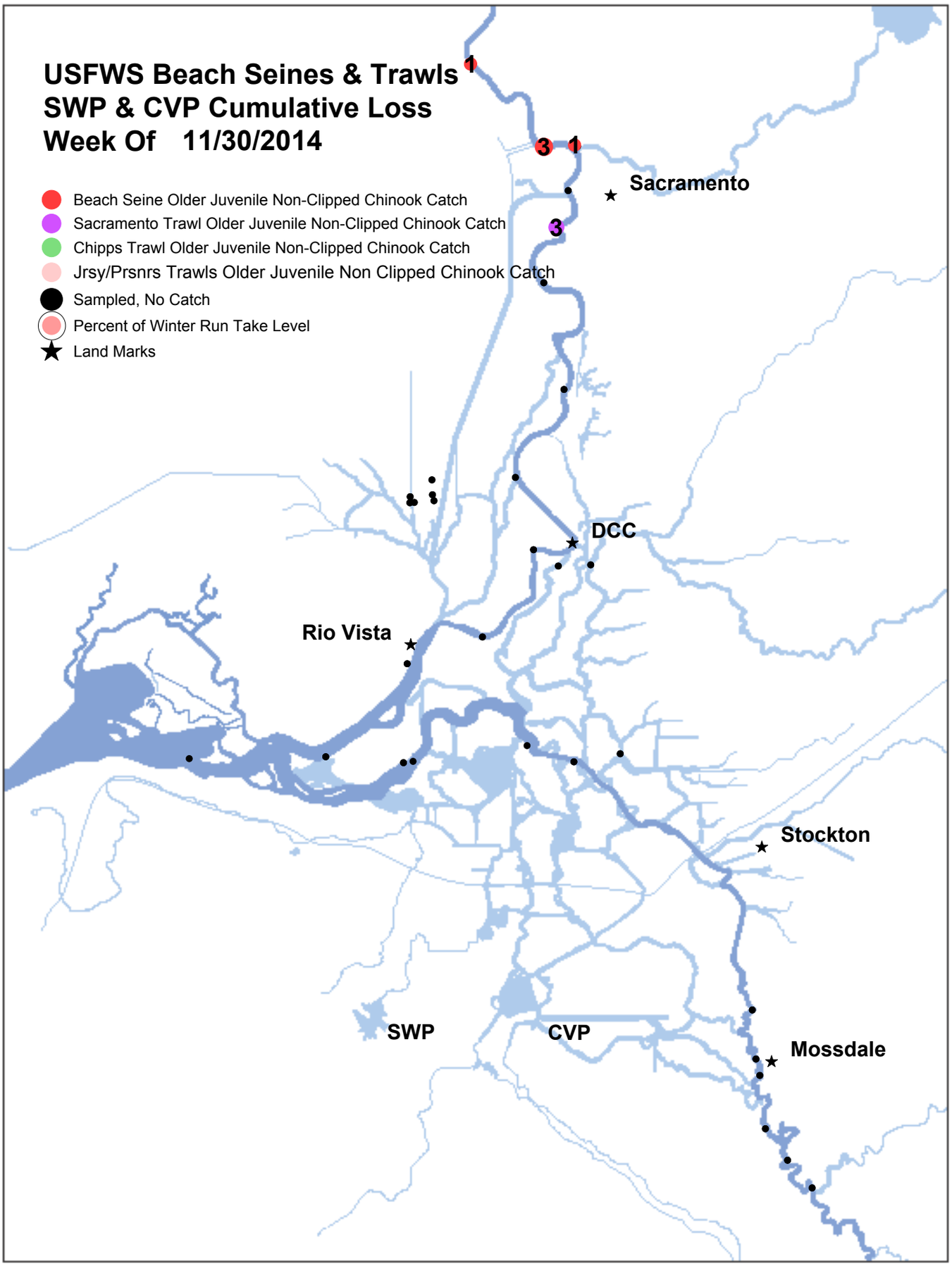
SWP & CVP Cumulative Loss
Week Of 11/23/2014
Beach Seine Older Juvenile Non-Clipped Chinook Catch
Sacramento Trawl Older Juvenile Non-Clipped Chinook Catch
Chipps Trawl Older Juvenile Non-Clipped Chinook Catch
Jrsy/Prsnrs Trawls Older Juvenile Non Clipped Chinook Catch
Sampled, No Catch
Percent of Winter Run Take Level
Land Marks
1
Sacramento
DCC
Rio Vista
Stockton
SWP
CVP
Mossdale


USFWS Beach Seines & Trawls
SWP & CVP Cumulative Loss
Week Of 11/30/2014
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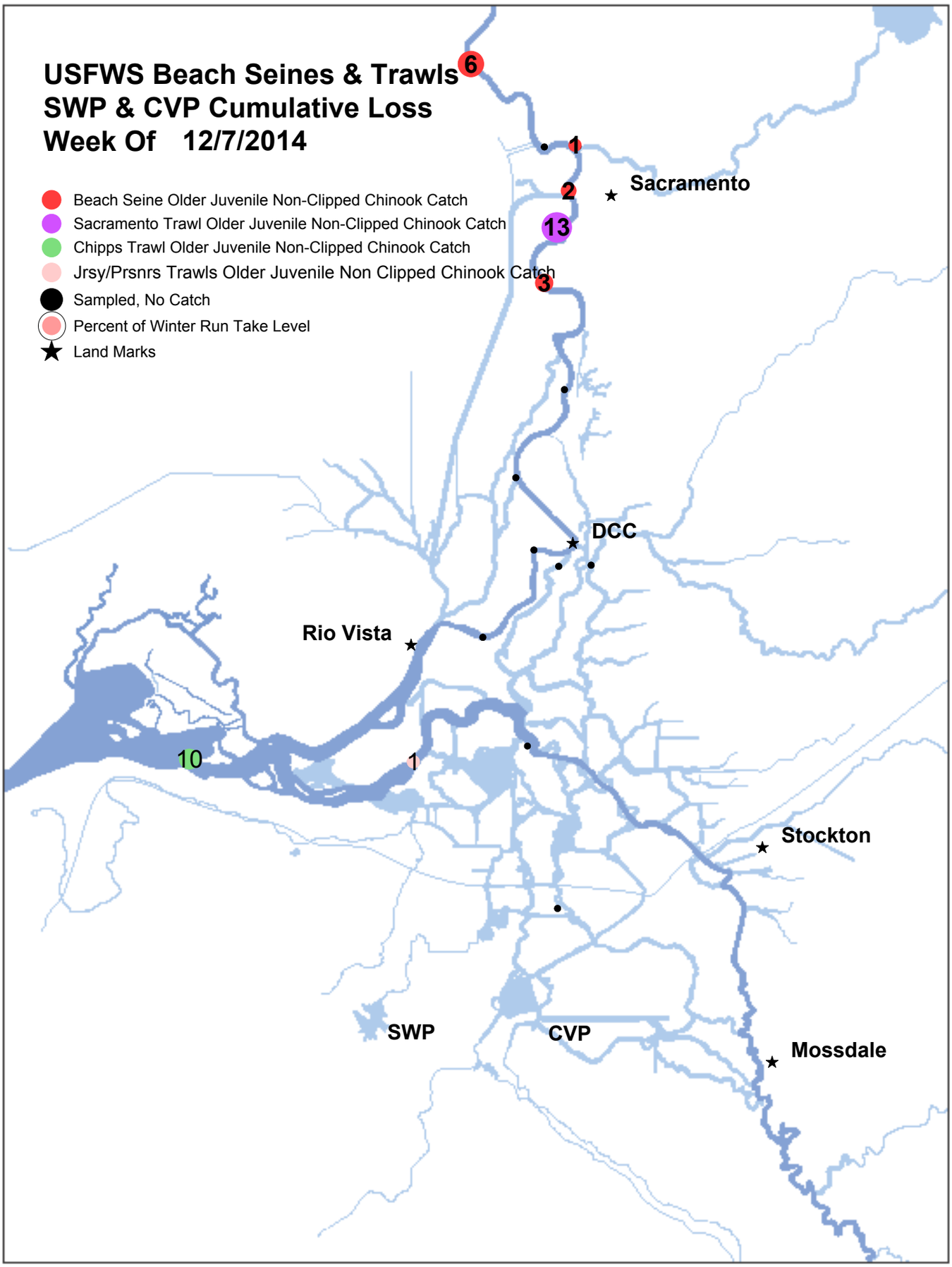
Sacramento Trawl Older Juvenile Non-Clipped Chinook Catch
Chipps Trawl Older Juvenile Non-Clipped Chinook Catch
Jrsy/Prsnrs Trawls Older Juvenile Non Clipped Chinook Catch
