Juvenile Chinook Salmon Radio-Telemetry Studies in the Northern and Central Sacramento - San Joaquin Delta 2002 - 2003

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FINAL REPORT

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INTRODUCTION

The Sacramento-San Joaquin Delta (Delta) in California (Figure 1) is used by juvenile Chinook salmon (*Oncorhynchus tshawytscha*) to migrate from upstream spawning grounds to the Pacific Ocean. The Delta has been extensively modified both structurally and hydrodynamically and considerable restoration efforts are in progress there to improve fish habitat. There is limited understanding of how juvenile salmon migrate through the Delta which possesses multiple channels, diverse shoreline and channel habitats, and complex hydrodynamics of river flow, water diversions and tides. There is a need to better understand the basic biology characterizing the migratory behavior of juvenile Chinook in the Delta to enable restoration efforts to succeed.

This research project was conducted to improve the understanding of juvenile anadromous salmonid migratory behavior in the Delta to enhance ongoing and future Delta ecosystem restoration efforts. Empirical data on the behavior of outmigrating salmonids is expected to assist resource managers in formulating options to improve fish survival. It is widely recognized that mortality to all juvenile anadromous salmonids occurs as the fish migrate through the Delta. Although the general mortality factors are known (e.g., predation, unscreened diversions), many site-specific causal mechanisms are not clearly understood. This circumstance is largely attributable to unknown migration behavior and routes as the juvenile salmonids negotiate numerous Delta channels in a hydraulically complex, tidal environment.

Various forms of evidence indicate that south Delta export operations cause juvenile salmon mortality to some degree. One theory suggests that a portion of this mortality is caused by the net reverse flow in some locations within the Delta channels caused by export operations. Longer and more complicated fish migration routes and navigation problems caused by the hydrological effects of export pumping are believed to be among factors affecting juvenile Chinook salmon. Concurrent diversion of large amounts of water from the Delta and successful salmon restoration efforts will require determining the locations and causes of salmon losses so the causes can be reduced or eliminated.

The study utilized radio telemetry as the technique to evaluate juvenile salmon migratory behavior at various locations in the northern and central Delta. The use of radio telemetry to monitor the movements and behavior of young downstream migrant salmonids has been successfully used in a variety of fish passage investigations for approximately the past two decades. This project was designed as three individual, short-term, four-week experiments to evaluate the behavior of radio-tagged juvenile Chinook with the objective of determining how young salmon migrate through the Delta under varied hydrodynamic conditions after release at two locations in the northern Delta and one location in the central Delta. Juvenile Chinook were fitted with radio transmitters, released in the lower Sacramento River and in northern Georgiana Slough in the northern Delta and the lower San Joaquin River in the central Delta. Radio-tagged fish were subsequently monitored to determine their individual behavior patterns as they migrated through the Delta.

The study objectives included an evaluation of how the radio-tagged salmon respond to flood and ebb tides, where fish migrated within the Delta channels, the degree of variability in migratory behavior of the individual tagged fish, and predation on radio-tagged salmon. These studies were designed and built upon prior, similar research in the north and south Delta described by Vogel (2001, 2002).

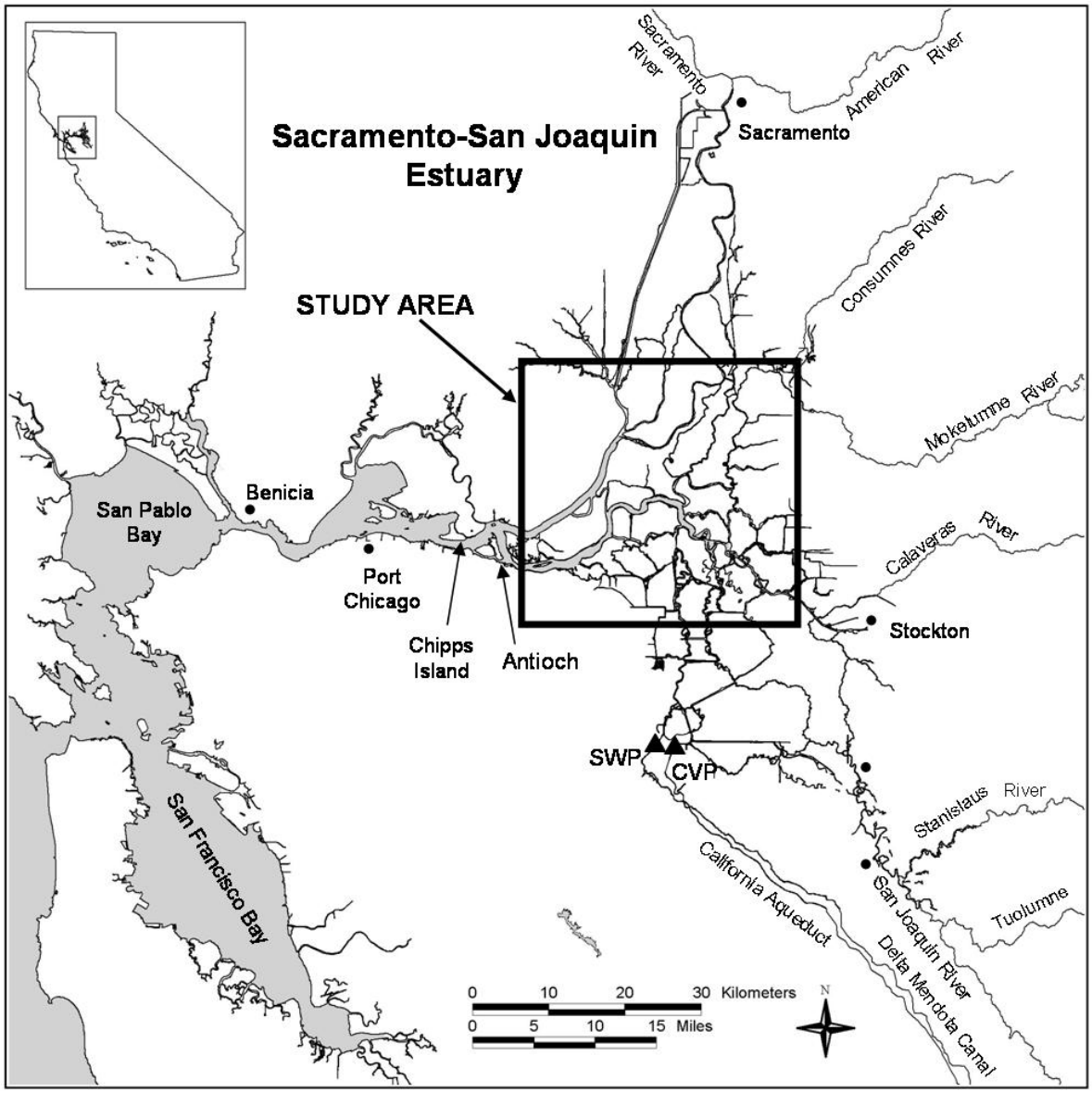

Figure 1. The Sacramento - San Joaquin Bay/Delta and juvenile Chinook salmon telemetry study area.

MATERIALS AND METHODS

Radio Transmitter Attachment and Implantation

During the north Delta studies, both externally-attached radio transmitters and internally-implanted radio transmitters were used in the experiments to allow comparisons between techniques. During the two central Delta experiments, only internally-implanted radio transmitters were used.

External Attachment Procedures

Individual juvenile late-fall Chinook salmon (experimental fish) at Coleman National Fish Hatchery near Anderson, California were fitted with externally-mounted, 1-gram, miniature radio transmitters[1] (Figure 2). The transmitters measured approximately 6 mm in diameter and 16 mm long with a trailing flexible antenna. Control fish were fitted with non-functional ("dummy") transmitters of the same size and weight as functional transmitters and held in live pens at the hatchery and Delta release sites to monitor potential latent mortality and behavioral effects resulting from tagging and transport.

External attachment utilized a tag harness constructed of a small plastic plate (3 mm x 15 mm) with a piece of 3/0 stainless steel suture wire bent in a U-shape with the ends of the wire passed through small holes in either end of the plastic plate. Heat-shrink tubing was cut to fit the length of the plate and transmitter and ethyl cyanoacrylate adhesive was used to secure the harness

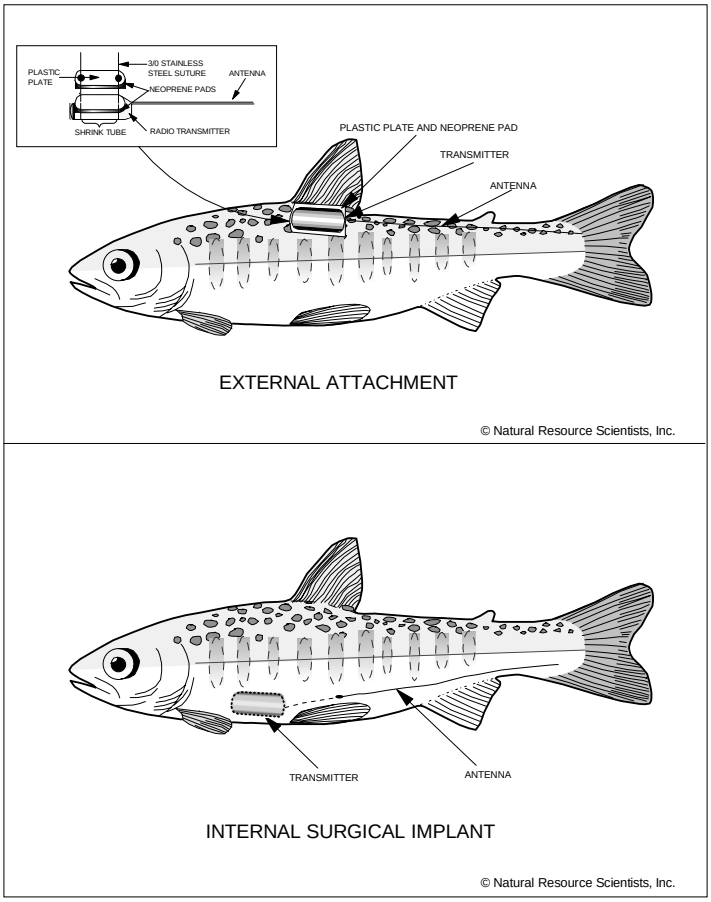

Figure 2. External attachment and internal implantation of a radio tag in juvenile Chinook salmon.

[1]Advanced Telemetry Systems, Inc. 48-49 MHz radio transmitters and mobile radio-receiving units were used for this study.

assembly to the transmitter. A second plastic plate identical in dimensions and in location of the holes to that previously described was used as a back plate to externally secure the transmitter harness assembly on the opposite side of the fish. After assembly, the radio tags were painted a flat olive green color to camouflage the tag from potential predators (e.g., piscivorous birds and fish).

Fish were anesthetized individually in aerated solutions containing 100 mg/liter 2,2,2 tricaine methanesulfonate buffered with an equal weight of sodium bicarbonate, 2 ml of PolyAqua, and about 7 g/liter sodium chloride. Water temperature of the anesthetic solution was monitored and maintained within 2^{o}F. Immediately prior to surgery, the internal radio tag switch was activated by removing an external magnet.

Upon sedation, the fish was placed dorsum up in a foam tagging cradle which supported the entire body of the fish and was saturated with a solution containing hatchery water, PolyAqua, and 0.9% sodium chloride. All surgical equipment and the tag-harness suture wire were disinfected with a Betadine solution and rinsed with physiological saline before radio tagging each fish. Two hypodermic needles (spaced about 1.6 cm apart) were pushed through the dorsal musculature approximately 1.5 cm ventral to the dorsal fin. The ends of the suture wire protruding from the tag-harness assembly were threaded through the hypodermic needles and the needles then withdrawn leaving the suture wire-harness-transmitter assembly in place (antenna pointing toward the posterior of the fish). A thin neoprene pad, followed by the plastic back plate, were threaded on the ends of the wires and gently pulled taut against the body of the fish. The ends of the wires were twisted (8-10x) to secure and complete the external attachment of the transmitter to the fish (Figure 2). The fish's buccal cavity (mouth and gills) was continuously irrigated with the anesthetic solution (using a flexible plastic tube fed by gravity from a head bucket) throughout the attachment procedure.

After tagging, the fish was placed in a 20-liter recovery bucket containing an aerated solution of hatchery water, 3 ml PolyAqua and about 5 to 7 g/liter sodium chloride. The entire tagging procedure from removal of the fish from the anesthetic solution to placing the fish in the recovery solution took approximately one minute. After visible recovery from the surgery, the fish was placed in circular holding tanks at the hatchery for one to four days prior to transport. No mortalities occurred from the external tagging method.

Internal Implant Procedures

Fish handling in preparation for internal transmitter placement (Figure 2) was similar to the procedures previously described for externally radio-tagged salmon. Upon sedation, the fish was placed ventral side up in a foam tagging cradle which supported the entire body of the fish and was saturated with a solution containing hatchery water, PolyAqua, and 0.9% sodium chloride. All surgical equipment and the tag-harness suture wire were disinfected with a Novalsan solution and rinsed with physiological saline before radio tagging each fish. An incision, approximately

15 mm long was made about 3 mm adjacent and parallel to the ventral line and about 6 mm in front of the pelvic girdle. A hypodermic needle with a protective hollow plastic sheath or tube was inserted through the incision, inside the body cavity, and pushed through the body wall between the lateral line and the pelvic fins. The hypodermic needle was withdrawn leaving the hollow tube temporarily remaining protruding through the body wall. The radio transmitter antenna was threaded through the plastic tube (open incision side first) and out through the body wall removing the plastic tube so that only the antenna remained protruding through the body wall. The transmitter was then gently pushed through the incision and placed inside the body cavity. For control fish fitted with "dummy" transmitters, a passive integrated transponder (PIT) tag[2] was inserted into the body cavity by hand. The assumption was made that the PIT tag has negligible effects on juvenile salmon (Prentice et al. 1990). Addition of the PIT tag allowed for subsequent rapid differentiation of active and "dummy" tagged fish. Antiseptic (Oxytetracycline) was added inside the body cavity using a micro-pipette prior to closure of the incision. The incision was closed with three sutures placed equidistance apart on the incision. The trailing antenna was sutured to the side of the fish at a location approximately between the lateral line and the anal fin. The continuous anesthetic procedure was the same as that described for external tag attachment.

After tagging, the fish was placed in a 20-liter recovery bucket containing an aerated solution of hatchery water, 3 ml PolyAqua and about 5 to 7 g/liter sodium chloride. The entire internal implant procedure from removal of the fish from the anesthetic solution to placing the fish in the recovery solution took approximately 6-8 minutes. After visible recovery from the surgery, the fish was placed in circular holding tanks at the hatchery for one to four days prior to transport. No mortalities occurred from the internal tagging method.

Fish Transport and Release Procedures

Radio-tagged salmon were allowed to acclimate for one to four days prior to transport to the Delta. Fish were transported to the Delta in an insulated, 110-liter fish-hauling tank with bottled oxygen aeration (1.5-3.0 liters/minute). The transport tank was filled with hatchery water and prepared by adding approximately 5 g/liter sodium chloride to minimize osmotic stress during handling and transport (Carmichael and Tomasso 1988, Long et al. 1977, Wedemeyer 1992) and 30 ml PolyAqua. Test fish were transferred to a holding pen (a 3-ft x 3-ft x 5-ft live pen covered with 1/4-inch-mesh galvanized hardware cloth) in the Delta for acclimation to ambient conditions overnight prior to release. Control fish, with "dummy" transmitters were held in the live pen for the duration of the individual experiments to monitor potential latent tagging and fish transport mortality.

[2] "The PIT tag consists of an antenna coil that has about 1,200 wraps of a specially coated copper wire 0.0254 mm in diameter. The antenna coil is bonded to a pad and an integrated circuit chip. The electronic components of the tag are encapsulated in a glass tube 12.0 mm long by 2.1 mm in diameter."

On the morning after overnight acclimation to the Delta water, fish were netted from the live pen, transferred to 20-l buckets with aerated water, transported to the release site, and released. Because telemetry data could only be acquired during daylight hours, fish were always released during the morning to maximize data collection for the first day. As a consequence, each fish release occurred during different tidal phases so caution should be used in making some comparisons between releases.

The tag and release pattern was repeated over a four-week consecutive period in each of three experiments to ascertain potential differences within a range of environmental conditions (e.g., tidal, hydrodynamic, weather, and river flow) in the Delta. During the north Delta experiment, 34 radio-tagged salmon were released in two separate releases of 16 and 18 fish in different weeks near Ryde on the Sacramento River and 28 radio-tagged salmon were released in two separate releases of 12 and 16 fish in different weeks in northern Georgiana Slough. For each of the two central Delta experiments, 49 and 51 radio-tagged salmon were released in the San Joaquin River near 14-mile Slough in groups of 12-14 fish each week over four consecutive-week periods.

The two release sites on the lower Sacramento near Ryde and northern Georgiana Slough were chosen to correspond to the same release sites used in the prior study by Vogel (2001). Additionally, those sites have been used by U.S. Fish and Wildlife Service for releases of coded-wire tagged salmon for comparative Delta fish survival experiments. Comparisons betweens the sites may provide insights into potential survival differences for the two primary pathways juvenile salmon enter the Delta (when the Delta Cross Channel gates are closed).

The release site on the San Joaquin River adjacent to 14-Mile Slough was chosen to provide insight into fish migration behavior in a Delta region where fish migration pathways are poorly understood. Specifically, the release site was selected on the mainstem San Joaquin River upstream of Turner Cut, Columbia Cut, Middle River, and Old River to allow for fish to be exposed to those potential pathways into the south Delta.

Radio-Tracking Procedures

The morning after overnight acclimation in the live pen, radio-tagged salmon were transported to the release site in aerated water and released. Radio-tagged fish were monitored using ATS Model R2100 radio-scanning receivers for four days (approximately 12 hours/day during daylight) following release. The tracking method was with mobile receivers on two 21-foot jet boats with inboard V-8 engines. Each time a radio-tagged fish was located, time, position (via a Garmin III+ GPS), relative location in the channel, flow direction, and any relevant biological and behavioral observations were recorded (Appendix A). Radio receivers were usually set to 2-second scan rates for individual 1-pulse/second tag frequencies programmed into the receiver. The maximum time to cycle through all frequencies was two seconds times the total number of different frequencies in the Delta at any one time.

Initial mobile tracking each day had to be performed relatively slowly to avoid missing radio tag pulses. Once a tag was detected and its position located, that frequency was temporarily deleted from the scanner's memory to allow for a more rapid scanning cycle for the remaining frequencies; the deleted frequencies were re-entered into the scanner's memory after mobile reconnaissance to other Delta regions. Based on experience acquired from prior, similar studies (Vogel 2001, 2002), if a radio-tagged fish could not be readily located after it was missing the next day, minimal effort was expended to locate that fish to avoid losing data on those fish that could be readily located. In most instances, this allowed for more data collection on the majority of the radio-tagged salmon. Radio tracking generally occurred for 4 days, a period established as a function of ensuring sufficient radio tag battery life and budgetary constraints. A Telex headset was worn during boat tracking to minimize background noise from the boat engine. Radio-tagged fish locations [reported in Universal Transverse Mercator (UTM) coordinates - WGS84 datum] were recorded on field data forms (Appendix A) and transferred to schematic plan view maps of relevant locations in the Delta. During post-processing of telemetry data, some GPS coordinates were adjusted to more accurately depict fish locations because GPS readings taken from the jet boat did not exactly correspond to fish locations.

All data collected during this study are provided in Appendices to this report. Data are presented in spreadsheet format for each fish and each release (Appendices C-E) and in individual maps depicting each telemetered location for each fish during the study (Appendices I-K) (162 individual maps). The report summarizes data in the Appendices but readers can refer to specific data on individual radio-tagged fish in the Appendices. Because of software limitations in exporting files after processing telemetry locations on Delta maps, some image clarity was lost in the transfer. For this reason, a high-quality map of the Delta is included as Appendix L for readers to refer to because of the frequent reference to specific waterways and landmarks that may not be easily discernable on all maps in this report.

During radio tracking, it was common to cover approximately 85 river miles during one day's mobile telemetry reconnaissance. Actual distances traveled by each jet boat were approximately 150 to 200 miles each day because of backtracking, the need for frequent triangulation to pinpoint exact fish locations, and the "zigzag" pattern required to ensure adequate radio transmitter reception coverage in wide Delta channels. Because portions of the lower Sacramento River downstream of the Cache Slough confluence and the San Joaquin River are more than one-half mile wide, it was necessary to establish mobile tracking patterns to maximize the probability of radio tag detection (described in Vogel 2001). In general, radio tag transmissions could be picked up within approximately 1/8th of a mile from the fish, but reception was variable depending on depth of the fish. Additional details and the benefits and constraints of the mobile radio-tracking procedures are described in Vogel (2001, 2002).

Telemetry results presented in this report are more qualitative in nature instead of quantitative. This is attributable to the fact that the monitoring effort could not be uniform during each day of

the experiments. The effort expended each day of monitoring in specific regions of the Delta varied. Although attempts were made to cover the same channels each day with mobile receivers, the effort was not uniform enough to allow quantitative and conclusive comparisons. Although comparisons are made between experiments, caution should be observed in interpreting these comparisons recognizing the limitations of unequal sampling effort and other variable discussed in this report.

Observations on Probable Predation

The following is the basis used in this project to assume predation of tagged fish. During the course of this and prior, similar studies, there were notable differences in some radio-tagged fish behaviors that suggested predation losses. Although it was not possible to confirm predation, there were aberrant characteristics of radio tag transmissions that indicated that some radio-tagged salmon may have encountered predators. These characteristics were largely derived from more than a thousand individual observations of radio-tagged salmon [combined from this study and studies during 1996 and 1997 in the Delta (lower Mokelumne River and San Joaquin River) (Natural Resource Scientists, Inc., unpublished data); Vogel 2001, Vogel 2002]. Some of the indicators of probable predation included: abrupt change (decline) in radio tag transmission signal strength, signal remaining consistently attenuated, a sudden change in behavior in comparison to prior observations of the same tag or other radio-tagged fish (e.g., moving with strong currents then abruptly moving for extended distances against the current), or a radio tag remaining in the exact same location where a juvenile salmon would not be expected to maintain position for such a long duration (e.g., mid San Joaquin River channel). In some instances, externally-attached radio tags may have become detached from the juvenile salmon after release. However, because of the strength of the stainless steel surgical wire used to attach the transmitters to the fish and the fact that no control ("dummy") tags were ever noted to have been shed by the fish, any detached radio tags were presumed to have resulted from physical trauma from actual or attempted predation by piscivorous fish or birds (i.e. the predator severed the tag from the fish during the predation attempt). Additionally, some of the tags may have been located after a predator regurgitated or defecated the tag. During the study, a test transmitter was placed at a 40-ft depth in the San Joaquin River and there were no problems with tag detection.

Some of the radio tags could not be located anywhere in the study area after the fish had been previously detected actively migrating downstream from the release sites. It is conceivable that some of the radio-tagged salmon may have been preyed on by piscivorous birds (e.g., herons, egrets, cormorants) as was discovered in juvenile radio-tagged juvenile salmon experiments in the upper Sacramento River (Vogel et al. 1988), although this could not be confirmed in the north and central Delta experiments. The premise of predation is somewhat subjective and not absolute in all instances, but experience acquired from a large amount of observations of radio-tagged salmon movements over several years of study suggests that the assumption is probably valid in most instances.

Animation Graphics

Some of the results presented in this report display time series animations of fish telemetry data in relation to flow and velocity in specific Delta channels. The software program, called "Gr" was developed by John Donovan, U.S. Geological Survey (USGS), for displaying, editing and printing X-Y data, displaying or animating vector data, particle paths, or two-dimension data fields (Donovan 2002). Details on the program are available at: http://ca.water.usgs.gov/program/sfbay/gr/manual.pdf and may be downloaded at: http://ca.water.usgs.gov/program/sfbay/gr/. Flow data used for the animations were obtained from the USGS for stations at Rio Vista and Jersey Point. Estimated flow and velocity data for channels in the interior Delta were obtained from DMS2 (Delta Simulation Model) outputs provided by the California Department of Water Resources (CDWR). DSM2 calculates stages, flows, and velocities for specific channels in the Delta. The animation outputs were converted to .avi files as clickable links for viewing with this report. For the links to .avi files to function properly, the .avi files must be within the same directory as this electronic report file on reader's computers. Animation files were created only for those instances where sufficient fish telemetry data in relation to flow or velocity were available to illustrate fish movements. Assumed fish positions between known locations were interpolated when locations were recorded within the same tide phase and, in some instances, were extrapolated when locations were recorded before and after tide phase changes. For example, in this latter instance, the estimated fish location at slack tide was estimated based on fish behavior (movement) before and after the tide phase change. The magnitude and direction of the flow and velocity vectors are placed adjacent to those channels represented in the DSM2 outputs. An example is provided in the following file showing flow vectors in red and velocity vectors in green: Flow and Velocity.avi

RESULTS AND DISCUSSION

NORTHERN DELTA - 2002

Fish tagging and release data are provided in Appendix B. The Delta Cross Channel gates were closed during all four fish releases.

First Fish Release - Sacramento River, January 22-25, 2002

Figure 3 shows the results of four days of monitoring for the 16 radio-tagged late-fall Chinook released in the lower Sacramento River on January 22, 2002. All detected locations for each fish are shown on separate maps in Appendix I (16 maps). Detailed telemetry data on individual fish are provided in Appendix C. The fish quickly dispersed in a downstream direction but did not move as a school. Eleven of the 16 radio tags were documented to have reached or passed the confluence with Cache Slough near Rio Vista. Five of the 16 radio tags were last detected in the Sacramento River upstream of the Cache Slough confluence. Daily mobile radio receiver

reconnaissance by the two jet boats encompassed an area from Ryde to Collinsville to the San Joaquin River via Three-Mile Slough to Liberty Island on Cache Slough and several miles upstream of Cache Slough in the shipping channel and Steamboat Slough (approximately 85 river miles traversed and scanned each day by each jet boat) (Appendix L).

Fish Movements with the Tides

The close proximity of a USGS flow monitoring station at Rio Vista in the vicinity of the location of radio-tagged fish reaching the Cache Slough confluence provided data to compare fish movements with ebb and flood flow. Animation file N.Delta 2002.avi shows the movements of eight radio-tagged salmon in that Delta region the day after release in the lower Sacramento River. These fish moved considerable distances (several miles) with the flood tide north into Cache Slough and south with the ebb tide. These movements were similar to that observed and described in detail for the same scanning area in the 2000 radio-telemetry study (Vogel 2001). However the Sacramento River flow was substantially higher during the 2000 study (approximately 22,000 cfs to 50,000 cfs) compared to this study (approximately 14,000 cfs to 23,000 cfs). The lower flow would undoubtedly cause greater tidal seiching back up into Cache Slough.

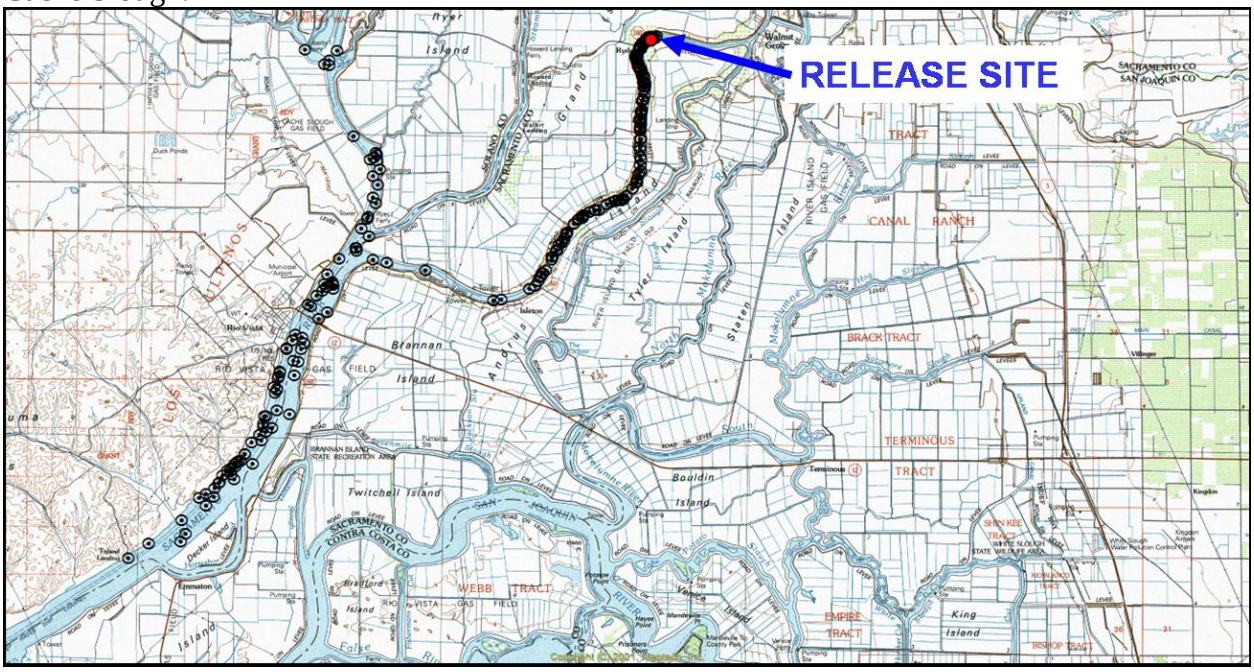

Figure 3. Locations of 16 radio-tagged juvenile Chinook salmon, January 22 – 25, 2002.

Second Fish Release - Georgiana Slough, January 30-February 2, 2002

Figure 4 shows the results of four days of monitoring for the 16 radio-tagged late-fall Chinook

released in northern Georgiana Slough on January 30, 2002. All detected locations for each fish are shown on separate maps in Appendix I (16 maps). Detailed telemetry data on individual fish are provided in Appendix C. The fish quickly dispersed in a downstream direction but did not move as a school. During the four days of tracking, positive downstream (southerly) flows were observed in Georgiana Slough with no flow reversals. Only seven of the 16 radio tags were documented to have exited Georgiana Slough and entered the lower Mokelumne River and only two fish entered into the San Joaquin River. Figure 4 shows the multiple telemetered locations for the two fish that entered the main stem San Joaquin River.

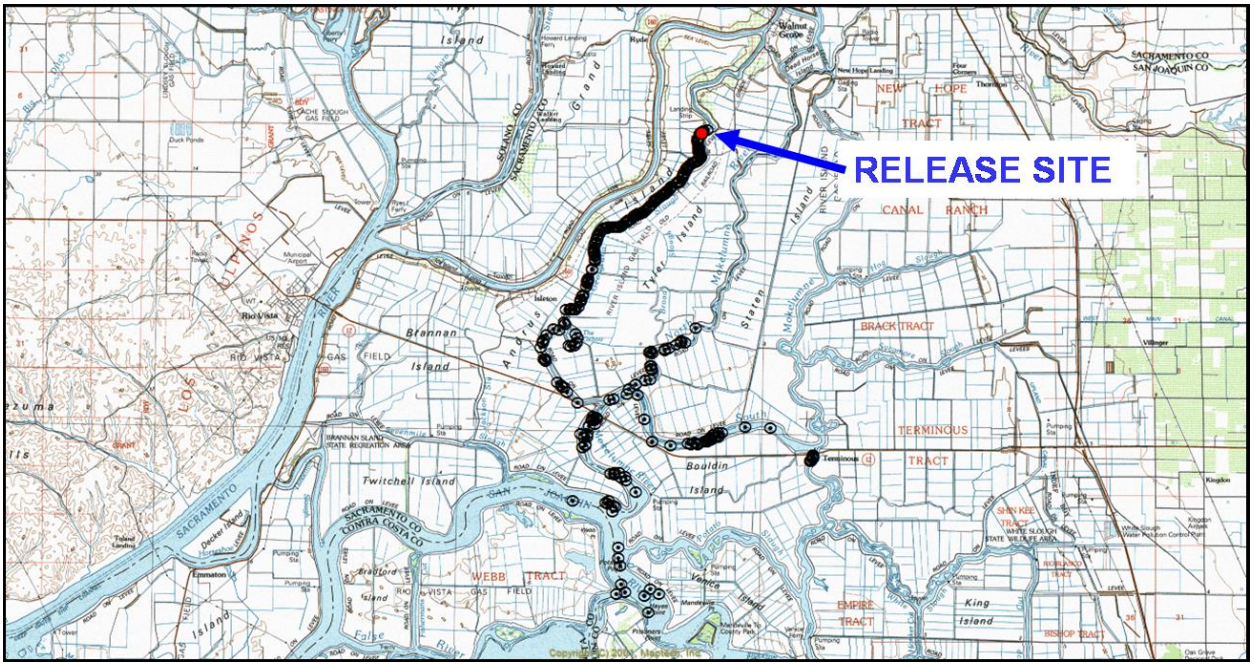

Figure 4. Locations of 16 radio-tagged juvenile Chinook salmon, January 30 – February 2, 2002.

For the Georgiana Slough fish release, mobile tracking by both jet boats was performed from the release site in northern Georgiana Slough to the North and South Forks or the Mokelumne River (upstream of the convergence of the forks in the lower Mokelumne River) to the San Joaquin River upstream of Middle River and downstream of Antioch. The scanning range also included the lower portions of Middle and Old Rivers, Potato Slough, False River, Fisherman's Cut, and Three-Mile Slough to the Sacramento River (Appendix L).

Third Fish Release - Sacramento River, February 6 - 9, 2002

Figure 5 shows the results of four days of monitoring for the 18 radio-tagged late-fall Chinook. All detected locations for each fish are shown on separate maps in Appendix I (18 maps). Detailed telemetry data on individual fish are provided in Appendix C. The fish quickly

dispersed in a downstream direction but did not move as a school. Thirteen of the 18 radio tags were documented to have reached or passed the confluence with Cache Slough near Rio Vista. Five of the 18 radio tags were last detected in the Sacramento River upstream of Isleton. On the fourth day after release, radio scanning via the jet boats mobile radio receivers encompassed an area from Cache Slough upstream of the shipping channel to Honker Bay past the western end of Chipps Island including a scan of Sherman Lake (Appendix L).

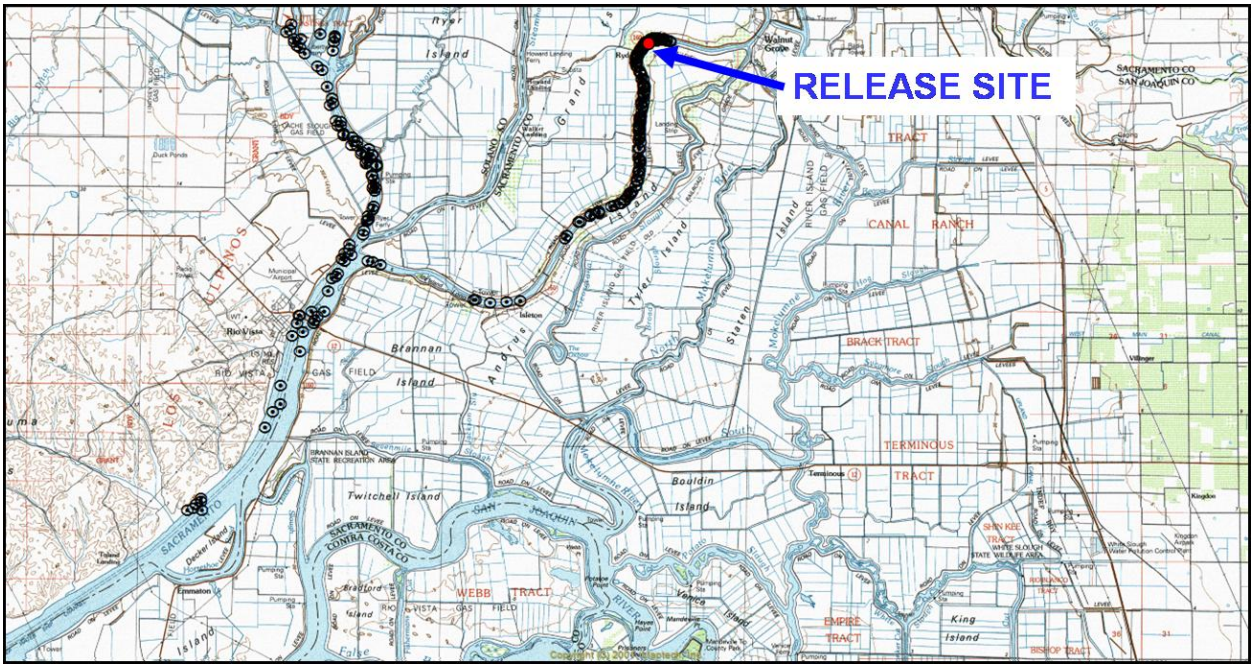

Figure 5. Locations of 18 radio-tagged juvenile Chinook salmon, February 6 – 9, 2002.

Fourth Fish Release - Georgiana Slough, February 12 - 15, 2002

Figure 6 shows the results of four days of monitoring for the 12 radio-tagged late-fall Chinook released in Georgiana Slough on February 12, 2002. All detected locations for each fish are shown on separate maps in Appendix I (12 maps). Detailed telemetry data on individual fish are provided in Appendix C. During the four days of tracking, positive downstream (southerly) flows were observed in Georgiana Slough with no flow reversals. Only six of the 12 radio tags were documented to have exited Georgiana Slough and entered the lower Mokelumne River and only one fish entered into the San Joaquin River. Some of the fish moved with the flood tide back up into the North and South Forks of the Mokelumne River. During the four days of monitoring, areas scanned included Georgiana Slough, the San Joaquin River from Middle River to False River, the lower portions of Middle, Old, and False Rivers, Fishermans Cut, Three-Mile Slough, South and North Forks Mokelumne River, Mokelumne River, Franks Tract, and Potato Slough (Appendix L).

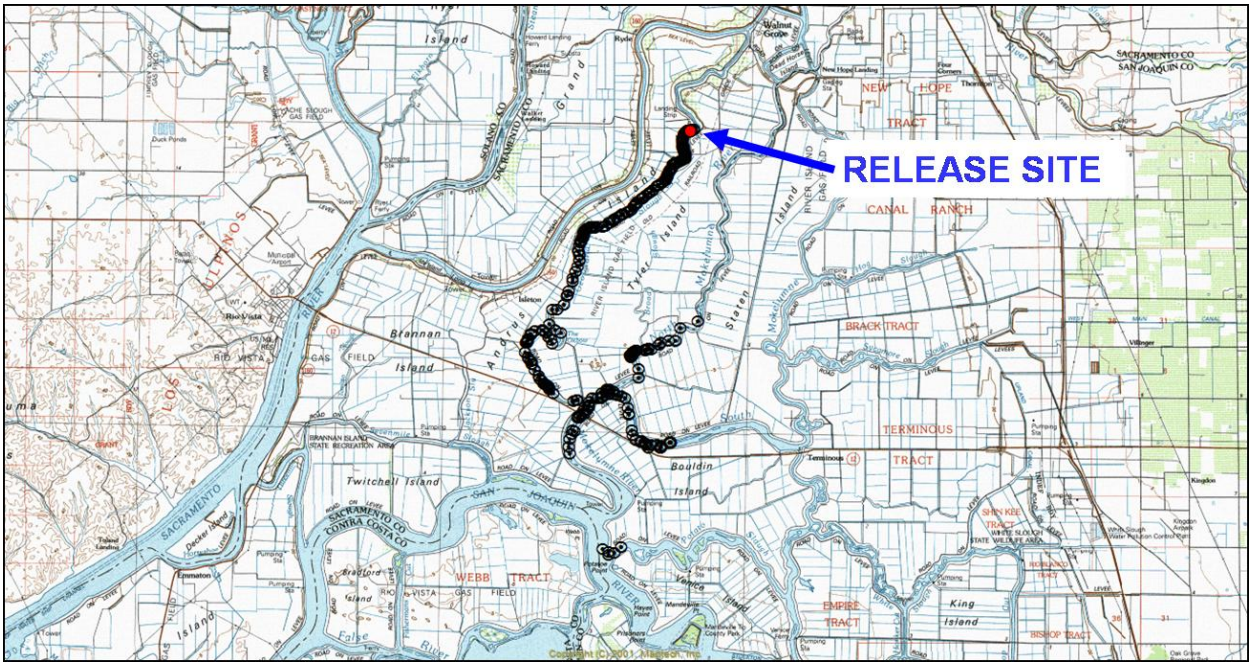

Figure 6. Locations of 16 radio-tagged juvenile Chinook salmon, February 12 – 15, 2002.

Comparisons between the Four North Delta Fish Release Experiments

Environmental Conditions during the Study

During the four-consecutive week study, a wide range of hydrodynamic/environmental conditions occurred in the Delta. The two experiments of radio-tagged Chinook salmon released in the lower Sacramento River near Ryde occurred during the transition between a neap to spring tide cycle[3] (Figure 7). The two experiments of radio-tagged salmon released in northern Georgiana Slough occurred during the transition between a spring to neap tide cycle (Figure 8). At the time the radio-tag experiments were initiated, the Sacramento River flow was declining after significant flows that had occurred previously in January. The Sacramento River flows (as measured at Freeport) gradually declined from approximately 23,000 cfs to approximately 14,000 cfs during the four weeks of experiments (Figure 9). Water temperatures during the four experiments were in the 45-51^{o}F range (as measured at Rio Vista) (Figure 9). Delta inflow and the Delta outflow index gradually declined during the four weeks (Figure 10). The Delta export/inflow ratio was in the range of about 40-50% during the experiments (Figure 10). Daily data on Delta flow and diversions are provided in Appendix F.

[3] "When the principal semidiurnal and diurnal tides are in phase, the partial tides reinforce each other and the tidal ranges are at their maximum. The tides in this period are known as the spring tides. Similarly, when the partial tides are out of phase, their effects tend to cancel each other and the tidal ranges become relatively small. Tides in this period are known as neap tides. The beating frequency of the principal semidiurnal and diurnal partial tides gives rise to the spring-neap tidal cycle variations in a fortnightly period." (Cheng and Gartner 1984).

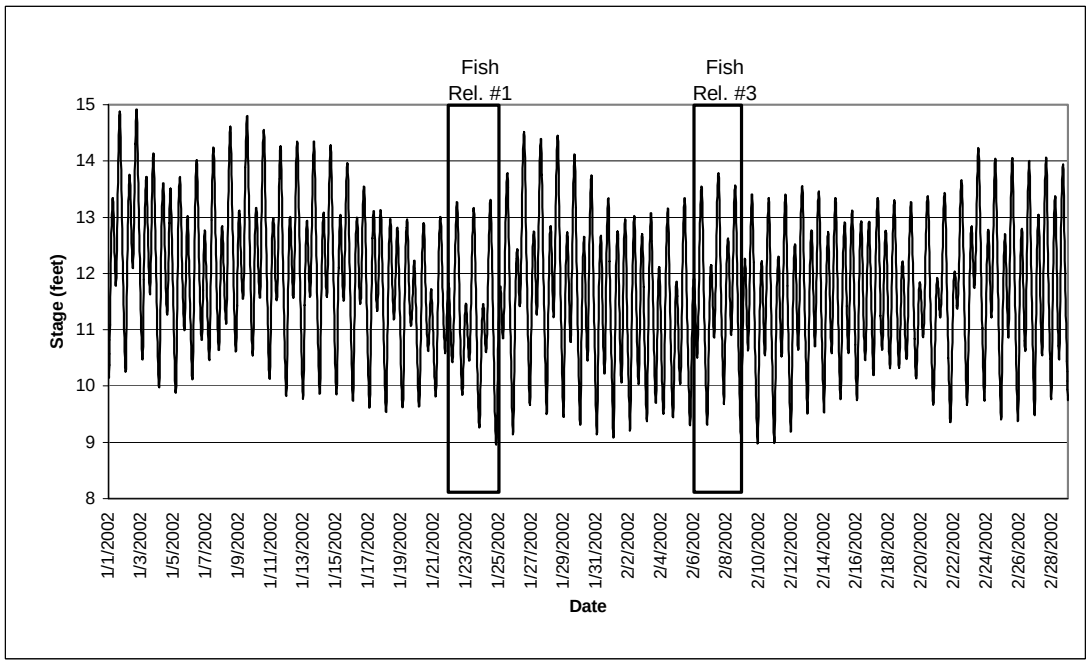

Figure 7. Sacramento River tidal stage measured by USGS at Rio Vista and the timing of the two Sacramento River releases at Ryde (January - February 2002).

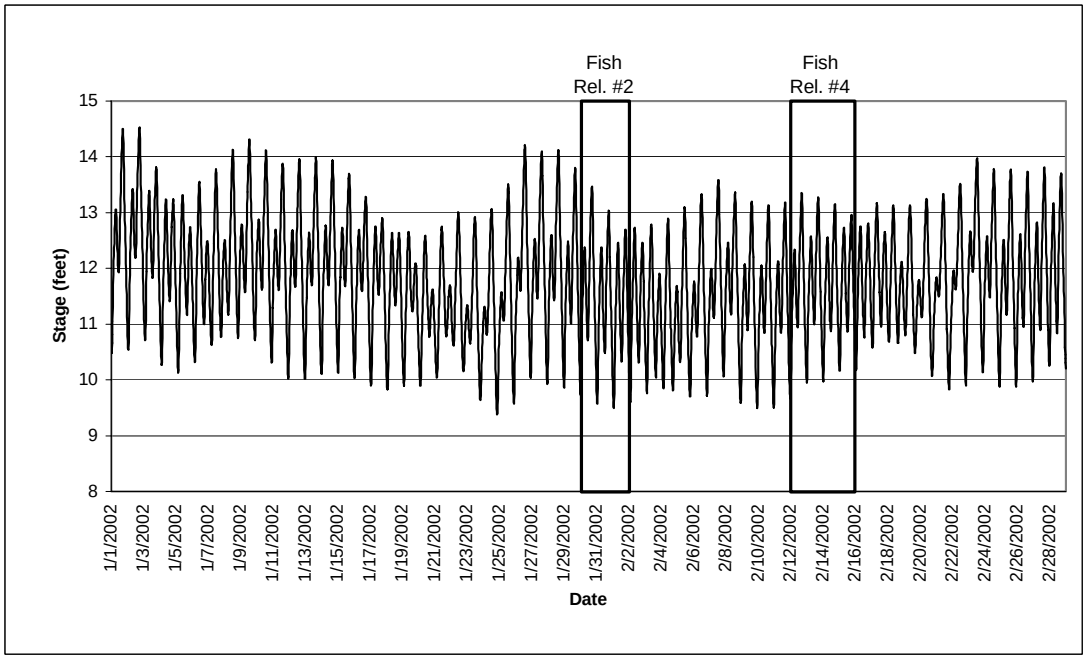

Figure 8. San Joaquin River tidal stage measured by USGS at Jersey Point and the timing of the two Georgiana Slough releases (January - February 2002).

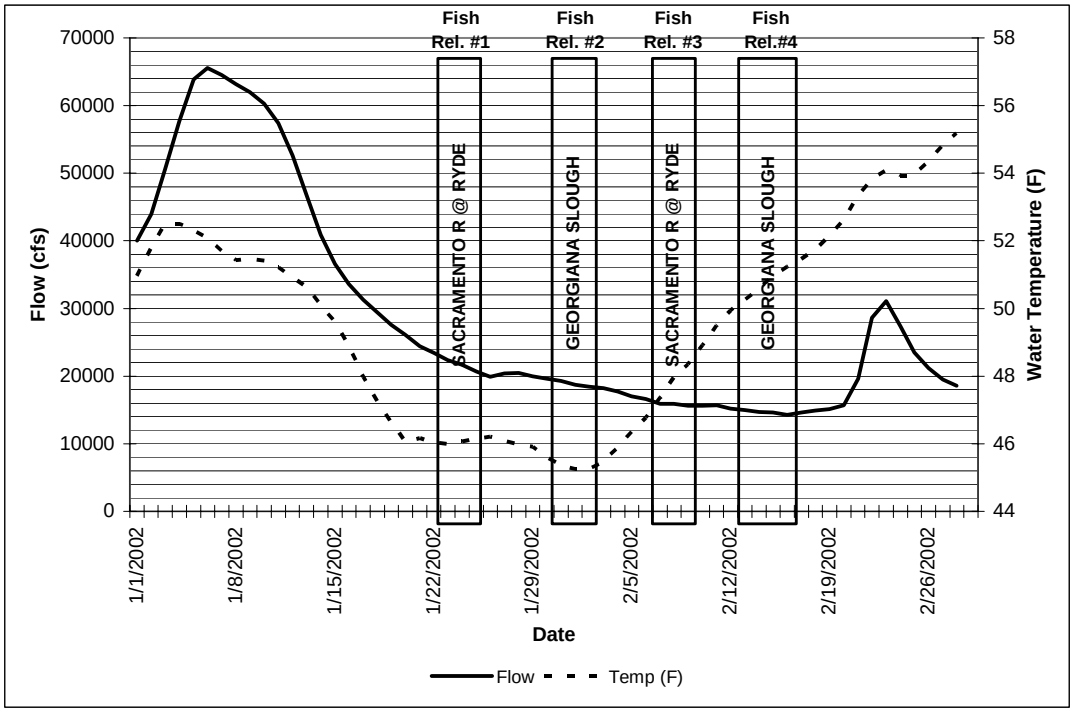

Figure 9. Daily river flow (cfs) at Freeport and water temperatures (F) at Rio Vista (January - February 2002)

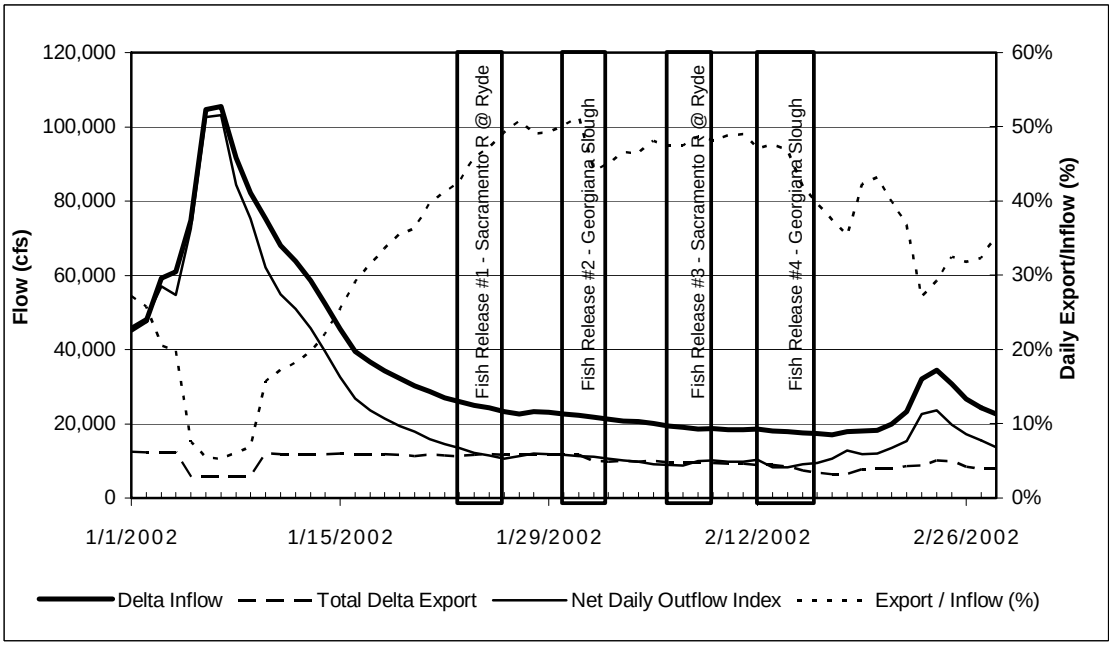

Figure 10. Delta conditions, January - February 2002.

Flow Connections at Three-Mile Slough and Georgiana Slough

Despite routine telemetry coverage throughout Three-Mile Slough, no fish movements were detected in the area during any of the four fish release experiments. No radio-tagged salmon were detected migrating from the Sacramento River to Georgiana Slough or vice-versa. These results were consistent with that noted by Vogel (2001) in the similar radio-tagging study performed in 2000.

Proportion of Fish Reaching the Major Tidal Basins

Eleven of 16 radio-tagged salmon from fish release no. 1 in the Sacramento River were confirmed to reach the Cache Slough confluence near Rio Vista; 13 of 18 radio-tagged salmon from the second Sacramento River release (fish release no. 3) reached Cache Slough (70.6% combined). For the first Georgiana Slough release (fish release no. 2), only 2 of 16 radio-tagged salmon reached the San Joaquin River and only 1 of 12 radio-tagged salmon reached the San Joaquin River from the second Georgiana Slough release (fish release no. 4) (10.7 % combined). In the similar study performed in 2000, 64 % of the fish released in the Sacramento near Ryde reached Cache Slough and 60 % of the fish released in northern Georgiana Slough reached the San Joaquin River (Vogel 2001). It is not known why fish migrating through Georgiana Slough experienced higher predation rates as compared to the lower Sacramento River (discussed below). One possibility is that the channel is much narrower in Georgiana Slough and predatory fish habitat is in closer proximity to the smolt migration pathway within the channel.

Predation

Table 1 provides the estimated predation rates (based on criteria described earlier) on radio-tagged smolts by release location. For those fish released in Georgiana Slough, predation was substantially higher (82.1%) as compared to fish released in the lower Sacramento River (23.5%). These results demonstrate higher predation rates than that reported for a similar study in 2000 where predation rates on radio-tagged fish released in Georgiana Slough were 36% and in the lower Sacramento River were 20% (Vogel 2001). However, in both studies, fish released in Georgiana Slough had higher predation rates than observed in the lower Sacramento River.

Table 1. Predation rates on radio-tagged fish by release location.

Release Location	Predation Rate (%)
Lower Sacramento River (Release No. 1)	25.0 % (4 of 16 fish)
Northern Georgiana Slough (Release No. 2)	87.5 % (14 of 16 fish)
Lower Sacramento River (Release No. 3)	22.2 % (4 of 18 fish)
Northern Georgiana Slough (Release No. 4)	75 % (9 of 12 fish)
TOTAL	50 % (31 of 62 fish)

Comparisons between Externally- and Internally-Radio-Tagged Salmon

Initial Migration Rates

For the first three fish releases, half of each release group was externally tagged and half was internally tagged to determine potential differences in subsequent fish behavior. The comparison was made because of concern that the externally-attached radio tags may reduce swimming performance of the fish and make the fish more vulnerable to predation because of reduced escape-response capabilities. Because both externally- and internally-tagged salmon were released simultaneously, direct comparisons of their initial migration rates in the lower Sacramento River and northern Georgiana Slough was possible. After the fish reached the major tidal basins (confluence with Cache Slough and the San Joaquin River), valid comparisons could not be made because of highly variable fish movements attributable to tide phase. Comparisons between release sites are not useful because of different flow conditions. Migration rates for each fish were computed from the time of initial downstream migration until the end of the first day's telemetry monitoring using data provided in Appendix C.

Migration rates between externally and internally tagged salmon appeared similar for the three fish releases (Tables 2-4) suggesting that tagging method may not have affected swimming performance. On average, the externally marked fish had slower migration rate than the average of the internally tagged fish although the range was similar. Peake et al. (1997) did not find any differences between external and internal radio tags on swimming performance of hatchery Atlantic salmon (*Salmo salar*) smolts. However, those fish were about 50 mm larger in fork length and the radio tags were approximately 1.6 grams heavier in air than tags used in this study. The sample sizes used for comparison in this study are small and may not be sufficient to derive definite conclusions. The initial smolt migration rates reported here are less than that reported by Vogel (2001) for a similar study, but the flow conditions in that study were substantially higher than this study.

Table 2. Initial migration rate for individual radio-tagged juvenile late-fall chinook released in the Sacramento River near Ryde on January 22, 2002.

External Tag Attachment				Internal Tag Implant			
Fish Tag Frequency (48 MHz)	**Time (hours)**	**Distance (miles)**	**Migration Rate (miles/hour)**	**Fish Tag Frequency (48 MHz)**	**Time (hours)**	**Distance (miles)**	**Migration Rate (miles/hour)**
.691	5.05	3.86	0.76	.871	7.65	5.94	0.78
.701	7.90	4.41	0.56	.882	Insuff. Data	---	---
.732	Insuff. data	---	---	.891	7.57	6.88	0.91
.741	Insuff. data	---	---	.951	7.50	7.05	0.94
.851	7.72	6.26	0.81	.962	6.60	5.76	0.87
.921	Insuff. data	---	---	.971	7.65	5.81	0.76
.931	6.63	5.37	0.81	.981	6.15	5.51	0.90
.942	5.12	4.93	0.96	.991	5.28	5.07	0.96
Average, Range:		**0.78, 0.56 – 0.96**		**Average, Range:**		**0.87, 0.76 – 0.96**	

Table 3. Initial migration rate for individual radio-tagged juvenile late-fall chinook released in northern Georgiana Slough on January 30, 2002.

External Tag Attachment				Internal Tag Implant			
Fish Tag Frequency (48 MHz)	**Time (hours)**	**Distance (miles)**	**Migration Rate (miles/hour)**	**Fish Tag Frequency (49 MHz)**	**Time (hours)**	**Distance (miles)**	**Migration Rate (miles/hour)**
.711	Insuff. data	---	---	.004	9.03	6.04	0.67
.791	7.17	3.50	0.49	.014	9.73	7.53	0.77
.801	7.12	3.31	0.47	.034	8.93	6.21	0.69
.811	7.23	3.67	0.51	.044	8.88	4.71	0.53
.821	9.22	5.51	0.60	.054	9.13	4.69	0.51
.831	9.25	5.51	0.60	.065	7.18	3.03	0.42
.841	8.87	4.70	0.53	.075	8.98	6.05	0.67
.911	9.68	7.11	0.73	.084	Insuff. Data	---	---
Average, Range:		**0.56, 0.47 – 0.73**		**Average, Range:**		**0.61, 0.42 – 0. 77**	

Table 4. Initial migration rate for individual radio-tagged juvenile late-fall chinook released in the Sacramento River near Ryde on February 6, 2002.							
External Tag Attachment				**Internal Tag Implant**			
Fish Tag Frequency (48 MHz)	**Time (hours)**	**Distance (miles)**	**Migration Rate (miles/hour)**	**Fish Tag Frequency (49 MHz)**	**Time (hours)**	**Distance (miles)**	**Migration Rate (miles/hour)**
.611	5.80	3.79	0.65	.164	6.63	3.58	0.54
.631	4.75	3.57	0.75	.174	6.63	3.21	0.48
.641	4.13	3.84	0.93	.184	5.57	4.48	0.81
.651	5.92	4.95	0.84	.195	6.55	3.43	0.52
.660	3.48	2.27	0.65	.211	5.23	4.98	0.95
.671	3.48	2.19	0.63	.231	5.63	3.34	0.59
.681	4.77	3.30	0.69	.261	5.43	4.46	0.82
.751	4.92	2.75	0.56	.272	5.52	3.95	0.72
.771	5.65	4.73	0.84	.282	5.50	3.41	0.62
Average, Range:		**0.73, 0.56 – 0.93**		**Average, Range:**		**0.67, 0.48 – 0.95**	

Predation

If one of the two radio-tagging methods caused increased vulnerability to predation, it was hypothesized that any differences could be detected by observing more apparent predation losses. Table 5 shows a comparison of assumed predation on each group of fish by tagging method. The fourth fish release included only internally implanted radio tags and were not included in Table 5 to allow for a more-direct comparison for fish released at the same location and time. Although the sample sizes are small, the results suggest that external attachment of the radio tag may make the smolts more vulnerable to predation as compared to internal implants.

Table 5. Comparison of predation rates on radio-tagged salmon.		
Release Location	**External Attachment**	**Internal Implant**
Lower Sacramento River (Release No. 1)	37.5 % 3 of 8 fish	12.5 % 1 of 8 fish
Northern Georgiana Slough (Release No. 2)	100 % 8 of 8 fish	75 % 6 of 8 fish
Lower Sacramento River (Release No. 3)	22.2 % 2 of 9 fish	22.2 % 2 of 9 fish
TOTAL	52 % (13 of 25 fish)	36 % (9 of 25 fish)

CENTRAL DELTA – 2002

Fish tagging and release data are provided in Appendix B.

First Fish Release – April 2 - 4, 2002

Figure 11 shows the results of three days[4] of monitoring for the 14 radio-tagged late-fall Chinook released in the San Joaquin River near 14-Mile Slough on April 2, 2002. All detected locations for each fish are shown on separate maps in Appendix J (14 maps). Detailed telemetry data on individual fish are provided in Appendix D. The fish were released during slack tide on the transition from a flood tide to ebb tide. Shortly after release, the fish dispersed rapidly downstream during the ebb tide.

This fish release was the first attempt to radio track juvenile salmon in this region of the Delta. As a consequence, more experience was acquired during each subsequent day and week of mobile telemetry reconnaissance. Success rate in locating radio-tagged fish was relatively low for the first week of 2002 central Delta experiments as compared to telemetry performed elsewhere in prior research projects where the channels were fewer and configurations were less complex [e.g., north Delta; (Vogel 2001) and south Delta; (Vogel 2002)]. In contrast to the north Delta and south Delta, the central Delta is composed of numerous, complex channels where juvenile salmon may migrate. In addition, many of the main channels possess multiple pathways where salmon may migrate. Much of the first week of the 2002 experiment was devoted to attempting to locate fish in channels that later in the study were found to not be primary locations where juvenile salmon migrated or resided.

Few salmon could be located after the second day of radio tracking. Although the main stem San Joaquin River was extensively monitored upstream of the release site and many miles downstream of the release site, success in locating radio-tagged salmon was much lower than anticipated. Based on experience acquired from subsequent fish releases and mobile tracking in the central Delta, it is likely that a significant, but unquantifiable portion, of fish from the first release moved into channels south of the San Joaquin River within the first night after release and were not located because the telemetry reconnaissance range in those channels was inadequate during early phases of the study. Additionally, based on later experiments and site-specific hydrodynamic conditions, it was evident that some channels utilized by salmon south of the San Joaquin River possess conditions unfavorable for salmon to re-enter the main stem San Joaquin (discussed in a subsequent section).

[4] Mobile telemetry monitoring during the first and second weeks of the four-week experiment were truncated from four to three days because of uncontrollable circumstances (an employee's personal tragedy) causing immediate, short-term manpower shortage.

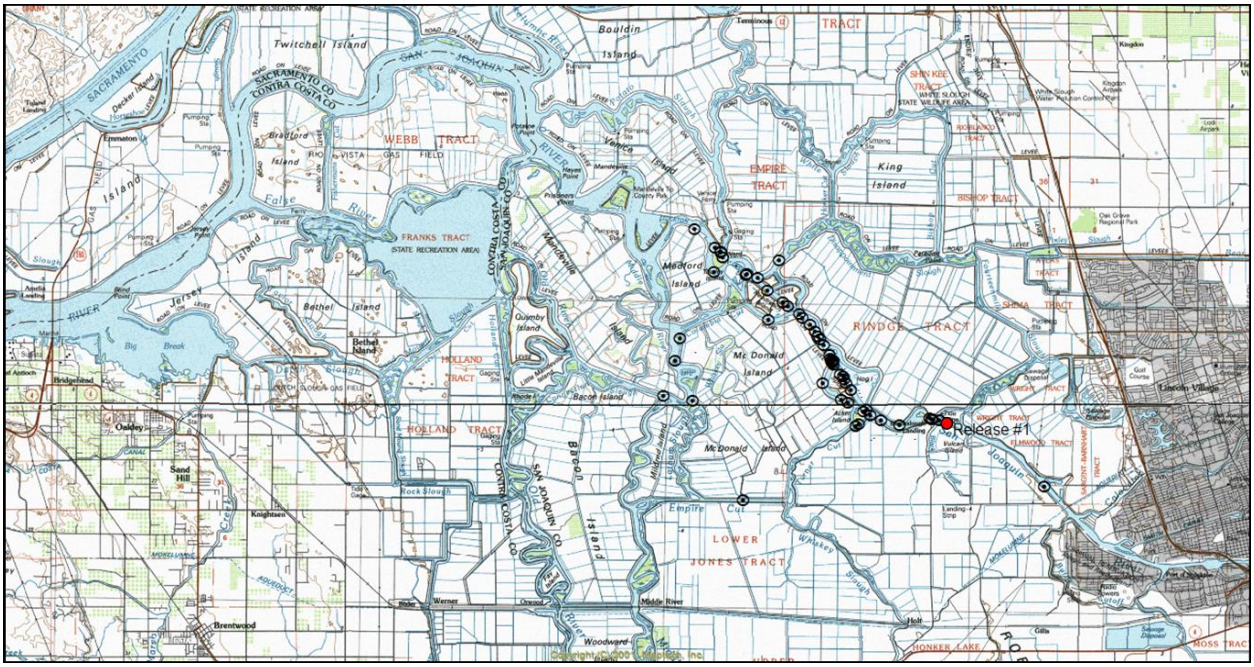

Figure 11. Locations of 14 radio-tagged juvenile Chinook salmon, April 2 - 4, 2002.

Second Fish Release – April 10 - 12, 2002

Figure 12 shows the results of three days of monitoring for the 12 radio-tagged late-fall Chinook released in the San Joaquin River near 14-Mile Slough on April 10, 2002. All detected locations for each fish are shown on separate maps in Appendix J (12 maps). Detailed telemetry data on individual fish are provided in Appendix D. The fish release occurred during the peak of an ebb tide and the fish initially moved rapidly downstream.

Based on experience acquired during the first release, more telemetry reconnaissance in channels south of the San Joaquin River occurred during the second experiment. During this experiment, more data were acquired for the release group which provided greater documentation of fish movement off the mainstream San Joaquin River. Fish movements into Turner Cut appeared to be a principal route for fish entry into areas south of the San Joaquin River (estimated for 6 of 12 fish released), and to a lesser extent, Columbia Cut or Middle River.

The telemetered locations of fish on the first day of monitoring were superimposed onto DSM2 model outputs for channel velocities and animated to illustrate basic fish movements in relation to channel velocities. The graphical animation should not be construed as a precise depiction of exact fish movement in relation to specific channel velocities because of numerous limitations and assumptions in interpolating unknown fish locations between known locations and DMS2 modeled velocities. For example, it was not possible to accurately interpolate fish locations

under constantly changing channel velocities; interpolation was approximately linear, whereas actual fish movements would undoubtedly accelerate or decelerate with increasing or decreasing channel velocities. Also, interpolations cannot account for fish behavior. Nevertheless, the animation provides a gross accounting for how the fish from this release moved in relation to estimated channel velocities: C. Delta 2002 fish.avi Two fish initially moved against the flow in Turner Cut, a rare occurrence in this study, but later moved with the flow. It could not be determined if this was attributable to predation or natural behavior.

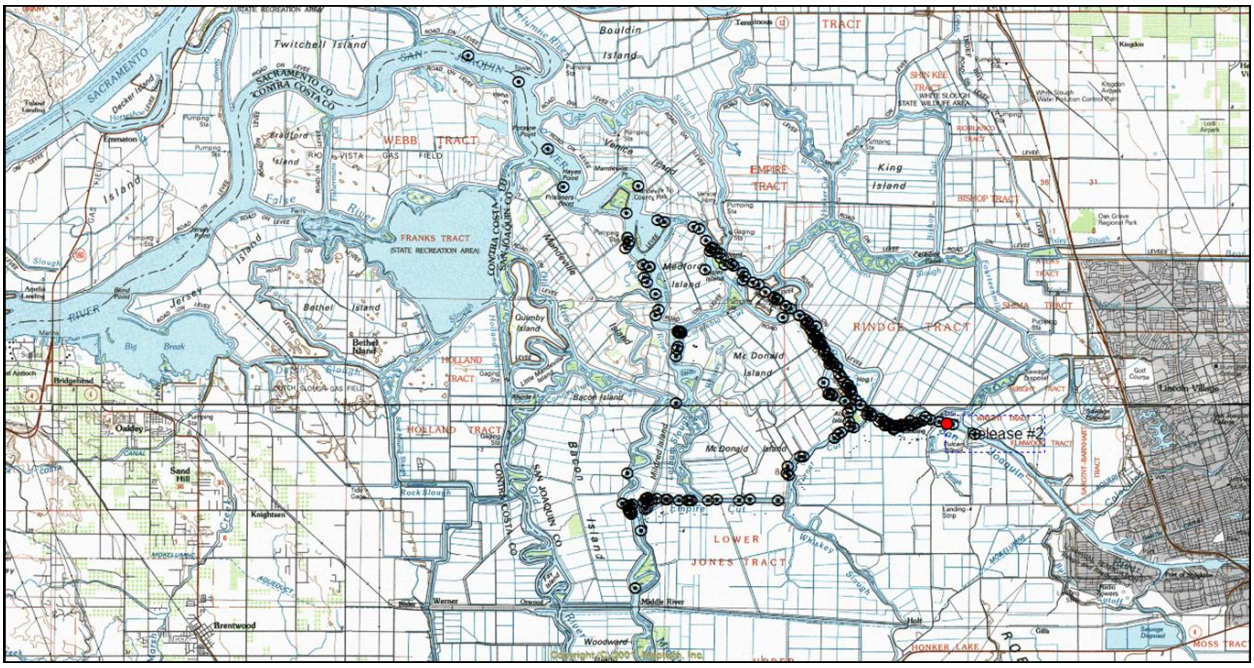

Figure 12. Locations of 12 radio-tagged juvenile Chinook salmon, April 10 - 12, 2002.

Third Fish Release – April 16 - 19, 2002

Figure 13 shows the results of four days of monitoring for the 13 radio-tagged late-fall Chinook released in the San Joaquin River near 14-Mile Slough on April 16, 2002. All detected locations for each fish are shown on separate maps in Appendix J (13 maps). Detailed telemetry data on individual fish are provided in Appendix D. The fish release occurred during slack tide just prior to the onset of an ebb tide. Shortly after release, the fish quickly dispersed in a downstream direction. This fish release occurred immediately after south Delta exports were curtailed and San Joaquin River flows increased.

Similar to that observed for the second fish release, 6 of 13 fish moved off the main stem San Joaquin River into Turner Cut documenting a principal pathway for fish into the south Delta.

Five of those fish were last observed far south (>5 miles) of the main stem San Joaquin River in Old River and Middle River.

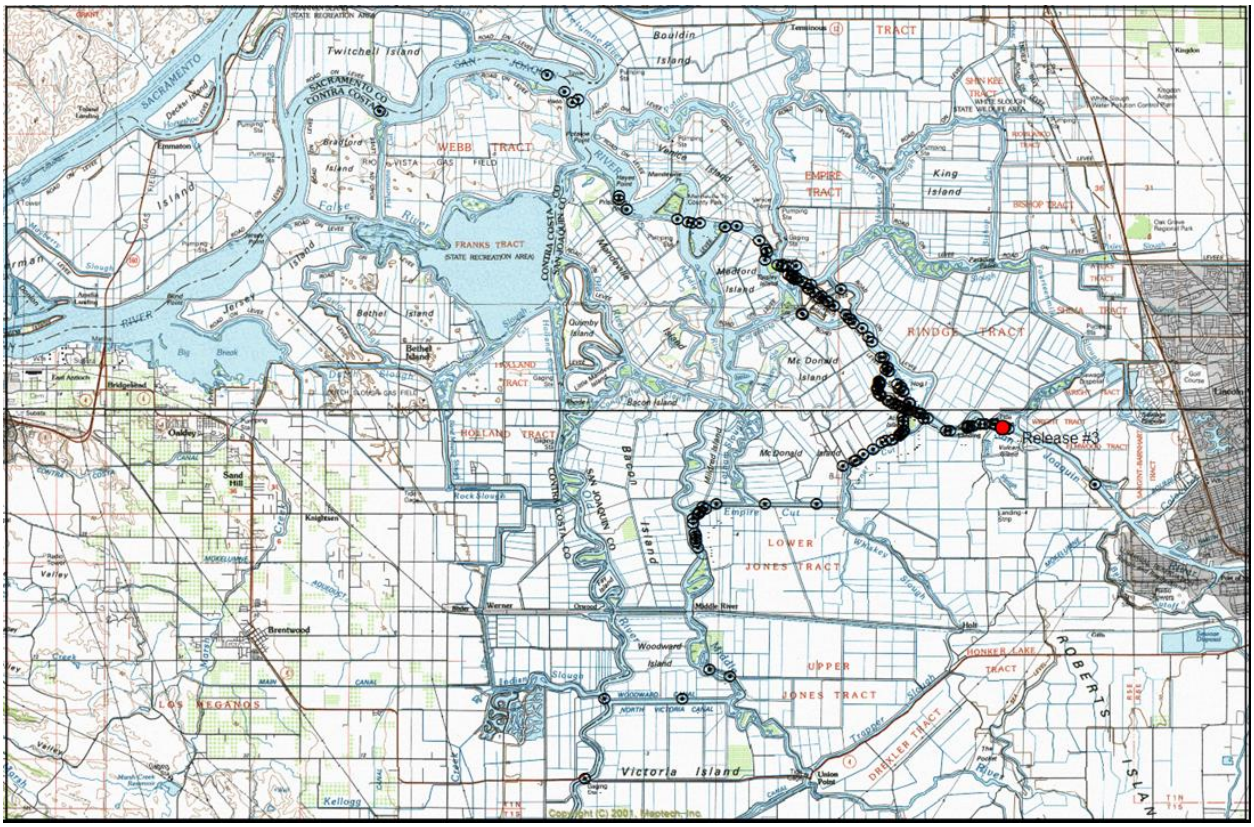

Figure 13. Locations of 13 radio-tagged juvenile Chinook salmon, April 16 - 19, 2002.

Fourth Fish Release – April 23 - 26, 2002

Figure 14 shows the results of four days of monitoring for the 12 radio-tagged late-fall Chinook released in the San Joaquin River near 14-Mile Slough on April 23, 2002. All detected locations for each fish are shown on separate maps in Appendix J (12 maps). Detailed telemetry data on individual fish are provided in Appendix D. These fish were released near the peak of an ebb tide and rapidly dispersed in a downstream direction in the main stem San Joaquin River. This fish release also occurred during the period when south Delta exports were curtailed and San Joaquin River flows were increased.

Unlike the prior fish releases, no fish movements off the main stem San Joaquin River into Turner Cut were observed. Notably, all of the radio-tagged fish were last detected in the San Joaquin River despite four and a half days of radio tracking and extensive reconnaissance in

channels south of the main stem. Only one of the radio-tagged fish was located south of the San Joaquin River but that fish re-entered the mainstem. Also noteworthy was the farthest-downstream movement of radio-tagged fish (e.g., two fish downstream of Antioch, nearly 30 mainstem river miles downstream of the release site). Water conductivity was not measured during this study but it was evident that attenuation of radio tag transmission was not a limitation for detection at this downstream location.

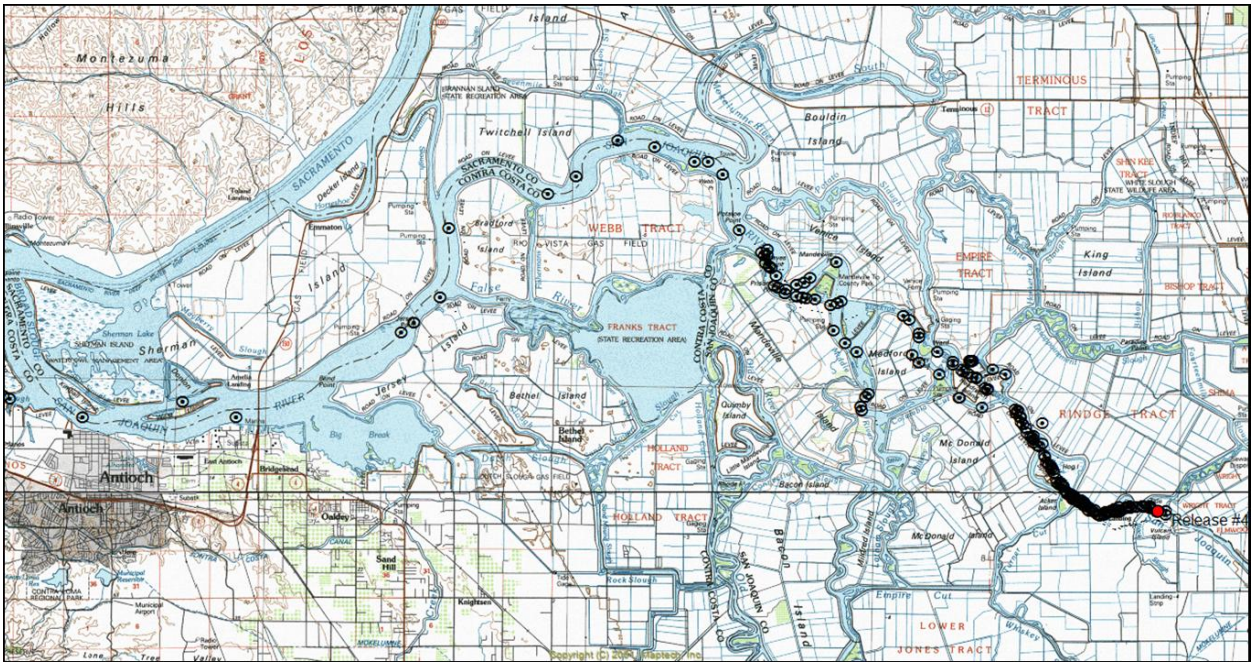

Figure 14. Locations of 12 radio-tagged juvenile Chinook salmon, April 23 - 26, 2002.

Comparisons between the Four Central Delta Fish Release Experiments in 2002

Environmental Conditions during the Study

During the four-consecutive week study, a wide range of hydrodynamic/environmental conditions occurred in the Delta. The first and third fish releases occurred during a spring tide cycle and the second and fourth fish releases occurred during a neap tide cycle (Figure 15). During 2002, the Vernalis Adaptive Management Plan experiments with increased San Joaquin River flow and reduced south Delta export levels occurred between April 15 and May 15, 2002. The Delta export/inflow ratio was highest during the first two fish releases (range of about 35-40%) and lowest during the last two fish releases (range of about 7-10%) (Figure 16), a decline attributable to the sharp export curtailment for the VAMP experiments beginning on April 15. Daily data on Delta flow and diversions are provided in Appendix G.

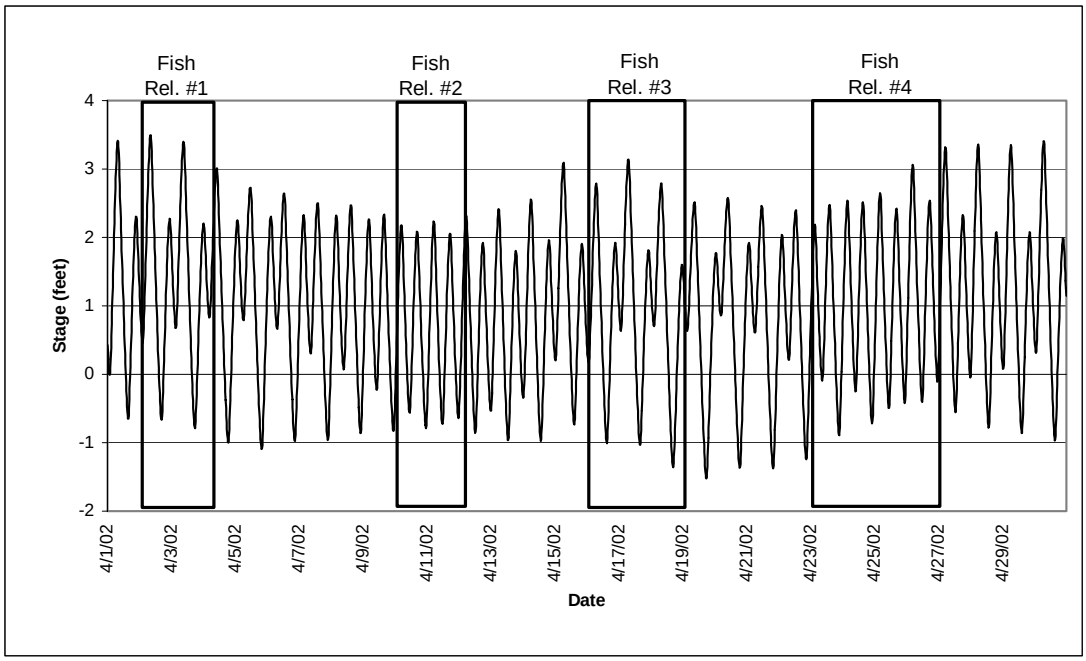

Figure 15. San Joaquin River (RM 31) tidal stage near Turner Cut estimated from the DSM2 model (April 2002).

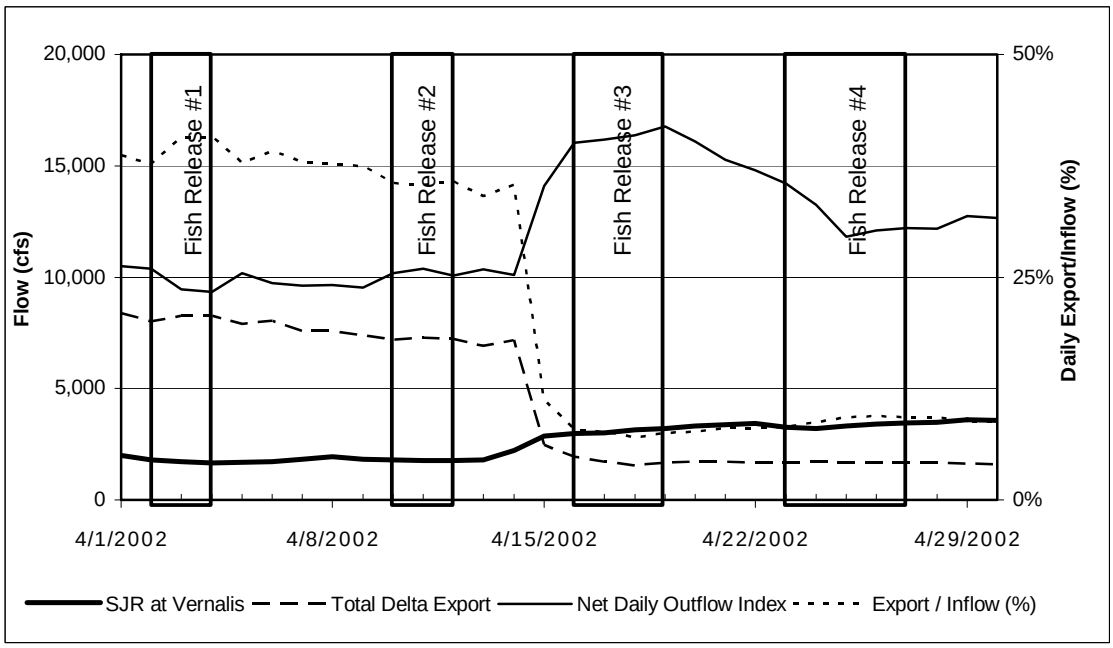

Figure 16. Delta conditions during April 2002.

DSM2 Model Run and Gr Animations

It was difficult to correlate Delta channel flows with the movements of radio-tagged salmon in the central Delta. Although some south Delta channels (such as Turner Cut) convey relatively small flow compared to the large flows evident in the mainstem San Joaquin River, a surprisingly high proportion of fish moved into Turner Cut during the study period. Initial attempts to correlate the magnitude and direction of flow vectors in the study area were not useful because of the large differences between San Joaquin River flows and south Delta channel flows. The following flow/velocity animation file illustrates the large differences in flows among channels (flow vectors are red and velocity vectors are green): Flow and Velocity.avi

The DSM2 model outputs provide useful information demonstrating how the magnitude and direction of velocity vectors in specific channels may have affected smolt movements. During the first week of experiments, the magnitude, duration, and direction of velocities in Turner Cut were more pronounced in a negative (southerly) direction than positive (Figure 17). Presumably, this was attributable to a combination of the tide cycle and higher south Delta exports than that occurring by the last week in the study. In the following animation file, note the map velocity vectors for Turner Cut (purple) and the San Joaquin River (RM 31) just downstream of Turner Cut (green) as well as the graphs at the bottom of the animation: 1st week of April 2002.avi In contrast, during the last week of experiments, the magnitude, duration, and direction of velocities were noticeably different during the approximate 25-hour tidal cycle: 4th week of April 2002.avi This suggests why substantial numbers of radio-tagged salmon moved into Turner Cut off the San Joaquin and failed to re-enter the San Joaquin with changing tides under higher export conditions. Tide cycle, flow, and export conditions appear to affect the net channel velocities such that the magnitude, duration, and direction of the velocities in the south Delta were more negative and southerly on average during the earlier release. Interestingly, the third fish release occurred during the VAMP period of reduced exports and increased San Joaquin River flow, but the Turner Cut channel velocities were similar to the pre-VAMP conditions present during the first fish release (i.e., mostly negative) (Figure 17). The first and third fish releases occurred during a spring tide cycle (Figure 15).

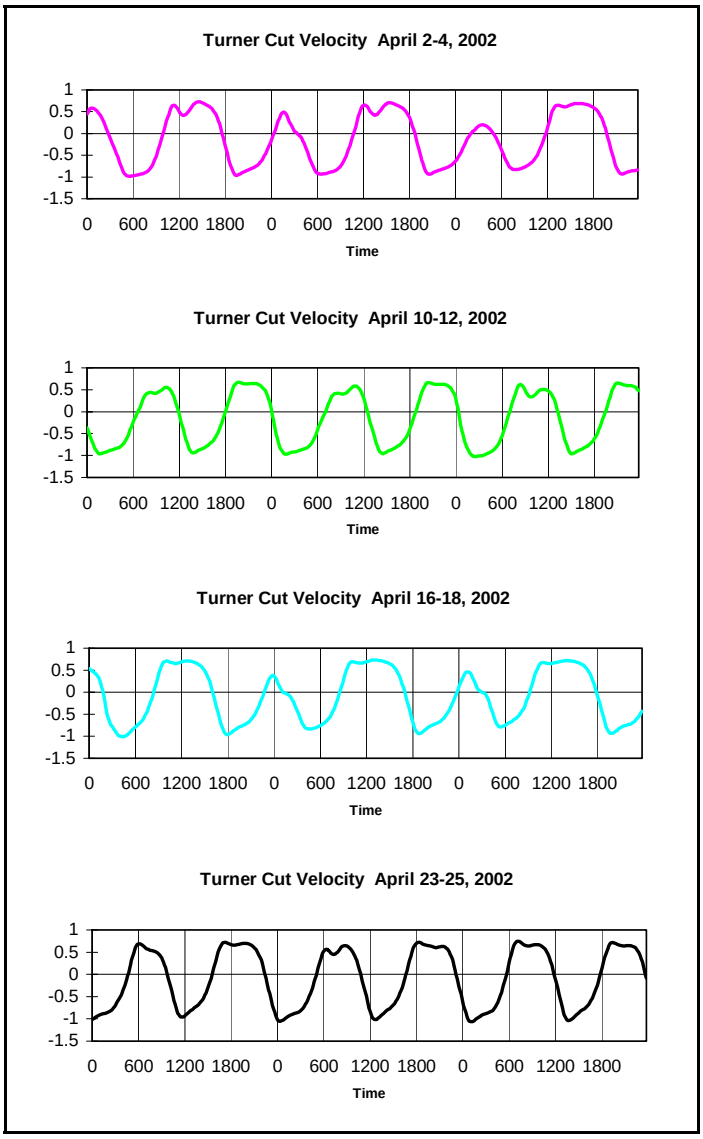

Figure 17. Channel velocities in Turner Cut for the first three days of each of the four 2002 central Delta fish releases (based on DSM2 outputs).