Sampled, No Catch
Percent of Winter Run Take Level
Land Marks
1
3
1
3
Sacramento
DCC
Rio Vista
Stockton
SWP
CVP
Mossdale


USFWS Beach Seines & Trawls
SWP & CVP Cumulative Loss
Week Of 12/7/2014
Beach Seine Older Juvenile Non-Clipped Chinook Catch
Sacramento Trawl Older Juvenile Non-Clipped Chinook Catch
Chipps Trawl Older Juvenile Non-Clipped Chinook Catch
Jrsy/Prsnrs Trawls Older Juvenile Non Clipped Chinook Catch
Sampled, No Catch
Percent of Winter Run Take Level
Land Marks
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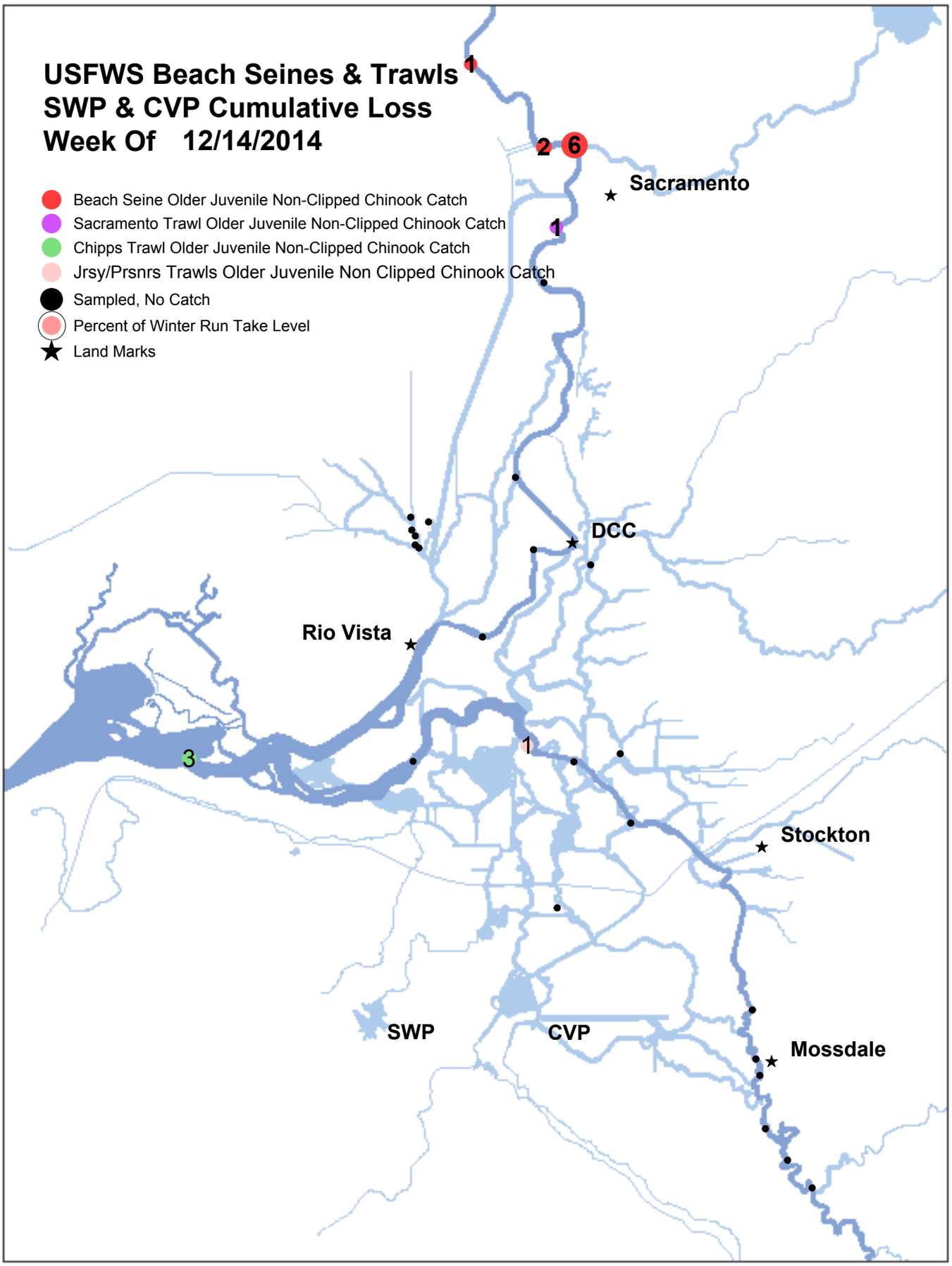
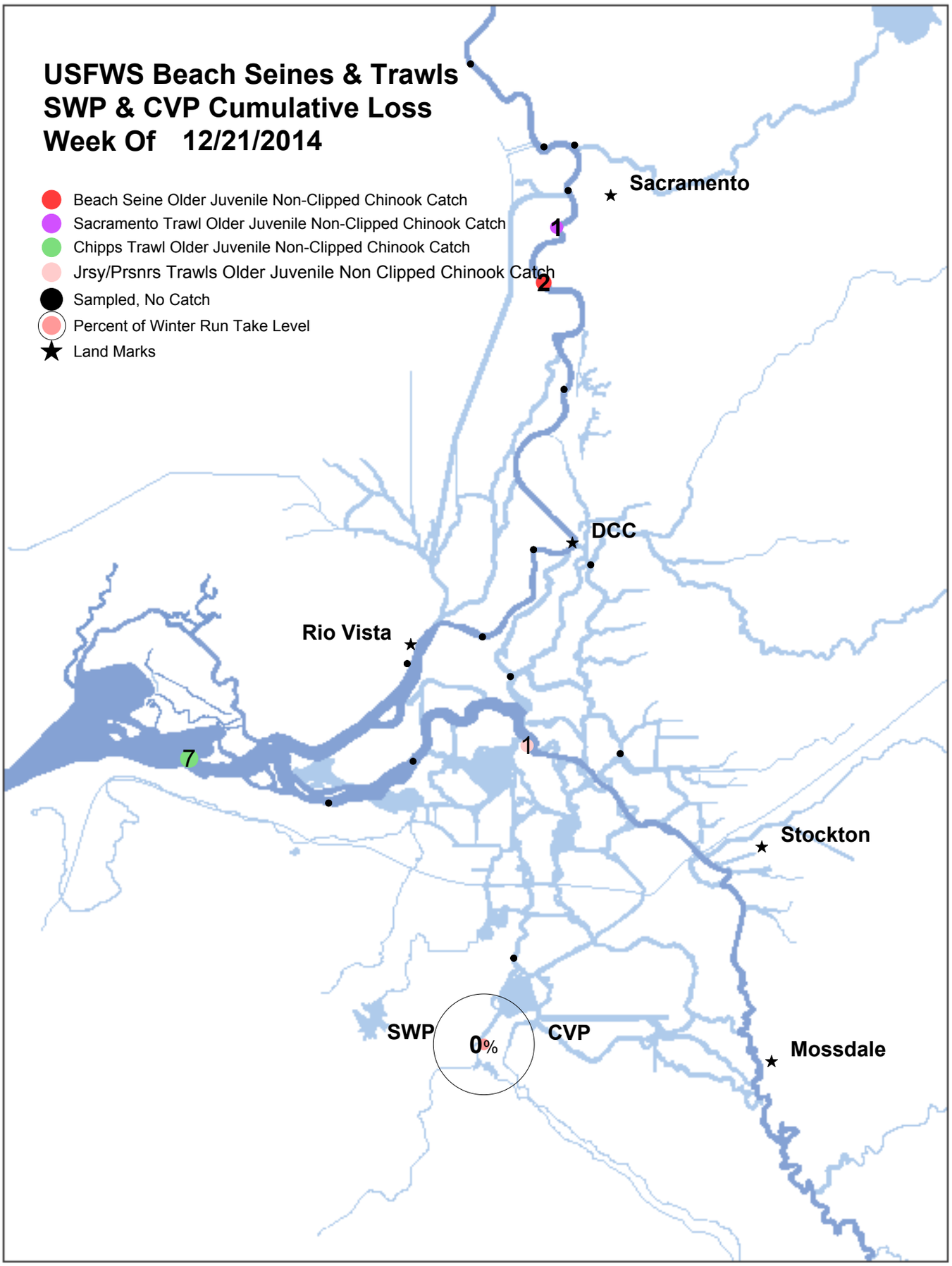
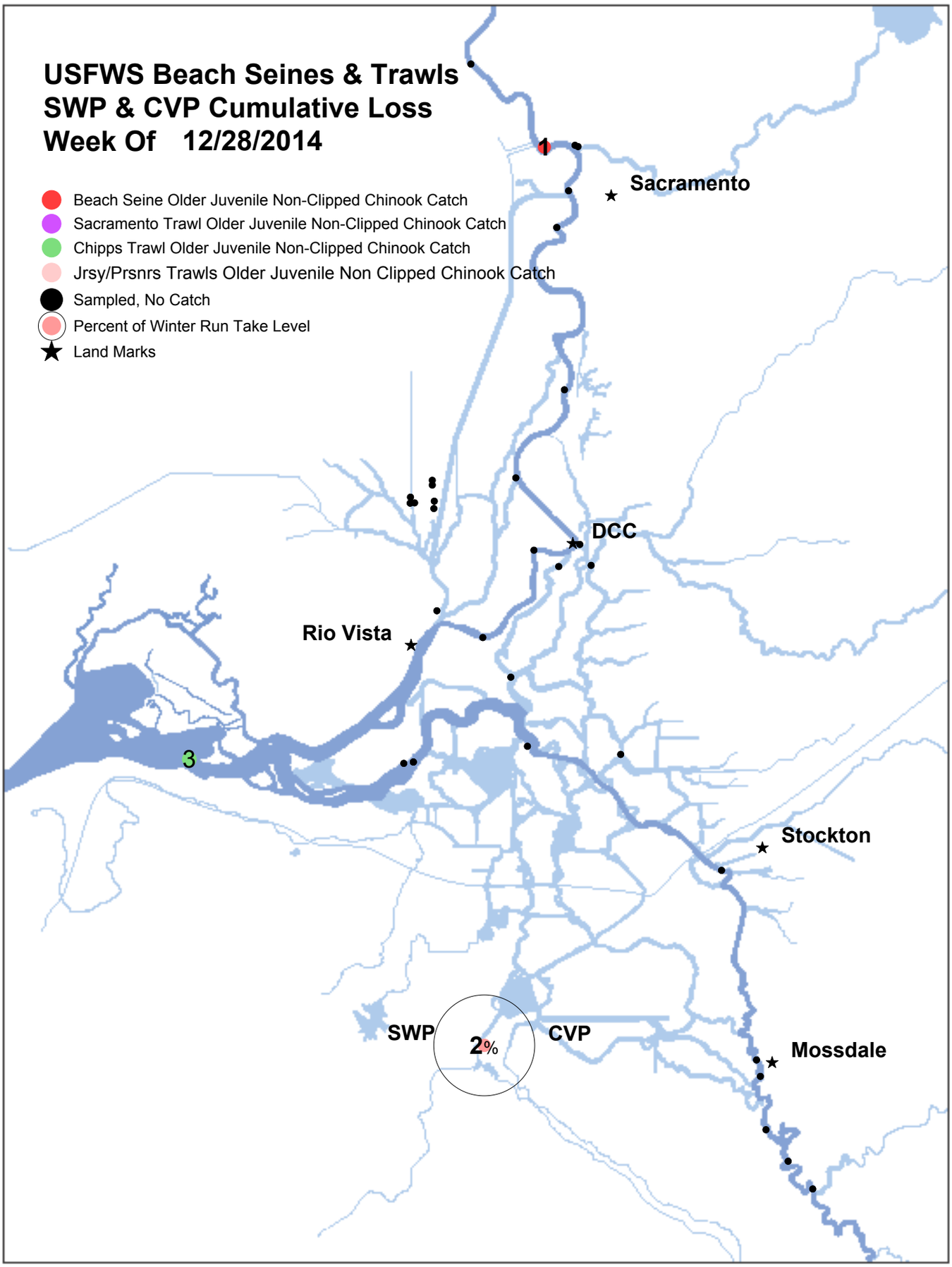
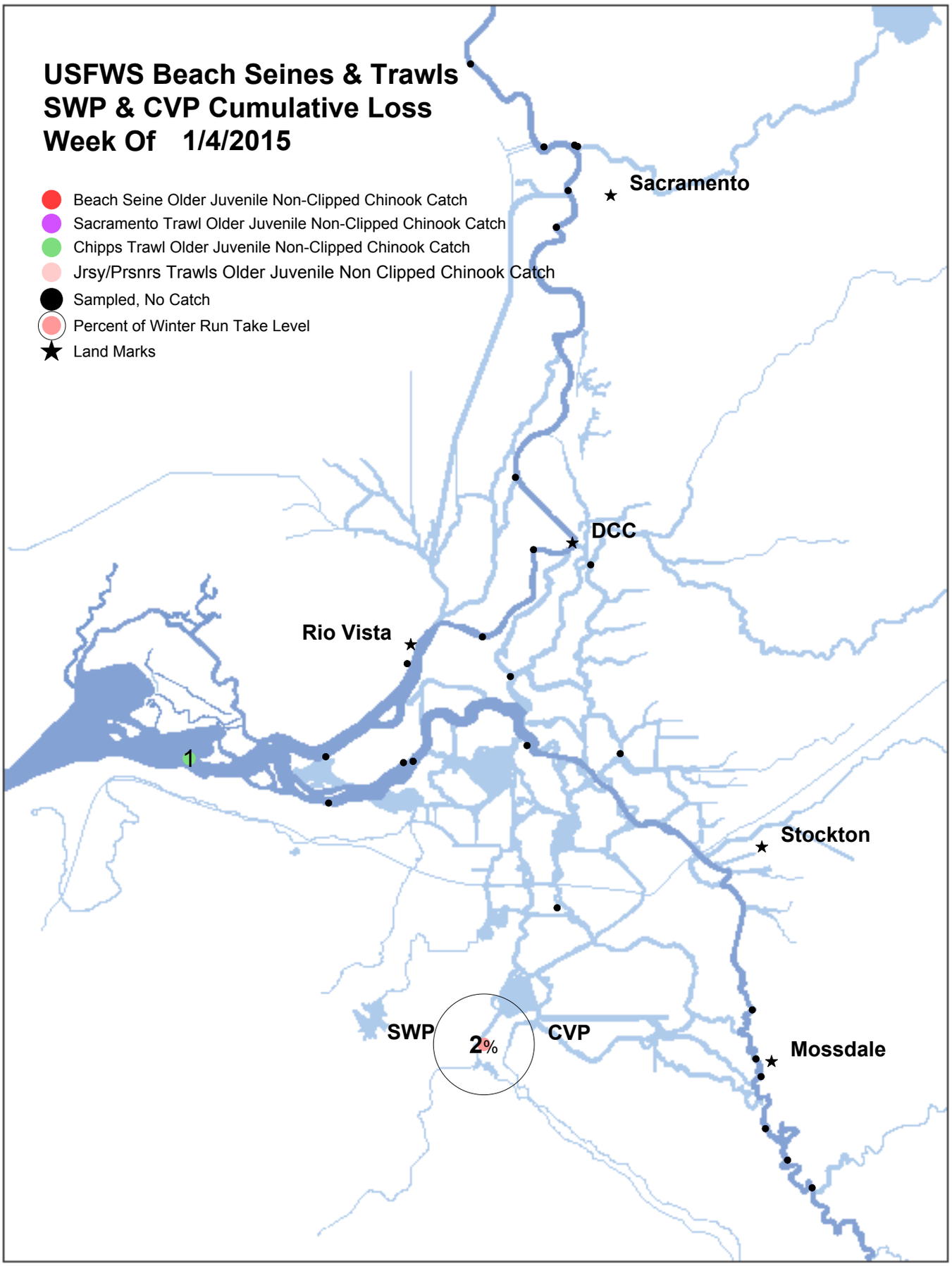
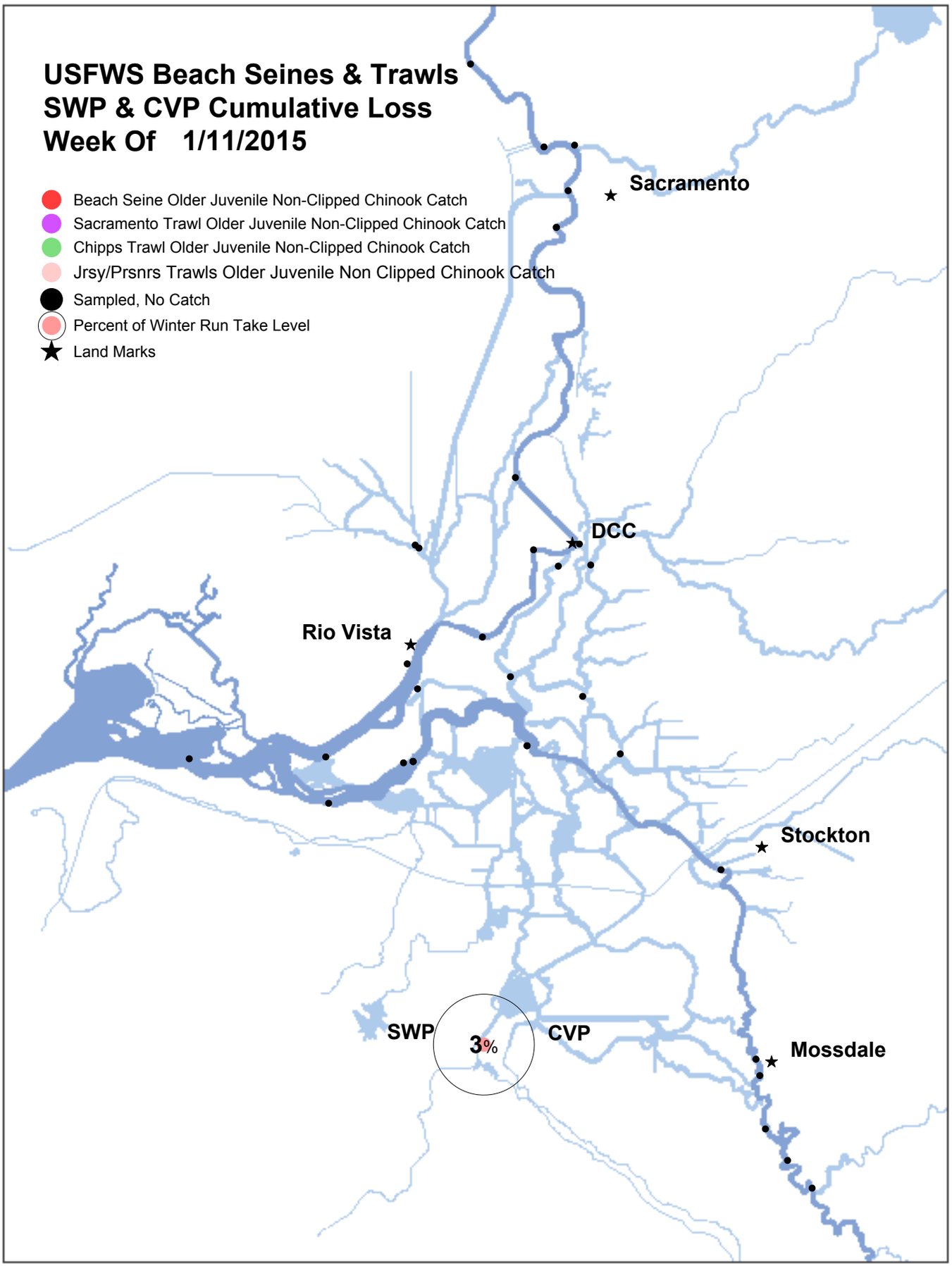
1
2
13
3
Sacramento
DCC
Rio Vista
10
1
Stockton
SWP
CVP
Mossdale


USFWS Beach Seines & Trawls
SWP & CVP Cumulative Loss
Week Of 12/14/2014
Beach Seine Older Juvenile Non-Clipped Chinook Catch
Sacramento Trawl Older Juvenile Non-Clipped Chinook Catch
Chipps Trawl Older Juvenile Non-Clipped Chinook Catch
Jrsy/Prsnrs Trawls Older Juvenile Non Clipped Chinook Catch
Sampled, No Catch
Percent of Winter Run Take Level
Land Marks
1
2
6
1
Sacramento
DCC
Rio Vista
3
1
Stockton
SWP
CVP
Mossdale


USFWS Beach Seines & Trawls
SWP & CVP Cumulative Loss
Week Of 12/21/2014
Beach Seine Older Juvenile Non-Clipped Chinook Catch
Sacramento Trawl Older Juvenile Non-Clipped Chinook Catch
Chipps Trawl Older Juvenile Non-Clipped Chinook Catch
Jrsy/Prsnrs Trawls Older Juvenile Non Clipped Chinook Catch
Sampled, No Catch
Percent of Winter Run Take Level
Land Marks
Sacramento
1
2
DCC
Rio Vista
7
1
Stockton
SWP
0%
CVP
Mossdale


USFWS Beach Seines & Trawls
SWP & CVP Cumulative Loss
Week Of 12/28/2014
Beach Seine Older Juvenile Non-Clipped Chinook Catch
Sacramento Trawl Older Juvenile Non-Clipped Chinook Catch
Chipps Trawl Older Juvenile Non-Clipped Chinook Catch
Jrsy/Prsnrs Trawls Older Juvenile Non Clipped Chinook Catch
Sampled, No Catch
Percent of Winter Run Take Level
Land Marks
1
Sacramento
DCC
Rio Vista
3
Stockton
SWP
2%
CVP
Mossdale


USFWS Beach Seines & Trawls
SWP & CVP Cumulative Loss
Week Of 1/4/2015
Beach Seine Older Juvenile Non-Clipped Chinook Catch