It was beyond the scope of this investigation to analyze site-specific hydrodynamic conditions but further work in this area will likely yield meaningful results to better explain fish movements in this Delta region.

CENTRAL DELTA – 2003

Fish tagging and release data are provided in Appendix B.

First Fish Release – April 8 - 11, 2003

Figure 18 shows the results of four days of monitoring for the 13 radio-tagged late-fall Chinook released in the San Joaquin River near 14-Mile Slough on April 8, 2003. All detected locations for each fish are shown on separate maps in Appendix K (13 maps). Detailed telemetry data on individual fish are provided in Appendix E. This group of fish was released during near-slack tide conditions at the end of a flood tide. Shortly after release, the fish disperse rapidly in a downstream direction.

During this first experiment, 5 of 13 radio-tagged salmon could not be located the day after release. This circumstance was believed to be attributable to two circumstances: 1) a new field crew that had not yet acquired experience in mobile tracking in the region south of the San Joaquin, and 2) the channels south of the San Joaquin River exhibited long periods within each day of slack to net negative velocities that may have resulted in rapid movement of some radio-tagged fish to the south during nighttime and out of the telemetry reconnaissance range (discussed in a following section). However, 6 of the 13 radio-tagged salmon were located after 4 days of monitoring and all of those fish remained within the mainstem San Joaquin River.

One of the radio-tagged fish (49.311 MHz) from this release was subsequently captured live at the Tracy Fish Salvage facilities on April 18th and held in an aquarium for one week. The incision on the fish had completely healed with no evident fungus or disease (Lloyd Hess, USBR, personal communication). Although this radio-tagged fish was found within the mainstem San Joaquin River each day of the four-day monitoring, it eventually moved into south Delta channels until it was captured at the federal south Delta water export facility.

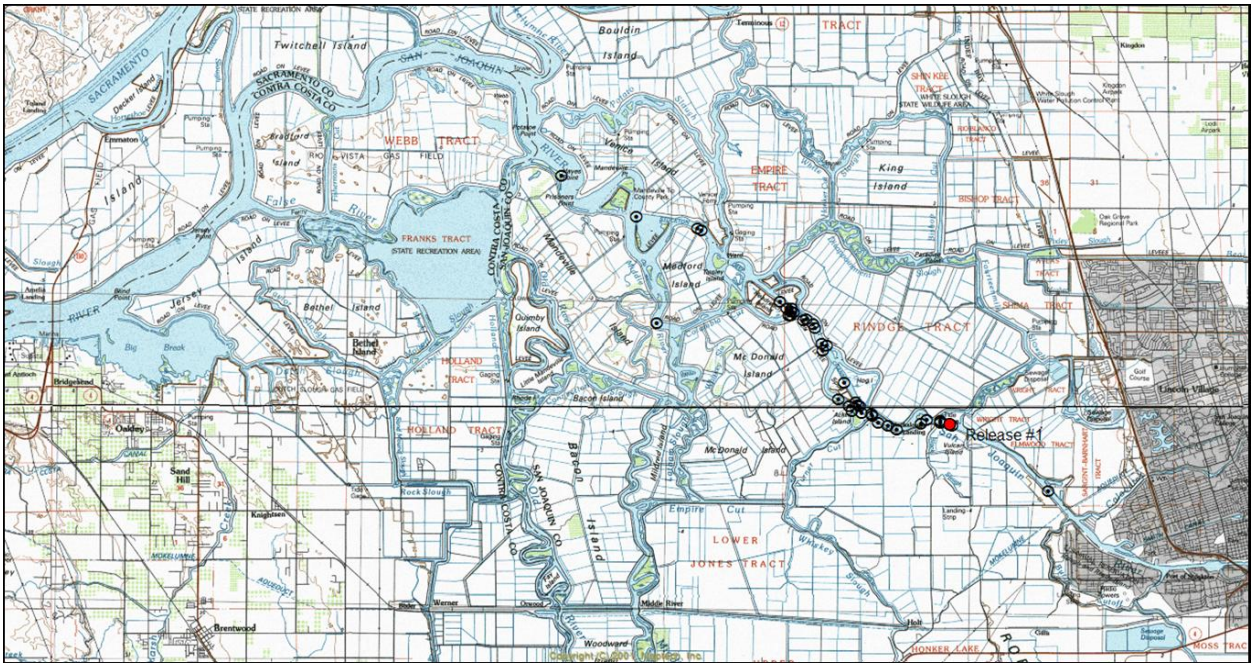

Figure 18. Locations of 13 radio-tagged juvenile Chinook salmon, April 8 - 11, 2003.

Second Fish Release – April 15 - 18, 2003

Figure 19 shows the results of four days of monitoring for the 12 radio-tagged late-fall Chinook released in the San Joaquin River near 14-Mile Slough on April 15, 2003. All detected locations for each fish are shown on separate maps in Appendix K (12 maps). Detailed telemetry data on individual fish are provided in Appendix E. The fish were released at the peak of an ebb tide and dispersed rapidly downstream in the mainstem San Joaquin River.

Most of the fish in this release group remained in the mainstem San Joaquin River within the first one to two days after release. However, after four days of monitoring, two thirds of the release group were last detected in channels south of the mainstem.

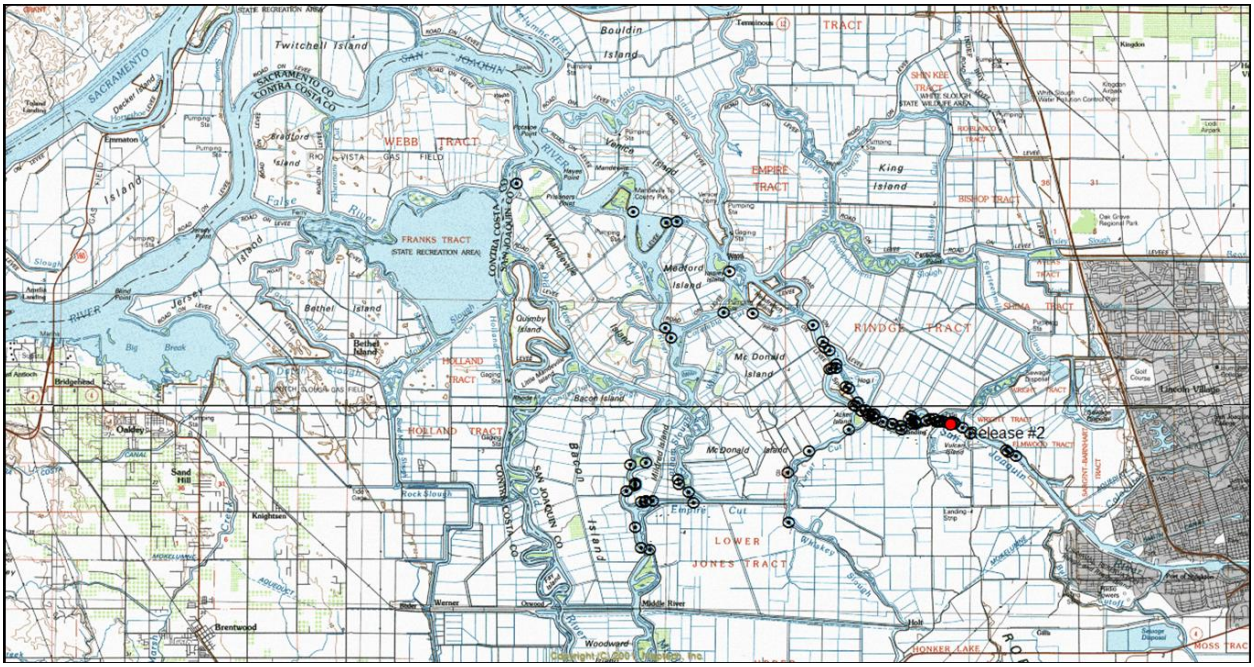

Figure 19. Locations of 12 radio-tagged juvenile Chinook salmon, April 15 - 18, 2003.

Third Fish Release – April 22 - 25, 2003

Figure 20 shows the results of four days of monitoring for the 12 radio-tagged late-fall Chinook released in the San Joaquin River near 14-Mile Slough on April 22, 2003. All detected locations for each fish are shown on separate maps in Appendix K (12 maps). Detailed telemetry data on individual fish are provided in Appendix E. The fish were released in near-slack water conditions at the end of a flood tide. Shortly after the transition to an ebb tide, the fish dispersed rapidly downstream.

During fish monitoring for this release group, it was evident that both Turner Cut and Columbia Cut were pathways for some fish movement into the interior Delta south of the San Joaquin River. After four days of monitoring, 10 of the 12 fish (83%) were last detected south of the mainstem. Based on an examination of DSM2 model outputs for Delta channels during this period, the duration and magnitude of velocities in channels south of the mainstem indicate that net flow direction was negative (southerly) suggesting why the majority of radio-tagged fish moved south of the mainstem into the south Delta.

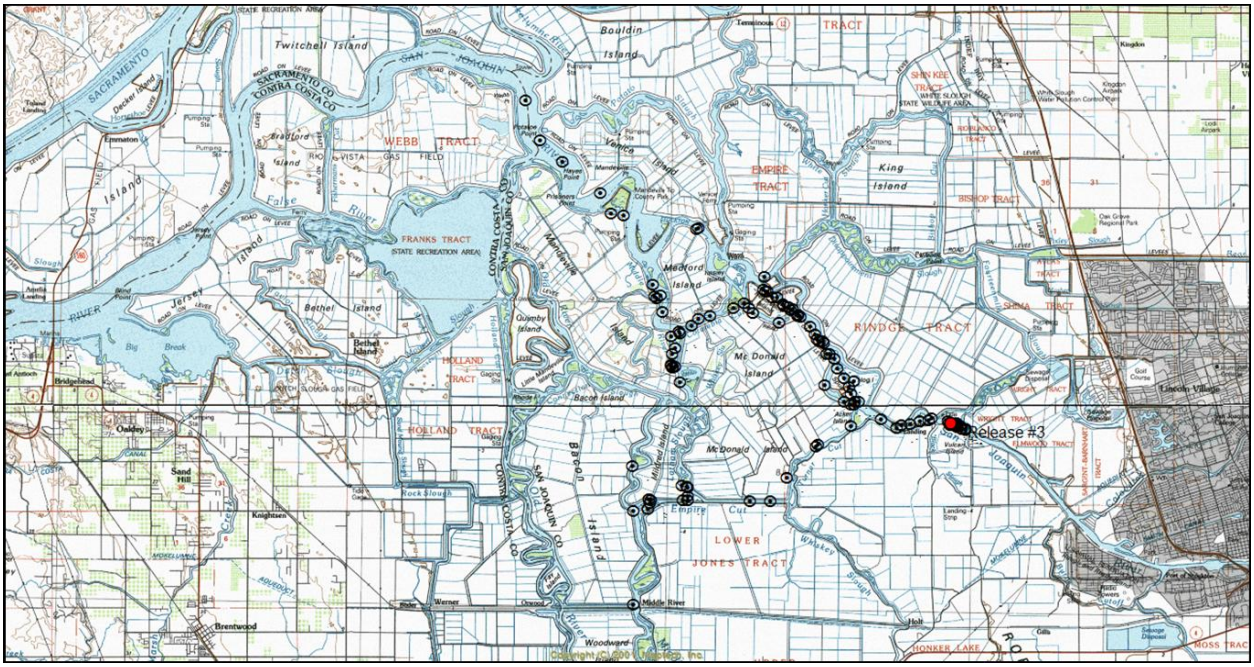

Figure 20. Locations of 12 radio-tagged juvenile Chinook salmon, April 22 - 25, 2003.

Fourth Fish Release - April 29 – May 3, 2003

Figure 21 shows the results of four days of monitoring for the 12 radio-tagged late-fall Chinook released in the San Joaquin River near 14-Mile Slough on April 29, 2003. All detected locations for each fish are shown on separate maps in Appendix K (12 maps). Detailed telemetry data on individual fish are provided in Appendix E. The fish release occurred during an ebb tide and the fish rapidly dispersed in a downstream direction.

During four and a half days of monitoring, 75% of the fish from this release group were last detected in the San Joaquin River. One of the fish was last detected approximately 30 miles downstream of the release site four and a half days after release. Although 3 of the 12 fish were last detected south of the San Joaquin, this number was substantially lower than release groups 2 and 3.

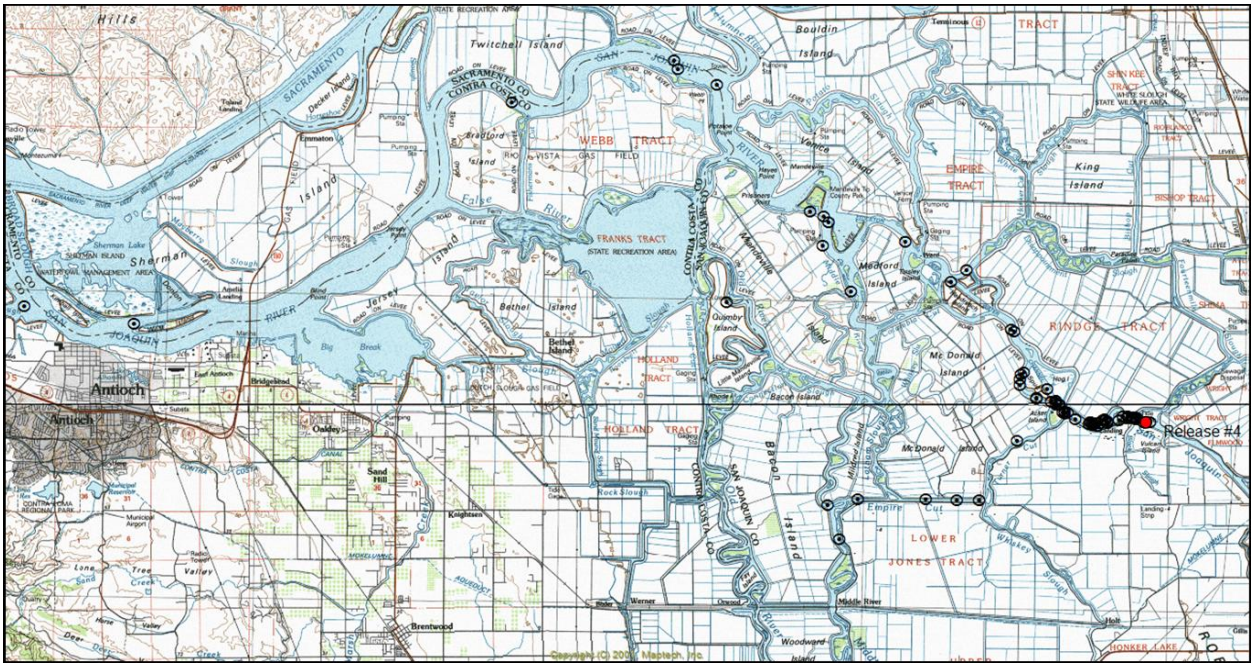

Figure 21. Locations of 12 radio-tagged juvenile Chinook salmon, April 29 – May 3, 2003.

Comparisons between the Four 2003 Central Delta Fish Release Experiments

Environmental Conditions during the Study

During the four-consecutive week study, a wide range of hydrodynamic/environmental conditions occurred in the Delta. The first and third fish releases occurred during a spring tide cycle and the second and fourth fish releases occurred during a neap tide cycle (Figure 22). During 2003, the Vernalis Adaptive Management Plan experiments with increased San Joaquin River flow and reduced south Delta export levels occurred between April 15 and May 15. The first fish release occurred prior to VAMP and the last three fish releases occurred during the VAMP study period. The Delta export/inflow ratio was highest during the first fish release (about 40%) and lowest during the last three fish releases (range of about 3-7%) (Figure 23), a decline attributable to the sharp export curtailment for the VAMP experiments beginning on April 15 and significant precipitation runoff during late April and early May. Daily data on Delta flow and diversions are provided in Appendix H.

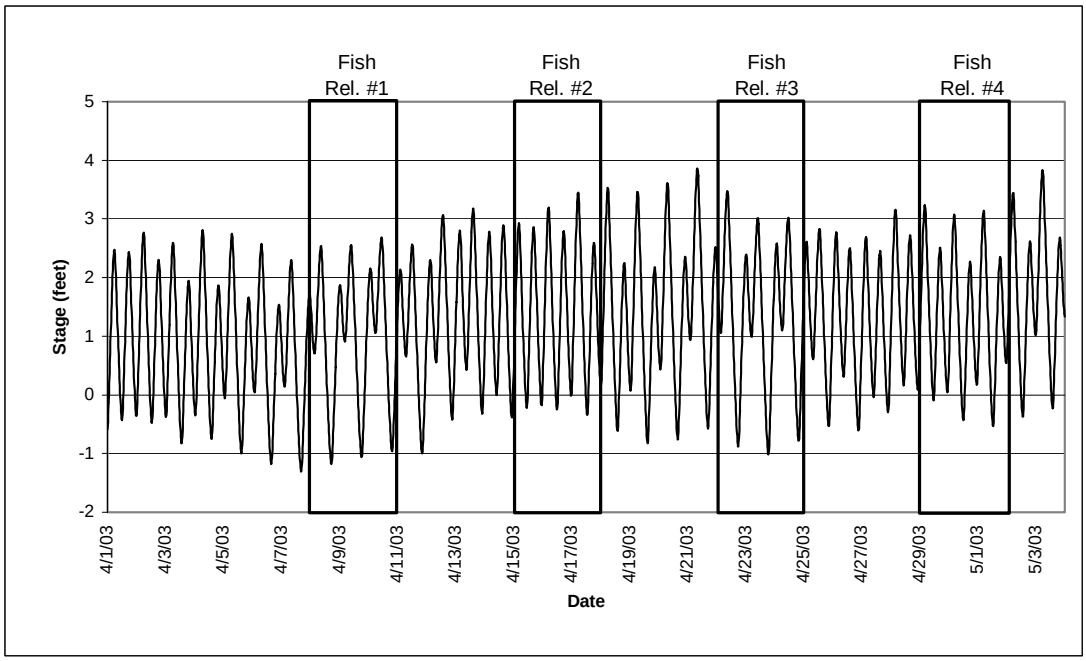

Figure 22. San Joaquin River (RM 31) tidal stage near Turner Cut estimated from the DSM2 model (April - May 2003).

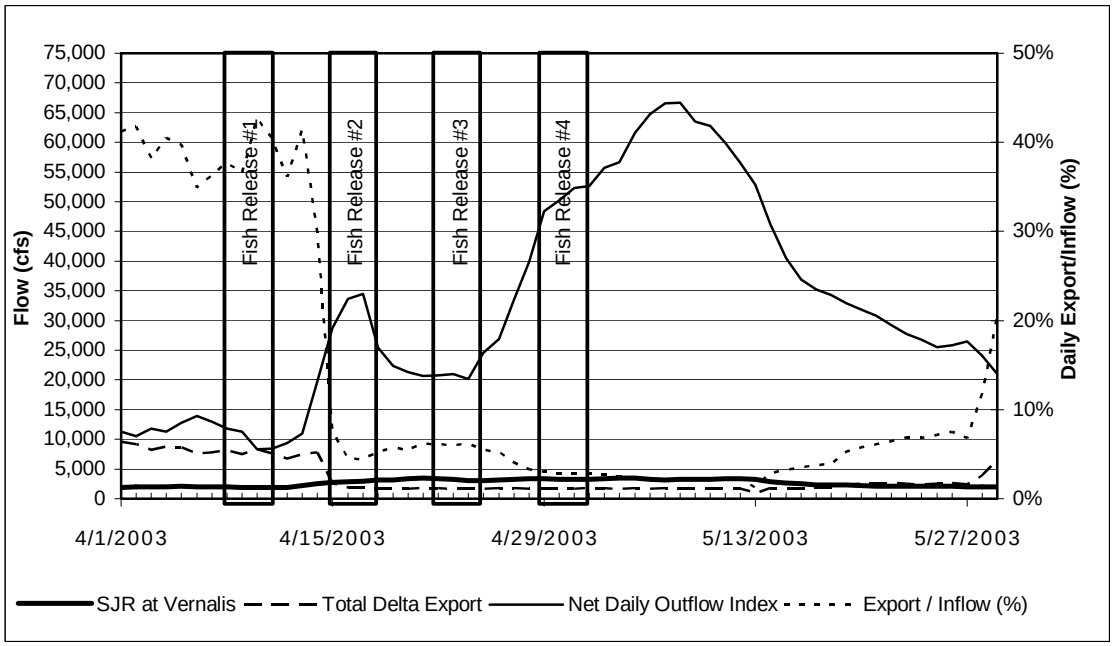

Figure 23. Delta conditions, April – May 2003.

During the first and third weeks of experiments, the magnitude, duration, and direction of velocities in Turner Cut were more pronounced in a negative (southerly) direction than positive (Figure 24). As described for the 2002 study, tide cycle, flow, and export conditions appear to affect the net channel velocities such that the magnitude, duration, and direction of the velocities in the south Delta were more negative and southerly on average during the first release prior to implementation of VAMP. Interestingly, although the third fish release occurred during the VAMP period of reduced exports and increased San Joaquin River flow, the Turner Cut channel velocities were somewhat similar to the pre-VAMP conditions present during the first fish release (i.e., mostly negative) (Figure 24).

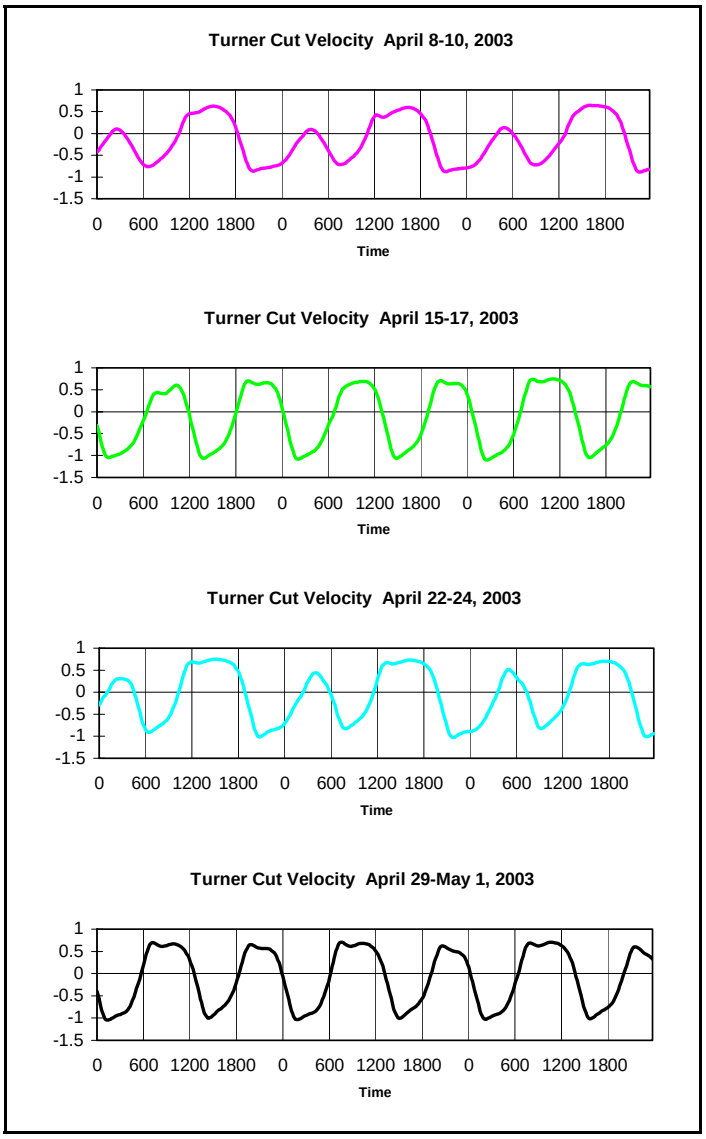

Figure 24. Channel velocities in Turner Cut for the first three days of each of the four 2003 central Delta fish releases (based on DSM2 outputs).

Observations Relevant to the Three Studies

Schooling/Shoaling Behavior

Schooling or shoaling behavior was not observed among radio-tagged fish during the three separate experiments. To the contrary, fish generally dispersed rapidly after initial release and within three to four days dispersed over a wide geographic range during each of the three four-

week experiments. Although there were instances where some radio-tagged fish were found in the general vicinity of other radio-tagged fish, the distances were too great to assume schooling behavior. These results were consistent with radio-tag studies of juvenile Chinook salmon in the lower Mokelumne River and San Joaquin River during 1996 and 1997 (Natural Resource Scientists, Inc., unpublished data), the northern Delta in 2000 (Vogel 2001) and the southern Delta in 2000-2001 (Vogel 2002).

Areas of Probable/Possible Predation

There were some regions in the Delta where predation appears to be higher than other regions. Empirical evidence of predation was not possible, so conclusions concerning predation on radio-tagged fish remain somewhat speculative. Georgiana Slough appears to be a region where a high rate of predation occurred on radio-tagged smolts. Considerable predation also appeared to have occurred on many of those fish exiting Georgiana Slough in the lower Mokelumne River. The incidence of predation on fish released in the Sacramento River consistently appeared to be less than fish released in Georgiana Slough both in this study and the study conducted in 2000. Of those fish released in the Sacramento River with apparent predation, the locations of probable predation were more sporadic than the Georgiana Slough releases.

Migratory Behavior and Pathways Utilized within the Delta Channels

Based on hundreds of observations of individual radio-tagged salmon positions within the Delta channels during the three four-week experiments, it was evident most of the fish utilized the middle portion of the channels for their migratory pathway (Appendices I-K). Although there were exceptions, this phenomenon was evident during ebb and flood tides. Many of the fish were found migrating within the main shipping channels.

It could not be determined how some fish ultimately migrated downstream over time, given that they moved such large distances back and forth with the ebb and flood tides in the lower Sacramento and San Joaquin River. Future analyses and studies of exact fish movements in relation to variables such as tidal excursion would be valuable (see Recommendations section). It was clear that radio-tagged salmon did not specifically "hold in position" on flood tides and migrate on ebb tides; fish moved back and forth large distances on both ebb and flood tides. Because fish were commonly found migrating with the prevailing tidal flow direction in mid channel, there were no obvious "micro-habitat" characteristics to indicate how the fish migrated in a net downstream direction within three to four days. Although it could not be determined from this study, salmon smolts may exhibit migratory behavior differences during the tide transitions.

More frequent tracking of individual fish would be helpful to determine specific fish behaviors (see Recommendations section). Because boat tracking at night could not be performed, no data were collected on potential differential diel migratory behavior. There was no apparent

qualitative evidence of differential vertical positioning of fish in the water column on ebb versus flood tide, although this could not be specifically evaluated with techniques employed in this study. Although some types of telemetry tags (e.g., radio and sonic) can be manufactured to transmit water depth, the tag sizes are too large for attachment to smolt-sized Chinook salmon. Individual migration rates for some fish could be determined in small increments of time within a daily tide cycle, but data were insufficient to explain net migration distances.

These experiments could not explain why some fish moved off the mainstem San Joaquin River into south Delta channels. Due to the wide variation in hydrologic conditions during the two central Delta studies, it was difficult to determine the principal factors affecting fish migration. Based on limited data from these studies, it may be that a combination of a neap tide, reduced exports, and increased San Joaquin River flows is beneficial for outmigrating smolts, but more research is necessary.

More detailed analyses of fish movements in relation to quantitative measures of Delta hydrodynamics such as tidal excursion, net flow over a complete tide cycle, and flow structure at specific channel flow splits (e.g., Turner Cut) may provide more definitive conclusions on fish migration behavior. For example, water particle tracking model results in comparison to radio-tagged fish migration data may indicate specific differential migratory rates on more discrete phases of a daily tidal cycle (e.g., higher high water to lower low water versus other tidal phases). Comparisons of fish movements with the varying Delta channel velocity regimens and potential migratory differences between tides over time (i.e., spring versus neap) would also provide additional insight on fish migratory behavior. For these reasons, detailed telemetry data are provided in Appendices C-E to allow interested individuals the ability to compare radio-tagged salmon movements using additional analytical methods. These potential future analyses using data provided in this report may provide insight on how some of the juvenile salmon were able to migrate downstream in a tidal-flow-dominated environment.

Fish Movement with the Tides

During studies conducted in 2000 in the north Delta and in 2001 in the south Delta, it was evident that radio-tagged smolt movement corresponded well with ebb and flood tides with fish moving several miles in either direction each day depending on the tidal excursion where fish were present (Vogel 2001, 2002). The movement of radio-tagged fish in relation to tidal excursion was also a noteworthy observation during this project in the north and central Delta. It is evident that fish do not “hold” in position on a flood tide and move downstream on an ebb tide. For those radio-tagged salmon exhibiting net downstream movement in the strong tidal environment, the differential migration rates on flood and ebb tide cycles were subtle and could not be accurately measured during this study although some differential behavior must exist for fish to exit the Delta.

Comments on the Use of Telemetry to Observe Smolt Movements

Biotelemetry has been widely applied to research of fish migration, orientation, movement patterns at obstructions, ecology, behavior, and physiology (Stasko and Pincock 1977). The goal of biotelemetry studies is to utilize a transmitter attached to an animal and observe its behavior and/or physiological patterns with the underlying assumption that the mode of transmitter attachment does not significantly influence the individual's behavior (e.g., feeding, swimming ability) (McKinley et al. 1992). Each mode of transmitter attachment possesses advantages and disadvantages. One of the earliest research projects on juvenile salmonids using radio-telemetry in the Central Valley occurred during fish passage studies at the Red Bluff Diversion Dam on the Sacramento River. At that time, radio transmitters were relatively large (4 grams in air, 19 mm length x 13 mm diameter) which required use of large salmonid smolts (e.g., yearling Chinook salmon and steelhead) to accommodate the size of the transmitters and were externally attached to the dorsal side of the fish (Vogel et al. 1988). More recently, smaller-sized externally attached transmitters (1 gram, 16 mm length x 6 mm diameter) were used on smolt migration studies in the Delta (Vogel 2001, 2002). During research investigations at the Delta Cross Channel in 2001 and during these three studies, 1-gram radio transmitters were surgically implanted in late-fall Chinook salmon smolts with no apparent latent effects from surgery.

Recently, the use of telemetry has become more widely used as a technique to estimate fish mortality. Important transmitter characteristics for mortality studies include:

- Small size for implantation with no effect on the fish
- Relatively long battery life
- Adequate detection range, so that relocation probability is high, and
- Unique signal so that individuals can be distinguished (Pine et al. 2003)

In a review of telemetry methods, Pine et al. (2003) provide descriptions of how other researchers have estimated natural mortality (e.g., predation) through telemetered fish detection and signal attenuation, as well as migratory information on fish moving between detection locations. Those telemetry techniques are similar to those described in this report.

The advantages of using radio telemetry included the ability to track the fish rapidly over large distances because the radio signal easily transmitted though the air/water interface. Monitoring of radio-tagged juvenile salmon provides greater insight into fish behavior and movements as compared to other tagging techniques (e.g., coded-wire tags, passive integrated transponders). Therefore, the technique can allow for an improved understanding of factors affecting fish survival. In experiments comparing migratory behavior of radio-tagged juvenile salmon with PIT-tagged[5] salmon, differences were negligible (Hockersmith et al. 2003). For Columbia River

[5] Because of their very small size, passive integrated transponder tags have negligible effects on juvenile salmon (Prentice et al. 1990).

investigations on juvenile salmon mortality, radio telemetry has been a valuable tool to provide detailed information on fish survival using far fewer fish than more traditional mass marking programs that have become restricted due to endangered species considerations (Skalski et al. 2001). Also, recent research in the Columbia River basin indicates that survival estimates using radio-tagged yearling Chinook salmon can produce accurate, precise, and unbiased results with relatively small sample sizes as compared to evaluations based on coded-wire or PIT-tagged salmon (Hockersmith et al. 2003).

A limitation associated with radio telemetry is that radio signal detection can be low when the lateral distance between the radio tag and receiver is excessive. Also, transmission strength is attenuated when the tag is in deep water and when signals are obscured by loud background noise or high conductivity (Bunt et al. 2003). All of these factors were encountered during these telemetry experiments in the Delta, but were overcome through the use of specialized field techniques and direct audio detection by human hearing that allowed discrimination of valid tag pulses (described in Vogel 2001 and 2002). Because of the relatively high conductivity and water depths in the Delta, low frequency (<50 MHz) tags were used to overcome the problem of signal attenuation that is evident compared to higher frequencies (e.g., >100 MHz) (Freund and Hartman 2002). However, the procedure is considerably labor intensive, requiring traversing large areas of the Delta in short periods to locate widely dispersed radio-tagged fish (e.g., about 85 river miles/day). In addition, mobile reconnaissance at night was not possible in certain Delta regions because of safety considerations (Vogel 2001).

One of the concerns using radio tags is the effect that the transmitter may have on normal fish behavior. Research has demonstrated that surgical implantation is preferable to gastric placement because gastric placement causes greater undesirable effects on fish (e.g., aberrant behavior, altered feeding behavior, reduced growth) (Novick 2000). However, surgical implant of tags requires experienced personnel, aseptic conditions, and increased handling (Novick 2000, Hockersmith et al. 2003). Increased fish stress can be expected if appropriate precautions are not undertaken. Although short-term stress is evident from surgical implantation of tags, the presence of tags is not chronically stressful after fish acclimation over several days (Jepsen et al. 2001). During these Delta research projects, there were no fish mortalities, nor were any adverse effects observed among tagged fish.

Due to the limitations on the size of transmitters, researchers have often recommended not tagging fish when a tag exceeds more than 2% of the weight of the fish (in air), although some researchers suggest that rule can be exceeded under certain circumstances (Brown et al. 1999). Recent work on the Columbia River indicates that tags can be implanted in juvenile salmon 120 mm FL or larger using a tag weight about 4-5% of the fish's weight (Novick 2000). When comparing surgical versus gastric implants of 1-gram transmitters, Adams et al. (1998a) recommended surgical implants for juvenile Chinook salmon between 114 and 159 mm FL which represented transmitter weights of 2.3-5.5% of fish weights. Adams et al. (1998b) recommended surgical implants (representing 2.2-5.6% of the fish's body weight) as the

preferred method of juvenile Chinook salmon radio-tag studies. Those studies used 1-gram transmitters or larger. This study used 1-gram transmitters and large enough fish so that the transmitter was less than 2% of the body weight.

RECOMMENDATIONS

Based on results from this research, the following recommendations should be considered for future studies.

Compare swimming performance of control (untagged), externally-tagged, and internally tagged juvenile salmon in laboratory studies. Although we did not observe any readily detectable adverse effects on swimming behavior of experimental or control fish, the experimental fish released in this study could potentially have exhibited reduced swimming performance under circumstances not provided in the confined environment of the holding pens. For example, if the burst speed of telemetered salmon was reduced as a result of transmitter attachment, the test fish may have been more prone to predation. Laboratory studies could be conducted to determine if there are any measurable differences between untagged and tagged fish.

Compare behavior between hatchery and wild fish. Caution should be used in interpreting results from any field investigation using hatchery fish as a surrogate for wild fish. Although there have been many decades of studies in the Central Valley and Delta using hatchery salmon, many questions remain concerning the applicability of those study results to wild fish. The use of hatchery fish is particularly advantageous because the availability of large numbers of fish allows sufficient data to be generated for the research project of interest. However, there are uncertainties of how hatchery fish behavior may differ from wild fish in a natural setting. For future biotelemetry studies, it would be useful to radio tag and record the behavior of wild juvenile salmon in comparison to the behavior of radio-tagged hatchery juvenile salmon. Those experiments could be performed by releasing similarly-sized wild and hatchery fish fitted with internally-implanted transmitters at the same time to observe potential differences in migratory behavior. Degree of smoltification should also be similar. Such a study may be limited by the potential behavioral changes that could occur from tagging and temporarily holding wild fish. Results from this research may also be valuable in interpreting results from past biotelemetry studies that have used hatchery fish, such as described in this report.

Release radio-tagged salmon with large groups of coded-wire tagged (CWT) salmon. Radio-tagged fish in this study did not exhibit any evident schooling behavior. In the future, it may be valuable to release radio-tagged fish at the same time and location as large groups of CWT salmon. Numerous studies have been performed in the Delta by using CWT juvenile salmon. Monitoring the migratory behavior of radio-tagged fish released in concert with mass releases of coded-wire tagged salmon may provide valuable information in interpreting results of past and future CWT studies.

Confirm telemetry characteristics associated with possible or probable predation on radio-tagged salmon. As described in this report, there were numerous characteristics of radio tag telemetry used to assume possible or probable predation. Because it may not be feasible to capture a predator after consumption of a radio-tagged fish, it would be valuable to insert a radio tag in the stomach of a predator or purposefully "feed" a radio-tagged fish to a predator, release it back into the Delta and monitor the resultant telemetry characteristics of the radio tag. The outcome would be worthwhile in interpreting results from this study and future similar telemetry experiments in the Delta.

Perform mobile telemetry monitoring at night with the use of radar. During this study, mobile monitoring at night by boat was not feasible primarily because of safety concerns (e.g., reduced visibility and wide dispersal of radio-tagged fish) which precluded the ability to monitor telemetered fish continuously over complete tidal cycles. However, it may be feasible to track fish at night by boat with the use of radar, if the numbers of telemetered fish are sufficiently small (to alleviate the problems of wide dispersal among many radio-tagged fish in the Delta at one time). This effort could focus on acquiring more intensive data on fewer numbers of individual fish, particularly during the first 24 to 48 hours after release before the fish disperse over large distances in the Delta. The use of radar would also minimize the navigational problems associated with fog that can hamper field studies in the Delta. The acquisition of more data on fish movements over the entire tidal cycle would increase the probability of detecting how salmon exhibit net downstream movement in a tidal environment.

Acoustic Tag Salmon. Recent developments in miniaturization of acoustic tags have resulted in tags weighing only 0.8 grams (in air). Because an antenna is not required for sonic tags, the time and stress associated with an acoustic transmitter implant is less as compared to a radio transmitter implant. Acoustic tags were recently used in studies at Georgiana Slough; fish as small as 109 mm FL were successfully internally tagged with no mortalities (Vogel, unpublished data). Smaller acoustic tags (0.7 grams) are likely to be developed in 2004 (Mark Timco, HTI, Inc., Seattle, WA) that may allow for surgically implanting transmitters in even smaller-sized salmon. Sonic "listening" stations could be established within specific Delta channels to determine migratory pathways and, if strategically placed, could also determine mortality in specific reaches of the Delta. The listening stations would also be advantageous because the receivers would operate 24 hours a day thereby overcoming the limitation of night-time observations that could not be achieved in this study. This would also allow for the release of tagged fish at pre-determined times such as specific ebb or flood tide conditions, depending on study objectives. The use of acoustic-tagged salmon would also allow for studies of the interaction between fish movements and flow structure at key flow splits in the Delta (e.g., Turner Cut) using strategically placed hydrophones and acoustic Doppler current profiler equipment such as that employed for a pilot study at Georgiana Slough in December 2003. This research is important because we could not determine why some fish were diverted into side channels like Turner Cut based on data developed in this report.

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APPENDICES

APPENDIX A
FIELD DATA FORM

2002-2003 JUVENILE CHINOOK SALMON RADIO-TELEMETRY DELTA STUDIES

DATE: / / 20__ **OBSERVER:** **SURVEY VIA:** BOAT LAND

WEATHER CONDITIONS:____

FREQUENCY	OBSERVER UTM COORDINATES	MILITARY TIME	ESTIMATED FISH POSITION	GENERAL LOCATION / LANDMARKS
	6 4		6 4	
Q DIRECTION:	U/S	SLACK	SIGNAL STRENGTH: H M L	NOTES:
	D/S	FISH CHANNEL POSITION (FACING D/S): LB MID RB		
	6 4		6 4	
Q DIRECTION:	U/S	SLACK	SIGNAL STRENGTH: H M L	NOTES:
	D/S	FISH CHANNEL POSITION (FACING D/S): LB MID RB		
	6 4		6 4	
Q DIRECTION:	U/S	SLACK	SIGNAL STRENGTH: H M L	NOTES:
	D/S	FISH CHANNEL POSITION (FACING D/S): LB MID RB		
	6 4		6 4	
Q DIRECTION:	U/S	SLACK	SIGNAL STRENGTH: H M L	NOTES:
	D/S	FISH CHANNEL POSITION (FACING D/S): LB MID RB		
	6 4		6 4	
Q DIRECTION:	U/S	SLACK	SIGNAL STRENGTH: H M L	NOTES:
	D/S	FISH CHANNEL POSITION (FACING D/S): LB MID RB		
	6 4		6 4	
Q DIRECTION:	U/S	SLACK	SIGNAL STRENGTH: H M L	NOTES:
	D/S	FISH CHANNEL POSITION (FACING D/S): LB MID RB		
	6 4		6 4	
Q DIRECTION:	U/S	SLACK	SIGNAL STRENGTH: H M L	NOTES:
	D/S	FISH CHANNEL POSITION (FACING D/S): LB MID RB		
	6 4		6 4	
Q DIRECTION:	U/S	SLACK	SIGNAL STRENGTH: H M L	NOTES:
	D/S	FISH CHANNEL POSITION (FACING D/S): LB MID RB		
	6 4		6 4	
Q DIRECTION:	U/S	SLACK	SIGNAL STRENGTH: H M L	NOTES:
	D/S	FISH CHANNEL POSITION (FACING D/S): LB MID RB		
	6 4		6 4	
Q DIRECTION:	U/S	SLACK	SIGNAL STRENGTH: H M L	NOTES:
	D/S	FISH CHANNEL POSITION (FACING D/S): LB MID RB		
	6 4		6 4	
Q DIRECTION:	U/S	SLACK	SIGNAL STRENGTH: H M L	NOTES:
	D/S	FISH CHANNEL POSITION (FACING D/S): LB MID RB		

PAGE ______ OF _______

NATURAL RESOURCE SCIENTISTS, INC., RED BLUFF, CA

APPENDIX B
FISH RELEASE DATA

NORTHERN DELTA - 2002

First Fish Release - Sacramento River, January 22-25, 2002

On January 17, 2002, eight juvenile late-fall Chinook salmon at Coleman Hatchery were externally radio tagged and eight salmon were internally radio tagged. The externally-tagged fish ranged in size from 146 mm to 180 mm fork length (FL) (mean=162 mm FL) and the internally-tagged fish ranged in size from 155 mm to 172 mm FL (mean=166 mm FL). Two salmon ranging in size from 158 mm to 171 mm FL (mean=164 mm FL) were externally tagged with "dummy" transmitters and two salmon ranging in size from 167 mm to 173 mm (mean=170 mm FL) were internally tagged with "dummy" transmitters for use as control fish. On January 21, the 16 radio-tagged salmon and four "dummy" tagged salmon were transported from Coleman Hatchery to the Delta on the lower Mokelumne River just upstream of the Highway 12 bridge near the Georgiana Slough confluence. No mortalities occurred from the tagging or transport procedures. On the morning of January 22, the radio-tagged salmon were removed from the live pen, transported to the release site, and released at 0916 hours in the middle of the Sacramento River adjacent to Koket Resort near Ryde.

On January 26, nine days after surgery, the two salmon fitted with "dummy" transmitters and the two salmon with internally implanted "dummy" transmitters were found to be healthy and actively swimming in the live pen placed in the lower Mokelumne River near the Georgiana Slough confluence.

Second Fish Release - Georgiana Slough, January 30-February 2, 2002

On January 28, 2002, eight juvenile late-fall Chinook salmon at Coleman Hatchery were externally radio tagged and eight salmon were internally radio tagged. The externally-tagged fish ranged in size from 161 mm to 186 mm FL (mean=172 mm FL) and the internally-tagged fish ranged in size from 160 mm to 192 mm FL (mean=170 mm FL). Two salmon ranging in size from 161 mm to 176 mm FL (mean=168 mm FL) were externally tagged with "dummy" transmitters and two salmon ranging in size from 163 mm to 165 mm (mean=164 mm FL) were internally tagged with "dummy" transmitters for use as control fish. On January 29, the 16 radio-tagged salmon and four "dummy" tagged salmon were transported from Coleman Hatchery to the Delta on the lower Mokelumne River just upstream of the Highway 12 bridge near the Georgiana Slough confluence. No mortalities occurred from the tagging or transport procedures. On the morning of January 30, the radio-tagged salmon were removed from the live pen, transported to the release site, and released at 0940 hours in mid channel of northern Georgiana Slough.

On February 3, six days after surgery, the two salmon fitted with "dummy" transmitters and the two salmon with internally implanted "dummy" transmitters were found to be healthy and actively swimming in the live pen placed in the lower Mokelumne River near the Georgiana Slough confluence.

Third Fish Release - Sacramento River, February 6 - 9, 2002

On February 4, 2002, nine juvenile late-fall Chinook salmon at Coleman Hatchery were externally radio tagged and nine salmon were internally radio tagged. The externally-tagged fish ranged in size from 155 mm to 169 mm fork length (FL) (mean=162 mm FL) and the internally-tagged fish ranged in size from 150 mm to 175 mm FL (mean=162 mm FL). One salmon (165 mm FL) was externally tagged with a "dummy" transmitters and two salmon ranging in size from 155 mm to 165 mm (mean=160 mm FL) were internally tagged with "dummy" transmitter for use as control fish. On February 5, the 18 radio-tagged salmon and three "dummy" tagged salmon were transported from Coleman Hatchery to the Delta on the lower Mokelumne River just upstream of the Highway 12 bridge near the Georgiana Slough confluence. No mortalities occurred from the tagging or transport procedures. On the morning of February 6, the radio-tagged salmon were removed from the live pen, transported to the release site, and released at 0912 hours in the middle of the Sacramento River adjacent to Koket Resort near Ryde.

On February 10, six days after surgery, the one salmon fitted with a "dummy" transmitter and the two salmon with internally implanted "dummy" transmitters were found to be healthy and actively swimming in the live pen placed in the lower Mokelumne River near the Georgiana Slough confluence.

Fourth Fish Release - Georgiana Slough, February 12 - 15, 2002

On February 8, 2002, twelve juvenile late-fall Chinook salmon at Coleman Hatchery were internally radio tagged. The internally-tagged fish ranged in size from 151 mm to 181 mm FL (mean=165 mm FL). Two salmon ranging in size from 151 mm to 160 mm FL (mean=156 mm FL) were internally tagged with "dummy" transmitters for use as control fish. On February 11, the 12 radio-tagged salmon and two "dummy" tagged salmon were transported from Coleman Hatchery to the Delta on the lower Mokelumne River just upstream of the Highway 12 bridge. No mortalities occurred from the tagging or transport procedures. On the morning of February 12, the radio-tagged salmon were removed from the live pen, transported to the release site, and released at 0935 hours in mid channel of northern Georgiana Slough.

On February 16, eight days after surgery, the two salmon with internally implanted "dummy" transmitters were found to be healthy and actively swimming in the live pen placed in the lower Mokelumne River near the Georgiana Slough confluence.

CENTRAL DELTA – 2002

First Fish Release – April 2 - 4, 2002

On March 29, 2002, 14 juvenile late-fall Chinook salmon at Coleman Hatchery were internally radio tagged. The fish ranged in size from 150 mm to 185 mm fork length (FL) (mean=155 mm FL). Four salmon ranging in size from 147 mm to 188 mm FL (mean=168 mm FL) were internally tagged with "dummy" transmitters for use as control fish. On April 1, the 14 radio-tagged salmon and four "dummy" tagged salmon were transported from Coleman Hatchery to the Delta on Little Connection Slough just north of the San Joaquin River. No mortalities occurred from the tagging or transport procedures. On the morning of April 2, the radio-tagged salmon were removed from the live pen, transported to the release site, and released at 0918 hours in the middle of the San Joaquin River adjacent to 14-Mile Slough.

On April 5, seven days after surgery, the four salmon with internally implanted "dummy" transmitters were found to be healthy and actively swimming in the live pen placed in Little Connection Slough.

Second Fish Release – April 10 - 12, 2002

On April 8, 2002, 12 juvenile late-fall Chinook salmon at Coleman Hatchery were internally radio tagged. The fish ranged in size from 156 mm to 191 mm fork length (FL) (mean=177 mm FL). Two salmon ranging in size from 174 mm to 182 mm FL (mean=178 mm FL) were internally tagged with "dummy" transmitters for use as control fish. On April 9, the 12 radio-tagged salmon and two "dummy" tagged salmon were transported from Coleman Hatchery to the Delta on Little Connection Slough just north of the San Joaquin River. No mortalities occurred from the tagging or transport procedures. On the morning of April 10, the radio-tagged salmon were removed from the live pen, transported to the release site, and released at 0738 hours in the middle of the San Joaquin River adjacent to 14-Mile Slough.

On April 12, four days after surgery, the two salmon with internally implanted "dummy" transmitters were found to be healthy and actively swimming in the live pen placed in Little Connection Slough.

Third Fish Release – April 16 - 19, 2002

On April 12, 2002, 13 juvenile late-fall Chinook salmon at Coleman Hatchery were internally radio tagged. The fish ranged in size from 149 mm to 177 mm fork length (FL) (mean=164 mm FL). Two salmon ranging in size from 168 mm to 201 mm FL (mean=184 mm FL) were internally tagged with "dummy" transmitters for use as control fish. On April 15, the 13 radio-tagged salmon and two "dummy" tagged salmon were transported from Coleman Hatchery to the Delta on Little Connection Slough just north of the San Joaquin River. No mortalities occurred from the tagging or transport procedures. On the morning of April 16, the radio-tagged salmon were removed from the

live pen, transported to the release site, and released at 0751 hours in the middle of the San Joaquin River adjacent to 14-Mile Slough.

On April 19, seven days after surgery, the two salmon with internally implanted "dummy" transmitters were found to be healthy and actively swimming in the live pen placed in Little Connection Slough.

Fourth Fish Release – April 23 - 26, 2002

On April 19, 2002, 12 juvenile late-fall Chinook salmon at Coleman Hatchery were internally radio tagged. The fish ranged in size from 150 mm to 178 mm fork length (FL) (mean=165 mm FL). Two salmon ranging in size from 163 mm to 172 mm FL (mean=168 mm FL) were internally tagged with "dummy" transmitters for use as control fish. On April 22, the 12 radio-tagged salmon and two "dummy" tagged salmon were transported from Coleman Hatchery to the Delta on Little Connection Slough just north of the San Joaquin River. No mortalities occurred from the tagging or transport procedures. On the morning of April 23, the radio-tagged salmon were removed from the live pen, transported to the release site, and released at 0720 hours in the middle of the San Joaquin River adjacent to 14-Mile Slough.

On April 27, eight days after surgery, the two salmon with internally implanted "dummy" transmitters were found to be healthy and actively swimming in the live pen placed in Little Connection Slough.

CENTRAL DELTA – 2003

First Fish Release – April 8 - 11, 2003

On April 3, 2003, 13 juvenile late-fall Chinook salmon at Coleman Hatchery were internally radio tagged. The fish ranged in size from 165 mm to 219 mm fork length (FL) (mean=185 mm FL). Three salmon ranging in size from 178 mm to 199 mm FL (mean=191 mm FL) were internally tagged with "dummy" transmitters on March 29, 2003 for use as control fish. On April 7, the 13 radio-tagged salmon and three "dummy" tagged salmon were transported from Coleman Hatchery to the Delta on Little Connection Slough just north of the San Joaquin River. No mortalities occurred from the tagging or transport procedures. On the morning of April 8, the radio-tagged salmon were removed from the live pen, transported to the release site, and released at 0754 hours in the middle of the San Joaquin River adjacent to 14-Mile Slough.

On April 12, 14 days after surgery, the three salmon with internally implanted "dummy" transmitters were found to be healthy and actively swimming in the live pen placed in Little Connection Slough.

Second Fish Release – April 15 - 18, 2003

On April 11, 2003, 12 juvenile late-fall Chinook salmon at Coleman Hatchery were internally radio tagged. The fish ranged in size from 179 mm to 205 mm fork length (FL) (mean=190 mm FL). Two salmon ranging in size from 175 mm to 191 mm FL (mean=183 mm FL) were internally tagged with "dummy" transmitters on March 29, 2003 for use as control fish. On April 14, the 12 radio-tagged salmon and two "dummy" tagged salmon were transported from Coleman Hatchery to the Delta on Little Connection Slough just north of the San Joaquin River. No mortalities occurred from the tagging or transport procedures. On the morning of April 15, the radio-tagged salmon were removed from the live pen, transported to the release site, and released at 0819 hours in the middle of the San Joaquin River adjacent to 14-Mile Slough.

On April 19, 21 days after surgery, the two salmon with internally implanted "dummy" transmitters were found to be healthy and actively swimming in the live pen placed in Little Connection Slough.

Third Fish Release – April 22 - 25, 2003

On April 18, 2003, 12 juvenile late-fall Chinook salmon at Coleman Hatchery were internally radio tagged. The fish ranged in size from 173 mm to 219 mm fork length (FL) (mean=199 mm FL). Two salmon ranging in size from 187 mm to 211 mm FL (mean=199 mm FL) were internally tagged with "dummy" transmitters on March 29, 2003 for use as control fish. On April 21, the 12 radio-tagged salmon and two "dummy" tagged salmon were transported from Coleman Hatchery to the Delta on Little Connection Slough just north of the San Joaquin River. No mortalities occurred from the tagging or transport procedures. On the morning of April 22, the radio-tagged salmon were removed from the live pen, transported to the release site, and released at 0827 hours in the middle of the San Joaquin River adjacent to 14-Mile Slough.

On April 26, 28 days after surgery, the two salmon with internally implanted "dummy" transmitters were found to be healthy and actively swimming in the live pen placed in Little Connection Slough.

Fourth Fish Release – April 29 – May 2, 2003

On April 23, 2003, 13 juvenile late-fall Chinook salmon at Coleman Hatchery were internally radio tagged. The fish ranged in size from 171 mm to 211 mm fork length (FL) (mean=191 mm FL). Two salmon ranging in size from 197 mm to 198 mm FL (mean=198 mm FL) were internally tagged with "dummy" transmitters on March 29 and April 18, 2003, respectively, for use as control fish. On April 28, the 13 radio-tagged salmon and two "dummy" tagged salmon were transported from Coleman Hatchery to the Delta on Little Connection Slough just north of the San Joaquin River. No mortalities occurred from the tagging or transport procedures. On the morning of April 29, the

radio-tagged salmon were removed from the live pen, transported to the release site, and released at 0807 hours in the middle of the San Joaquin River adjacent to 14-Mile Slough.

On May 3, 15 and 35 days after surgery, the two salmon with internally implanted “dummy” transmitters were found to be healthy and actively swimming in the live pen placed in Little Connection Slough.

Appendix C. Fish Release No. 1 - Telemetry and observational data for 16 radio-tagged juvenile chinook salmon released in the Sacramento River near Ryde at 0916 hrs. on January 22, 2002.

Fish #	Radio Tag Attachment (I=Internal / E=External)	Date	Military Time	Telemetry Map Location (refer to appendix figures)	Fish Location (via GPS) (WGS 84) Latitude (degrees North)	(WGS 84) Longitude (degrees West)	Radio Signal Strength (H=High/M=Med/L=Low)	Position of Fish in Channel Facing Downstream
48.691	E	1/22/2002	9:16	RELEASE SITE #1	38.2410433	121.5547391	H	Mid-Channel
48.691	E	1/22/2002	9:39	.691-1	38.2415554	121.5538834	H	Mid-Channel
48.691	E	1/22/2002	10:26	.691-2	38.2409575	121.5543637	H	Left Bank
48.691	E	1/22/2002	11:07	.691-3	38.2363428	121.5587055	H	Left Bank
48.691	E	1/22/2002	11:48	.691-4	38.2300235	121.5563396	H	Left Bank
48.691	E	1/22/2002	12:27	.691-5	38.2240291	121.5562182	H	Left Bank
48.691	E	1/22/2002	13:16	.691-6	38.2159699	121.5574741	H	Left Bank
48.691	E	1/22/2002	14:24	.691-7	38.1993925	121.5585778	H	Left Bank
48.691	E	1/22/2002	15:29	.691-8	38.1919228	121.5704637	M	Mid-Channel
48.691	E	1/22/2002	16:45	.691-9	38.1931687	121.5662143	M	Right Bank
48.691	E	1/23/2002	11:33	.691-10	38.201731	121.5574696	M	Left Bank
48.691	E	1/23/2002	12:57	.691-99	38.201731	121.5574696	M	Left Bank
48.701	E	1/22/2002	9:16	RELEASE SITE #1	38.2410433	121.5547391	H	Mid-Channel
48.701	E	1/22/2002	9:43	.701-1	38.2410007	121.5553793	H	Right Bank
48.701	E	1/22/2002	10:35	.701-2	38.2378815	121.5577839	H	Left Bank
48.701	E	1/22/2002	11:00	.701-3	38.234108	121.5587153	H	Mid-Channel
48.701	E	1/22/2002	11:43	.701-4	38.2283054	121.5566021	H	Right Bank
48.701	E	1/22/2002	12:29	.701-5	38.222589	121.5571035	M	Right Bank
48.701	E	1/22/2002	13:21	.701-6	38.2111744	121.557386	H	Left Bank
48.701	E	1/22/2002	14:20	.701-7	38.2080959	121.5576752	H	Mid-Channel
48.701	E	1/22/2002	15:18	.701-8	38.2051792	121.5574426	H	Left Bank
48.701	E	1/22/2002	16:26	.701-9	38.1924339	121.5687751	H	Mid-Channel
48.701	E	1/22/2002	17:10	.701-10	38.1878892	121.5796432	H	Left Bank
48.701	E	1/23/2002	11:47	.701-11	38.2375252	121.6718913	M	Left Bank
48.701	E	1/23/2002	14:19	.701-12	38.2331583	121.6746328	M	Right Bank
48.701	E	1/23/2002	16:20	.701-99	38.2345279	121.674608	H	Right Bank
48.732	E	1/22/2002	9:16	RELEASE SITE #1	38.2410433	121.5547391	H	Mid-Channel
48.732	E	1/22/2002	9:49	.732-1	38.2382155	121.557823	H	Mid-Channel
48.732	E	1/22/2002	10:39	.732-2	38.2350852	121.5590388	H	Mid-Channel
48.732	E	1/22/2002	11:51	.732-3	38.2348349	121.5592037	M	Right Bank
48.732	E	1/22/2002	12:10	.732-4	38.2328514	121.5583974	H	Mid-Channel
48.732	E	1/22/2002	13:08	.732-5	38.2323055	121.557974	H	Mid-Channel
48.732	E	1/22/2002	14:08	.732-6	38.2336625	121.5583928	M	Left Bank
48.732	E	1/22/2002	15:09	.732-7	38.231368	121.5572156	H	Left Bank
48.732	E	1/22/2002	16:10	.732-8	38.2303813	121.5568019	H	Mid-Channel
48.732	E	1/23/2002	11:50	.732-99	38.232046	121.557385	L	Left Bank
48.741	E	1/22/2002	9:16	RELEASE SITE #1	38.2410433	121.5547391	H	Mid-Channel
48.741	E	1/22/2002	9:56	.741-1	38.2389688	121.5575225	H	Right Bank
48.741	E	1/22/2002	10:31	.741-2	38.2398217	121.5565344	H	Right Bank
48.741	E	1/22/2002	11:10	.741-3	38.2392073	121.5566237	H	Left Bank
48.741	E	1/22/2002	11:32	.741-4	38.2392073	121.5566237		Left Bank
48.741	E	1/22/2002	12:05	.741-5	38.2392073	121.5566237	H	Left Bank
48.741	E	1/22/2002	12:58	.741-6	38.2398355	121.5556743	H	Left Bank
48.741	E	1/22/2002	13:46	.741-7	38.2399571	121.5557681	H	Left Bank
48.741	E	1/22/2002	14:56	.741-8	38.2399571	121.5557681		Left Bank
48.741	E	1/22/2002	16:20	.741-9	38.2169848	121.557963	H	Right Bank
48.741	E	1/22/2002	17:13	.741-10	38.1985732	121.5592017	M	Mid-Channel
48.741	E	1/23/2002	11:00	.741-11	38.1723542	121.6383936	H	Left Bank
48.741	E	1/23/2002	13:30	.741-12	38.174438	121.6528734	M	Right Bank
48.741	E	1/23/2002	17:28	.741-13	38.1754376	121.6580751	M	Mid-Channel
48.741	E	1/24/2002	9:38	.741-14	38.1373555	121.6951266	M	Right Bank
48.741	E	1/24/2002	13:37	.741-15	38.1404834	121.6935646	M	Right Bank
48.741	E	1/24/2002	16:00	.741-16	38.1356685	121.6949741	M	Right Bank
48.741	E	1/24/2002	16:54	.741-99	38.139962	121.693688	H	Right Bank
48.851	E	1/22/2002	9:16	RELEASE SITE #1	38.2410433	121.5547391	H	Mid-Channel
48.851	E	1/22/2002	9:54	.851-1	38.2383807	121.5580711	H	Right Bank
48.851	E	1/22/2002	10:34	.851-2	38.2379542	121.5576383	H	Left Bank
48.851	E	1/22/2002	11:03	.851-3	38.2355639	121.5591208	H	Right Bank
48.851	E	1/22/2002	11:36	.851-4	38.2349588	121.5590185	H	Right Bank
48.851	E	1/22/2002	12:24	.851-5	38.2268411	121.5562426	H	Mid-Channel
48.851	E	1/22/2002	13:18	.851-6	38.2142794	121.5577816	H	Mid-Channel
48.851	E	1/22/2002	14:26	.851-7	38.1983362	121.5591582	H	Left Bank
48.851	E	1/22/2002	14:44	.851-8	38.1934364	121.5642698	H	Left Bank
48.851	E	1/22/2002	15:34	.851-9	38.1871531	121.5814155	H	Mid-Channel
48.851	E	1/22/2002	16:37	.851-10	38.1713614	121.5946785	M	Right Bank
48.851	E	1/22/2002	16:59	.851-11	38.1669569	121.5993976	H	Mid-Channel
48.851	E	1/23/2002	9:03	.851-12	38.1977034	121.6562504	H	Left Bank

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Fish #	Radio Tag Attachment (I=Internal / E=External)	Date	Military Time	Telemetry Map Location (refer to appendix figures)	Fish Location (via GPS) (WGS 84) Latitude (degrees North)	(WGS 84) Longitude (degrees West)	Radio Signal Strength (H=High/M=Med/L=Low)	Position of Fish in Channel Facing Downstream
48.851	E	1/23/2002	12:06	.851-13	38.233299	121.676302	M	Mid-Channel
48.851	E	1/23/2002	14:05	.851-14	38.2052468	121.6594352	H	Mid-Channel
48.851	E	1/23/2002	16:50	.851-15	38.1450056	121.6861234	H	Left Bank
48.851	E	1/24/2002	11:29	.851-16	38.1130234	121.7115177	M	Right Bank
48.851	E	1/24/2002	14:02	.851-17	38.1151043	121.7089715	M	Right Bank
48.851	E	1/24/2002	15:18	.851-18	38.114633	121.7095502	H	Right Bank
48.851	E	1/24/2002	17:04	.851-19	38.1136631	121.7098638	M	Right Bank
48.851	E	1/25/2002	13:57	.851-20	38.1110201	121.7145755	M	Right Bank
48.851	E	1/25/2002	14:55	.851-99	38.1124135	121.712612	H	Right Bank
48.871	I	1/22/2002	9:16	RELEASE SITE #1	38.2410433	121.5547391	H	Mid-Channel
48.871	I	1/22/2002	10:33	.871-1	38.2356742	121.5593014	H	Right Bank
48.871	I	1/22/2002	11:17	.871-2	38.2300765	121.5569898	H	Right Bank
48.871	I	1/22/2002	11:57	.871-3	38.2230219	121.5563981	H	Mid-Channel
48.871	I	1/22/2002	13:00	.871-4	38.2144492	121.557664	H	Mid-Channel
48.871	I	1/22/2002	14:02	.871-5	38.2005515	121.5582923	H	Mid-Channel
48.871	I	1/22/2002	14:54	.871-6	38.1929636	121.5672137	H	Right Bank
48.871	I	1/22/2002	15:43	.871-7	38.1886505	121.5792969	H	Mid-Channel
48.871	I	1/22/2002	16:08	.871-8	38.1830586	121.5856395	H	Mid-Channel
48.871	I	1/22/2002	16:31	.871-9	38.1781593	121.589521	M	Mid-Channel
48.871	I	1/22/2002	16:55	.871-10	38.1702701	121.5953616	H	Mid-Channel
48.871	I	1/23/2002	9:35	.871-11	38.1876818	121.6601683	H	Mid-Channel
48.871	I	1/23/2002	11:30	.871-12	38.204926	121.6565973	H	Left Bank
48.871	I	1/23/2002	13:54	.871-13	38.1920178	121.65712	M	Left Bank
48.871	I	1/23/2002	16:00	.871-14	38.1780432	121.6645006	H	Left Bank
48.871	I	1/23/2002	17:23	.871-15	38.1682737	121.6764024	M	Mid-Channel
48.871	I	1/24/2002	10:14	.871-16	38.1264041	121.6990408	M	Right Bank
48.871	I	1/24/2002	13:31	.871-17	38.1485703	121.6906016	M	Right Bank
48.871	I	1/24/2002	15:30	.871-18	38.1146874	121.7030359	M	Mid-Channel
48.871	I	1/24/2002	17:10	.871-19	38.1055418	121.7204542	H	Right Bank
48.871	I	1/25/2002	9:17	.871-20	38.0908417	121.742046	H	Right Bank
48.871	I	1/25/2002	10:20	.871-21	38.0976921	121.7295777	H	Mid-Channel
48.871	I	1/25/2002	11:45	.871-22	38.1155314	121.7076522	H	Right Bank
48.871	I	1/25/2002	14:09	.871-23	38.1240937	121.6979296	M	Mid-Channel
48.871	I	1/25/2002	15:07	.871-24	38.1115312	121.711042	H	Mid-Channel
48.871	I	1/25/2002	15:22	.871-99	38.1088794	121.7157765	H	Right Bank
48.882	I	1/22/2002	9:16	RELEASE SITE #1	38.2410433	121.5547391	H	Mid-Channel
48.882	I	1/22/2002	10:22	.882-1	38.2398572	121.5557567	H	Left Bank
48.882	I	1/22/2002	11:39	.882-2	38.2412674	121.551718	H	Left Bank
48.882	I	1/22/2002	12:28	.882-3	38.2413214	121.5524483	H	Left Bank
48.882	I	1/22/2002	13:23	.882-4	38.2411092	121.5535037	H	Left Bank
48.882	I	1/22/2002	14:28	.882-5	38.2411092	121.5535037	H	Left Bank
48.882	I	1/22/2002	15:20	.882-6	38.2412467	121.5529639	H	Left Bank
48.882	I	1/22/2002	17:15	.882-7	38.2412467	121.5529639	H	Left Bank
48.882	I	1/23/2002	12:04	.882-99	38.2412129	121.5531474		Left Bank
48.891	I	1/22/2002	9:16	RELEASE SITE #1	38.2410433	121.5547391	H	Mid-Channel
48.891	I	1/22/2002	10:38	.891-1	38.2324134	121.557949	H	Mid-Channel
48.891	I	1/22/2002	11:14	.891-2	38.2275784	121.5558722	M	Left Bank
48.891	I	1/22/2002	11:54	.891-3	38.2226779	121.5565899	H	Mid-Channel
48.891	I	1/22/2002	12:56	.891-4	38.2112209	121.5574993	M	Mid-Channel
48.891	I	1/22/2002	14:07	.891-5	38.1945401	121.5626588	H	Mid-Channel
48.891	I	1/22/2002	15:01	.891-6	38.1875245	121.580826	H	Mid-Channel
48.891	I	1/22/2002	15:52	.891-7	38.1763505	121.5906212	H	Mid-Channel
48.891	I	1/22/2002	16:18	.891-8	38.1691548	121.5962962	H	Mid-Channel
48.891	I	1/22/2002	16:50	.891-9	38.1635504	121.6100211	M	Mid-Channel
48.891	I	1/23/2002	9:02	.891-10	38.1939424	121.6583521	H	Right Bank
48.891	I	1/23/2002	11:32	.891-11	38.2065236	121.6568078	H	Left Bank
48.891	I	1/23/2002	13:40	.891-12	38.1787583	121.664773	M	Left Bank
48.891	I	1/23/2002	15:52	.891-13	38.150315	121.6838256	H	Left Bank
48.891	I	1/23/2002	16:46	.891-14	38.1407034	121.687433	H	Left Bank
48.891	I	1/24/2002	9:29	.891-15	38.1490032	121.6904234	L	Right Bank
48.891	I	1/24/2002	12:02	.891-16	38.1646388	121.6793332	M	Mid-Channel
48.891	I	1/24/2002	13:14	.891-17	38.1672123	121.6757823	H	Mid-Channel
48.891	I	1/24/2002	16:05	.891-18	38.1416932	121.6929497	H	Right Bank
48.891	I	1/24/2002	16:58	.891-19	38.1231084	121.7008106	H	Right Bank
48.891	I	1/25/2002	9:07	.891-20	38.1092279	121.715508	M	Right Bank
48.891	I	1/25/2002	11:45	.891-21	38.1153139	121.7083633	H	Right Bank
48.891	I	1/25/2002	14:00	.891-22	38.1122123	121.7115205	M	Right Bank
48.891	I	1/25/2002	14:57	.891-23	38.1074436	121.7171703	H	Right Bank

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Fish #	Radio Tag Attachment (I=Internal / E=External)	Date	Military Time	Telemetry Map Location (refer to appendix figures)	Fish Location (via GPS) (WGS 84) Latitude (degrees North)	(WGS 84) Longitude (degrees West)	Radio Signal Strength (H=High/M=Med/L=Low)	Position of Fish in Channel Facing Downstream
48.891	I	1/25/2002	15:22	.891-99	38.1043621	121.7230181	M	Right Bank
48.921	E	1/22/2002	9:16	RELEASE SITE #1	38.2410433	121.5547391	H	Mid-Channel
48.921	E	1/23/2002	11:57	.921-99	38.2397618	121.5567869	L	Right Bank
48.931	E	1/22/2002	9:16	RELEASE SITE #1	38.2410433	121.5547391	H	Mid-Channel
48.931	E	1/22/2002	9:50	.931-1	38.2381366	121.5574377	H	Left Bank
48.931	E	1/22/2002	10:28	.931-2	38.2402768	121.5556513	H	Mid-Channel
48.931	E	1/22/2002	11:05	.931-3	38.2353127	121.5592171	H	Right Bank
48.931	E	1/22/2002	11:41	.931-4	38.2277499	121.5561332	M	Mid-Channel
48.931	E	1/22/2002	12:31	.931-5	38.2195616	121.5571518	M	Mid-Channel
48.931	E	1/22/2002	13:19	.931-6	38.2139444	121.5576511	H	Mid-Channel
48.931	E	1/22/2002	14:18	.931-7	38.2088781	121.5575227	H	Left Bank
48.931	E	1/22/2002	15:25	.931-8	38.1927884	121.567526	H	Right Bank
48.931	E	1/22/2002	16:30	.931-9	38.1832539	121.5856215	H	Mid-Channel
48.931	E	1/22/2002	17:06	.931-99	38.1762862	121.5912732	H	Mid-Channel
48.942	E	1/22/2002	9:16	RELEASE SITE #1	38.2410433	121.5547391	H	Mid-Channel
48.942	E	1/22/2002	10:09	.942-1	38.2415474	121.5532322	H	Mid-Channel
48.942	E	1/22/2002	10:23	.942-2	38.2414391	121.5525657	H	Left Bank
48.942	E	1/22/2002	11:19	.942-3	38.2418014	121.5514342	M	Mid-Channel
48.942	E	1/22/2002	12:01	.942-4	38.2411527	121.5541085	H	Left Bank
48.942	E	1/22/2002	13:05	.942-5	38.2352293	121.5590245	H	Mid-Channel
48.942	E	1/22/2002	14:16	.942-6	38.2138899	121.557618	H	Mid-Channel
48.942	E	1/22/2002	15:22	.942-7	38.1986834	121.5588088	H	Left Bank
48.942	E	1/22/2002	16:28	.942-8	38.1882524	121.5799098	M	Right Bank
48.942	E	1/22/2002	17:08	.942-9	38.1830435	121.5858796	M	Mid-Channel
48.942	E	1/23/2002	9:47	.942-10	38.1755998	121.6707337	M	Right Bank
48.942	E	1/23/2002	12:28	.942-11	38.1846971	121.6623924	H	Mid-Channel
48.942	E	1/23/2002	14:54	.942-12	38.1450068	121.6878466	M	Mid-Channel
48.942	E	1/23/2002	15:43	.942-13	38.1293893	121.6895068	H	Left Bank
48.942	E	1/24/2002	10:18	.942-14	38.1305311	121.6941186	M	Mid-Channel
48.942	E	1/24/2002	13:42	.942-15	38.1369207	121.6941188	H	Right Bank
48.942	E	1/24/2002	15:26	.942-16	38.1098808	121.7099558	H	Mid-Channel
48.942	E	1/24/2002	17:08	.942-17	38.0915764	121.7299116	H	Left Bank
48.942	E	1/25/2002	9:12	.942-18	38.0937937	121.7282767	M	Left Bank
48.942	E	1/25/2002	12:09	.942-19	38.1214023	121.6998483	H	Mid-Channel
48.942	E	1/25/2002	14:12	.942-20	38.12863	121.6982141	M	Right Bank
48.942	E	1/25/2002	14:47	.942-99	38.1288188	121.6989866	H	Right Bank
48.951	I	1/22/2002	9:16	RELEASE SITE #1	38.2410433	121.5547391	H	Mid-Channel
48.951	I	1/22/2002	10:30	.951-1	38.2378052	121.5581739	H	Mid-Channel
48.951	I	1/22/2002	11:24	.951-2	38.2360155	121.5592033	H	Right Bank
48.951	I	1/22/2002	12:08	.951-3	38.2317517	121.5576422	H	Mid-Channel
48.951	I	1/22/2002	13:07	.951-4	38.2190303	121.5571852	H	Mid-Channel
48.951	I	1/22/2002	14:04	.951-5	38.1964255	121.5606119	H	Mid-Channel
48.951	I	1/22/2002	14:59	.951-6	38.1895776	121.5769724	H	Mid-Channel
48.951	I	1/22/2002	15:49	.951-7	38.1783438	121.5892584	H	Mid-Channel
48.951	I	1/22/2002	16:20	.951-8	38.1677086	121.5974426	H	Mid-Channel
48.951	I	1/22/2002	16:46	.951-9	38.1633698	121.613038	M	Mid-Channel
48.951	I	1/23/2002	9:09	.951-10	38.2121658	121.6655676	H	Left Bank
48.951	I	1/23/2002	14:21	.951-11	38.2376946	121.6837257		Mid-Channel
48.951	I	1/23/2002	16:10	.951-99	38.2057787	121.6578722	H	Mid-Channel
48.962	I	1/22/2002	9:16	RELEASE SITE #1	38.2410433	121.5547391	H	Mid-Channel
48.962	I	1/22/2002	9:41	.962-1	38.2415363	121.5537923	H	Mid-Channel
48.962	I	1/22/2002	10:26	.962-2	38.2395096	121.5564411	H	Mid-Channel
48.962	I	1/22/2002	10:33	.962-3	38.2392457	121.5565915	H	Mid-Channel
48.962	I	1/22/2002	11:08	.962-4	38.2363974	121.5587501	H	Mid-Channel
48.962	I	1/22/2002	11:24	.962-5	38.2360155	121.5592033	H	Right Bank
48.962	I	1/22/2002	11:38	.962-6	38.2339013	121.5587651	M	Mid-Channel
48.962	I	1/22/2002	12:11	.962-7	38.2291126	121.5562891	H	Mid-Channel
48.962	I	1/22/2002	12:22	.962-8	38.2279959	121.5563454	H	Mid-Channel
48.962	I	1/22/2002	13:09	.962-9	38.2199377	121.5569502	H	Mid-Channel
48.962	I	1/22/2002	13:13	.962-10	38.2185595	121.5573977	H	Mid-Channel
48.962	I	1/22/2002	13:57	.962-11	38.2113587	121.5577136	H	Mid-Channel
48.962	I	1/22/2002	14:23	.962-12	38.2034734	121.5577208	H	Mid-Channel
48.962	I	1/22/2002	14:45	.962-13	38.196481	121.560725	H	Mid-Channel
48.962	I	1/22/2002	15:32	.962-14	38.1903126	121.5736695	M	Left Bank
48.962	I	1/22/2002	15:39	.962-15	38.1902011	121.5748821	H	Mid-Channel
48.962	I	1/22/2002	16:02	.962-16	38.1880371	121.5799939	H	Mid-Channel

Appendix C. Fish Release No. 1 - Telemetry and observational data for 16 radio-tagged juvenile chinook salmon released in the Sacramento River near Ryde at 0916 hrs. on January 22, 2002.

Fish #	Radio Tag Attachment (I=Internal / E=External)	Date	Military Time	Telemetry Map Location (refer to appendix figures)	Fish Location (via GPS) (WGS 84) Latitude (degrees North)	(WGS 84) Longitude (degrees West)	Radio Signal Strength (H=High/M=Med/L=Low)	Position of Fish in Channel Facing Downstream
48.962	I	1/22/2002	16:33	.962-17	38.1804773	121.5875618	H	Mid-Channel
48.962	I	1/22/2002	16:34	.962-18	38.1798335	121.5887388	M	Right Bank
48.962	I	1/22/2002	16:58	.962-19	38.1724184	121.5933175	H	Mid-Channel
48.962	I	1/22/2002	17:02	.962-20	38.1705727	121.5950361	H	Mid-Channel
48.962	I	1/23/2002	9:51	.962-21	38.1510753	121.6881487	H	Mid-Channel
48.962	I	1/23/2002	12:59	.962-22	38.1420818	121.6929003	H	Right Bank
48.962	I	1/23/2002	15:05	.962-23	38.1046829	121.7177204	M	Mid-Channel
48.962	I	1/23/2002	15:19	.962-24	38.1022082	121.7205351	H	Mid-Channel
48.962	I	1/23/2002	17:01	.962-99	38.0864172	121.7498409	H	Right Bank
48.971	I	1/22/2002	9:16	RELEASE SITE #1	38.2410433	121.5547391	H	Mid-Channel
48.971	I	1/22/2002	10:37	.971-1	38.2329217	121.5582475	H	Mid-Channel
48.971	I	1/22/2002	11:20	.971-2	38.2328949	121.5582708	H	Mid-Channel
48.971	I	1/22/2002	12:03	.971-3	38.2259836	121.5561339	H	Mid-Channel
48.971	I	1/22/2002	13:03	.971-4	38.2173937	121.5574688	H	Mid-Channel
48.971	I	1/22/2002	14:01	.971-5	38.2011263	121.5581325	H	Mid-Channel
48.971	I	1/22/2002	14:49	.971-6	38.1929448	121.5648598	H	Left Bank
48.971	I	1/22/2002	15:41	.971-7	38.1883639	121.5794395	H	Mid-Channel
48.971	I	1/22/2002	16:09	.971-8	38.1817532	121.5864982	H	Mid-Channel
48.971	I	1/22/2002	16:30	.971-9	38.1780832	121.5893205	H	Mid-Channel
48.971	I	1/22/2002	16:55	.971-10	38.1715378	121.5943555	H	Mid-Channel
48.971	I	1/23/2002	9:38	.971-11	38.1824404	121.6596935	H	Mid-Channel
48.971	I	1/23/2002	11:28	.971-12	38.2021219	121.6556895	H	Left Bank
48.971	I	1/23/2002	13:42	.971-13	38.178971	121.6644608	H	Mid-Channel
48.971	I	1/23/2002	15:55	.971-14	38.1485281	121.6852158	M	Left Bank
48.971	I	1/23/2002	17:15	.971-15	38.1363901	121.6942195	M	Right Bank
48.971	I	1/24/2002	15:37	.971-16	38.1210188	121.7034714	H	Right Bank
48.971	I	1/24/2002	17:00	.971-99	38.1174341	121.7061243	H	Right Bank
48.981	I	1/22/2002	9:16	RELEASE SITE #1	38.2410433	121.5547391	H	Mid-Channel
48.981	I	1/22/2002	10:18	.981-1	38.2411964	121.5547361	H	Mid-Channel
48.981	I	1/22/2002	11:10	.981-2	38.2363845	121.5591617	H	Right Bank
48.981	I	1/22/2002	12:05	.981-3	38.2279036	121.5561759	H	Mid-Channel
48.981	I	1/22/2002	13:05	.981-4	38.2167414	121.5576087	H	Mid-Channel
48.981	I	1/22/2002	14:00	.981-5	38.2034561	121.5577782	H	Mid-Channel
48.981	I	1/22/2002	14:57	.981-6	38.1917961	121.5704205	H	Mid-Channel
48.981	I	1/22/2002	15:47	.981-7	38.1835217	121.5851853	H	Mid-Channel
48.981	I	1/22/2002	16:11	.981-8	38.1783175	121.589316	H	Mid-Channel
48.981	I	1/22/2002	16:27	.981-9	38.1755657	121.5913099	H	Mid-Channel
48.981	I	1/23/2002	9:33	.981-10	38.1881673	121.6600681	H	Mid-Channel
48.981	I	1/23/2002	11:33	.981-11	38.2072928	121.6570906	H	Left Bank
48.981	I	1/23/2002	14:48	.981-12	38.1666774	121.6730981	M	Left Bank
48.981	I	1/23/2002	15:53	.981-13	38.1680557	121.6730502	H	Left Bank
48.981	I	1/23/2002	17:22	.981-14	38.1683049	121.6735708	M	Left Bank
48.981	I	1/24/2002	13:01	.981-15	38.200213	121.6581914	H	Right Bank
48.981	I	1/24/2002	16:40	.981-16	38.1688814	121.6735489	M	Left Bank
48.981	I	1/25/2002	9:00	.981-17	38.1251963	121.6957766	M	Mid-Channel
48.981	I	1/25/2002	10:40	.981-18	38.1532267	121.6871172	H	Mid-Channel
48.981	I	1/25/2002	11:31	.981-19	38.1620802	121.6826096	H	Right Bank
48.981	I	1/25/2002	14:29	.981-99	38.1711736	121.6754252	M	Right Bank
48.991	I	1/22/2002	9:16	RELEASE SITE #1	38.2410433	121.5547391	H	Mid-Channel
48.991	I	1/22/2002	10:53	.991-1	38.2411349	121.5534004	H	Left Bank
48.991	I	1/22/2002	11:45	.991-2	38.2414197	121.5545717	M	Right Bank
48.991	I	1/22/2002	12:17	.991-3	38.2382923	121.5574787	H	Mid-Channel
48.991	I	1/22/2002	13:13	.991-4	38.226846	121.5559407	H	Left Bank
48.991	I	1/22/2002	13:54	.991-5	38.2150817	121.5578	H	Mid-Channel
48.991	I	1/22/2002	14:42	.991-6	38.2060352	121.5577242	H	Mid-Channel
48.991	I	1/22/2002	15:34	.991-7	38.1935354	121.5645171	H	Mid-Channel
48.991	I	1/22/2002	16:05	.991-8	38.1902111	121.5749618	H	Mid-Channel
48.991	I	1/22/2002	16:36	.991-9	38.1861328	121.5827484	H	Mid-Channel
48.991	I	1/22/2002	17:02	.991-10	38.1810495	121.5871854	H	Mid-Channel
48.991	I	1/23/2002	10:16	.991-11	38.1599247	121.6752636	M	Left Bank
48.991	I	1/23/2002	13:36	.991-12	38.1578989	121.678633	L	Left Bank
48.991	I	1/24/2002	9:25	.991-13	38.151938	121.6847236	L	Left Bank
48.991	I	1/24/2002	12:01	.991-14	38.1661548	121.6771028	H	Mid-Channel
48.991	I	1/24/2002	13:22	.991-15	38.1616704	121.6814299	M	Mid-Channel
48.991	I	1/24/2002	15:48	.991-16	38.1255689	121.6993067	M	Right Bank
48.991	I	1/24/2002	17:00	.991-99	38.1174341	121.7061243	H	Right Bank

Appendix C. Fish Release No. 2 - Telemetry and observational data for 16 radio-tagged juvenile chinook salmon released in Georgiana Slough at 0940 hrs. on January 30, 2002.