Sacramento Trawl Older Juvenile Non-Clipped Chinook Catch
Chipps Trawl Older Juvenile Non-Clipped Chinook Catch
Jrsy/Prsnrs Trawls Older Juvenile Non Clipped Chinook Catch
Sampled, No Catch
Percent of Winter Run Take Level
Land Marks
Sacramento
DCC
Rio Vista
1
Stockton
SWP
2%
CVP
Mossdale


USFWS Beach Seines & Trawls
SWP & CVP Cumulative Loss
Week Of 1/11/2015
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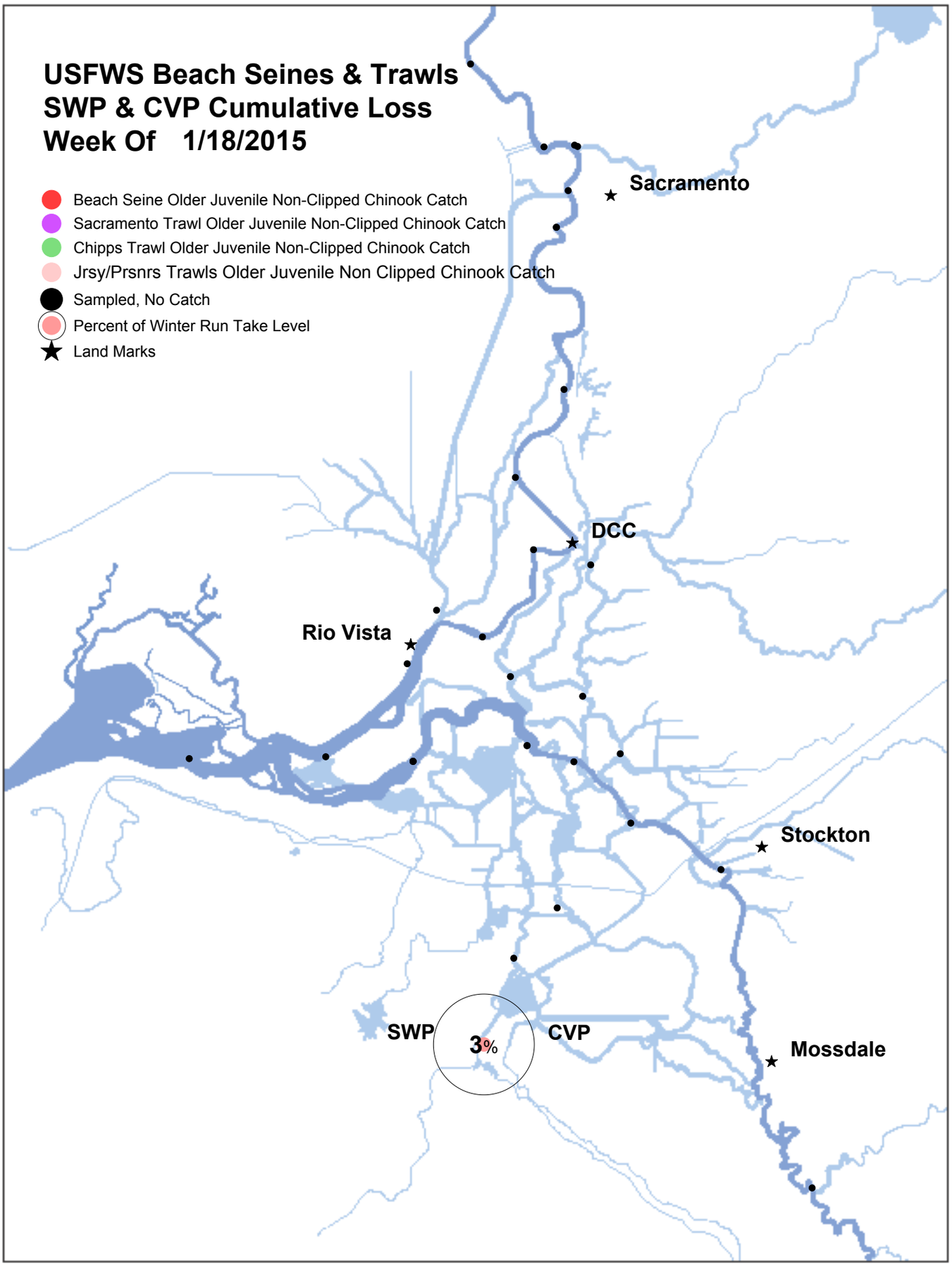
Chipps Trawl Older Juvenile Non-Clipped Chinook Catch
Jrsy/Prsnrs Trawls Older Juvenile Non Clipped Chinook Catch
Sampled, No Catch
Percent of Winter Run Take Level
Land Marks
Sacramento
DCC
Rio Vista
Stockton
SWP
3%
CVP
Mossdale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SWP & CVP Cumulative Loss
Week Of 1/18/2015
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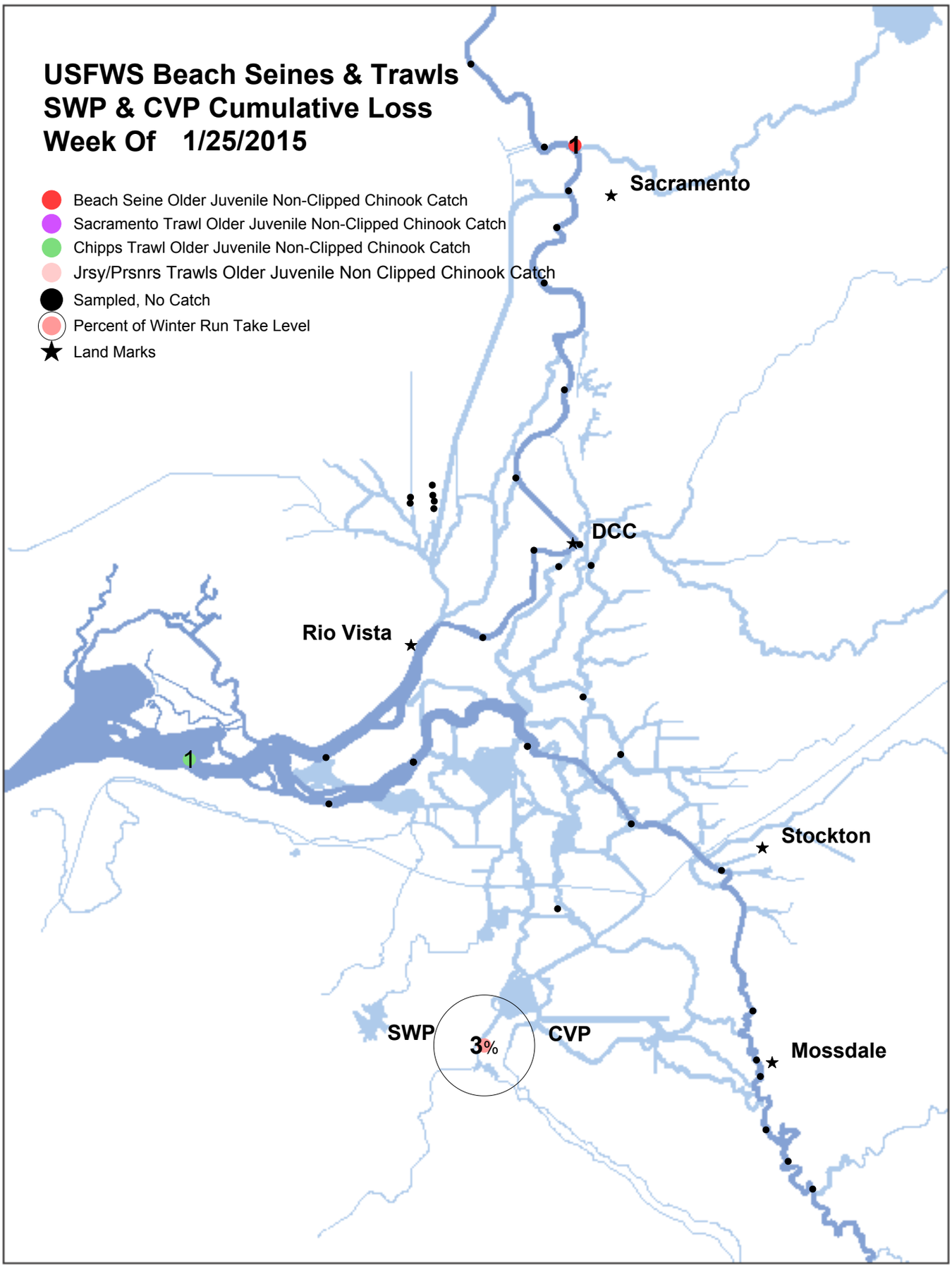
Chipps Trawl Older Juvenile Non-Clipped Chinook Catch
Jrsy/Prsnrs Trawls Older Juvenile Non Clipped Chinook Catch
Sampled, No Catch
Percent of Winter Run Take Level
Land Marks
Sacramento
DCC
Rio Vista
Stockton
SWP
3%
CVP
Mossdale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SWP & CVP Cumulative Loss
Week Of 1/25/2015
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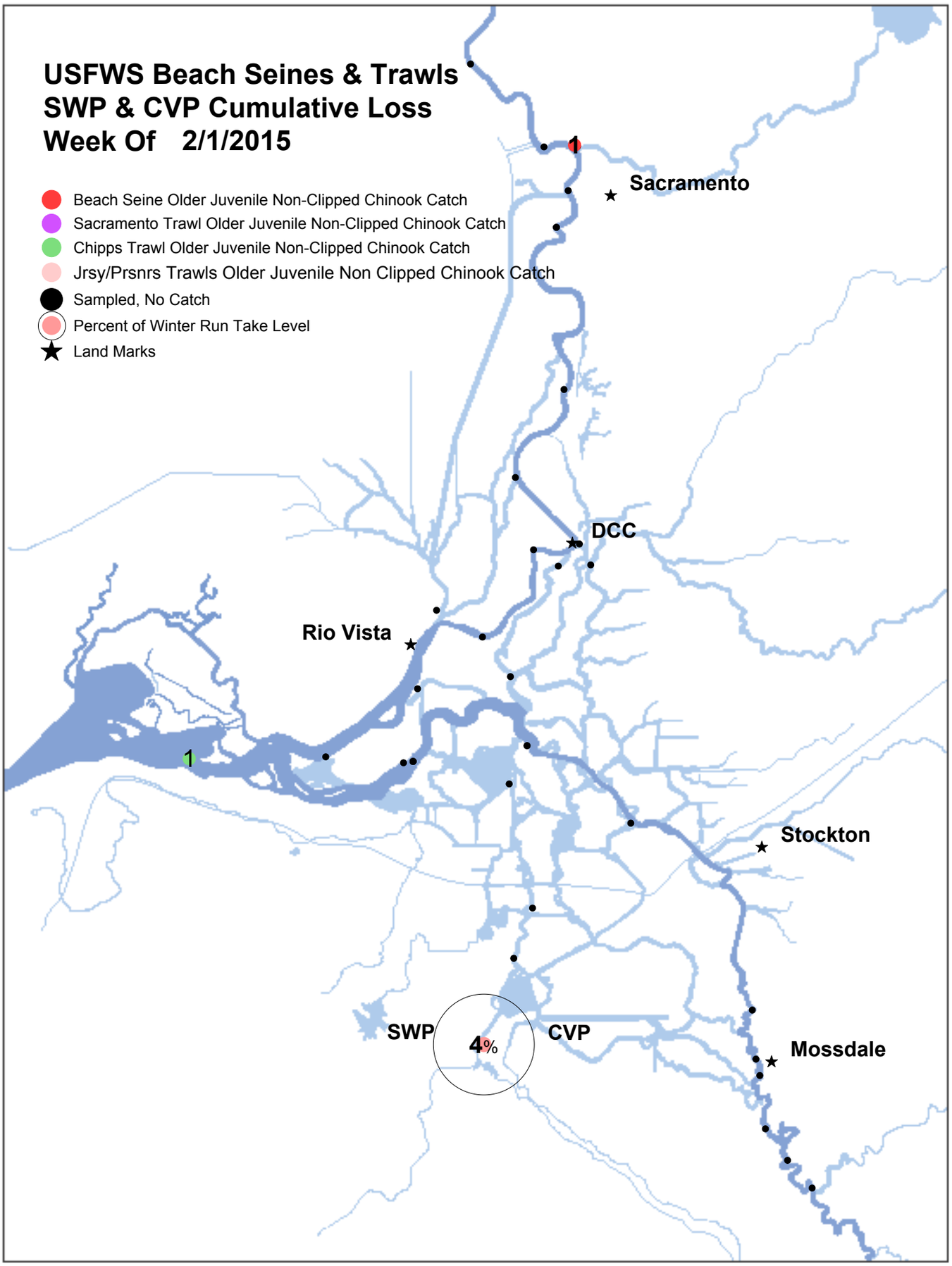
Chipps Trawl Older Juvenile Non-Clipped Chinook Catch
Jrsy/Prsnrs Trawls Older Juvenile Non Clipped Chinook Catch
Sampled, No Catch
Percent of Winter Run Take Level
Land Marks
1
Sacramento
DCC
Rio Vista
1
Stockton
SWP
3%
CVP