Fish #	Radio Tag Attachment (I=Internal / E=External)	Date	Military Time	Telemetry Map Location (refer to appendix figures)	Fish Location (via GPS) (WGS 84) Latitude (degrees North)	Fish Location (via GPS) (WGS 84) Longitude (degrees West)	Radio Signal Strength (H=High/M=Med/L=Low)	Position of Fish in Channel Facing Downstream
48.711	E	1/30/2002	9:40	RELEASE SITE #2	38.2105756	121.5377387	H	Mid-Channel
48.711	E	1/30/2002	10:30	.711-1	38.2099745	121.5397861	L	Mid-Channel
48.711	E	1/30/2002	11:01	.711-2	38.2098042	121.539858	L	Left Bank
48.711	E	1/30/2002	11:34	.711-3	38.2102078	121.5389819	L	Left Bank
48.711	E	1/30/2002	12:13	.711-99	38.2102356	121.5390385	L	Left Bank
48.791	E	1/30/2002	9:40	RELEASE SITE #2	38.2105756	121.5377387	H	Mid-Channel
48.791	E	1/30/2002	10:39	.791-1	38.2038021	121.5405718	H	Mid-Channel
48.791	E	1/30/2002	11:18	.791-2	38.199498	121.5452144	H	Mid-Channel
48.791	E	1/30/2002	11:56	.791-3	38.1919745	121.5534395	H	Right Bank
48.791	E	1/30/2002	12:36	.791-4	38.189317	121.5577662	H	Mid-Channel
48.791	E	1/30/2002	13:18	.791-5	38.1857488	121.5637565	H	Right Bank
48.791	E	1/30/2002	14:05	.791-6	38.1817448	121.5716559	H	Left Bank
48.791	E	1/30/2002	14:58	.791-7	38.177095	121.5798639	H	Mid-Channel
48.791	E	1/30/2002	16:06	.791-8	38.1791485	121.5790134	H	Mid-Channel
48.791	E	1/30/2002	16:50	.791-9	38.1781981	121.57942	M	Right Bank
48.791	E	1/31/2002	9:01	.791-10	38.116843	121.5512705	H	Mid-Channel
48.791	E	1/31/2002	12:22	.791-11	38.1247772	121.561096	H	Mid-Channel
48.791	E	1/31/2002	14:25	.791-12	38.1179768	121.5584575	H	Mid-Channel
48.791	E	1/31/2002	16:08	.791-13	38.1182094	121.538627	H	Mid-Channel
48.791	E	1/31/2002	17:02	.791-14	38.1186542	121.535983	H	Mid-Channel
48.791	E	2/1/2002	8:49	.791-15	38.1206515	121.5335475	H	Right Bank
48.791	E	2/1/2002	10:03	.791-16	38.1207619	121.5322905	H	Right Bank
48.791	E	2/1/2002	11:52	.791-17	38.1201635	121.5356107	H	Right Bank
48.791	E	2/1/2002	13:43	.791-18	38.1196043	121.5348461	H	Mid-Channel
48.791	E	2/1/2002	14:15	.791-19	38.1191309	121.5366352	M	Mid-Channel
48.791	E	2/1/2002	15:12	.791-20	38.1200429	121.5353279	M	Right Bank
48.791	E	2/1/2002	15:43	.791-21	38.1190611	121.5368191	L	Right Bank
48.791	E	2/1/2002	15:49	.791-22	38.1174321	121.5449735	L	Right Bank
48.791	E	2/1/2002	16:40	.791-23	38.1198652	121.5333693	H	Mid-Channel
48.791	E	2/1/2002	17:03	.791-24	38.1193735	121.5336872	H	Mid-Channel
48.791	E	2/2/2002	8:55	.791-25	38.1178846	121.5423102	M	Right Bank
48.791	E	2/2/2002	12:28	.791-26	38.1176415	121.541513	H	Mid-Channel
48.791	E	2/2/2002	14:51	.791-27	38.1182443	121.537805	H	Left Bank
48.791	E	2/2/2002	15:25	.791-28	38.1185309	121.5369437	H	Mid-Channel
48.791	E	2/2/2002	16:20	.791-99	38.1181971	121.5376348	H	Left Bank
48.801	E	1/30/2002	9:40	RELEASE SITE #2	38.2105756	121.5377387	H	Mid-Channel
48.801	E	1/30/2002	10:21	.801-1	38.209753	121.5400875	H	Mid-Channel
48.801	E	1/30/2002	10:52	.801-2	38.2072623	121.541268	H	Mid-Channel
48.801	E	1/30/2002	11:27	.801-3	38.2022758	121.5403054	H	Mid-Channel
48.801	E	1/30/2002	12:04	.801-4	38.1978273	121.5463896	H	Mid-Channel
48.801	E	1/30/2002	12:43	.801-5	38.1929437	121.5517862	H	Left Bank
48.801	E	1/30/2002	13:23	.801-6	38.1896653	121.5573505	H	Mid-Channel
48.801	E	1/30/2002	14:10	.801-7	38.1869963	121.5603865	H	Right Bank
48.801	E	1/30/2002	15:06	.801-8	38.1841778	121.5667429	H	Mid-Channel
48.801	E	1/30/2002	16:12	.801-9	38.1817271	121.5716125	H	Left Bank
48.801	E	1/30/2002	16:47	.801-10	38.1807313	121.5780008	H	Mid-Channel
48.801	E	1/31/2002	10:09	.801-11	38.1573505	121.5881451	H	Right Bank
48.801	E	1/31/2002	14:51	.801-99	38.1576794	121.5892687	M	Right Bank
48.811	E	1/30/2002	9:40	RELEASE SITE #2	38.2105756	121.5377387	H	Mid-Channel
48.811	E	1/30/2002	10:18	.811-1	38.2079183	121.5411178	H	Mid-Channel
48.811	E	1/30/2002	10:51	.811-2	38.2052039	121.5409664	H	Mid-Channel
48.811	E	1/30/2002	11:25	.811-3	38.2015965	121.5407529	H	Left Bank
48.811	E	1/30/2002	12:07	.811-4	38.1988551	121.5456954	H	Right Bank
48.811	E	1/30/2002	12:46	.811-5	38.195281	121.5481759	H	Mid-Channel
48.811	E	1/30/2002	13:24	.811-6	38.1912055	121.5545714	H	Mid-Channel
48.811	E	1/30/2002	14:12	.811-7	38.1874848	121.559806	H	Mid-Channel
48.811	E	1/30/2002	15:07	.811-8	38.1841433	121.5668285	H	Mid-Channel
48.811	E	1/30/2002	16:08	.811-9	38.181553	121.5756985	H	Left Bank
48.811	E	1/30/2002	16:54	.811-10	38.1753823	121.5805707	H	Mid-Channel
48.811	E	1/30/2002	18:40	.811-11	38.1613295	121.5847925	H	Left Bank
48.811	E	1/31/2002	8:54	.811-12	38.1319022	121.5637514	H	Mid-Channel
48.811	E	1/31/2002	12:06	.811-13	38.1252933	121.5798072		Mid-Channel
48.811	E	1/31/2002	13:13	.811-14	38.1173397	121.5838739	H	Left Bank
48.811	E	1/31/2002	13:59	.811-15	38.1204305	121.5830955	H	Mid-Channel
48.811	E	1/31/2002	15:08	.811-16	38.1305211	121.5746629	H	Mid-Channel
48.811	E	1/31/2002	15:47	.811-17	38.1336799	121.5676301	H	Mid-Channel
48.811	E	1/31/2002	17:14	.811-18	38.1364318	121.5590529	H	Mid-Channel
48.811	E	2/1/2002	13:26	.811-19	38.1227939	121.5825365	L	Right Bank
48.811	E	2/1/2002	14:34	.811-20	38.1194019	121.5830461	H	Left Bank
48.811	E	2/1/2002	15:23	.811-21	38.116296	121.5847402	H	Mid-Channel
48.811	E	2/1/2002	16:33	.811-22	38.1193673	121.5840888	H	Mid-Channel

Appendix C. Fish Release No. 2 - Telemetry and observational data for 16 radio-tagged juvenile chinook salmon released in Georgiana Slough at 0940 hrs. on January 30, 2002.

Fish #	Radio Tag Attachment (I=Internal / E=External)	Date	Military Time	Telemetry Map Location (refer to appendix figures)	Fish Location (via GPS) (WGS 84) Latitude (degrees North)	Fish Location (via GPS) (WGS 84) Longitude (degrees West)	Radio Signal Strength (H=High/M=Med/L=Low)	Position of Fish in Channel Facing Downstream
48.811	E	2/2/2002	9:28	.811-23	38.120437	121.5855661	H	Right Bank
48.811	E	2/2/2002	12:02	.811-24	38.1245812	121.5812812	H	Right Bank
48.811	E	2/2/2002	13:40	.811-25	38.1243271	121.5811378	H	Right Bank
48.811	E	2/2/2002	14:30	.811-26	38.1243913	121.5812279	H	Right Bank
48.811	E	2/2/2002	16:00	.811-99	38.1169415	121.5837333	H	Left Bank
48.821	E	1/30/2002	9:40	RELEASE SITE #2	38.2105756	121.5377387	H	Mid-Channel
48.821	E	1/30/2002	10:36	.821-1	38.2067936	121.5412545	M	Mid-Channel
48.821	E	1/30/2002	11:22	.821-2	38.2014053	121.5413278	H	Left Bank
48.821	E	1/30/2002	12:01	.821-3	38.1951658	121.5483267	H	Left Bank
48.821	E	1/30/2002	12:39	.821-4	38.1917006	121.5537966	H	Mid-Channel
48.821	E	1/30/2002	13:20	.821-5	38.1861925	121.5617154	H	Mid-Channel
48.821	E	1/30/2002	14:03	.821-6	38.1817699	121.5722377	H	Mid-Channel
48.821	E	1/30/2002	15:00	.821-7	38.1813364	121.5773611	H	Right Bank
48.821	E	1/30/2002	16:04	.821-8	38.1723945	121.580172	H	Mid-Channel
48.821	E	1/30/2002	16:57	.821-9	38.1655908	121.5831805	H	Right Bank
48.821	E	1/30/2002	17:46	.821-10	38.1600854	121.5855014	H	Mid-Channel
48.821	E	1/30/2002	18:53	.821-11	38.1530286	121.5914696	H	Mid-Channel
48.821	E	1/31/2002	10:40	.821-12	38.1482588	121.5995498	H	Right Bank
48.821	E	1/31/2002	14:24	.821-99	38.1496764	121.5982674	L	Left Bank
48.831	E	1/30/2002	9:40	RELEASE SITE #2	38.2105756	121.5377387	H	Mid-Channel
48.831	E	1/30/2002	10:15	.831-1	38.2054839	121.5410179	H	Mid-Channel
48.831	E	1/30/2002	10:48	.831-2	38.2013132	121.5418892	H	Mid-Channel
48.831	E	1/30/2002	11:15	.831-3	38.1972899	121.5466515	H	Mid-Channel
48.831	E	1/30/2002	11:53	.831-4	38.1903191	121.5563367	H	Mid-Channel
48.831	E	1/30/2002	12:34	.831-5	38.1860732	121.5622772	H	Mid-Channel
48.831	E	1/30/2002	13:16	.831-6	38.1823577	121.5701825	H	Mid-Channel
48.831	E	1/30/2002	13:59	.831-7	38.1796232	121.5787758	H	Mid-Channel
48.831	E	1/30/2002	14:54	.831-8	38.1781097	121.5795587	H	Mid-Channel
48.831	E	1/30/2002	16:00	.831-9	38.1660235	121.5828602	H	Mid-Channel
48.831	E	1/30/2002	17:03	.831-10	38.1614132	121.5850077	H	Mid-Channel
48.831	E	1/30/2002	17:54	.831-11	38.1581939	121.5863369	H	Mid-Channel
48.831	E	1/30/2002	18:55	.831-12	38.1534552	121.5917239	H	Mid-Channel
48.831	E	1/31/2002	8:55	.831-13	38.132825	121.5908114	M	Mid-Channel
48.831	E	1/31/2002	10:56	.831-14	38.1357234	121.594375	H	Right Bank
48.831	E	1/31/2002	13:59	.831-99	38.1343349	121.5919888	H	Left Bank
48.841	E	1/30/2002	9:40	RELEASE SITE #2	38.2105756	121.5377387	H	Mid-Channel
48.841	E	1/30/2002	10:21	.841-1	38.209753	121.5400875	H	Mid-Channel
48.841	E	1/30/2002	10:53	.841-2	38.2077115	121.5411562	H	Mid-Channel
48.841	E	1/30/2002	11:28	.841-3	38.2027535	121.5403073	H	Mid-Channel
48.841	E	1/30/2002	12:06	.841-4	38.1988551	121.5456954	H	Mid-Channel
48.841	E	1/30/2002	12:42	.841-5	38.1925505	121.5525579	H	Mid-Channel
48.841	E	1/30/2002	13:22	.841-6	38.1898297	121.5570193	H	Left Bank
48.841	E	1/30/2002	14:08	.841-7	38.1854126	121.5642655	H	Left Bank
48.841	E	1/30/2002	15:04	.841-8	38.1831678	121.5686253	H	Mid-Channel
48.841	E	1/30/2002	16:10	.841-9	38.1817234	121.575117	H	Mid-Channel
48.841	E	1/30/2002	16:48	.841-10	38.1797843	121.5786814	H	Mid-Channel
48.841	E	1/30/2002	18:32	.841-11	38.1612595	121.5849651	H	Mid-Channel
48.841	E	1/31/2002	9:29	.841-12	38.1479842	121.5472767	H	Mid-Channel
48.841	E	1/31/2002	12:49	.841-13	38.1455555	121.5535033	H	Mid-Channel
48.841	E	1/31/2002	14:44	.841-14	38.1457395	121.5523196	H	Mid-Channel
48.841	E	1/31/2002	15:54	.841-15	38.1468733	121.5492616	H	Mid-Channel
48.841	E	1/31/2002	17:21	.841-16	38.1517158	121.5419398	H	Mid-Channel
48.841	E	2/1/2002	10:12	.841-17	38.1475919	121.5476155	H	Left Bank
48.841	E	2/1/2002	12:20	.841-18	38.1451714	121.5537572	H	Left Bank
48.841	E	2/1/2002	14:29	.841-19	38.144707	121.5592325	H	Right Bank
48.841	E	2/1/2002	16:07	.841-20	38.1448903	121.5587496	H	Right Bank
48.841	E	2/1/2002	16:22	.841-21	38.1446108	121.559474	H	Right Bank
48.841	E	2/2/2002	8:20	.841-22	38.1441838	121.5584554	H	Left Bank
48.841	E	2/2/2002	12:18	.841-23	38.1475644	121.5461211	H	Left Bank
48.841	E	2/2/2002	14:45	.841-24	38.1406888	121.5592624	L	Mid-Channel
48.841	E	2/2/2002	15:50	.841-25	38.1395243	121.558433	H	Right Bank
48.841	E	2/2/2002	16:28	.841-99	38.1395893	121.5585915	H	Right Bank
48.911	E	1/30/2002	9:40	RELEASE SITE #2	38.2105756	121.5377387	H	Mid-Channel
48.911	E	1/30/2002	10:15	.911-1	38.2054839	121.5410179	H	Mid-Channel
48.911	E	1/30/2002	10:43	.911-2	38.2007781	121.5430647	H	Left Bank
48.911	E	1/30/2002	11:11	.911-3	38.1946563	121.5493988	H	Mid-Channel
48.911	E	1/30/2002	11:52	.911-4	38.1899158	121.556975	H	Mid-Channel
48.911	E	1/30/2002	12:31	.911-5	38.1846359	121.565976	H	Mid-Channel
48.911	E	1/30/2002	13:13	.911-6	38.1816389	121.5755513	H	Mid-Channel
48.911	E	1/30/2002	13:55	.911-7	38.1749497	121.5805676	H	Mid-Channel

Appendix C. Fish Release No. 2 - Telemetry and observational data for 16 radio-tagged juvenile chinook salmon released in Georgiana Slough at 0940 hrs. on January 30, 2002.

Fish #	Radio Tag Attachment (I=Internal / E=External)	Date	Military Time	Telemetry Map Location (refer to appendix figures)	Fish Location (via GPS) (WGS 84) Latitude (degrees North)	Fish Location (via GPS) (WGS 84) Longitude (degrees West)	Radio Signal Strength (H=High/M=Med/L=Low)	Position of Fish in Channel Facing Downstream
48.911	E	1/30/2002	14:50	.911-8	38.1664149	121.5827588	H	Mid-Channel
48.911	E	1/30/2002	15:23	.911-9	38.1594438	121.585714	H	Mid-Channel
48.911	E	1/30/2002	15:51	.911-10	38.157307	121.5882715	H	Mid-Channel
48.911	E	1/30/2002	17:10	.911-11	38.1501577	121.5872909	H	Mid-Channel
48.911	E	1/30/2002	18:27	.911-12	38.1511823	121.5938219	H	Mid-Channel
48.911	E	1/30/2002	19:21	.911-13	38.1474165	121.5999539	H	Mid-Channel
48.911	E	1/31/2002	9:10	.911-14	38.1425492	121.5993595	L	Mid-Channel
48.911	E	1/31/2002	10:49	.911-15	38.1426953	121.5992911	H	Left Bank
48.911	E	1/31/2002	14:11	.911-99	38.1424643	121.5988162	L	Left Bank
49.004	I	1/30/2002	9:40	RELEASE SITE #2	38.2105756	121.5377387	H	Mid-Channel
49.004	I	1/30/2002	10:07	.004-1	38.2075412	121.5412281	H	Mid-Channel
49.004	I	1/30/2002	10:31	.004-2	38.2030066	121.5403707	H	Mid-Channel
49.004	I	1/30/2002	11:01	.004-3	38.1997527	121.5449625	H	Mid-Channel
49.004	I	1/30/2002	11:33	.004-4	38.1953371	121.5483347	H	Mid-Channel
49.004	I	1/30/2002	11:53	.004-5	38.1921432	121.5531484	H	Mid-Channel
49.004	I	1/30/2002	12:32	.004-6	38.1867303	121.5607457	H	Mid-Channel
49.004	I	1/30/2002	12:47	.004-7	38.1851677	121.5648754	H	Mid-Channel
49.004	I	1/30/2002	13:33	.004-8	38.1816303	121.5755857	H	Mid-Channel
49.004	I	1/30/2002	14:08	.004-9	38.1768631	121.5800624	H	Mid-Channel
49.004	I	1/30/2002	14:36	.004-10	38.1740294	121.5804828	H	Mid-Channel
49.004	I	1/30/2002	15:04	.004-11	38.1691711	121.5811592	H	Mid-Channel
49.004	I	1/30/2002	15:37	.004-12	38.1640999	121.5836089	H	Mid-Channel
49.004	I	1/30/2002	16:32	.004-13	38.1573201	121.5878603	H	Mid-Channel
49.004	I	1/30/2002	17:09	.004-14	38.1573948	121.5895823	H	Mid-Channel
49.004	I	1/30/2002	18:42	.004-15	38.1474775	121.5869888	H	Mid-Channel
49.004	I	1/31/2002	8:49	.004-16	38.132191	121.5682183	H	Mid-Channel
49.004	I	1/31/2002	12:17	.004-17	38.1309037	121.5732289	H	Mid-Channel
49.004	I	1/31/2002	14:40	.004-18	38.1350441	121.5644074	H	Mid-Channel
49.004	I	1/31/2002	15:50	.004-19	38.1362758	121.56103	H	Mid-Channel
49.004	I	1/31/2002	17:16	.004-99	38.140439	121.5588029	H	Mid-Channel
49.014	I	1/30/2002	9:40	RELEASE SITE #2	38.2105756	121.5377387	H	Mid-Channel
49.014	I	1/30/2002	10:08	.014-1	38.2074503	121.5411614	H	Mid-Channel
49.014	I	1/30/2002	10:34	.014-2	38.2033216	121.5403416	H	Mid-Channel
49.014	I	1/30/2002	11:03	.014-3	38.1990416	121.5454747	H	Mid-Channel
49.014	I	1/30/2002	11:31	.014-4	38.1937835	121.5509691	H	Mid-Channel
49.014	I	1/30/2002	11:55	.014-5	38.190256	121.5565085	H	Mid-Channel
49.014	I	1/30/2002	12:31	.014-6	38.1855275	121.5640805	H	Mid-Channel
49.014	I	1/30/2002	12:45	.014-7	38.1835272	121.5677962	H	Mid-Channel
49.014	I	1/30/2002	13:31	.014-8	38.1807215	121.5779325	H	Mid-Channel
49.014	I	1/30/2002	14:07	.014-9	38.1743083	121.5804431	H	Mid-Channel
49.014	I	1/30/2002	14:34	.014-10	38.1692884	121.5811683	H	Mid-Channel
49.014	I	1/30/2002	15:02	.014-11	38.1649292	121.5832252	H	Mid-Channel
49.014	I	1/30/2002	15:32	.014-12	38.1601347	121.5853774	H	Mid-Channel
49.014	I	1/30/2002	16:29	.014-13	38.1530117	121.5915613	H	Mid-Channel
49.014	I	1/30/2002	17:19	.014-14	38.1465502	121.5878169	H	Mid-Channel
49.014	I	1/30/2002	18:25	.014-15	38.1514044	121.5958148	H	Mid-Channel
49.014	I	1/30/2002	19:24	.014-16	38.1420123	121.5986993	H	Mid-Channel
49.014	I	1/31/2002	12:03	.014-17	38.1250921	121.5795601	M	Mid-Channel
49.014	I	1/31/2002	13:09	.014-18	38.1233816	121.5803596	H	Left Bank
49.014	I	1/31/2002	14:03	.014-19	38.1248773	121.5804313	H	Mid-Channel
49.014	I	1/31/2002	15:15	.014-20	38.1243843	121.5806462	M	Mid-Channel
49.014	I	1/31/2002	16:41	.014-21	38.1254488	121.5807396	H	Right Bank
49.014	I	2/1/2002	8:47	.014-22	38.1062996	121.5684688	H	Mid-Channel
49.014	I	2/1/2002	10:29	.014-23	38.1071969	121.5705123	M	Mid-Channel
49.014	I	2/1/2002	11:57	.014-24	38.1080078	121.5730818	M	Mid-Channel
49.014	I	2/1/2002	12:59	.014-25	38.1087156	121.5712545	H	Left Bank
49.014	I	2/1/2002	14:28	.014-26	38.1074729	121.5690339	H	Left Bank
49.014	I	2/1/2002	15:27	.014-27	38.1087541	121.5729418	H	Left Bank
49.014	I	2/1/2002	16:37	.014-28	38.108427	121.5742028	H	Mid-Channel
49.014	I	2/2/2002	11:13	.014-29	38.0993857	121.5755076	H	Right Bank
49.014	I	2/2/2002	11:56	.014-30	38.0996934	121.5763569	M	Right Bank
49.014	I	2/2/2002	13:56	.014-31	38.1001306	121.5752536	H	Right Bank
49.014	I	2/2/2002	15:42	.014-32	38.0985023	121.5725197	M	Right Bank
49.014	I	2/2/2002	16:10	.014-99	38.0988474	121.5732581	M	Right Bank
49.034	I	1/30/2002	9:40	RELEASE SITE #2	38.2105756	121.5377387	H	Mid-Channel
49.034	I	1/30/2002	10:08	.034-1	38.2074503	121.5411614	H	Mid-Channel
49.034	I	1/30/2002	10:39	.034-2	38.2052401	121.5409771	H	Mid-Channel
49.034	I	1/30/2002	10:58	.034-3	38.202599	121.5402076	H	Mid-Channel
49.034	I	1/30/2002	11:10	.034-4	38.2008127	121.5429498	H	Mid-Channel
49.034	I	1/30/2002	11:36	.034-5	38.1965653	121.5470884	H	Mid-Channel
49.034	I	1/30/2002	11:59	.034-6	38.1935006	121.5514086	H	Mid-Channel

Appendix C. Fish Release No. 2 - Telemetry and observational data for 16 radio-tagged juvenile chinook salmon released in Georgiana Slough at 0940 hrs. on January 30, 2002.

Fish #	Radio Tag Attachment (I=Internal / E=External)	Date	Military Time	Telemetry Map Location (refer to appendix figures)	Fish Location (via GPS) (WGS 84) Latitude (degrees North)	Fish Location (via GPS) (WGS 84) Longitude (degrees West)	Radio Signal Strength (H=High/M=Med/L=Low)	Position of Fish in Channel Facing Downstream
49.034	I	1/30/2002	12:34	.034-7	38.1898304	121.5571592	H	Mid-Channel
49.034	I	1/30/2002	12:51	.034-8	38.1882307	121.5589006	H	Mid-Channel
49.034	I	1/30/2002	13:36	.034-9	38.1836874	121.5676384	H	Mid-Channel
49.034	I	1/30/2002	14:10	.034-10	38.1815737	121.5761234	H	Mid-Channel
49.034	I	1/30/2002	14:39	.034-11	38.1766659	121.5801462		Mid-Channel
49.034	I	1/30/2002	15:06	.034-12	38.1730443	121.5802507	H	Mid-Channel
49.034	I	1/30/2002	15:39	.034-13	38.1655629	121.5831126	H	Mid-Channel
49.034	I	1/30/2002	16:36	.034-14	38.1573302	121.589458	H	Mid-Channel
49.034	I	1/30/2002	17:12	.034-15	38.1528112	121.5913711	H	Mid-Channel
49.034	I	1/30/2002	18:36	.034-16	38.1463791	121.5893266	H	Mid-Channel
49.034	I	1/31/2002	8:57	.034-17	38.13434	121.5924109	L	Mid-Channel
49.034	I	1/31/2002	10:59	.034-18	38.1347238	121.5928599	H	Mid-Channel
49.034	I	1/31/2002	13:52	.034-99	38.129621	121.5866829	M	Right Bank
49.044	I	1/30/2002	9:40	RELEASE SITE #2	38.2105756	121.5377387	H	Mid-Channel
49.044	I	1/30/2002	10:17	.044-1	38.2094233	121.540391	H	Mid-Channel
49.044	I	1/30/2002	10:47	.044-2	38.2082578	121.5410185	M	Mid-Channel
49.044	I	1/30/2002	11:15	.044-3	38.202536	121.5402088	H	Mid-Channel
49.044	I	1/30/2002	11:41	.044-4	38.2003489	121.5440668	H	Mid-Channel
49.044	I	1/30/2002	12:03	.044-5	38.197782	121.5463676	H	Mid-Channel
49.044	I	1/30/2002	12:37	.044-6	38.1924718	121.5527536	H	Mid-Channel
49.044	I	1/30/2002	12:56	.044-7	38.1901045	121.5566485	H	Mid-Channel
49.044	I	1/30/2002	13:39	.044-8	38.1858258	121.5629376	H	Mid-Channel
49.044	I	1/30/2002	14:14	.044-9	38.1850377	121.5653004	H	Mid-Channel
49.044	I	1/30/2002	14:46	.044-10	38.1821675	121.5703731	H	Mid-Channel
49.044	I	1/30/2002	15:13	.044-11	38.1817645	121.5725347	H	Mid-Channel
49.044	I	1/30/2002	15:47	.044-12	38.1815134	121.577095	H	Mid-Channel
49.044	I	1/30/2002	16:49	.044-13	38.1747956	121.5804907	H	Mid-Channel
49.044	I	1/30/2002	18:33	.044-14	38.1612595	121.5849651	H	Mid-Channel
49.044	I	1/31/2002	9:05	.044-15	38.1172658	121.5439159	H	Mid-Channel
49.044	I	1/31/2002	12:27	.044-16	38.1172073	121.5413847	M	Left Bank
49.044	I	1/31/2002	14:31	.044-17	38.1187412	121.5371791	H	Mid-Channel
49.044	I	1/31/2002	16:14	.044-18	38.1224607	121.5233012		Mid-Channel
49.044	I	1/31/2002	16:53	.044-19	38.1220909	121.5139884	H	Mid-Channel
49.044	I	2/1/2002	9:03	.044-20	38.1134156	121.4980306	H	Mid-Channel
49.044	I	2/1/2002	9:51	.044-21	38.1138941	121.4980142	H	Mid-Channel
49.044	I	2/1/2002	11:34	.044-22	38.1141109	121.4980554	H	Mid-Channel
49.044	I	2/1/2002	13:56	.044-23	38.1125232	121.4986354	H	Mid-Channel
49.044	I	2/1/2002	15:23	.044-24	38.1124065	121.498672	H	Mid-Channel
49.044	I	2/1/2002	16:45	.044-25	38.1133984	121.4980306	H	Mid-Channel
49.044	I	2/2/2002	8:40	.044-26	38.1121614	121.499236	M	Left Bank
49.044	I	2/2/2002	12:35	.044-27	38.1133019	121.4982203	M	Mid-Channel
49.044	I	2/2/2002	15:00	.044-28	38.1131396	121.4981175	H	Mid-Channel
49.044	I	2/2/2002	16:09	.044-99	38.1132603	121.4977914	H	Left Bank
49.054	I	1/30/2002	9:40	RELEASE SITE #2	38.2105756	121.5377387	H	Mid-Channel
49.054	I	1/30/2002	10:19	.054-1	38.2095374	121.5401489	H	Mid-Channel
49.054	I	1/30/2002	10:51	.054-2	38.2074328	121.5412074	M	Mid-Channel
49.054	I	1/30/2002	11:16	.054-3	38.2033858	121.5404317	H	Mid-Channel
49.054	I	1/30/2002	11:41	.054-4	38.2003489	121.5440668	H	Mid-Channel
49.054	I	1/30/2002	12:07	.054-5	38.1963677	121.547138	H	Mid-Channel
49.054	I	1/30/2002	12:42	.054-6	38.1914701	121.5541094	H	Mid-Channel
49.054	I	1/30/2002	12:54	.054-7	38.19044	121.5560824	H	Mid-Channel
49.054	I	1/30/2002	13:41	.054-8	38.1852111	121.5647609	H	Mid-Channel
49.054	I	1/30/2002	14:12	.054-9	38.1831309	121.5685575	H	Mid-Channel
49.054	I	1/30/2002	14:43	.054-10	38.1817203	121.5733462	H	Mid-Channel
49.054	I	1/30/2002	15:12	.054-11	38.1812919	121.5774076	H	Mid-Channel
49.054	I	1/30/2002	15:45	.054-12	38.1791701	121.5789349	H	Mid-Channel
49.054	I	1/30/2002	16:47	.054-13	38.1734677	121.5802311	H	Mid-Channel
49.054	I	1/30/2002	18:48	.054-14	38.161626	121.5847183	H	Left Bank
49.054	I	1/31/2002	10:24	.054-15	38.1466576	121.5900059	M	Mid-Channel
49.054	I	1/31/2002	14:41	.054-99	38.1490232	121.586628	M	Mid-Channel
49.065	I	1/30/2002	9:40	RELEASE SITE #2	38.2105756	121.5377387	H	Mid-Channel
49.065	I	1/30/2002	10:08	.065-1	38.2075412	121.5412281	H	Mid-Channel
49.065	I	1/30/2002	10:39	.065-2	38.2052401	121.5409771	H	Mid-Channel
49.065	I	1/30/2002	11:10	.065-3	38.2008127	121.5429498	H	Mid-Channel
49.065	I	1/30/2002	11:37	.065-4	38.1978179	121.5463555	H	Mid-Channel
49.065	I	1/30/2002	12:00	.065-5	38.1949843	121.5489583	H	Mid-Channel
49.065	I	1/30/2002	12:36	.065-6	38.1915042	121.5539489	H	Mid-Channel
49.065	I	1/30/2002	12:53	.065-7	38.1894055	121.5577014	H	Mid-Channel
49.065	I	1/30/2002	13:38	.065-8	38.1857823	121.5628081	H	Mid-Channel
49.065	I	1/30/2002	14:17	.065-9	38.1858637	121.562846	H	Mid-Channel
49.065	I	1/30/2002	14:46	.065-10	38.1821539	121.5704351	H	Mid-Channel

Appendix C. Fish Release No. 2 - Telemetry and observational data for 16 radio-tagged juvenile chinook salmon released in Georgiana Slough at 0940 hrs. on January 30, 2002.

Fish #	Radio Tag Attachment (I=Internal / E=External)	Date	Military Time	Telemetry Map Location (refer to appendix figures)	Fish Location (via GPS) (WGS 84) Latitude (degrees North)	Fish Location (via GPS) (WGS 84) Longitude (degrees West)	Radio Signal Strength (H=High/M=Med/L=Low)	Position of Fish in Channel Facing Downstream
49.065	I	1/30/2002	15:21	.065-11	38.181757	121.5719787	H	Mid-Channel
49.065	I	1/30/2002	15:48	.065-12	38.1818951	121.571196	H	Mid-Channel
49.065	I	1/30/2002	16:51	.065-13	38.1817053	121.572957	H	Mid-Channel
49.065	I	1/31/2002	9:17	.065-14	38.1475251	121.5999975	L	Right Bank
49.065	I	1/31/2002	10:35	.065-15	38.1477825	121.5996617	M	Mid-Channel
49.065	I	1/31/2002	14:17	.065-99	38.1461	121.6006524	M	Left Bank
49.075	I	1/30/2002	9:40	RELEASE SITE #2	38.2105756	121.5377387	H	Mid-Channel
49.075	I	1/30/2002	10:18	.075-1	38.2097434	121.540042	H	Mid-Channel
49.075	I	1/30/2002	10:43	.075-2	38.2081427	121.5410448	H	Mid-Channel
49.075	I	1/30/2002	11:17	.075-3	38.2038659	121.5406277		Mid-Channel
49.075	I	1/30/2002	11:44	.075-4	38.2011267	121.5421099	H	Mid-Channel
49.075	I	1/30/2002	12:04	.075-5	38.1996396	121.545006	H	Mid-Channel
49.075	I	1/30/2002	12:40	.075-6	38.1930115	121.5519436	H	Mid-Channel
49.075	I	1/30/2002	12:57	.075-7	38.1908016	121.5554358	H	Mid-Channel
49.075	I	1/30/2002	13:45	.075-8	38.1853498	121.5642895	H	Mid-Channel
49.075	I	1/30/2002	14:24	.075-9	38.1806342	121.5781625	H	Mid-Channel
49.075	I	1/30/2002	14:40	.075-10	38.178225	121.5794081	H	Mid-Channel
49.075	I	1/30/2002	15:08	.075-11	38.171809	121.5801948	H	Mid-Channel
49.075	I	1/30/2002	15:41	.075-12	38.1659054	121.5831174	H	Mid-Channel
49.075	I	1/30/2002	16:37	.075-13	38.157332	121.5873579	H	Mid-Channel
49.075	I	1/30/2002	17:07	.075-14	38.1571678	121.5912159	H	Mid-Channel
49.075	I	1/30/2002	18:42	.075-15	38.1474775	121.5869888	H	Mid-Channel
49.075	I	1/31/2002	10:34	.075-16	38.102685	121.5644719	H	Mid-Channel
49.075	I	1/31/2002	11:45	.075-17	38.0970987	121.5734536	M	Mid-Channel
49.075	I	1/31/2002	13:32	.075-18	38.100271	121.5883775	H	Mid-Channel
49.075	I	1/31/2002	15:38	.075-19	38.0862775	121.5714177	H	Right Bank
49.075	I	1/31/2002	16:25	.075-20	38.0809716	121.5708597	H	Right Bank
49.075	I	1/31/2002	17:08	.075-21	38.071994	121.5611277	H	Mid-Channel
49.075	I	1/31/2002	17:28	.075-22	38.0670229	121.5599483	H	Left Bank
49.075	I	2/1/2002	9:30	.075-23	38.0731888	121.5689363	H	Left Bank
49.075	I	2/1/2002	10:05	.075-24	38.0725506	121.5720382	H	Mid-Channel
49.075	I	2/1/2002	12:17	.075-25	38.075485	121.5702596	H	Left Bank
49.075	I	2/1/2002	14:14	.075-26	38.0833387	121.5713495	H	Right Bank
49.075	I	2/1/2002	15:56	.075-27	38.073861	121.5590504	H	Right Bank
49.075	I	2/1/2002	16:53	.075-99	38.0724322	121.5557154	H	Right Bank
49.084	I	1/30/2002	9:40	RELEASE SITE #2	38.2105756	121.5377387	H	Mid-Channel
49.084	I	1/30/2002	10:24	.084-1	38.2048167	121.540997	L	Right Bank
49.084	I	1/30/2002	10:55	.084-2	38.2041386	121.5408164	L	Right Bank
49.084	I	1/30/2002	11:21	.084-3	38.2041386	121.5408164	L	Right Bank
49.084	I	1/30/2002	11:47	.084-4	38.2041386	121.5408164	L	Right Bank
49.084	I	1/30/2002	12:14	.084-99	38.2041386	121.5408164	L	Right Bank

Appendix C. Fish Release No. 3 - Telemetry and observational data for 18 radio-tagged juvenile chinook salmon released in the Sacramento River near Ryde at 0912 hrs. on February 6, 2002.

Fish #	Radio Tag Attachment (I=Internal / E=External)	Date	Military Time	Telemetry Map Location (refer to appendix figures)	Fish Location (via GPS) (WGS 84) Latitude (degrees North)	Fish Location (via GPS) (WGS 84) Longitude (degrees West)	Radio Signal Strength (H=High/M=Med/L=Low)	Position of Fish in Channel Facing Downstream
48.611	E	2/6/2002	9:12	RELEASE SITE #3	38.2413147	121.5543195	H	Mid-Channel
48.611	E	2/6/2002	10:07	.611-1	38.241659	121.5532533	H	Mid-Channel
48.611	E	2/6/2002	10:46	.611-2	38.2418488	121.5510965	H	Mid-Channel
48.611	E	2/6/2002	11:38	.611-3	38.2418665	121.5506092	H	Mid-Channel
48.611	E	2/6/2002	12:34	.611-4	38.2393411	121.5562925	H	Left Bank
48.611	E	2/6/2002	13:05	.611-5	38.2362379	121.5589704	H	Mid-Channel
48.611	E	2/6/2002	13:56	.611-6	38.2301037	121.5562695	H	Left Bank
48.611	E	2/6/2002	14:44	.611-7	38.2247309	121.5559945	M	Left Bank
48.611	E	2/6/2002	15:30	.611-8	38.2161902	121.557801	H	Mid-Channel
48.611	E	2/6/2002	16:22	.611-9	38.2063271	121.5574703	M	Left Bank
48.611	E	2/6/2002	16:55	.611-10	38.1997967	121.5584671	H	Mid-Channel
48.611	E	2/6/2002	17:26	.611-11	38.1933275	121.5650177	H	Mid-Channel
48.611	E	2/7/2002	11:48	.611-12	38.2116185	121.6649837	L	Mid-Channel
48.611	E	2/7/2002	14:06	.611-13	38.2093044	121.6596235	M	Left Bank
48.611	E	2/7/2002	15:27	.611-99	38.1886404	121.6596712	M	Mid-Channel
48.631	E	2/6/2002	9:12	RELEASE SITE #3	38.2413147	121.5543195	H	Mid-Channel
48.631	E	2/6/2002	10:08	.631-1	38.2415308	121.5533124	H	Mid-Channel
48.631	E	2/6/2002	10:51	.631-2	38.2421904	121.5505685	H	Right Bank
48.631	E	2/6/2002	11:39	.631-3	38.2418665	121.5506092	H	Mid-Channel
48.631	E	2/6/2002	12:40	.631-4	38.2408769	121.5543996		Left Bank
48.631	E	2/6/2002	13:09	.631-5	38.2389448	121.557043	H	Mid-Channel
48.631	E	2/6/2002	14:00	.631-6	38.2339454	121.5586843	M	Mid-Channel
48.631	E	2/6/2002	14:46	.631-7	38.2262536	121.5561057	M	Mid-Channel
48.631	E	2/6/2002	15:31	.631-8	38.2174628	121.5572276		Left Bank
48.631	E	2/6/2002	16:23	.631-9	38.2063271	121.5574703	H	Left Bank
48.631	E	2/6/2002	16:56	.631-10	38.1997967	121.5584671	H	Mid-Channel
48.631	E	2/6/2002	17:25	.631-11	38.1932605	121.5656187	H	Mid-Channel
48.631	E	2/7/2002	10:07	.631-12	38.2127272	121.6657972	H	Left Bank
48.631	E	2/7/2002	12:27	.631-13	38.2410486	121.6726613	H	Right Bank
48.631	E	2/7/2002	12:45	.631-14	38.2428825	121.6722623	H	Right Bank
48.631	E	2/7/2002	13:34	.631-15	38.2420998	121.6723794	H	Right Bank
48.631	E	2/7/2002	16:26	.631-16	38.2383403	121.6730419	M	Right Bank
48.631	E	2/8/2002	10:35	.631-17	38.2229998	121.6731008	H	Left Bank
48.631	E	2/8/2002	11:03	.631-18	38.2244498	121.6735685	M	Left Bank
48.631	E	2/8/2002	13:35	.631-19	38.2409929	121.6877455	H	Right Bank
48.631	E	2/8/2002	17:01	.631-20	38.2279213	121.6753334	H	Right Bank
48.631	E	2/9/2002	10:49	.631-21	38.2399959	121.6864265	H	Right Bank
48.631	E	2/9/2002	11:15	.631-22	38.2419818	121.6875494	H	Mid-Channel
48.631	E	2/9/2002	14:21	.631-23	38.2438378	121.6907111	H	Right Bank
48.631	E	2/9/2002	14:45	.631-99	38.244477	121.6890427	H	Mid-Channel
48.641	E	2/6/2002	9:12	RELEASE SITE #3	38.2413147	121.5543195	H	Mid-Channel
48.641	E	2/6/2002	10:17	.641-1	38.2420262	121.5525943	H	Right Bank
48.641	E	2/6/2002	11:02	.641-2	38.2420868	121.5523988	M	Right Bank
48.641	E	2/6/2002	11:48	.641-3	38.2422086	121.5505796	M	Right Bank
48.641	E	2/6/2002	12:50	.641-4	38.2412059	121.5460174	M	Mid-Channel
48.641	E	2/6/2002	13:20	.641-5	38.241727	121.547344	M	Right Bank
48.641	E	2/6/2002	14:04	.641-6	38.2403285	121.5559759	H	Mid-Channel
48.641	E	2/6/2002	14:51	.641-7	38.2358774	121.558966	H	Mid-Channel
48.641	E	2/6/2002	15:35	.641-8	38.2276248	121.5562157	H	Mid-Channel
48.641	E	2/6/2002	16:28	.641-9	38.2121196	121.5580298	H	Right Bank
48.641	E	2/6/2002	16:59	.641-10	38.2030418	121.5577978	H	Mid-Channel
48.641	E	2/6/2002	17:28	.641-11	38.194191	121.5635907		Right Bank
48.641	E	2/7/2002	12:05	.641-12	38.2375865	121.6837276	H	Mid-Channel
48.641	E	2/7/2002	13:18	.641-13	38.2419114	121.6852608	H	Left Bank
48.641	E	2/7/2002	16:40	.641-14	38.20756	121.6583877	H	Left Bank
48.641	E	2/8/2002	10:33	.641-15	38.2133483	121.6689042	H	Right Bank
48.641	E	2/8/2002	11:06	.641-16	38.2221947	121.6741807	H	Right Bank
48.641	E	2/8/2002	13:32	.641-17	38.2393798	121.6853293	H	Mid-Channel
48.641	E	2/8/2002	16:49	.641-99	38.1913819	121.6582507	M	Mid-Channel
48.651	E	2/6/2002	9:12	RELEASE SITE #3	38.2413147	121.5543195	H	Mid-Channel
48.651	E	2/6/2002	10:04	.651-1	38.2416068	121.5533538	H	Mid-Channel
48.651	E	2/6/2002	11:00	.651-2	38.2420274	121.5526971	H	Right Bank
48.651	E	2/6/2002	11:22	.651-3	38.2414289	121.5538516	H	Mid-Channel
48.651	E	2/6/2002	12:31	.651-4	38.2386054	121.5569274	H	Left Bank
48.651	E	2/6/2002	13:03	.651-5	38.234975	121.5588696	H	Mid-Channel
48.651	E	2/6/2002	13:50	.651-6	38.2257419	121.5562643	H	Mid-Channel
48.651	E	2/6/2002	14:36	.651-7	38.2136652	121.5576681		Mid-Channel
48.651	E	2/6/2002	15:21	.651-8	38.2001586	121.5585992	H	Left Bank
48.651	E	2/6/2002	16:14	.651-9	38.1904453	121.5731678	H	Left Bank
48.651	E	2/6/2002	16:44	.651-10	38.1877257	121.5803197	H	Mid-Channel
48.651	E	2/6/2002	17:17	.651-99	38.1828451	121.585872	H	Mid-Channel

Appendix C. Fish Release No. 3 - Telemetry and observational data for 18 radio-tagged juvenile chinook salmon released in the Sacramento River near Ryde at 0912 hrs. on February 6, 2002.

Fish #	Radio Tag Attachment (I=Internal / E=External)	Date	Military Time	Telemetry Map Location (refer to appendix figures)	Fish Location (via GPS) (WGS 84) Latitude (degrees North)	Fish Location (via GPS) (WGS 84) Longitude (degrees West)	Radio Signal Strength (H=High/M=Med/L=Low)	Position of Fish in Channel Facing Downstream
48.660	E	2/6/2002	9:12	RELEASE SITE #3	38.2413147	121.5543195	H	Mid-Channel
48.660	E	2/6/2002	10:08	.660-1	38.2418933	121.553511	H	Right Bank
48.660	E	2/6/2002	10:48	.660-2	38.2420506	121.5509255	H	Right Bank
48.660	E	2/6/2002	11:43	.660-3	38.2417105	121.5503604	H	Mid-Channel
48.660	E	2/6/2002	12:43	.660-4	38.2415964	121.5535512	H	Mid-Channel
48.660	E	2/6/2002	13:14	.660-5	38.240518	121.5552637	H	Left Bank
48.660	E	2/6/2002	14:06	.660-6	38.2407721	121.5546759	L	Left Bank
48.660	E	2/6/2002	14:54	.660-7	38.2368008	121.5585708	M	Left Bank
48.660	E	2/6/2002	15:38	.660-8	38.2321287	121.5575205	M	Left Bank
48.660	E	2/6/2002	16:35	.660-9	38.2233253	121.5568833	H	Right Bank
48.660	E	2/6/2002	17:04	.660-10	38.2167928	121.5577091	H	Mid-Channel
48.660	E	2/6/2002	17:35	.660-11	38.2093027	121.5576057	H	Mid-Channel
48.660	E	2/7/2002	9:32	.660-12	38.1979322	121.6581305	L	Right Bank
48.660	E	2/7/2002	11:42	.660-13	38.2078331	121.6625744	M	Right Bank
48.660	E	2/7/2002	14:02	.660-14	38.2066605	121.6593293	H	Mid-Channel
48.660	E	2/8/2002	9:50	.660-15	38.1388859	121.6925433	H	Mid-Channel
48.660	E	2/8/2002	12:55	.660-16	38.1613329	121.6810707	H	Mid-Channel
48.660	E	2/9/2002	15:07	.660-99	38.131223	121.6955553	H	Mid-Channel
48.671	E	2/6/2002	9:12	RELEASE SITE #3	38.2413147	121.5543195	H	Mid-Channel
48.671	E	2/6/2002	10:04	.671-1	38.2416685	121.553189	H	Mid-Channel
48.671	E	2/6/2002	10:47	.671-2	38.2418411	121.5510566	H	Mid-Channel
48.671	E	2/6/2002	11:45	.671-3	38.2418664	121.5484153	H	Right Bank
48.671	E	2/6/2002	12:53	.671-4	38.2413924	121.5472923	H	Right Bank
48.671	E	2/6/2002	13:18	.671-5	38.2415549	121.54873	H	Mid-Channel
48.671	E	2/6/2002	14:08	.671-6	38.2416936	121.5519381		Mid-Channel
48.671	E	2/6/2002	14:53	.671-7	38.2388477	121.5572049	H	Mid-Channel
48.671	E	2/6/2002	15:41	.671-8	38.2349236	121.5590877	H	Right Bank
48.671	E	2/6/2002	17:06	.671-9	38.2219149	121.5565113	H	Mid-Channel
48.671	E	2/6/2002	17:37	.671-10	38.2132774	121.5576415	H	Mid-Channel
48.671	E	2/7/2002	10:43	.671-11	38.1784065	121.6687182	L	Right Bank
48.671	E	2/7/2002	14:24	.671-12	38.1725844	121.6710731	M	Left Bank
48.671	E	2/8/2002	9:08	.671-13	38.101887	121.727475	H	Right Bank
48.671	E	2/8/2002	12:22	.671-14	38.1027297	121.725396	H	Right Bank
48.671	E	2/9/2002	14:50	.671-99	38.1055272	121.7224276	H	Right Bank
48.681	E	2/6/2002	9:12	RELEASE SITE #3	38.2413147	121.5543195	H	Mid-Channel
48.681	E	2/6/2002	10:05	.681-1	38.2417459	121.5532511	H	Mid-Channel
48.681	E	2/6/2002	10:49	.681-2	38.2417638	121.5508169	H	Mid-Channel
48.681	E	2/6/2002	11:36	.681-3	38.241622	121.5512425	H	Left Bank
48.681	E	2/6/2002	12:44	.681-4	38.2416941	121.553435	H	Right Bank
48.681	E	2/6/2002	13:10	.681-5	38.2391148	121.5569368	H	Mid-Channel
48.681	E	2/6/2002	13:57	.681-6	38.2302718	121.5567995	H	Mid-Channel
48.681	E	2/6/2002	14:43	.681-7	38.2222046	121.5566199	H	Mid-Channel
48.681	E	2/6/2002	15:29	.681-8	38.215648	121.557686	H	Mid-Channel
48.681	E	2/6/2002	16:21	.681-9	38.2062225	121.5577579	H	Mid-Channel
48.681	E	2/6/2002	16:58	.681-10	38.2025952	121.5581264	H	Right Bank
48.681	E	2/6/2002	17:30	.681-11	38.1965572	121.5610661		Right Bank
48.681	E	2/7/2002	9:19	.681-12	38.1645443	121.6026398	H	Left Bank
48.681	E	2/8/2002	10:21	.681-13	38.2012401	121.6581725	H	Right Bank
48.681	E	2/8/2002	11:11	.681-14	38.2161406	121.6701188	H	Mid-Channel
48.681	E	2/8/2002	13:28	.681-99	38.232636	121.6770645	H	Right Bank
48.751	E	2/6/2002	9:12	RELEASE SITE #3	38.2413147	121.5543195	H	Mid-Channel
48.751	E	2/6/2002	10:06	.751-1	38.2414016	121.5530618	H	Left Bank
48.751	E	2/6/2002	10:50	.751-2	38.2417811	121.5506641	H	Mid-Channel
48.751	E	2/6/2002	11:40	.751-3	38.2417811	121.5503807	H	Mid-Channel
48.751	E	2/6/2002	12:38	.751-4	38.2412291	121.5544786	H	Mid-Channel
48.751	E	2/6/2002	13:12	.751-5	38.2400436	121.5562557	H	Mid-Channel
48.751	E	2/6/2002	14:00	.751-6	38.2339454	121.5586843	H	Mid-Channel
48.751	E	2/6/2002	14:48	.751-7	38.2280403	121.5562989	M	Mid-Channel
48.751	E	2/6/2002	15:33	.751-8	38.2207929	121.5568762	H	Mid-Channel
48.751	E	2/6/2002	16:31	.751-9	38.2113532	121.5572683	H	Left Bank
48.751	E	2/6/2002	17:02	.751-10	38.2068182	121.5578375	H	Mid-Channel
48.751	E	2/6/2002	17:33	.751-11	38.2029148	121.5577318	H	Mid-Channel
48.751	E	2/7/2002	10:10	.751-12	38.1642531	121.6077135	H	Right Bank
48.751	E	2/8/2002	11:47	.751-99	38.1637938	121.6138404	M	Right Bank
48.771	E	2/6/2002	9:12	RELEASE SITE #3	38.2413147	121.5543195	H	Mid-Channel
48.771	E	2/6/2002	10:10	.771-1	38.2413731	121.5532519	H	Left Bank
48.771	E	2/6/2002	10:55	.771-2	38.2416665	121.5523368	H	Mid-Channel
48.771	E	2/6/2002	11:41	.771-3	38.2416837	121.5503757	H	Mid-Channel
48.771	E	2/6/2002	12:36	.771-4	38.2402204	121.555978	H	Mid-Channel

Appendix C. Fish Release No. 3 - Telemetry and observational data for 18 radio-tagged juvenile chinook salmon released in the Sacramento River near Ryde at 0912 hrs. on February 6, 2002.

Fish #	Radio Tag Attachment (I=Internal / E=External)	Date	Military Time	Telemetry Map Location (refer to appendix figures)	Fish Location (via GPS) (WGS 84) Latitude (degrees North)	Fish Location (via GPS) (WGS 84) Longitude (degrees West)	Radio Signal Strength (H=High/M=Med/L=Low)	Position of Fish in Channel Facing Downstream
48.771	E	2/6/2002	13:06	.771-5	38.2362379	121.5589704	H	Mid-Channel
48.771	E	2/6/2002	13:53	.771-6	38.2283909	121.5562234	H	Mid-Channel
48.771	E	2/6/2002	14:41	.771-7	38.2176832	121.5575659	H	Mid-Channel
48.771	E	2/6/2002	15:25	.771-8	38.2055504	121.5573371	H	Left Bank
48.771	E	2/6/2002	16:18	.771-9	38.1951982	121.5619283	H	Mid-Channel
48.771	E	2/6/2002	16:48	.771-10	38.1910367	121.5731872	H	Mid-Channel
48.771	E	2/6/2002	17:20	.771-11	38.1876689	121.580846	H	Mid-Channel
48.771	E	2/7/2002	9:44	.771-12	38.2103456	121.6640018	L	Mid-Channel
48.771	E	2/7/2002	12:16	.771-13	38.2461127	121.6886362	H	Right Bank
48.771	E	2/7/2002	16:37	.771-14	38.211536	121.6640714	H	Left Bank
48.771	E	2/8/2002	13:17	.771-15	38.2104944	121.6659865	H	Right Bank
48.771	E	2/8/2002	14:42	.771-16	38.2002161	121.6576774	M	Right Bank
48.771	E	2/9/2002	9:04	.771-17	38.1334905	121.6927176	H	Mid-Channel
48.771	E	2/9/2002	11:20	.771-18	38.1550224	121.6843431	H	Mid-Channel
48.771	E	2/9/2002	12:00	.771-19	38.1585272	121.6800027	H	Right Bank
48.771	E	2/9/2002	12:37	.771-20	38.1597114	121.6787258	H	Right Bank
48.771	E	2/9/2002	13:35	.771-99	38.161197	121.6761993	L	Right Bank
49.164	I	2/6/2002	9:12	RELEASE SITE #3	38.2413147	121.5543195	H	Mid-Channel
49.164	I	2/6/2002	10:33	.164-1	38.2422817	121.5513894	H	Right Bank
49.164	I	2/6/2002	11:55	.164-2	38.2403612	121.555701	M	Mid-Channel
49.164	I	2/6/2002	12:49	.164-3	38.2348583	121.5589062	H	Mid-Channel
49.164	I	2/6/2002	13:52	.164-4	38.2284363	121.5562568	H	Mid-Channel
49.164	I	2/6/2002	14:34	.164-5	38.2227398	121.5569063	H	Right Bank
49.164	I	2/6/2002	15:10	.164-6	38.2181242	121.5575115	L	Mid-Channel
49.164	I	2/6/2002	16:44	.164-7	38.1997574	121.558563	H	Mid-Channel
49.164	I	2/6/2002	17:11	.164-8	38.1944102	121.5629985	M	Mid-Channel
49.164	I	2/7/2002	10:51	.164-9	38.1647353	121.6195527	M	Right Bank
49.164	I	2/8/2002	11:44	.164-99	38.1646891	121.620227	M	Right Bank
49.174	I	2/6/2002	9:12	RELEASE SITE #3	38.2413147	121.5543195	H	Mid-Channel
49.174	I	2/6/2002	10:39	.174-1	38.2421317	121.5523865	M	Right Bank
49.174	I	2/6/2002	11:52	.174-2	38.2411424	121.5554684	M	Right Bank
49.174	I	2/6/2002	12:46	.174-3	38.2374596	121.5586492	H	Right Bank
49.174	I	2/6/2002	13:50	.174-4	38.2321655	121.5575769	M	Left Bank
49.174	I	2/6/2002	14:45	.174-5	38.2261307	121.5561834	M	Mid-Channel
49.174	I	2/6/2002	15:48	.174-6	38.2152124	121.5576576	H	Mid-Channel
49.174	I	2/6/2002	16:52	.174-7	38.2025921	121.5578752	M	Mid-Channel
49.174	I	2/6/2002	17:17	.174-8	38.198471	121.5591842	M	Mid-Channel
49.174	I	2/7/2002	10:26	.174-9	38.1779722	121.6661801	M	Mid-Channel
49.174	I	2/7/2002	11:37	.174-10	38.1977125	121.6569446	L	Mid-Channel
49.174	I	2/7/2002	13:55	.174-11	38.2057081	121.6605564	M	Right Bank
49.174	I	2/7/2002	15:17	.174-12	38.2161769	121.6711943	M	Right Bank
49.174	I	2/7/2002	16:19	.174-13	38.2178346	121.6719409	M	Right Bank
49.174	I	2/8/2002	10:24	.174-14	38.2048384	121.6568159	M	Left Bank
49.174	I	2/8/2002	13:15	.174-15	38.2075288	121.6580228	H	Left Bank
49.174	I	2/8/2002	14:45	.174-16	38.1968237	121.65734	H	Right Bank
49.174	I	2/8/2002	16:50	.174-99	38.1893739	121.6599775	H	Right Bank
49.184	I	2/6/2002	9:12	RELEASE SITE #3	38.2413147	121.5543195	H	Mid-Channel
49.184	I	2/6/2002	10:23	.184-1	38.2414021	121.5509498	H	Left Bank
49.184	I	2/6/2002	11:32	.184-2	38.2413819	121.5464024	H	Mid-Channel
49.184	I	2/6/2002	13:02	.184-3	38.2409802	121.5547403	H	Mid-Channel
49.184	I	2/6/2002	13:33	.184-4	38.2368077	121.5583992	H	Left Bank
49.184	I	2/6/2002	14:37	.184-5	38.2276494	121.5558713	H	Left Bank
49.184	I	2/6/2002	15:40	.184-6	38.21252	121.5576107	M	Mid-Channel
49.184	I	2/6/2002	16:41	.184-7	38.1941533	121.5634544	H	Mid-Channel
49.184	I	2/6/2002	17:06	.184-8	38.1909038	121.5733725	M	Mid-Channel
49.184	I	2/7/2002	9:21	.184-9	38.1600663	121.6854537		Right Bank
49.184	I	2/7/2002	10:49	.184-10	38.1767317	121.6696392	H	Right Bank
49.184	I	2/7/2002	12:31	.184-11	38.2040635	121.6568301	H	Left Bank
49.184	I	2/7/2002	13:58	.184-99	38.2058765	121.6601204	H	Right Bank
49.195	I	2/6/2002	9:12	RELEASE SITE #3	38.2413147	121.5543195	H	Mid-Channel
49.195	I	2/6/2002	10:39	.195-1	38.2421317	121.5523865	M	Right Bank
49.195	I	2/6/2002	11:58	.195-2	38.2391813	121.5572212	L	Right Bank
49.195	I	2/6/2002	12:57	.195-3	38.2351558	121.5589117	H	Mid-Channel
49.195	I	2/6/2002	13:47	.195-4	38.2323825	121.5576412	H	Left Bank
49.195	I	2/6/2002	14:40	.195-5	38.2268352	121.5557629	H	Left Bank
49.195	I	2/6/2002	15:44	.195-6	38.2149653	121.5578594	H	Mid-Channel
49.195	I	2/6/2002	16:47	.195-7	38.2017266	121.5578466	H	Mid-Channel
49.195	I	2/6/2002	17:12	.195-8	38.1957045	121.5613455	M	Mid-Channel
49.195	I	2/7/2002	11:16	.195-9	38.1750727	121.6553304	M	Right Bank
49.195	I	2/7/2002	15:15	.195-10	38.1762782	121.6598749	H	Mid-Channel

Appendix C. Fish Release No. 3 - Telemetry and observational data for 18 radio-tagged juvenile chinook salmon released in the Sacramento River near Ryde at 0912 hrs. on February 6, 2002.

Fish #	Radio Tag Attachment (I=Internal / E=External)	Date	Military Time	Telemetry Map Location (refer to appendix figures)	Fish Location (via GPS) (WGS 84) Latitude (degrees North)	Fish Location (via GPS) (WGS 84) Longitude (degrees West)	Radio Signal Strength (H=High/M=Med/L=Low)	Position of Fish in Channel Facing Downstream
49.195	I	2/7/2002	15:37	.195-99	38.1760134	121.657996	H	Right Bank
49.211	I	2/6/2002	9:12	RELEASE SITE #3	38.2413147	121.5543195	H	Mid-Channel
49.211	I	2/6/2002	10:36	.211-1	38.2422411	121.5517559	M	Right Bank
49.211	I	2/6/2002	11:47	.211-2	38.2418961	121.5525026	L	Mid-Channel
49.211	I	2/6/2002	13:19	.211-3	38.2374513	121.5579752	M	Left Bank
49.211	I	2/6/2002	13:44	.211-4	38.2353509	121.5586565	M	Left Bank
49.211	I	2/6/2002	14:47	.211-5	38.2280795	121.5558183	M	Left Bank
49.211	I	2/6/2002	16:37	.211-6	38.1895186	121.5765625	H	Mid-Channel
49.211	I	2/6/2002	17:01	.211-7	38.1836589	121.5853539	M	Mid-Channel
49.211	I	2/7/2002	9:12	.211-8	38.1762423	121.6685977	M	Mid-Channel
49.211	I	2/7/2002	10:16	.211-9	38.1924747	121.6576711	M	Mid-Channel
49.211	I	2/7/2002	11:52	.211-10	38.2140902	121.6691648	H	Right Bank
49.211	I	2/7/2002	13:51	.211-11	38.2174588	121.6700528	H	Left Bank
49.211	I	2/7/2002	16:06	.211-99	38.1880536	121.6603671	L	Mid-Channel
49.231	I	2/6/2002	9:12	RELEASE SITE #3	38.2413147	121.5543195	H	Mid-Channel
49.231	I	2/6/2002	10:38	.231-1	38.2421317	121.5523865	M	Right Bank
49.231	I	2/6/2002	11:38	.231-2	38.2417299	121.5497663	M	Mid-Channel
49.231	I	2/6/2002	13:03	.231-3	38.2409802	121.5547403	H	Mid-Channel
49.231	I	2/6/2002	13:38	.231-4	38.2400132	121.5559821	H	Mid-Channel
49.231	I	2/6/2002	14:50	.231-5	38.2317758	121.5574018	M	Mid-Channel
49.231	I	2/6/2002	15:52	.231-6	38.2191742	121.5573258	M	Mid-Channel
49.231	I	2/6/2002	16:53	.231-7	38.2051576	121.5576418		Mid-Channel
49.231	I	2/6/2002	17:16	.231-99	38.1983644	121.5591961	M	Mid-Channel
49.261	I	2/6/2002	9:12	RELEASE SITE #3	38.2413147	121.5543195	H	Mid-Channel
49.261	I	2/6/2002	10:42	.261-1	38.2417384	121.5526457	M	Mid-Channel
49.261	I	2/6/2002	11:38	.261-2	38.2417299	121.5497663	M	Mid-Channel
49.261	I	2/6/2002	12:59	.261-3	38.23931	121.556693	H	Mid-Channel
49.261	I	2/6/2002	13:55	.261-4	38.2232067	121.5560289	H	Left Bank
49.261	I	2/6/2002	14:20	.261-5	38.2186462	121.5573849	H	Mid-Channel
49.261	I	2/6/2002	15:20	.261-6	38.206078	121.5577379	M	Mid-Channel
49.261	I	2/6/2002	16:32	.261-7	38.192383	121.5683859	M	Mid-Channel
49.261	I	2/6/2002	17:04	.261-8	38.1900998	121.5761858	M	Mid-Channel
49.261	I	2/7/2002	9:36	.261-9	38.2014782	121.6584993	H	Right Bank
49.261	I	2/7/2002	11:58	.261-10	38.2339386	121.6790975	H	Right Bank
49.261	I	2/7/2002	12:54	.261-11	38.2434267	121.6779209	M	Mid-Channel
49.261	I	2/7/2002	16:15	.261-12	38.2084068	121.6623126	M	Right Bank
49.261	I	2/8/2002	9:04	.261-13	38.1038075	121.7242368	M	Right Bank
49.261	I	2/8/2002	12:00	.261-14	38.1265686	121.6984333	H	Right Bank
49.261	I	2/8/2002	15:45	.261-99	38.1047072	121.722287	H	Right Bank
49.272	I	2/6/2002	9:12	RELEASE SITE #3	38.2413147	121.5543195	H	Mid-Channel
49.272	I	2/6/2002	10:30	.272-1	38.241884	121.5512944	M	Mid-Channel
49.272	I	2/6/2002	11:38	.272-2	38.2417299	121.5497663	M	Mid-Channel
49.272	I	2/6/2002	12:42	.272-3	38.2385118	121.5577372	H	Right Bank
49.272	I	2/6/2002	13:28	.272-4	38.2314371	121.5569743	M	Left Bank
49.272	I	2/6/2002	14:30	.272-5	38.2187548	121.5574991	H	Mid-Channel
49.272	I	2/6/2002	15:18	.272-6	38.2096242	121.5581019	M	Right Bank
49.272	I	2/6/2002	16:27	.272-7	38.1966492	121.5604819	M	Mid-Channel
49.272	I	2/6/2002	17:09	.272-8	38.1926623	121.5674485	H	Mid-Channel
49.272	I	2/7/2002	9:00	.272-9	38.1671646	121.6747444	H	Mid-Channel
49.272	I	2/7/2002	10:38	.272-10	38.1851647	121.6615047	H	Mid-Channel
49.272	I	2/7/2002	11:38	.272-11	38.1984156	121.6578475	H	Right Bank
49.272	I	2/7/2002	14:01	.272-12	38.2051536	121.6607389	M	Right Bank
49.272	I	2/7/2002	15:32	.272-13	38.1841145	121.6618778	M	Mid-Channel
49.272	I	2/7/2002	16:00	.272-14	38.1883916	121.6599841	L	Mid-Channel
49.272	I	2/8/2002	10:04	.272-15	38.1711303	121.6731885	H	Mid-Channel
49.272	I	2/8/2002	11:32	.272-16	38.181214	121.666749	H	Right Bank
49.272	I	2/8/2002	13:04	.272-17	38.1797115	121.6669705	H	Mid-Channel
49.272	I	2/8/2002	14:51	.272-18	38.171666	121.6719459	H	Mid-Channel
49.272	I	2/8/2002	16:25	.272-19	38.1537807	121.6883057	M	Right Bank
49.272	I	2/9/2002	14:35	.272-99	38.1019973	121.7218618	M	Mid-Channel
49.282	I	2/6/2002	9:12	RELEASE SITE #3	38.2413147	121.5543195	H	Mid-Channel
49.282	I	2/6/2002	10:27	.282-1	38.2418938	121.5520941	H	Mid-Channel
49.282	I	2/6/2002	11:44	.282-2	38.2422318	121.5517332	M	Right Bank
49.282	I	2/6/2002	13:15	.282-3	38.2383462	121.5574662	M	Mid-Channel
49.282	I	2/6/2002	13:42	.282-4	38.2364126	121.5585213	H	Left Bank
49.282	I	2/6/2002	14:42	.282-5	38.225579	121.5562104	M	Mid-Channel
49.282	I	2/6/2002	15:45	.282-6	38.2149653	121.5578594	M	Mid-Channel
49.282	I	2/6/2002	16:48	.282-7	38.2017266	121.5578466	M	Mid-Channel
49.282	I	2/6/2002	17:14	.282-8	38.1961267	121.5609094	M	Mid-Channel

Appendix C. Fish Release No. 3 - Telemetry and observational data for 18 radio-tagged juvenile chinook salmon released in the Sacramento River near Ryde at 0912 hrs. on February 6, 2002.

Fish #	Radio Tag Attachment (I=Internal / E=External)	Date	Military Time	Telemetry Map Location (refer to appendix figures)	Fish Location (via GPS) (WGS 84) Latitude (degrees North)	(WGS 84) Longitude (degrees West)	Radio Signal Strength (H=High/M=Med/L=Low)	Position of Fish in Channel Facing Downstream
49.282	I	2/7/2002	11:00	.282-9	38.1599424	121.6856614	H	Right Bank
49.282	I	2/7/2002	14:59	.282-10	38.1577337	121.6863973	H	Right Bank
49.282	I	2/8/2002	14:56	.282-11	38.1577018	121.6803372	H	Left Bank
49.282	I	2/8/2002	16:21	.282-99	38.1489872	121.6851619	M	Left Bank

Appendix C. Fish Release No. 4 - Telemetry and observational data for 12 radio-tagged juvenile chinook salmon released in Georgiana Slough at 0935 hrs. on February 12, 2002.

Fish #	Radio Tag Attachment (I=Internal / E=External)	Date	Military Time	Telemetry Map Location (refer to appendix figures)	Fish Location (via GPS) (WGS 84) Latitude (degrees North)	Fish Location (via GPS) (WGS 84) Longitude (degrees West)	Radio Signal Strength (H=High/M=Med/L=Low)	Position of Fish in Channel Facing Downstream
49.024	I	2/12/2002	9:35	RELEASE SITE #4	38.2106059	121.5376605		Mid-Channel
49.024	I	2/12/2002	9:56	.024-1	38.2102288	121.5392214	H	Mid-Channel
49.024	I	2/12/2002	10:08	.024-2	38.2099087	121.5397846	H	Mid-Channel
49.024	I	2/12/2002	10:27	.024-3	38.2090755	121.5406835	H	Mid-Channel
49.024	I	2/12/2002	10:50	.024-4	38.2071356	121.5412248	H	Mid-Channel
49.024	I	2/12/2002	11:18	.024-5	38.2027977	121.5402379	H	Mid-Channel
49.024	I	2/12/2002	11:53	.024-6	38.2002515	121.5442058	H	Mid-Channel
49.024	I	2/12/2002	12:55	.024-7	38.1848158	121.5655788	H	Mid-Channel
49.024	I	2/12/2002	13:24	.024-8	38.1828855	121.5691218	H	Mid-Channel
49.024	I	2/12/2002	14:15	.024-9	38.1817144	121.5750931	H	Mid-Channel
49.024	I	2/12/2002	15:10	.024-10	38.1771861	121.579942	H	Mid-Channel
49.024	I	2/12/2002	15:31	.024-11	38.1776144	121.5795912	H	Mid-Channel
49.024	I	2/12/2002	16:07	.024-12	38.1793615	121.5787467	H	Mid-Channel
49.024	I	2/12/2002	16:27	.024-13	38.1800093	121.5786542	M	Mid-Channel
49.024	I	2/12/2002	16:51	.024-14	38.1772745	121.5798033	H	Mid-Channel
49.024	I	2/12/2002	17:22	.024-15	38.1778387	121.5795069	H	Mid-Channel
49.024	I	2/12/2002	17:50	.024-16	38.1785914	121.5791498	H	Mid-Channel
49.024	I	2/13/2002	9:09	.024-17	38.1787696	121.5789021	H	Left Bank
49.024	I	2/13/2002	9:28	.024-99	38.1796047	121.5787305	H	Mid-Channel
49.095	I	2/12/2002	9:35	RELEASE SITE #4	38.2106059	121.5376605		Mid-Channel
49.095	I	2/12/2002	9:54	.095-1	38.2095192	121.5402697	H	Mid-Channel
49.095	I	2/12/2002	10:10	.095-2	38.2083585	121.5410062	H	Mid-Channel
49.095	I	2/12/2002	10:26	.095-3	38.2079269	121.5410834	H	Mid-Channel
49.095	I	2/12/2002	10:51	.095-4	38.2060991	121.5412112	H	Mid-Channel
49.095	I	2/12/2002	11:21	.095-5	38.2038192	121.5404916	H	Mid-Channel
49.095	I	2/12/2002	11:58	.095-6	38.2022738	121.5401455	H	Mid-Channel
49.095	I	2/12/2002	12:44	.095-7	38.2020317	121.5402417	H	Mid-Channel
49.095	I	2/12/2002	13:40	.095-8	38.202204	121.5403297	H	Mid-Channel
49.095	I	2/12/2002	14:31	.095-9	38.201128	121.5422126	H	Mid-Channel
49.095	I	2/12/2002	15:22	.095-10	38.1991937	121.5453803	H	Mid-Channel
49.095	I	2/12/2002	16:17	.095-11	38.1978959	121.5463283	H	Mid-Channel
49.095	I	2/12/2002	17:01	.095-12	38.1956881	121.547574	H	Left Bank
49.095	I	2/12/2002	17:30	.095-13	38.1952187	121.5484903	H	Mid-Channel
49.095	I	2/13/2002	8:27	.095-14	38.1408495	121.5979228	H	Mid-Channel
49.095	I	2/13/2002	10:09	.095-15	38.1365796	121.5950607	H	Mid-Channel
49.095	I	2/13/2002	11:10	.095-16	38.1352522	121.5935466	H	Mid-Channel
49.095	I	2/13/2002	11:36	.095-17	38.1348683	121.59288	H	Mid-Channel
49.095	I	2/13/2002	12:02	.095-18	38.1336249	121.5913977	H	Mid-Channel
49.095	I	2/13/2002	13:08	.095-19	38.1340164	121.5917325	H	Mid-Channel
49.095	I	2/13/2002	13:40	.095-20	38.1352269	121.5934778	H	Mid-Channel
49.095	I	2/13/2002	15:02	.095-21	38.13747	121.5956598	H	Mid-Channel
49.095	I	2/13/2002	15:32	.095-22	38.1392243	121.5969155	H	Mid-Channel
49.095	I	2/13/2002	16:54	.095-23	38.1409044	121.5979902	H	Mid-Channel
49.095	I	2/14/2002	10:39	.095-24	38.1483291	121.5994001	H	Mid-Channel
49.095	I	2/14/2002	15:11	.095-25	38.1512102	121.5938898	H	Mid-Channel
49.095	I	2/16/2002	16:13	.095-99	38.151348	121.5941154	M	Mid-Channel
49.104	I	2/12/2002	9:35	RELEASE SITE #4	38.2106059	121.5376605		Mid-Channel
49.104	I	2/12/2002	10:03	.104-1	38.2102173	121.5387168	M	Left Bank
49.104	I	2/12/2002	10:38	.104-2	38.2055653	121.5410391	H	Mid-Channel
49.104	I	2/12/2002	11:08	.104-3	38.2022634	121.5402617	M	Mid-Channel
49.104	I	2/12/2002	11:53	.104-4	38.1987025	121.5457441	H	Mid-Channel
49.104	I	2/12/2002	12:41	.104-5	38.1915228	121.5539942	H	Mid-Channel
49.104	I	2/12/2002	13:37	.104-6	38.1836451	121.5676629	H	Mid-Channel
49.104	I	2/12/2002	14:38	.104-7	38.1805908	121.5783004	H	Mid-Channel
49.104	I	2/12/2002	15:34	.104-8	38.1805629	121.5782324	M	Mid-Channel
49.104	I	2/12/2002	16:24	.104-9	38.1733422	121.5802906	H	Mid-Channel
49.104	I	2/12/2002	17:18	.104-10	38.1628346	121.5840557	H	Mid-Channel
49.104	I	2/12/2002	17:46	.104-11	38.1614028	121.5848938	H	Mid-Channel
49.104	I	2/12/2002	18:05	.104-12	38.1587633	121.5860726	H	Mid-Channel
49.104	I	2/12/2002	18:34	.104-13	38.1573367	121.5884992	H	Mid-Channel
49.104	I	2/13/2002	8:31	.104-14	38.1161726	121.5539074	H	Left Bank
49.104	I	2/13/2002	9:19	.104-15	38.1185387	121.5587088	H	Mid-Channel
49.104	I	2/13/2002	10:27	.104-16	38.1258259	121.5613606	H	Mid-Channel
49.104	I	2/13/2002	10:58	.104-17	38.1262208	121.5612288	H	Mid-Channel
49.104	I	2/13/2002	11:41	.104-18	38.1280182	121.5617825	H	Mid-Channel
49.104	I	2/13/2002	13:08	.104-19	38.131714	121.5660484	H	Left Bank
49.104	I	2/13/2002	13:55	.104-20	38.131816	121.5670276	H	Left Bank
49.104	I	2/13/2002	14:50	.104-21	38.1308983	121.5627215	H	Right Bank
49.104	I	2/13/2002	16:02	.104-22	38.1312835	121.5647448	H	Left Bank
49.104	I	2/13/2002	16:53	.104-23	38.1328508	121.5676349	H	Right Bank
49.104	I	2/16/2002	16:22	.104-99	38.1468861	121.5902754	M	Mid-Channel

Appendix C. Fish Release No. 4 - Telemetry and observational data for 12 radio-tagged juvenile chinook salmon released in Georgiana Slough at 0935 hrs. on February 12, 2002.

Fish #	Radio Tag Attachment (I=Internal / E=External)	Date	Military Time	Telemetry Map Location (refer to appendix figures)	Fish Location (via GPS) (WGS 84) Latitude (degrees North)	Fish Location (via GPS) (WGS 84) Longitude (degrees West)	Radio Signal Strength (H=High/M=Med/L=Low)	Position of Fish in Channel Facing Downstream
49.114	I	2/12/2002	9:35	RELEASE SITE #4	38.2106059	121.5376605		Mid-Channel
49.114	I	2/12/2002	10:06	.114-1	38.2106725	121.5369376	H	Mid-Channel
49.114	I	2/12/2002	10:31	.114-2	38.2102097	121.5391304	H	Mid-Channel
49.114	I	2/12/2002	11:12	.114-3	38.205088	121.5410715	H	Right Bank
49.114	I	2/12/2002	11:59	.114-4	38.2004399	121.5439618	H	Mid-Channel
49.114	I	2/12/2002	12:43	.114-5	38.1942498	121.5500463	H	Mid-Channel
49.114	I	2/12/2002	13:42	.114-6	38.1902939	121.5563129	H	Mid-Channel
49.114	I	2/12/2002	14:45	.114-7	38.1854837	121.5641841	H	Mid-Channel
49.114	I	2/12/2002	15:40	.114-8	38.1817872	121.5715114	H	Mid-Channel
49.114	I	2/12/2002	16:28	.114-9	38.1795785	121.5785559	H	Left Bank
49.114	I	2/12/2002	17:10	.114-10	38.1763076	121.5803244	H	Mid-Channel
49.114	I	2/12/2002	17:35	.114-11	38.1745434	121.580507	H	Mid-Channel
49.114	I	2/13/2002	8:37	.114-12	38.1473096	121.5998946	H	Left Bank
49.114	I	2/13/2002	10:00	.114-13	38.1470962	121.6003024	M	Mid-Channel
49.114	I	2/13/2002	13:22	.114-14	38.1477367	121.5996055	H	Left Bank
49.114	I	2/13/2002	15:15	.114-15	38.1475146	121.5998722	M	Mid-Channel
49.114	I	2/13/2002	16:55	.114-16	38.1359876	121.5945358	L	Mid-Channel
49.114	I	2/13/2002	17:15	.114-17	38.1321588	121.5901366	L	Mid-Channel
49.114	I	2/14/2002	10:52	.114-18	38.147495	121.5997356	H	Left Bank
49.114	I	2/14/2002	15:09	.114-19	38.1479497	121.5995529	M	Mid-Channel
49.114	I	2/16/2002	16:00	.114-99	38.1471269	121.6001928	M	Mid-Channel
49.124	I	2/12/2002	9:35	RELEASE SITE #4	38.2106059	121.5376605		Mid-Channel
49.124	I	2/12/2002	9:52	.124-1	38.210113	121.5393265	M	Mid-Channel
49.124	I	2/12/2002	10:42	.124-2	38.2018515	121.54045	H	Mid-Channel
49.124	I	2/12/2002	11:02	.124-3	38.2001415	121.544779	H	Right Bank
49.124	I	2/12/2002	11:52	.124-4	38.1983281	121.5460713	H	Mid-Channel
49.124	I	2/12/2002	12:44	.124-5	38.1942934	121.5501264	H	Mid-Channel
49.124	I	2/12/2002	13:43	.124-6	38.1919135	121.5535183	H	Mid-Channel
49.124	I	2/12/2002	14:47	.124-7	38.1889915	121.5584746	H	Right Bank
49.124	I	2/12/2002	15:43	.124-8	38.1870809	121.5601318	H	Mid-Channel
49.124	I	2/12/2002	16:33	.124-9	38.1867031	121.5607348	H	Mid-Channel
49.124	I	2/12/2002	17:04	.124-10	38.1862196	121.5617263	H	Mid-Channel
49.124	I	2/12/2002	17:44	.124-99	38.1838937	121.5675493	H	Right Bank
49.134	I	2/12/2002	9:35	RELEASE SITE #4	38.2106059	121.5376605		Mid-Channel
49.134	I	2/12/2002	10:04	.134-1	38.2103265	121.5388137	H	Mid-Channel
49.134	I	2/12/2002	10:37	.134-2	38.2055625	121.5410364	H	Mid-Channel
49.134	I	2/12/2002	11:06	.134-3	38.2012995	121.5415126	H	Mid-Channel
49.134	I	2/12/2002	11:54	.134-4	38.1989054	121.5455568	H	Mid-Channel
49.134	I	2/12/2002	12:45	.134-5	38.1949035	121.5489828	H	Mid-Channel
49.134	I	2/12/2002	13:45	.134-6	38.1927635	121.5521242	H	Left Bank
49.134	I	2/12/2002	14:48	.134-7	38.1905025	121.5557989	H	Mid-Channel
49.134	I	2/12/2002	15:45	.134-8	38.1887074	121.5583427	H	Left Bank
49.134	I	2/12/2002	16:33	.134-9	38.1867031	121.5607348	H	Mid-Channel
49.134	I	2/12/2002	17:04	.134-10	38.1861863	121.5619438	H	Mid-Channel
49.134	I	2/12/2002	17:42	.134-11	38.1856126	121.5636678	H	Mid-Channel
49.134	I	2/13/2002	11:19	.134-12	38.1449629	121.5587938	H	Right Bank
49.134	I	2/13/2002	12:03	.134-13	38.144488	121.5597503	H	Right Bank
49.134	I	2/13/2002	13:41	.134-14	38.1429562	121.5607247	M	Right Bank
49.134	I	2/13/2002	15:12	.134-15	38.1438829	121.5603784	M	Right Bank
49.134	I	2/13/2002	16:03	.134-16	38.1434799	121.5605803	M	Right Bank
49.134	I	2/13/2002	17:02	.134-17	38.1431466	121.5605983	L	Right Bank
49.134	I	2/14/2002	10:06	.134-18	38.1446096	121.5588664	M	Right Bank
49.134	I	2/14/2002	11:25	.134-19	38.145019	121.5584475	M	Right Bank
49.134	I	2/14/2002	12:01	.134-20	38.1450424	121.5586553	H	Right Bank
49.134	I	2/14/2002	13:04	.134-21	38.1446665	121.5596099	H	Right Bank
49.134	I	2/14/2002	15:08	.134-22	38.1433796	121.560491	M	Right Bank
49.134	I	2/14/2002	16:20	.134-23	38.1444708	121.5598191	H	Right Bank
49.134	I	2/14/2002	16:55	.134-24	38.1430668	121.5607026	M	Right Bank
49.134	I	2/15/2002	9:42	.134-25	38.1441154	121.5602255	M	Right Bank
49.134	I	2/15/2002	12:57	.134-26	38.143463	121.5599416	L	Mid-Channel
49.134	I	2/15/2002	16:01	.134-27	38.1433923	121.5607875	M	Right Bank
49.134	I	2/15/2002	17:40	.134-99	38.1433644	121.5607195	M	Right Bank
49.144	I	2/12/2002	9:35	RELEASE SITE #4	38.2106059	121.5376605		Mid-Channel
49.144	I	2/12/2002	9:50	.144-1	38.209174	121.5406359	H	Mid-Channel
49.144	I	2/12/2002	10:12	.144-2	38.2069	121.5411153	H	Left Bank
49.144	I	2/12/2002	10:23	.144-3	38.2057909	121.5410689	H	Left Bank
49.144	I	2/12/2002	10:54	.144-4	38.2027809	121.540341	H	Mid-Channel
49.144	I	2/12/2002	11:16	.144-5	38.2013391	121.5417973	H	Mid-Channel
49.144	I	2/12/2002	11:49	.144-6	38.1982315	121.5460914	H	Mid-Channel
49.144	I	2/12/2002	12:51	.144-7	38.1901658	121.5564989	H	Mid-Channel
49.144	I	2/12/2002	13:27	.144-8	38.1862634	121.5616056	H	Mid-Channel

Appendix C. Fish Release No. 4 - Telemetry and observational data for 12 radio-tagged juvenile chinook salmon released in Georgiana Slough at 0935 hrs. on February 12, 2002.