Mossdale


USFWS Beach Seines & Trawls
SWP & CVP Cumulative Loss
Week Of 2/1/2015
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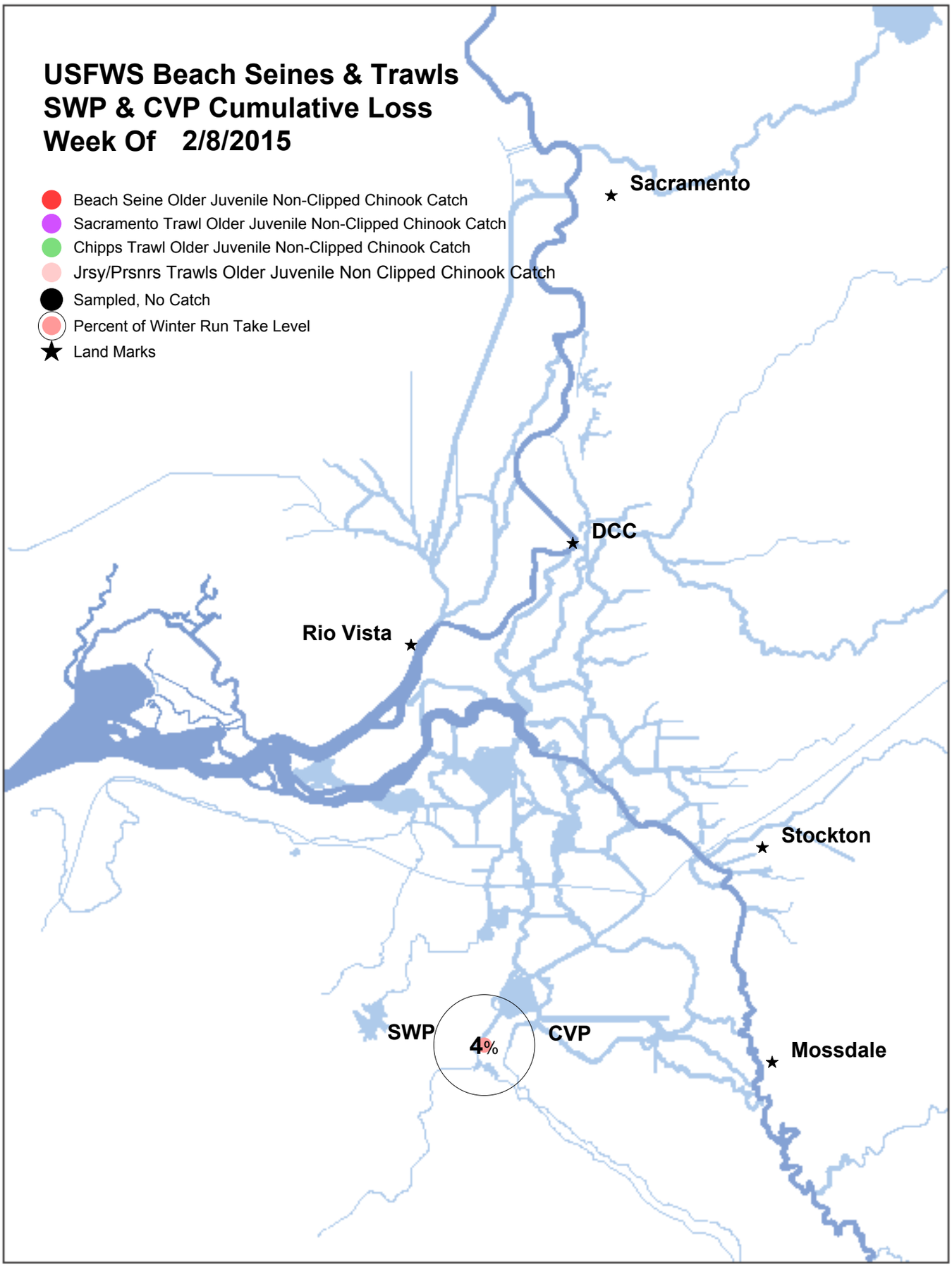
Sacramento Trawl Older Juvenile Non-Clipped Chinook Catch
Chipps Trawl Older Juvenile Non-Clipped Chinook Catch
Jrsy/Prsnrs Trawls Older Juvenile Non Clipped Chinook Catch
Sampled, No Catch
Percent of Winter Run Take Level
Land Marks
1
Sacramento
DCC
Rio Vista
1
Stockton
SWP
4%
CVP
Mossdale


USFWS Beach Seines & Trawls
SWP & CVP Cumulative Loss
Week Of 2/8/2015
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Sacramento Trawl Older Juvenile Non-Clipped Chinook Catch
Chipps Trawl Older Juvenile Non-Clipped Chinook Catch
Jrsy/Prsnrs Trawls Older Juvenile Non Clipped Chinook Catch
Sampled, No Catch
Percent of Winter Run Take Level
Land Marks
Sacramento
DCC
Rio Vista
Stockton
SWP
4%
CVP
Mossdale

Attachment D

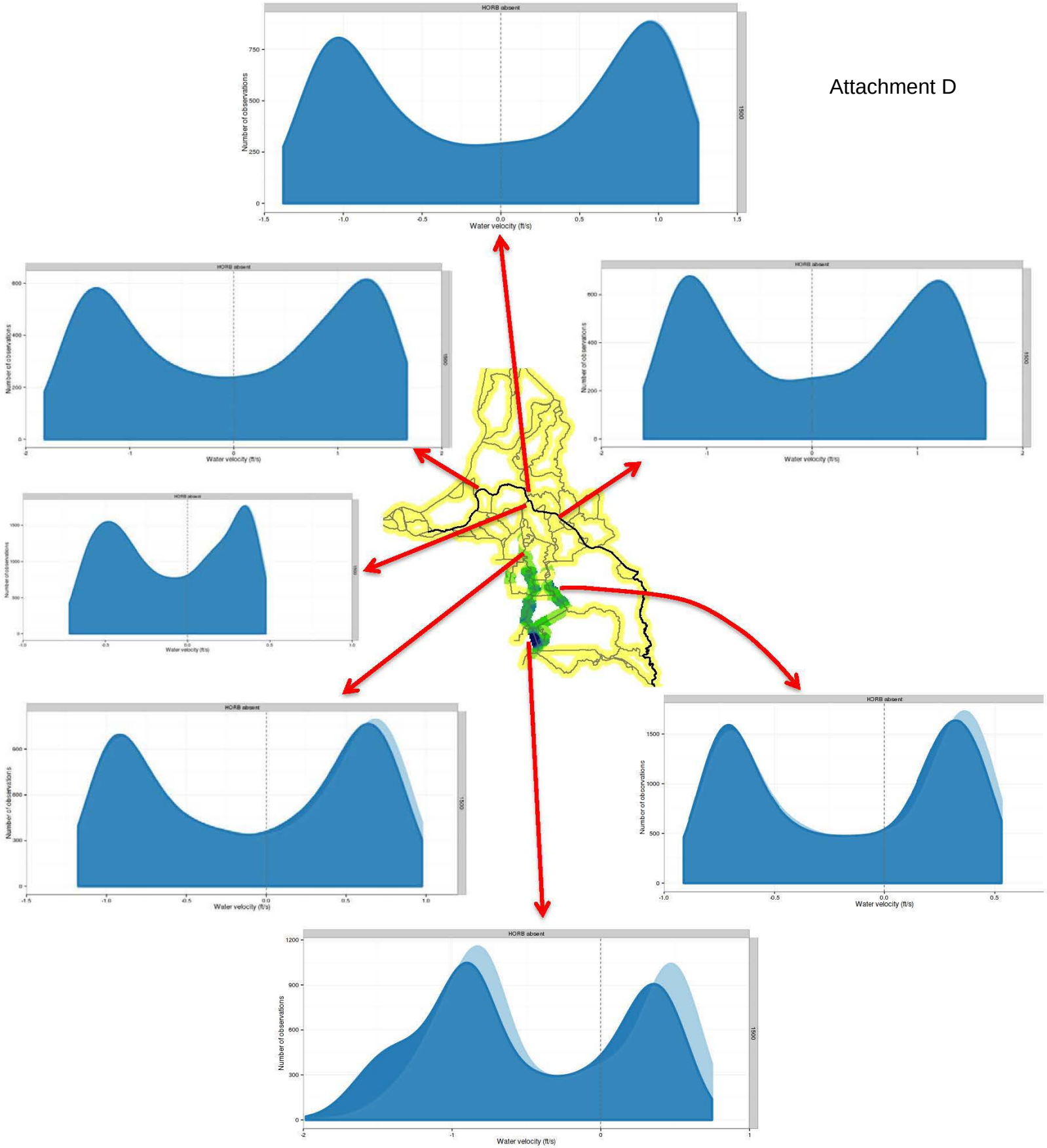

Figure 1. Effect of exports on velocities in the Delta. Blue plots depict the frequency of instantaneous velocities observed at example channels for exports at 2,333cfs (light blue area) and 3,622 cfs (dark blue area). Colored Delta map (center) indexes changes in velocity (in all Delta channels) associated with increasing exports from 2,333cfs to 3,622 cfs . Yellow areas indicate no or very small changes in velocities. Green and blue areas indicates largest observed differences in velocity. San Joaquin River inflows fixed at 1,500 cfs for all data shown.