Fish #	Radio Tag Attachment (I=Internal / E=External)	Date	Military Time	Telemetry Map Location (refer to appendix figures)	Fish Location (via GPS) (WGS 84) Latitude (degrees North)	Fish Location (via GPS) (WGS 84) Longitude (degrees West)	Radio Signal Strength (H=High/M=Med/L=Low)	Position of Fish in Channel Facing Downstream
49.144	I	2/12/2002	14:19	.144-9	38.182191	121.5703702	H	Mid-Channel
49.144	I	2/12/2002	15:12	.144-10	38.1806342	121.5781625	H	Mid-Channel
49.144	I	2/12/2002	16:04	.144-11	38.1744704	121.5804285	H	Mid-Channel
49.144	I	2/12/2002	16:32	.144-12	38.1719706	121.580146	H	Mid-Channel
49.144	I	2/12/2002	16:45	.144-13	38.1698869	121.5807803	H	Mid-Channel
49.144	I	2/12/2002	17:11	.144-14	38.1684547	121.5816281	H	Mid-Channel
49.144	I	2/12/2002	17:54	.144-15	38.1656041	121.5827922	H	Left Bank
49.144	I	2/13/2002	8:54	.144-16	38.1513492	121.5894175	H	Mid-Channel
49.144	I	2/13/2002	9:44	.144-17	38.1501405	121.5872659	H	Mid-Channel
49.144	I	2/13/2002	13:30	.144-18	38.1504099	121.5925357	H	Mid-Channel
49.144	I	2/13/2002	15:18	.144-19	38.1509305	121.5971107	H	Mid-Channel
49.144	I	2/13/2002	17:03	.144-20	38.1513009	121.5939452	H	Right Bank
49.144	I	2/14/2002	8:10	.144-21	38.1210655	121.5822036	H	Left Bank
49.144	I	2/14/2002	10:12	.144-22	38.1202372	121.5832245	H	Mid-Channel
49.144	I	2/14/2002	10:56	.144-23	38.1165218	121.5840494	H	Left Bank
49.144	I	2/14/2002	11:34	.144-24	38.1144535	121.5836787	H	Left Bank
49.144	I	2/14/2002	13:34	.144-25	38.1186713	121.5836885	H	Left Bank
49.144	I	2/14/2002	14:37	.144-26	38.1263312	121.5791824	H	Mid-Channel
49.144	I	2/14/2002	15:32	.144-27	38.1308445	121.5753184	H	Right Bank
49.144	I	2/14/2002	15:59	.144-28	38.1323698	121.5717974	H	Right Bank
49.144	I	2/14/2002	16:30	.144-29	38.133077	121.5699239	H	Right Bank
49.144	I	2/14/2002	16:44	.144-30	38.1333932	121.5699861	H	Right Bank
49.144	I	2/14/2002	17:07	.144-31	38.1332652	121.5690987	H	Right Bank
49.144	I	2/14/2002	17:30	.144-32	38.1331973	121.5694423	H	Right Bank
49.144	I	2/15/2002	11:50	.144-33	38.0844763	121.5692977	H	Right Bank
49.144	I	2/15/2002	12:18	.144-34	38.0860524	121.5714335	M	Right Bank
49.144	I	2/15/2002	13:09	.144-35	38.0848904	121.5671672	M	Mid-Channel
49.144	I	2/15/2002	13:45	.144-36	38.0852071	121.5693633	H	Right Bank
49.144	I	2/15/2002	15:11	.144-99	38.0867903	121.5646917	M	Right Bank
49.155	I	2/12/2002	9:35	RELEASE SITE #4	38.2106059	121.5376605		Mid-Channel
49.155	I	2/12/2002	9:54	.155-1	38.209204	121.5405795	M	Mid-Channel
49.155	I	2/12/2002	10:40	.155-2	38.2028431	121.5402712	H	Mid-Channel
49.155	I	2/12/2002	11:04	.155-3	38.2008418	121.5431205	H	Mid-Channel
49.155	I	2/12/2002	11:56	.155-4	38.1991845	121.5453691	H	Mid-Channel
49.155	I	2/12/2002	12:37	.155-5	38.1877353	121.5596526	H	Right Bank
49.155	I	2/12/2002	13:34	.155-6	38.1828683	121.5691906	H	Mid-Channel
49.155	I	2/12/2002	14:40	.155-7	38.1815955	121.5744137	H	Left Bank
49.155	I	2/12/2002	15:37	.155-8	38.1815783	121.5760878	M	Mid-Channel
49.155	I	2/12/2002	16:30	.155-9	38.1818546	121.5747593	M	Mid-Channel
49.155	I	2/12/2002	17:08	.155-10	38.1811493	121.577536	H	Mid-Channel
49.155	I	2/12/2002	17:36	.155-11	38.1805426	121.5780227	H	Left Bank
49.155	I	2/13/2002	8:29	.155-12	38.1417761	121.5985441	H	Mid-Channel
49.155	I	2/13/2002	10:12	.155-13	38.1334086	121.5914019	H	Mid-Channel
49.155	I	2/13/2002	11:00	.155-14	38.1299546	121.5824982	H	Mid-Channel
49.155	I	2/13/2002	11:31	.155-15	38.1301272	121.5812164	H	Mid-Channel
49.155	I	2/13/2002	11:55	.155-16	38.1302117	121.5811152	H	Mid-Channel
49.155	I	2/13/2002	13:05	.155-17	38.1301445	121.580804	H	Mid-Channel
49.155	I	2/13/2002	13:50	.155-18	38.1296246	121.5765401	H	Mid-Channel
49.155	I	2/13/2002	14:46	.155-19	38.1309171	121.5731378	M	Mid-Channel
49.155	I	2/13/2002	15:22	.155-20	38.1327895	121.5699979	H	Mid-Channel
49.155	I	2/13/2002	16:09	.155-21	38.1309783	121.5714937	H	Left Bank
49.155	I	2/13/2002	16:30	.155-22	38.1315499	121.5710718	H	Left Bank
49.155	I	2/13/2002	17:08	.155-23	38.1310835	121.5719936	H	Left Bank
49.155	I	2/13/2002	17:25	.155-24	38.1308962	121.572157	H	Left Bank
49.155	I	2/14/2002	8:18	.155-25	38.1168926	121.5530947	L	Mid-Channel
49.155	I	2/14/2002	9:19	.155-26	38.117092	121.5546535	L	Mid-Channel
49.155	I	2/14/2002	11:09	.155-27	38.1181331	121.5567291	M	Right Bank
49.155	I	2/14/2002	13:18	.155-28	38.1174575	121.5455662	H	Right Bank
49.155	I	2/14/2002	14:42	.155-29	38.1173993	121.5459666	H	Right Bank
49.155	I	2/14/2002	16:08	.155-30	38.1177018	121.5456526	H	Right Bank
49.155	I	2/14/2002	17:06	.155-31	38.1176319	121.5458251	H	Right Bank
49.155	I	2/15/2002	9:58	.155-32	38.1175353	121.5460323	H	Right Bank
49.155	I	2/15/2002	13:19	.155-33	38.1176958	121.5458923	H	Right Bank
49.155	I	2/15/2002	16:10	.155-34	38.1175895	121.5460427	H	Right Bank
49.155	I	2/15/2002	17:52	.155-99	38.1176229	121.5458253	H	Right Bank
49.300	I	2/12/2002	9:35	RELEASE SITE #4	38.2106059	121.5376605		Mid-Channel
49.300	I	2/12/2002	10:07	.300-1	38.2102856	121.5394372	H	Mid-Channel
49.300	I	2/12/2002	10:26	.300-2	38.2082511	121.5410655	H	Mid-Channel
49.300	I	2/12/2002	10:52	.300-3	38.2052772	121.5410677	H	Mid-Channel
49.300	I	2/12/2002	11:20	.300-4	38.2033308	121.5403528	H	Mid-Channel
49.300	I	2/12/2002	11:54	.300-5	38.2007412	121.5437278	H	Mid-Channel
49.300	I	2/12/2002	12:40	.300-6	38.1984616	121.545943	H	Mid-Channel

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Fish #	Radio Tag Attachment (I=Internal / E=External)	Date	Military Time	Telemetry Map Location (refer to appendix figures)	Fish Location (via GPS) (WGS 84) Latitude (degrees North)	Fish Location (via GPS) (WGS 84) Longitude (degrees West)	Radio Signal Strength (H=High/M=Med/L=Low)	Position of Fish in Channel Facing Downstream
49.300	I	2/12/2002	13:36	.300-7	38.1968339	121.546946	H	Mid-Channel
49.300	I	2/12/2002	14:28	.300-8	38.1956804	121.547677	H	Mid-Channel
49.300	I	2/12/2002	15:20	.300-9	38.195574	121.5478161	H	Mid-Channel
49.300	I	2/12/2002	16:15	.300-10	38.1956371	121.5478149	H	Left Bank
49.300	I	2/12/2002	17:02	.300-11	38.1956283	121.5478379	H	Mid-Channel/Right Bank
49.300	I	2/12/2002	17:32	.300-12	38.1973172	121.5466738	H	Mid-Channel/Right Bank
49.300	I	2/13/2002	9:20	.300-99	38.1980147	121.5462374	H	Mid-Channel
49.310	I	2/12/2002	9:35	RELEASE SITE #4	38.2106059	121.5376605		Mid-Channel
49.310	I	2/12/2002	10:02	.310-1	38.2100196	121.5397852	H	Mid-Channel
49.310	I	2/12/2002	10:33	.310-2	38.2092442	121.540486	H	Mid-Channel
49.310	I	2/12/2002	11:11	.310-3	38.2041821	121.5406899	H	Mid-Channel
49.310	I	2/12/2002	12:00	.310-4	38.2002404	121.5440347	H	Left Bank
49.310	I	2/12/2002	12:47	.310-5	38.1961885	121.5472215	H	Mid-Channel
49.310	I	2/12/2002	13:47	.310-6	38.1909782	121.5551468	H	Mid-Channel
49.310	I	2/12/2002	14:42	.310-7	38.1853461	121.5647235	H	Mid-Channel
49.310	I	2/12/2002	15:38	.310-8	38.1816629	121.5760417	H	Mid-Channel
49.310	I	2/12/2002	16:26	.310-9	38.1776074	121.5797512	H	Mid-Channel
49.310	I	2/12/2002	17:12	.310-10	38.1734858	121.5802422	H	Mid-Channel
49.310	I	2/12/2002	17:35	.310-11	38.1745434	121.580507	H	Mid-Channel
49.310	I	2/13/2002	8:57	.310-12	38.1573248	121.5905082	H	Mid-Channel
49.310	I	2/13/2002	9:39	.310-13	38.1530009	121.5914131	H	Mid-Channel
49.310	I	2/13/2002	13:20	.310-14	38.1444583	121.600524	H	Mid-Channel
49.310	I	2/13/2002	15:10	.310-15	38.1418574	121.5985539	H	Mid-Channel
49.310	I	2/13/2002	16:56	.310-16	38.1423139	121.5990473	H	Mid-Channel
49.310	I	2/14/2002	8:10	.310-17	38.1318653	121.5688522	H	Left Bank
49.310	I	2/14/2002	10:20	.310-18	38.125556	121.5799161	H	Mid-Channel/Right Bank
49.310	I	2/14/2002	10:50	.310-19	38.1251348	121.5808598	h	Right Bank
49.310	I	2/14/2002	11:29	.310-20	38.1251376	121.5803464	H	Right Bank
49.310	I	2/14/2002	13:32	.310-21	38.1251849	121.580528	H	Right Bank
49.310	I	2/14/2002	14:38	.310-22	38.1269397	121.5788283	M	Mid-Channel
49.310	I	2/14/2002	15:37	.310-23	38.1262768	121.5784077	H	Left Bank
49.310	I	2/14/2002	16:02	.310-24	38.1273189	121.5773949	H	Left Bank
49.310	I	2/14/2002	16:34	.310-25	38.1283476	121.5767588	M	Left Bank
49.310	I	2/14/2002	17:03	.310-26	38.1288767	121.5765432	H	Mid-Channel
49.310	I	2/14/2002	17:34	.310-27	38.1283851	121.5768836	M	Left Bank/Mid-Channel
49.310	I	2/15/2002	13:47	.310-99	38.1213569	121.5829407	L	Mid-Channel
49.320	I	2/12/2002	9:35	RELEASE SITE #4	38.2106059	121.5376605		Mid-Channel
49.320	I	2/12/2002	10:02	.320-1	38.2105984	121.5370553	H	Left Bank
49.320	I	2/12/2002	10:30	.320-2	38.2104616	121.5376519	H	Mid-Channel
49.320	I	2/12/2002	10:47	.320-3	38.209138	121.5406366	H	Mid-Channel
49.320	I	2/12/2002	11:23	.320-4	38.2045711	121.5408077	H	Mid-Channel
49.320	I	2/12/2002	11:56	.320-5	38.200832	121.5430522	H	Mid-Channel
49.320	I	2/12/2002	12:38	.320-6	38.1967161	121.5468913	H	Mid-Channel
49.320	I	2/12/2002	13:32	.320-7	38.1922396	121.5529295	H	Mid-Channel
49.320	I	2/12/2002	14:25	.320-8	38.1885798	121.5587111	H	Mid-Channel
49.320	I	2/12/2002	15:16	.320-9	38.1854463	121.5640707	H	Mid-Channel
49.320	I	2/12/2002	16:11	.320-10	38.1841844	121.567007	H	Left Bank
49.320	I	2/12/2002	16:54	.320-11	38.1819306	121.5713783	H	Mid-Channel
49.320	I	2/12/2002	17:25	.320-12	38.1818159	121.573801	H	Mid-Channel
49.320	I	2/12/2002	17:48	.320-13	38.1817746	121.5763364	H	Mid-Channel
49.320	I	2/13/2002	8:39	.320-14	38.149607	121.5984969	H	Mid-Channel
49.320	I	2/13/2002	9:57	.320-15	38.1499198	121.5982741	H	Mid-Channel
49.320	I	2/13/2002	13:28	.320-16	38.1509902	121.5935859	H	Mid-Channel
49.320	I	2/13/2002	15:22	.320-17	38.1480027	121.5909501	H	Mid-Channel
49.320	I	2/13/2002	17:05	.320-18	38.1490574	121.5917286	H	Mid-Channel
49.320	I	2/14/2002	14:47	.320-19	38.1344634	121.5921803	H	Left Bank
49.320	I	2/14/2002	15:24	.320-20	38.1346649	121.5924503	H	Left Bank
49.320	I	2/14/2002	16:17	.320-21	38.1343982	121.5920104	H	Left Bank
49.320	I	2/14/2002	17:18	.320-22	38.1346078	121.5922004	H	Left Bank
49.320	I	2/15/2002	14:06	.320-23	38.134581	121.5922237	L	Left Bank
49.320	I	2/16/2002	15:54	.320-99	38.1427967	121.5994831	L	Mid-Channel
49.330	I	2/12/2002	9:35	RELEASE SITE #4	38.2106059	121.5376605		Mid-Channel
49.330	I	2/12/2002	9:50	.330-1	38.209504	121.5403552	H	Mid-Channel
49.330	I	2/12/2002	10:16	.330-2	38.2054221	121.541122	H	Mid-Channel
49.330	I	2/12/2002	10:56	.330-3	38.2015711	121.5408905	H	Mid-Channel
49.330	I	2/12/2002	11:11	.330-4	38.2002626	121.5443769	H	Left Bank
49.330	I	2/12/2002	11:47	.330-5	38.1985699	121.5459523	H	Mid-Channel
49.330	I	2/12/2002	12:36	.330-6	38.1937917	121.5509004	H	Mid-Channel
49.330	I	2/12/2002	13:30	.330-7	38.1888176	121.5582611	H	Left Bank
49.330	I	2/12/2002	14:22	.330-8	38.1846911	121.5656954	H	Mid-Channel
49.330	I	2/12/2002	15:14	.330-9	38.1817402	121.575732	H	Mid-Channel

Appendix C. Fish Release No. 4 - Telemetry and observational data for 12 radio-tagged juvenile chinook salmon released in Georgiana Slough at 0935 hrs. on February 12, 2002.

Fish #	Radio Tag Attachment (I=Internal / E=External)	Date	Military Time	Telemetry Map Location (refer to appendix figures)	Fish Location (via GPS) (WGS 84) Latitude (degrees North)	Fish Location (via GPS) (WGS 84) Longitude (degrees West)	Radio Signal Strength (H=High/M=Med/L=Low)	Position of Fish in Channel Facing Downstream
49.330	I	2/12/2002	16:30	.330-10	38.174498	121.5804737	H	Mid-Channel
49.330	I	2/12/2002	16:49	.330-11	38.1717906	121.5801609	H	Mid-Channel
49.330	I	2/12/2002	17:20	.330-12	38.1685461	121.5816393	H	Mid-Channel
49.330	I	2/12/2002	17:52	.330-13	38.1666853	121.5827712	H	Mid-Channel
49.330	I	2/12/2002	18:27	.330-14	38.1616797	121.584683	H	Mid-Channel
49.330	I	2/13/2002	8:29	.330-15	38.1197867	121.5598022	H	Mid-Channel
49.330	I	2/13/2002	9:24	.330-16	38.1212357	121.5603784	H	Mid-Channel
49.330	I	2/13/2002	10:30	.330-17	38.1177326	121.5569109	H	Left Bank/Mid-Channel
49.330	I	2/13/2002	10:55	.330-18	38.1173892	121.5546362	H	Mid-Channel
49.330	I	2/13/2002	11:46	.330-19	38.1174732	121.5556042	H	Mid-Channel
49.330	I	2/13/2002	13:16	.330-20	38.1167895	121.549127	H	Mid-Channel
49.330	I	2/13/2002	14:58	.330-21	38.1168727	121.5507566	H	Mid-Channel
49.330	I	2/13/2002	16:09	.330-22	38.1161406	121.5491171	H	Left Bank
49.330	I	2/13/2002	16:47	.330-23	38.1160847	121.5496999	H	Left Bank
49.330	I	2/14/2002	9:38	.330-24	38.1467035	121.5501094	H	Right Bank
49.330	I	2/14/2002	10:04	.330-25	38.1453074	121.5530927	H	Left Bank
49.330	I	2/14/2002	11:35	.330-26	38.1449448	121.5551197	H	Left Bank
49.330	I	2/14/2002	11:56	.330-27	38.1450764	121.55409	H	Left Bank
49.330	I	2/14/2002	12:59	.330-28	38.145252	121.5551821	H	Mid-Channel
49.330	I	2/14/2002	15:10	.330-29	38.1478101	121.5463102	H	Mid-Channel
49.330	I	2/14/2002	16:25	.330-30	38.1518279	121.5418252	H	Mid-Channel
49.330	I	2/14/2002	16:50	.330-31	38.153973	121.5353342	H	Mid-Channel
49.330	I	2/15/2002	9:13	.330-32	38.1477351	121.5438923	H	Right Bank
49.330	I	2/15/2002	9:37	.330-33	38.1471087	121.5493482	H	Mid-Channel
49.330	I	2/15/2002	12:52	.330-34	38.1369808	121.5575246	H	Mid-Channel
49.330	I	2/15/2002	15:56	.330-35	38.1393878	121.5575913	M	Mid-Channel
49.330	I	2/15/2002	17:47	.330-99	38.1454172	121.5539578	H	Mid-Channel

Appendix D. Fish Release No. 1 - Telemetry and observational data for 14 radio-tagged juvenile chinook salmon released near Fourteen Mile Slough on the San Joaquin River at 0918 hrs. on April 2, 2002.

Fish #	Date	Military Time	Telemetry Map Location (refer to appendix figures)	Fish Location (via GPS) (WGS 84) Latitude (degrees North)	Fish Location (via GPS) (WGS 84) Longitude (degrees West)	Radio Signal Strength (H=High/M=Med/L=Low)	Position of Fish in Channel Facing Downstream
49.344	4/2/2002	9:18	RELEASE SITE #1	37.9952564	121.4180784	H	Mid-Channel
49.344	4/2/2002	9:49	.344-1	37.9954669	121.4210006	H	Mid-Channel
49.344	4/2/2002	11:59	.344-2	38.0079656	121.4541509	H	Mid-Channel
49.344	4/3/2002	12:20	.344-3	37.9964676	121.4440062	M	Left Bank
49.344	4/3/2002	14:29	.344-4	38.0199041	121.4635833	H	Mid-Channel
49.344	4/4/2002	11:02	.344-99	38.0426511	121.4781728	H	Mid-Channel
49.354	4/2/2002	9:18	RELEASE SITE #1	37.9952564	121.4180784	H	Mid-Channel
49.354	4/2/2002	11:55	.354-1	38.0127813	121.458515	M	Mid-Channel
49.354	4/3/2002	7:50	.354-2	37.9936116	121.433214	H	Right Bank
49.354	4/3/2002	12:06	.354-3	38.0073129	121.4538571	M	Mid-Channel
49.354	4/4/2002	9:44	.354-99	37.9755206	121.3790759	M	Mid-Channel
49.364	4/2/2002	9:18	RELEASE SITE #1	37.9952564	121.4180784	H	Mid-Channel
49.364	4/2/2002	12:11	.364-1	38.006014	121.4530871	M	Left Bank
49.364	4/2/2002	13:50	.364-2	38.0191834	121.4629148	M	Mid-Channel
49.364	4/3/2002	9:00	.364-3	38.0174317	121.4612769	L	Mid-Channel
49.364	4/3/2002	12:08	.364-4	38.0217763	121.4647859	H	Mid-Channel
49.364	4/3/2002	14:43	.364-5	38.0384104	121.4903619	H	Mid-Channel
49.364	4/4/2002	11:32	.364-99	38.0398726	121.4928588	H	Mid-Channel
49.375	4/2/2002	9:18	RELEASE SITE #1	37.9952564	121.4180784	H	Mid-Channel
49.375	4/2/2002	12:05	.375-1	38.0121092	121.458119	M	Mid-Channel
49.375	4/2/2002	14:05	.375-2	38.0268407	121.4702856	M	Mid-Channel
49.375	4/3/2002	8:32	.375-99	38.0291606	121.4747377	H	Mid-Channel
49.384	4/2/2002	9:18	RELEASE SITE #1	37.9952564	121.4180784	H	Mid-Channel
49.384	4/2/2002	9:50	.384-1	37.9954669	121.4210006	H	Mid-Channel
49.384	4/2/2002	11:48	.384-2	38.0125501	121.4580642	H	Mid-Channel
49.384	4/2/2002	14:09	.384-3	38.0434075	121.4991479	M	Mid-Channel
49.384	4/4/2002	10:58	.384-4	38.0008521	121.510471	H	Right Bank
49.384	4/4/2002	14:30	.384-99	38.0126984	121.5172366	L	Right Bank
49.394	4/2/2002	9:18	RELEASE SITE #1	37.9952564	121.4180784	H	Mid-Channel
49.394	4/2/2002	12:30	.394-1	38.0012534	121.4549752	H	Left Bank
49.394	4/2/2002	13:44	.394-2	38.0061007	121.4617529	H	Left Bank
49.394	4/3/2002	8:50	.394-3	38.0374529	121.4859832	M	Mid-Channel
49.394	4/4/2002	11:25	.394-99	38.0022361	121.5215931	H	Mid-Channel
49.404	4/2/2002	9:18	RELEASE SITE #1	37.9952564	121.4180784	H	Mid-Channel
49.404	4/2/2002	9:52	.404-1	37.9956841	121.4217362	H	Mid-Channel
49.404	4/2/2002	12:25	.404-2	38.0085826	121.4551517	M	
49.404	4/2/2002	13:58	.404-99	38.025683	121.4692729	M	Mid-Channel
49.414	4/2/2002	9:18	RELEASE SITE #1	37.9952564	121.4180784	H	Mid-Channel
49.414	4/2/2002	11:55	.414-1	38.0143319	121.4592457	H	Mid-Channel
49.414	4/2/2002	14:01	.414-2	38.0336416	121.4825523	M	Mid-Channel
49.414	4/3/2002	7:47	.414-3	37.9952609	121.4400003	H	Mid-Channel
49.414	4/3/2002	13:48	.414-4	37.9977965	121.4463697	H	Left Bank
49.414	4/3/2002	14:24	.414-5	38.0002721	121.452308	H	Left Bank
49.414	4/4/2002	13:50	.414-99	37.9714734	121.4914608	H	Mid-Channel
49.425	4/2/2002	9:18	RELEASE SITE #1	37.9952564	121.4180784	H	Mid-Channel
49.425	4/2/2002	11:50	.425-1	38.0132816	121.458869	H	Mid-Channel
49.425	4/2/2002	11:52	.425-2	38.0127525	121.4576955	H	Mid-Channel
49.425	4/2/2002	14:05	.425-3	38.0382414	121.4905363	H	Mid-Channel
49.425	4/2/2002	14:10	.425-4	38.0386126	121.4899703	M	Mid-Channel
49.425	4/3/2002	8:06	.425-99	38.039097	121.5024721	H	Mid-Channel
49.435	4/2/2002	9:18	RELEASE SITE #1	37.9952564	121.4180784	H	Mid-Channel
49.435	4/3/2002	7:40	.435-1	37.9982003	121.4455526	H	Left Bank
49.435	4/3/2002	12:24	.435-2	37.9934835	121.4493874	H	Mid-Channel
49.435	4/3/2002	13:43	.435-99	37.9939127	121.4484446	H	Mid-Channel

Appendix D. Fish Release No. 1 - Telemetry and observational data for 14 radio-tagged juvenile chinook salmon released near Fourteen Mile Slough on the San Joaquin River at 0918 hrs. on April 2, 2002.

Fish #	Date	Military Time	Telemetry Map Location (refer to appendix figures)	Fish Location (via GPS) (WGS 84) Latitude (degrees North)	(WGS 84) Longitude (degrees West)	Radio Signal Strength (H=High/M=Med/L=Low)	Position of Fish in Channel Facing Downstream
49.454	4/2/2002	9:18	RELEASE SITE #1	37.9952564	121.4180784	H	Mid-Channel
49.454	4/2/2002	12:03	.454-1	38.0114804	121.4575854	M	Left Bank
49.454	4/2/2002	13:55	.454-2	38.0200567	121.4635345	L	Mid-Channel
49.454	4/3/2002	7:31	.454-3	38.0462833	121.5020522	H	Mid-Channel
49.454	4/3/2002	11:50	.454-4	38.04511	121.4997969	M	Right Bank
49.454	4/3/2002	14:50	.454-5	38.045228	121.4998628	L	Right Bank
49.454	4/4/2002	10:49	.454-99	38.0193383	121.5156447	H	Right Bank
49.464	4/2/2002	9:18	RELEASE SITE #1	37.9952564	121.4180784	H	Mid-Channel
49.464	4/2/2002	9:47	.464-1	37.9952815	121.4206174	H	Mid-Channel
49.464	4/2/2002	11:58	.464-99	38.0125281	121.4584519	M	Mid-Channel
49.474	4/2/2002	9:18	RELEASE SITE #1	37.9952564	121.4180784	H	Mid-Channel
49.474	4/2/2002	11:53	.474-1	38.0126636	121.4577884	H	Mid-Channel
49.474	4/3/2002	8:23	.474-99	38.0251114	121.4821814	H	Mid-Channel
49.484	4/2/2002	9:18	RELEASE SITE #1	37.9952564	121.4180784	H	Mid-Channel
49.484	4/2/2002	12:04	.484-1	38.0040519	121.4512263	H	Mid-Channel
49.484	4/3/2002	9:00	.484-2	38.0236995	121.4664433	M	Mid-Channel
49.484	4/3/2002	11:58	.484-3	38.0302324	121.4767777	M	Mid-Channel
49.484	4/4/2002	8:45	.484-99	38.0519573	121.5095611	M	Left Bank

Appendix D. Fish Release No. 2 - Telemetry and observational data for 12 radio-tagged juvenile chinook salmon released near Fourteen Mile Slough on the San Joaquin River at 0738 hrs. on April 10, 2002.

Fish #	Date	Military Time	Telemetry Map Location (refer to appendix figures)	Fish Location (via GPS) (WGS 84) Latitude (degrees North)	Fish Location (via GPS) (WGS 84) Longitude (degrees West)	Radio Signal Strength (H=High/M=Med/L=Low)	Position of Fish in Channel Facing Downstream
49.154	4/10/2002	7:38	RELEASE SITE #2	37.9939186	121.4130964	H	Mid-Channel
49.154	4/10/2002	8:55	.154-1	37.9933197	121.432275	M	Mid-Channel
49.154	4/10/2002	9:20	.154-2	37.9943228	121.4372188	H	Mid-Channel
49.154	4/10/2002	10:50	.154-3	37.9947533	121.4520482	H	Mid-Channel
49.154	4/10/2002	11:25	.154-4	37.9915836	121.4549845	H	Mid-Channel
49.154	4/10/2002	12:25	.154-5	37.9844213	121.4689465	H	Left Bank
49.154	4/10/2002	16:09	.154-6	37.9715741	121.5106758	H	Mid-Channel
49.154	4/10/2002	16:45	.154-7	37.9692787	121.5273545	H	Mid-Channel
49.154	4/10/2002	17:12	.154-8	37.9627188	121.5295914	H	Mid-Channel
49.154	4/11/2002	9:55	.154-9	37.9795645	121.5348002	H	Mid-Channel
49.154	4/11/2002	13:16	.154-10	37.9705698	121.5369258	H	Right Bank
49.154	4/11/2002	14:36	.154-11	37.9689321	121.5342374	H	Left Bank
49.154	4/11/2002	16:54	.154-12	37.9684103	121.5335875	H	Mid-Channel
49.154	4/11/2002	17:35	.154-13	37.967987	121.5336074	H	Mid-Channel
49.154	4/12/2002	8:20	.154-14	37.9678825	121.5331768	H	Mid-Channel
49.154	4/12/2002	10:30	.154-15	37.9675779	121.5333195	H	Mid-Channel
49.154	4/12/2002	12:09	.154-16	37.9682051	121.533751	H	Mid-Channel
49.154	4/12/2002	14:24	.154-17	37.9684316	121.533849	H	Left Bank
49.154	4/12/2002	16:24	.154-18	37.9678001	121.5337932	H	Mid-Channel
49.154	4/12/2002	17:17	.154-99	37.9683066	121.5339425	H	Mid-Channel
49.231	4/10/2002	7:38	RELEASE SITE #2	37.9939186	121.4130964	H	Mid-Channel
49.231	4/10/2002	8:18	.231-1	37.9946153	121.4267128	H	Mid-Channel
49.231	4/10/2002	8:47	.231-2	37.9946796	121.4389763	H	Mid-Channel
49.231	4/10/2002	9:41	.231-3	38.0049446	121.4526312	H	Mid-Channel
49.231	4/10/2002	10:15	.231-4	38.0122119	121.4577068	H	Mid-Channel
49.231	4/10/2002	12:46	.231-5	38.0319222	121.4799102	H	Mid-Channel
49.231	4/10/2002	15:06	.231-6	38.0317256	121.4800396	H	Mid-Channel
49.231	4/10/2002	16:48	.231-7	38.0363796	121.4880221	H	Left Bank
49.231	4/10/2002	18:09	.231-8	38.0413033	121.4952823	H	Mid-Channel
49.231	4/11/2002	10:34	.231-9	38.0369997	121.4913936	H	Left Bank
49.231	4/11/2002	11:35	.231-10	38.0392106	121.4916217	L	Mid-Channel
49.231	4/12/2002	11:55	.231-11	38.0455874	121.504015	M	Left Bank
49.231	4/12/2002	15:15	.231-12	38.0465369	121.5035627	M	Mid-Channel
49.231	4/12/2002	17:33	.231-99	38.0487928	121.5052034	H	Left Bank
49.241	4/10/2002	7:38	RELEASE SITE #2	37.9939186	121.4130964	H	Mid-Channel
49.241	4/10/2002	8:31	.241-1	37.9936785	121.4287713	H	Left Bank
49.241	4/10/2002	8:52	.241-2	37.9929046	121.4349372	M	Left Bank
49.241	4/10/2002	9:35	.241-3	37.9996252	121.447675	H	Mid-Channel
49.241	4/10/2002	9:57	.241-4	38.0036231	121.4515087	H	Mid-Channel
49.241	4/10/2002	12:26	.241-5	38.0029918	121.450793	H	Mid-Channel
49.241	4/10/2002	15:55	.241-6	37.9795823	121.4752295	H	Mid-Channel
49.241	4/10/2002	16:28	.241-7	37.9714144	121.4784837	H	Mid-Channel
49.241	4/10/2002	17:00	.241-8	37.9716752	121.4889293	H	Mid-Channel
49.241	4/10/2002	17:47	.241-9	37.9715769	121.5045053	H	Mid-Channel
49.241	4/11/2002	9:18	.241-10	37.9696327	121.5333242	M	Mid-Channel
49.241	4/11/2002	14:43	.241-11	37.9720791	121.5278792	M	Right Bank
49.241	4/11/2002	16:46	.241-12	37.9721356	121.5237568	M	
49.241	4/11/2002	17:40	.241-13	37.9721842	121.527638	M	Right Bank
49.241	4/12/2002	7:45	.241-14	37.9716693	121.5153529	H	Mid-Channel
49.241	4/12/2002	10:43	.241-15	37.9722765	121.5270897	M	
49.241	4/12/2002	12:00	.241-16	37.9718873	121.5276781	L	
49.241	4/12/2002	14:31	.241-17	37.971924	121.5255712	L	
49.241	4/12/2002	16:24	.241-18	37.9702163	121.5338704	H	Mid-Channel
49.241	4/12/2002	17:24	.241-99	37.9714609	121.5267303	L	
49.261	4/10/2002	7:38	RELEASE SITE #2	37.9939186	121.4130964	H	Mid-Channel
49.261	4/10/2002	8:22	.261-1	37.9937366	121.4317764	M	Mid-Channel
49.261	4/10/2002	8:47	.261-2	37.9946796	121.4389763	H	Mid-Channel
49.261	4/10/2002	9:41	.261-3	38.005916	121.4524855	H	Mid-Channel
49.261	4/10/2002	10:18	.261-4	38.0123065	121.4580465	H	Mid-Channel
49.261	4/10/2002	12:39	.261-5	38.02651	121.4704976	H	Mid-Channel

Appendix D. Fish Release No. 2 - Telemetry and observational data for 12 radio-tagged juvenile chinook salmon released near Fourteen Mile Slough on the San Joaquin River at 0738 hrs. on April 10, 2002.

Fish #	Date	Military Time	Telemetry Map Location (refer to appendix figures)	Fish Location (via GPS) (WGS 84) Latitude (degrees North)	Fish Location (via GPS) (WGS 84) Longitude (degrees West)	Radio Signal Strength (H=High/M=Med/L=Low)	Position of Fish in Channel Facing Downstream
49.261	4/10/2002	15:25	.261-6	38.0131894	121.4593949	H	Left Bank
49.261	4/10/2002	16:08	.261-7	38.0140439	121.459958	H	Mid-Channel
49.261	4/10/2002	17:06	.261-8	38.0161774	121.461155	H	Mid-Channel
49.261	4/10/2002	17:55	.261-9	38.018721	121.4633915	H	Mid-Channel
49.261	4/10/2002	18:20	.261-10	38.0222637	121.4662226	H	Left Bank
49.261	4/10/2002	18:55	.261-11	38.0285348	121.4737367	H	Mid-Channel
49.261	4/11/2002	9:30	.261-12	38.0108968	121.4563789	H	Mid-Channel
49.261	4/11/2002	10:05	.261-13	38.0180005	121.4634294	H	Left Bank
49.261	4/11/2002	11:40	.261-14	38.0334972	121.4832389	H	Mid-Channel
49.261	4/11/2002	13:09	.261-15	38.0463323	121.5023588	H	Mid-Channel
49.261	4/11/2002	14:48	.261-16	38.0399738	121.5055081	H	Left Bank
49.261	4/11/2002	15:32	.261-17	38.0466311	121.5031733	H	Mid-Channel
49.261	4/11/2002	15:51	.261-18	38.04495	121.5013842	H	Mid-Channel
49.261	4/11/2002	16:32	.261-19	38.0449621	121.5002102	H	Mid-Channel
49.261	4/11/2002	17:50	.261-20	38.0435795	121.4999193	H	Mid-Channel
49.261	4/12/2002	7:27	.261-21	38.041475	121.5287811	H	Left Bank
49.261	4/12/2002	10:52	.261-22	38.0646041	121.5589242	H	Left Bank
49.261	4/12/2002	16:08	.261-99	38.0955929	121.5756154	M	Mid-Channel
49.272	4/10/2002	7:38	RELEASE SITE #2	37.9939186	121.4130964	H	Mid-Channel
49.272	4/10/2002	8:28	.272-1	37.9941626	121.427235	M	Mid-Channel
49.272	4/10/2002	8:56	.272-2	37.9940174	121.4325562	M	Right Bank
49.272	4/10/2002	9:26	.272-3	37.9955767	121.4400278	M	Mid-Channel
49.272	4/10/2002	10:39	.272-4	38.0057019	121.4526495	H	Mid-Channel
49.272	4/10/2002	15:29	.272-5	38.0118827	121.4593995	H	Left Bank
49.272	4/10/2002	16:06	.272-6	38.0130261	121.4593186	H	Left Bank
49.272	4/10/2002	17:07	.272-7	38.0124635	121.4590228	H	Left Bank
49.272	4/10/2002	17:52	.272-8	38.015674	121.4612567	H	Left Bank
49.272	4/10/2002	18:22	.272-9	38.0189214	121.4649366	H	Left Bank
49.272	4/10/2002	18:51	.272-10	38.0244245	121.4674421	H	Left Bank
49.272	4/11/2002	12:50	.272-11	37.9702663	121.532822	M	Mid-Channel
49.272	4/11/2002	14:41	.272-12	37.9708597	121.5283817	M	Left Bank
49.272	4/11/2002	17:23	.272-99	37.9455446	121.5320051	H	Right Bank
49.280	4/10/2002	7:38	RELEASE SITE #2	37.9939186	121.4130964	H	Mid-Channel
49.280	4/10/2002	8:14	.280-1	37.9950088	121.4244724	H	Mid-Channel
49.280	4/10/2002	8:51	.280-2	37.9935886	121.4341938	H	Mid-Channel
49.280	4/10/2002	9:32	.280-3	37.9976093	121.4451551	H	Mid-Channel
49.280	4/10/2002	10:45	.280-4	38.0043808	121.4515611	H	Mid-Channel
49.280	4/10/2002	12:56	.280-5	38.0210268	121.4653598	H	Left Bank
49.280	4/10/2002	15:19	.280-6	38.0175449	121.4623567	H	Mid-Channel
49.280	4/10/2002	16:10	.280-7	38.0178845	121.462828	H	Mid-Channel
49.280	4/10/2002	17:05	.280-8	38.0175848	121.4619571	H	Mid-Channel
49.280	4/10/2002	17:58	.280-9	38.0212175	121.4654697	H	Mid-Channel
49.280	4/10/2002	18:21	.280-10	38.0222637	121.4662226	H	Left Bank
49.280	4/10/2002	18:55	.280-11	38.0260853	121.4766586	H	Mid-Channel
49.280	4/11/2002	7:50	.280-12	38.021392	121.5155577	H	Right Bank
49.280	4/12/2002	7:22	.280-13	38.0464325	121.5353372	M	Left Bank
49.280	4/12/2002	11:37	.280-14	38.0328747	121.5242474	H	Mid-Channel
49.280	4/12/2002	15:36	.280-15	38.0377959	121.528604	H	Right Bank
49.280	4/12/2002	16:42	.280-16	38.0484358	121.5341007	L	Left Bank
49.280	4/12/2002	17:25	.280-99	38.0496957	121.5346796	M	
49.291	4/10/2002	7:38	RELEASE SITE #2	37.9939186	121.4130964	H	Mid-Channel
49.291	4/10/2002	8:10	.291-1	37.9962538	121.4232272	H	Right Bank
49.291	4/10/2002	8:48	.291-2	37.9937517	121.436969	H	Mid-Channel
49.291	4/10/2002	9:35	.291-3	37.9996252	121.447675	H	Mid-Channel
49.291	4/10/2002	10:25	.291-4	38.0109185	121.4566632	M	Mid-Channel
49.291	4/10/2002	12:36	.291-5	38.0233179	121.4641386	H	Right Bank
49.291	4/10/2002	15:36	.291-6	38.0088401	121.455545	H	Mid-Channel
49.291	4/10/2002	16:00	.291-7	38.0079947	121.4549932	H	Mid-Channel
49.291	4/10/2002	17:42	.291-8	38.0026461	121.4580894	H	Mid-Channel
49.291	4/10/2002	18:28	.291-9	38.003221	121.4593188	H	Mid-Channel

Appendix D. Fish Release No. 2 - Telemetry and observational data for 12 radio-tagged juvenile chinook salmon released near Fourteen Mile Slough on the San Joaquin River at 0738 hrs. on April 10, 2002.

Fish #	Date	Military Time	Telemetry Map Location (refer to appendix figures)	Fish Location (via GPS) (WGS 84) Latitude (degrees North)	Fish Location (via GPS) (WGS 84) Longitude (degrees West)	Radio Signal Strength (H=High/M=Med/L=Low)	Position of Fish in Channel Facing Downstream
49.291	4/10/2002	18:44	.291-10	38.0029222	121.4585278	H	Mid-Channel
49.291	4/11/2002	8:30	.291-11	37.9715765	121.5122924	H	Mid-Channel
49.291	4/11/2002	9:11	.291-12	37.9716885	121.5197356	H	Mid-Channel
49.291	4/11/2002	14:45	.291-13	37.9720791	121.5278792	H	Right Bank
49.291	4/12/2002	7:51	.291-14	37.9689646	121.5281804	H	Mid-Channel
49.291	4/12/2002	15:56	.291-99	38.0003343	121.5165632	H	Mid-Channel
49.301	4/10/2002	7:38	RELEASE SITE #2	37.9939186	121.4130964	H	Mid-Channel
49.301	4/10/2002	8:13	.301-1	37.9954301	121.4216163	H	Mid-Channel
49.301	4/10/2002	8:54	.301-2	37.9936509	121.4321085	H	Left Bank
49.301	4/10/2002	9:24	.301-3	37.9947483	121.4387243	H	Mid-Channel
49.301	4/10/2002	10:01	.301-4	38.0010264	121.4493652	H	Mid-Channel
49.301	4/10/2002	12:43	.301-5	38.0293324	121.4754748	H	Mid-Channel
49.301	4/10/2002	15:09	.301-6	38.031057	121.4785153	H	Mid-Channel
49.301	4/10/2002	16:45	.301-7	38.0357735	121.4857443	H	Mid-Channel
49.301	4/10/2002	18:11	.301-8	38.0418358	121.4960462	H	Mid-Channel
49.301	4/10/2002	19:17	.301-9	38.052079	121.5077921	M	Mid-Channel
49.301	4/11/2002	8:16	.301-10	38.0265995	121.5240315	H	Mid-Channel
49.301	4/11/2002	10:20	.301-11	38.0283972	121.5229359	H	Mid-Channel
49.301	4/11/2002	15:12	.301-12	38.0220441	121.5158179	M	Right Bank
49.301	4/11/2002	16:26	.301-13	38.0171416	121.5158257	H	Right Bank
49.301	4/11/2002	16:58	.301-14	38.0161748	121.516335	H	Left Bank
49.301	4/11/2002	17:53	.301-15	38.014141	121.5165697	H	Right Bank
49.301	4/12/2002	8:41	.301-16	38.0310269	121.4782767	H	Mid-Channel
49.301	4/12/2002	15:25	.301-17	38.0476747	121.5345033	H	Mid-Channel
49.301	4/12/2002	16:38	.301-18	38.0410858	121.526487	H	Right Bank
49.301	4/12/2002	17:12	.301-99	38.0409426	121.5265697	H	
49.312	4/10/2002	7:38	RELEASE SITE #2	37.9939186	121.4130964	H	Mid-Channel
49.312	4/10/2002	8:28	.312-1	37.9941626	121.427235	M	Mid-Channel
49.312	4/10/2002	9:31	.312-2	37.9974127	121.4439179	H	Mid-Channel
49.312	4/10/2002	10:10	.312-3	38.0008092	121.4534015	H	Left Bank
49.312	4/10/2002	10:53	.312-4	38.0063769	121.461508	H	Left Bank
49.312	4/10/2002	11:25	.312-5	38.0128632	121.4592651	H	Left Bank
49.312	4/10/2002	12:37	.312-6	38.0252482	121.4684161	H	Mid-Channel
49.312	4/10/2002	15:15	.312-7	38.0191483	121.4636788	H	Mid-Channel
49.312	4/10/2002	16:15	.312-8	38.0200031	121.4635698	H	Mid-Channel
49.312	4/10/2002	17:04	.312-9	38.0189493	121.4629311	H	Mid-Channel
49.312	4/10/2002	17:58	.312-10	38.0201184	121.4648091	H	Mid-Channel
49.312	4/10/2002	18:20	.312-11	38.0222637	121.4662226	H	Left Bank
49.312	4/10/2002	18:52	.312-12	38.0244497	121.4673049	H	Mid-Channel
49.312	4/11/2002	9:07	.312-13	38.0380358	121.4906659	H	Mid-Channel
49.312	4/11/2002	11:14	.312-14	38.0542827	121.5210024	H	Mid-Channel
49.312	4/11/2002	14:10	.312-15	38.0647577	121.5305719	H	Left Bank
49.312	4/11/2002	15:45	.312-16	38.0569177	121.5349459	H	Right Bank
49.312	4/11/2002	16:42	.312-17	38.0549093	121.5235315	H	Mid-Channel
49.312	4/11/2002	17:52	.312-18	38.0528185	121.5099653	H	Mid-Channel
49.312	4/12/2002	7:32	.312-19	38.0364127	121.5275378	H	Left Bank
49.312	4/12/2002	11:01	.312-20	38.0759073	121.5649842	H	Right Bank
49.312	4/12/2002	16:16	.312-99	38.1035084	121.5945652	H	Right Bank
49.320	4/10/2002	7:38	RELEASE SITE #2	37.9939186	121.4130964	H	Mid-Channel
49.320	4/10/2002	9:14	.320-1	37.994983	121.4292787	H	Mid-Channel
49.320	4/10/2002	10:20	.320-2	37.9932424	121.4502352	H	Mid-Channel
49.320	4/10/2002	10:55	.320-3	37.9933853	121.4515076	H	Mid-Channel
49.320	4/10/2002	11:29	.320-4	37.9899298	121.4573878	H	Left Bank
49.320	4/10/2002	12:25	.320-5	37.9845083	121.4700948	H	Right Bank
49.320	4/10/2002	16:05	.320-6	37.9715402	121.4931557	H	Mid-Channel
49.320	4/10/2002	16:35	.320-7	37.9716991	121.5013607	H	Mid-Channel
49.320	4/10/2002	17:05	.320-8	37.9716013	121.5114039	H	Mid-Channel
49.320	4/10/2002	17:42	.320-99	37.971796	121.5204051	H	Mid-Channel

Appendix D. Fish Release No. 2 - Telemetry and observational data for 12 radio-tagged juvenile chinook salmon released near Fourteen Mile Slough on the San Joaquin River at 0738 hrs. on April 10, 2002.

Fish #	Date	Military Time	Telemetry Map Location (refer to appendix figures)	Fish Location (via GPS) (WGS 84) Latitude (degrees North)	Fish Location (via GPS) (WGS 84) Longitude (degrees West)	Radio Signal Strength (H=High/M=Med/L=Low)	Position of Fish in Channel Facing Downstream
49.331	4/10/2002	7:38	RELEASE SITE #2	37.9939186	121.4130964	H	Mid-Channel
49.331	4/10/2002	8:16	.331-1	37.9946344	121.4261203	H	Left Bank
49.331	4/10/2002	8:48	.331-2	37.9937517	121.436969	H	Mid-Channel
49.331	4/10/2002	9:38	.331-3	38.0042416	121.4512565	H	Mid-Channel
49.331	4/10/2002	9:56	.331-4	38.0067181	121.4538582	H	Mid-Channel
49.331	4/10/2002	13:02	.331-5	38.0240323	121.4677807	H	Left Bank
49.331	4/10/2002	15:19	.331-6	38.0184327	121.4633976	H	Mid-Channel
49.331	4/10/2002	16:40	.331-7	38.0264262	121.4702942	H	Mid-Channel
49.331	4/10/2002	18:02	.331-8	38.0314387	121.4787581	H	Mid-Channel
49.331	4/10/2002	19:09	.331-9	38.0416501	121.4984431	H	Mid-Channel
49.331	4/11/2002	7:55	.331-10	38.0218672	121.5153658	M	Right Bank
49.331	4/11/2002	10:37	.331-11	38.0216455	121.5149374	M	Right Bank
49.331	4/11/2002	12:03	.331-12	38.0217432	121.5148215	M	Right Bank
49.331	4/11/2002	15:43	.331-13	38.0213912	121.514783	H	Right Bank
49.331	4/11/2002	16:22	.331-14	38.0213912	121.514783	H	Right Bank
49.331	4/11/2002	17:07	.331-15	38.0214195	121.514885	H	Left Bank
49.331	4/11/2002	17:57	.331-16	38.0214909	121.5148266	H	Right Bank
49.331	4/12/2002	7:09	.331-17	38.0213964	121.515193	H	Right Bank
49.331	4/12/2002	9:12	.331-18	38.0214919	121.5149063	H	Right Bank
49.331	4/12/2002	12:27	.331-19	38.0215836	121.5157475	L	Right Bank
49.331	4/12/2002	14:56	.331-20	38.0212777	121.5150701	H	Right Bank
49.331	4/12/2002	17:45	.331-99	38.0212764	121.5149676	H	Right Bank
49.444	4/10/2002	7:38	RELEASE SITE #2	37.9939186	121.4130964	H	Mid-Channel
49.444	4/10/2002	9:00	.444-1	37.9936637	121.4323929	L	Mid-Channel
49.444	4/10/2002	9:20	.444-2	37.9943228	121.4372188	H	Mid-Channel
49.444	4/10/2002	10:49	.444-3	38.0008988	121.4533654	H	Left Bank
49.444	4/10/2002	11:28	.444-4	38.0031826	121.4591374	H	Left Bank
49.444	4/10/2002	13:08	.444-5	38.0029013	121.4596786	H	Left Bank
49.444	4/10/2002	15:38	.444-6	37.9969436	121.4452489	H	Left Bank
49.444	4/10/2002	16:25	.444-7	37.993811	121.4387214	H	Left Bank
49.444	4/10/2002	17:17	.444-8	37.9939116	121.4307022	H	Mid-Channel
49.444	4/10/2002	18:36	.444-9	37.9948424	121.4181214	H	Mid-Channel
49.444	4/11/2002	9:38	.444-10	37.9987285	121.4514294	H	Mid-Channel
49.444	4/11/2002	9:55	.444-11	37.9974584	121.4521622	H	Mid-Channel
49.444	4/11/2002	12:40	.444-12	37.9949173	121.4405884	H	Mid-Channel
49.444	4/11/2002	16:12	.444-13	37.9911226	121.404935	H	Mid-Channel
49.444	4/12/2002	9:17	.444-14	37.9925484	121.4352636	H	Left Bank
49.444	4/12/2002	9:50	.444-15	37.9965962	121.4435138	H	Mid-Channel
49.444	4/12/2002	14:53	.444-16	37.9911351	121.4558366	H	Left Bank
49.444	4/12/2002	16:45	.444-17	37.9816037	121.4747436	H	Left Bank
49.444	4/12/2002	17:07	.444-99	37.9790874	121.4745908	H	Mid-Channel

Appendix D. Fish Release No. 3 - Telemetry and observational data for 13 radio-tagged juvenile chinook salmon released near Fourteen Mile Slough on the San Joaquin River at 0751 hrs. on April 16 2002.

Fish #	Date	Military Time	Telemetry Map Location (refer to appendix figures)	Fish Location (via GPS) (WGS 84) Latitude (degrees North)	(WGS 84) Longitude (degrees West)	Radio Signal Strength (H=High/M=Med/L=Low)	Position of Fish in Channel Facing Downstream
49.165	4/16/2002	7:51	RELEASE SITE #3	37.9941076	121.413081	H	Mid-Channel
49.165	4/16/2002	8:42	.165-1	37.9957029	121.4217927	H	Mid-Channel
49.165	4/16/2002	10:13	.165-2	38.0017067	121.4497039	H	Mid-Channel
49.165	4/16/2002	11:29	.165-3	38.0074893	121.4542521	H	Left Bank
49.165	4/16/2002	13:35	.165-4	38.0268676	121.4716636	H	Mid-Channel
49.165	4/16/2002	14:43	.165-5	38.0425743	121.4974214	H	Mid-Channel
49.165	4/16/2002	15:11	.165-6	38.0476785	121.5033343	H	Mid-Channel
49.165	4/16/2002	17:01	.165-7	38.0555051	121.5308025	H	Mid-Channel
49.165	4/17/2002	7:57	.165-8	37.9995207	121.4506839	H	Mid-Channel
49.165	4/17/2002	12:16	.165-9	37.9716745	121.4846715	H	Mid-Channel
49.165	4/17/2002	13:37	.165-10	37.9716922	121.5036492	H	Mid-Channel
49.165	4/17/2002	15:08	.165-11	37.97177	121.5219198	H	Mid-Channel
49.165	4/17/2002	17:23	.165-12	37.9604836	121.5295791	H	Mid-Channel
49.165	4/18/2002	9:08	.165-99	37.9206139	121.5166987	M	Left Bank
49.175	4/16/2002	7:51	RELEASE SITE #3	37.9941076	121.413081	H	Mid-Channel
49.175	4/16/2002	9:20	.175-1	37.9948629	121.4283816	H	Mid-Channel
49.175	4/16/2002	10:41	.175-2	38.0064816	121.4530089	H	Mid-Channel
49.175	4/16/2002	11:31	.175-3	38.0124214	121.4578733	H	Mid-Channel
49.175	4/16/2002	13:03	.175-4	38.0284355	121.4737274	H	Mid-Channel
49.175	4/16/2002	14:01	.175-5	38.0376476	121.4885088	M	Right Bank
49.175	4/16/2002	15:17	.175-6	38.0470407	121.5027889	M	Mid-Channel
49.175	4/16/2002	16:53	.175-7	38.0546834	121.5141901	M	Right Bank
49.175	4/17/2002	7:33	.175-8	38.0373063	121.486499	H	Right Bank
49.175	4/17/2002	10:17	.175-9	38.0543797	121.5186868	H	Mid-Channel
49.175	4/17/2002	12:31	.175-10	38.0596935	121.5553389	H	Mid-Channel
49.175	4/18/2002	8:10	.175-11	38.09139	121.5760847	L	Mid-Channel
49.175	4/18/2002	11:32	.175-12	38.0993166	121.5854536	M	Right Bank
49.175	4/19/2002	8:39	.175-99	38.0887395	121.6479482	H	Mid-Channel
49.341	4/16/2002	7:51	RELEASE SITE #3	37.9941076	121.413081	H	Mid-Channel
49.341	4/16/2002	10:34	.341-1	37.9990933	121.4469801	H	Mid-Channel
49.341	4/16/2002	11:18	.341-2	38.0058298	121.4534668	H	Left Bank
49.341	4/16/2002	13:47	.341-3	38.0203558	121.463665	H	Mid-Channel
49.341	4/16/2002	14:27	.341-4	38.0272012	121.472363	H	Mid-Channel
49.341	4/16/2002	15:00	.341-5	38.0322959	121.4802329	H	Mid-Channel
49.341	4/16/2002	17:11	.341-6	38.0430825	121.4969894	H	Right Bank
49.341	4/17/2002	10:19	.341-7	38.0396276	121.493915	H	Left Bank
49.341	4/17/2002	10:44	.341-8	38.0389337	121.4925162	H	Left Bank
49.341	4/17/2002	13:03	.341-9	38.0396131	121.4934936	M	Left Bank
49.341	4/17/2002	14:39	.341-10	38.0392101	121.4929891	L	Left Bank
49.341	4/18/2002	7:12	.341-11	38.0361311	121.4876171	M	Mid-Channel
49.341	4/18/2002	10:52	.341-12	38.0359186	121.4872112	M	Left Bank
49.341	4/18/2002	17:27	.341-13	38.0444918	121.5036157	L	Left Bank
49.341	4/19/2002	7:33	.341-14	38.039665	121.4940281	L	Left Bank
49.341	4/19/2002	12:48	.341-99	38.0388865	121.4923462	L	Left Bank
49.352	4/16/2002	7:51	RELEASE SITE #3	37.9941076	121.413081	H	Mid-Channel
49.352	4/16/2002	8:47	.352-1	37.9943302	121.4283132	H	Mid-Channel
49.352	4/16/2002	9:25	.352-2	37.9987248	121.4456896	H	Mid-Channel
49.352	4/16/2002	10:03	.352-3	38.0003791	121.4522261	H	Mid-Channel
49.352	4/16/2002	11:07	.352-4	38.0026347	121.4579074	H	Mid-Channel
49.352	4/16/2002	11:55	.352-5	38.0024412	121.4575812	H	Mid-Channel
49.352	4/16/2002	13:57	.352-6	38.0015647	121.4560279	H	Mid-Channel
49.352	4/16/2002	15:10	.352-7	38.0044168	121.4611731	H	Mid-Channel
49.352	4/16/2002	15:41	.352-8	38.0009802	121.4540698	H	Mid-Channel
49.352	4/17/2002	8:07	.352-9	37.9936983	121.4363438	H	Mid-Channel
49.352	4/17/2002	11:00	.352-10	38.0112736	121.4576239	H	Left Bank
49.352	4/17/2002	15:33	.352-11	37.9953494	121.4521496	H	Mid-Channel
49.352	4/17/2002	17:59	.352-12	37.9829534	121.4745791	H	North Bank
49.352	4/18/2002	7:45	.352-13	37.9629562	121.5298371	H	Mid-Channel
49.352	4/18/2002	14:45	.352-99	37.9228276	121.5243223	H	Mid-Channel
49.362	4/16/2002	7:51	RELEASE SITE #3	37.9941076	121.413081	H	Mid-Channel
49.362	4/16/2002	8:20	.362-1	37.9952243	121.4177032	H	Mid-Channel
49.362	4/16/2002	10:40	.362-2	37.9936072	121.4349108	H	Mid-Channel

Appendix D. Fish Release No. 3 - Telemetry and observational data for 13 radio-tagged juvenile chinook salmon released near Fourteen Mile Slough on the San Joaquin River at 0751 hrs. on April 16 2002.

Fish #	Date	Military Time	Telemetry Map Location (refer to appendix figures)	Fish Location (via GPS) (WGS 84) Latitude (degrees North)	Fish Location (via GPS) (WGS 84) Longitude (degrees West)	Radio Signal Strength (H=High/M=Med/L=Low)	Position of Fish in Channel Facing Downstream
49.362	4/16/2002	11:31	.362-3	37.9988771	121.4456181	H	Mid-Channel
49.362	4/16/2002	12:51	.362-4	38.0128723	121.457898	H	Mid-Channel
49.362	4/16/2002	14:41	.362-5	38.0334351	121.4833086	H	Mid-Channel
49.362	4/16/2002	17:27	.362-6	38.0425792	121.4949826	H	Right Bank
49.362	4/17/2002	9:46	.362-7	38.0428111	121.4919809	H	Right Bank
49.362	4/17/2002	10:37	.362-8	38.0394129	121.4919366	H	Mid-Channel
49.362	4/17/2002	12:13	.362-9	38.0467926	121.5031244	H	Mid-Channel
49.362	4/17/2002	14:51	.362-99	38.0565673	121.5364801	H	Mid-Channel
49.372	4/16/2002	7:51	RELEASE SITE #3	37.9941076	121.413081	H	Mid-Channel
49.372	4/16/2002	8:28	.372-1	37.9948293	121.415138	M	Mid-Channel
49.372	4/16/2002	10:17	.372-2	37.9972038	121.4444804	H	Mid-Channel
49.372	4/16/2002	11:18	.372-3	37.9934919	121.4520748	H	Mid-Channel
49.372	4/16/2002	12:37	.372-4	37.9923756	121.4535331	H	Mid-Channel
49.372	4/16/2002	14:08	.372-5	37.9928606	121.4527257	H	Mid-Channel
49.372	4/16/2002	15:16	.372-6	37.992253	121.4538089	H	Mid-Channel
49.372	4/16/2002	16:35	.372-7	37.9910578	121.4561229	H	Mid-Channel
49.372	4/16/2002	17:38	.372-8	37.9903615	121.4586883	H	Mid-Channel
49.372	4/18/2002	8:25	.372-99	37.913998	121.5638472	H	Mid-Channel
49.382	4/16/2002	7:51	RELEASE SITE #3	37.9941076	121.413081	H	Mid-Channel
49.382	4/16/2002	8:47	.382-1	37.9950043	121.4275017	H	Mid-Channel
49.382	4/16/2002	10:04	.382-2	37.999936	121.4514268	H	Mid-Channel
49.382	4/16/2002	11:15	.382-3	37.99637	121.4523217	H	Mid-Channel
49.382	4/16/2002	12:36	.382-4	37.9928813	121.4529303	H	Mid-Channel
49.382	4/16/2002	14:10	.382-5	37.9909214	121.4560347	H	Mid-Channel
49.382	4/16/2002	15:19	.382-6	37.9899013	121.4600188	H	Mid-Channel
49.382	4/16/2002	16:37	.382-7	37.986424	121.4670261	H	Mid-Channel
49.382	4/16/2002	17:46	.382-8	37.9844924	121.4702545	H	Left Bank
49.382	4/17/2002	8:41	.382-9	37.9687661	121.5288788	H	Mid-Channel
49.382	4/17/2002	12:27	.382-10	37.9708315	121.5268453	H	Mid-Channel
49.382	4/17/2002	13:32	.382-11	37.9693941	121.5279328	H	Mid-Channel
49.382	4/17/2002	15:04	.382-12	37.9688599	121.5284557	H	Mid-Channel
49.382	4/17/2002	17:21	.382-13	37.9673018	121.5306953	H	Mid-Channel
49.382	4/17/2002	17:39	.382-14	37.9658399	121.5305423	H	Left Bank
49.382	4/18/2002	8:17	.382-15	37.9140232	121.5344633	H	Right Bank
49.382	4/19/2002	16:04	.382-99	37.8903843	121.5711408	M	Mid-Channel
49.392	4/16/2002	7:51	RELEASE SITE #3	37.9941076	121.413081	H	Mid-Channel
49.392	4/16/2002	8:44	.392-1	37.9950882	121.4263611	H	Mid-Channel
49.392	4/16/2002	10:05	.392-2	38.0011117	121.4537937	H	Mid-Channel
49.392	4/16/2002	11:02	.392-3	38.0061038	121.4619921	H	Mid-Channel
49.392	4/16/2002	11:53	.392-4	38.0038157	121.4606845	H	Mid-Channel
49.392	4/16/2002	13:52	.392-5	38.0079824	121.4609277	H	Mid-Channel
49.392	4/16/2002	15:10	.392-6	38.0044168	121.4611731	H	Mid-Channel
49.392	4/16/2002	15:45	.392-7	38.0015869	121.4549796	H	Mid-Channel
49.392	4/16/2002	16:41	.392-8	37.9977086	121.4519975	H	Mid-Channel
49.392	4/16/2002	17:35	.392-9	37.9935778	121.4517541	H	Mid-Channel
49.392	4/16/2002	17:55	.392-10	37.9926846	121.4530483	H	Mid-Channel
49.392	4/17/2002	8:26	.392-11	37.9773525	121.3805612	H	Right Bank
49.392	4/17/2002	11:40	.392-12	37.9954746	121.4235855	H	Mid-Channel
49.392	4/17/2002	16:13	.392-13	38.0217076	121.4650494	H	Mid-Channel
49.392	4/17/2002	18:11	.392-14	38.0158157	121.4603766	H	Mid-Channel
49.392	4/18/2002	16:07	.392-99	38.0359388	121.4755201	H	Right Bank
49.402	4/16/2002	7:51	RELEASE SITE #3	37.9941076	121.413081	H	Mid-Channel
49.402	4/16/2002	8:28	.402-1	37.9946264	121.4141289	H	Mid-Channel
49.402	4/16/2002	10:30	.402-2	37.9971857	121.4431141	H	Mid-Channel
49.402	4/16/2002	11:13	.402-3	37.9995267	121.4497726	H	Left Bank
49.402	4/16/2002	12:37	.402-4	37.9926298	121.4529925	H	Mid-Channel
49.402	4/16/2002	14:10	.402-5	37.9909214	121.4560347	H	Mid-Channel
49.402	4/16/2002	15:22	.402-6	37.9845834	121.4696263	H	Mid-Channel
49.402	4/16/2002	16:33	.402-7	37.9876839	121.4634357	H	Left Bank
49.402	4/16/2002	17:43	.402-99	37.9843948	121.4703704	H	Mid-Channel

Appendix D. Fish Release No. 3 - Telemetry and observational data for 13 radio-tagged juvenile chinook salmon released near Fourteen Mile Slough on the San Joaquin River at 0751 hrs. on April 16 2002.

Fish #	Date	Military Time	Telemetry Map Location (refer to appendix figures)	Fish Location (via GPS) (WGS 84) Latitude (degrees North)	Fish Location (via GPS) (WGS 84) Longitude (degrees West)	Radio Signal Strength (H=High/M=Med/L=Low)	Position of Fish in Channel Facing Downstream
49.413	4/16/2002	7:51	RELEASE SITE #3	37.9941076	121.413081	H	Mid-Channel
49.413	4/16/2002	8:40	.413.1	37.9955475	121.418949	H	Mid-Channel
49.413	4/16/2002	10:13	.413-2	38.0017989	121.4498615	H	Mid-Channel
49.413	4/16/2002	11:23	.413-3	38.0052464	121.4522832	H	Mid-Channel
49.413	4/16/2002	13:40	.413-4	38.0243965	121.4673743	M	Mid-Channel
49.413	4/16/2002	14:34	.413-5	38.0338751	121.4824905	H	Mid-Channel
49.413	4/16/2002	17:22	.413-6	38.0403601	121.494823	M	Mid-Channel
49.413	4/17/2002	7:20	.413-7	38.0381167	121.4899463	H	Mid-Channel
49.413	4/17/2002	10:26	.413-8	38.0559312	121.5324467	H	Mid-Channel
49.413	4/17/2002	12:35	.413-9	38.0636613	121.5584754	H	Mid-Channel
49.413	4/18/2002	8:04	.413-10	38.0922443	121.5737076	H	Right Bank
49.413	4/19/2002	8:18	.413-99	38.0945147	121.5788636	H	Left Bank
49.426	4/16/2002	7:51	RELEASE SITE #3	37.9941076	121.413081	H	Mid-Channel
49.426	4/16/2002	8:20	.426-1	37.9956721	121.4181605	H	Mid-Channel
49.426	4/16/2002	10:07	.426-2	38.0016718	181.4552626	H	Mid-Channel
49.426	4/16/2002	11:04	.426-3	38.0056855	121.4617047	H	Mid-Channel
49.426	4/16/2002	11:47	.426-4	38.0081835	121.4611399	H	Mid-Channel
49.426	4/16/2002	13:55	.426-5	38.0073893	121.461054	L	Left Bank
49.426	4/16/2002	15:08	.426-6	38.007603	121.4608559	H	Right Bank
49.426	4/16/2002	15:48	.426-7	38.0075432	121.4611077	H	Mid-Channel
49.426	4/16/2002	16:49	.426-8	38.0112117	121.4577164	H	Left Bank
49.426	4/16/2002	17:28	.426-9	38.0116197	121.4585849	H	Left Bank
49.426	4/17/2002	8:37	.426-10	37.9703305	121.5257055		
49.426	4/17/2002	12:42	.426-11	37.9613031	121.5295286	H	East Bank
49.426	4/17/2002	13:29	.426-12	37.9623678	121.5296326	H	East Bank
49.426	4/17/2002	15:00	.426-13	37.9605734	121.5295545	H	Mid-Channel
49.426	4/17/2002	17:25	.426-99	37.9588763	121.5286095	H	Mid-Channel
49.439	4/16/2002	7:51	RELEASE SITE #3	37.9941076	121.413081	H	Mid-Channel
49.439	4/16/2002	8:28	.439-1	37.9948293	121.415138	H	Mid-Channel
49.439	4/16/2002	10:15	.439-2	37.9986277	121.446523	H	Mid-Channel
49.439	4/16/2002	11:10	.439-3	38.0008284	121.4534922	H	Mid-Channel
49.439	4/16/2002	11:51	.439-4	38.0065929	121.4614921	H	Mid-Channel
49.439	4/16/2002	13:28	.439-5	38.025846	121.4707164	H	Mid-Channel
49.439	4/16/2002	14:40	.439-6	38.0430091	121.4990079	H	Mid-Channel
49.439	4/16/2002	15:14	.439-7	38.0503709	121.5059919	H	Mid-Channel
49.439	4/16/2002	16:59	.439-8	38.0554627	121.5281363	M	Mid-Channel
49.439	4/17/2002	7:35	.439-9	38.0349599	121.4855446	H	Mid-Channel
49.439	4/17/2002	10:17	.439-10	38.0543797	121.5186868	H	Mid-Channel
49.439	4/17/2002	12:34	.439-99	38.0623446	121.5583986	H	Mid-Channel
49.458	4/16/2002	7:51	RELEASE SITE #3	37.9941076	121.413081	H	Mid-Channel
49.458	4/16/2002	8:42	.458-1	37.9957029	121.4217927	H	Mid-Channel
49.458	4/16/2002	10:15	.458-2	37.9986277	121.446523	H	Left Bank
49.458	4/16/2002	11:44	.458-3	38.0052018	121.4523183	L	Mid-Channel
49.458	4/16/2002	12:53	.458-4	38.0157508	121.4595464	M	Mid-Channel
49.458	4/16/2002	14:32	.458-5	38.0309665	121.477788	H	Mid-Channel
49.458	4/16/2002	14:59	.458-6	38.0325263	121.480627	H	Mid-Channel
49.458	4/16/2002	17:15	.458-7	38.0361354	121.4872523	H	Mid-Channel
49.458	4/19/2002	13:12	.458-8	38.0286251	121.4897994	L	Left Bank
49.458	4/19/2002	14:25	.458-9	38.0286251	121.4897994	L	Left Bank
49.458	4/19/2002	16:47	.458-99	38.0283517	121.4895658		Left Bank

Appendix D. Fish Release No. 4 - Telemetry and observational data for 12 radio-tagged juvenile chinook salmon released near Fourteen Mile Slough on the San Joaquin River at 0720 hrs. on April 23 2002.

Fish #	Date	Military Time	Telemetry Map Location (refer to appendix figures)	Fish Location (via GPS) (WGS 84) Latitude (degrees North)	Fish Location (via GPS) (WGS 84) Longitude (degrees West)	Radio Signal Strength (H=High/M=Med/L=Low)	Position of Fish in Channel Facing Downstream
49.004	4/23/2002	7:20	RELEASE SITE #4	37.9942225	121.4135796	H	Mid-Channel
49.004	4/23/2002	8:07	.004-1	37.9951903	121.4191958	H	Mid-Channel
49.004	4/23/2002	8:44	.004-2	37.994195	121.4296599	H	Mid-Channel
49.004	4/23/2002	9:30	.004-3	37.9960606	121.4411792	H	Mid-Channel
49.004	4/23/2002	11:07	.004-4	37.9967652	121.4413009	M	Right Bank
49.004	4/23/2002	12:32	.004-5	37.997356	121.4423589	L	Right Bank
49.004	4/23/2002	13:33	.004-6	37.9970586	121.4423652	L	Right Bank
49.004	4/23/2002	14:43	.004-7	37.9974096	121.4423236	L	Right Bank
49.004	4/23/2002	15:55	.004-8	37.9974458	121.4423342	L	Right Bank
49.004	4/23/2002	16:33	.004-9	38.0019179	121.4499956	L	Mid-Channel
49.004	4/23/2002	18:08	.004-10	38.0240022	121.4668471	L	Mid-Channel
49.004	4/24/2002	9:24	.004-11	38.0388887	121.4827175	H	Mid-Channel
49.004	4/24/2002	11:28	.004-12	38.0386757	121.4829726	H	Mid-Channel
49.004	4/24/2002	15:26	.004-13	38.0388099	121.48289	H	Mid-Channel
49.004	4/24/2002	16:53	.004-14	38.0385376	121.4834426	H	Mid-Channel
49.004	4/25/2002	7:16	.004-15	38.0384775	121.4829767	H	Mid-Channel
49.004	4/25/2002	12:42	.004-16	38.0383732	121.4832751	H	Mid-Channel
49.004	4/25/2002	15:17	.004-17	38.0381435	121.4836331	H	Mid-Channel
49.004	4/25/2002	16:40	.004-18	38.0382687	121.4835507	M	Mid-Channel
49.004	4/25/2002	17:48	.004-19	38.0384035	121.4835251	M	Mid-Channel
49.004	4/26/2002	7:22	.004-20	38.0384673	121.4837945	H	Mid-Channel
49.004	4/26/2002	11:17	.004-21	38.038535	121.4834512	H	Mid-Channel
49.004	4/27/2002	13:58	.004-99	38.0385029	121.4828508	H	Mid-Channel
49.014	4/23/2002	7:20	RELEASE SITE #4	37.9942225	121.4135796	H	Mid-Channel
49.014	4/23/2002	8:12	.014-1	37.9951442	121.4191171	H	Mid-Channel
49.014	4/23/2002	8:40	.014-2	37.995005	121.4255315	H	Mid-Channel
49.014	4/23/2002	9:28	.014-3	37.9966857	121.4427831	H	Mid-Channel
49.014	4/23/2002	10:20	.014-4	37.9995925	121.4479263	H	Mid-Channel
49.014	4/23/2002	11:23	.014-5	37.9977958	121.4449462	H	Mid-Channel
49.014	4/23/2002	12:07	.014-6	37.9943434	121.4286204	H	Mid-Channel
49.014	4/23/2002	13:50	.014-7	37.9940833	121.429389	H	Mid-Channel
49.014	4/23/2002	14:17	.014-8	37.9938269	121.433141	H	Mid-Channel
49.014	4/23/2002	15:30	.014-9	37.9973403	121.4438967	H	Mid-Channel
49.014	4/23/2002	16:37	.014-10	38.0080778	121.4544561	H	Mid-Channel
49.014	4/23/2002	17:24	.014-11	38.0186895	121.4630504	H	Mid-Channel
49.014	4/24/2002	9:17	.014-12	38.0563929	121.5318903	H	Mid-Channel
49.014	4/24/2002	9:52	.014-13	38.0572565	121.5448096	H	Mid-Channel
49.014	4/24/2002	10:42	.014-14	38.066349	121.5579097	H	Mid-Channel
49.014	4/24/2002	12:12	.014-15	38.0676217	121.5602786	H	Left Bank
49.014	4/24/2002	17:14	.014-16	38.057709	121.5464192	H	Mid-Channel
49.014	4/24/2002	17:50	.014-99	38.0664773	121.5588191	H	Mid-Channel
49.024	4/23/2002	7:20	RELEASE SITE #4	37.9942225	121.4135796	H	Mid-Channel
49.024	4/23/2002	8:11	.024-1	37.9951809	121.4191619	H	Mid-Channel
49.024	4/23/2002	9:33	.024-2	37.9938915	121.4318984	H	Mid-Channel
49.024	4/23/2002	10:22	.024-3	37.9991612	121.4473431	H	Mid-Channel
49.024	4/23/2002	11:23	.024-4	37.9978018	121.4447183	H	Mid-Channel
49.024	4/23/2002	12:01	.024-5	37.9979956	121.4450672	H	Mid-Channel
49.024	4/23/2002	13:39	.024-6	37.9973945	121.4439069	H	Mid-Channel
49.024	4/23/2002	14:20	.024-7	37.9995961	121.4475162	H	Mid-Channel
49.024	4/23/2002	15:36	.024-8	38.0025575	121.4513489	H	Left Bank
49.024	4/23/2002	16:42	.024-9	38.015979	121.4611478	H	Left Bank
49.024	4/23/2002	17:26	.024-10	38.0217723	121.4651733	H	Mid-Channel
49.024	4/23/2002	18:06	.024-11	38.0219082	121.4652275	H	Mid-Channel
49.024	4/24/2002	7:59	.024-12	38.0202532	121.4647835	H	Mid-Channel
49.024	4/24/2002	9:05	.024-13	38.0217856	121.4648085	H	Mid-Channel
49.024	4/24/2002	11:47	.024-14	38.0237262	121.465725	H	Right Bank
49.024	4/24/2002	14:19	.024-15	38.0012621	121.4487908	H	Right Bank
49.024	4/24/2002	16:11	.024-16	38.0078034	121.4541543	H	Mid-Channel
49.024	4/24/2002	16:34	.024-17	38.0068369	121.4532976	H	Mid-Channel
49.024	4/25/2002	7:22	.024-18	38.0336173	121.4827693	H	Mid-Channel
49.024	4/25/2002	12:10	.024-19	38.0609217	121.5570131	R	Mid-Channel

Appendix D. Fish Release No. 4 - Telemetry and observational data for 12 radio-tagged juvenile chinook salmon released near Fourteen Mile Slough on the San Joaquin River at 0720 hrs. on April 23 2002.

Fish #	Date	Military Time	Telemetry Map Location (refer to appendix figures)	Fish Location (via GPS) (WGS 84) Latitude (degrees North)	Fish Location (via GPS) (WGS 84) Longitude (degrees West)	Radio Signal Strength (H=High/M=Med/L=Low)	Position of Fish in Channel Facing Downstream
49.024	4/25/2002	13:36	.024-20	38.0587341	121.5528046	H	Mid-Channel
49.024	4/25/2002	15:02	.024-21	38.0612677	121.5485145	H	Right Bank
49.024	4/25/2002	16:12	.024-22	38.0603693	121.5553256	H	Mid-Channel
49.024	4/25/2002	17:26	.024-23	38.0638125	121.5561128	H	Mid-Channel
49.024	4/25/2002	17:58	.024-24	38.0709614	121.5614443	H	Left Bank
49.024	4/26/2002	8:08	.024-25	38.0933571	121.6311227	H	Mid-Channel
49.024	4/26/2002	12:46	.024-99	38.0472819	121.6964851	H	Mid-Channel
49.034	4/23/2002	7:20	RELEASE SITE #4	37.9942225	121.4135796	H	Mid-Channel
49.034	4/23/2002	8:53	.034-1	37.99504	121.4254511	M	Mid-Channel
49.034	4/23/2002	9:40	.034-2	37.9942236	121.4392479	H	Mid-Channel
49.034	4/23/2002	10:27	.034-3	37.9939931	121.4374991	H	Mid-Channel
49.034	4/23/2002	11:12	.034-4	37.9955164	121.4402341	H	Mid-Channel
49.034	4/23/2002	12:20	.034-5	37.9961722	121.4414387	H	Mid-Channel
49.034	4/23/2002	13:46	.034-6	38.0014099	121.449061	H	Right Bank
49.034	4/23/2002	14:33	.034-7	38.0074633	121.4536489	M	Mid-Channel
49.034	4/23/2002	15:41	.034-8	38.0151521	121.4599348	H	Mid-Channel
49.034	4/23/2002	17:31	.034-9	38.0302073	121.4769264	H	Mid-Channel
49.034	4/23/2002	18:25	.034-10	38.0376576	121.4899899	H	Mid-Channel
49.034	4/24/2002	7:57	.034-11	38.0577977	121.5484918	H	Mid-Channel
49.034	4/24/2002	8:54	.034-12	38.0700177	121.559445	H	Mid-Channel
49.034	4/24/2002	10:23	.034-13	38.0975382	121.5866967	H	Left Bank
49.034	4/24/2002	14:47	.034-99	38.0976904	121.5813794	H	Mid-Channel
49.045	4/23/2002	7:20	RELEASE SITE #4	37.9942225	121.4135796	H	Mid-Channel
49.045	4/23/2002	8:07	.045-1	37.9951903	121.4191958	H	Mid-Channel
49.045	4/23/2002	8:39	.045-2	37.995005	121.4255315	M	Mid-Channel
49.045	4/23/2002	9:34	.045-3	37.9939367	121.4312369	H	Left Bank
49.045	4/23/2002	10:29	.045-4	37.9939692	121.4296192	H	Mid-Channel
49.045	4/23/2002	11:19	.045-5	37.9954546	121.4241098	H	Mid-Channel
49.045	4/23/2002	12:11	.045-6	37.9950069	121.4169449	H	Mid-Channel
49.045	4/23/2002	14:04	.045-7	37.9940825	121.4105534	H	Mid-Channel
49.045	4/23/2002	15:17	.045-8	37.9953494	121.4182927	H	Mid-Channel
49.045	4/23/2002	16:28	.045-9	37.9946612	121.430151	H	Mid-Channel
49.045	4/23/2002	17:12	.045-10	37.9954742	121.4404513	H	Mid-Channel
49.045	4/23/2002	17:59	.045-11	38.0001241	121.4485984	H	Mid-Channel
49.045	4/24/2002	7:58	.045-12	38.0230235	121.4664346	L	Left Bank
49.045	4/24/2002	9:20	.045-13	38.0353801	121.4859803	L	Mid-Channel
49.045	4/24/2002	11:13	.045-14	38.0457865	121.5026663	L	Left Bank
49.045	4/24/2002	15:34	.045-15	38.0305757	121.478229	H	Mid-Channel
49.045	4/24/2002	16:55	.045-16	38.0358774	121.4868133	H	Mid-Channel
49.045	4/24/2002	18:04	.045-17	38.0467906	121.5029649	H	Mid-Channel
49.045	4/25/2002	8:26	.045-18	38.1020678	121.60147	H	Mid-Channel
49.045	4/25/2002	14:51	.045-99	38.0881409	121.6413685	H	Mid-Channel
49.054	4/23/2002	7:20	RELEASE SITE #4	37.9942225	121.4135796	H	Mid-Channel
49.054	4/23/2002	8:20	.054-1	37.9952603	121.4190349	H	Mid-Channel
49.054	4/23/2002	9:36	.054-2	37.9937521	121.4329377	H	Mid-Channel
49.054	4/23/2002	10:26	.054-3	37.9953397	121.4398278	H	Mid-Channel
49.054	4/23/2002	11:14	.054-4	37.9957556	121.4406048	H	Mid-Channel
49.054	4/23/2002	11:57	.054-5	37.9979483	121.4455807	H	Mid-Channel
49.054	4/23/2002	13:42	.054-6	38.0023945	121.4499172	H	Mid-Channel
49.054	4/23/2002	14:28	.054-7	38.0086467	121.4552301	H	Mid-Channel
49.054	4/23/2002	15:39	.054-8	38.0133875	121.4586959	H	Mid-Channel
49.054	4/23/2002	17:50	.054-9	38.0343962	121.47055	H	Mid-Channel
49.054	4/23/2002	18:33	.054-10	38.0359543	121.4753261	H	Mid-Channel
49.054	4/24/2002	7:44	.054-11	38.0520798	121.5085671	H	Mid-Channel
49.054	4/24/2002	11:05	.054-12	38.0632407	121.5433688	L	Mid-Channel
49.054	4/24/2002	11:28	.054-13	38.0619731	121.5457991	M	Mid-Channel
49.054	4/24/2002	12:20	.054-14	38.0570528	121.5414627	H	Mid-Channel
49.054	4/24/2002	14:50	.054-15	38.0439926	121.5304743	M	Left Bank
49.054	4/24/2002	16:10	.054-16	38.0413796	121.5261963	M	Right Bank
49.054	4/24/2002	17:31	.054-17	38.0478117	121.5346487	M	Left Bank

Appendix D. Fish Release No. 4 - Telemetry and observational data for 12 radio-tagged juvenile chinook salmon released near Fourteen Mile Slough on the San Joaquin River at 0720 hrs. on April 23 2002.

Fish #	Date	Military Time	Telemetry Map Location (refer to appendix figures)	Fish Location (via GPS) (WGS 84) Latitude (degrees North)	Fish Location (via GPS) (WGS 84) Longitude (degrees West)	Radio Signal Strength (H=High/M=Med/L=Low)	Position of Fish in Channel Facing Downstream
49.054	4/24/2002	17:56	.054-18	38.0553137	121.5356845	H	Left Bank
49.054	4/25/2002	8:35	.054-19	38.1041231	121.6152083	H	Mid-Channel
49.054	4/26/2002	8:27	.054-99	38.0502757	21.6917706	H	Mid-Channel
49.065	4/23/2002	7:20	RELEASE SITE #4	37.9942225	121.4135796	H	Mid-Channel
49.065	4/23/2002	9:13	.065-1	37.9954329	121.4251807	L	Right Bank
49.065	4/23/2002	10:00	.065-2	37.9941392	121.4295244	H	Mid-Channel
49.065	4/23/2002	11:53	.065-3	37.9949172	121.4163091	M	Mid-Channel
49.065	4/23/2002	13:59	.065-4	37.9938753	121.4138945	H	Left Bank
49.065	4/23/2002	15:06	.065-5	37.9928788	121.4108413	H	Left Bank
49.065	4/23/2002	16:56	.065-6	37.9950983	121.423753	M	Mid-Channel
49.065	4/23/2002	17:57	.065-7	37.9940056	121.4309963	L	Mid-Channel
49.065	4/24/2002	8:14	.065-8	38.0036061	121.4515888	H	Mid-Channel
49.065	4/24/2002	9:00	.065-9	38.0053392	121.4524863	H	Mid-Channel
49.065	4/24/2002	12:17	.065-10	38.0064612	121.4535105	M	Left Bank
49.065	4/24/2002	14:16	.065-11	37.9978136	121.4456177	M	Mid-Channel
49.065	4/24/2002	16:31	.065-12	38.002086	121.4497643	M	Right Bank
49.065	4/25/2002	7:35	.065-13	38.0079811	121.4546404	H	Mid-Channel
49.065	4/25/2002	10:28	.065-14	38.0142413	121.4598969	M	Mid-Channel
49.065	4/25/2002	13:01	.065-15	38.0018986	121.4505883	H	Left Bank
49.065	4/25/2002	15:30	.065-16	37.9933893	121.4341183	H	Mid-Channel
49.065	4/25/2002	16:53	.065-17	37.995014	121.439049	M	Mid-Channel
49.065	4/26/2002	11:02	.065-99	38.0157982	121.4604111	H	Mid-Channel
49.075	4/23/2002	7:20	RELEASE SITE #4	37.9942225	121.4135796	H	Mid-Channel
49.075	4/23/2002	8:28	.075-1	37.9954811	121.4166956	H	Right Bank
49.075	4/23/2002	8:44	.075-2	37.9956478	121.4190379	H	Mid-Channel
49.075	4/23/2002	9:54	.075-3	37.9953636	121.4247153	H	Right Bank
49.075	4/23/2002	11:44	.075-4	37.9930462	121.4354238	H	Left Bank
49.075	4/23/2002	12:45	.075-5	37.9952008	121.4280441	H	Right Bank
49.075	4/23/2002	13:56	.075-6	37.9942581	121.4276315	H	Mid-Channel
49.075	4/23/2002	15:15	.075-7	37.9942397	121.4302864	L	Mid-Channel
49.075	4/23/2002	16:11	.075-8	37.9984825	121.4464464	M	Mid-Channel
49.075	4/23/2002	17:25	.075-9	38.0162712	121.4600595	L	Right Bank
49.075	4/26/2002	12:13	.075-10	38.0337521	121.4813422	H	Right Bank
49.075	4/26/2002	13:25	.075-99	38.0334633	121.4815163	H	Right Bank
49.085	4/23/2002	7:20	RELEASE SITE #4	37.9942225	121.4135796	H	Mid-Channel
49.085	4/23/2002	8:12	.085-1	37.9951442	121.4191171	H	Mid-Channel
49.085	4/23/2002	9:58	.085-2	37.9948501	121.4301242	H	Right Bank
49.085	4/23/2002	12:03	.085-3	37.9942475	121.4275178	M	Left Bank
49.085	4/23/2002	13:00	.085-4	37.994272	121.4313778	M	Right Bank
49.085	4/23/2002	14:12	.085-5	37.9934974	121.4327609		Mid-Channel
49.085	4/23/2002	15:00	.085-6	37.9931199	121.4362194	H	Left Bank
49.085	4/23/2002	16:06	.085-7	37.9983973	121.444774	H	Right Bank
49.085	4/23/2002	17:05	.085-8	38.0064064	121.4527713	H	Right Bank
49.085	4/23/2002	17:45	.085-9	38.0141015	121.4567901	H	Right Bank
49.085	4/23/2002	18:24	.085-10	38.0133311	121.4578314	M	Right Bank
49.085	4/24/2002	9:45	.085-11	38.0275183	121.4878284	H	Mid-Channel
49.085	4/24/2002	11:03	.085-12	38.038226	121.5027177	H	Left Bank
49.085	4/24/2002	13:57	.085-13	38.0346797	121.4953039	H	Mid-Channel
49.085	4/24/2002	15:14	.085-14	38.0275871	121.4875763	H	Mid-Channel
49.085	4/24/2002	17:57	.085-15	38.0247938	121.4792259	H	Mid-Channel
49.085	4/26/2002	7:42	.085-16	38.0384945	121.4901067	H	Mid-Channel
49.085	4/26/2002	13:13	.085-99	38.0404814	121.5052443	H	Mid-Channel
49.095	4/23/2002	7:20	RELEASE SITE #4	37.9942225	121.4135796	H	Mid-Channel
49.095	4/23/2002	8:29	.095-1	37.9956608	121.4193338	H	Mid-Channel
49.095	4/23/2002	9:16	.095-2	37.9953373	121.4247728	H	Mid-Channel
49.095	4/23/2002	10:24	.095-3	37.9929849	121.4335234	H	Left Bank
49.095	4/23/2002	11:47	.095-4	37.993943	121.4283329	H	Left Bank
49.095	4/23/2002	12:49	.095-5	37.9937456	121.4324481	H	Mid-Channel
49.095	4/23/2002	13:53	.095-6	37.9945924	121.4398778	M	Left Bank

Appendix D. Fish Release No. 4 - Telemetry and observational data for 12 radio-tagged juvenile chinook salmon released near Fourteen Mile Slough on the San Joaquin River at 0720 hrs. on April 23 2002.

Fish #	Date	Military Time	Telemetry Map Location (refer to appendix figures)	Fish Location (via GPS) (WGS 84) Latitude (degrees North)	Fish Location (via GPS) (WGS 84) Longitude (degrees West)	Radio Signal Strength (H=High/M=Med/L=Low)	Position of Fish in Channel Facing Downstream
49.095	4/23/2002	14:46	.095-7	37.9973745	121.443076	H	Right Bank
49.095	4/23/2002	16:03	.095-8	37.9975255	121.4456352	M	Left Bank
49.095	4/23/2002	17:02	.095-9	38.0025398	121.4500053	H	Right Bank
49.095	4/23/2002	17:48	.095-10	38.0201215	121.4567891	M	Mid-Channel
49.095	4/23/2002	18:27	.095-11	38.0172868	121.4626013	H	Mid-Channel
49.095	4/24/2002	7:45	.095-12	38.0413933	121.4959755	H	Mid-Channel
49.095	4/24/2002	9:38	.095-13	38.0508633	121.5064491	M	Mid-Channel
49.095	4/24/2002	11:19	.095-14	38.0559772	121.5332436	L	Mid-Channel
49.095	4/24/2002	15:01	.095-15	38.0288217	121.5215715	H	Right Bank
49.095	4/24/2002	15:27	.095-16	38.0251011	121.5245515	H	Mid-Channel
49.095	4/24/2002	16:04	.095-17	38.0238354	121.5242351	H	Mid-Channel
49.095	4/24/2002	17:18	.095-18	38.0278982	121.5226725	H	Mid-Channel
49.095	4/25/2002	10:23	.095-19	38.0781467	121.678539	H	Mid-Channel
49.095	4/26/2002	8:45	.095-20	38.0219831	121.7585588	H	Left Bank
49.095	4/26/2002	11:21	.095-21	38.0274131	121.8429272	H	Mid-Channel
49.095	4/26/2002	12:21	.095-99	38.0281967	121.8456379	H	Mid-Channel
49.104	4/23/2002	7:20	RELEASE SITE #4	37.9942225	121.4135796	H	Mid-Channel
49.104	4/23/2002	8:08	.104-1	37.995181	121.4191732	H	Mid-Channel
49.104	4/23/2002	10:09	.104-2	37.99601	121.4414422	H	Mid-Channel
49.104	4/23/2002	11:42	.104-3	37.996777	121.4435555	M	Mid-Channel
49.104	4/23/2002	12:56	.104-4	37.9965514	121.4421709	M	Right Bank
49.104	4/23/2002	14:20	.104-5	37.9991265	121.4460797	H	Right Bank
49.104	4/23/2002	14:54	.104-6	38.00168	121.4490439	H	Right Bank
49.104	4/23/2002	15:58	.104-7	38.0106513	121.4562132	H	Right Bank
49.104	4/23/2002	17:12	.104-8	38.0234693	121.4660721	H	Mid-Channel
49.104	4/23/2002	18:13	.104-99	38.029942	121.4773193	H	Left Bank
49.114	4/23/2002	7:20	RELEASE SITE #4	37.9942225	121.4135796	H	Mid-Channel
49.114	4/23/2002	8:27	.114-1	37.9956608	121.4193338	H	Mid-Channel
49.114	4/23/2002	8:34	.114-2	37.9953231	121.4216983	H	Mid-Channel
49.114	4/23/2002	10:29	.114-3	37.9945744	121.4371679	M	Right Bank
49.114	4/23/2002	12:00	.114-4	37.9945786	121.4300389	H	Right Bank
49.114	4/23/2002	13:02	.114-5	37.9943432	121.4279372	M	Mid-Channel
49.114	4/23/2002	14:15	.114-6	37.9927784	121.4356117	M	Left Bank
49.114	4/23/2002	15:22	.114-7	37.9977569	121.4447306	M	Mid-Channel
49.114	4/23/2002	16:30	.114-8	38.0100678	121.4557014	M	Right Bank
49.114	4/23/2002	17:09	.114-9	38.0197207	121.4640314	H	Mid-Channel
49.114	4/23/2002	18:16	.114-10	38.03476	121.4847169	H	Mid-Channel
49.114	4/24/2002	8:06	.114-11	38.0680034	121.5335734	H	Mid-Channel
49.114	4/24/2002	9:11	.114-12	38.0598308	121.5525778	H	Mid-Channel
49.114	4/24/2002	9:59	.114-13	38.071739	121.5594454	H	Mid-Channel
49.114	4/24/2002	11:41	.114-14	38.0939848	121.5760343	H	Mid-Channel
49.114	4/24/2002	14:11	.114-15	38.0668258	121.5585729	H	Left Bank
49.114	4/24/2002	17:21	.114-16	38.0701212	121.5605374	H	Left Bank
49.114	4/24/2002	17:46	.114-17	38.0774293	121.5700735	H	Left Bank
49.114	4/25/2002	10:31	.114-18	38.0577066	121.6817106	H	Mid-Channel
49.114	4/26/2002	8:42	.114-19	38.0267239	121.7783716	H	Mid-Channel
49.114	4/26/2002	9:41	.114-99	38.0220616	121.8159651	H	Mid-Channel

Appendix E. Fish Release No. 1 - Telemetry and observational data for 13 radio-tagged juvenile chinook salmon released near Fourteen Mile Slough on the San Joaquin River at 0754 hrs. on April 8, 2003.

Fish #	Date	Military Time	Telemetry Map Location (refer to appendix figures)	Fish Location (via GPS) (WGS 84) Latitude (degrees North)	(WGS 84) Longitude (degrees West)	Radio Signal Strength (H=High/M=Med/L=Low)	Position of Fish in Channel Facing Downstream
9.232	4/8/2003	7:54	RELEASE SITE #1	37.99417243	121.413407	H	Mid-Channel
9.232	4/10/2003	11:35	.232-1	37.99595348	121.4232081	M	Mid-Channel
9.232	4/11/2003	8:49	.232-99	37.97470336	121.37752	H	Right Bank
9.281	4/8/2003	7:54	RELEASE SITE #1	37.99417243	121.413407	H	Mid-Channel
9.291	4/8/2003	7:54	RELEASE SITE #1	37.99417243	121.413407	H	Mid-Channel
9.291	4/8/2003	11:58	.291-1	38.00006214	121.4523097	H	Left Bank
9.291	4/8/2003	18:25	.291-2	38.05240623	121.5089337	M	Mid-Channel
9.291	4/9/2003	9:49	.291-3	38.02323537	121.4649236	M	Right Bank
9.291	4/11/2003	15:52	.291-99	38.02812055	121.4739704	M	Left Bank
9.301	4/8/2003	7:54	RELEASE SITE #1	37.99417243	121.413407	H	Mid-Channel
9.301	4/8/2003	17:34	.301-1	38.02698755	121.4741648	H	Left Bank
9.301	4/9/2003	10:35	.301-2	37.99767886	121.443807	M	Right Bank
9.301	4/9/2003	17:35	.301-3	38.02563368	121.4684623	H	Mid-Channel
9.301	4/10/2003	8:53	.301-4	38.0002347	121.4483085	H	Right Bank
9.301	4/11/2003	8:25	.301-99	37.99720539	121.4434412	H	Mid-Channel
9.311	4/8/2003	7:54	RELEASE SITE #1	37.99417243	121.413407	H	Mid-Channel
9.311	4/8/2003	10:06	.311-1	37.99505457	121.4180116	H	Left Bank
9.311	4/8/2003	17:25	.311-2	38.01846193	121.4623917	L	Mid-Channel
9.311	4/9/2003	11:46	.311-3	37.99797989	121.4474905	M	Left Bank
9.311	4/9/2003	17:25	.311-4	38.02887455	121.4737383	M	Right Bank
9.311	4/10/2003	8:30	.311-5	38.01796385	121.4608301	M	Right Bank
9.311	4/10/2003	15:02	.311-6	38.02890795	121.4756175	H	Left Bank
9.311	4/11/2003	15:34	.311-99	38.02776398	121.472884	H	Mid-Channel
9.352	4/8/2003	7:54	RELEASE SITE #1	37.99417243	121.413407	H	Mid-Channel
9.352	4/8/2003	12:08	.352-1	38.00705202	121.454099	H	Mid-Channel
9.352	4/9/2003	9:30	.352-99	38.03091176	121.4779458	H	Mid-Channel
9.372	4/8/2003	7:54	RELEASE SITE #1	37.99417243	121.413407	H	Mid-Channel
9.372	4/8/2003	14:01	.372-1	38.02433654	121.4657437	H	Mid-Channel
9.372	4/8/2003	18:08	.372-99	38.05190004	121.507394	M	Mid-Channel
9.382	4/8/2003	7:54	RELEASE SITE #1	37.99417243	121.413407	H	Mid-Channel
9.382	4/9/2003	13:16	.382-1	38.00130625	121.4496071	H	Mid-Channel
9.382	4/10/2003	8:43	.382-2	38.01663856	121.4621678	H	Left Bank
9.382	4/11/2003	8:33	.382-99	38.0560006	121.5317244	H	Right Bank
9.401	4/8/2003	7:54	RELEASE SITE #1	37.99417243	121.413407	H	Mid-Channel
9.401	4/8/2003	12:17	.401-1	37.99529298	121.4412609	H	Left Bank
9.401	4/8/2003	16:11	.401-2	38.00198433	121.4569675	L	Right Bank
9.401	4/9/2003	11:15	.401-3	37.9985496	121.4510546	L	Left Bank
9.401	4/9/2003	17:41	.401-4	38.02534675	121.4692657	H	Left Bank
9.401	4/11/2003	9:33	.401-99	38.00042481	121.4490562	L	Mid-Channel
9.412	4/8/2003	7:54	RELEASE SITE #1	37.99417243	121.413407	H	Mid-Channel
9.412	4/8/2003	10:33	.412-1	37.99395883	121.4378387	L	Right Bank
9.412	4/8/2003	18:54	.412-2	38.06787552	121.5598832	L	Mid-Channel
9.412	4/9/2003	14:05	.412-99	38.02453371	121.5240816	M	Right Bank
9.432	4/8/2003	7:54	RELEASE SITE #1	37.99417243	121.413407	H	Mid-Channel
9.432	4/8/2003	12:38	.432-99	37.99468541	121.4254217	H	Mid-Channel
9.442	4/8/2003	7:54	RELEASE SITE #1	37.99417243	121.413407	H	Mid-Channel
9.442	4/8/2003	9:56	.442-1	37.99563332	121.4181586	H	Right Bank
9.442	4/8/2003	17:37	.442-99	38.02690765	121.4749526	H	Right Bank
9.472	4/8/2003	7:54	RELEASE SITE #1	37.99417243	121.413407	H	Mid-Channel
9.472	4/8/2003	16:25	.472.99	37.99277942	121.4345385	H	Right Bank

Appendix E. Fish Release No. 2 - Telemetry and observational data for 12 radio-tagged juvenile chinook salmon released near Fourteen Mile Slough on the San Joaquin River at 0819 hrs. on April 15, 2003.

Fish #	Date	Military Time	Telemetry Map Location (refer to appendix figures)	Fish Location (via GPS) (WGS 84) Latitude (degrees North)	Fish Location (via GPS) (WGS 84) Longitude (degrees West)	Radio Signal Strength (H=High/M=Med/L=Low)	Position of Fish in Channel Facing Downstream
49.122	4/15/2003	8:19	RELEASE SITE #2	37.99447491	121.4131158	H	Mid-Channel
49.122	4/15/2003	11:14	.122-1	37.99450449	121.4361758	L	Right Bank
49.122	4/15/2003	14:16	.122-2	37.99504027	121.419629	H	Left Bank
49.122	4/15/2003	15:43	.122-3	37.99590688	121.4204076	H	Right Bank
49.122	4/16/2003	11:40	.122-4	37.98021129	121.4752934	H	Mid-Channel
49.122	4/16/2003	13:46	.122-5	37.96537314	121.4749743	H	Mid-Channel
49.122	4/17/2003	16:00	.122-99	37.95744566	121.5268482	L	Mid-Channel
49.221	4/15/2003	8:19	RELEASE SITE #2	37.99447491	121.4131158	H	Mid-Channel
49.221	4/15/2003	9:45	.221-1	37.99516442	121.4194783	H	Left Bank
49.221	4/15/2003	13:39	.221-2	37.99698946	121.4434685	H	Mid-Channel
49.221	4/15/2003	16:20	.221-3	37.99172453	121.4069917	H	Left Bank
49.221	4/16/2003	8:41	.221-4	37.98513026	121.3899749	M	Left Bank
49.221	4/16/2003	15:48	.221-5	38.01870869	121.461965	L	Right Bank
49.221	4/16/2003	18:36	.221-6	37.99995751	121.4505238	M	Left Bank
49.221	4/17/2003	8:14	.221-7	37.99965194	121.4499039	H	Left Bank
49.221	4/17/2003	18:40	.221-8	38.0397559	121.4971116	H	Mid-Channel
49.221	4/18/2003	11:31	.221-99	38.05738732	121.5330759	M	Right Bank
49.242	4/15/2003	8:19	RELEASE SITE #2	37.99447491	121.4131158	H	Mid-Channel
49.242	4/15/2003	13:26	.242-1	37.99837812	121.4476188	H	Left Bank
49.242	4/15/2003	15:27	.242-2	37.99612074	121.4425189	H	Left Bank
49.242	4/15/2003	16:05	.242-3	37.99444506	121.4364504	H	Right Bank
49.242	4/16/2003	13:48	.242-4	37.97820952	121.5160723	M	Right Bank
49.242	4/16/2003	14:15	.242-99	37.97437776	121.512381		Mid-Channel
49.322	4/15/2003	8:19	RELEASE SITE #2	37.99447491	121.4131158	H	Mid-Channel
49.322	4/15/2003	8:44	.322-1	37.99480929	121.4145207	M	Mid-Channel
49.322	4/15/2003	14:12	.322-2	38.00081192	121.4490253	M	Mid-Channel
49.322	4/15/2003	15:10	.322-3	37.99850347	121.4461926	H	Left Bank
49.322	4/16/2003	17:39	.322-99	37.99544489	121.4276261	M	Right Bank
49.332	4/15/2003	8:19	RELEASE SITE #2	37.99447491	121.4131158	H	Mid-Channel
49.332	4/15/2003	9:25	.332-1	37.99485694	121.412709	H	Right Bank
49.332	4/15/2003	14:24	.332-2	37.98617172	121.3929809	H	Left Bank
49.332	4/15/2003	16:32	.332-3	37.98665047	121.393722	M	Left Bank
49.332	4/16/2003	10:34	.332-4	38.01065911	121.4597641	H	Mid-Channel
49.332	4/16/2003	15:45	.332-5	38.01700758	121.4614424	H	Mid-Channel
49.332	4/16/2003	18:42	.332-6	38.01103608	121.4589588	H	Left Bank
49.332	4/17/2003	9:12	.332-99	38.02316089	121.5209762	H	Mid-Channel
49.343	4/15/2003	8:19	RELEASE SITE #2	37.99447491	121.4131158	H	Mid-Channel
49.343	4/15/2003	10:00	.343-1	37.99495777	121.427591	M	Mid-Channel
49.343	4/15/2003	14:13	.343-2	37.99530541	121.4232675	H	Mid-Channel
49.343	4/15/2003	15:46	.343-3	37.99603546	121.420587		
49.343	4/15/2003	17:20	.343-4	37.99521774	121.4140678	H	Right Bank
49.343	4/16/2003	15:21	.343-5	37.99459327	121.4272913	H	Mid-Channel
49.343	4/16/2003	17:25	.343-6	37.99534563	121.4182103	H	Right Bank
49.343	4/17/2003	8:27	.343-7	37.99294618	121.4328495	M	Left Bank
49.343	4/17/2003	12:45	.343-8	38.02395888	121.4658085	M	Right Bank
49.343	4/17/2003	17:55	.343-9	38.01205715	121.4571035	H	Right Bank
49.343	4/18/2003	7:45	.343-10	38.00495825	121.4525029	H	Left Bank
49.343	4/18/2003	15:32	.343-99	38.05417544	121.5205687	H	Left Bank
49.392	4/15/2003	8:19	RELEASE SITE #2	37.99447491	121.4131158	H	Mid-Channel
49.392	4/15/2003	8:51	.392-1	37.99518172	121.4167448	H	Mid-Channel
49.392	4/15/2003	14:27	.392-2	37.99298854	121.4523786	H	Left Bank
49.392	4/16/2003	17:21	.392-3	37.97691429	121.5320721	M	Left Bank
49.392	4/17/2003	9:24	.392-4	37.97482107	121.5354951	H	Mid-Channel
49.392	4/17/2003	15:28	.392-5	37.98263202	121.5338369	H	Left Bank
49.392	4/17/2003	17:45	.392-99	37.96421064	121.5323592	H	Mid-Channel

Appendix E. Fish Release No. 2 - Telemetry and observational data for 12 radio-tagged juvenile chinook salmon released near Fourteen Mile Slough on the San Joaquin River at 0819 hrs. on April 15, 2003.

Fish #	Date	Military Time	Telemetry Map Location (refer to appendix figures)	Fish Location (via GPS) (WGS 84) Latitude (degrees North)	Fish Location (via GPS) (WGS 84) Longitude (degrees West)	Radio Signal Strength (H=High/M=Med/L=Low)	Position of Fish in Channel Facing Downstream
49.421	4/15/2003	8:19	RELEASE SITE #2	37.99447491	121.4131158	H	Mid-Channel
49.421	4/15/2003	13:34	.421-1	37.99753347	121.4430357	M	Mid-Channel
49.421	4/15/2003	16:15	.421-2	37.99400575	121.4332369	H	Right Bank
49.421	4/15/2003	17:41	.421-3	37.99599954	121.4300172	M	Mid-Channel
49.421	4/16/2003	10:13	.421-4	38.02746603	121.4881798	H	Mid-Channel
49.421	4/16/2003	14:30	.421-5	38.02765977	121.4990791	H	Mid-Channel
49.421	4/16/2003	18:11	.421-6	38.0199074	121.5188202	H	Mid-Channel
49.421	4/17/2003	9:42	.421-7	37.9829565	121.528069	M	Left Bank
49.421	4/17/2003	14:23	.421-8	37.97166357	121.5287385	L	Mid-Channel
49.421	4/17/2003	17:56	.421-99	37.97179004	121.5280415	M	Mid-Channel
49.451	4/15/2003	8:19	RELEASE SITE #2	37.99447491	121.4131158	H	Mid-Channel
49.451	4/15/2003	9:50	.451-1	37.99342187	121.4098816	H	Mid-Channel
49.451	4/15/2003	14:18	.451-2	37.99701613	121.4292097	M	Right Bank
49.451	4/15/2003	15:38	.451-3	37.99603197	121.4223409	H	Right Bank
49.451	4/18/2003	16:30	.451-99	38.00543107	121.4535066	L	Left Bank
49.462	4/15/2003	8:19	RELEASE SITE #2	37.99447491	121.4131158	H	Mid-Channel
49.462	4/15/2003	9:12	.462-1	37.99474689	121.4132352	M	Right Bank
49.462	4/15/2003	14:03	.462-2	37.99687767	121.4452361	L	Mid-Channel
49.462	4/16/2003	13:54	.462-3	37.97676635	121.5159761	H	Right Bank
49.462	4/16/2003	17:29	.462-4	37.97659021	121.5321013	L	Left Bank
49.462	4/17/2003	14:27	.462-5	37.97192142	121.5255798	M	Right Bank
49.462	4/17/2003	17:40	.462-99	37.95811579	121.5299878	L	Left Bank
49.482	4/15/2003	8:19	RELEASE SITE #2	37.99447491	121.4131158	H	Mid-Channel
49.482	4/15/2003	10:18	.482-1	37.99451502	121.4288531	H	Mid-Channel
49.482	4/15/2003	13:52	.482-2	37.99745907	121.444905	H	Mid-Channel
49.482	4/15/2003	15:53	.482-3	37.9950436	121.4185357	H	Left Bank
49.482	4/16/2003	11:27	.482-4	37.98648554	121.4671131	H	Mid-Channel
49.482	4/16/2003	17:57	.482-5	37.97142304	121.5103459	H	Mid-Channel
49.482	4/17/2003	14:34	.482-99	37.97169768	121.5300243	M	Right Bank
49.492	4/15/2003	8:19	RELEASE SITE #2	37.99447491	121.4131158	H	Mid-Channel
49.492	4/15/2003	10:34	.492-1	37.99511762	121.4395906	M	Mid-Channel
49.492	4/15/2003	14:01	.492-2	38.01611142	121.4597638	H	Mid-Channel
49.492	4/15/2003	15:45	.492-3	38.01113787	121.4571	M	Mid-Channel
49.492	4/16/2003	8:15	.492-4	38.05457408	121.5164462	H	Right Bank
49.492	4/16/2003	15:52	.492-99	38.06565066	121.5769914	M	Mid-Channel

Appendix E. Fish Release No. 3 - Telemetry and observational data for 12 radio-tagged juvenile chinook salmon released near Fourteen Mile Slough on the San Joaquin River at 0827 hrs. on April 22 2003.

Fish #	Date	Military Time	Telemetry Map Location (refer to appendix figures)	Fish Location (via GPS) (WGS 84) Latitude (degrees North)	Fish Location (via GPS) (WGS 84) Longitude (degrees West)	Radio Signal Strength High/M=Med/L=L	Position of Fish in Channel Facing Downstream
9.001	4/22/2003	8:27	RELEASE SITE #3	37.99447491	121.4131158		Mid-Channel
9.001	4/22/2003	9:41	.001-1	37.99391602	121.4131051	M	Mid-Channel
9.001	4/22/2003	11:03	.001-2	37.99407675	121.4123273		Mid-Channel
9.001	4/22/2003	14:06	.001-3	37.99396516	121.4328962	H	Right Bank
9.001	4/22/2003	16:58	.001-4	37.94610926	121.4628313	L	Right Bank
9.001	4/22/2003	18:21	.001-5	38.03204385	121.4790732	H	Right Bank
9.001	4/23/2003	10:41	.001-6	38.0302409	121.4916206	H	Mid-Channel
9.001	4/23/2003	11:48	.001-7	38.02664451	121.5042723		Mid-Channel
9.001	4/23/2003	14:01	.001-99	38.03180781	121.5241863	H/M	
9.031	4/22/2003	8:27	RELEASE SITE #3	37.99447491	121.4131158		Mid-Channel
9.031	4/22/2003	9:02	.031-1	37.99499367	121.4154961	M	Mid-Channel
9.031	4/22/2003	11:03	.031-2	37.99565915	121.4403308	H	Mid-Channel
9.031	4/22/2003	11:40	.031-3	38.00528244	121.4524847	H	Mid-Channel
9.031	4/22/2003	13:18	.031-4	38.02639134	121.4705884	H	Mid-Channel
9.031	4/22/2003	15:13	.031-5	38.05209682	121.5094073	H	Left Bank
9.031	4/22/2003	17:26	.031-6	38.07209937	121.5596522	H	Right Bank
9.031	4/23/2003	8:33	.031-7	38.05697998	121.5416209	M	Mid-Channel
9.031	4/23/2003	11:32	.031-8	38.05612748	121.5368394	H	Mid-Channel
9.031	4/23/2003	15:13	.031-9	38.07858247	121.5680417	H	Right Bank
9.031	4/24/2003	13:36	.031-99	38.0902045	121.5736761	H	Mid-Channel
9.072	4/22/2003	8:27	RELEASE SITE #3	37.99447491	121.4131158		Mid-Channel
9.072	4/22/2003	10:07	.072-1	37.99378247	121.4105571	M	Mid-Channel
9.072	4/22/2003	10:20	.072-2	37.99263351	121.4088965	H	Right Bank
9.072	4/22/2003	14:00	.072-3	38.00708784	121.4506585	H	Right Bank
9.072	4/22/2003	15:47	.072-4	38.01883973	121.4637166	H	Mid-Channel
9.072	4/22/2003	18:12	.072-5	38.02838508	121.4742156	M	Left Bank
9.072	4/22/2003	18:13	.072-6	38.02926021	121.4749835	H	Right Bank
9.072	4/23/2003	9:19	.072-7	38.02883652	121.4896328	H	Mid-Channel
9.072	4/23/2003	10:46	.072-8	38.02756484	121.488155	H	Mid-Channel
9.072	4/23/2003	11:07	.072-9	38.02737725	121.4882842	H	Left Bank
9.072	4/23/2003	13:23	.072-10	38.02358526	121.5110447	H	
9.072	4/24/2003	9:46	.072-11	38.02188183	121.5160235	H	Mid-Channel
9.072	4/24/2003	14:53	.072-12	38.02787921	121.522089	H	Left Bank
9.072	4/24/2003	17:39	.072-13	38.03235798	121.5249386	H	Right Bank
9.072	4/25/2003	9:02	.072-14	38.01180653	121.5189035	H	Mid-Channel
9.072	4/25/2003	13:57	.072-99	37.97287469	121.5125366	H	Mid-Channel
9.082	4/22/2003	8:27	RELEASE SITE #3	37.99447491	121.4131158		Mid-Channel
9.082	4/22/2003	9:15	.082-1	37.99462141	121.4119511	H	Right Bank
9.082	4/22/2003	10:53	.082-2	37.99501646	121.4259157	H	Mid-Channel
9.082	4/22/2003	13:19	.082-3	38.01502344	121.460641	H	Left Bank
9.082	4/22/2003	15:23	.082-4	38.02659269	121.4715184	M	Mid-Channel
9.082	4/22/2003	17:41	.082-5	38.03215781	121.4809166	H	Left Bank
9.082	4/23/2003	8:12	.082-6	38.00104106	121.4499999	H	Left Bank
9.082	4/23/2003	11:32	.082-7	37.98832756	121.4639319	HH	Right Bank
9.082	4/23/2003	13:56	.082-8	37.97165365	121.4895645	H	Mid-Channel
9.082	4/23/2003	17:43	.082-9	37.97559913	121.5127549	H	
9.082	4/24/2003	15:20	.082-99	37.97628332	121.514836	M	Mid-Channel
9.082	4/24/2003	9:20	.082-10	37.97599117	121.5131113	M	Mid-Channel
9.092	4/22/2003	8:27	RELEASE SITE #3	37.99447491	121.4131158		Mid-Channel
9.092	4/22/2003	9:37	.092-1	37.99357293	121.4117232	H	Mid-Channel
9.092	4/22/2003	10:57	.092-2	37.99419247	121.4296686	H	Mid-Channel
9.092	4/22/2003	13:37	.092-3	38.0137428	121.45782		Right Bank
9.092	4/22/2003	15:28	.092-4	38.02867205	121.4734121	H	Right Bank
9.092	4/22/2003	17:57	.092-5	38.0525462	121.5086004	H	Mid-Channel
9.092	4/23/2003	10:18	.092-6	38.01130105	121.5174101	H	Right Bank
9.092	4/23/2003	13:32	.092-7	38.01099274	121.5179744	M	Mid-Channel
9.092	4/23/2003	14:40	.092-8	38.01097817	121.5182481	H	
9.092	4/23/2003	16:30	.092-9	38.01150906	121.5188981	H	Mid-Channel
9.092	4/23/2003	17:52	.092-10	38.0149275	121.5184078	H	Mid-Channel
9.092	4/25/2003	9:55	.092-99	37.98187865	121.5334078	H	Right Bank

Appendix E. Fish Release No. 3 - Telemetry and observational data for 12 radio-tagged juvenile chinook salmon released near Fourteen Mile Slough on the San Joaquin River at 0827 hrs. on April 22 2003.

Fish #	Date	Military Time	Telemetry Map Location (refer to appendix figures)	Fish Location (via GPS) (WGS 84) Latitude (degrees North)	(WGS 84) Longitude (degrees West)	Radio Signal Strength High/M=Med/L=L	Position of Fish in Channel Facing Downstream
9.101	4/22/2003	8:27	RELEASE SITE #3	37.99447491	121.4131158		Mid-Channel
9.101	4/22/2003	9:56	.101-1	37.99292365	121.4103593	H	Left Bank
9.101	4/22/2003	10:43	.101-2	37.99393091	121.4122051	H	Mid-Channel
9.101	4/22/2003	13:27	.101-3	38.01084194	121.4565253	H	Mid-Channel
9.101	4/23/2003	10:00	.101-4	37.96940528	121.5275996	H	Mid-Channel
9.101	4/23/2003	14:13	.101-5	37.9717532	121.5265395	H	Mid-Channel
9.101	4/23/2003	17:11	.101-6	37.97214776	121.5271008	L	Right Bank
9.101	4/24/2003	15:31	.101-99	37.97224915	121.527281	L	Right Bank
9.111	4/22/2003	8:27	RELEASE SITE #3	37.99447491	121.4131158		Mid-Channel
9.111	4/22/2003	9:46	.111-1	37.99332728	121.4122182	H	Left Bank
9.111	4/22/2003	10:48	.111-2	37.99531534	121.4226637	H	Mid-Channel
9.111	4/22/2003	13:47	.111-3	38.01870898	121.4619878	H	Right Bank
9.111	4/22/2003	15:47	.111-4	38.02683343	121.4713197	L	Mid-Channel
9.111	4/22/2003	18:27	.111-5	38.0382247	121.4838451	H	Mid-Channel
9.111	4/23/2003	9:00	.111-6	37.9999608	121.4514576	H	Mid-Channel
9.111	4/23/2003	16:54	.111-7	37.97175345	121.5143808	L	Right Bank
9.111	4/23/2003	17:28	.111-8	37.97179595	121.5127519	H	Mid-Channel
9.111	4/24/2003	13:59	.111-99	37.96940257	121.5273834	H	Mid-Channel
9.152	4/22/2003	8:27	RELEASE SITE #3	37.99447491	121.4131158		Mid-Channel
9.152	4/22/2003	10:17	.152-1	37.99445761	121.4125013	M	Right Bank
9.152	4/22/2003	11:14	.152-2	37.99398928	121.414527	H	Left Bank
9.152	4/22/2003	14:12	.152-3	37.99326806	121.4346875	H	Mid-Channel
9.152	4/22/2003	16:26	.152-4	38.01946176	121.4644213	H	Mid-Channel
9.152	4/22/2003	17:45	.152-5	38.03372259	121.4827529	H	Right Bank
9.152	4/23/2003	15:35	.152-99	38.06278997	121.5457573	H	Right Bank
9.172	4/22/2003	8:27	RELEASE SITE #3	37.99447491	121.4131158		Mid-Channel
9.172	4/22/2003	9:28	.172-1	37.99381473	121.4109436	H	Mid-Channel
9.172	4/22/2003	10:40	.172-2	37.99401399	121.4123514	M	Mid-Channel
9.172	4/22/2003	10:58	.172-3	37.99462746	121.4150713	H	Left Bank
9.172	4/22/2003	16:11	.172-4	38.01813676	121.4616466	H	Right Bank
9.172	4/23/2003	9:12	.172-5	37.98770759	121.4647647	H	Mid-Channel
9.172	4/23/2003	13:50	.172-6	37.97842855	121.4754214		
9.172	4/23/2003	17:18	.172-7	37.97156022	121.4816087	H	Mid-Channel
9.172	4/24/2003	15:45	.172-99	37.96881397	121.5329278	L	Mid-Channel
9.201	4/22/2003	8:27	RELEASE SITE #3	37.99447491	121.4131158		Mid-Channel
9.201	4/22/2003	9:54	.201-1	37.99292365	121.4103593	H	
9.201	4/22/2003	10:26	.201-2	37.99272468	121.4089743	H	
9.201	4/22/2003	14:35	.201-3	38.00079796	121.4486497	H	Right Bank
9.201	4/22/2003	15:59	.201-4	38.01501031	121.4596388	M	Mid-Channel
9.201	4/22/2003	17:51	.201-5	38.03384986	121.4835365	M	Mid-Channel
9.201	4/23/2003	9:47	.201-6	38.00097024	121.4542039	H	Left Bank
9.201	4/23/2003	11:21	.201-7	38.00593958	121.4613549	H	Right Bank
9.201	4/23/2003	13:22	.201-8	38.02073218	121.4650897	H	Mid-Channel
9.201	4/24/2003	9:43	.201-9	38.02114729	121.5156623	H	Mid-Channel
9.201	4/24/2003	14:32	.201-10	38.00679116	121.5156785	H	Mid-Channel
9.201	4/24/2003	16:25	.201-11	38.02014008	121.5186902	H	Mid-Channel
9.201	4/25/2003	9:20	.201-12	38.03581147	121.5258037	H	Mid-Channel
9.201	4/25/2003	9:56	.201-13	38.0327803	121.5226856	L	Mid-Channel
9.201	4/25/2003	15:36	.201-99	38.01689761	121.5174112	M	Mid-Channel
9.252	4/22/2003	8:27	RELEASE SITE #3	37.99447491	121.4131158		Mid-Channel
9.252	4/22/2003	8:51	.252-1	37.993879	121.4123657	H	Mid-Channel
9.252	4/22/2003	10:15	.252-2	37.99282987	121.4087556	H	Right Bank
9.252	4/22/2003	14:28	.252-3	37.99592156	121.4215005	H	Right Bank
9.252	4/22/2003	16:12	.252-4	38.00774486	121.4540161	H	Mid-Channel
9.252	4/22/2003	17:56	.252-5	38.03008968	121.4770969	H	Mid-Channel
9.252	4/23/2003	7:37	.252-6	38.02346756	121.4668327	H	Left Bank
9.252	4/23/2003	15:37	.252-7	37.99995886	121.4506263	H	Mid-Channel
9.252	4/24/2003	9:36	.252-8	37.97101795	121.5268388	H	Mid-Channel
9.252	4/24/2003	16:17	.252-99	37.94116616	121.5330681	H	Mid-Channel

Appendix E. Fish Release No. 3 - Telemetry and observational data for 12 radio-tagged juvenile chinook salmon released near Fourteen Mile Slough on the San Joaquin River at 0827 hrs. on April 22 2003.

Fish #	Date	Military Time	Telemetry Map Location (refer to appendix figures)	Fish Location (via GPS) (WGS 84) Latitude (degrees North)	(WGS 84) Longitude (degrees West)	Radio Signal Strength High/M=Med/L=L	Position of Fish in Channel Facing Downstream
9.262	4/22/2003	8:27	RELEASE SITE #3	37.99447491	121.4131158		Mid-Channel
9.262	4/22/2003	9:26	.262-1	37.99377246	121.4111495	H	Mid-Channel
9.262	4/22/2003	10:24	.262-2	37.99274193	121.408917	H	Mid-Channel
9.262	4/22/2003	14:01	.262-3	38.00320049	121.4517881	H	Left Bank
9.262	4/22/2003	16:34	.262-4	38.02946093	121.4765631	H	Left Bank
9.262	4/22/2003	17:37	.262-5	38.03432674	121.4841762	M	Mid-Channel
9.262	4/23/2003	9:31	.262-6	38.02469257	121.4785758	H	Left Bank
9.262	4/23/2003	10:57	.262-7	38.02884069	121.4955801	H	Right Bank
9.262	4/23/2003	16:59	.262-8	37.99374567	121.4517022	H	Mid-Channel
9.262	4/24/2003	17:20	.262-99	38.02561963	121.508725	H	Mid-Channel

Appendix E. Fish Release No. 4 - Telemetry and observational data for 12 radio-tagged juvenile chinook salmon released near Fourteen Mile Slough on the San Joaquin River at 0807 hrs. on April 29 2003.

Fish #	Date	Military Time	Telemetry Map Location (refer to appendix figures)	Fish Location (via GPS) (WGS 84) Latitude (degrees North)	(WGS 84) Longitude (degrees West)	Radio Signal Strength (H=High/M=Med/L=Low)	Position of Fish in Channel Facing Downstream
9.012	4/29/2003	8:07	RELEASE SITE #4	37.99434223	121.4133009	H	Mid-Channel
9.012	5/1/2003	11:54	.012-1	38.03333048	121.5248736	H	Mid-Channel
9.012	5/2/2003	10:51	.012-99	38.03034446	121.5713285	H	Right Bank
9.041	4/29/2003	8:07	RELEASE SITE #4	37.99434223	121.4133009	H	Mid-Channel
9.041	4/29/2003	8:42	.041-1	37.99545632	121.4177296	H	Mid-Channel
9.041	4/29/2003	9:56	.041-2	37.99526304	121.4302037	H	Mid-Channel
9.041	4/29/2003	11:25	.041-3	38.00027825	121.4481937	H	Right Bank
9.041	4/29/2003	14:38	.041-4	38.00071462	121.4484807	H	Right Bank
9.041	4/29/2003	18:11	.041-5	38.00422684	121.4517096	H	Right Bank
9.041	4/30/2003	13:59	.041-6	38.03951291	121.4817105	H	Mid-Channel
9.041	5/1/2003	7:52	.041-7	38.04808512	121.5043375	H	Mid-Channel
9.041	5/1/2003	17:24	.041-8	38.05683276	121.5399256	H	Mid-Channel
9.041	5/3/2003	9:59	.041-9	38.10167488	121.5906857		
9.041	5/3/2003	12:08	.041-99	38.08939203	121.6514028		
9.052	4/29/2003	8:07	RELEASE SITE #4	37.99434223	121.4133009	H	Mid-Channel
9.052	4/29/2003	8:45	.052-1	37.99584715	121.4193156	H	Mid-Channel
9.052	4/29/2003	10:22	.052-2	37.99364843	121.4348275	H	Mid-Channel
9.052	4/29/2003	11:11	.052-3	37.99905707	121.4567496	H	Right Bank
9.052	4/29/2003	14:33	.052-4	37.9995755	121.4482086	H	Mid-Channel
9.052	4/29/2003	17:05	.052-5	37.99765834	121.4449805	H	Left Bank
9.052	4/30/2003	11:15	.052-6	37.97132204	121.4771281	H	Mid-Channel
9.052	4/30/2003	17:08	.052-99	37.97150647	121.4970699	H	Mid-Channel
9.061	4/29/2003	8:07	RELEASE SITE #4	37.99434223	121.4133009	H	Mid-Channel
9.061	4/29/2003	9:06	.061-1	37.99543533	121.4201899	M	Left Bank
9.061	4/29/2003	10:02	.061-2	37.99345786	121.434729	H	Mid-Channel
9.061	4/29/2003	14:17	.061-3	38.00127979	121.4558147	H	Left Bank
9.061	4/29/2003	17:27	.061-4	38.02184997	121.465112	H	Mid-Channel
9.061	4/30/2003	16:27	.061-99	38.05387419	121.533203	H	Left Bank
9.132	4/29/2003	8:07	RELEASE SITE #4	37.99434223	121.4133009	H	Mid-Channel
9.132	4/29/2003	9:14	.132-1	37.99558895	121.4202208	H	Left Bank
9.132	4/29/2003	10:35	.132-99	37.99379259	121.4361796	M	Mid-Channel
9.142	4/29/2003	8:07	RELEASE SITE #4	37.99434223	121.4133009	H	Mid-Channel
9.142	4/29/2003	9:14	.142-1	37.99502717	121.424697	H	Left Bank
9.142	4/29/2003	9:59	.142-2	37.99491942	121.4307919	H	Mid-Channel
9.142	4/29/2003	11:37	.142-3	3.67830649	121.7704286	H	Mid-Channel
9.142	4/29/2003	14:08	.142-4	38.00853436	121.4613006	H	Left Bank
9.142	4/29/2003	16:48	.142-5	38.00529506	121.4616873	H	Mid-Channel
9.142	4/30/2003	8:09	.142-6	38.03623328	121.4873615	H	Left Bank
9.142	4/30/2003	16:34	.142-7	38.0553744	121.5349852	H	Mid-Channel
9.142	4/30/2003	18:15	.142-8	38.04689108	121.5354734	H	Right Bank
9.142	5/1/2003	10:13	.142-9	38.09898358	121.5894601	H	Mid-Channel
9.142	5/3/2003	10:33	.142-10	38.02364029	121.7933333		
9.142	5/3/2003	11:37	.142-99	38.02910818	121.8341587		
9.162	4/29/2003	8:07	RELEASE SITE #4	37.99434223	121.4133009	H	Mid-Channel
9.162	4/29/2003	8:47	.162-1	37.99538062	121.4188017	H	Mid-Channel
9.162	4/29/2003	10:04	.162-2	37.99333146	121.4326819	H	Mid-Channel
9.162	4/29/2003	11:35	.162-3	37.9973305	121.4440421	H	Mid-Channel
9.162	4/29/2003	14:49	.162-4	37.99391787	121.4340815	H	Right Bank
9.162	4/29/2003	17:45	.162-5	37.99498101	121.4300048	H	Mid-Channel
9.162	5/1/2003	10:41	.162-99	38.00912444	121.4602518	H	Left Bank
9.182	4/29/2003	8:07	RELEASE SITE #4	37.99434223	121.4133009	H	Mid-Channel
9.182	4/29/2003	8:50	.182-1	37.99571122	121.4185897	H	Mid-Channel
9.182	4/29/2003	9:55	.182-2	37.99438131	121.4357229	H	Right Bank
9.182	4/29/2003	11:12	.182-3	37.99718507	121.4459926	H	Left Bank
9.182	4/29/2003	14:30	.182-99	37.9995869	121.4470239	H	Right Bank

Appendix E. Fish Release No. 4 - Telemetry and observational data for 12 radio-tagged juvenile chinook salmon released near Fourteen Mile Slough on the San Joaquin River at 0807 hrs. on April 29 2003.

Fish #	Date	Military Time	Telemetry Map Location (refer to appendix figures)	Fish Location (via GPS) (WGS 84) Latitude (degrees North)	Fish Location (via GPS) (WGS 84) Longitude (degrees West)	Radio Signal Strength (H=High/M=Med/L=Low)	Position of Fish in Channel Facing Downstream
9.192	4/29/2003	8:07	RELEASE SITE #4	37.99434223	121.4133009	H	Mid-Channel
9.192	4/29/2003	8:55	.192-1	37.99445586	121.4157127	H	Left Bank
9.192	4/29/2003	10:29	.192-2	37.99604983	121.4216572	H	Right Bank
9.192	4/29/2003	11:49	.192-3	37.99401749	121.4334417	H	Right Bank
9.192	4/29/2003	14:37	.192-4	37.99419658	121.432003	H	Right Bank
9.192	4/29/2003	17:41	.192-5	37.99396039	121.429161	M	Left Bank
9.192	4/30/2003	11:26	.192-6	37.97176587	121.5225205	H	Mid-Channel
9.192	4/30/2003	14:14	.192-99	37.95984619	121.5292703	H	Mid-Channel
9.362	4/29/2003	8:07	RELEASE SITE #4	37.99434223	121.4133009	H	Mid-Channel
9.362	4/29/2003	9:30	.362-1	37.99602815	121.4234001	L	Mid-Channel
9.362	4/29/2003	10:14	.362-2	37.99472832	121.4293041	M	Mid-Channel
9.362	4/29/2003	11:43	.362-3	37.99703008	121.4451759	M	Mid-Channel
9.362	4/29/2003	14:45	.362-4	38.00040303	121.4501386	H	Mid-Channel
9.362	5/1/2003	11:29	.362-5	37.97008474	121.5336539	M	Mid-Channel
9.362	5/2/2003	9:30	.362-99	38.09433061	121.5750441	M	
9.602	4/29/2003	8:07	RELEASE SITE #4	37.99434223	121.4133009	H	Mid-Channel
9.602	4/29/2003	8:59	.602-1	37.99581983	121.4199653	H	Right Bank
9.602	4/29/2003	10:28	.602-2	37.99514853	121.4412412	H	Left Bank
9.602	4/29/2003	11:32	.602-3	37.99941857	121.4472438	H	Right Bank
9.602	4/29/2003	15:03	.602-4	37.98891693	121.4628265	H	Mid-Channel
9.602	4/29/2003	17:11	.602-99	37.97129389	121.4854166	H	Mid-Channel
9.652	4/29/2003	8:07	RELEASE SITE #4	37.99434223	121.4133009	H	Mid-Channel
9.652	4/29/2003	9:12	.652-1	37.99578272	121.4198864	H	Left Bank
9.652	4/29/2003	9:20	.652-2	37.99563631	121.4217344	H	Mid-Channel
9.652	4/29/2003	10:10	.652-3	37.99436655	121.4352905	H	Right Bank
9.652	4/29/2003	11:47	.652-4	38.90417725	121.4317744	H	Left Bank
9.652	4/29/2003	14:25	.652-5	38.00700659	121.4616287	H	Mid-Channel
9.652	4/29/2003	16:30	.652-99	38.02110651	121.4640794	H	Right Bank

APPENDIX F
DELTA CONDITIONS REPORT
(JANUARY AND FEBRUARY 2002)

U.S. BUREAU OF RECLAMATION - CENTRAL VALLEY OPERATIONS OFFICE
DELTA OUTFLOW COMPUTATION (values in c.f.s)

JANUARY 2002

	DELTA INFLOW									DELTA EXPORTS							OUTFLOW INDEX			Export / Inflow		
					San Joaquin River @ Vernalis																	
Date	Sacto Riv. @ Freeport Prev. day	SRTP Prev. week	Yolo + Misc Prev. day	East Side Streams Prev. day	previous day	7 day average	monthly average	Total Delta Inflow	NDCU	Clifton Court (CLT)	Tracy (TRA)	Contra Costa (CCC)	Byron Bethany (BBID)	North Bay	Total Delta Exports	3 day average TRA & CLT	NDOI daily	7 day avg	monthly average	Daily (%)	3 Day (%)	14 Day (%)
01/01/02	35,394	217	3,378	1,339	4,946	2,942	4,634	45,274	-13,134	8,294	4,027	70	0	20	12,411	11,838	45,997	31,460	45,997	27.20%	30.20%	34.10%
01/02/02	40,034	218	1,875	1,068	4,634	3,307	4,530	47,829	-12,956	8,210	4,078	91	0	25	12,404	12,146	48,381	34,464	47,189	25.70%	28.00%	33.50%
01/03/02	44,072	220	8,907	1,646	4,425	3,674	4,484	59,270	-10,039	8,121	4,017	108	0	19	12,265	12,249	57,044	38,986	50,474	20.50%	24.10%	31.70%
01/04/02	50,652	221	3,293	2,447	4,393	4,267	4,859	61,006	-5,981	8,095	4,053	103	0	23	12,275	12,191	54,713	43,704	51,534	19.90%	21.80%	29.70%
01/05/02	57,660	223	9,602	1,285	5,984	4,683	4,900	74,754	-3,521	1,493	4,101	112	0	22	5,728	9,960	72,546	50,164	55,736	7.50%	15.30%	22.60%
01/06/02	63,876	224	34,595	952	5,065	4,828	4,808	104,712	-3,571	1,497	4,107	113	0	23	5,741	7,783	102,542	59,887	63,537	5.40%	9.70%	15.90%
01/07/02	65,552	226	34,482	886	4,346	4,700	4,700	105,492	-3,393	1,489	4,109	111	0	23	5,732	5,599	103,152	69,196	69,196	5.30%	5.90%	10.40%
01/08/02	64,512	227	21,939	851	4,053	4,547	4,558	91,582	1,400	1,497	4,186	91	0	25	5,798	5,629	84,384	74,680	71,095	6.20%	5.60%	9.80%
01/09/02	63,184	227	14,493	800	3,566	4,360	4,398	82,270	1,350	1,497	4,075	98	0	21	5,691	5,618	75,229	78,516	71,554	6.80%	6.00%	9.30%
01/10/02	62,030	227	9,162	758	3,113	4,125	4,233	75,290	1,300	7,688	4,124	101	0	19	11,931	7,689	62,059	79,232	70,605	15.70%	9.30%	12.10%
01/11/02	60,264	227	4,080	709	2,748	3,640	4,083	68,028	1,300	7,589	4,130	101	0	11	11,831	9,701	54,897	79,258	69,177	17.20%	12.90%	14.80%
01/12/02	57,447	227	2,860	659	2,588	3,268	3,948	63,781	1,022	7,490	4,116	187	0	18	11,811	11,712	50,948	76,173	67,658	18.20%	17.00%	17.20%
01/13/02	52,660	227	2,628	624	2,464	2,982	3,825	58,603	1,022	7,444	4,124	291	0	11	11,870	11,631	45,711	68,054	65,969	19.70%	18.30%	16.70%
01/14/02	46,804	227	2,375	602	2,344	2,723	3,712	52,352	972	7,447	4,108	295	0	15	11,865	11,576	39,515	58,963	64,080	22.10%	19.90%	16.40%
01/15/02	41,324	227	1,145	583	2,241	2,523	3,608	45,520	972	7,398	4,214	296	0	22	11,930	11,578	32,618	51,568	61,982	25.50%	22.20%	16.40%
01/16/02	36,500	227	66	562	2,161	2,377	3,514	39,516	922	7,341	4,175	293	0	21	11,830	11,561	26,765	44,645	59,781	29.10%	25.20%	16.50%
01/17/02	33,829	227	0	525	2,094	2,274	3,426	36,675	1,150	7,342	4,170	280	0	23	11,816	11,547	23,709	39,166	57,659	31.40%	28.50%	16.80%
01/18/02	31,490	227	0	503	2,025	2,185	3,345	34,245	1,100	7,346	4,161	249	0	17	11,772	11,511	21,373	34,377	55,643	33.60%	31.30%	17.30%
01/19/02	29,550	227	0	490	1,963	2,106	3,270	32,230	1,100	7,294	4,163	249	0	9	11,715	11,492	19,415	29,872	53,737	35.50%	33.40%	18.10%
01/20/02	27,648	227	0	475	1,917	2,039	3,200	30,267	1,100	6,842	4,162	278	0	12	11,294	11,323	17,873	25,896	51,944	36.40%	35.10%	19.40%
01/21/02	26,096	227	0	464	1,875	1,981	3,135	28,662	1,050	7,245	4,144	290	0	11	11,689	11,284	15,923	22,525	50,228	39.70%	37.10%	21.40%
01/22/02	24,412	227	0	451	1,834	1,934	3,076	26,924	1,050	6,931	4,166	291	0	11	11,399	11,163	14,475	19,933	48,603	41.20%	39.00%	23.20%
01/23/02	23,432	227	0	457	1,828	1,893	3,021	25,944	1,000	6,906	4,156	289	0	10	11,361	11,183	13,583	18,050	47,080	42.60%	41.10%	25.30%
01/24/02	22,416	227	0	441	1,811	1,860	2,969	24,895	1,000	7,249	4,169	287	0	15	11,721	11,193	12,174	16,402	45,626	45.90%	43.20%	27.60%
01/25/02	21,788	227	0	424	1,789	1,832	2,921	24,228	1,000	7,246	4,192	285	0	11	11,734	11,306	11,494	14,991	44,261	47.20%	45.20%	30.20%
01/26/02	20,848	227	0	419	1,773	1,811	2,877	23,267	1,000	7,250	4,197	251	0	9	11,706	11,435	10,561	13,726	42,965	49.20%	47.40%	33.10%
01/27/02	20,080	227	0	471	1,764	1,795	2,836	22,542	-419	7,244	4,202	248	0	9	11,703	11,444	11,258	12,781	41,790	50.80%	49.00%	35.80%
01/28/02	20,548	227	0	789	1,763	1,781	2,796	23,327	-419	7,242	4,187	275	0	12	11,715	11,440	12,031	12,225	40,728	49.00%	49.60%	38.30%
01/29/02	20,604	227	0	600	1,740	1,770	2,760	23,171	-419	7,241	4,173	280	0	12	11,706	11,429	11,885	11,855	39,733	49.30%	49.70%	40.40%
01/30/02	20,156	227	0	533	1,748	1,765	2,728	22,664	-648	7,237	4,140	279	0	12	11,668	11,406	11,644	11,578	38,797	50.20%	49.50%	42.10%
01/31/02	19,724	227	0	479	1,780	1,764	2,697	22,210	-698	7,235	4,132	289	0	14	11,669	11,386	11,238	11,444	37,908	51.20%	50.20%	43.70%
Sum	1,204,586	6,997	154,880	23,292	86,775	87,736	113,851	1,476,530	(34,388)	200,440	128,258	6,581	0	505	335,781	329,003	1,175,137	1,233,771	1,682,266	925%	901%	740%
Average	38,858	226	4,996	751	2,799	2,830	3,673	47,630	(1,109)	6,466	4,137	212	0	16	10,832	10,613	37,908	39,799	*****	30%	29%	24%

U.S. BUREAU OF RECLAMATION - CENTRAL VALLEY OPERATIONS OFFICE
DELTA OUTFLOW COMPUTATION (values in c.f.s)

FEBRUARY 2002

	DELTA INFLOW									DELTA EXPORTS							OUTFLOW INDEX			Export / Inflow		
	Sacto Riv.			East Side	San Joaquin River @ Vernalis							Contra	Byron		Total	3 day						
	@ Freeport	SRTP	Yolo + Misc	Streams	previous	7 day	monthly	Total Delta	NDCU	Clifton Court	Tracy	Costa	Bethany	North Bay	Delta	average	NDOI	7 day avg	monthly	Daily	3 Day	14 Day
Date	Prev. day	Prev. week	Prev. day	Prev. day	day	average	average	Inflow		(CLT)	(TRA)	(CCC)	(BBID)		Exports	TRA & CLT	daily		average	(%)	(%)	(%)
02/01/02	19,360	227	0	458	1,779	1,764	1,772	21,824	672	5,484	4,149	285	0	12	9,930	10,792	11,222	11,406	11,222	44.10%	48.50%	42.90%
02/02/02	18,728	229	0	461	1,772	1,764	1,769	21,190	672	5,497	4,044	300	0	10	9,851	10,180	10,667	11,421	10,944	45.00%	46.80%	41.80%
02/03/02	18,364	230	0	455	1,765	1,761	1,760	20,814	672	5,544	4,147	316	0	6	10,012	9,622	10,130	11,260	10,673	46.60%	45.20%	40.60%
02/04/02	18,140	232	0	438	1,744	1,759	1,752	20,554	900	5,400	4,135	299	0	13	9,847	9,589	9,806	10,942	10,456	46.40%	46.00%	41.50%
02/05/02	17,657	233	0	430	1,726	1,757	1,748	20,046	900	5,496	4,143	329	0	13	9,980	9,622	9,166	10,553	10,198	48.10%	47.00%	42.50%
02/06/02	17,000	235	0	422	1,732	1,757	1,754	19,389	900	5,502	3,686	334	0	23	9,546	9,454	8,943	10,168	9,989	47.40%	47.30%	42.70%
02/07/02	16,611	236	0	418	1,782	1,773	1,773	19,047	900	5,496	3,533	329	0	28	9,385	9,286	8,762	9,814	9,814	47.40%	47.60%	42.70%
02/08/02	16,037	238	0	417	1,893	1,795	1,793	18,585	-698	5,491	3,563	316	0	32	9,403	9,091	9,880	9,622	9,822	48.70%	47.80%	42.60%
02/09/02	16,032	238	0	584	1,926	1,817	1,806	18,780	-698	5,488	3,567	313	0	29	9,397	9,046	10,081	9,538	9,851	48.20%	48.10%	43.10%
02/10/02	15,691	238	0	624	1,915	1,841	1,817	18,468	-748	5,499	3,531	302	0	31	9,363	9,046	9,853	9,499	9,851	48.90%	48.60%	43.70%
02/11/02	15,757	238	0	553	1,911	1,871	1,828	18,459	-748	5,494	3,543	268	0	31	9,336	9,041	9,870	9,508	9,853	49.00%	48.70%	44.40%
02/12/02	15,819	238	0	528	1,938	1,901	1,837	18,523	-748	5,192	3,534	269	0	33	9,027	8,931	10,243	9,662	9,885	47.10%	48.30%	44.60%
02/13/02	15,386	238	0	520	1,944	1,923	1,845	18,088	850	5,190	3,444	293	0	25	8,952	8,799	8,286	9,568	9,762	47.70%	47.90%	44.60%
02/14/02	15,162	238	0	519	1,937	1,924	1,849	17,856	850	4,989	3,361	294	0	25	8,669	8,570	8,337	9,507	9,660	46.80%	47.20%	44.20%
02/15/02	14,858	238	0	519	1,896	1,915	1,850	17,511	850	3,988	3,366	96	0	22	7,472	8,112	9,189	9,408	9,629	42.00%	45.50%	42.50%
02/16/02	14,689	238	0	521	1,863	1,907	1,850	17,311	850	3,494	3,359	91	0	21	6,965	7,519	9,496	9,325	9,621	39.60%	42.80%	40.00%
02/17/02	14,395	238	0	524	1,863	1,904	1,853	17,020	-63	2,999	3,372	76	0	8	6,455	6,860	10,628	9,436	9,680	37.40%	39.70%	37.00%
02/18/02	14,602	238	0	1,113	1,889	1,903	1,857	17,842	-1,432	2,971	3,353	77	0	12	6,413	6,516	12,861	9,863	9,857	35.40%	37.50%	35.50%
02/19/02	14,901	238	0	1,054	1,930	1,902	1,861	18,123	-1,432	4,298	3,369	71	0	13	7,751	6,788	11,804	10,086	9,959	42.30%	38.40%	37.30%
02/20/02	15,111	238	0	867	1,934	1,904	1,866	18,150	-1,660	4,482	3,362	45	0	12	7,901	7,279	11,909	10,604	10,057	43.20%	40.40%	40.20%
02/21/02	15,714	238	0	1,984	1,954	1,921	1,873	19,890	-1,610	4,573	3,362	3	0	21	7,959	7,816	13,541	11,347	10,223	39.90%	41.70%	43.00%
02/22/02	19,558	238	0	1,506	2,014	1,943	1,879	23,316	-698	5,190	3,361	0	0	22	8,574	8,110	15,440	12,240	10,460	36.70%	39.70%	43.80%
02/23/02	28,563	238	0	1,209	2,018	1,962	1,884	32,028	672	5,295	3,380	3	0	22	8,699	8,387	22,657	14,120	10,990	27.10%	33.40%	43.10%
02/24/02	31,119	238	0	1,079	1,996	1,974	1,888	34,432	672	6,695	3,370	5	0	18	10,088	9,097	23,672	15,984	11,519	29.20%	30.40%	44.10%
02/25/02	27,482	238	0	979	1,971	1,979	1,891	30,670	900	6,597	3,360	7	0	8	9,972	9,566	19,798	16,975	11,850	32.50%	29.50%	44.50%
02/26/02	23,615	238	0	888	1,963	1,982	1,894	26,704	900	4,997	3,497	5	0	11	8,509	9,505	17,295	17,759	12,059	31.80%	31.10%	43.10%
02/27/02	21,284	238	0	824	1,957	1,977	1,895	24,303	900	3,998	3,862	6	0	12	7,878	8,771	15,525	18,275	12,188	32.30%	32.20%	39.00%
02/28/02	19,648	238	0	786	1,922	1,961	1,895	22,594	900	3,998	3,988	9	0	14	8,009	8,114	13,685	18,296	12,241	35.30%	33.10%	35.50%
Sum	511,283	6,620	0	20,680	52,934	52,541	51,339	591,517	3,425	139,337	100,741	4,741	0	527	245,343	243,509	342,746	326,186	292,313	1166%	1180%	1171%
Average	18,260	236	0	739	1,891	1,876	1,834	21,126	122	4,976	3,598	169	0	19	8,762	8,697	12,241	11,650	*****	42%	42%	42%

APPENDIX G
DELTA CONDITIONS REPORT
(APRIL 2002)

U.S. BUREAU OF RECLAMATION - CENTRAL VALLEY OPERATIONS OFFICE
DELTA OUTFLOW COMPUTATION (values in c.f.s)

APRIL 2002

	DELTA INFLOW									DELTA EXPORTS							OUTFLOW INDEX			Export / Inflow		
	Sacto Riv.			East Side	San Joaquin River @ Vernalis					Clifton		Contra	Byron		Total	3 day						
Date	@ Freeport Prev. day	SRTP Prev. week	Yolo + Misc Prev. day	Streams Prev. day	previous day	7 day average	monthly average	Total Delta Inflow	NDCU	Court (CLT)	Tracy (TRA)	Costa (CCC)	Bethany (BBID)	North Bay	Delta Exports	average TRA & CLT	NDOI daily	7 day avg	monthly average	Daily (%)	3 Day (%)	14 Day (%)
04/01/02	17,442	225	0	923	2,036	2,054	1,989	20,626	1,750	3,799	4,213	336	23	69	8,393	7,919	10,483	16,710	10,483	38.70%	37.70%	34.10%
04/02/02	16,998	222	0	937	1,989	1,988	1,899	20,146	1,750	3,392	4,244	343	47	71	8,004	7,998	10,392	14,628	10,437	37.70%	38.90%	34.80%
04/03/02	16,487	218	0	956	1,809	1,930	1,835	19,470	1,750	3,700	4,248	294	26	64	8,279	7,865	9,441	12,524	10,105	40.70%	39.00%	34.60%
04/04/02	16,537	215	0	962	1,708	1,878	1,790	19,422	1,800	3,692	4,240	324	37	59	8,279	7,839	9,342	11,014	9,915	40.70%	39.60%	34.70%
04/05/02	16,999	211	16	993	1,655	1,833	1,767	19,874	1,800	4,379	3,157	326	32	62	7,892	7,805	10,182	10,314	9,968	37.80%	39.70%	34.80%
04/06/02	16,623	208	66	1,002	1,674	1,798	1,759	19,573	1,800	4,957	2,758	318	35	53	8,051	7,728	9,721	9,988	9,927	39.20%	39.20%	34.60%
04/07/02	16,065	204	67	943	1,717	1,768	1,768	18,996	1,800	4,538	2,681	309	0	55	7,584	7,490	9,613	9,882	9,882	38.00%	38.30%	33.90%
04/08/02	16,124	201	47	894	1,826	1,761	1,790	19,092	1,850	4,289	3,040	332	124	57	7,595	7,421	9,647	9,763	9,853	37.70%	38.30%	34.10%
04/09/02	15,728	201	41	862	1,939	1,763	1,793	18,771	1,850	3,690	3,408	317	67	50	7,399	7,215	9,522	9,639	9,816	37.50%	37.70%	34.10%
04/10/02	16,309	201	44	861	1,823	1,778	1,795	19,238	1,850	3,496	3,400	293	42	51	7,197	7,108	10,191	9,746	9,854	35.60%	36.90%	34.50%
04/11/02	16,544	201	57	913	1,809	1,793	1,792	19,524	1,850	3,600	3,394	329	85	50	7,287	6,996	10,387	9,895	9,902	35.40%	36.10%	34.70%
04/12/02	16,186	201	57	941	1,761	1,805	1,789	19,146	1,850	3,499	3,392	331	57	51	7,216	6,927	10,080	9,880	9,917	35.70%	35.60%	34.80%
04/13/02	16,203	201	59	968	1,761	1,818	1,791	19,192	1,900	3,194	3,402	337	50	50	6,933	6,827	10,359	9,971	9,951	34.10%	35.10%	34.60%
04/14/02	16,063	201	131	984	1,806	1,875	1,822	19,185	1,900	3,392	3,433	323	25	57	7,181	6,771	10,104	10,041	9,962	35.40%	35.10%	34.60%
04/15/02	14,938	201	138	986	2,227	2,008	1,892	18,490	1,900	497	1,657	340	78	68	2,484	5,192	14,106	10,678	10,238	11.20%	27.10%	26.60%
04/16/02	15,631	201	182	1,013	2,869	2,173	1,959	19,896	1,900	593	997	315	20	69	1,953	3,523	16,043	11,610	10,601	7.90%	18.10%	18.10%
04/17/02	15,149	201	287	974	2,975	2,343	2,021	19,586	1,672	584	995	146	65	68	1,728	1,774	16,186	12,466	10,929	7.70%	8.90%	8.90%
04/18/02	14,794	201	380	969	3,003	2,540	2,083	19,347	1,444	477	931	121	55	65	1,539	1,526	16,365	13,320	11,231	7.00%	7.50%	7.70%
04/19/02	15,309	201	332	915	3,142	2,746	2,142	19,899	1,444	594	941	134	41	60	1,689	1,508	16,766	14,276	11,523	7.50%	7.40%	7.50%
04/20/02	14,717	201	290	824	3,200	2,961	2,200	19,232	1,444	638	888	160	40	57	1,703	1,490	16,085	15,094	11,751	7.70%	7.40%	7.50%
04/21/02	13,871	201	256	787	3,311	3,125	2,256	18,426	1,444	650	890	158	41	54	1,711	1,534	15,271	15,832	11,919	8.10%	7.80%	7.80%
04/22/02	13,641	201	190	754	3,373	3,205	2,309	18,159	1,672	648	880	161	72	60	1,677	1,531	14,810	15,932	12,050	8.00%	8.00%	7.70%
04/23/02	13,203	201	231	729	3,430	3,244	2,350	17,794	1,900	642	877	158	63	76	1,689	1,529	14,205	15,670	12,144	8.20%	8.10%	7.70%
04/24/02	12,402	201	343	728	3,252	3,275	2,386	16,926	1,950	647	890	175	71	81	1,722	1,528	13,254	15,251	12,190	8.70%	8.30%	7.70%
04/25/02	10,948	201	355	738	3,215	3,298	2,423	15,457	1,950	635	877	168	68	72	1,684	1,523	11,823	14,602	12,175	9.30%	8.70%	7.80%
04/26/02	11,137	201	373	737	3,308	3,328	2,461	15,756	1,950	641	880	162	43	58	1,698	1,523	12,108	13,937	12,173	9.40%	9.10%	8.00%
04/27/02	11,027	201	446	749	3,408	3,349	2,498	15,831	1,950	642	881	153	50	47	1,672	1,519	12,209	13,383	12,174	9.30%	9.30%	8.10%
04/28/02	10,946	201	480	759	3,454	3,366	2,534	15,840	2,000	648	875	149	50	40	1,662	1,523	12,178	12,941	12,174	9.30%	9.30%	8.20%
04/29/02	11,405	201	511	765	3,496	3,392	2,571	16,378	2,000	648	883	150	84	37	1,635	1,526	12,743	12,646	12,194	8.80%	9.10%	8.20%
04/30/02	11,207	201	518	741	3,609	3,437	2,604	16,276	2,000	614	877	144	62	35	1,608	1,515	12,668	12,426	12,210	8.80%	9.00%	8.30%
Sum	440,633	6,126	5,897	26,307	76,585	73,632	62,068	555,548	54,120	63,415	64,229	7,306	1,553	1,746	135,144	134,173	366,284	374,059	327,648	661%	690%	639%
Average	14,688	204	197	877	2,553	2,454	2,069	18,518	1,804	2,114	2,141	244	52	58	4,505	4,472	12,209	12,469	*****	22%	23%	21%

APPENDIX H
DELTA CONDITIONS REPORT
(APRIL AND MAY 2003)

U.S. BUREAU OF RECLAMATION - CENTRAL VALLEY OPERATIONS OFFICE
DELTA OUTFLOW COMPUTATION (values in c.f.s)

APRIL 2003

	DELTA INFLOW									DELTA EXPORTS							OUTFLOW INDEX			Export / Inflow		
	Sacto Riv.			East Side	San Joaquin River @ Vernalis					Clifton		Contra	Byron		Total	3 day						
Date	@ Freeport Prev. day	SRTP Prev. week	Yolo + Misc Prev. day	Streams Prev. day	previous day	7 day average	monthly average	Total Delta Inflow	NDCU	Court (CLT)	Tracy (TRA)	Costa (CCC)	Bethany (BBID)	North Bay	Delta Exports	average TRA & CLT	NDOI daily	7 day avg	monthly average	Daily (%)	3 Day (%)	14 Day (%)
04/01/03	19,878	175	0	609	1,987	1,983	1,939	22,649	1,750	5,696	3,638	252	0	42	9,628	9,889	11,271	12,481	11,271	41.20%	40.80%	34.90%
04/02/03	18,524	172	0	625	1,939	1,976	1,972	21,260	1,522	5,557	3,346	245	20	39	9,167	9,329	10,571	12,077	10,921	41.80%	41.00%	34.80%
04/03/03	18,037	169	0	698	2,004	1,983	1,997	20,908	837	5,098	2,910	239	29	38	8,257	8,749	11,814	11,915	11,219	38.20%	40.40%	34.30%
04/04/03	17,923	167	0	704	2,047	1,990	2,003	20,841	887	5,686	2,756	240	11	45	8,716	8,451	11,238	11,777	11,223	40.50%	40.10%	34.40%
04/05/03	18,228	164	0	715	2,020	2,004	2,016	21,127	-254	5,672	2,706	240	0	34	8,652	8,276	12,728	11,907	11,524	39.70%	39.40%	34.60%
04/06/03	18,213	161	0	927	2,071	2,012	2,016	21,372	-254	4,797	2,658	231	0	35	7,721	8,092	13,905	12,015	11,921	34.90%	38.30%	34.60%
04/07/03	17,827	158	0	765	2,015	2,021	2,021	20,765	-26	4,788	2,740	269	0	37	7,835	7,787	12,956	12,069	12,069	36.30%	36.90%	33.90%
04/08/03	17,764	159	0	690	2,050	2,025	2,015	20,663	709	5,080	2,718	329	16	43	8,155	7,594	11,799	12,144	12,035	37.70%	36.30%	33.50%
04/09/03	16,671	159	0	677	1,970	2,013	2,004	19,477	709	4,392	2,749	336	23	44	7,498	7,489	11,270	12,244	11,950	36.50%	36.80%	33.60%
04/10/03	15,705	160	0	739	1,919	1,985	1,989	18,523	1,850	5,190	2,749	337	27	44	8,293	7,626	8,380	11,754	11,593	42.70%	38.90%	34.80%
04/11/03	15,157	161	0	809	1,850	1,964	1,978	17,977	1,850	4,093	3,212	331	43	44	7,637	7,462	8,490	11,361	11,311	40.40%	39.80%	34.70%
04/12/03	15,130	162	0	836	1,874	1,947	1,976	18,002	1,850	3,098	3,405	246	10	40	6,778	7,249	9,374	10,882	11,150	36.10%	39.80%	34.40%
04/13/03	14,490	162	0	957	1,950	1,976	1,994	17,559	-839	3,869	3,411	144	10	33	7,447	7,029	10,951	10,460	11,134	41.40%	39.30%	34.40%
04/14/03	16,139	163	3,468	3,306	2,216	2,044	2,033	25,292	-2,208	4,175	3,410	176	29	38	7,771	7,122	19,729	11,428	11,748	29.90%	35.00%	34.70%
04/15/03	19,724	178	4,013	2,622	2,532	2,154	2,079	29,069	-2,208	642	1,606	326	0	42	2,617	5,704	28,660	13,836	12,876	7.70%	23.70%	27.20%
04/16/03	24,883	193	3,784	1,736	2,734	2,290	2,129	33,330	-2,208	649	858	308	0	39	1,855	3,780	33,683	17,038	14,176	4.50%	12.90%	17.30%
04/17/03	25,998	208	3,680	1,380	2,875	2,455	2,181	34,141	-2,208	645	859	309	0	40	1,853	1,753	34,496	20,769	15,371	4.40%	5.40%	7.70%
04/18/03	23,375	223	0	1,207	3,005	2,641	2,236	27,810	531	645	860	315	21	43	1,841	1,505	25,438	23,190	15,931	5.30%	4.70%	6.50%
04/19/03	21,499	238	0	1,180	3,177	2,820	2,287	26,094	1,900	643	858	297	0	42	1,840	1,503	22,354	25,044	16,269	5.80%	5.10%	6.30%
04/20/03	20,432	253	0	1,079	3,204	2,985	2,341	24,968	1,900	599	859	295	76	36	1,713	1,488	21,355	26,531	16,523	5.50%	5.50%	6.10%
04/21/03	19,739	268	0	1,006	3,371	3,124	2,396	24,384	1,900	646	859	288	0	38	1,831	1,488	20,653	26,663	16,720	6.20%	5.80%	6.10%
04/22/03	18,979	265	0	1,012	3,499	3,221	2,443	23,755	1,215	639	860	281	46	13	1,746	1,488	20,793	25,539	16,905	6.10%	5.90%	6.00%
04/23/03	18,887	262	0	1,123	3,416	3,283	2,480	23,688	987	627	857	285	58	7	1,718	1,496	20,983	23,724	17,082	6.00%	6.10%	5.90%
04/24/03	18,359	259	0	992	3,307	3,288	2,504	22,917	1,037	615	858	286	46	6	1,719	1,485	20,161	21,677	17,210	6.20%	6.10%	5.80%
04/25/03	18,599	255	3,538	1,037	3,040	3,272	2,526	26,469	124	643	856	259	43	9	1,724	1,485	24,621	21,560	17,507	5.50%	5.90%	5.60%
04/26/03	20,350	252	3,496	1,613	3,070	3,272	2,552	28,781	124	639	859	282	0	3	1,784	1,490	26,873	22,206	17,867	5.20%	5.60%	5.60%
04/27/03	27,137	249	3,474	2,027	3,200	3,254	2,578	36,087	809	639	853	284	15	3	1,764	1,496	33,514	23,943	18,447	4.10%	4.90%	5.30%
04/28/03	34,462	246	2,742	1,722	3,244	3,229	2,605	42,416	859	645	857	286	93	17	1,711	1,497	39,846	26,685	19,211	3.30%	4.10%	5.10%
04/29/03	36,978	248	3,824	2,486	3,328	3,230	2,633	46,864	-3,249	623	857	271	61	23	1,712	1,491	48,401	30,629	20,218	3.00%	3.40%	4.80%
04/30/03	38,500	250	4,657	2,755	3,418	3,231	2,655	49,580	-2,336	625	857	246	61	20	1,686	1,487	50,230	34,807	21,218	2.90%	3.10%	4.50%
Sum	627,587	6,139	36,676	38,034	78,332	75,672	66,578	786,768	7,560	77,355	56,881	8,233	738	937	142,669	142,780	636,537	548,355	434,600	619%	651%	607%
Average	20,920	205	1,223	1,268	2,611	2,522	2,219	26,226	252	2,579	1,896	274	25	31	4,756	4,759	21,218	18,279	*****	21%	22%	20%

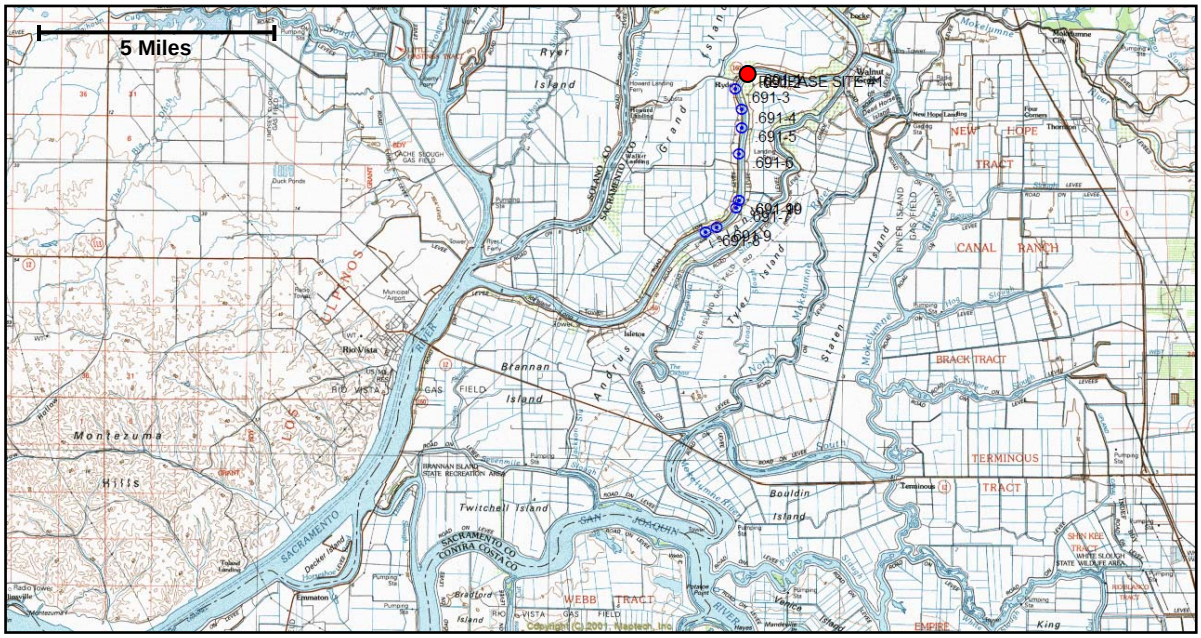
U.S. BUREAU OF RECLAMATION - CENTRAL VALLEY OPERATIONS OFFICE
DELTA OUTFLOW COMPUTATION (values in c.f.s)

MAY 2003

	DELTA INFLOW									DELTA EXPORTS							OUTFLOW INDEX			Export / Inflow		
	Sacto Riv. @ Freeport	SRTP	Yolo + Misc	East Side Streams	San Joaquin River @ Vernalis previous day	7 day average	monthly average	Total Delta Inflow	NDCU	Clifton Court (CLT)	Tracy (TRA)	Contra Costa (CCC)	Byron Bethany (BBID)	North Bay	Total Delta Exports	3 day average TRA & CLT	NDOI daily	7 day avg	monthly average	Daily (%)	3 Day (%)	14 Day (%)
Date	Prev. day	Prev. week	Prev. day	Prev. day																		
05/01/03	40,831	252	4,913	2,436	3,319	3,265	3,277	51,751	-2,336	602	854	246	6	27	1,724	1,472	52,364	39,407	52,364	2.80%	2.90%	4.40%
05/02/03	42,451	255	4,376	1,651	3,277	3,293	3,270	52,010	-2,336	641	858	252	34	38	1,754	1,479	52,591	43,403	52,478	2.80%	2.80%	4.20%
05/03/03	44,706	257	4,265	1,524	3,263	3,311	3,290	54,015	-3,427	643	857	255	34	43	1,764	1,485	55,678	47,518	53,544	2.70%	2.80%	4.00%
05/04/03	48,783	259	4,683	1,615	3,331	3,348	3,342	58,671	274	611	862	252	34	43	1,733	1,490	56,663	50,825	54,324	2.50%	2.70%	3.80%
05/05/03	53,502	261	4,340	2,083	3,498	3,366	3,365	63,684	274	618	858	262	25	43	1,755	1,483	61,655	53,940	55,790	2.30%	2.50%	3.50%
05/06/03	56,851	265	4,127	2,027	3,458	3,352	3,358	66,728	274	571	854	257	0	39	1,722	1,458	64,732	56,273	57,281	2.10%	2.30%	3.20%
05/07/03	59,304	268	3,901	1,833	3,318	3,337	3,337	68,624	324	648	857	258	21	43	1,785	1,469	66,515	58,600	58,600	2.20%	2.20%	3.00%
05/08/03	61,762	272	3,251	1,659	3,213	3,333	3,326	70,157	1,694	641	860	269	19	43	1,793	1,477	66,670	60,643	59,608	2.10%	2.10%	2.90%
05/09/03	62,394	275	0	1,620	3,251	3,338	3,323	67,540	2,200	643	855	280	10	43	1,810	1,501	63,530	62,206	60,044	2.20%	2.20%	2.70%
05/10/03	61,427	279	0	1,777	3,295	3,331	3,319	66,778	2,200	640	853	281	10	43	1,807	1,497	62,770	63,219	60,317	2.20%	2.20%	2.60%
05/11/03	58,880	282	0	1,547	3,285	3,316	3,326	63,994	2,250	626	854	279	10	46	1,795	1,490	59,950	63,689	60,283	2.30%	2.20%	2.50%
05/12/03	55,417	286	0	1,440	3,392	3,307	3,331	60,535	2,300	641	855	283	131	42	1,689	1,489	56,546	62,959	59,972	2.30%	2.30%	2.40%
05/13/03	51,050	282	0	1,434	3,392	3,294	3,323	56,158	2,300	0	732	282	83	49	980	1,236	52,877	61,265	59,426	1.20%	1.90%	1.90%
05/14/03	45,348	277	0	1,453	3,227	3,245	3,291	50,305	2,350	643	860	284	41	56	1,802	1,244	46,153	58,357	58,478	2.90%	2.10%	1.90%
05/15/03	39,955	273	0	1,499	2,875	3,160	3,249	44,602	2,350	645	859	283	76	64	1,776	1,246	40,476	54,615	57,278	3.20%	2.30%	2.00%
05/16/03	36,746	268	0	1,496	2,653	3,045	3,201	41,163	2,400	639	859	280	40	67	1,805	1,502	36,958	50,819	56,008	3.50%	3.20%	2.40%
05/17/03	35,355	264	0	1,487	2,488	2,909	3,150	39,594	2,450	650	860	287	0	79	1,875	1,504	35,268	46,890	54,788	3.80%	3.50%	2.50%
05/18/03	34,564	259	0	1,445	2,333	2,751	3,102	38,601	2,450	646	861	295	0	80	1,882	1,505	34,270	43,221	53,648	3.90%	3.70%	2.60%
05/19/03	33,875	255	0	1,391	2,289	2,604	3,063	37,810	2,500	646	1,447	294	104	86	2,368	1,703	32,942	39,849	52,558	5.30%	4.30%	3.00%
05/20/03	33,092	255	0	1,309	2,364	2,463	3,022	37,020	2,550	639	1,690	309	169	98	2,567	1,976	31,903	36,853	51,526	5.80%	5.00%	3.60%
05/21/03	32,184	254	0	1,245	2,239	2,354	2,979	35,922	2,550	536	1,690	315	53	106	2,594	2,216	30,778	34,657	50,538	6.10%	5.70%	4.20%
05/22/03	30,796	254	0	1,227	2,111	2,278	2,940	34,388	2,600	647	1,687	246	83	109	2,605	2,297	29,182	33,043	49,567	6.50%	6.10%	4.60%
05/23/03	29,307	253	0	1,217	2,121	2,218	2,902	32,898	2,650	648	1,690	153	74	107	2,525	2,300	27,723	31,724	48,617	6.90%	6.50%	4.90%
05/24/03	28,357	253	0	1,260	2,070	2,179	2,867	31,940	2,700	543	1,691	177	76	109	2,446	2,303	26,794	30,513	47,708	6.80%	6.70%	5.10%
05/25/03	27,123	252	0	1,277	2,059	2,149	2,835	30,711	2,750	590	1,692	175	76	99	2,481	2,285	25,480	29,258	46,819	7.20%	6.90%	5.40%
05/26/03	27,647	252	0	1,243	2,082	2,119	2,809	31,224	2,750	644	1,690	173	0	101	2,609	2,284	25,865	28,247	46,013	7.50%	7.10%	5.80%
05/27/03	28,091	250	0	1,191	2,151	2,091	2,781	31,683	2,800	647	1,745	183	229	99	2,445	2,336	26,438	27,466	45,288	6.80%	7.20%	6.00%
05/28/03	27,362	248	0	1,179	2,046	2,069	2,751	30,835	2,850	647	3,100	161	117	108	3,899	2,825	24,086	26,510	44,531	11.80%	8.70%	7.60%
05/29/03	26,861	246	0	1,331	1,952	2,058	2,727	30,390	2,900	2,695	3,619	186	69	92	6,523	4,151	20,967	25,336	43,718	20.50%	13.00%	11.60%
05/30/03	27,223	244	0	1,606	2,046	2,071	2,708	31,119	2,950	4,195	3,892	184	127	89	8,233	6,049	19,936	24,224	42,925	25.60%	19.30%	17.60%
05/31/03	28,158	242	0	2,026	2,162	2,089	2,691	32,588	3,000	6,673	4,386	193	126	97	11,222	8,486	18,366	23,020	42,133	33.50%	26.70%	25.10%
Sum	1,269,402	8,092	33,856	47,528	84,560	87,043	96,255	1,443,438	53,541	30,498	45,327	7,634	1,877	2,188	83,768	67,238	1,306,126	1,368,549	1,636,172	197%	169%	157%
Average	40,948	261	1,092	1,533	2,728	2,808	3,105	46,563	1,727	984	1,462	246	61	71	2,702	2,169	42,133	44,147	*****	6%	5%	5%

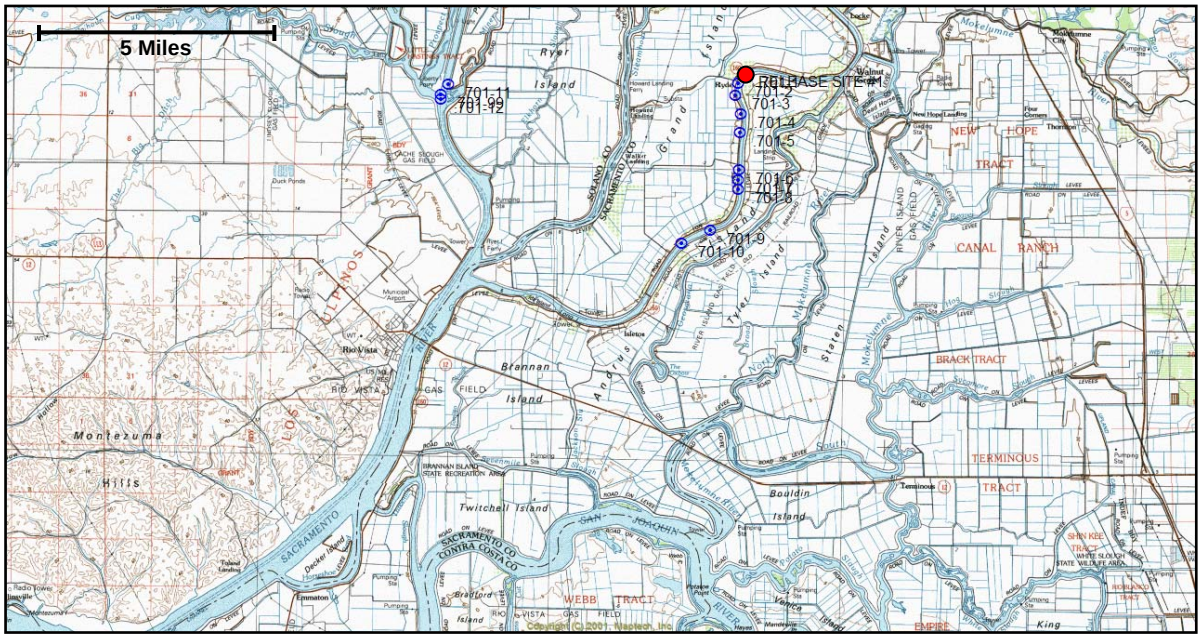
APPENDIX I

NORTH DELTA 2002 TELEMETRY LOCATION MAPS



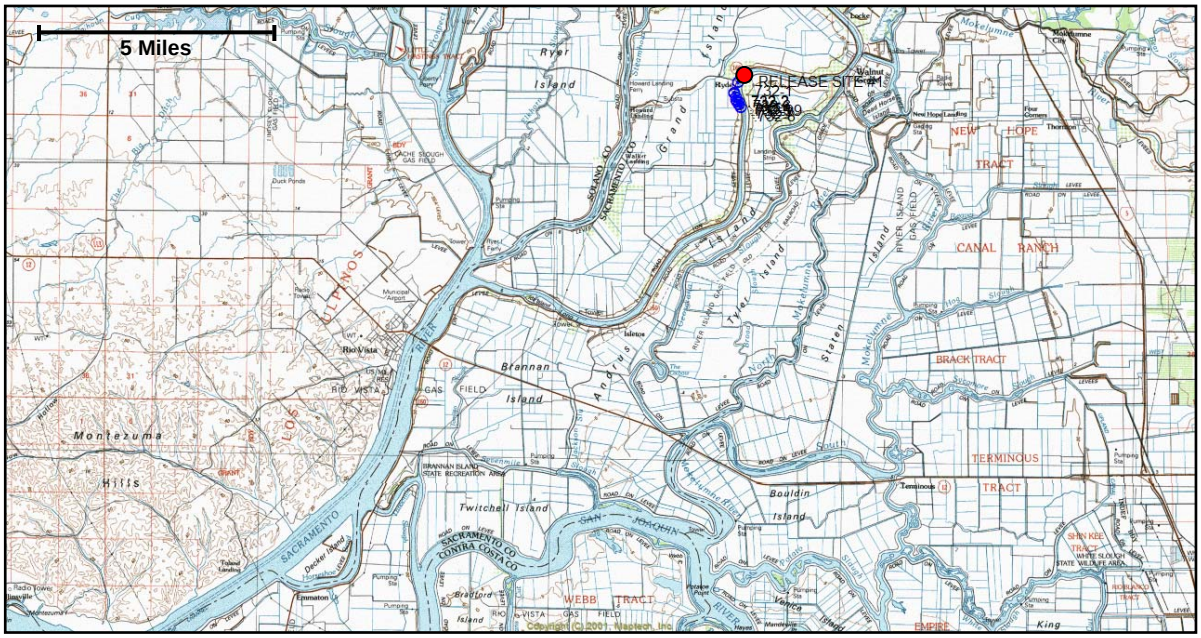
Release 1 – Fish 48.691 MHz (EXTERNAL) – January 22, 2002 at 9:16

.691-1: 1/22/02 at 9:39
.691-2: 1/22/02 at 10:26
.691-3: 1/22/02 at 11:07
.691-4: 1/22/02 at 11:48
.691-5: 1/22/02 at 12:27
.691-6: 1/22/02 at 13:16
.691-7: 1/22/02 at 14:24
.691-8: 1/22/02 at 15:29
.691-9: 1/22/02 at 16:45
.691-10: 1/23/02 at 11:33
.691-99: 1/23/02 at 12:57



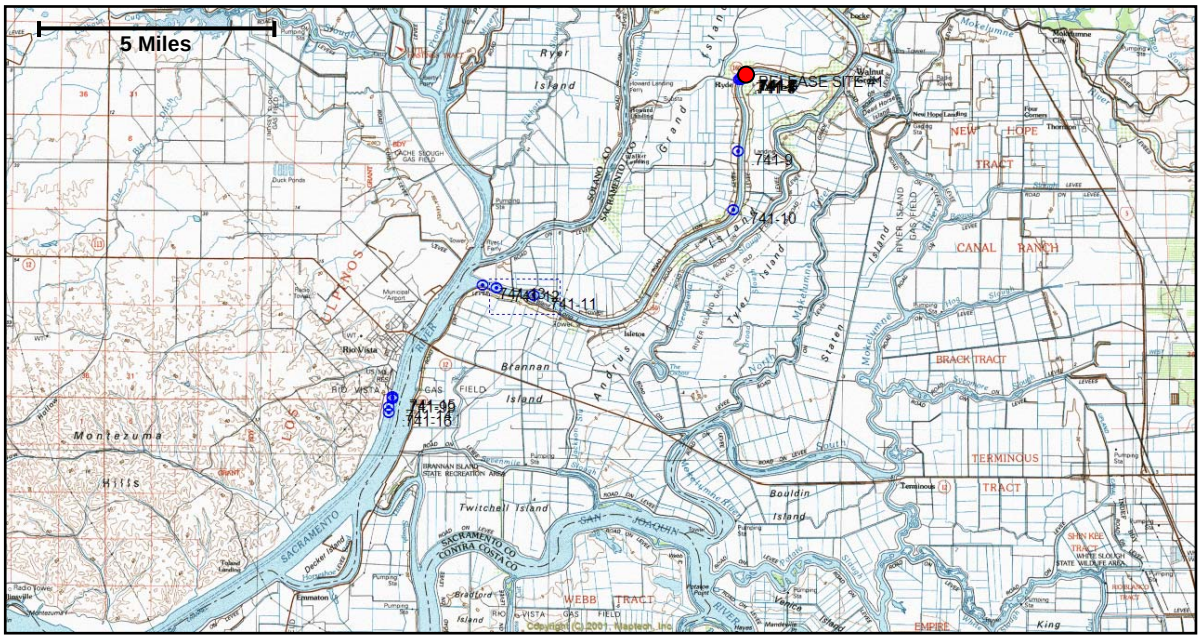
Release 1 – Fish 48.701 MHz (EXTERNAL) – January 22, 2002 at 9:16

.701-1: 1/22/02 at 9:43
.701-2: 1/22/02 at 10:35
.701-3: 1/22/02 at 11:00
.701-4: 1/22/02 at 11:43
.701-5: 1/22/02 at 12:29
.701-6: 1/22/02 at 13:21
.701-7: 1/22/02 at 14:20
.701-8: 1/22/02 at 15:18
.701-9: 1/22/02 at 16:26
.701-10: 1/22/02 at 17:10
.701-11: 1/23/02 at 11:47
.701-12: 1/23/02 at 14:19
.701-99: 1/23/02 at 16:20



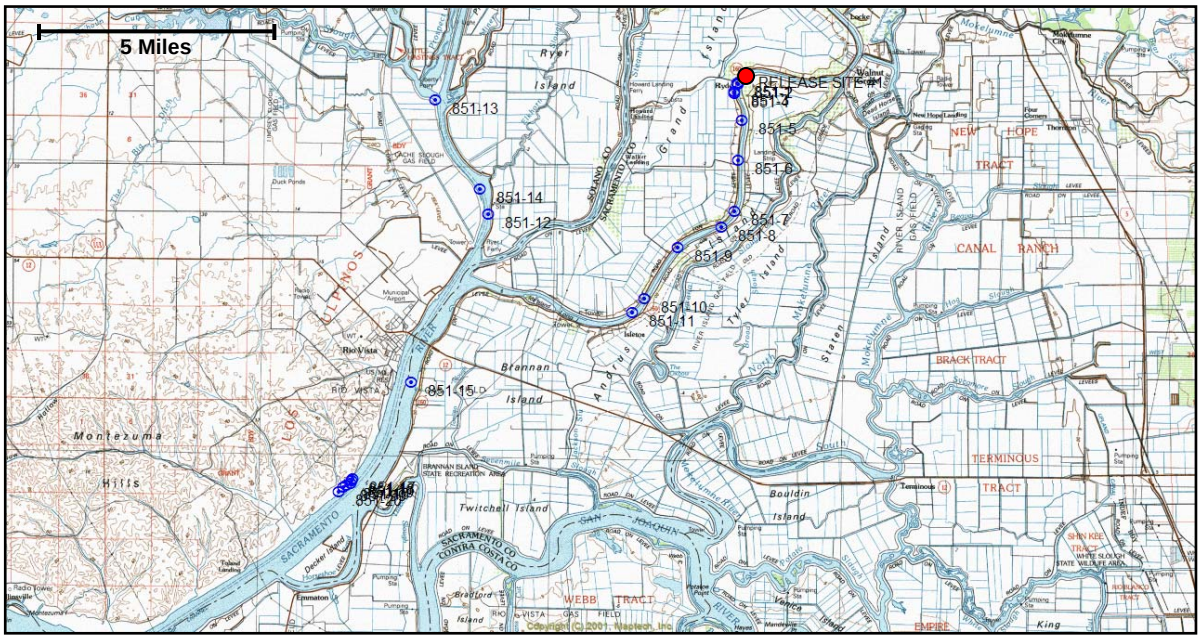
Release 1 – Fish 48.732 MHz (EXTERNAL) – January 22, 2002 at 9:16

.732-1: 1/22/02 at 9:49
.732-2: 1/22/02 at 10:39
.732-3: 1/22/02 at 11:51
.732-4: 1/22/02 at 12:10
.732-5: 1/22/02 at 13:08
.732-6: 1/22/02 at 14:08
.732-7: 1/22/02 at 15:09
.732-8: 1/22/02 at 16:10
.732-99: 1/23/02 at 11:50



Release 1 – Fish 48.741 MHz (EXTERNAL) – January 22, 2002 at 9:16

.741-1: 1/22/02 at 9:56
.741-2: 1/22/02 at 10:31
.741-3: 1/22/02 at 11:10
.741-4: 1/22/02 at 11:32
.741-5: 1/22/02 at 12:05
.741-6: 1/22/02 at 12:58
.741-7: 1/22/02 at 13:46
.741-8: 1/22/02 at 14:56
.741-9: 1/22/02 at 16:20
.741-10: 1/22/02 at 17:13
.741-11: 1/23/02 at 11:00
.741-12: 1/23/02 at 13:30
.741-13: 1/23/02 at 17:28
.741-14: 1/24/02 at 9:38
.741-15: 1/24/02 at 13:37
.741-16: 1/24/02 at 16:00
.741-99: 1/24/02 at 16:54

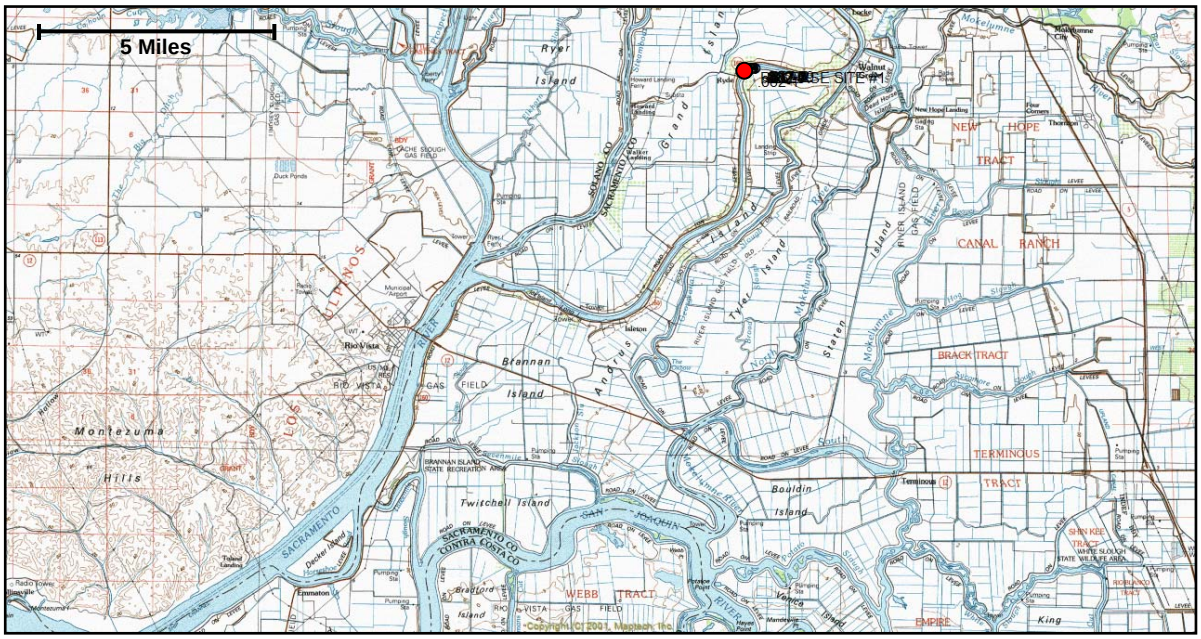


Release 1 – Fish 48.851 MHz (EXTERNAL) – January 22, 2002 at 9:16

.851-1: 1/22/02 at 9:54	.851-8: 1/22/02 at 14:44	.851-15: 1/23/02 at 16:50
.851-2: 1/22/02 at 10:34	.851-9: 1/22/02 at 15:34	.851-16: 1/24/02 at 11:29
.851-3: 1/22/02 at 11:03	.851-10: 1/22/02 at 16:37	.851-17: 1/24/02 at 14:02
.851-4: 1/22/02 at 11:36	.851-11: 1/22/02 at 16:59	.851-18: 1/24/02 at 15:18
.851-5: 1/22/02 at 12:24	.851-12: 1/23/02 at 9:03	.851-19: 1/24/02 at 17:04
.851-6: 1/22/02 at 13:18	.851-13: 1/23/02 at 12:06	.851-20: 1/25/02 at 13:57
.851-7: 1/22/02 at 14:26	.851-14: 1/23/02 at 14:05	.851-99: 1/25/02 at 14:55

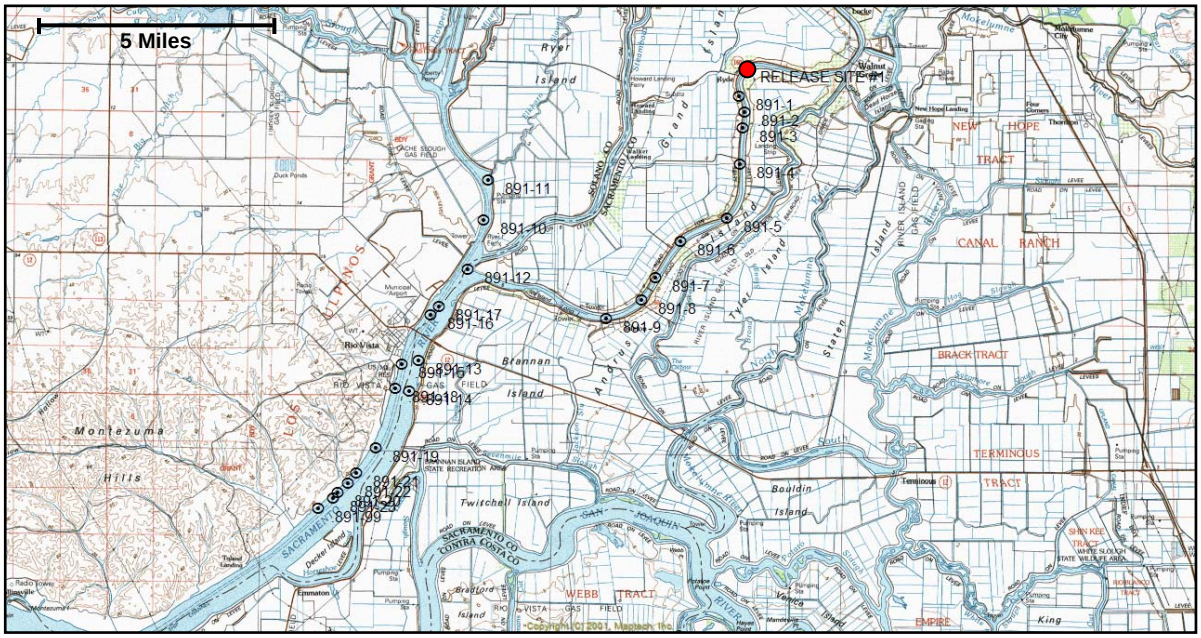
Release 1 – Fish 48.871 MHz (INTERNAL) – January 22, 2002 at 9:16

.871-1: 1/22/02 at 10:33	.871-10: 1/22/02 at 16:55	.871-18: 1/24/02 at 15:30
.871-2: 1/22/02 at 11:17	.871-11: 1/23/02 at 9:35	.871-19: 1/24/02 at 17:10
.871-3: 1/22/02 at 11:57	.871-12: 1/23/02 at 11:30	.871-20: 1/25/02 at 9:17
.871-4: 1/22/02 at 13:00	.871-13: 1/23/02 at 13:54	.871-21: 1/25/02 at 10:20
.871-5: 1/22/02 at 14:02	.871-14: 1/23/02 at 16:00	.871-22: 1/25/02 at 11:45
.871-6: 1/22/02 at 14:54	.871-15: 1/23/02 at 17:23	.871-23: 1/25/02 at 14:09
.871-7: 1/22/02 at 15:43	.871-16: 1/24/02 at 10:14	.871-24: 1/25/02 at 15:07
.871-8: 1/22/02 at 16:08	.871-17: 1/24/02 at 13:31	.871-99: 1/25/02 at 15:22
.871-9: 1/22/02 at 16:31		



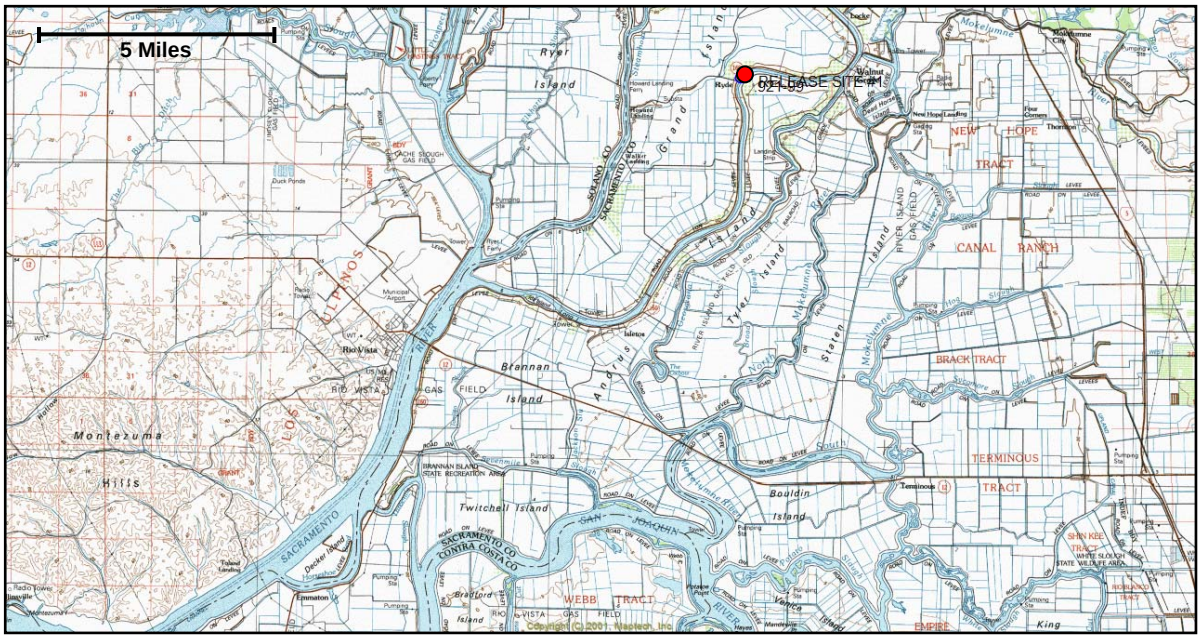
Release 1 – Fish 48.882 MHz (INTERNAL) – January 22, 2002 at 9:16

.882-1: 1/22/02 at 10:22	.882-5: 1/22/02 at 14:28
.882-2: 1/22/02 at 11:39	.882-6: 1/22/02 at 15:20
.882-3: 1/22/02 at 12:28	.882-7: 1/22/02 at 17:15
.882-4: 1/22/02 at 13:23	.882-99: 1/23/02 at 12:04

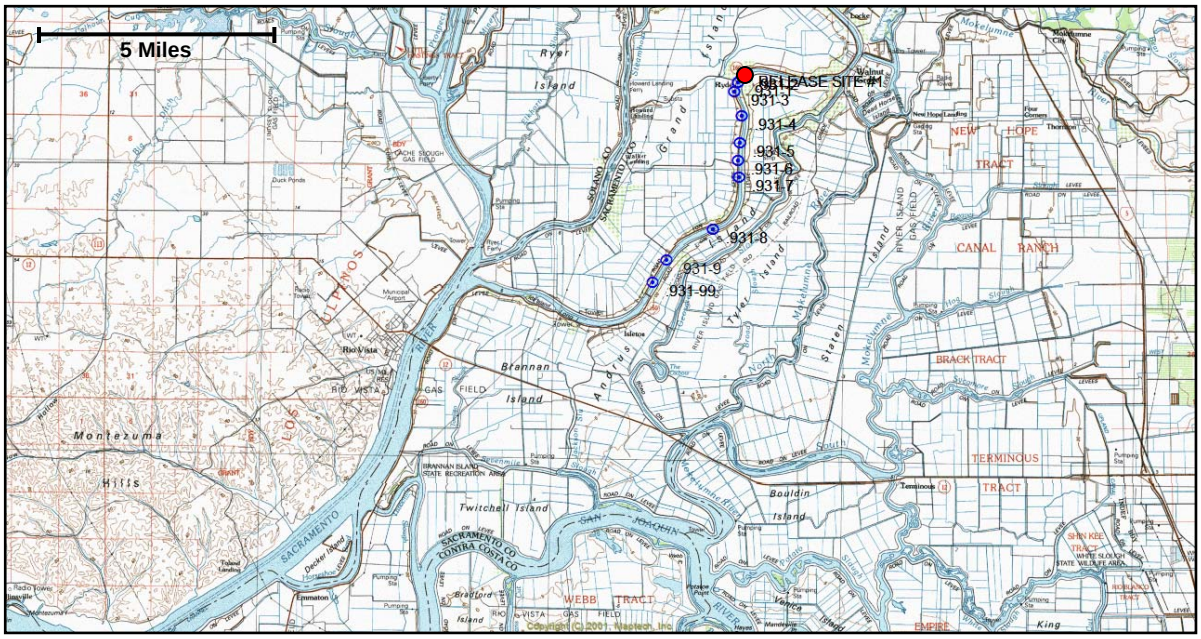


Release 1 – Fish 48.891 MHz (INTERNAL) – January 22, 2002 at 9:16

.891-1: 1/22/02 at 10:38	.891-9: 1/22/02 at 16:50	.891-17: 1/24/02 at 13:14
.891-2: 1/22/02 at 11:14	.891-10: 1/23/02 at 9:02	.891-18: 1/24/02 at 16:05
.891-3: 1/22/02 at 11:54	.891-11: 1/23/02 at 11:32	.891-19: 1/24/02 at 16:58
.891-4: 1/22/02 at 12:56	.891-12: 1/23/02 at 13:40	.891-20: 1/25/02 at 9:07
.891-5: 1/22/02 at 14:07	.891-13: 1/23/02 at 15:52	.891-21: 1/25/02 at 11:45
.891-6: 1/22/02 at 15:01	.891-14: 1/23/02 at 16:46	.891-22: 1/25/02 at 14:00
.891-7: 1/22/02 at 15:52	.891-15: 1/24/02 at 9:29	.891-23: 1/25/02 at 14:57
.891-8: 1/22/02 at 16:18	.891-16: 1/24/02 at 12:02	.891-99: 1/25/02 at 15:22

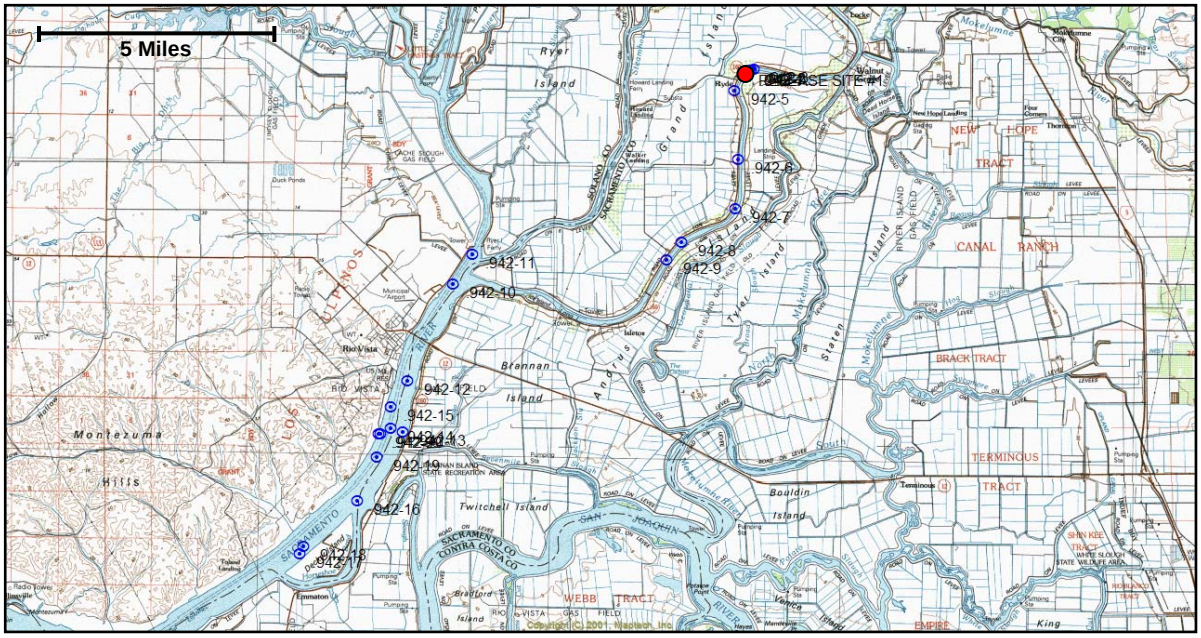


Release 1 – Fish 48.921 MHz (EXTERNAL) – January 22, 2002 at 9:16
.921-99: 1/23/02 at 11:57



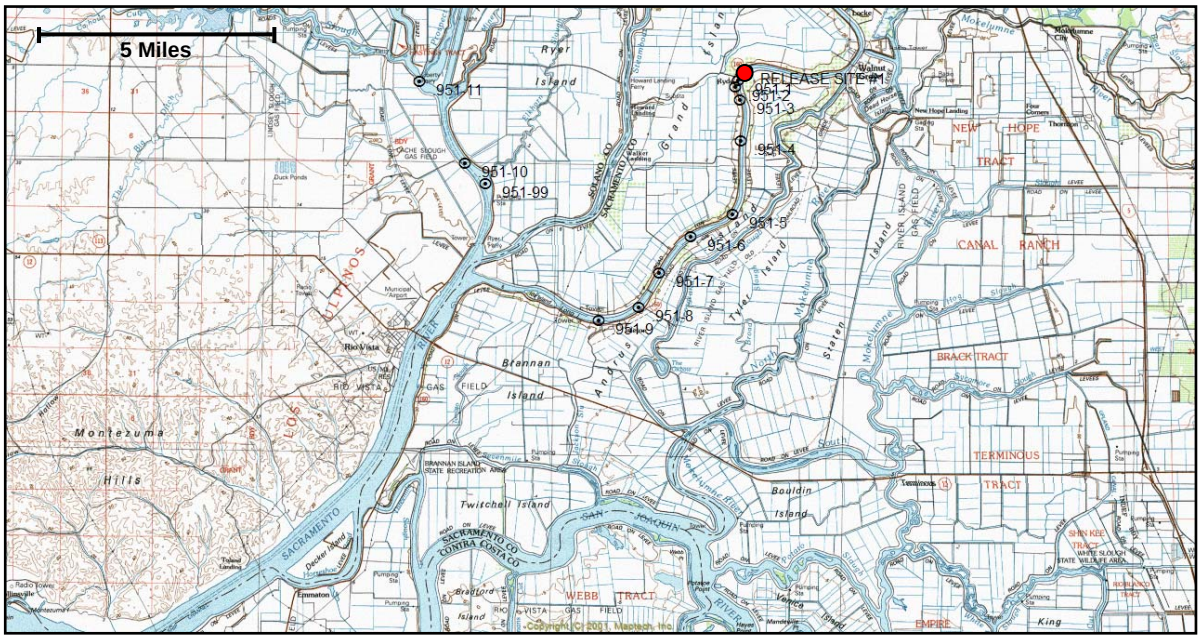
Release 1 – Fish 48.931 MHz (EXTERNAL) – January 22, 2002 at 9:16

.931-1: 1/22/02 at 9:50
.931-2: 1/22/02 at 10:28
.931-3: 1/22/02 at 11:05
.931-4: 1/22/02 at 11:41
.931-5: 1/22/02 at 12:31
.931-6: 1/22/02 at 13:19
.931-7: 1/22/02 at 14:18
.931-8: 1/22/02 at 15:25
.931-9: 1/22/02 at 16:30
.931-99: 1/22/02 at 17:06



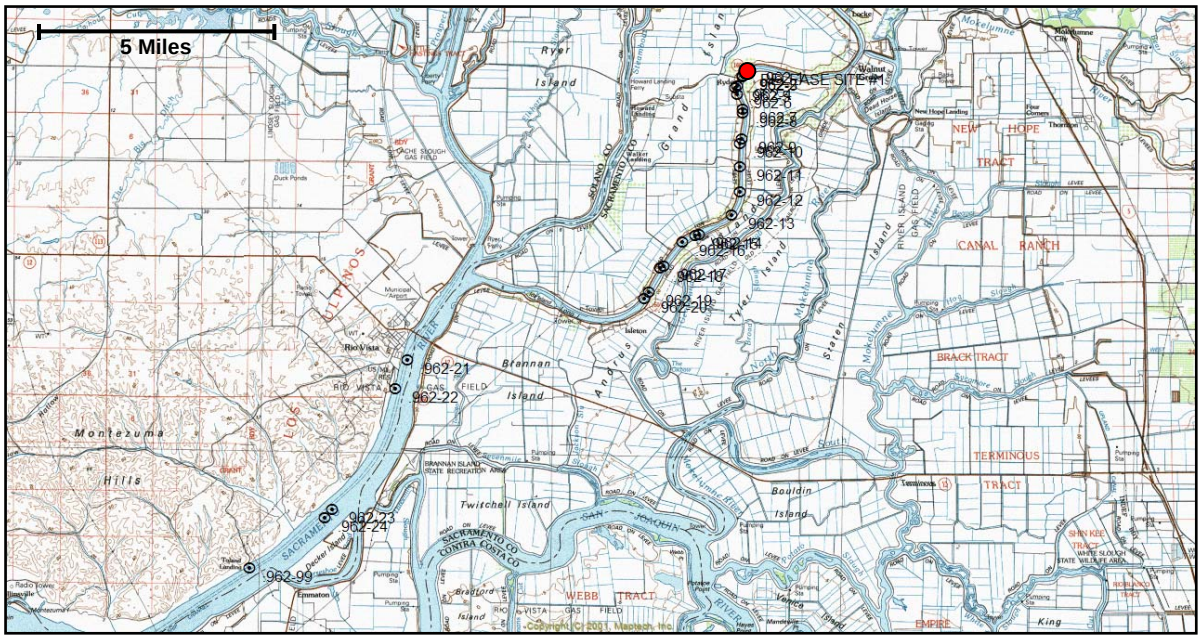
Release 1 – Fish 48.942 MHz (EXTERNAL) – January 22, 2002 at 9:16

.942-1: 1/22/02 at 10:09	.942-8: 1/22/02 at 16:28	.942-15: 1/24/02 at 13:42
.942-2: 1/22/02 at 10:23	.942-9: 1/22/02 at 17:08	.942-16: 1/24/02 at 15:26
.942-3: 1/22/02 at 11:19	.942-10: 1/23/02 at 9:47	.942-17: 1/24/02 at 17:08
.942-4: 1/22/02 at 12:01	.942-11: 1/23/02 at 12:28	.942-18: 1/25/02 at 9:12
.942-5: 1/22/02 at 13:05	.942-12: 1/23/02 at 14:54	.942-19: 1/25/02 at 12:09
.942-6: 1/22/02 at 14:16	.942-13: 1/23/02 at 15:43	.942-20: 1/25/02 at 14:12
.942-7: 1/22/02 at 15:22	.942-14: 1/24/02 at 10:18	.942-99: 1/25/02 at 14:47



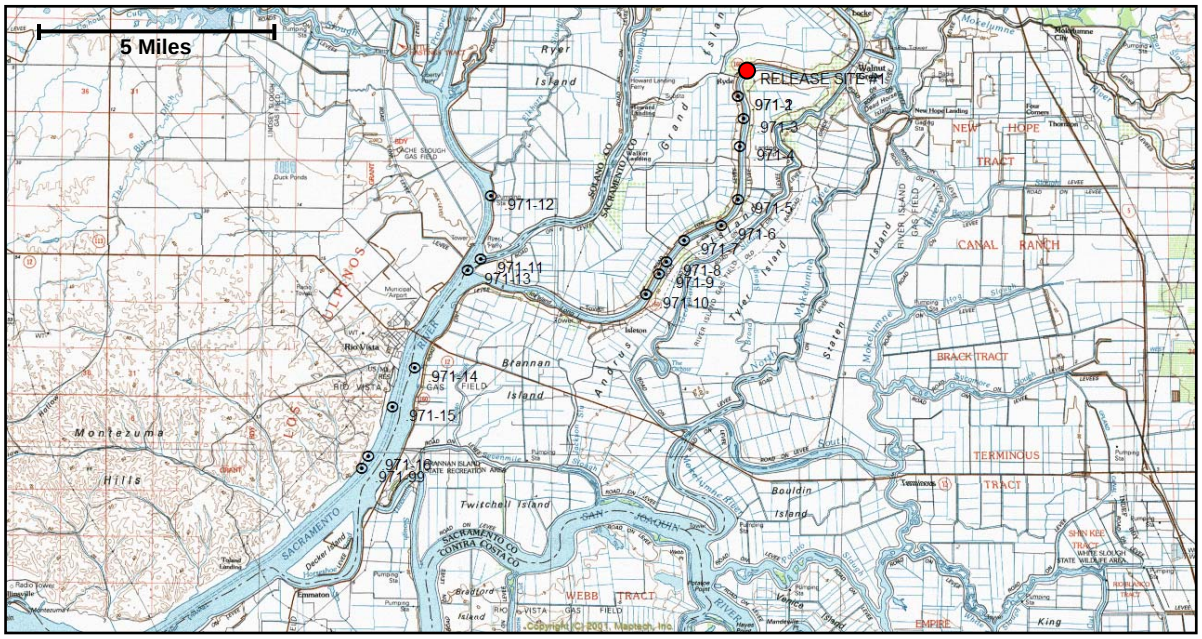
Release 1 – Fish 48.951 MHz (INTERNAL) – January 22, 2002 at 9:16

.951-1: 1/22/02 at 10:30	.951-7: 1/22/02 at 15:49
.951-2: 1/22/02 at 11:24	.951-8: 1/22/02 at 16:20
.951-3: 1/22/02 at 12:08	.951-9: 1/22/02 at 16:46
.951-4: 1/22/02 at 13:07	.951-10: 1/23/02 at 9:09
.951-5: 1/22/02 at 14:04	.951-11: 1/23/02 at 14:21
.951-6: 1/22/02 at 14:59	.951-99: 1/23/02 at 16:10



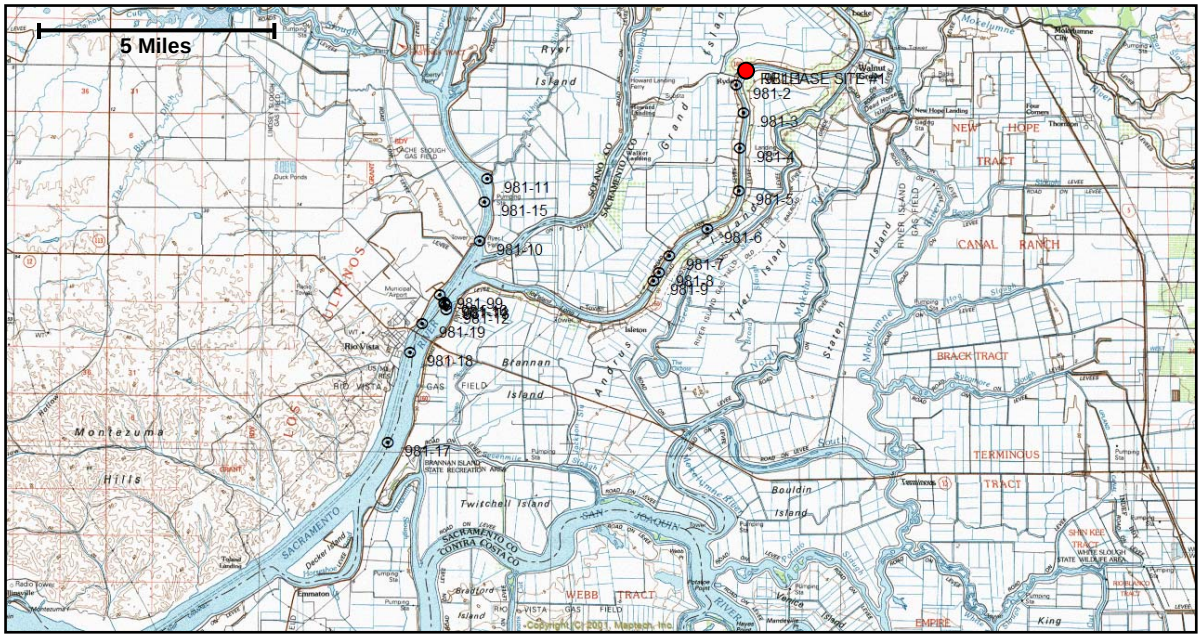
Release 1 – Fish 48.962 MHz (INTERNAL) – January 22, 2002 at 9:16

.962-1: 1/22/02 at 9:41	.962-10: 1/22/02 at 13:13	.962-18: 1/22/02 at 16:34
.962-2: 1/22/02 at 10:26	.962-11: 1/22/02 at 13:57	.962-19: 1/22/02 at 16:58
.962-3: 1/22/02 at 10:33	.962-12: 1/22/02 at 14:23	.962-20: 1/22/02 at 17:02
.962-4: 1/22/02 at 11:08	.962-13: 1/22/02 at 14:45	.962-21: 1/23/02 at 9:51
.962-5: 1/22/02 at 11:24	.962-14: 1/22/02 at 15:32	.962-22: 1/23/02 at 12:59
.962-6: 1/22/02 at 11:38	.962-15: 1/22/02 at 15:39	.962-23: 1/23/02 at 15:05
.962-7: 1/22/02 at 12:11	.962-16: 1/22/02 at 16:02	.962-24: 1/23/02 at 15:19
.962-8: 1/22/02 at 12:22	.962-17: 1/22/02 at 16:33	.962-99: 1/23/02 at 17:01
.962-9: 1/22/02 at 13:09		



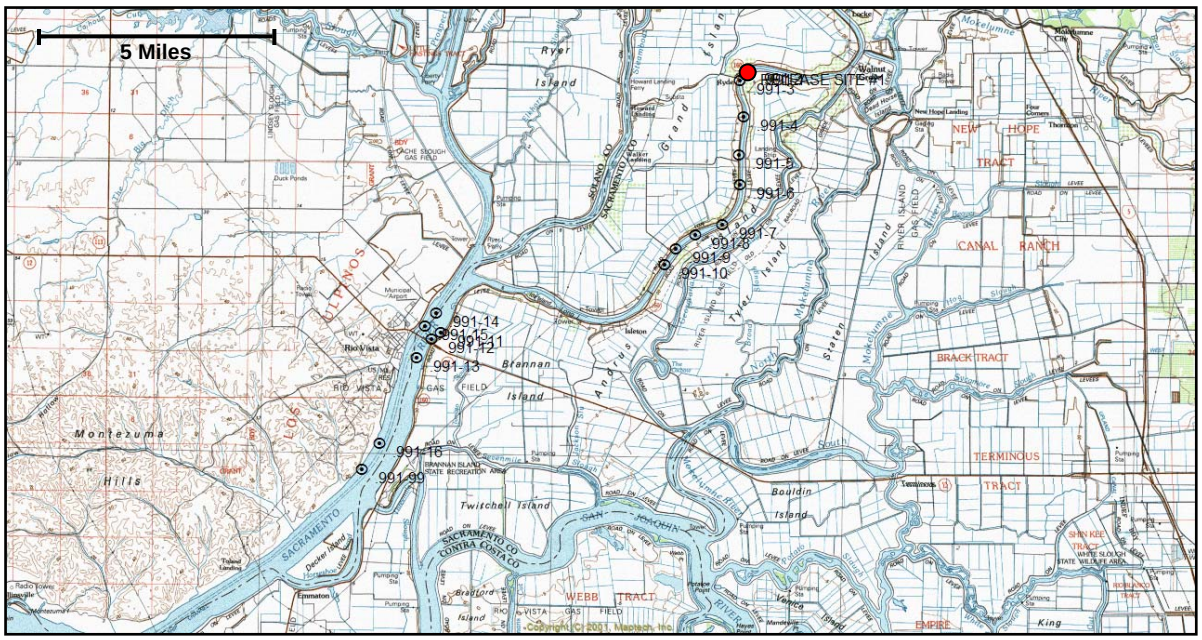
Release 1 – Fish 48.971 MHz (INTERNAL) – January 22, 2002 at 9:16

.971-1: 1/22/02 at 10:37	.971-7: 1/22/02 at 15:41	.971-13: 1/23/02 at 13:42
.971-2: 1/22/02 at 11:20	.971-8: 1/22/02 at 16:09	.971-14: 1/23/02 at 15:55
.971-3: 1/22/02 at 12:03	.971-9: 1/22/02 at 16:30	.971-15: 1/23/02 at 17:15
.971-4: 1/22/02 at 13:03	.971-10: 1/22/02 at 16:55	.971-16: 1/24/02 at 15:37
.971-5: 1/22/02 at 14:01	.971-11: 1/23/02 at 9:38	.971-99: 1/24/02 at 17:00
.971-6: 1/22/02 at 14:49	.971-12: 1/23/02 at 11:28	



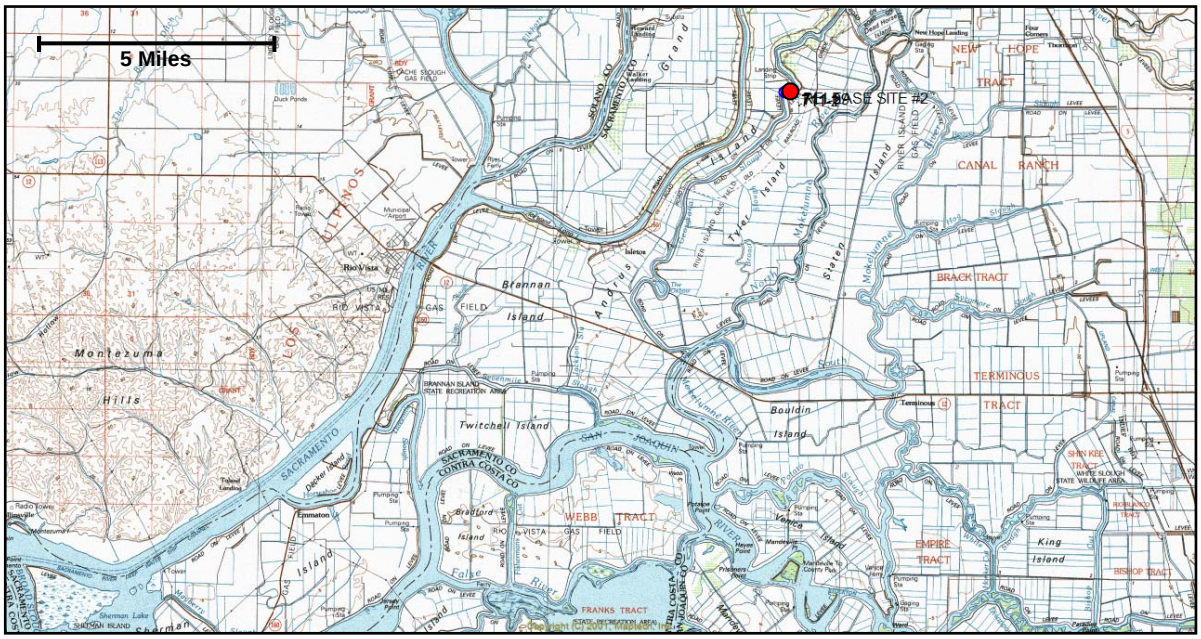
Release 1 – Fish 48.981 MHz (INTERNAL) – January 22, 2002 at 9:16

.981-1: 1/22/02 at 10:18	.981-8: 1/22/02 at 16:11	.981-15: 1/24/02 at 13:01
.981-2: 1/22/02 at 11:10	.981-9: 1/22/02 at 16:27	.981-16: 1/24/02 at 16:40
.981-3: 1/22/02 at 12:05	.981-10: 1/23/02 at 9:33	.981-17: 1/25/02 at 9:00
.981-4: 1/22/02 at 13:05	.981-11: 1/23/02 at 11:33	.981-18: 1/25/02 at 10:40
.981-5: 1/22/02 at 14:00	.981-12: 1/23/02 at 14:48	.981-19: 1/25/02 at 11:31
.981-6: 1/22/02 at 14:57	.981-13: 1/23/02 at 15:53	.981-99: 1/25/02 at 14:29
.981-7: 1/22/02 at 15:47	.981-14: 1/23/02 at 17:22	



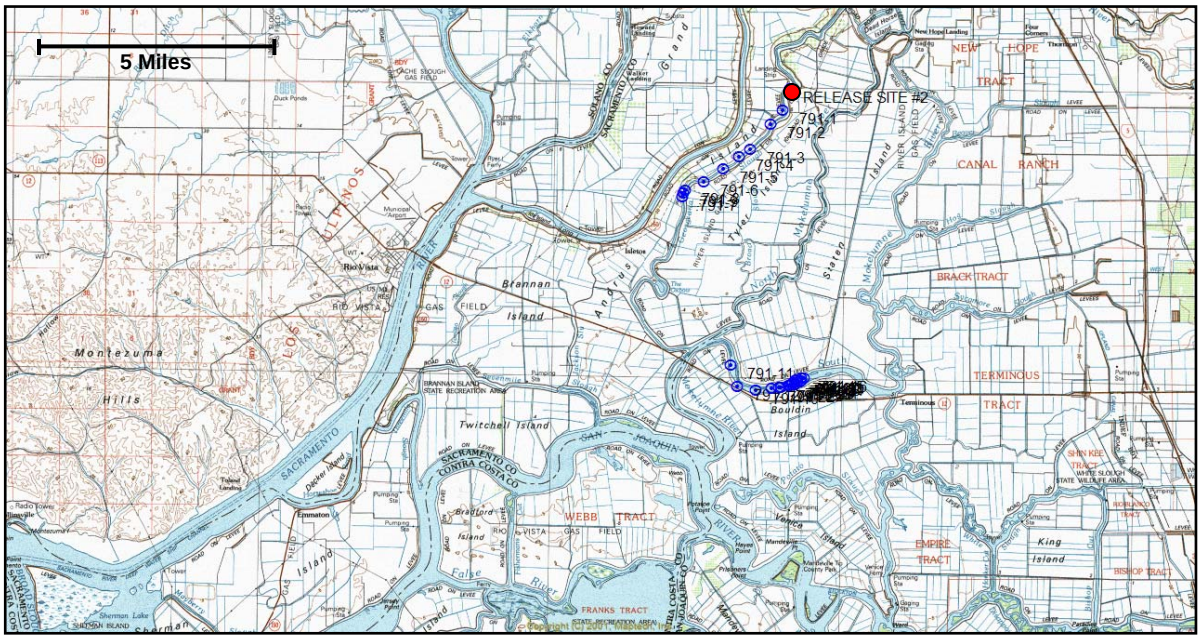
Release 1 – Fish 48.991 MHz (INTERNAL) – January 22, 2002 at 9:16

.991-1: 1/22/02 at 10:53	.991-7: 1/22/02 at 15:34	.991-13: 1/24/02 at 9:25
.991-2: 1/22/02 at 11:45	.991-8: 1/22/02 at 16:05	.991-14: 1/24/02 at 12:01
.991-3: 1/22/02 at 12:17	.991-9: 1/22/02 at 16:36	.991-15: 1/24/02 at 13:22
.991-4: 1/22/02 at 13:13	.991-10: 1/22/02 at 17:02	.991-16: 1/24/02 at 15:48
.991-5: 1/22/02 at 13:54	.991-11: 1/23/02 at 10:16	.991-99: 1/24/02 at 17:00
.991-6: 1/22/02 at 14:42	.991-12: 1/23/02 at 13:36	



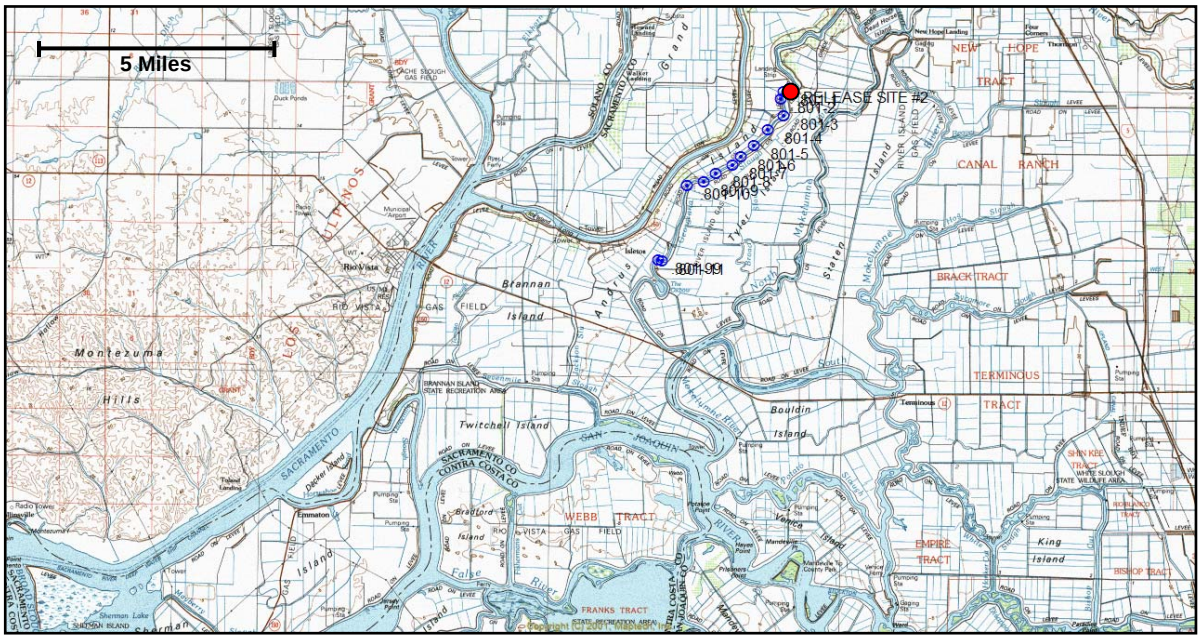
Release 2 – Fish 48.711 MHz (EXTERNAL) – January 30, 2002 at 9:40

.711-1: 1/30/02 at 10:30
.711-2: 1/30/02 at 11:01
.711-3: 1/30/02 at 11:34
.711-99: 1/30/02 at 12:13



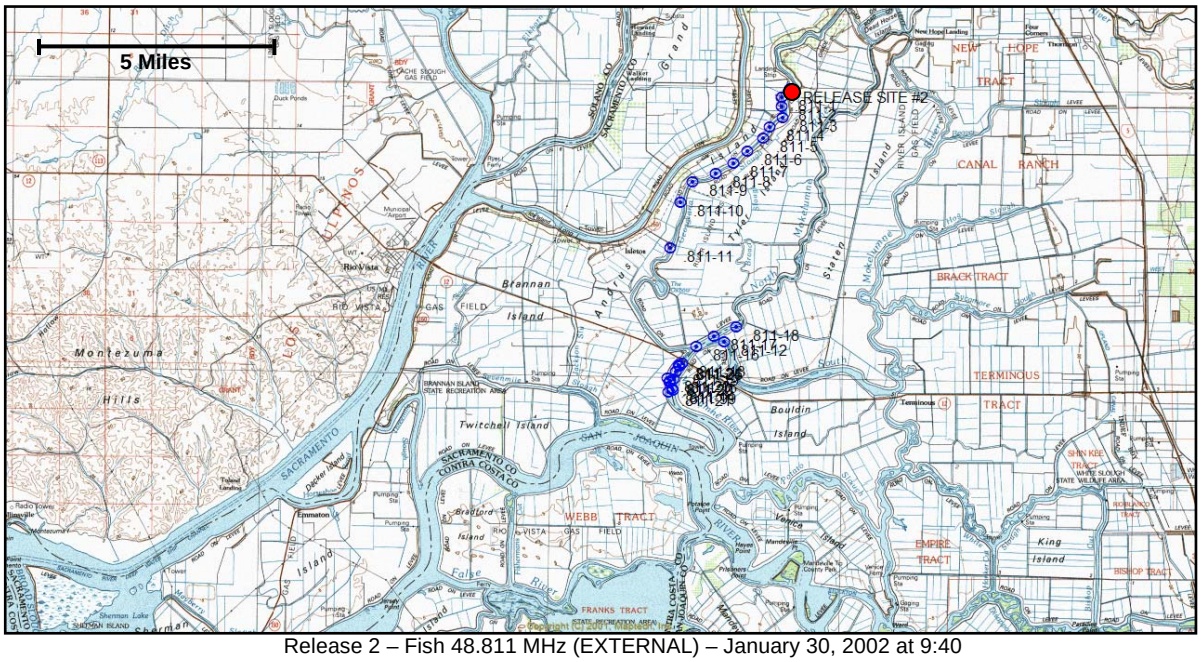
Release 2 – Fish 48.791 MHz (EXTERNAL) – January 30, 2002 at 9:40

.791-1: 1/30/02 at 10:39
.791-2: 1/30/02 at 11:18
.791-3: 1/30/02 at 11:56
.791-4: 1/30/02 at 12:36
.791-5: 1/30/02 at 13:18
.791-6: 1/30/02 at 14:05
.791-7: 1/30/02 at 14:58
.791-8: 1/30/02 at 16:06
.791-9: 1/30/02 at 16:50
.791-10: 1/31/02 at 9:01
.791-11: 1/31/02 at 12:22
.791-12: 1/31/02 at 14:25
.791-13: 1/31/02 at 16:08
.791-14: 1/31/02 at 17:02
.791-15: 2/1/02 at 8:49
.791-16: 2/1/02 at 10:03
.791-17: 2/1/02 at 11:52
.791-18: 2/1/02 at 13:43
.791-19: 2/1/02 at 14:15
.791-20: 2/1/02 at 15:12
.791-21: 2/1/02 at 15:43
.791-22: 2/1/02 at 15:49
.791-23: 2/1/02 at 16:40
.791-24: 2/1/02 at 17:03
.791-25: 2/2/02 at 8:55
.791-26: 2/2/02 at 12:28
.791-27: 2/2/02 at 14:51
.791-28: 2/2/02 at 15:25
.791-99: 2/2/02 at 16:20



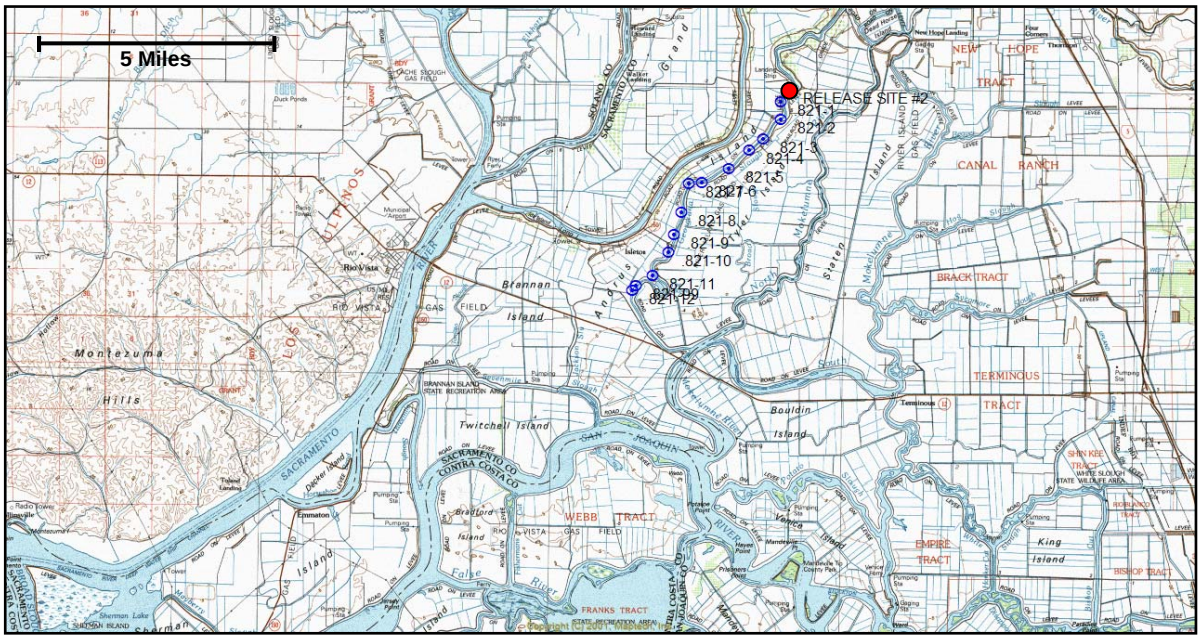
Release 2 – Fish 48.801 MHz (EXTERNAL) – January 30, 2002 at 9:40

.801-1: 1/30/02 at 10:21
.801-2: 1/30/02 at 10:52
.801-3: 1/30/02 at 11:27
.801-4: 1/30/02 at 12:04
.801-5: 1/30/02 at 12:43
.801-6: 1/30/02 at 13:23
.801-7: 1/30/02 at 14:10
.801-8: 1/30/02 at 15:06
.801-9: 1/30/02 at 16:12
.801-10: 1/30/02 at 16:47
.801-11: 1/31/02 at 10:09
.801-99: 1/31/02 at 14:51



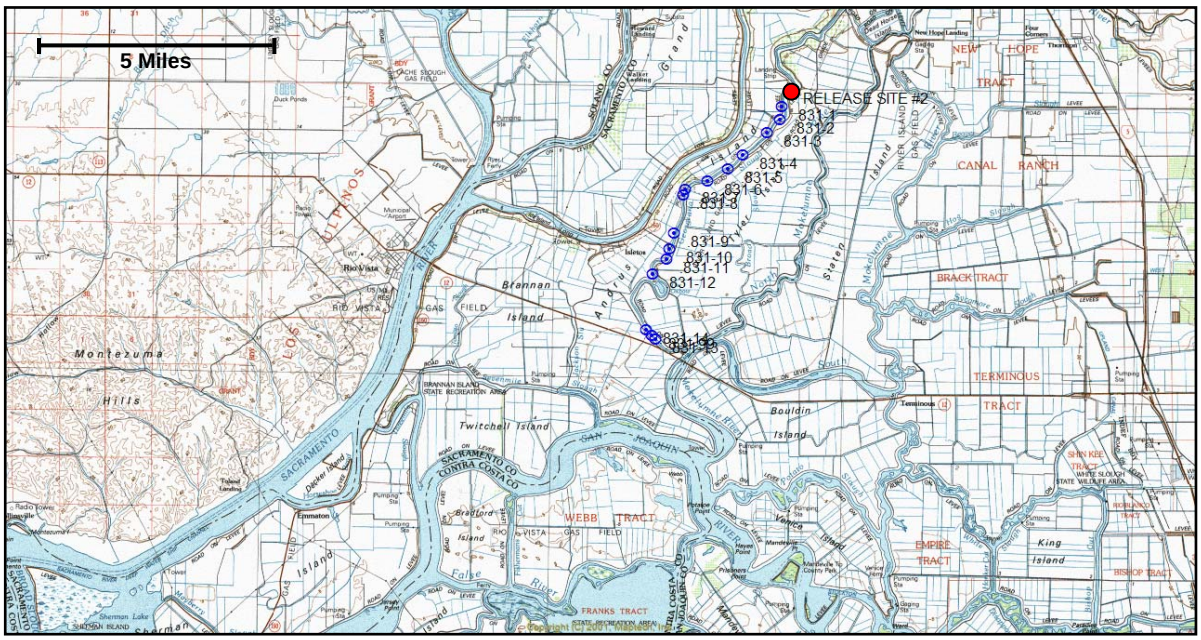
Release 2 – Fish 48.811 MHz (EXTERNAL) – January 30, 2002 at 9:40

.811-1: 1/30/02 at 10:18
.811-2: 1/30/02 at 10:51
.811-3: 1/30/02 at 11:25
.811-4: 1/30/02 at 12:07
.811-5: 1/30/02 at 12:46
.811-6: 1/30/02 at 13:24
.811-7: 1/30/02 at 14:12
.811-8: 1/30/02 at 15:07
.811-9: 1/30/02 at 16:08
.811-10: 1/30/02 at 16:54
.811-11: 1/30/02 at 18:40
.811-12: 1/31/02 at 8:54
.811-13: 1/31/02 at 12:06
.811-14: 1/31/02 at 13:13
.811-15: 1/31/02 at 13:59
.811-16: 1/31/02 at 15:08
.811-17: 1/31/02 at 15:47
.811-18: 1/31/02 at 17:14
.811-19: 2/1/02 at 13:26
.811-20: 2/1/02 at 14:34
.811-21: 2/1/02 at 15:23
.811-22: 2/1/02 at 16:33
.811-23: 2/2/02 at 9:28
.811-24: 2/2/02 at 12:02
.811-25: 2/2/02 at 13:40
.811-26: 2/2/02 at 14:30
.811-99: 2/2/02 at 16:00



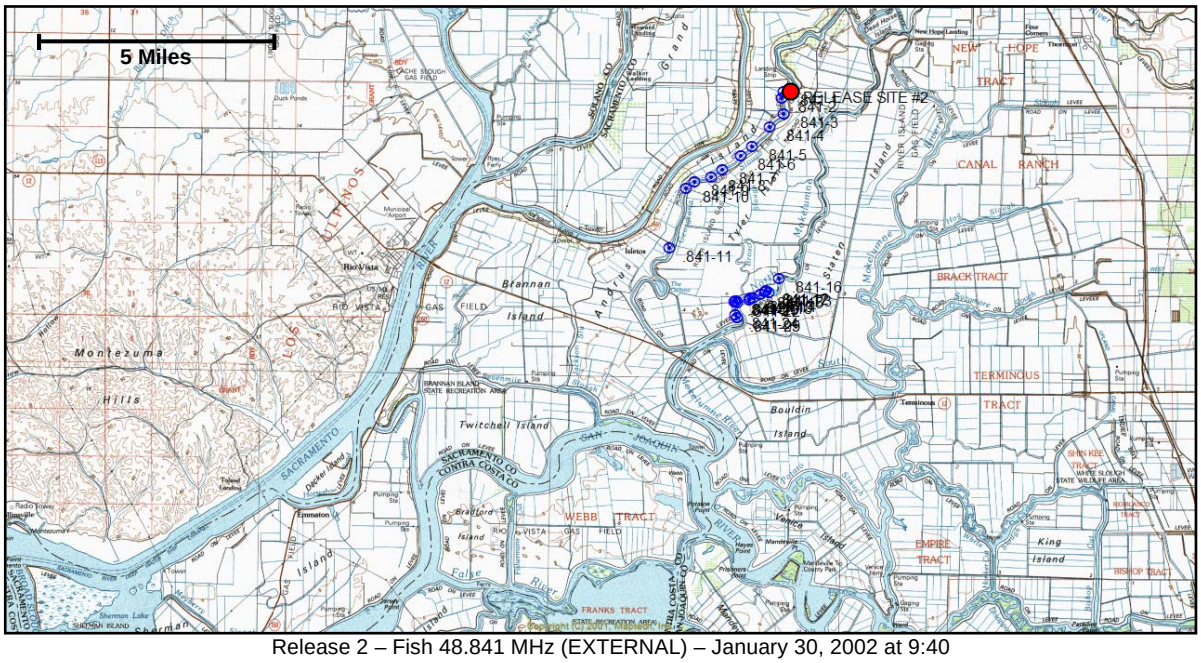
Release 2 – Fish 48.821 MHz (EXTERNAL) – January 30, 2002 at 9:40

.821-1: 1/30/02 at 10:36
.821-2: 1/30/02 at 11:22
.821-3: 1/30/02 at 12:01
.821-4: 1/30/02 at 12:39
.821-5: 1/30/02 at 13:20
.821-6: 1/30/02 at 14:03
.821-7: 1/30/02 at 15:00
.821-8: 1/30/02 at 16:04
.821-9: 1/30/02 at 16:57
.821-10: 1/30/02 at 17:46
.821-11: 1/30/02 at 18:53
.821-12: 1/31/02 at 10:40
.821-99: 1/31/02 at 14:24



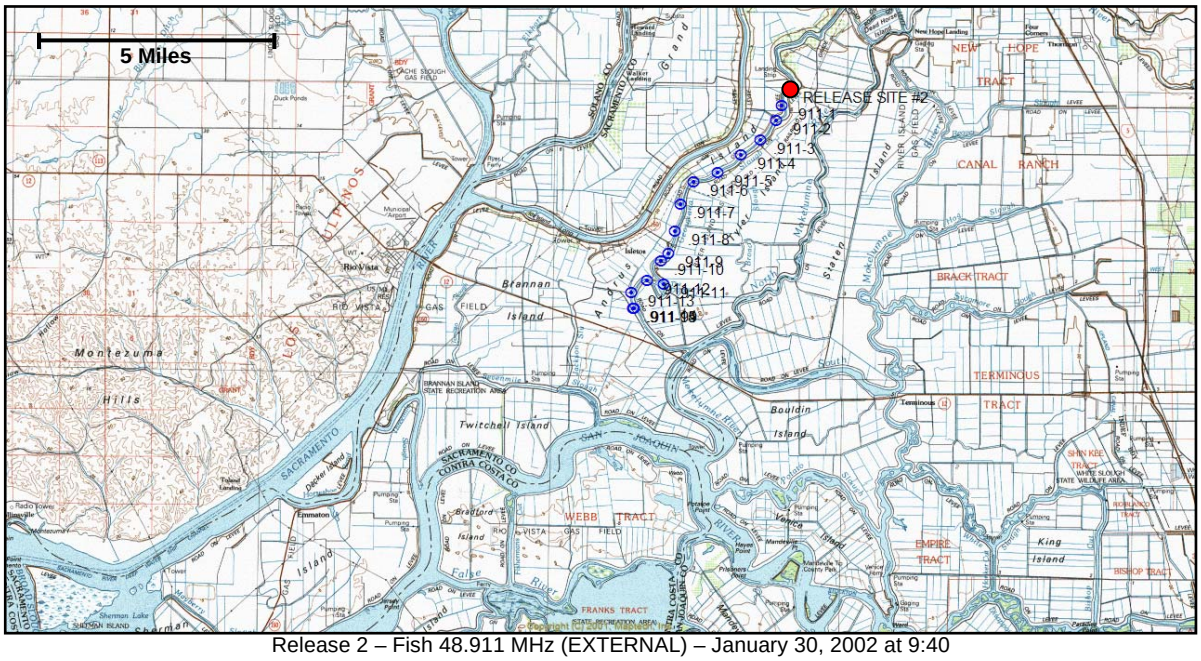
Release 2 – Fish 48.831 MHz (EXTERNAL) – January 30, 2002 at 9:40

.831-1: 1/30/02 at 10:15
.831-2: 1/30/02 at 10:48
.831-3: 1/30/02 at 11:15
.831-4: 1/30/02 at 11:53
.831-5: 1/30/02 at 12:34
.831-6: 1/30/02 at 13:16
.831-7: 1/30/02 at 13:59
.831-8: 1/30/02 at 14:54
.831-9: 1/30/02 at 16:00
.831-10: 1/30/02 at 17:03
.831-11: 1/30/02 at 17:54
.831-12: 1/30/02 at 18:55
.831-13: 1/31/02 at 8:55
.831-14: 1/31/02 at 10:56
.831-99: 1/31/02 at 13:59



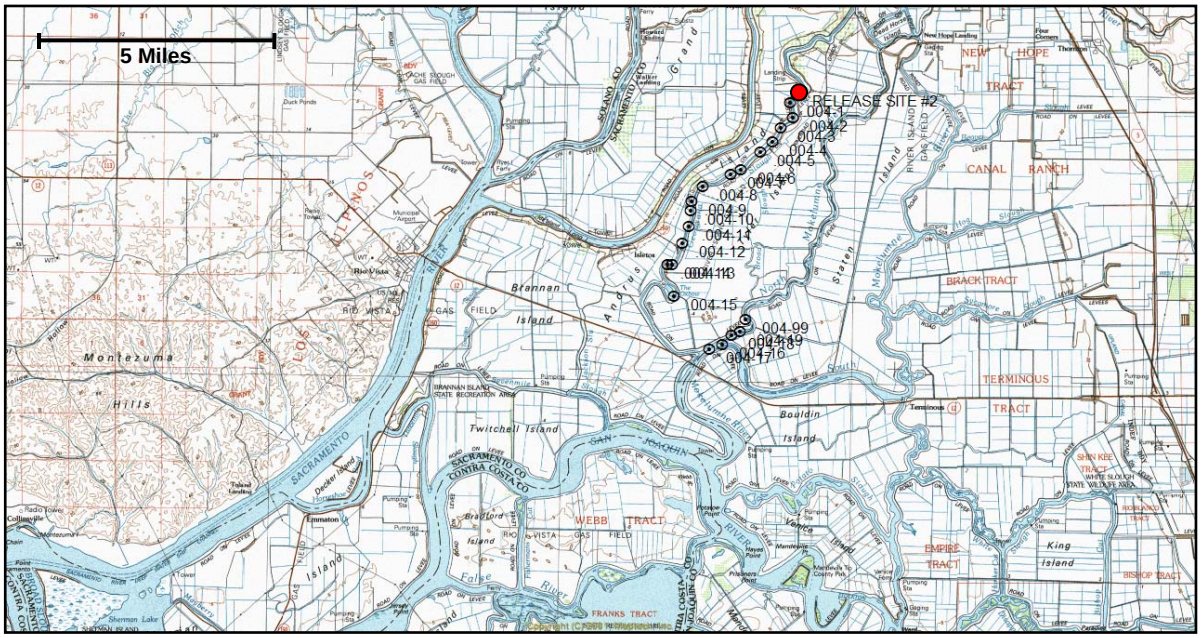
Release 2 – Fish 48.841 MHz (EXTERNAL) – January 30, 2002 at 9:40

.841-1: 1/30/02 at 10:21	.841-10: 1/30/02 at 16:48	.841-19: 2/1/02 at 14:29
.841-2: 1/30/02 at 10:53	.841-11: 1/30/02 at 18:32	.841-20: 2/1/02 at 16:07
.841-3: 1/30/02 at 11:28	.841-12: 1/31/02 at 9:29	.841-21: 2/1/02 at 16:22
.841-4: 1/30/02 at 12:06	.841-13: 1/31/02 at 12:49	.841-22: 2/2/02 at 8:20
.841-5: 1/30/02 at 12:42	.841-14: 1/31/02 at 14:44	.841-23: 2/2/02 at 12:18
.841-6: 1/30/02 at 13:22	.841-15: 1/31/02 at 15:54	.841-24: 2/2/02 at 14:45
.841-7: 1/30/02 at 14:08	.841-16: 1/31/02 at 17:21	.841-25: 2/2/02 at 15:50
.841-8: 1/30/02 at 15:04	.841-17: 2/1/02 at 10:12	.841-99: 2/2/02 at 16:28
.841-9: 1/30/02 at 16:10	.841-18: 2/1/02 at 12:20	



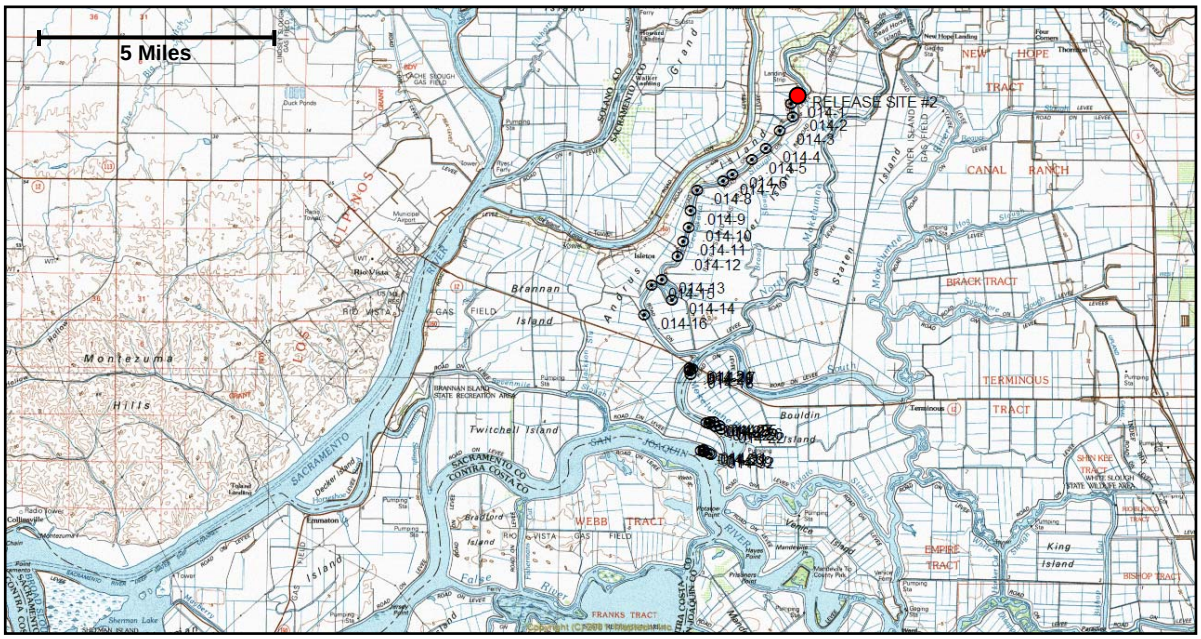
Release 2 – Fish 48.911 MHz (EXTERNAL) – January 30, 2002 at 9:40

.911-1: 1/30/02 at 10:15	.911-7: 1/30/02 at 13:55	.911-12: 1/30/02 at 18:27
.911-2: 1/30/02 at 10:43	.911-8: 1/30/02 at 14:50	.911-13: 1/30/02 at 19:21
.911-3: 1/30/02 at 11:11	.911-9: 1/30/02 at 15:23	.911-14: 1/31/02 at 9:10
.911-4: 1/30/02 at 11:52	.911-10: 1/30/02 at 15:51	.911-15: 1/31/02 at 10:49
.911-5: 1/30/02 at 12:31	.911-11: 1/30/02 at 17:10	.911-99: 1/31/02 at 14:11
.911-6: 1/30/02 at 13:13		



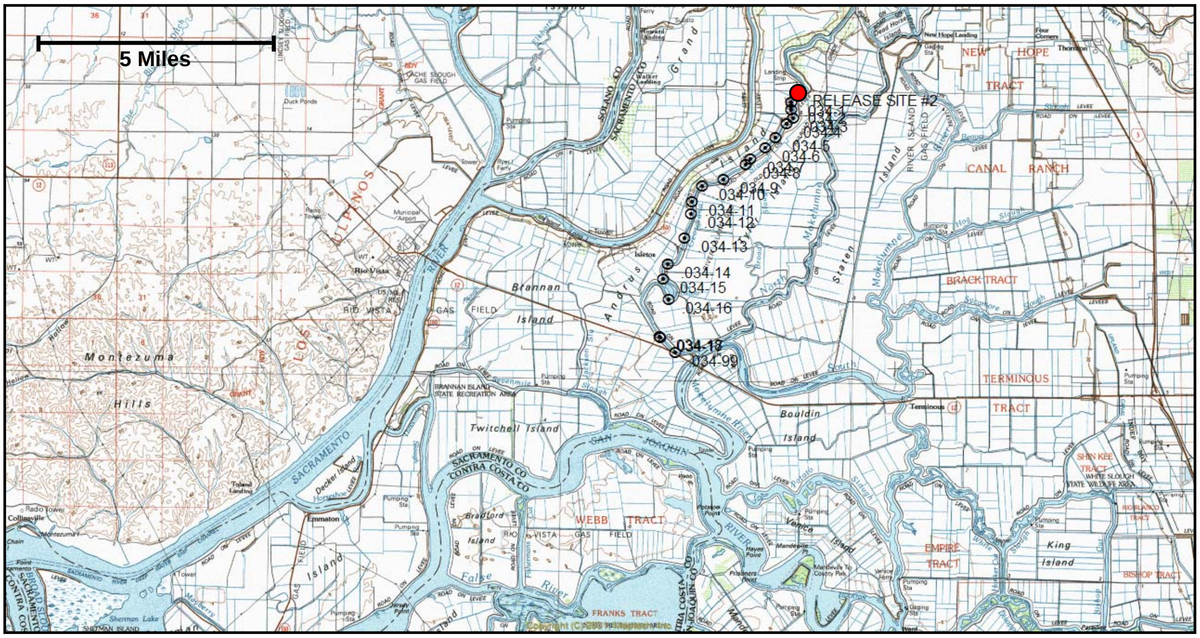
Release 2 – Fish 49.004 MHz (INTERNAL) – January 30, 2002 at 9:40

.004-1: 1/30/02 at 10:07	.004-8: 1/30/02 at 13:33	.004-15: 1/30/02 at 18:42
.004-2: 1/30/02 at 10:31	.004-9: 1/30/02 at 14:08	.004-16: 1/31/02 at 8:49
.004-3: 1/30/02 at 11:01	.004-10: 1/30/02 at 14:36	.004-17: 1/31/02 at 12:17
.004-4: 1/30/02 at 11:33	.004-11: 1/30/02 at 15:04	.004-18: 1/31/02 at 14:40
.004-5: 1/30/02 at 11:53	.004-12: 1/30/02 at 15:37	.004-19: 1/31/02 at 15:50
.004-6: 1/30/02 at 12:32	.004-13: 1/30/02 at 16:32	.004-99: 1/31/02 at 17:16
.004-7: 1/30/02 at 12:47	.004-14: 1/30/02 at 17:09	



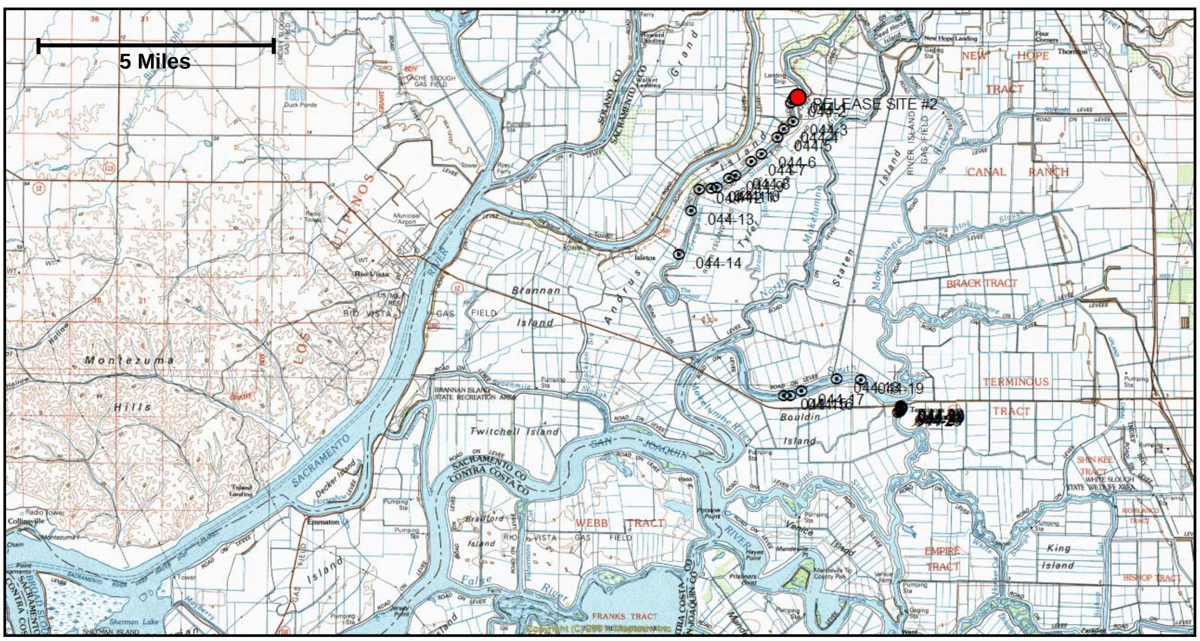
Release 2 – Fish 49.014 MHz (INTERNAL) – January 30, 2002 at 9:40

.014-1: 1/30/02 at 10:08	.014-12: 1/30/02 at 15:32	.014-23: 2/1/02 at 10:29
.014-2: 1/30/02 at 10:34	.014-13: 1/30/02 at 16:29	.014-24: 2/1/02 at 11:57
.014-3: 1/30/02 at 11:03	.014-14: 1/30/02 at 17:19	.014-25: 2/1/02 at 12:59
.014-4: 1/30/02 at 11:31	.014-15: 1/30/02 at 18:25	.014-26: 2/1/02 at 14:28
.014-5: 1/30/02 at 11:55	.014-16: 1/30/02 at 19:24	.014-27: 2/1/02 at 15:27
.014-6: 1/30/02 at 12:31	.014-17: 1/31/02 at 12:03	.014-28: 2/1/02 at 16:37
.014-7: 1/30/02 at 12:45	.014-18: 1/31/02 at 13:09	.014-29: 2/2/02 at 11:13
.014-8: 1/30/02 at 13:31	.014-19: 1/31/02 at 14:03	.014-30: 2/2/02 at 11:56
.014-9: 1/30/02 at 14:07	.014-20: 1/31/02 at 15:15	.014-31: 2/2/02 at 13:56
.014-10: 1/30/02 at 14:34	.014-21: 1/31/02 at 16:41	.014-32: 2/2/02 at 15:42
.014-11: 1/30/02 at 15:02	.014-22: 2/1/02 at 8:47	.014-99: 2/2/02 at 16:10



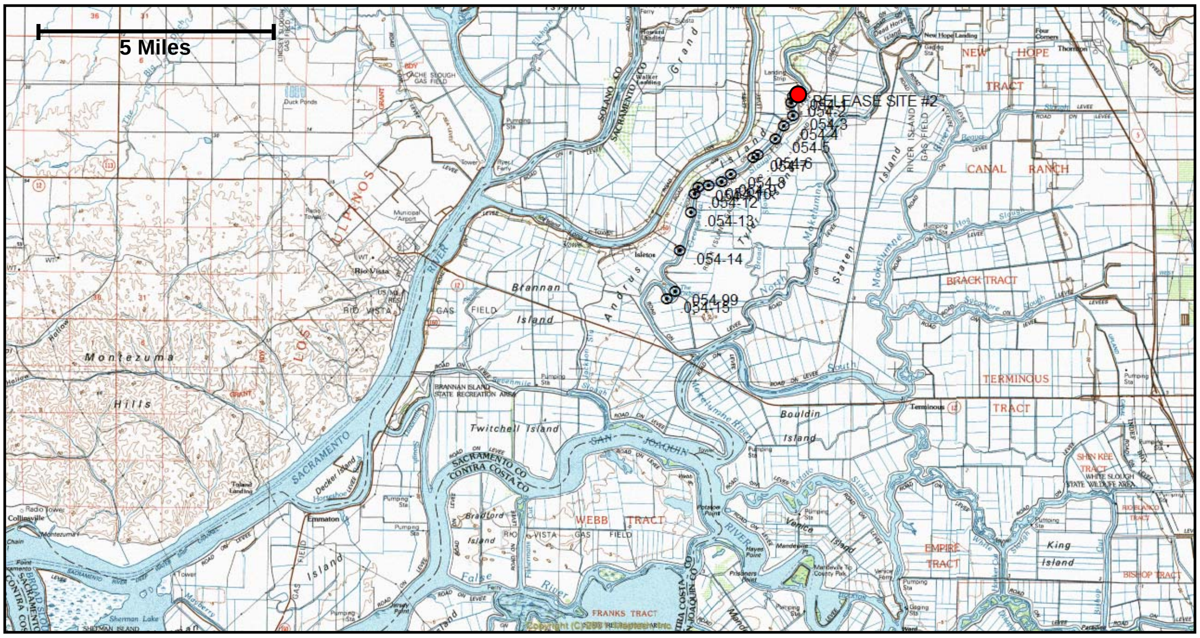
Release 2 – Fish 49.034 MHz (INTERNAL) – January 30, 2002 at 9:40

.034-1: 1/30/02 at 10:08
.034-2: 1/30/02 at 10:39
.034-3: 1/30/02 at 10:58
.034-4: 1/30/02 at 11:10
.034-5: 1/30/02 at 11:36
.034-6: 1/30/02 at 11:59
.034-7: 1/30/02 at 12:34
.034-8: 1/30/02 at 12:51
.034-9: 1/30/02 at 13:36
.034-10: 1/30/02 at 14:10
.034-11: 1/30/02 at 14:39
.034-12: 1/30/02 at 15:06
.034-13: 1/30/02 at 15:39
.034-14: 1/30/02 at 16:36
.034-15: 1/30/02 at 17:12
.034-16: 1/30/02 at 18:36
.034-17: 1/31/02 at 8:57
.034-18: 1/31/02 at 10:59
.034-99: 1/31/02 at 13:52



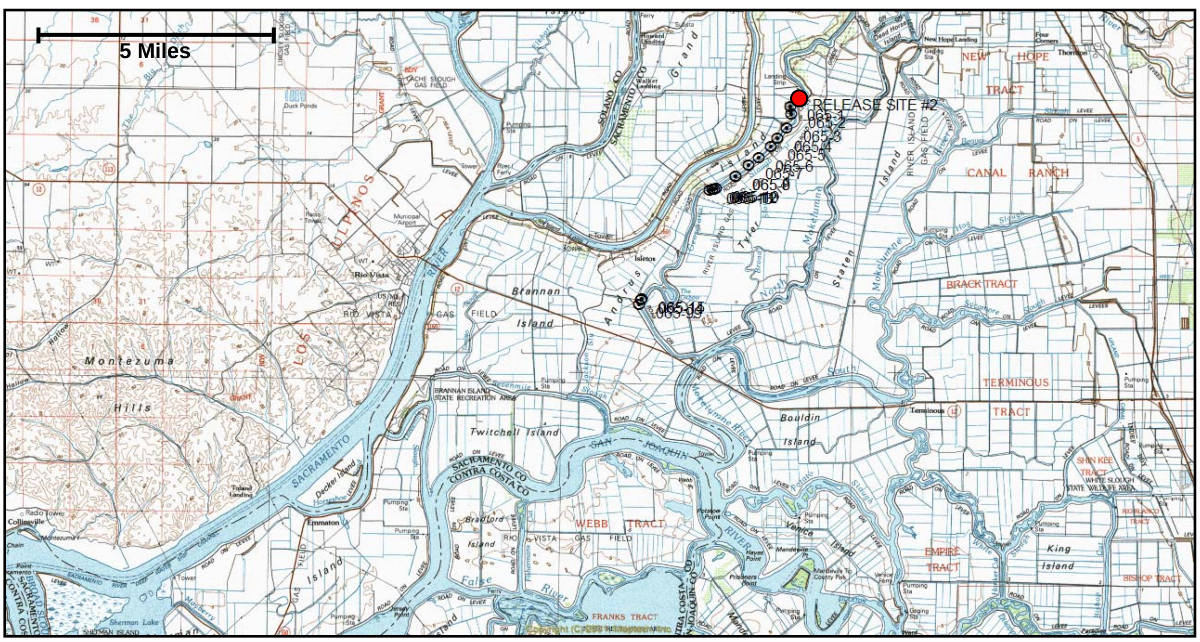
Release 2 – Fish 49.044 MHz (INTERNAL) – January 30, 2002 at 9:40

.044-1: 1/30/02 at 10:17
.044-2: 1/30/02 at 10:47
.044-3: 1/30/02 at 11:15
.044-4: 1/30/02 at 11:41
.044-5: 1/30/02 at 12:03
.044-6: 1/30/02 at 12:37
.044-7: 1/30/02 at 12:56
.044-8: 1/30/02 at 13:39
.044-9: 1/30/02 at 14:14
.044-10: 1/30/02 at 14:46
.044-11: 1/30/02 at 15:13
.044-12: 1/30/02 at 15:47
.044-13: 1/30/02 at 16:49
.044-14: 1/30/02 at 18:33
.044-15: 1/31/02 at 9:05
.044-16: 1/31/02 at 12:27
.044-17: 1/31/02 at 14:31
.044-18: 1/31/02 at 16:14
.044-19: 1/31/02 at 16:53
.044-20: 2/1/02 at 9:03
.044-21: 2/1/02 at 9:51
.044-22: 2/1/02 at 11:34
.044-23: 2/1/02 at 13:56
.044-24: 2/1/02 at 15:23
.044-25: 2/1/02 at 16:45
.044-26: 2/2/02 at 8:40
.044-27: 2/2/02 at 12:35
.044-28: 2/2/02 at 15:00
.044-99: 2/2/02 at 16:09



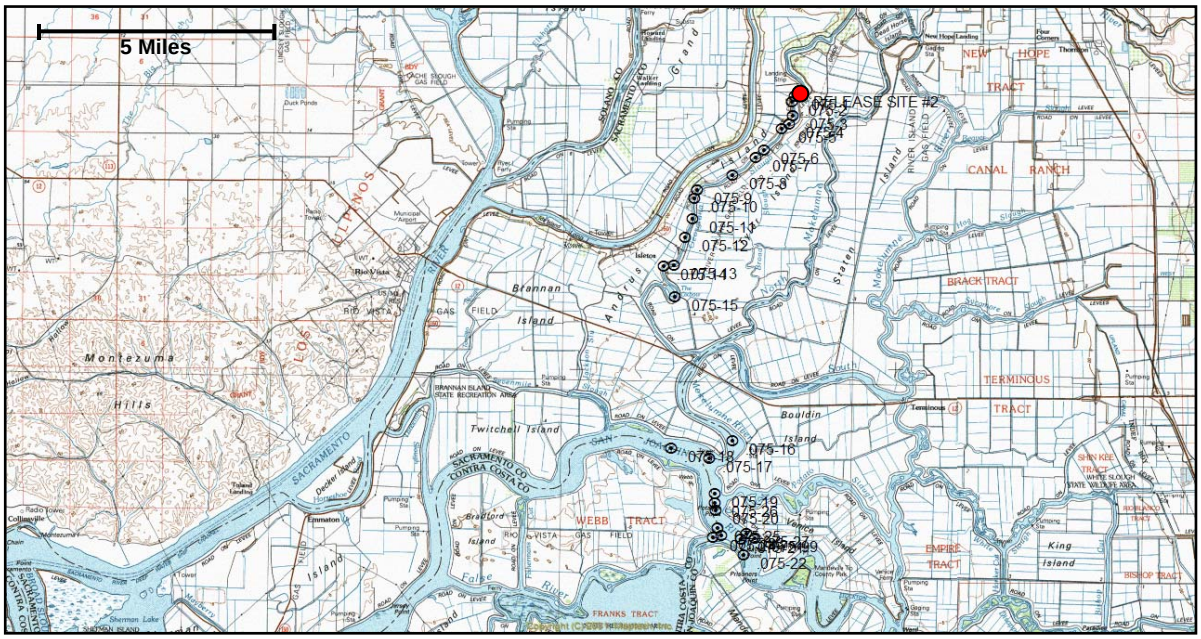
Release 2 – Fish 49.054 MHz (INTERNAL) – January 30, 2002 at 9:40

.054-1: 1/30/02 at 10:19
.054-2: 1/30/02 at 10:51
.054-3: 1/30/02 at 11:16
.054-4: 1/30/02 at 11:41
.054-5: 1/30/02 at 12:07
.054-6: 1/30/02 at 12:42
.054-7: 1/30/02 at 12:54
.054-8: 1/30/02 at 13:41
.054-9: 1/30/02 at 14:12
.054-10: 1/30/02 at 14:43
.054-11: 1/30/02 at 15:12
.054-12: 1/30/02 at 15:45
.054-13: 1/30/02 at 16:47
.054-14: 1/30/02 at 18:48
.054-15: 1/31/02 at 10:24
.054-99: 1/31/02 at 14:41



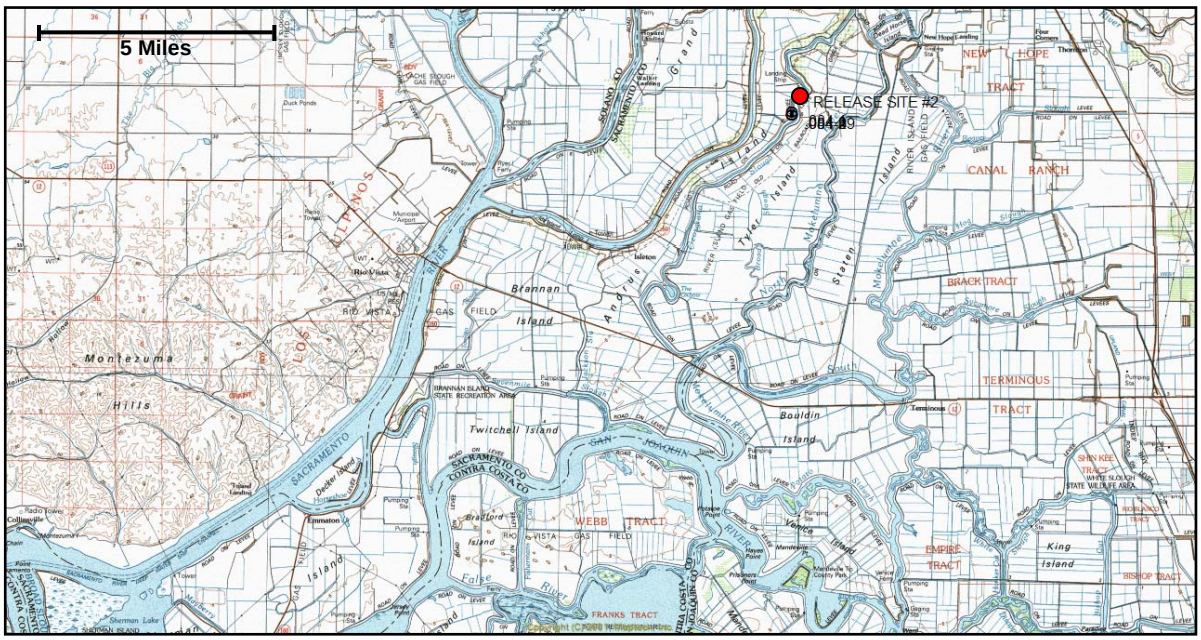
Release 2 – Fish 49.065 MHz (INTERNAL) – January 30, 2002 at 9:40

.065-1: 1/30/02 at 10:08
.065-2: 1/30/02 at 10:39
.065-3: 1/30/02 at 11:10
.065-4: 1/30/02 at 11:37
.065-5: 1/30/02 at 12:00
.065-6: 1/30/02 at 12:36
.065-7: 1/30/02 at 12:53
.065-8: 1/30/02 at 13:38
.065-9: 1/30/02 at 14:17
.065-10: 1/30/02 at 14:46
.065-11: 1/30/02 at 15:21
.065-12: 1/30/02 at 15:48
.065-13: 1/30/02 at 16:51
.065-14: 1/31/02 at 9:17
.065-15: 1/31/02 at 10:35
.065-99: 1/31/02 at 14:17



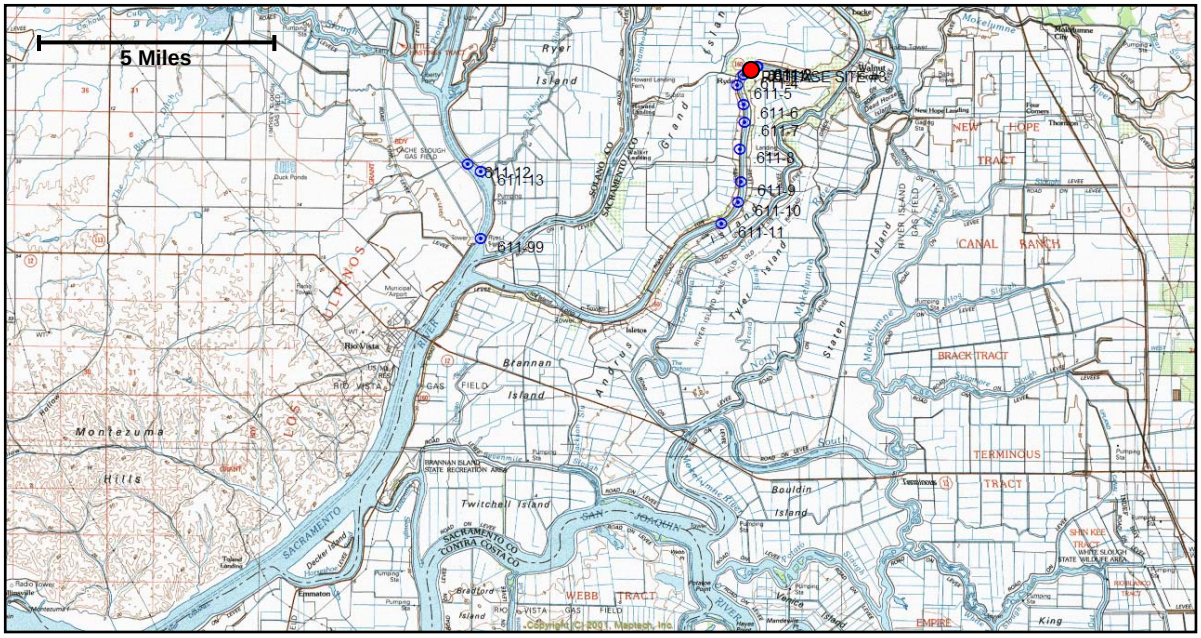
Release 2 – Fish 49.075 MHz (INTERNAL) – January 30, 2002 at 9:40

.075-1: 1/30/02 at 10:18
.075-2: 1/30/02 at 10:43
.075-3: 1/30/02 at 11:17
.075-4: 1/30/02 at 11:44
.075-5: 1/30/02 at 12:04
.075-6: 1/30/02 at 12:40
.075-7: 1/30/02 at 12:57
.075-8: 1/30/02 at 13:45
.075-9: 1/30/02 at 14:24
.075-10: 1/30/02 at 14:40
.075-11: 1/30/02 at 15:08
.075-12: 1/30/02 at 15:41
.075-13: 1/30/02 at 16:37
.075-14: 1/30/02 at 17:07
.075-15: 1/30/02 at 18:42
.075-16: 1/31/02 at 10:34
.075-17: 1/31/02 at 11:45
.075-18: 1/31/02 at 13:32
.075-19: 1/31/02 at 15:38
.075-20: 1/31/02 at 16:25
.075-21: 1/31/02 at 17:08
.075-22: 1/31/02 at 17:28
.075-23: 2/1/02 at 9:30
.075-24: 2/1/02 at 10:05
.075-25: 2/1/02 at 12:17
.075-26: 2/1/02 at 14:14
.075-27: 2/1/02 at 15:56
.075-99: 2/1/02 at 16:53



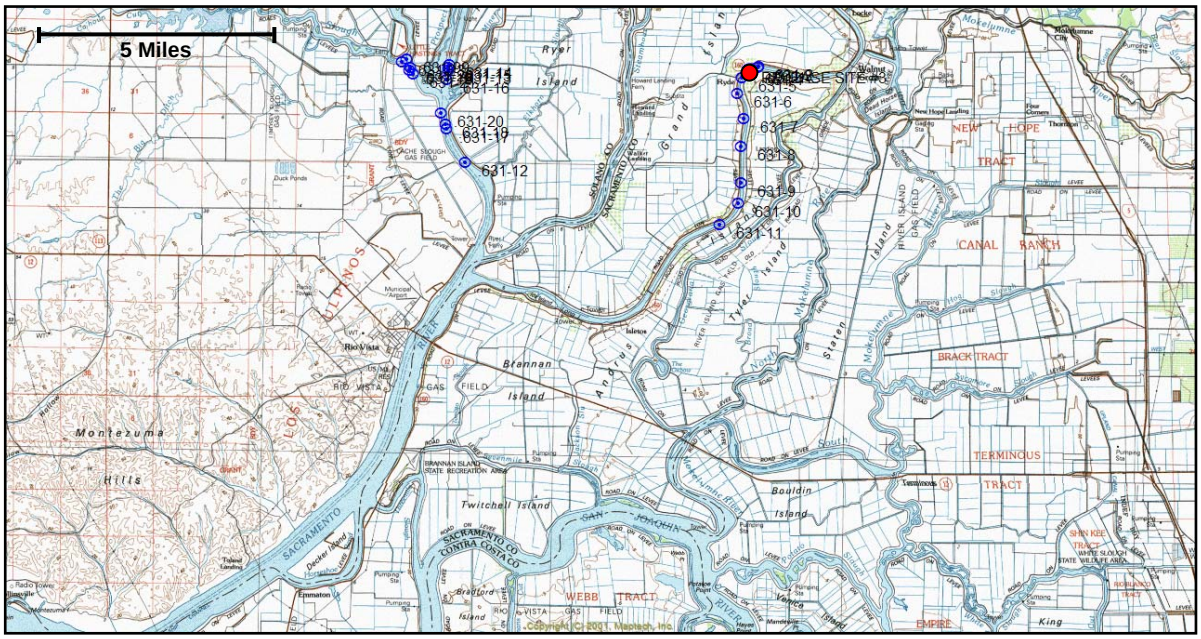
Release 2 – Fish 49.084 MHz (INTERNAL) – January 30, 2002 at 9:40

.084-1: 1/30/02 at 10:24
.084-2: 1/30/02 at 10:55
.084-3: 1/30/02 at 11:21
.084-4: 1/30/02 at 11:47
.084-99: 1/30/02 at 12:14



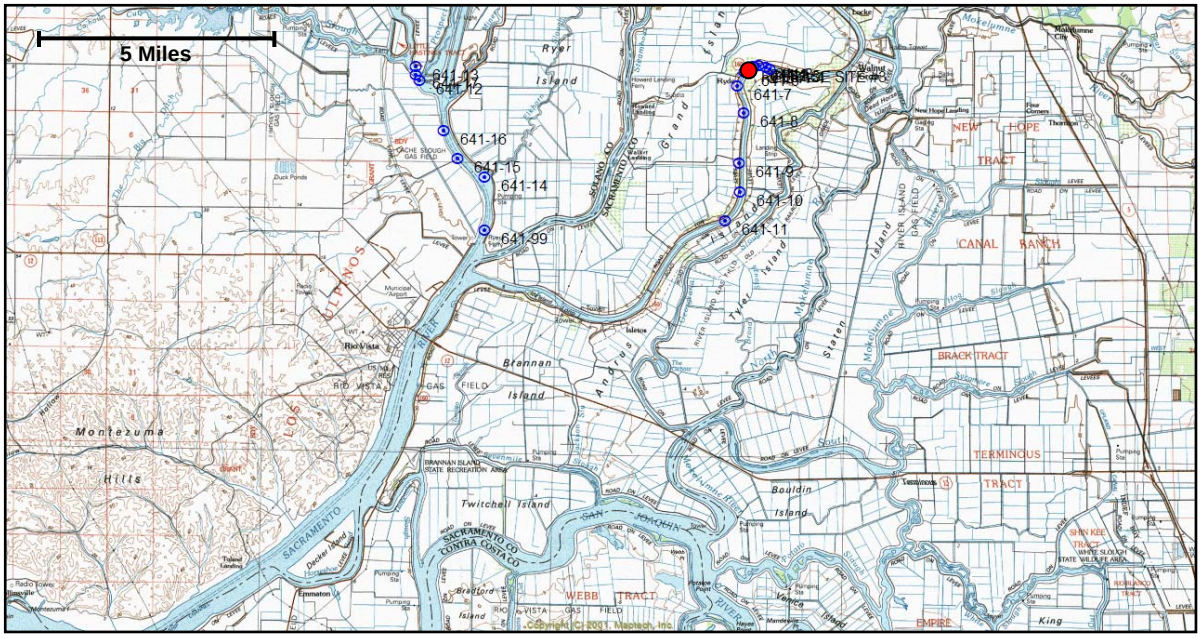
Release 3 – Fish 48.611 MHz (EXTERNAL) – February 6, 2002 at 9:12

.611-1: 2/6/02 at 10:07	.611-8: 2/6/02 at 15:30
.611-2: 2/6/02 at 10:46	.611-9: 2/6/02 at 16:22
.611-3: 2/6/02 at 11:38	.611-10: 2/6/02 at 16:55
.611-4: 2/6/02 at 12:34	.611-11: 2/6/02 at 17:26
.611-5: 2/6/02 at 13:05	.611-12: 2/7/02 at 11:48
.611-6: 2/6/02 at 13:56	.611-13: 2/7/02 at 14:06
.611-7: 2/6/02 at 14:44	.611-99: 2/7/02 at 15:27



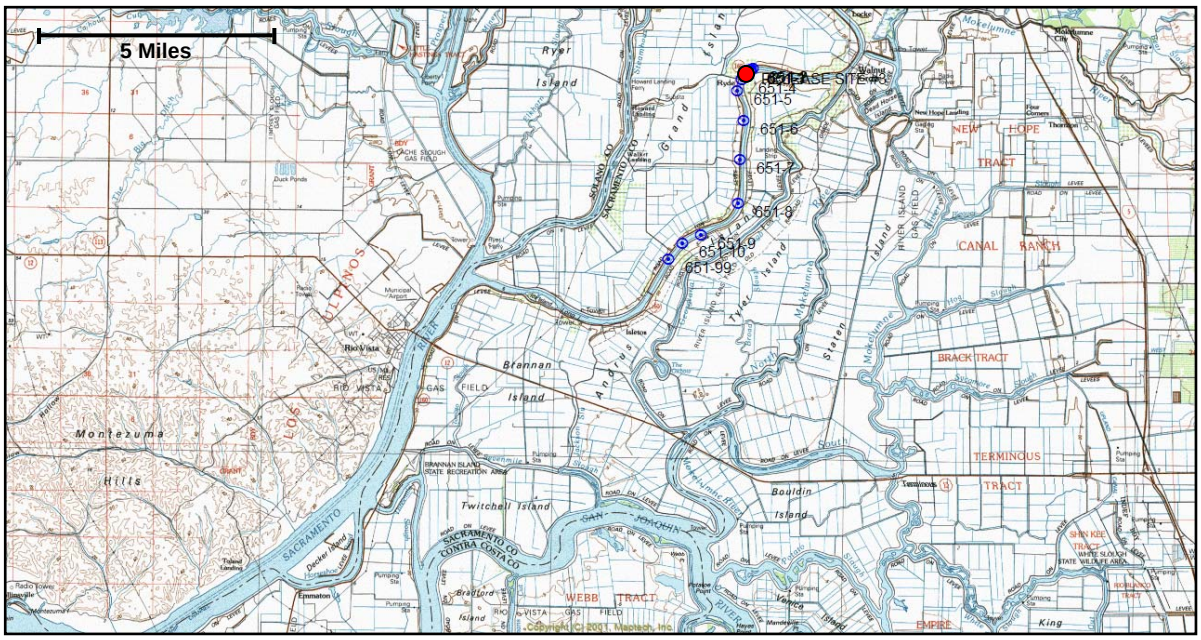
Release 3 – Fish 48.631 MHz (EXTERNAL) – February 6, 2002 at 9:12

.631-1: 2/6/02 at 10:08	.631-9: 2/6/02 at 16:23	.631-17: 2/8/02 at 10:35
.631-2: 2/6/02 at 10:51	.631-10: 2/6/02 at 16:56	.631-18: 2/8/02 at 11:03
.631-3: 2/6/02 at 11:39	.631-11: 2/6/02 at 17:25	.631-19: 2/8/02 at 13:35
.631-4: 2/6/02 at 12:40	.631-12: 2/7/02 at 10:07	.631-20: 2/8/02 at 17:01
.631-5: 2/6/02 at 13:09	.631-13: 2/7/02 at 12:27	.631-21: 2/9/02 at 10:49
.631-6: 2/6/02 at 14:00	.631-14: 2/7/02 at 12:45	.631-22: 2/9/02 at 11:15
.631-7: 2/6/02 at 14:46	.631-15: 2/7/02 at 13:34	.631-23: 2/9/02 at 14:21
.631-8: 2/6/02 at 15:31	.631-16: 2/7/02 at 16:26	.631-99: 2/9/02 at 14:45



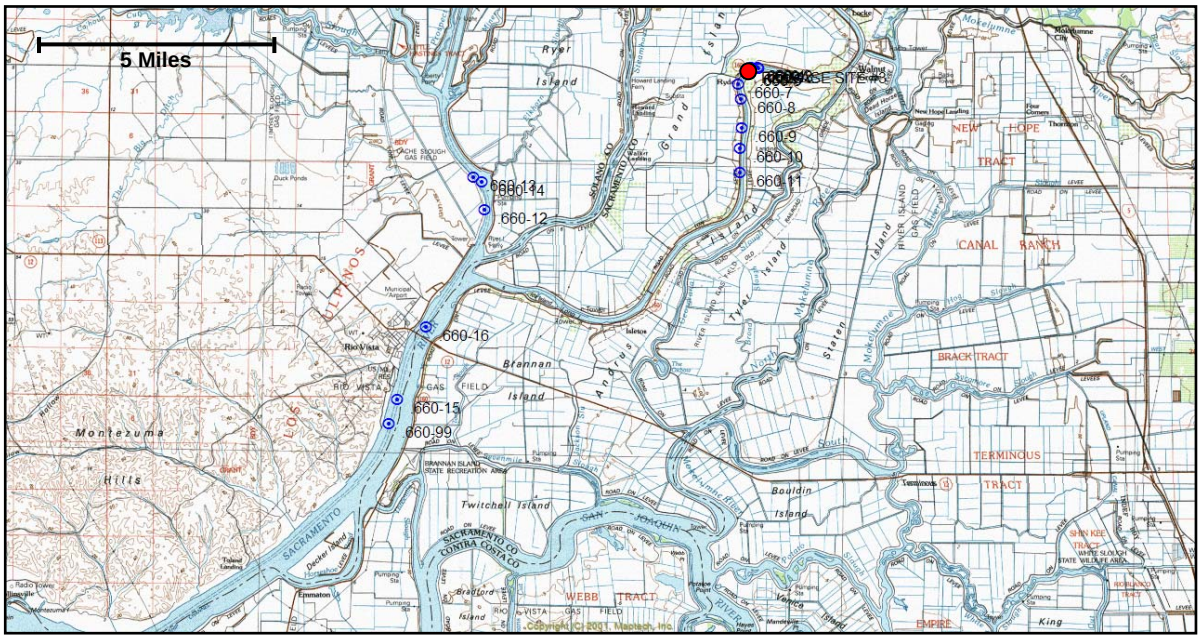
Release 3 – Fish 48.641 MHz (EXTERNAL) – February 6, 2002 at 9:12

.641-1: 2/6/02 at 10:17	.641-7: 2/6/02 at 14:51	.641-13: 2/7/02 at 13:18
.641-2: 2/6/02 at 11:02	.641-8: 2/6/02 at 15:35	.641-14: 2/7/02 at 16:40
.641-3: 2/6/02 at 11:48	.641-9: 2/6/02 at 16:28	.641-15: 2/8/02 at 10:33
.641-4: 2/6/02 at 12:50	.641-10: 2/6/02 at 16:59	.641-16: 2/8/02 at 11:06
.641-5: 2/6/02 at 13:20	.641-11: 2/6/02 at 17:28	.641-17: 2/8/02 at 13:32
.641-6: 2/6/02 at 14:04	.641-12: 2/7/02 at 12:05	.641-99: 2/8/02 at 16:49



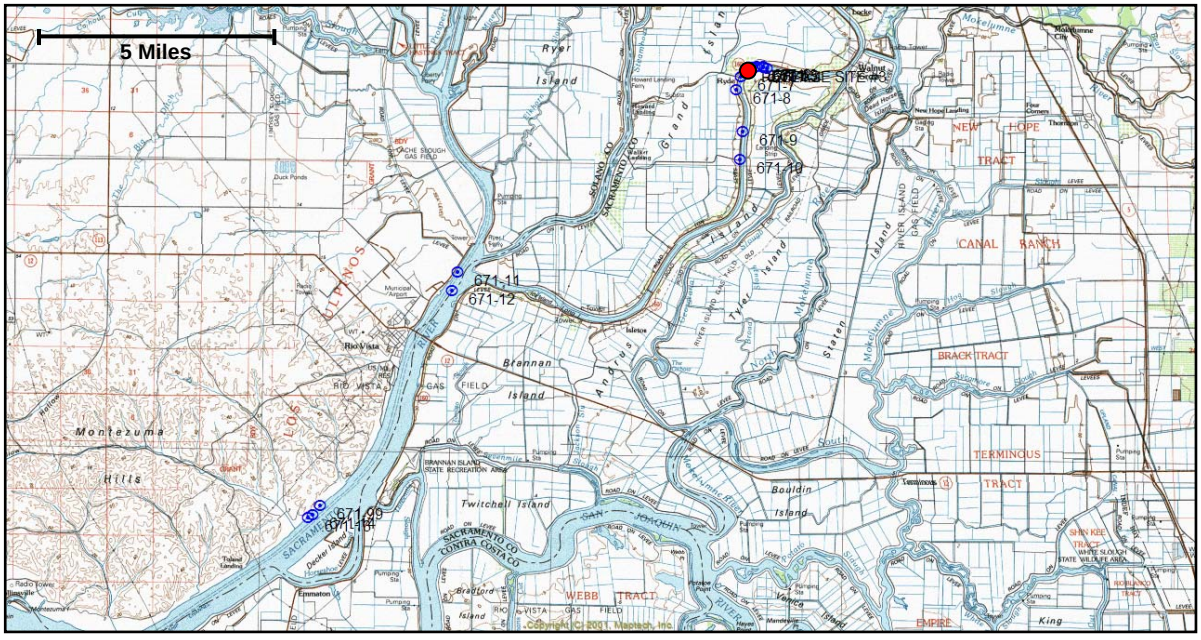
Release 3 – Fish 48.651 MHz (EXTERNAL) – February 6, 2002 at 9:12

.651-1: 2/6/02 at 10:04	.651-7: 2/6/02 at 14:36
.651-2: 2/6/02 at 11:00	.651-8: 2/6/02 at 15:21
.651-3: 2/6/02 at 11:22	.651-9: 2/6/02 at 16:14
.651-4: 2/6/02 at 12:31	.651-10: 2/6/02 at 16:44
.651-5: 2/6/02 at 13:03	.651-99: 2/6/02 at 17:17
.651-6: 2/6/02 at 13:50	



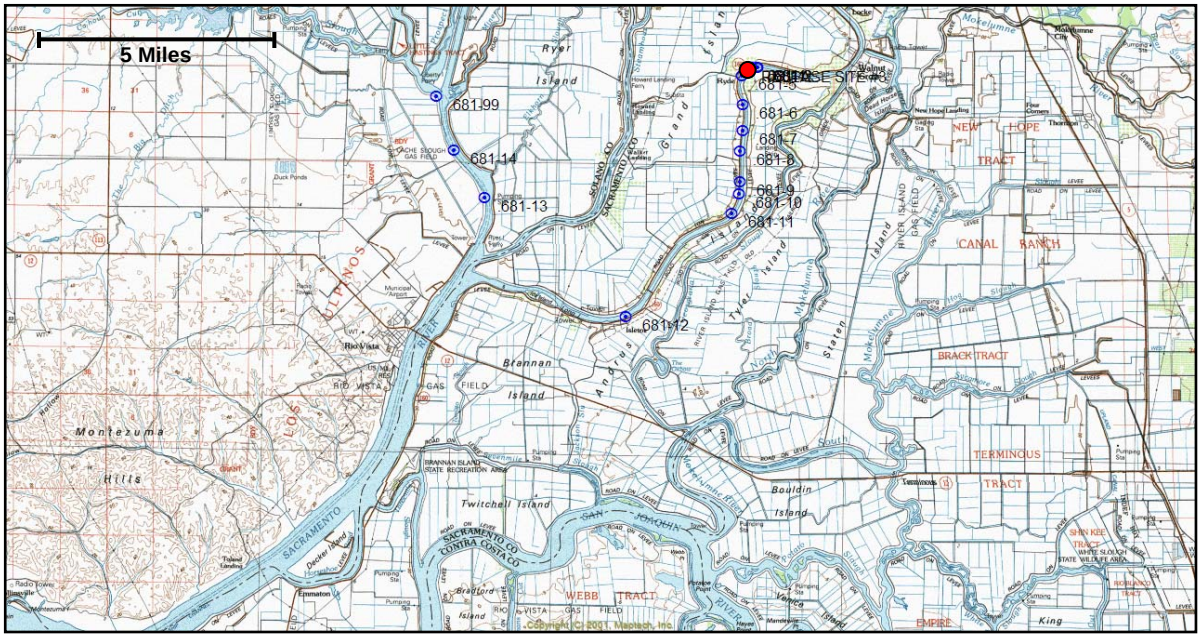
Release 3 – Fish 48.660 MHz (EXTERNAL) – February 6, 2002 at 9:12

.660-1: 2/6/02 at 10:08	.660-7: 2/6/02 at 14:54	.660-13: 2/7/02 at 11:42
.660-2: 2/6/02 at 10:48	.660-8: 2/6/02 at 15:38	.660-14: 2/7/02 at 14:02
.660-3: 2/6/02 at 11:43	.660-9: 2/6/02 at 16:35	.660-15: 2/8/02 at 9:50
.660-4: 2/6/02 at 12:43	.660-10: 2/6/02 at 17:04	.660-16: 2/8/02 at 12:55
.660-5: 2/6/02 at 13:14	.660-11: 2/6/02 at 17:35	.660-99: 2/9/02 at 15:07
.660-6: 2/6/02 at 14:06	.660-12: 2/7/02 at 9:32	



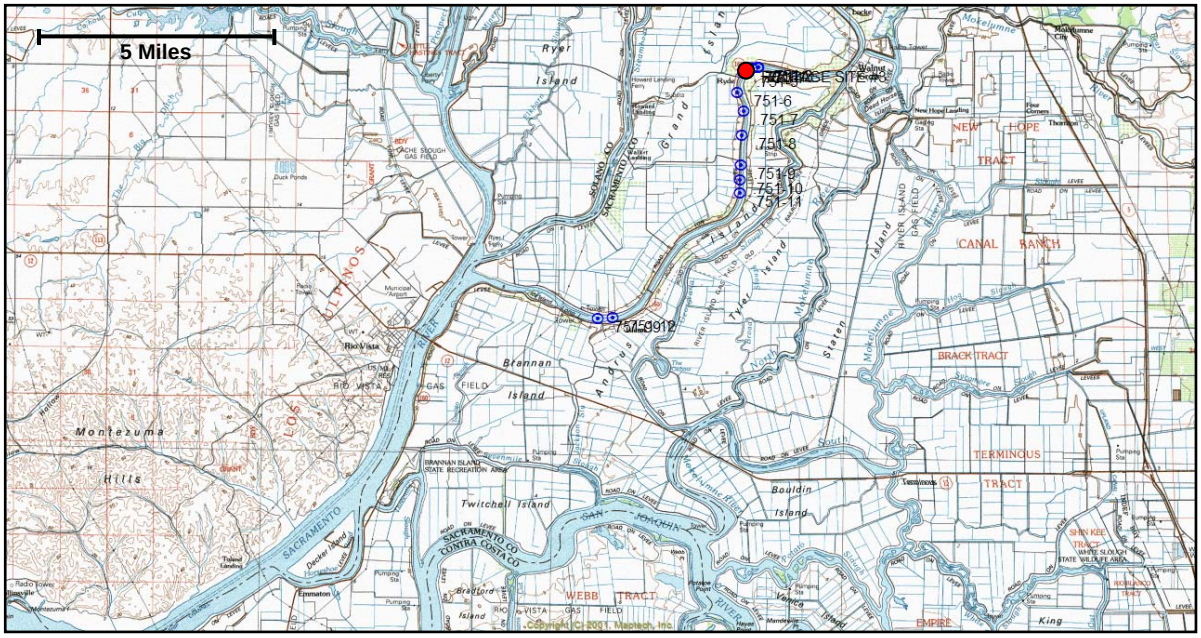
Release 3 – Fish 48.671 MHz (EXTERNAL) – February 6, 2002 at 9:12

.671-1: 2/6/02 at 10:04	.671-6: 2/6/02 at 14:08	.671-11: 2/7/02 at 10:43
.671-2: 2/6/02 at 10:47	.671-7: 2/6/02 at 14:53	.671-12: 2/7/02 at 14:24
.671-3: 2/6/02 at 11:45	.671-8: 2/6/02 at 15:41	.671-13: 2/8/02 at 9:08
.671-4: 2/6/02 at 12:53	.671-9: 2/6/02 at 17:06	.671-14: 2/8/02 at 12:22
.671-5: 2/6/02 at 13:18	.671-10: 2/6/02 at 17:37	.671-99: 2/9/02 at 14:50



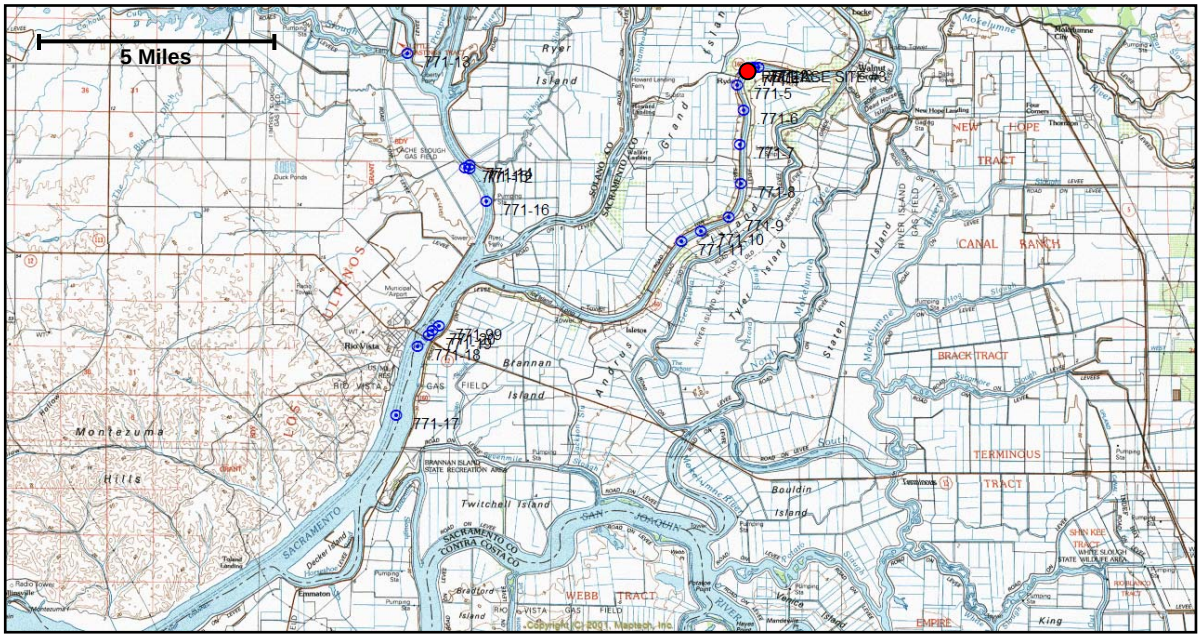
Release 3 – Fish 48.681 MHz (EXTERNAL) – February 6, 2002 at 9:12

.681-1: 2/6/02 at 10:05	.681-6: 2/6/02 at 13:57	.681-11: 2/6/02 at 17:30
.681-2: 2/6/02 at 10:49	.681-7: 2/6/02 at 14:43	.681-12: 2/7/02 at 9:19
.681-3: 2/6/02 at 11:36	.681-8: 2/6/02 at 15:29	.681-13: 2/8/02 at 10:21
.681-4: 2/6/02 at 12:44	.681-9: 2/6/02 at 16:21	.681-14: 2/8/02 at 11:11
.681-5: 2/6/02 at 13:10	.681-10: 2/6/02 at 16:58	.681-99: 2/8/02 at 13:28



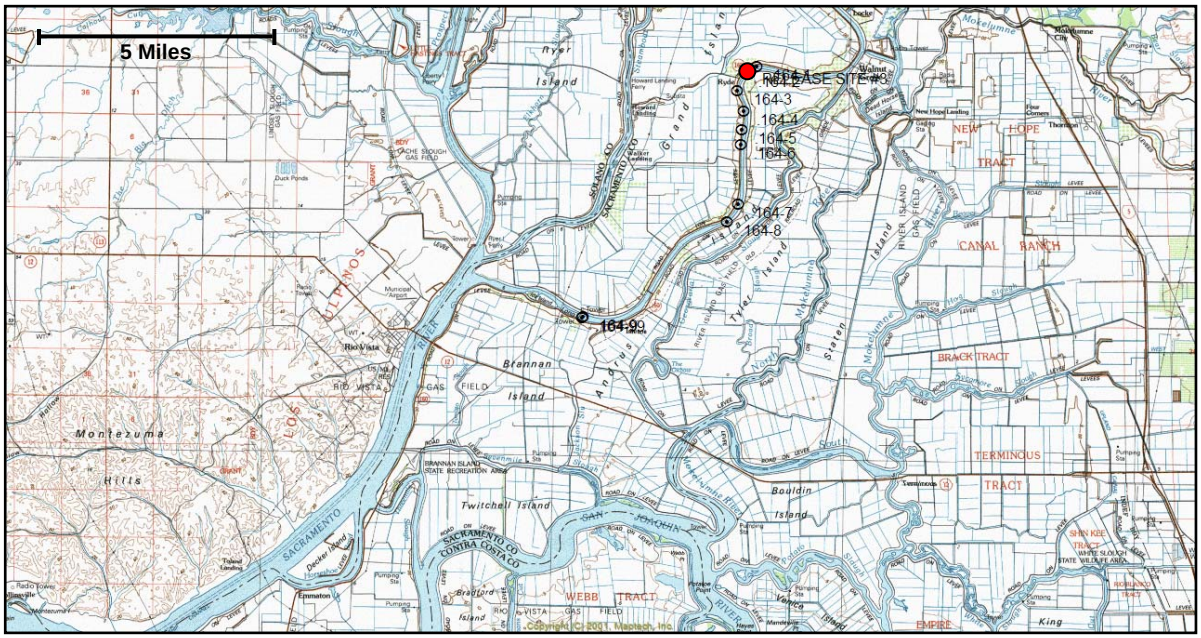
Release 3 – Fish 48.751 MHz (EXTERNAL) – February 6, 2002 at 9:12

.751-1: 2/6/02 at 10:06	.751-8: 2/6/02 at 15:33
.751-2: 2/6/02 at 10:50	.751-9: 2/6/02 at 16:31
.751-3: 2/6/02 at 11:40	.751-10: 2/6/02 at 17:02
.751-4: 2/6/02 at 12:38	.751-11: 2/6/02 at 17:33
.751-5: 2/6/02 at 13:12	.751-12: 2/7/02 at 10:10
.751-6: 2/6/02 at 14:00	.751-99: 2/8/02 at 11:47
.751-7: 2/6/02 at 14:48	



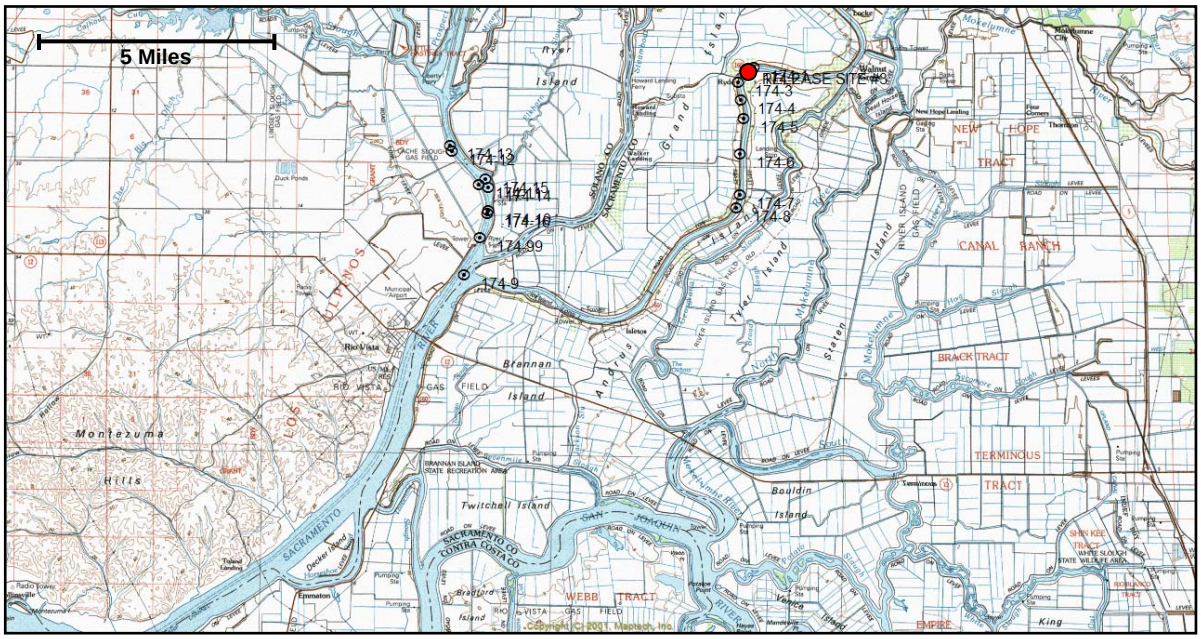
Release 3 – Fish 48.771 MHz (EXTERNAL) – February 6, 2002 at 9:12

.771-1: 2/6/02 at 10:10	.771-8: 2/6/02 at 15:25	.771-15: 2/8/02 at 13:17
.771-2: 2/6/02 at 10:55	.771-9: 2/6/02 at 16:18	.771-16: 2/8/02 at 14:42
.771-3: 2/6/02 at 11:41	.771-10: 2/6/02 at 16:48	.771-17: 2/9/02 at 9:04
.771-4: 2/6/02 at 12:36	.771-11: 2/6/02 at 17:20	.771-18: 2/9/02 at 11:20
.771-5: 2/6/02 at 13:06	.771-12: 2/7/02 at 9:44	.771-19: 2/9/02 at 12:00
.771-6: 2/6/02 at 13:53	.771-13: 2/7/02 at 12:16	.771-20: 2/9/02 at 12:37
.771-7: 2/6/02 at 14:41	.771-14: 2/7/02 at 16:37	.771-99: 2/9/02 at 13:35



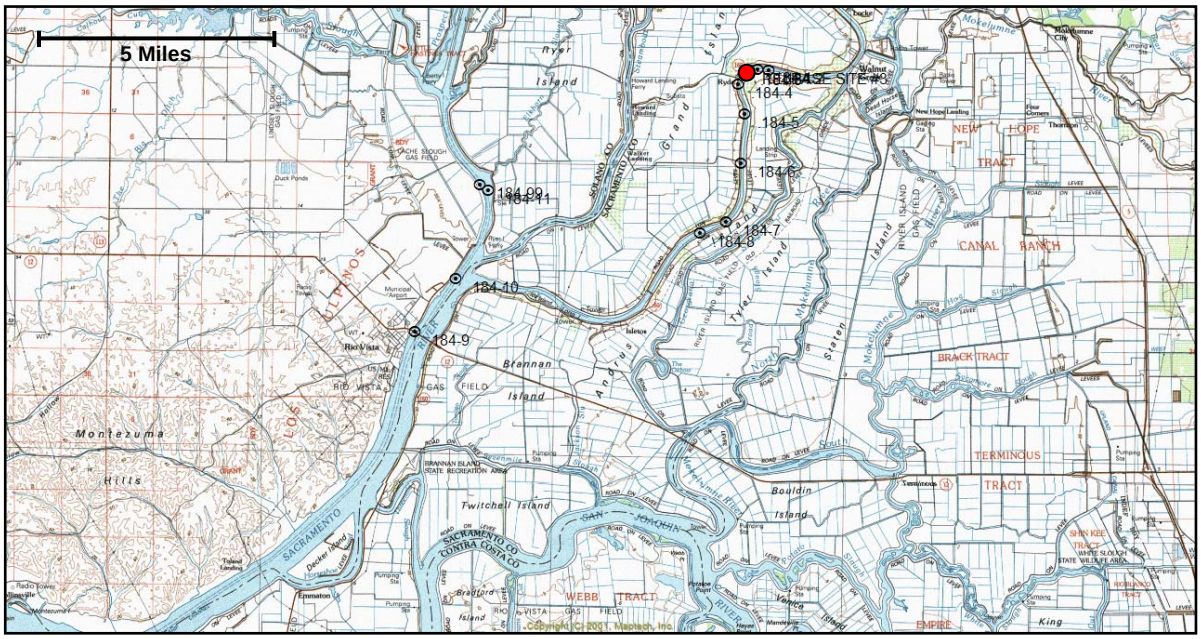
Release 3 – Fish 49.164 MHz (INTERNAL) – February 6, 2002 at 9:12

.164-1: 2/6/02 at 10:33	.164-6: 2/6/02 at 15:10
.164-2: 2/6/02 at 11:55	.164-7: 2/6/02 at 16:44
.164-3: 2/6/02 at 12:49	.164-8: 2/6/02 at 17:11
.164-4: 2/6/02 at 13:52	.164-9: 2/7/02 at 10:51
.164-5: 2/6/02 at 14:34	.164-99: 2/8/02 at 11:44



Release 3 – Fish 49.174 MHz (INTERNAL) – February 6, 2002 at 9:12

. .174-1: 2/6/02 at 10:39	.174-7: 2/6/02 at 16:52	.174-13: 2/7/02 at 16:19
.174-2: 2/6/02 at 11:52	.174-8: 2/6/02 at 17:17	.174-14: 2/8/02 at 10:24
.174-3: 2/6/02 at 12:46	.174-9: 2/7/02 at 10:26	.174-15: 2/8/02 at 13:15
.174-4: 2/6/02 at 13:50	.174-10: 2/7/02 at 11:37	.174-16: 2/8/02 at 14:45
.174-5: 2/6/02 at 14:45	.174-11: 2/7/02 at 13:55	.174-99: 2/8/02 at 16:50
.174-6: 2/6/02 at 15:48	.174-12: 2/7/02 at 15:17	



Release 3 – Fish 49.184 MHz (INTERNAL) – February 6, 2002 at 9:12

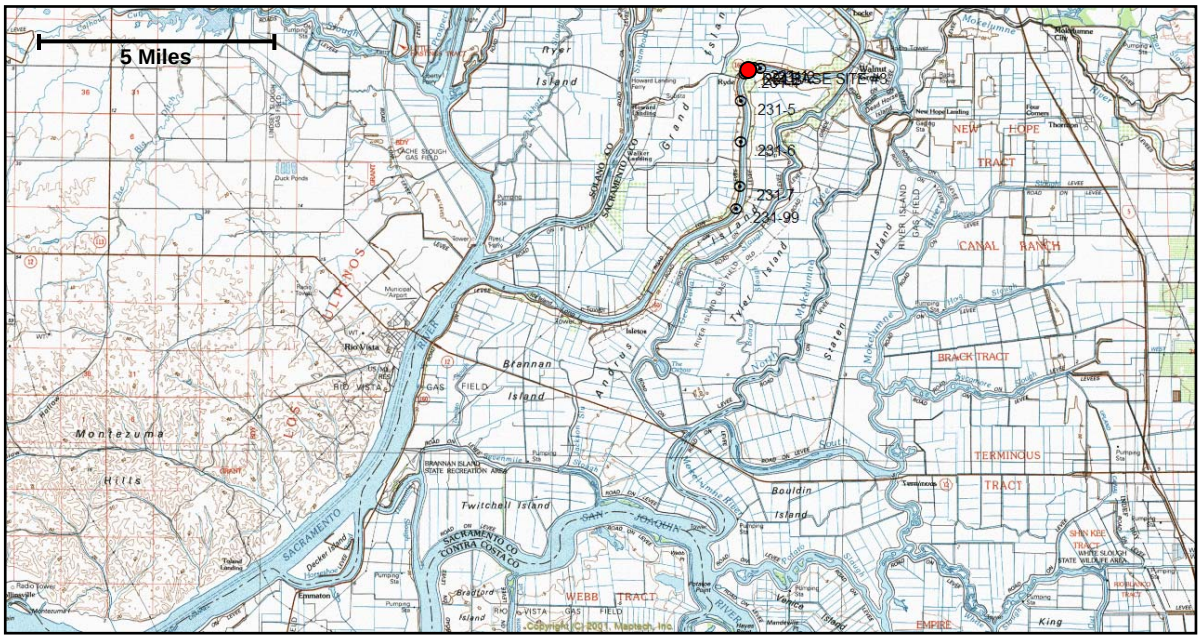
.184-1: 2/6/02 at 10:23	.184-7: 2/6/02 at 16:41
.184-2: 2/6/02 at 11:32	.184-8: 2/6/02 at 17:06
.184-3: 2/6/02 at 13:02	.184-9: 2/7/02 at 9:21
.184-4: 2/6/02 at 13:33	.184-10: 2/7/02 at 10:49
.184-5: 2/6/02 at 14:37	.184-11: 2/7/02 at 12:31
.184-6: 2/6/02 at 15:40	.184-99: 2/7/02 at 13:58

Release 3 – Fish 49.195 MHz (INTERNAL) – February 6, 2002 at 9:12

.195-1: 2/6/02 at 10:39
.195-2: 2/6/02 at 11:58
.195-3: 2/6/02 at 12:57
.195-4: 2/6/02 at 13:47
.195-5: 2/6/02 at 14:40
.195-6: 2/6/02 at 15:44
.195-7: 2/6/02 at 16:47
.195-8: 2/6/02 at 17:12
.195-9: 2/7/02 at 11:16
.195-10: 2/7/02 at 15:15
.195-99: 2/7/02 at 15:37

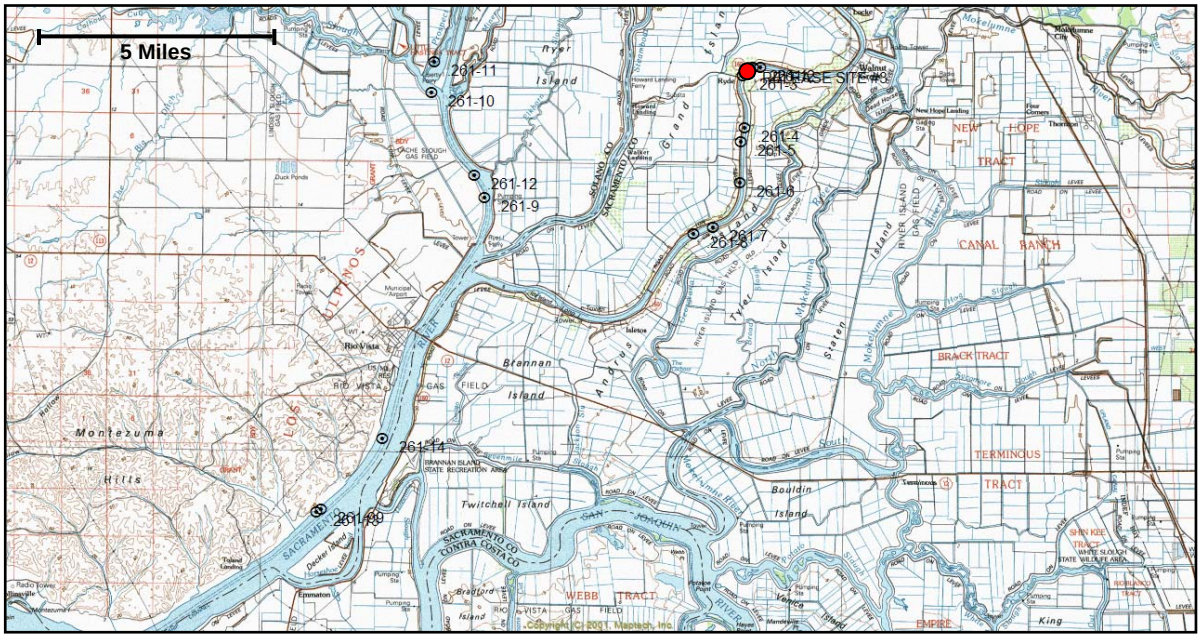
Release 3 – Fish 49.211 MHz (INTERNAL) – February 6, 2002 at 9:12

.211-1: 2/6/02 at 10:36
.211-2: 2/6/02 at 11:47
.211-3: 2/6/02 at 13:19
.211-4: 2/6/02 at 13:44
.211-5: 2/6/02 at 14:47
.211-6: 2/6/02 at 16:37
.211-7: 2/6/02 at 17:01
.211-8: 2/7/02 at 9:12
.211-9: 2/7/02 at 10:16
.211-10: 2/7/02 at 11:52
.211-11: 2/7/02 at 13:51
.211-99: 2/7/02 at 16:06



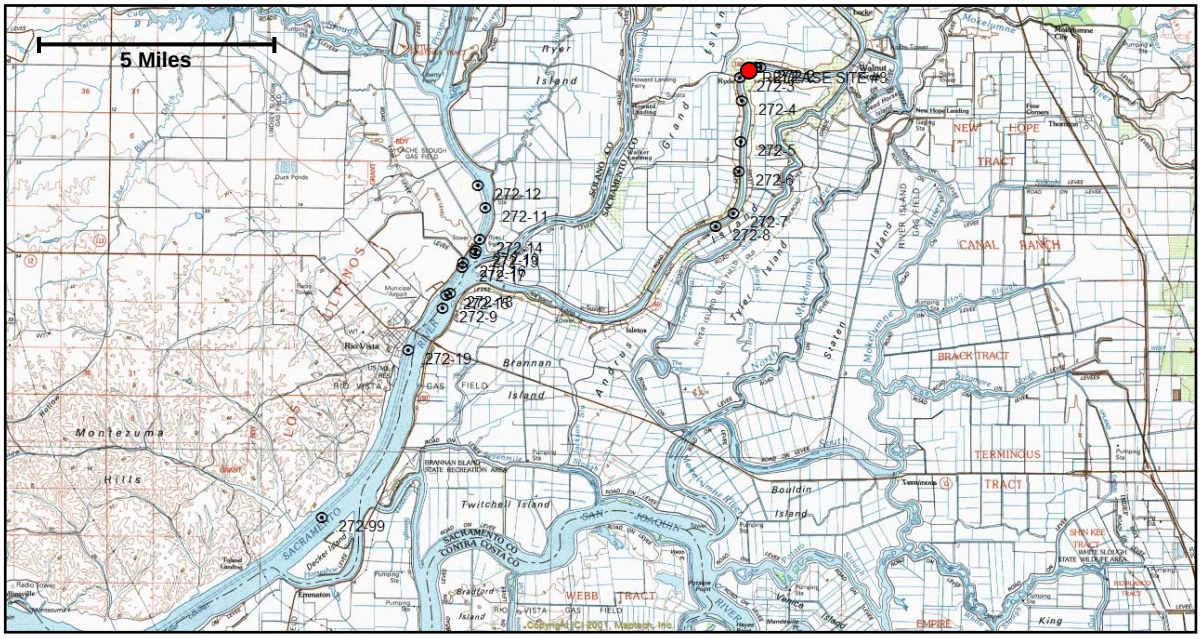
Release 3 – Fish 49.231 MHz (INTERNAL) – February 6, 2002 at 9:12

.231-1: 2/6/02 at 10:38	.231-5: 2/6/02 at 14:50
.231-2: 2/6/02 at 11:38	.231-6: 2/6/02 at 15:52
.231-3: 2/6/02 at 13:03	.231-7: 2/6/02 at 16:53
.231-4: 2/6/02 at 13:38	.231-99: 2/6/02 at 17:16



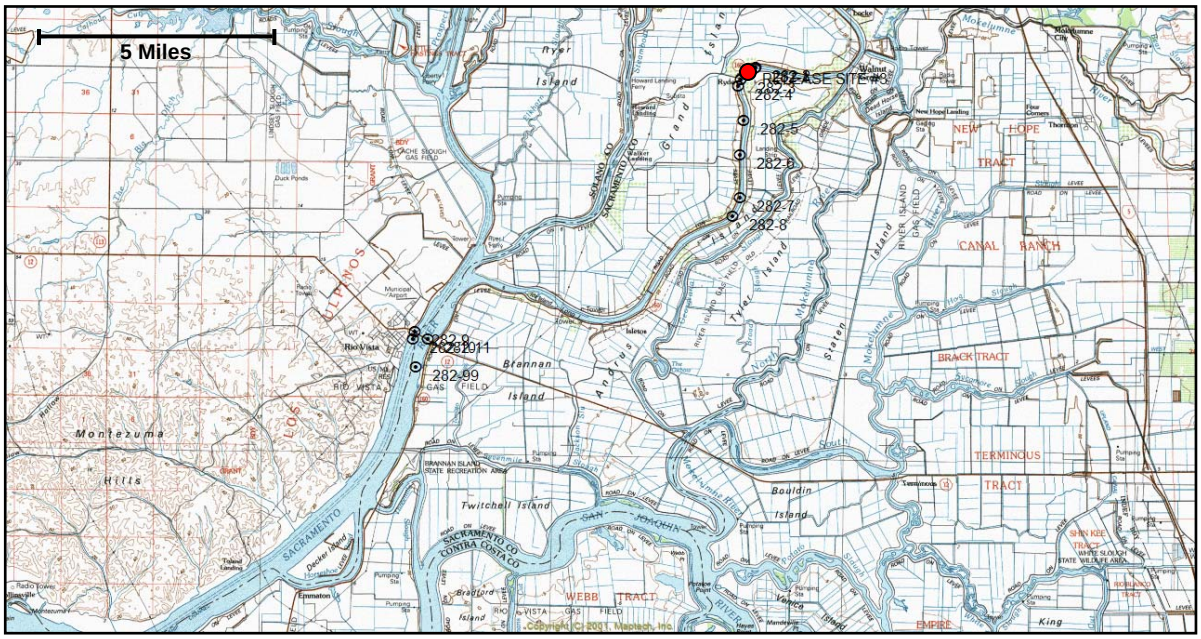
Release 3 – Fish 49.261 MHz (INTERNAL) – February 6, 2002 at 9:12

.261-1: 2/6/02 at 10:42	.261-6: 2/6/02 at 15:20	.261-11: 2/7/02 at 12:54
.261-2: 2/6/02 at 11:38	.261-7: 2/6/02 at 16:32	.261-12: 2/7/02 at 16:15
.261-3: 2/6/02 at 12:59	.261-8: 2/6/02 at 17:04	.261-13: 2/8/02 at 9:04
.261-4: 2/6/02 at 13:55	.261-9: 2/7/02 at 9:36	.261-14: 2/8/02 at 12:00
.261-5: 2/6/02 at 14:20	.261-10: 2/7/02 at 11:58	.261-99: 2/8/02 at 15:45



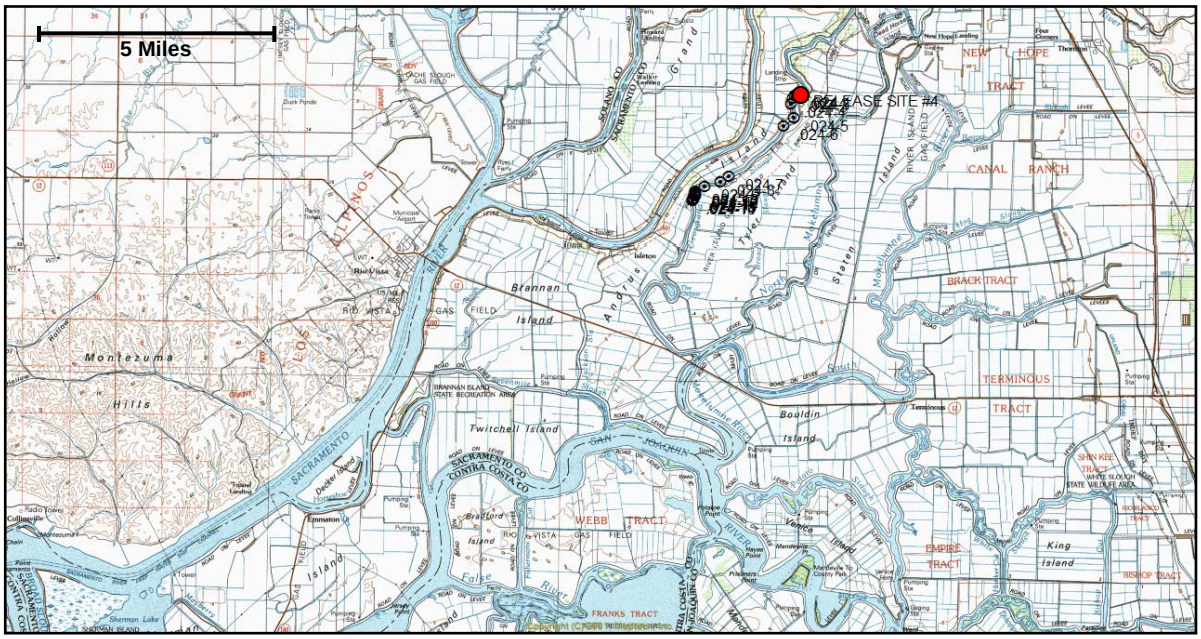
Release 3 – Fish 49.272 MHz (INTERNAL) – February 6, 2002 at 9:12

.272-1: 2/6/02 at 10:30	.272-8: 2/6/02 at 17:09	.272-15: 2/8/02 at 10:04
.272-2: 2/6/02 at 11:38	.272-9: 2/7/02 at 9:00	.272-16: 2/8/02 at 11:32
.272-3: 2/6/02 at 12:42	.272-10: 2/7/02 at 10:38	.272-17: 2/8/02 at 13:04
.272-4: 2/6/02 at 13:28	.272-11: 2/7/02 at 11:38	.272-18: 2/8/02 at 14:51
.272-5: 2/6/02 at 14:30	.272-12: 2/7/02 at 14:01	.272-19: 2/8/02 at 16:25
.272-6: 2/6/02 at 15:18	.272-13: 2/7/02 at 15:32	.272-99: 2/9/02 at 14:35
.272-7: 2/6/02 at 16:27	.272-14: 2/7/02 at 16:00	



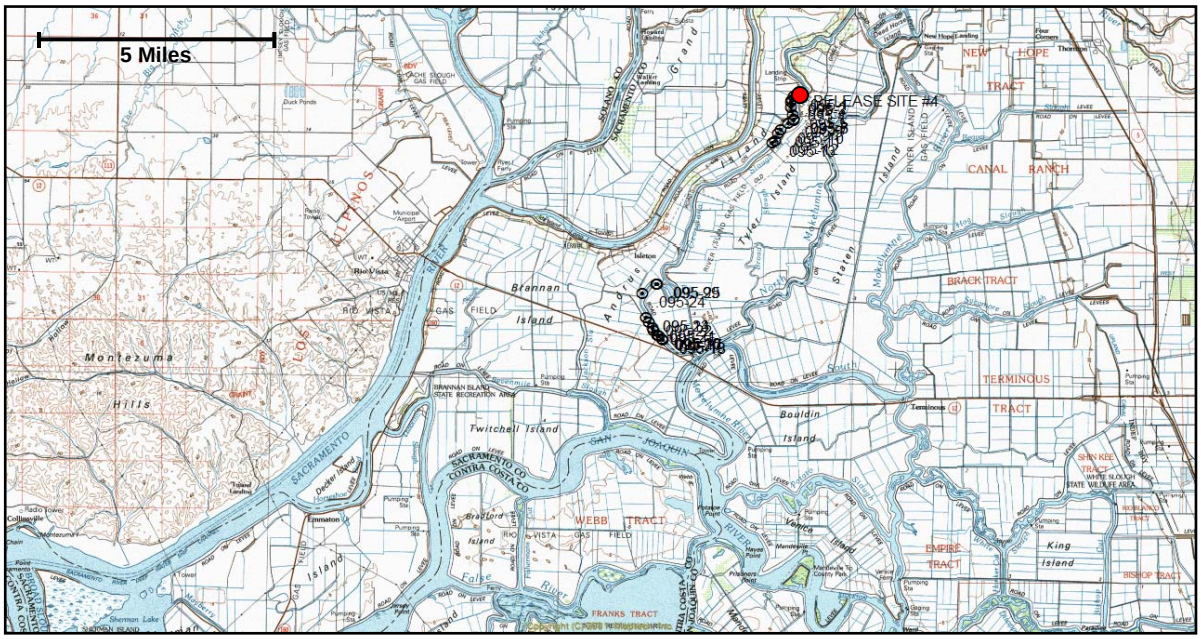
Release 3 – Fish 49.282 MHz (INTERNAL) – February 6, 2002 at 9:12

.282-1: 2/6/02 at 10:27	.282-7: 2/6/02 at 16:48
.282-2: 2/6/02 at 11:44	.282-8: 2/6/02 at 17:14
.282-3: 2/6/02 at 13:15	.282-9: 2/7/02 at 11:00
.282-4: 2/6/02 at 13:42	.282-10: 2/7/02 at 14:59
.282-5: 2/6/02 at 14:42	.282-11: 2/8/02 at 14:56
.282-6: 2/6/02 at 15:45	.282-99: 2/8/02 at 16:21



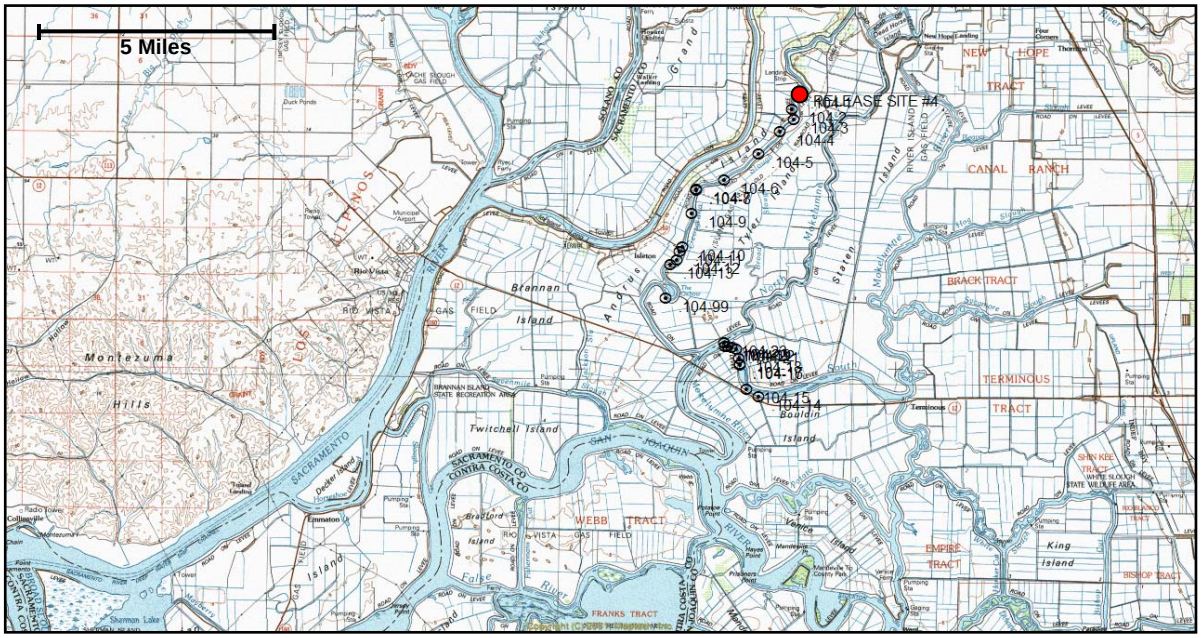
Release 4 – Fish 49.024 MHz (INTERNAL) – February 12, 2002 at 9:35

.024-1: 2/12/02 at 9:56	.024-7: 2/12/02 at 12:55	.024-13: 2/12/02 at 16:27
.024-2: 2/12/02 at 10:08	.024-8: 2/12/02 at 13:24	.024-14: 2/12/02 at 16:51
.024-3: 2/12/02 at 10:27	.024-9: 2/12/02 at 14:15	.024-15: 2/12/02 at 17:22
.024-4: 2/12/02 at 10:50	.024-10: 2/12/02 at 15:10	.024-16: 2/12/02 at 17:50
.024-5: 2/12/02 at 11:18	.024-11: 2/12/02 at 15:31	.024-17: 2/13/02 at 9:09
.024-6: 2/12/02 at 11:53	.024-12: 2/12/02 at 16:07	.024-99: 2/13/02 at 9:28



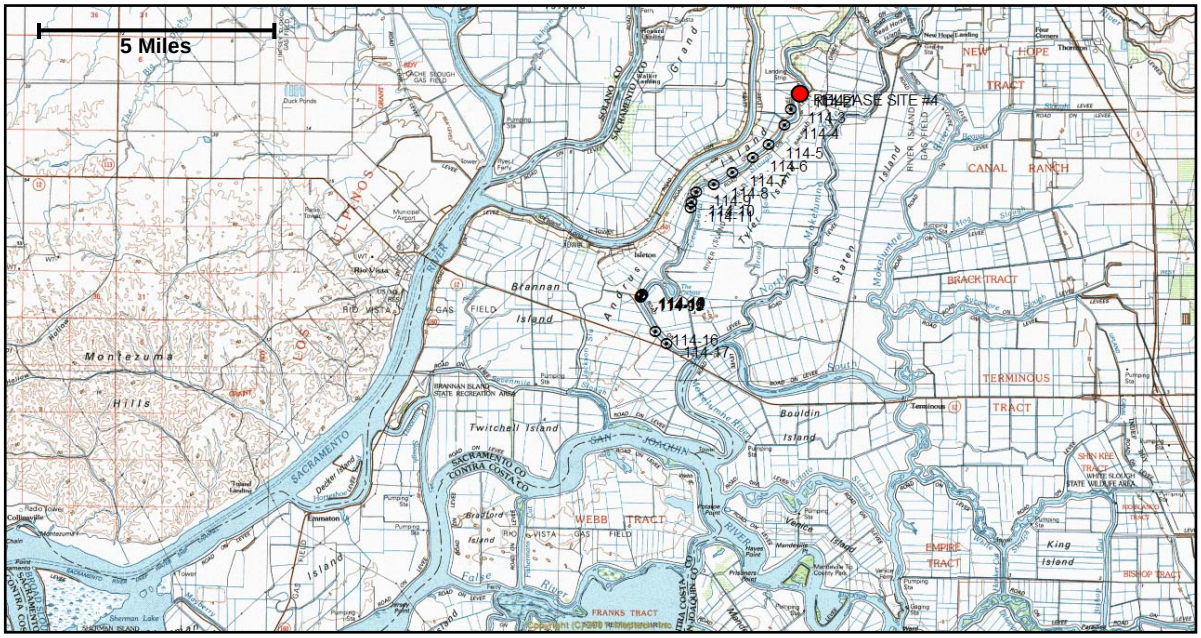
Release 4 – Fish 49.095 MHz (INTERNAL) – February 12, 2002 at 9:35

.095-1: 2/12/02 at 9:54	.095-10: 2/12/02 at 15:22	.095-19: 2/13/02 at 13:08
.095-2: 2/12/02 at 10:10	.095-11: 2/12/02 at 16:17	.095-20: 2/13/02 at 13:40
.095-3: 2/12/02 at 10:26	.095-12: 2/12/02 at 17:01	.095-21: 2/13/02 at 15:02
.095-4: 2/12/02 at 10:51	.095-13: 2/12/02 at 17:30	.095-22: 2/13/02 at 15:32
.095-5: 2/12/02 at 11:21	.095-14: 2/13/02 at 8:27	.095-23: 2/13/02 at 16:54
.095-6: 2/12/02 at 11:58	.095-15: 2/13/02 at 10:09	.095-24: 2/14/02 at 10:39
.095-7: 2/12/02 at 12:44	.095-16: 2/13/02 at 11:10	.095-25: 2/14/02 at 15:11
.095-8: 2/12/02 at 13:40	.095-17: 2/13/02 at 11:36	.095-99: 2/16/02 at 16:13
.095-9: 2/12/02 at 14:31	.095-18: 2/13/02 at 12:02	



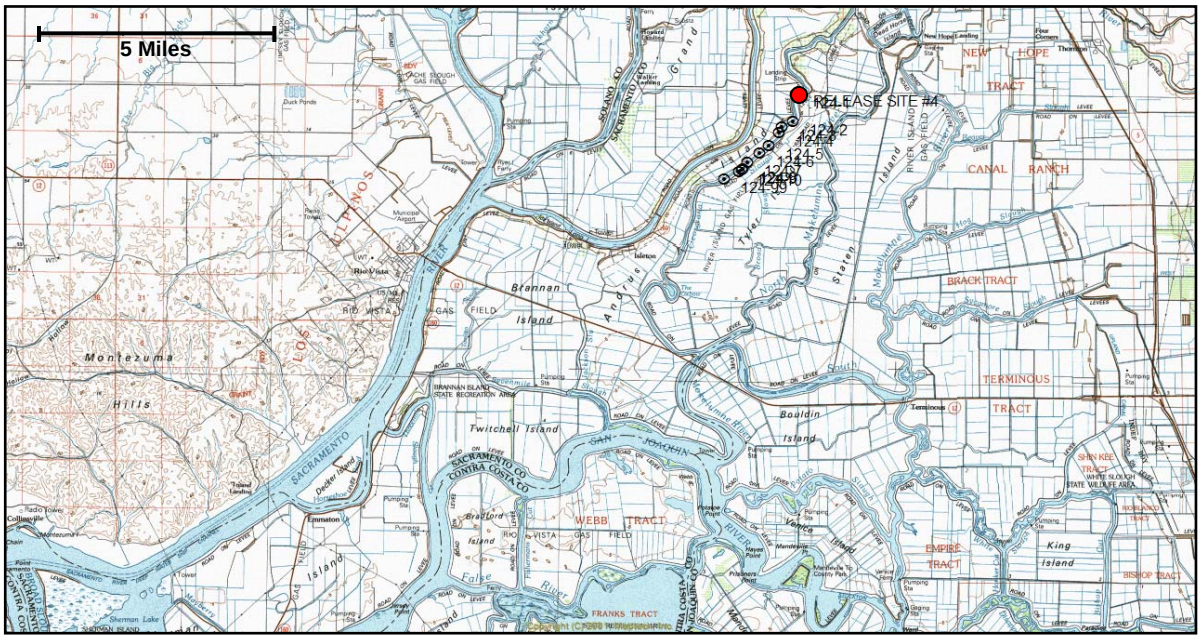
Release 4 – Fish 49.104 MHz (INTERNAL) – February 12, 2002 at 9:35

.104-1: 2/12/02 at 10:03	.104-9: 2/12/02 at 16:24	.104-17: 2/13/02 at 10:58
.104-2: 2/12/02 at 10:38	.104-10: 2/12/02 at 17:18	.104-18: 2/13/02 at 11:41
.104-3: 2/12/02 at 11:08	.104-11: 2/12/02 at 17:46	.104-19: 2/13/02 at 13:08
.104-4: 2/12/02 at 11:53	.104-12: 2/12/02 at 18:05	.104-20: 2/13/02 at 13:55
.104-5: 2/12/02 at 12:41	.104-13: 2/12/02 at 18:34	.104-21: 2/13/02 at 14:50
.104-6: 2/12/02 at 13:37	.104-14: 2/13/02 at 8:31	.104-22: 2/13/02 at 16:02
.104-7: 2/12/02 at 14:38	.104-15: 2/13/02 at 9:19	.104-23: 2/13/02 at 16:53
.104-8: 2/12/02 at 15:34	.104-16: 2/13/02 at 10:27	.104-99: 2/16/02 at 16:22



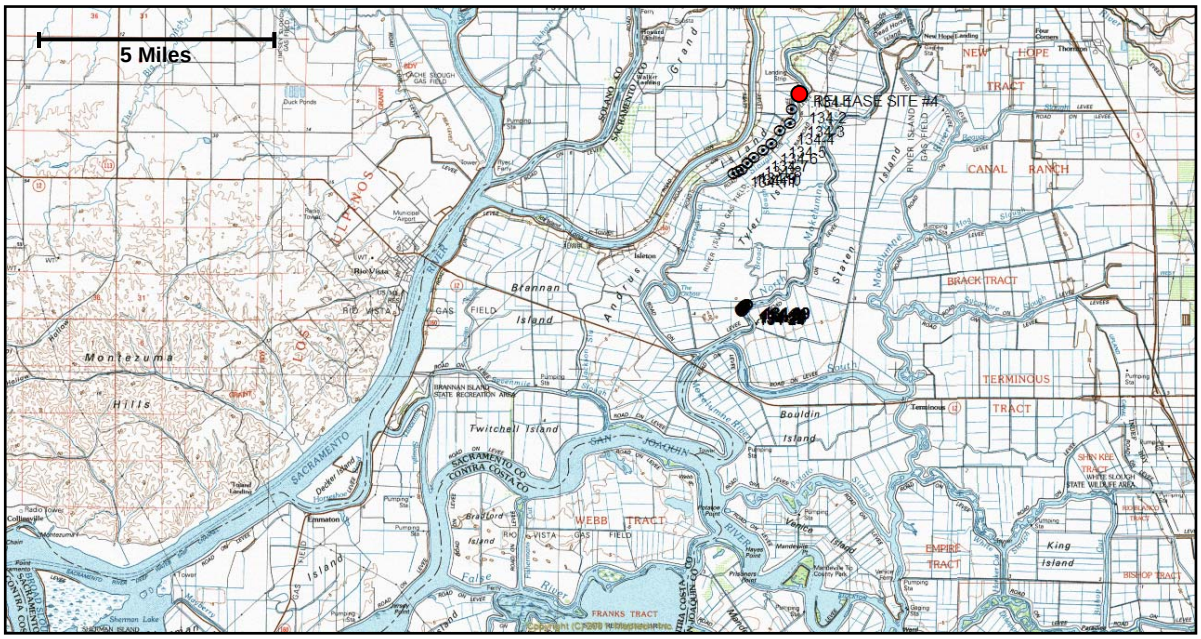
Release 4 – Fish 49.114 MHz (INTERNAL) – February 12, 2002 at 9:35

.114-1: 2/12/02 at 10:06	.114-8: 2/12/02 at 15:40	.114-15: 2/13/02 at 15:15
.114-2: 2/12/02 at 10:31	.114-9: 2/12/02 at 16:28	.114-16: 2/13/02 at 16:55
.114-3: 2/12/02 at 11:12	.114-10: 2/12/02 at 17:10	.114-17: 2/13/02 at 17:15
.114-4: 2/12/02 at 11:59	.114-11: 2/12/02 at 17:35	.114-18: 2/14/02 at 10:52
.114-5: 2/12/02 at 12:43	.114-12: 2/13/02 at 8:37	.114-19: 2/14/02 at 15:09
.114-6: 2/12/02 at 13:42	.114-13: 2/13/02 at 10:00	.114-99: 2/16/02 at 16:00
.114-7: 2/12/02 at 14:45	.114-14: 2/13/02 at 13:22	



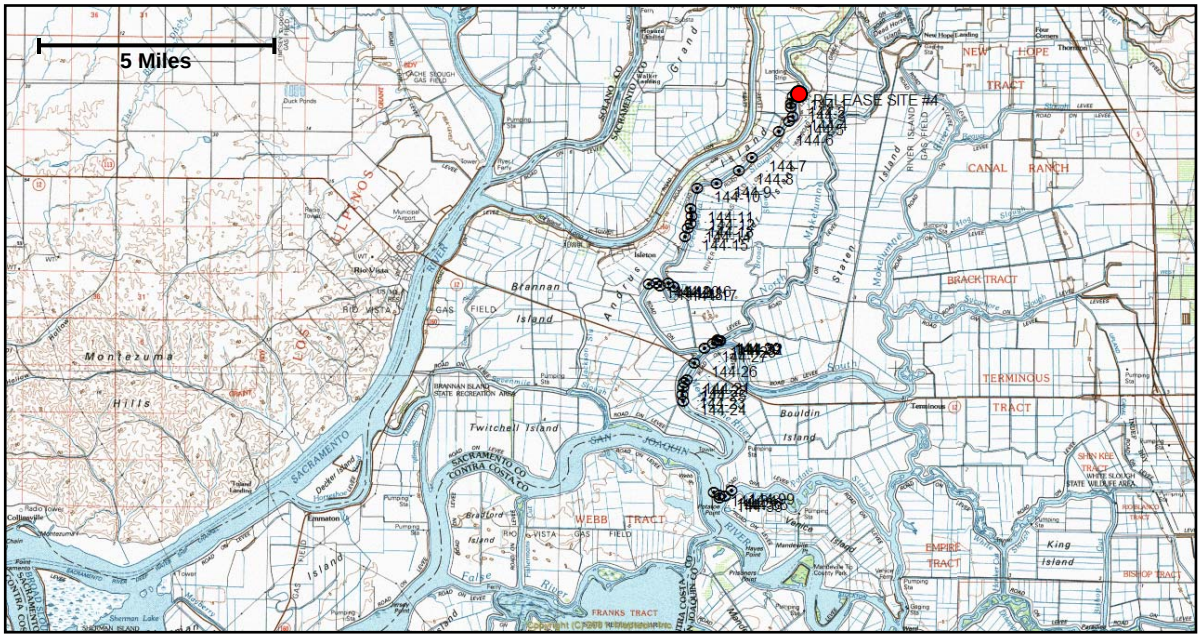
Release 4 – Fish 49.124 MHz (INTERNAL) – February 12, 2002 at 9:35

.124-1: 2/12/02 at 9:52
.124-2: 2/12/02 at 10:42
.124-3: 2/12/02 at 11:02
.124-4: 2/12/02 at 11:52
.124-5: 2/12/02 at 12:44
.124-6: 2/12/02 at 13:43
.124-7: 2/12/02 at 14:47
.124-8: 2/12/02 at 15:43
.124-9: 2/12/02 at 16:33
.124-10: 2/12/02 at 17:04
.124-99: 2/12/02 at 17:44



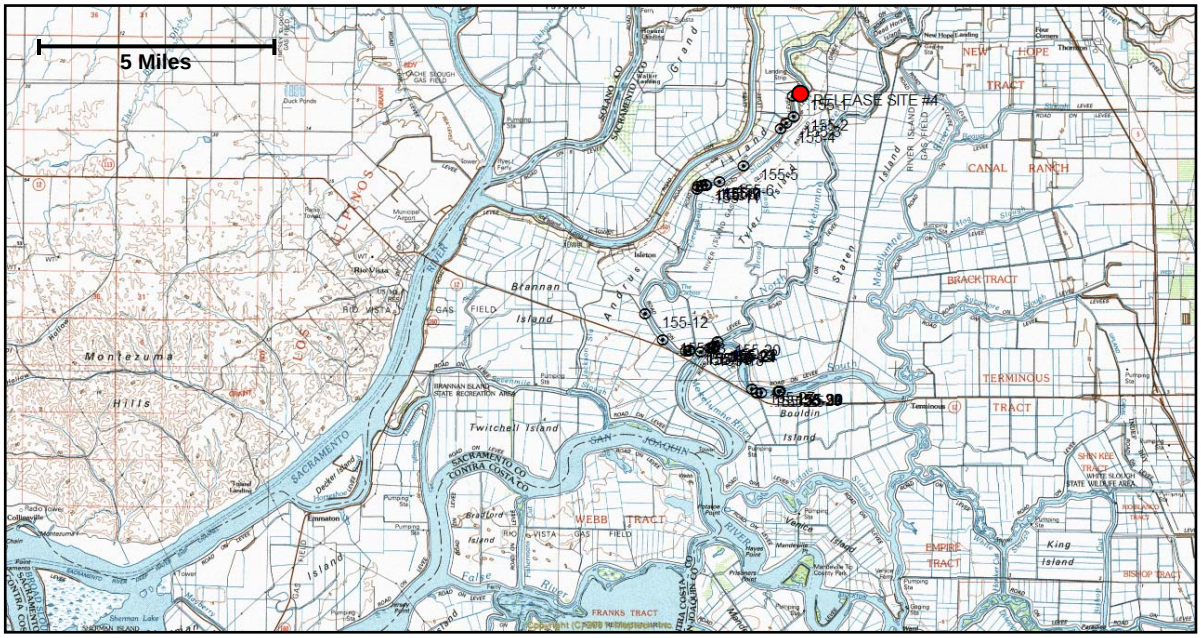
Release 4 – Fish 49.134 MHz (INTERNAL) – February 12, 2002 at 9:35

.134-1: 2/12/02 at 10:04
.134-2: 2/12/02 at 10:37
.134-3: 2/12/02 at 11:06
.134-4: 2/12/02 at 11:54
.134-5: 2/12/02 at 12:45
.134-6: 2/12/02 at 13:45
.134-7: 2/12/02 at 14:48
.134-8: 2/12/02 at 15:45
.134-9: 2/12/02 at 16:33
.134-10: 2/12/02 at 17:04
.134-11: 2/12/02 at 17:42
.134-12: 2/13/02 at 11:19
.134-13: 2/13/02 at 12:03
.134-14: 2/13/02 at 13:41
.134-15: 2/13/02 at 15:12
.134-16: 2/13/02 at 16:03
.134-17: 2/13/02 at 17:02
.134-18: 2/14/02 at 10:06
.134-19: 2/14/02 at 11:25
.134-20: 2/14/02 at 12:01
.134-21: 2/14/02 at 13:04
.134-22: 2/14/02 at 15:08
.134-23: 2/14/02 at 16:20
.134-24: 2/14/02 at 16:55
.134-25: 2/15/02 at 9:42
.134-26: 2/15/02 at 12:57
.134-27: 2/15/02 at 16:01
.134-99: 2/15/02 at 17:40



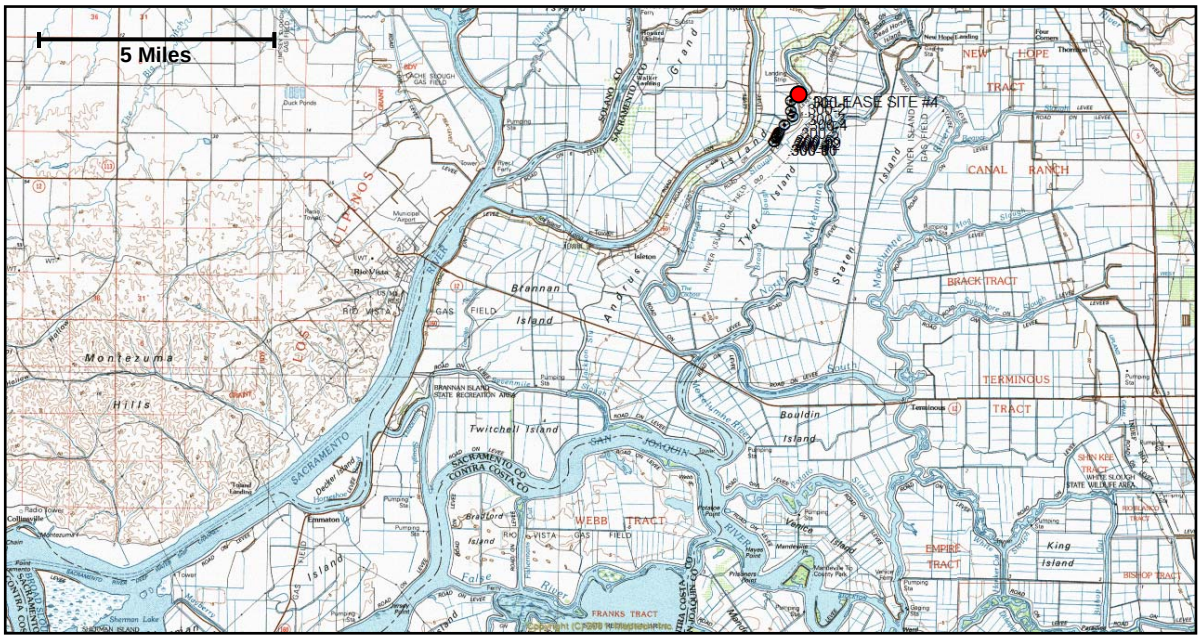
Release 4 – Fish 49.144 MHz (INTERNAL) – February 12, 2002 at 9:35

.144-1: 2/12/02 at 9:50	.144-11: 2/12/02 at 16:04	.144-20: 2/13/02 at 17:03	.144-29: 2/14/02 at 16:30
.144-2: 2/12/02 at 10:12	.144-12: 2/12/02 at 16:32	.144-21: 2/14/02 at 8:10	.144-30: 2/14/02 at 16:44
.144-3: 2/12/02 at 10:23	.144-13: 2/12/02 at 16:45	.144-22: 2/14/02 at 10:12	.144-31: 2/14/02 at 17:07
.144-4: 2/12/02 at 10:54	.144-14: 2/12/02 at 17:11	.144-23: 2/14/02 at 10:56	.144-32: 2/14/02 at 17:30
.144-5: 2/12/02 at 11:16	.144-15: 2/12/02 at 17:54	.144-24: 2/14/02 at 11:34	.144-33: 2/15/02 at 11:50
.144-6: 2/12/02 at 11:49	.144-16: 2/13/02 at 8:54	.144-25: 2/14/02 at 13:34	.144-34: 2/15/02 at 12:18
.144-7: 2/12/02 at 12:51	.144-17: 2/13/02 at 9:44	.144-26: 2/14/02 at 14:37	.144-35: 2/15/02 at 13:09
.144-8: 2/12/02 at 13:27	.144-18: 2/13/02 at 13:30	.144-27: 2/14/02 at 15:32	.144-36: 2/15/02 at 13:45
.144-9: 2/12/02 at 14:19	.144-19: 2/13/02 at 15:18	.144-28: 2/14/02 at 15:59	.144-99: 2/15/02 at 15:11
.144-10: 2/12/02 at 15:12			



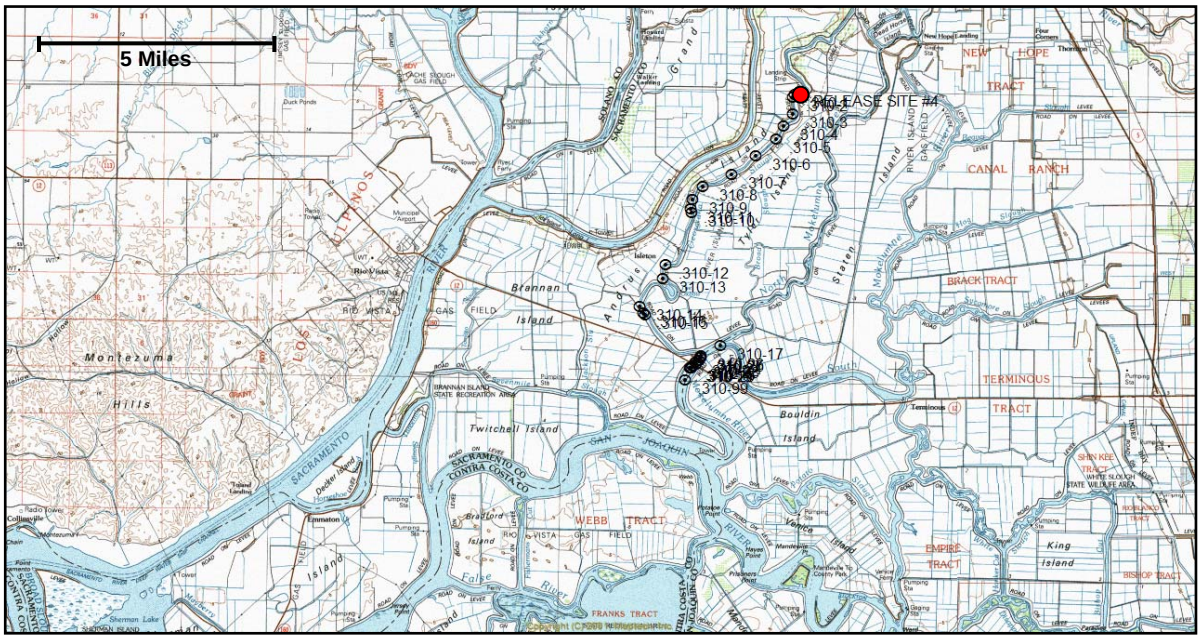
Release 4 – Fish 49.155 MHz (INTERNAL) – February 12, 2002 at 9:35

.155-1: 2/12/02 at 9:54	.155-10: 2/12/02 at 17:08	.155-19: 2/13/02 at 14:46	.155-28: 2/14/02 at 13:18
.155-2: 2/12/02 at 10:40	.155-11: 2/12/02 at 17:36	.155-20: 2/13/02 at 15:22	.155-29: 2/14/02 at 14:42
.155-3: 2/12/02 at 11:04	.155-12: 2/13/02 at 8:29	.155-21: 2/13/02 at 16:09	.155-30: 2/14/02 at 16:08
.155-4: 2/12/02 at 11:56	.155-13: 2/13/02 at 10:12	.155-22: 2/13/02 at 16:30	.155-31: 2/14/02 at 17:06
.155-5: 2/12/02 at 12:37	.155-14: 2/13/02 at 11:00	.155-23: 2/13/02 at 17:08	.155-32: 2/15/02 at 9:58
.155-6: 2/12/02 at 13:34	.155-15: 2/13/02 at 11:31	.155-24: 2/13/02 at 17:25	.155-33: 2/15/02 at 13:19
.155-7: 2/12/02 at 14:40	.155-16: 2/13/02 at 11:55	.155-25: 2/14/02 at 8:18	.155-34: 2/15/02 at 16:10
.155-8: 2/12/02 at 15:37	.155-17: 2/13/02 at 13:05	.155-26: 2/14/02 at 9:19	.155-99: 2/15/02 at 17:52
.155-9: 2/12/02 at 16:30	.155-18: 2/13/02 at 13:50	.155-27: 2/14/02 at 11:09	



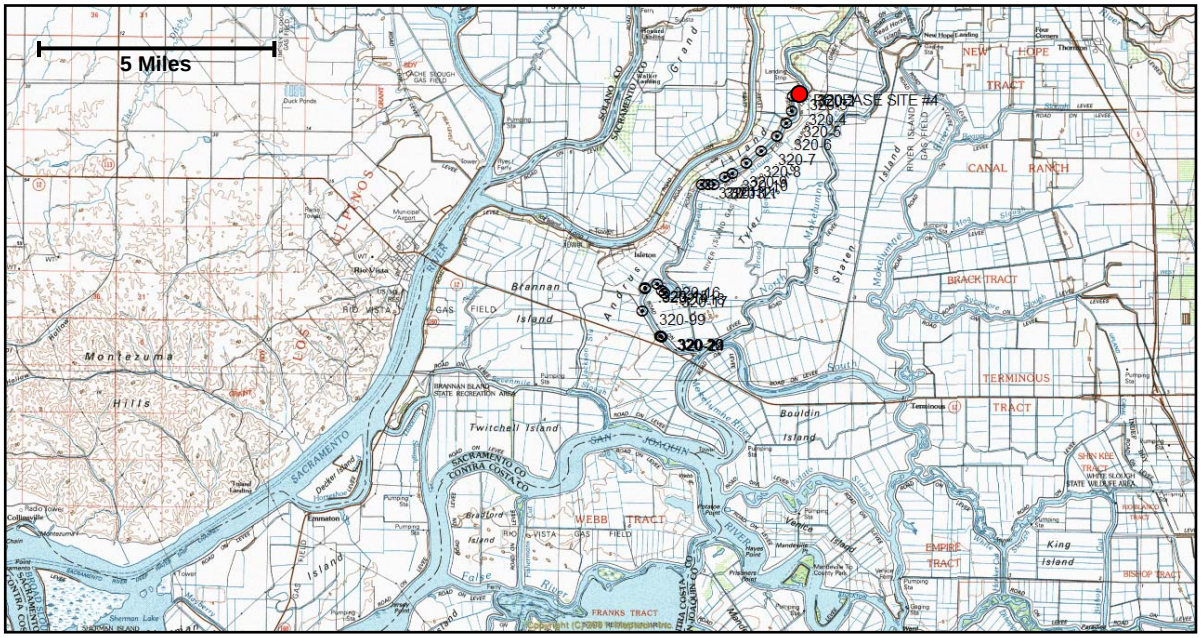
Release 4 – Fish 49.300 MHz (INTERNAL) – February 12, 2002 at 9:35

.300-1: 2/12/02 at 10:07
.300-2: 2/12/02 at 10:26
.300-3: 2/12/02 at 10:52
.300-4: 2/12/02 at 11:20
.300-5: 2/12/02 at 11:54
.300-6: 2/12/02 at 12:40
.300-7: 2/12/02 at 13:36
.300-8: 2/12/02 at 14:28
.300-9: 2/12/02 at 15:20
.300-10: 2/12/02 at 16:15
.300-11: 2/12/02 at 17:02
.300-12: 2/12/02 at 17:32
.300-99: 2/13/02 at 9:20



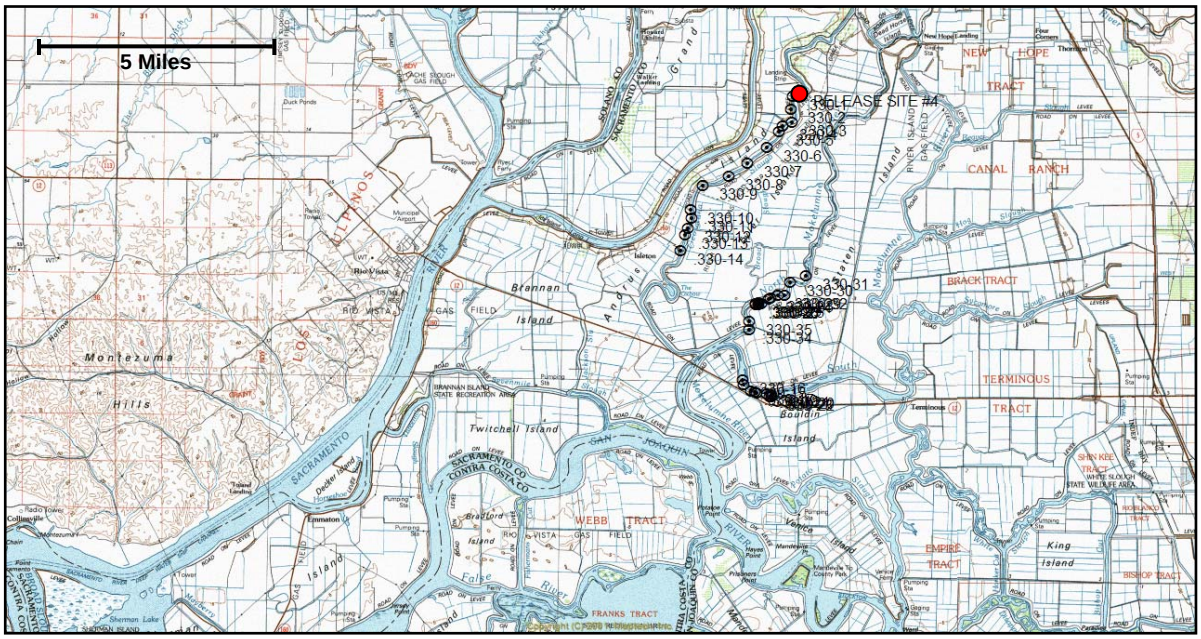
Release 4 – Fish 49.310 MHz (INTERNAL) – February 12, 2002 at 9:35

.310-1: 2/12/02 at 10:02
.310-2: 2/12/02 at 10:33
.310-3: 2/12/02 at 11:11
.310-4: 2/12/02 at 12:00
.310-5: 2/12/02 at 12:47
.310-6: 2/12/02 at 13:47
.310-7: 2/12/02 at 14:42
.310-8: 2/12/02 at 15:38
.310-9: 2/12/02 at 16:26
.310-10: 2/12/02 at 17:12
.310-11: 2/12/02 at 17:35
.310-12: 2/13/02 at 8:57
.310-13: 2/13/02 at 9:39
.310-14: 2/13/02 at 13:20
.310-15: 2/13/02 at 15:10
.310-16: 2/13/02 at 16:56
.310-17: 2/14/02 at 8:10
.310-18: 2/14/02 at 10:20
.310-19: 2/14/02 at 10:50
.310-20: 2/14/02 at 11:29
.310-21: 2/14/02 at 13:32
.310-22: 2/14/02 at 14:38
.310-23: 2/14/02 at 15:37
.310-24: 2/14/02 at 16:02
.310-25: 2/14/02 at 16:34
.310-26: 2/14/02 at 17:03
.310-27: 2/14/02 at 17:34
.310-99: 2/15/02 at 13:47



Release 4 – Fish 49.320 MHz (INTERNAL) – February 12, 2002 at 9:35

.320-1: 2/12/02 at 10:02	.320-9: 2/12/02 at 15:16	.320-17: 2/13/02 at 15:22
.320-2: 2/12/02 at 10:30	.320-10: 2/12/02 at 16:11	.320-18: 2/13/02 at 17:05
.320-3: 2/12/02 at 10:47	.320-11: 2/12/02 at 16:54	.320-19: 2/14/02 at 14:47
.320-4: 2/12/02 at 11:23	.320-12: 2/12/02 at 17:25	.320-20: 2/14/02 at 15:24
.320-5: 2/12/02 at 11:56	.320-13: 2/12/02 at 17:48	.320-21: 2/14/02 at 16:17
.320-6: 2/12/02 at 12:38	.320-14: 2/13/02 at 8:39	.320-22: 2/14/02 at 17:18
.320-7: 2/12/02 at 13:32	.320-15: 2/13/02 at 9:57	.320-23: 2/15/02 at 14:06
.320-8: 2/12/02 at 14:25	.320-16: 2/13/02 at 13:28	.320-99: 2/16/02 at 15:54

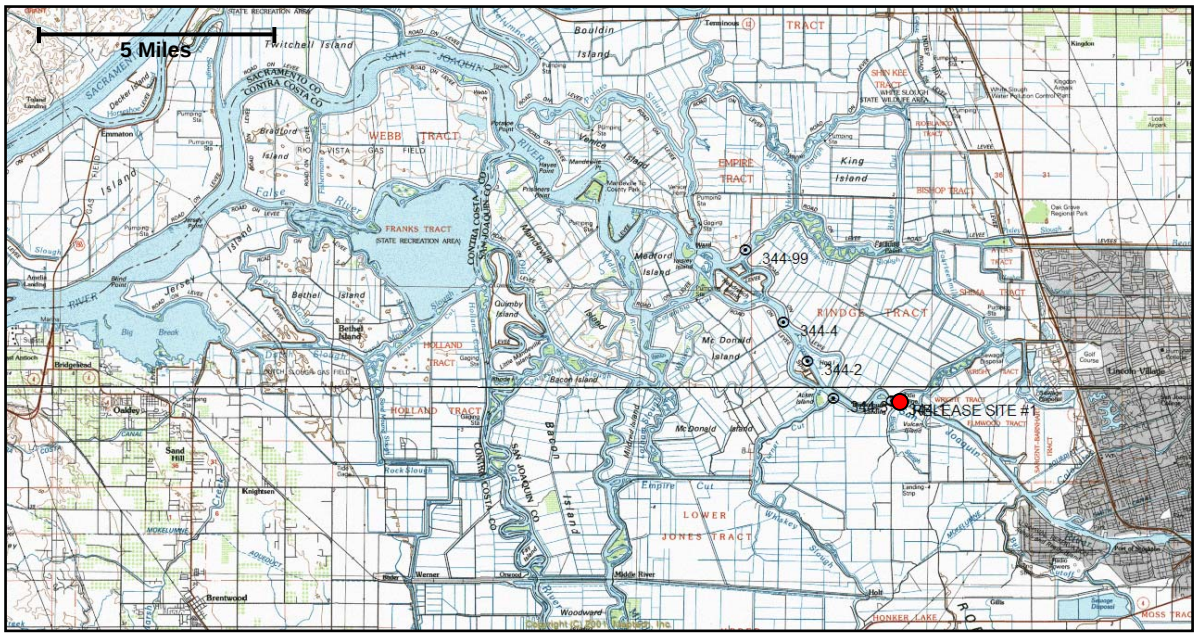


Release 4 – Fish 49.330 MHz (INTERNAL) – February 12, 2002 at 9:35

.330-1: 2/12/02 at 9:50	.330-10: 2/12/02 at 16:30	.330-19: 2/13/02 at 11:46	.330-28: 2/14/02 at 12:59
.330-2: 2/12/02 at 10:16	.330-11: 2/12/02 at 16:49	.330-20: 2/13/02 at 13:16	.330-29: 2/14/02 at 15:10
.330-3: 2/12/02 at 10:56	.330-12: 2/12/02 at 17:20	.330-21: 2/13/02 at 14:58	.330-30: 2/14/02 at 16:25
.330-4: 2/12/02 at 11:11	.330-13: 2/12/02 at 17:52	.330-22: 2/13/02 at 16:09	.330-31: 2/14/02 at 16:50
.330-5: 2/12/02 at 11:47	.330-14: 2/12/02 at 18:27	.330-23: 2/13/02 at 16:47	.330-32: 2/15/02 at 9:13
.330-6: 2/12/02 at 12:36	.330-15: 2/13/02 at 8:29	.330-24: 2/14/02 at 9:38	.330-33: 2/15/02 at 9:37
.330-7: 2/12/02 at 13:30	.330-16: 2/13/02 at 9:24	.330-25: 2/14/02 at 10:04	.330-34: 2/15/02 at 12:52
.330-8: 2/12/02 at 14:22	.330-17: 2/13/02 at 10:30	.330-26: 2/14/02 at 11:35	.330-35: 2/15/02 at 15:56
.330-9: 2/12/02 at 15:14	.330-18: 2/13/02 at 10:55	.330-27: 2/14/02 at 11:56	.330-99: 2/15/02 at 17:47

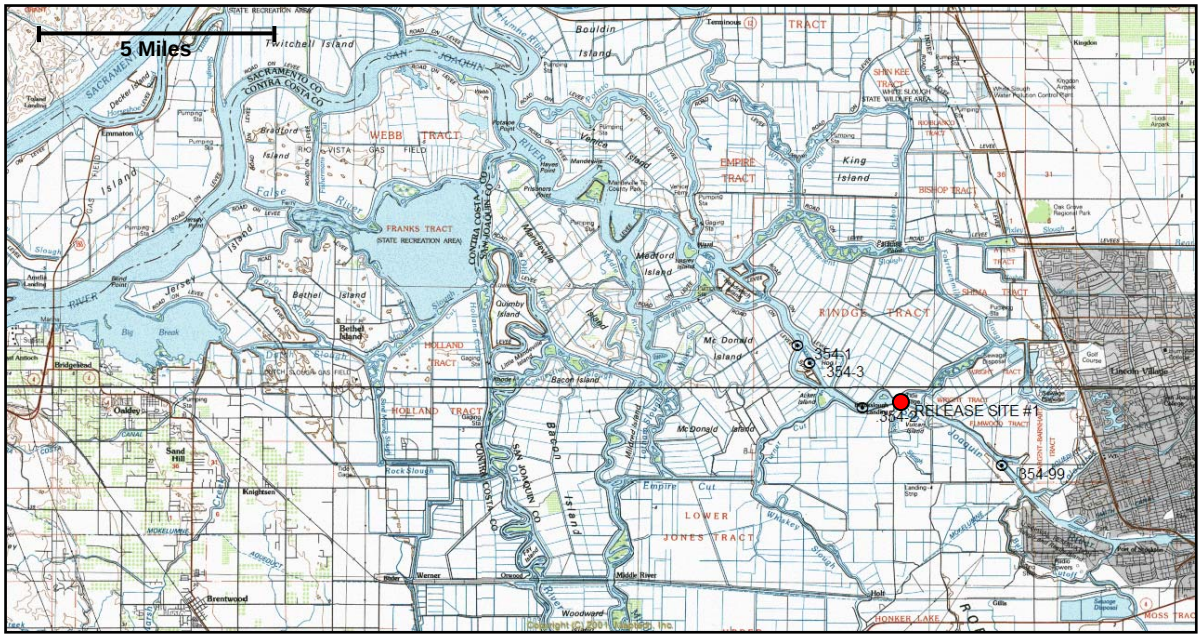
APPENDIX J

CENTRAL DELTA 2002 TELEMETRY LOCATION MAPS



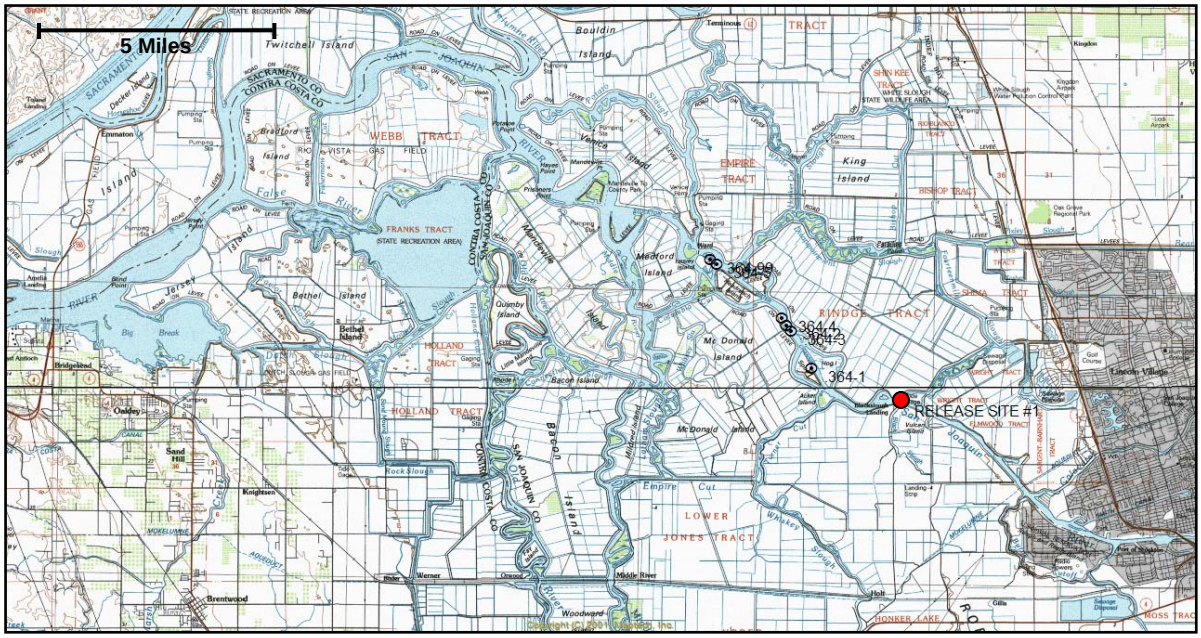
Release 1 – Fish 49.344 MHz – April 2, 2002 at 9:18

.344-1: 4/2/02 at 9:49
.344-2: 4/2/02 at 11:59
.344-3: 4/3/02 at 12:20
.344-4: 4/3/02 at 14:29
.344-99: 4/4/02 at 11:02



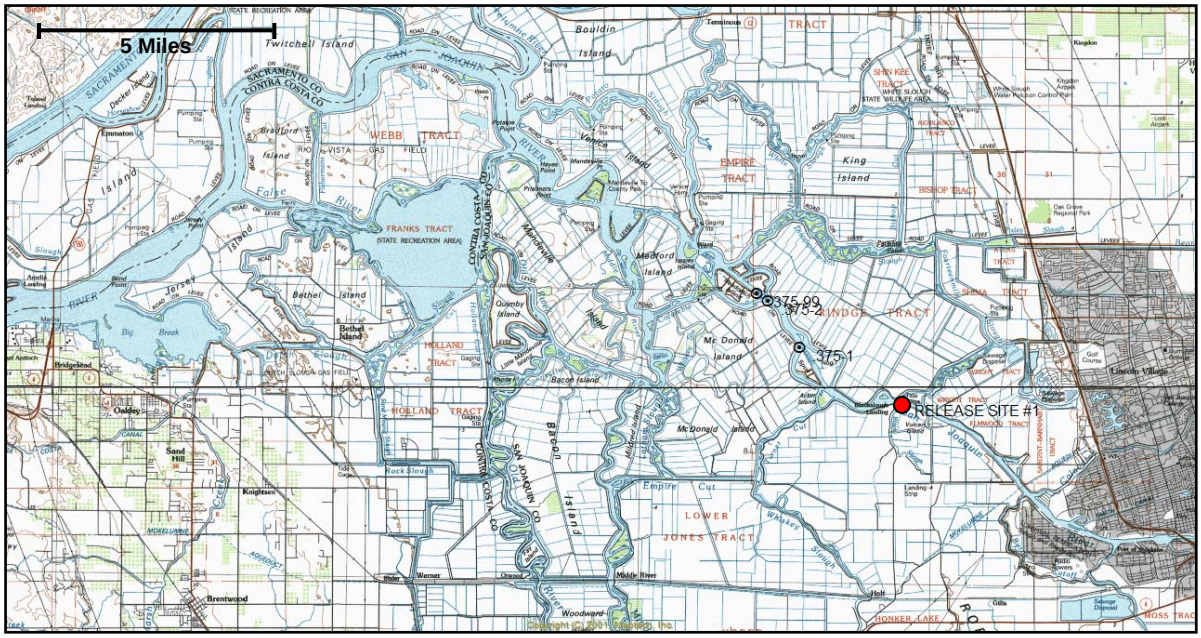
Release 1 – Fish 49.354 MHz – April 2, 2002 at 9:18

.354-1: 4/2/02 at 11:55
.354-2: 4/3/02 at 7:50
.354-3: 4/3/02 at 12:06
.354-99: 4/4/02 at 9:44



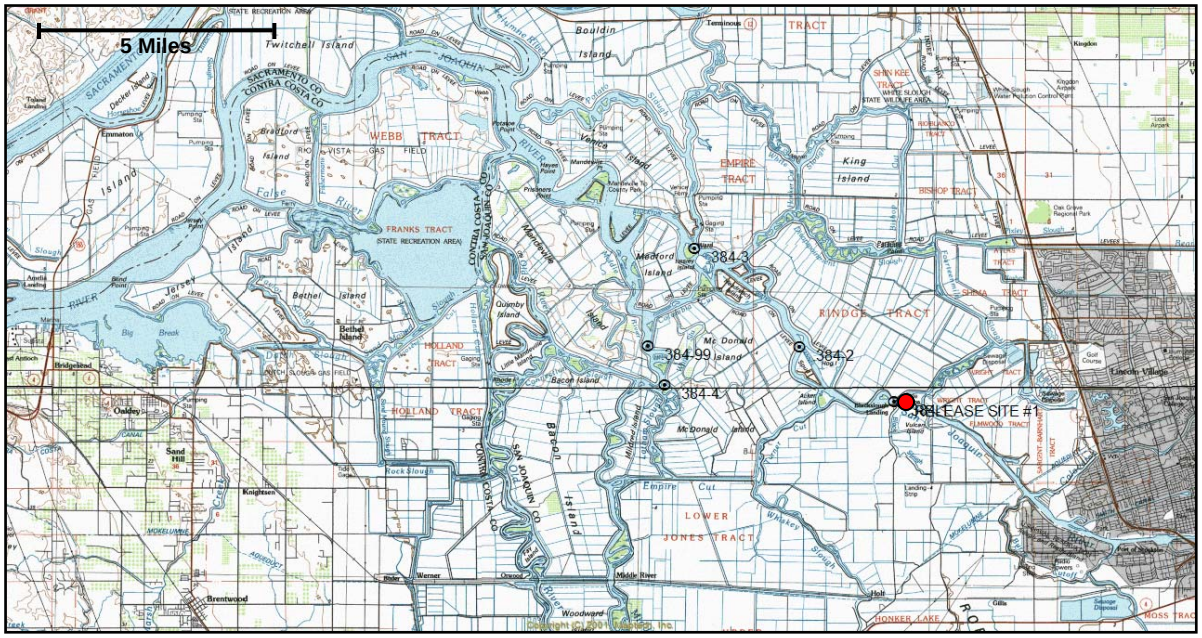
Release 1 – Fish 49.364 MHz – April 2, 2002 at 9:18

.364-1: 4/2/02 at 12:11
.364-2: 4/2/02 at 13:50
.364-3: 4/3/02 at 9:00
.364-4: 4/3/02 at 12:08
.364-5: 4/3/02 at 14:43
.364-99: 4/4/02 at 11:32



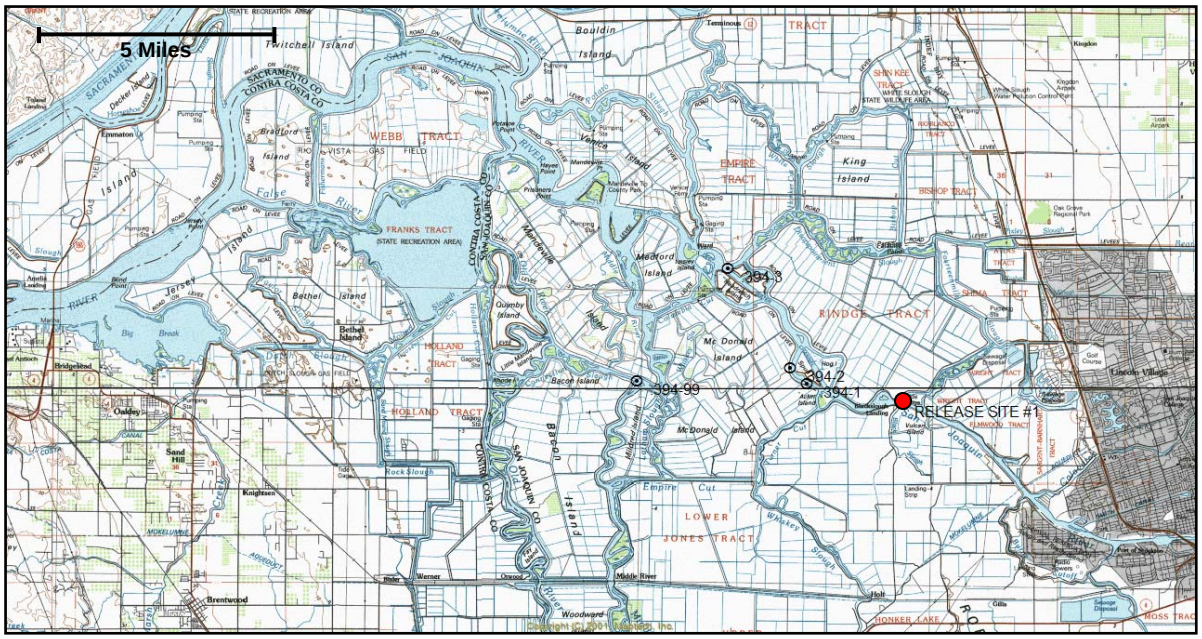
Release 1 – Fish 49.375 MHz – April 2, 2002 at 9:18

.375-1: 4/2/02 at 12:05
.375-2: 4/2/02 at 14:05
.375-99: 4/3/02 at 8:32



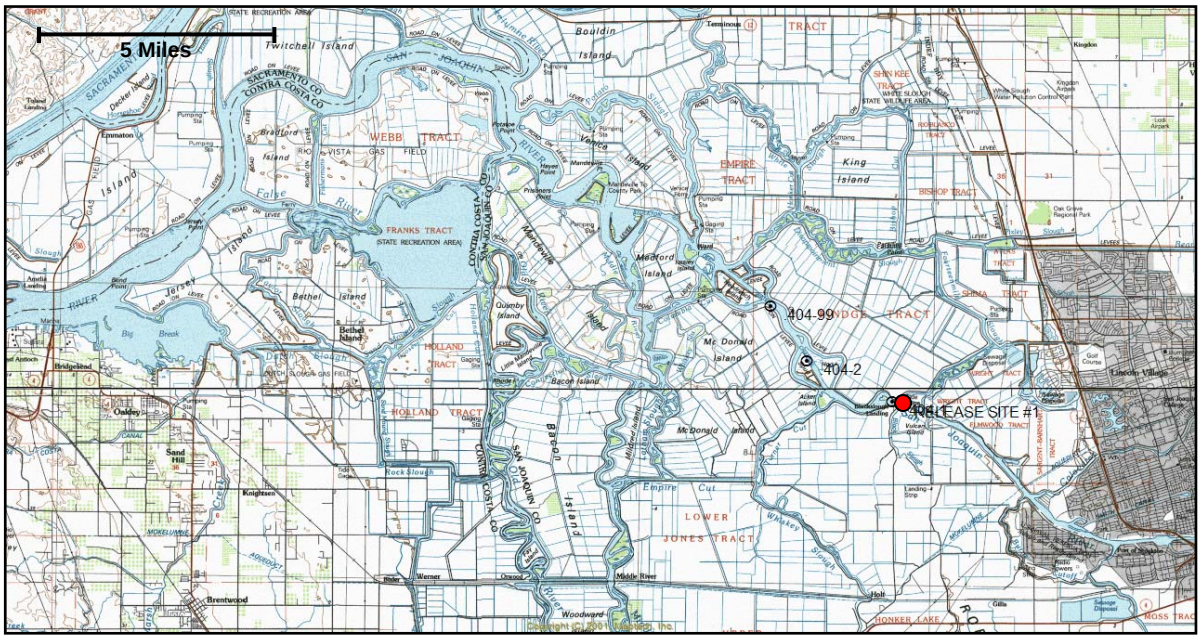
Release 1 – Fish 49.384 MHz – April 2, 2002 at 9:18

.384-1: 4/2/02 at 9:50
.384-2: 4/2/02 at 11:48
.384-3: 4/2/02 at 14:09
.384-4: 4/4/02 at 10:58
.384-99: 4/4/02 at 14:30

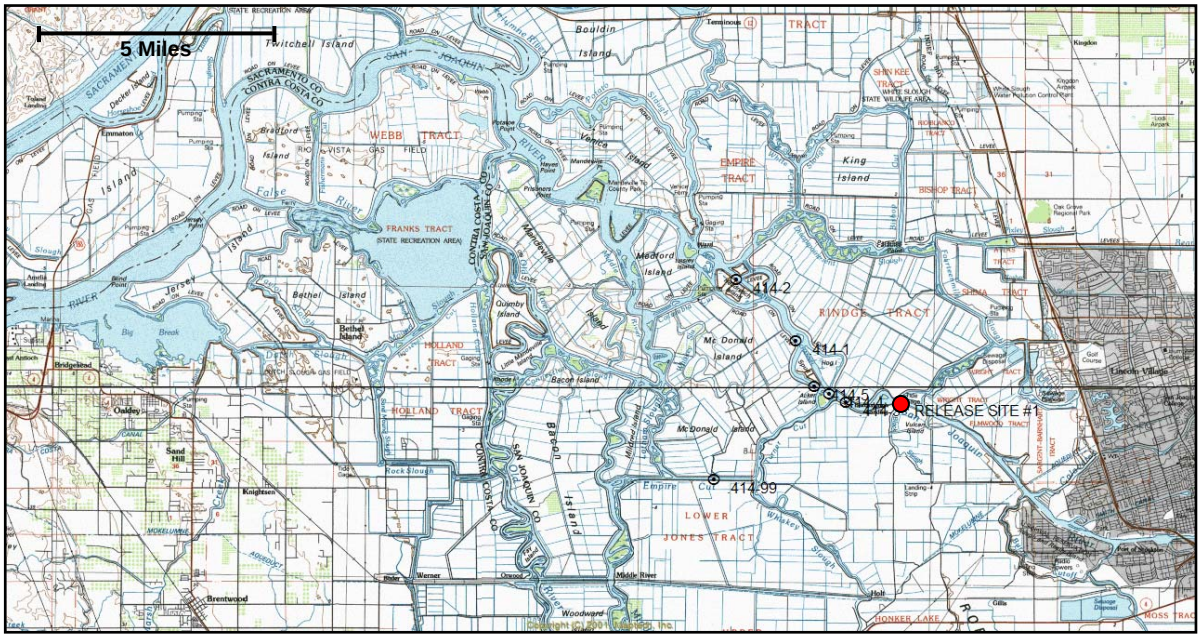


Release 1 – Fish 49.394 MHz – April 2, 2002 at 9:18

.394-1: 4/2/02 at 12:30
.394-2: 4/2/02 at 13:44
.394-3: 4/3/02 at 8:50
.394-99: 4/4/02 at 11:25

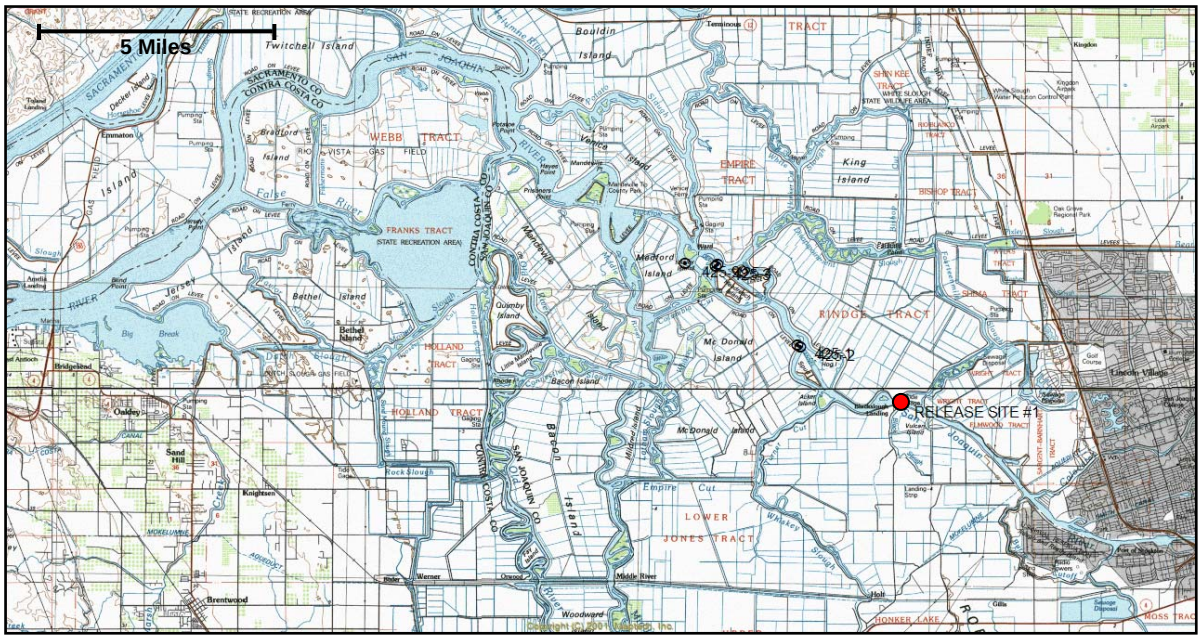


Release 1 – Fish 49.404 MHz – April 2, 2002 at 9:18
.404-1: 4/2/02 at 9:52
.404-2: 4/2/02 at 12:25
.404-99: 4/2/02 at 13:58



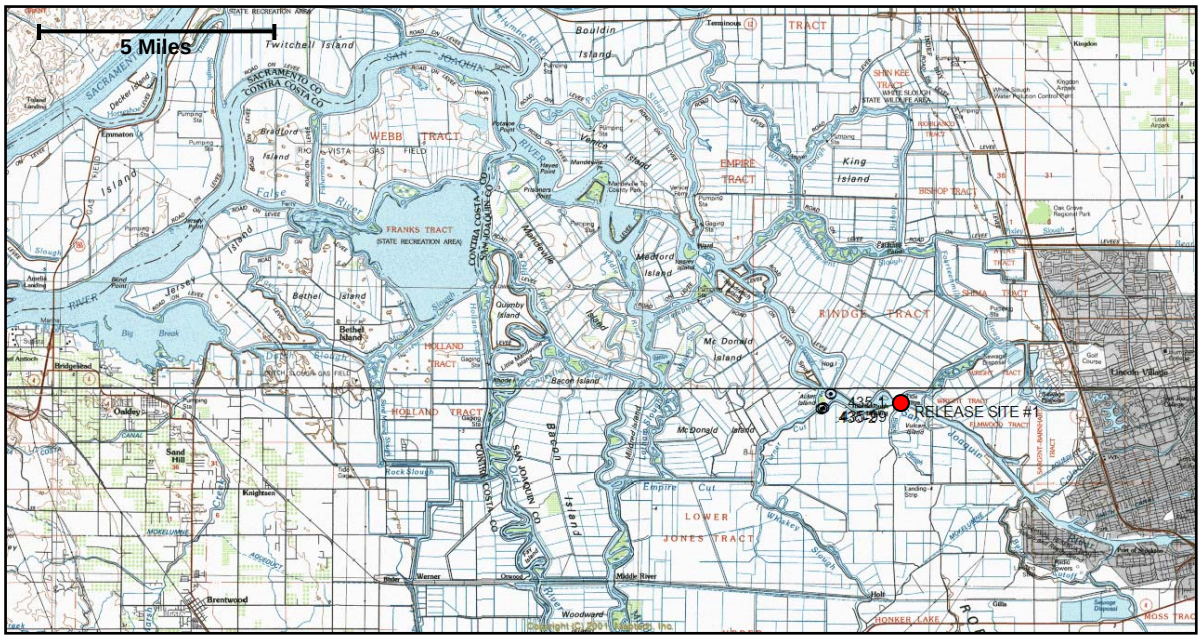
Release 1 – Fish 49.414 MHz – April 2, 2002 at 9:18

.414-1: 4/2/02 at 11:55	.414-4: 4/3/02 at 13:48
.414-2: 4/2/02 at 14:01	.414-5: 4/3/02 at 14:24
.414-3: 4/3/02 at 7:47	.414-99: 4/4/02 at 13:50



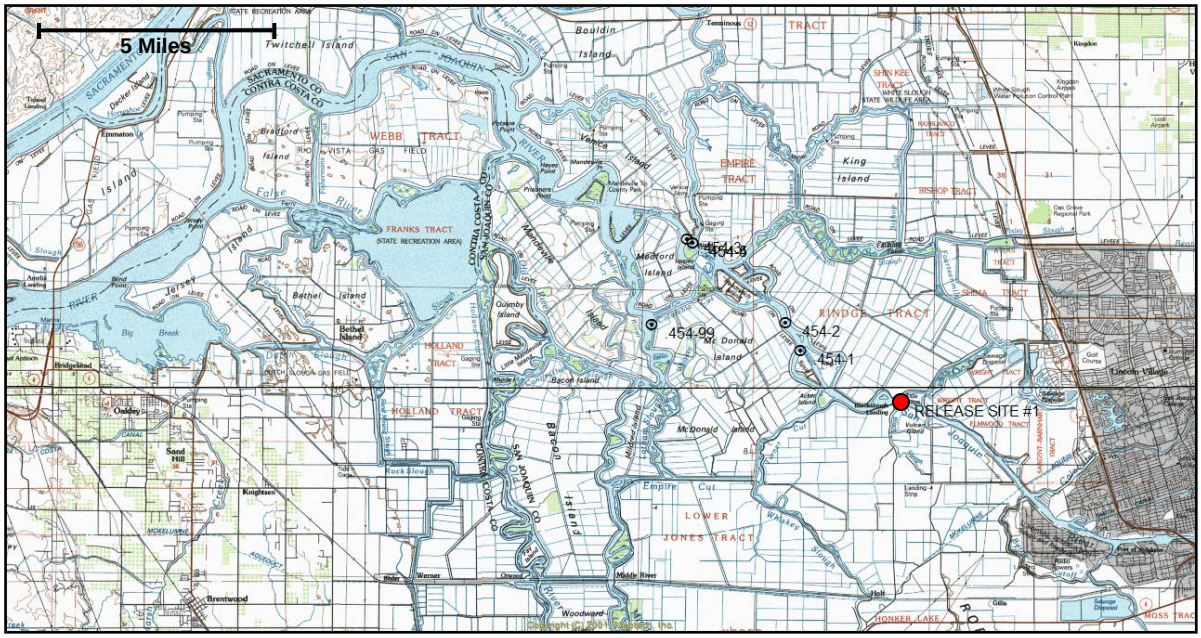
Release 1 – Fish 49.425 MHz – April 2, 2002 at 9:18

.425-1: 4/2/02 at 11:50
.425-2: 4/2/02 at 11:52
.425-3: 4/2/02 at 14:05
.425-4: 4/2/02 at 14:10
.425-99: 4/3/02 at 8:06



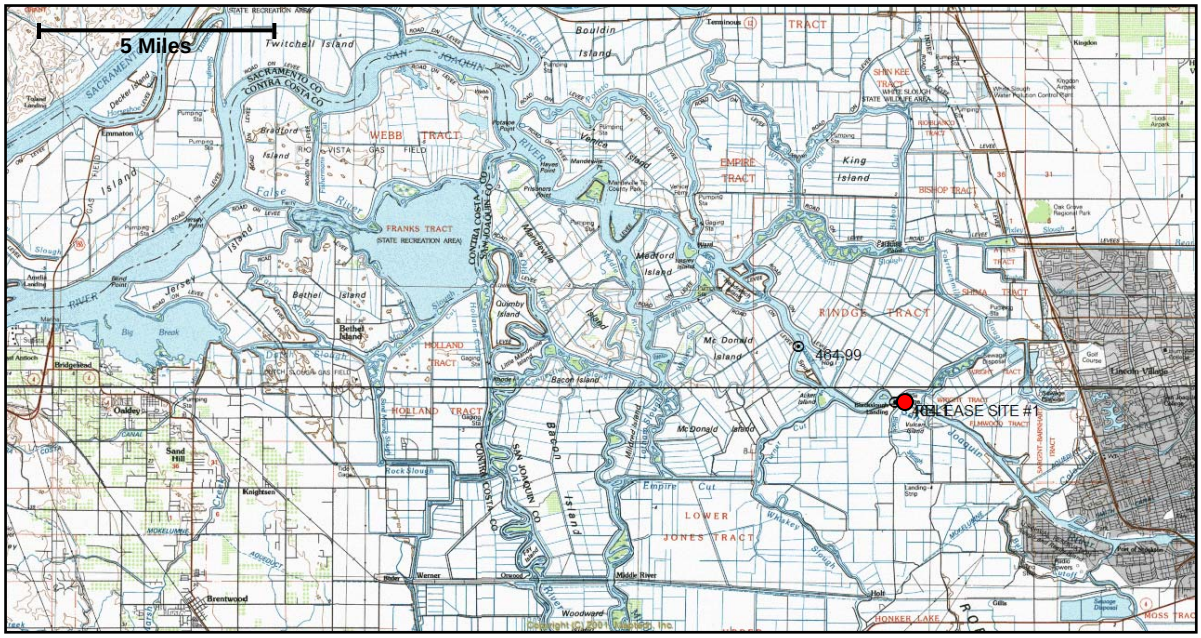
Release 1 – Fish 49.435 MHz – April 2, 2002 at 9:18

.435-1: 4/3/02 at 7:40
.435-2: 4/3/02 at 12:24
.435-99: 4/3/02 at 13:43



Release 1 – Fish 49.454 MHz – April 2, 2002 at 9:18

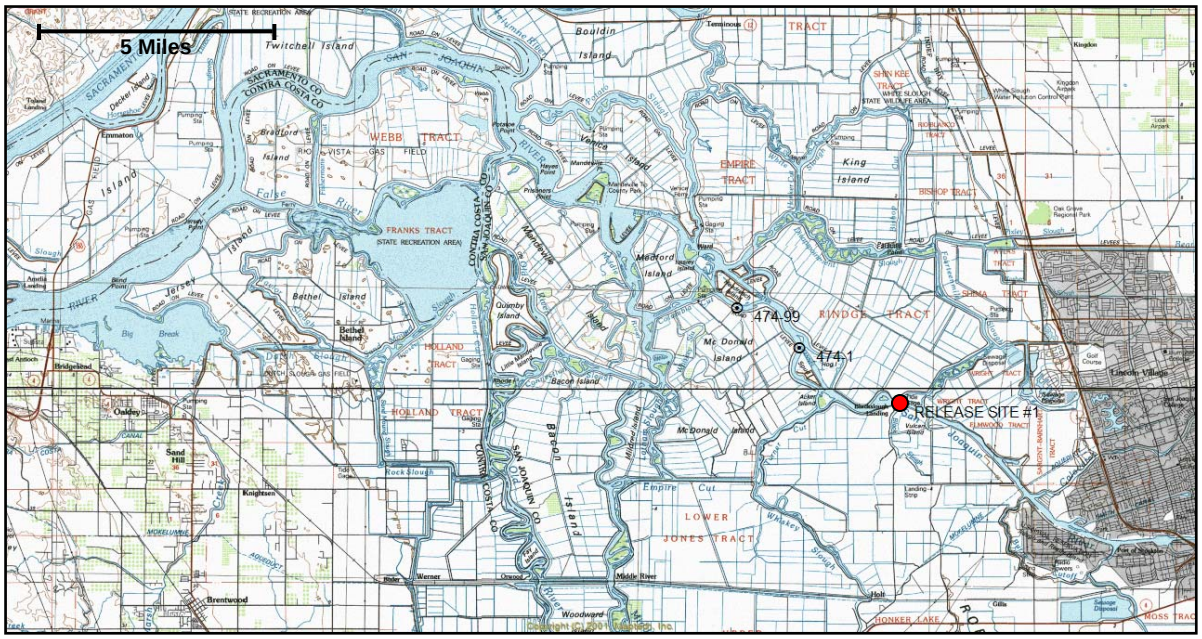
.454-1: 4/2/02 at 12:03	.454-4: 4/3/02 at 11:50
.454-2: 4/2/02 at 13:55	.454-5: 4/3/02 at 14:50
.454-3: 4/3/02 at 7:31	.454-99: 4/4/02 at 10:49



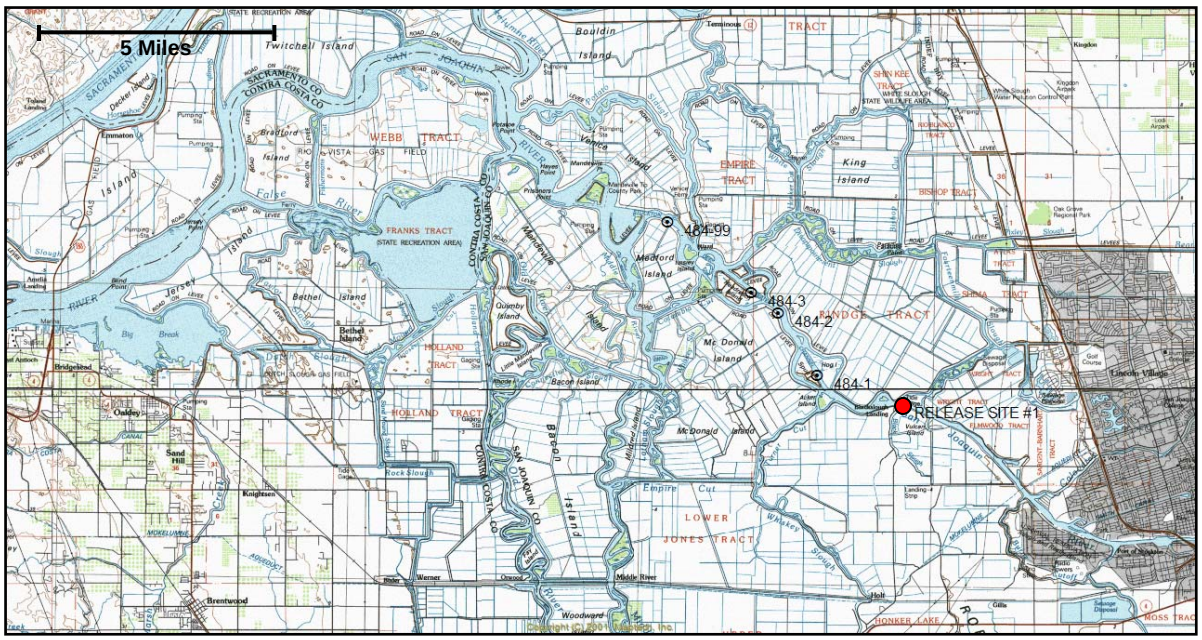
Release 1 – Fish 49.464 MHz – April 2, 2002 at 9:18

.464-1: 4/2/02 at 9:47

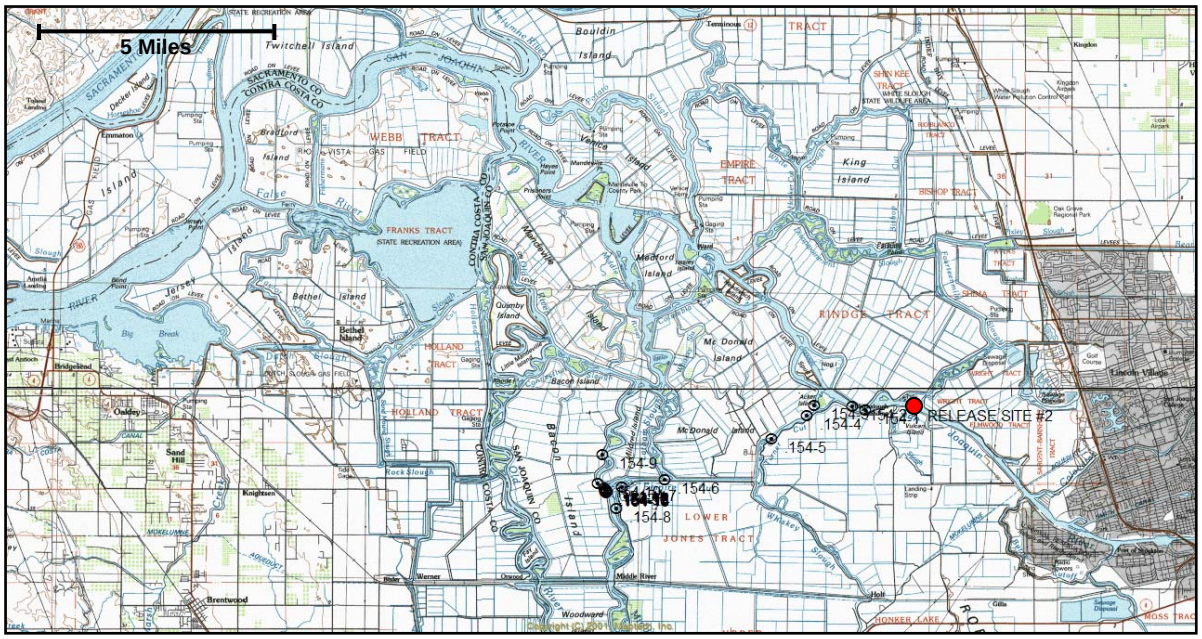
.464-99: 4/2/02 at 11:58



Release 1 – Fish 49.474 MHz – April 2, 2002 at 9:18
.474-1: 4/2/02 at 11:53
.474-99: 4/3/02 at 8:23

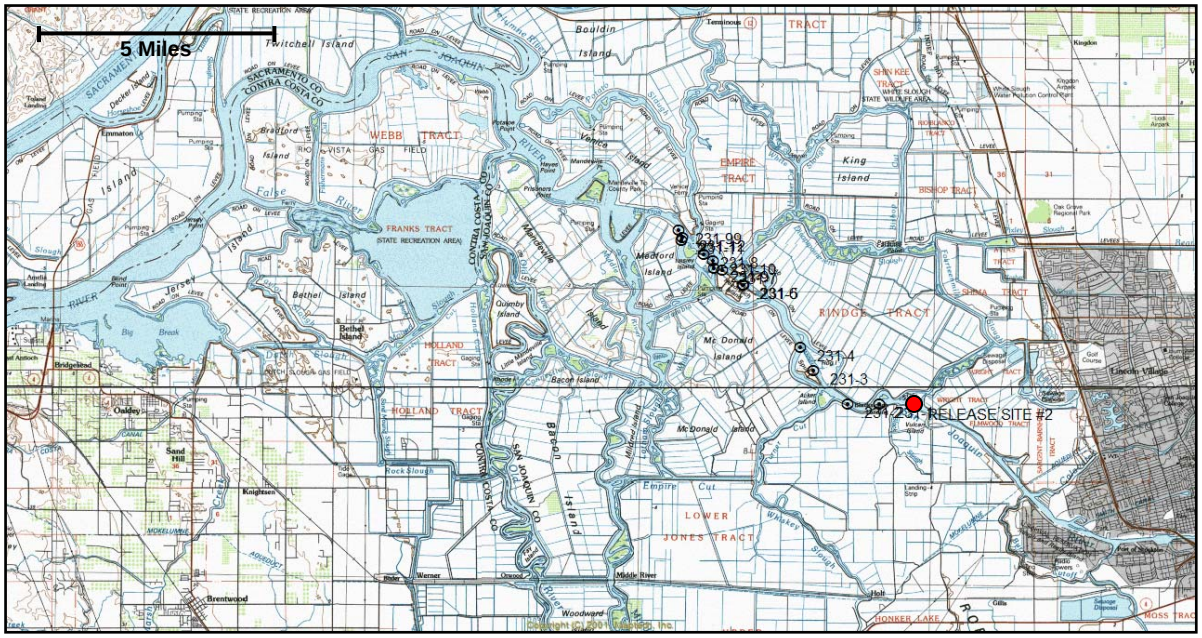


Release 1 – Fish 49.484 MHz – April 2, 2002 at 9:18
.484-1: 4/2/02 at 12:04
.484-2: 4/3/02 at 9:00
.484-3: 4/3/02 at 11:58
.484-99: 4/4/02 at 8:45



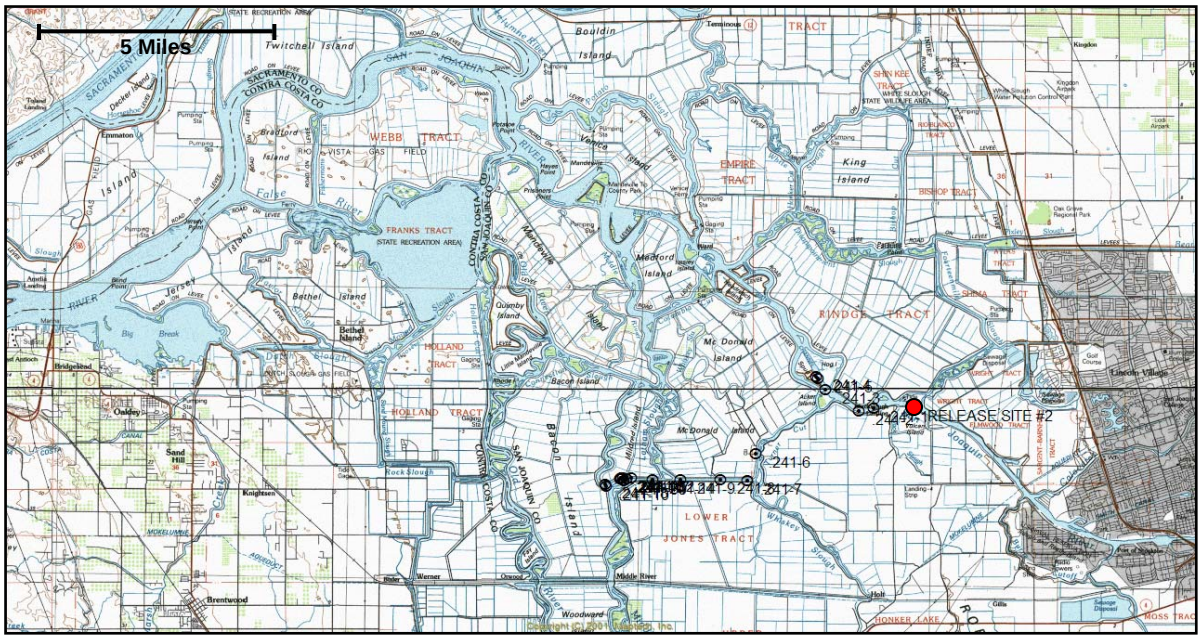
Release 2 – Fish 49.154 MHz – April 10, 2002 at 7:38

.154-1: 4/10/02 at 8:55
.154-2: 4/10/02 at 9:20
.154-3: 4/10/02 at 10:50
.154-4: 4/10/02 at 11:25
.154-5: 4/10/02 at 12:25
.154-6: 4/10/02 at 16:09
.154-7: 4/10/02 at 16:45
.154-8: 4/10/02 at 17:12
.154-9: 4/11/02 at 9:55
.154-10: 4/11/02 at 13:16
.154-11: 4/11/02 at 14:36
.154-12: 4/11/02 at 16:54
.154-13: 4/11/02 at 17:35
.154-14: 4/12/02 at 8:20
.154-15: 4/12/02 at 10:30
.154-16: 4/12/02 at 12:09
.154-17: 4/12/02 at 14:24
.154-18: 4/12/02 at 16:24
.154-99: 4/12/02 at 17:17



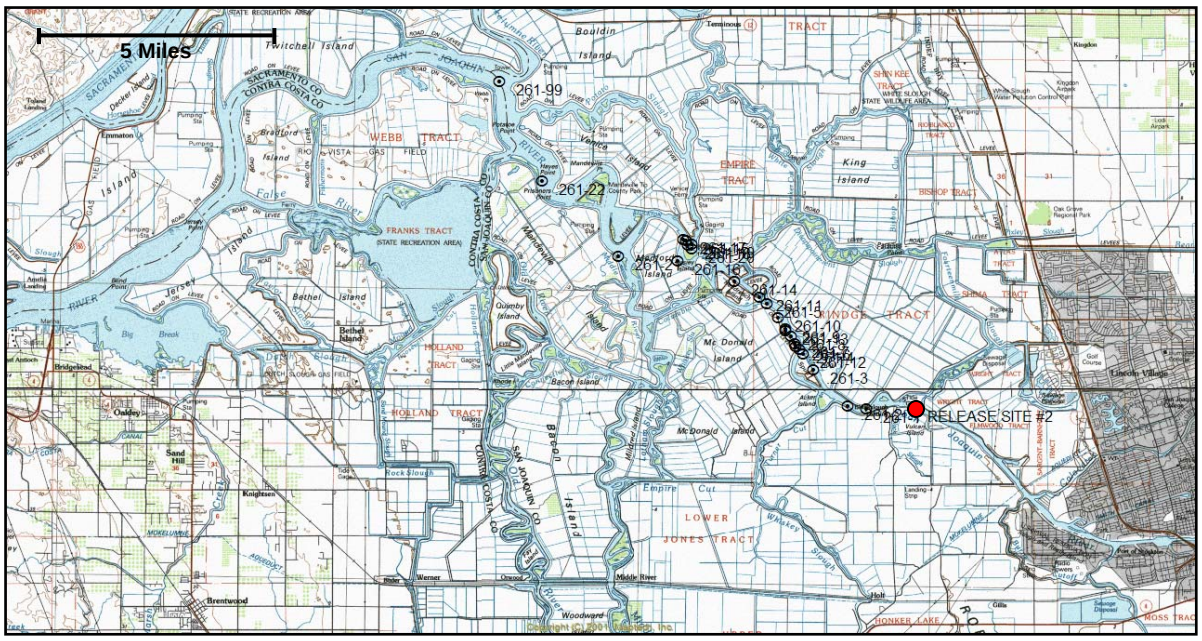
Release 2 – Fish 49.231 MHz – April 10, 2002 at 7:38

.231-1: 4/10/02 at 8:18
.231-2: 4/10/02 at 8:47
.231-3: 4/10/02 at 9:41
.231-4: 4/10/02 at 10:15
.231-5: 4/10/02 at 12:46
.231-6: 4/10/02 at 15:06
.231-7: 4/10/02 at 16:48
.231-8: 4/10/02 at 18:09
.231-9: 4/11/02 at 10:34
.231-10: 4/11/02 at 11:35
.231-11: 4/12/02 at 11:55
.231-12: 4/12/02 at 15:15
.231-99: 4/12/02 at 17:33



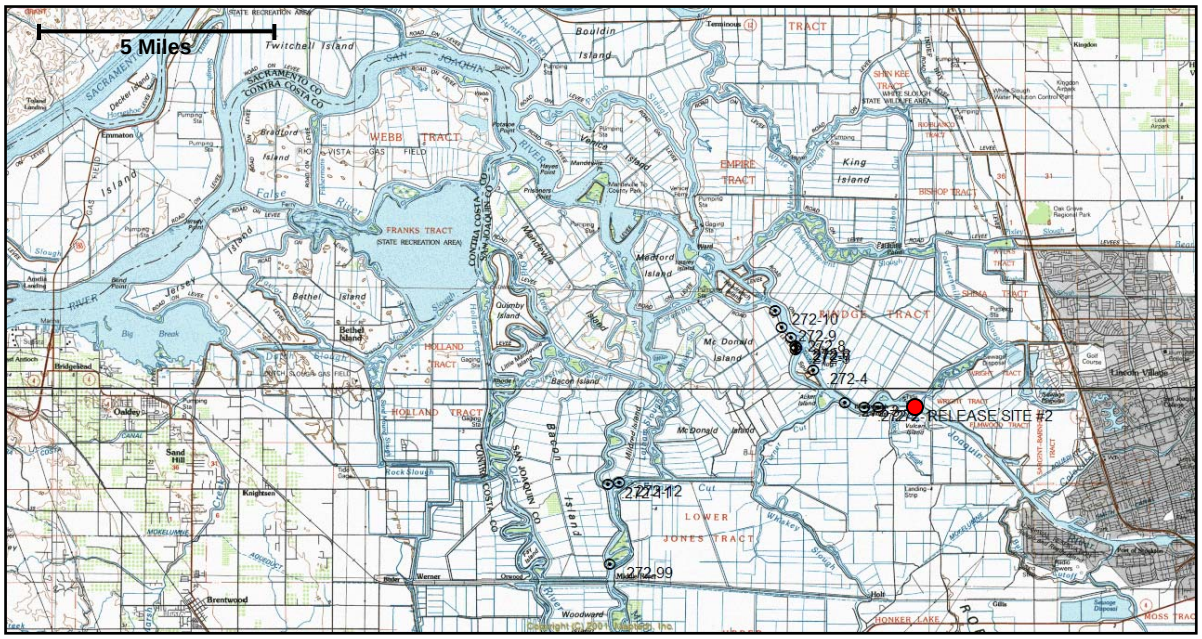
Release 2 – Fish 49.241 MHz – April 10, 2002 at 7:38

.241-1: 4/10/02 at 8:31
.241-2: 4/10/02 at 8:52
.241-3: 4/10/02 at 9:35
.241-4: 4/10/02 at 9:57
.241-5: 4/10/02 at 12:26
.241-6: 4/10/02 at 15:55
.241-7: 4/10/02 at 16:28
.241-8: 4/10/02 at 17:00
.241-9: 4/10/02 at 17:47
.241-10: 4/11/02 at 9:18
.241-11: 4/11/02 at 14:43
.241-12: 4/11/02 at 16:46
.241-13: 4/11/02 at 17:40
.241-14: 4/12/02 at 7:45
.241-15: 4/12/02 at 10:43
.241-16: 4/12/02 at 12:00
.241-17: 4/12/02 at 14:31
.241-18: 4/12/02 at 16:24
.241-99: 4/12/02 at 17:24



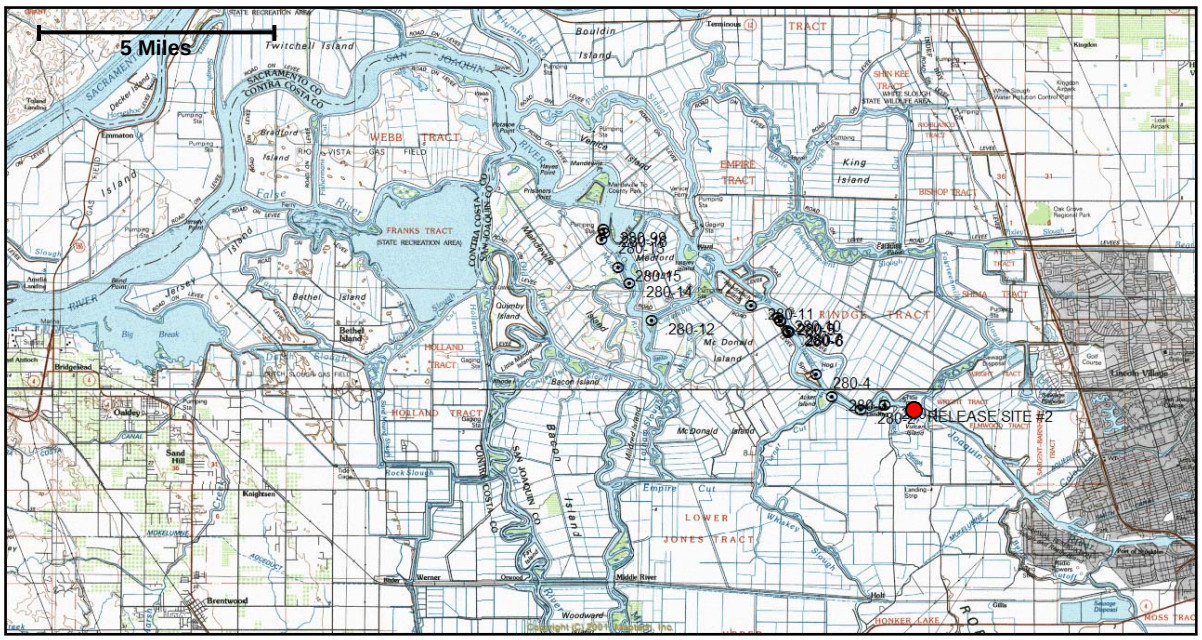
Release 2 – Fish 49.261 MHz – April 10, 2002 at 7:38

.261-1: 4/10/02 at 8:22
.261-2: 4/10/02 at 8:47
.261-3: 4/10/02 at 9:41
.261-4: 4/10/02 at 10:18
.261-5: 4/10/02 at 12:39
.261-6: 4/10/02 at 15:25
.261-7: 4/10/02 at 16:08
.261-8: 4/10/02 at 17:06
.261-9: 4/10/02 at 17:55
.261-10: 4/10/02 at 18:20
.261-11: 4/10/02 at 18:55
.261-12: 4/11/02 at 9:30
.261-13: 4/11/02 at 10:05
.261-14: 4/11/02 at 11:40
.261-15: 4/11/02 at 13:09
.261-16: 4/11/02 at 14:48
.261-17: 4/11/02 at 15:32
.261-18: 4/11/02 at 15:51
.261-19: 4/11/02 at 16:32
.261-20: 4/11/02 at 17:50
.261-21: 4/12/02 at 7:27
.261-22: 4/12/02 at 10:52
.261-99: 4/12/02 at 16:08



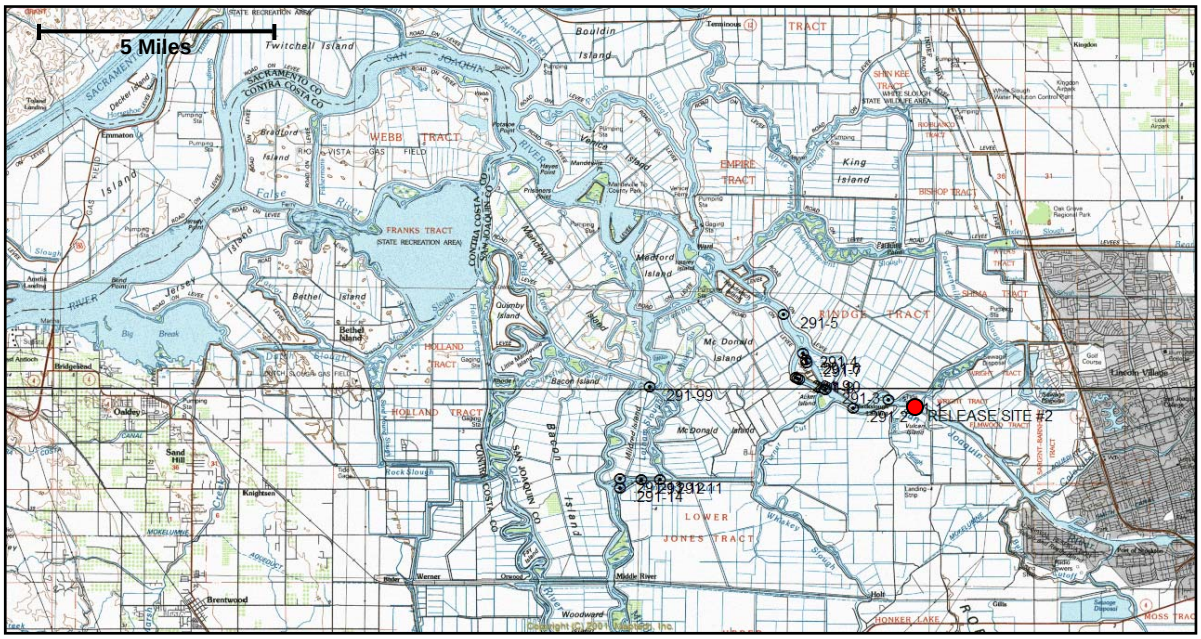
Release 2 – Fish 49.271 MHz – April 10, 2002 at 7:38

.272-1: 4/10/02 at 8:28
.272-2: 4/10/02 at 8:56
.272-3: 4/10/02 at 9:26
.272-4: 4/10/02 at 10:39
.272-5: 4/10/02 at 15:29
.272-6: 4/10/02 at 16:06
.272-7: 4/10/02 at 17:07
.272-8: 4/10/02 at 17:52
.272-9: 4/10/02 at 18:22
.272-10: 4/10/02 at 18:51
.272-11: 4/11/02 at 12:50
.272-12: 4/11/02 at 14:41
.272-99: 4/11/02 at 17:23



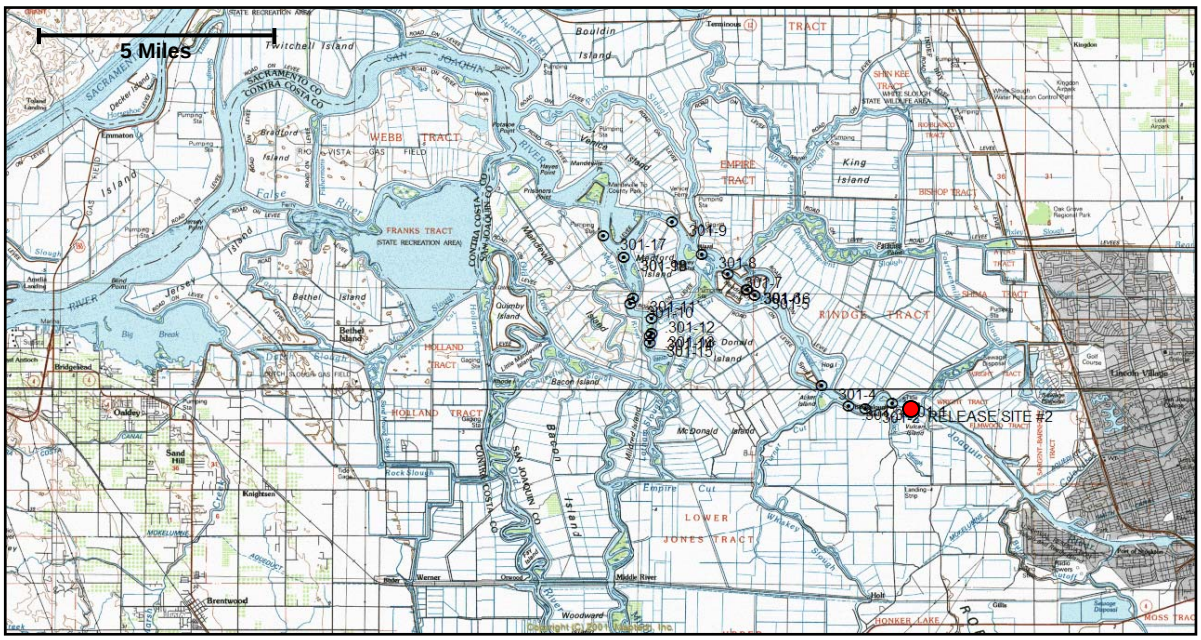
Release 2 – Fish 49.280 MHz – April 10, 2002 at 7:38

.280-1: 4/10/02 at 8:14
.280-2: 4/10/02 at 8:51
.280-3: 4/10/02 at 9:32
.280-4: 4/10/02 at 10:45
.280-5: 4/10/02 at 12:56
.280-6: 4/10/02 at 15:19
.280-7: 4/10/02 at 16:10
.280-8: 4/10/02 at 17:05
.280-9: 4/10/02 at 17:58
.280-10: 4/10/02 at 18:21
.280-11: 4/10/02 at 18:55
.280-12: 4/11/02 at 7:50
.280-13: 4/12/02 at 7:22
.280-14: 4/12/02 at 11:37
.280-15: 4/12/02 at 15:36
.280-16: 4/12/02 at 16:42
.280-99: 4/12/02 at 17:25



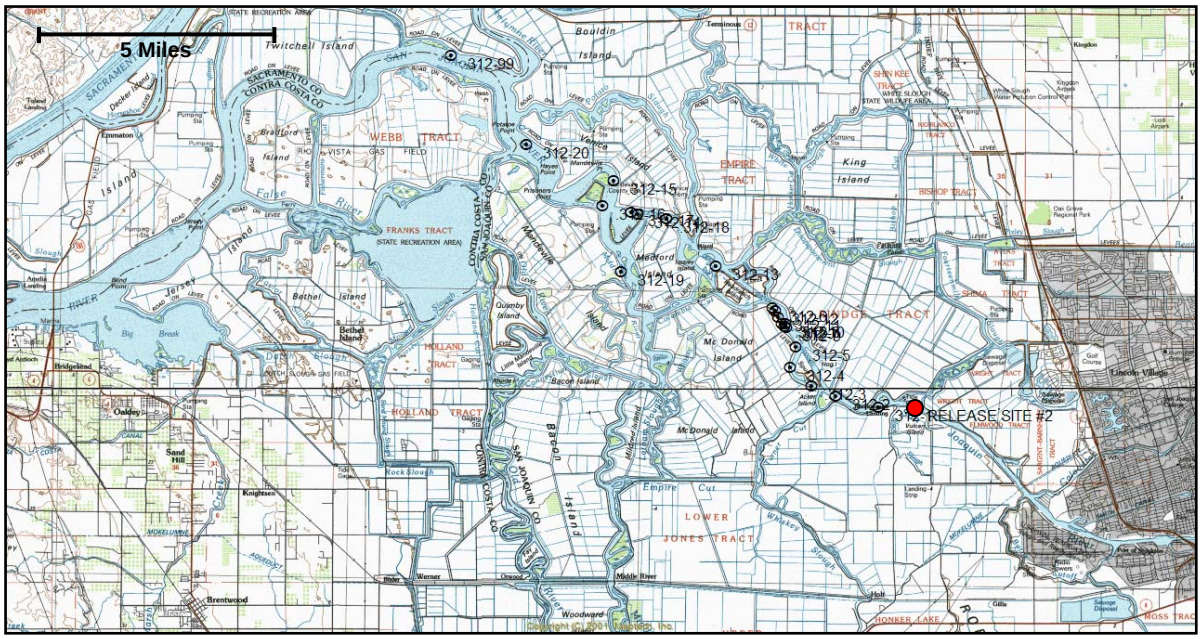
Release 2 – Fish 49.291 MHz – April 10, 2002 at 7:38

.291-1: 4/10/2002 at 8:10	.291-6: 4/10/02 at 15:36	.291-11: 4/11/02 at 8:30
.291-2: 4/10/02 at 8:48	.291-7: 4/10/02 at 16:00	.291-12: 4/11/02 at 9:11
.291-3: 4/10/02 at 9:35	.291-8: 4/10/02 at 17:42	.291-13: 4/11/02 at 14:45
.291-4: 4/10/02 at 10:25	.291-9: 4/10/02 at 18:28	.291-14: 4/12/02 at 7:51
.291-5: 4/10/02 at 12:36	.291-10: 4/10/02 at 18:44	.291-99: 4/12/02 at 15:56



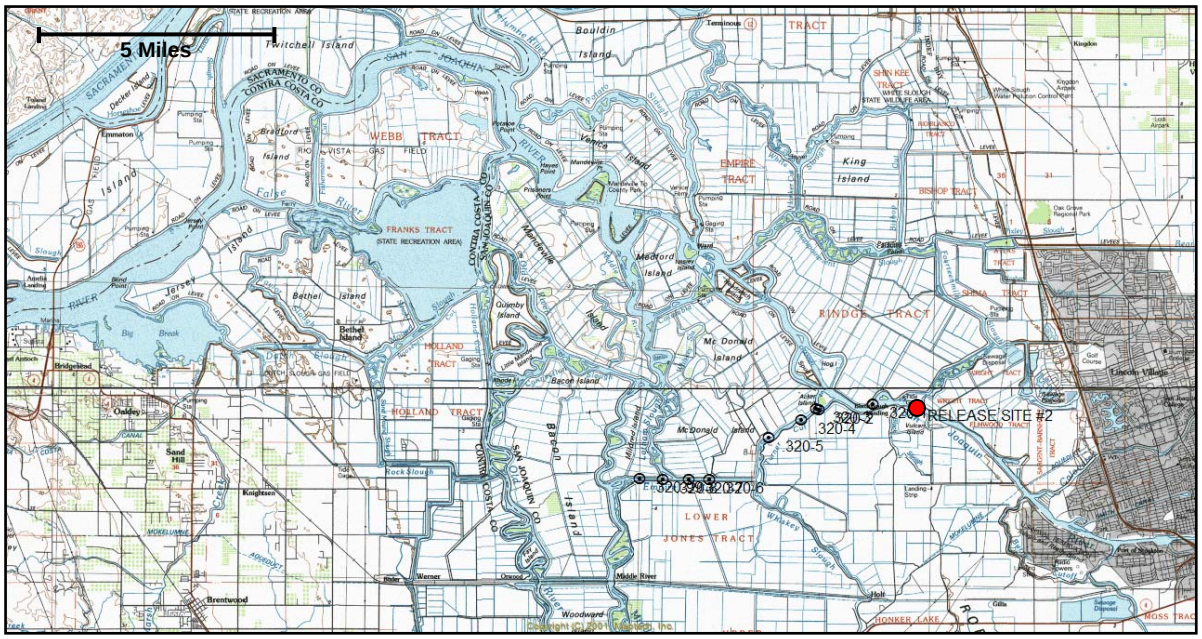
Release 2 – Fish 49.301 MHz – April 10, 2002 at 7:38

.301-1: 4/10/02 at 8:13	.301-8: 4/10/02 at 18:11	.301-14: 4/11/02 at 16:58
.301-2: 4/10/02 at 8:54	.301-9: 4/10/02 at 19:17	.301-15: 4/11/02 at 17:53
.301-3: 4/10/02 at 9:24	.301-10: 4/11/02 at 8:16	.301-16: 4/12/02 at 8:41
.301-4: 4/10/02 at 10:01	.301-11: 4/11/02 at 10:20	.301-17: 4/12/02 at 15:25
.301-5: 4/10/02 at 12:43	.301-12: 4/11/02 at 15:12	.301-18: 4/12/02 at 16:38
.301-6: 4/10/02 at 15:09	.301-13: 4/11/02 at 16:26	.301-99: 4/12/02 at 17:12
.301-7: 4/10/02 at 16:45		



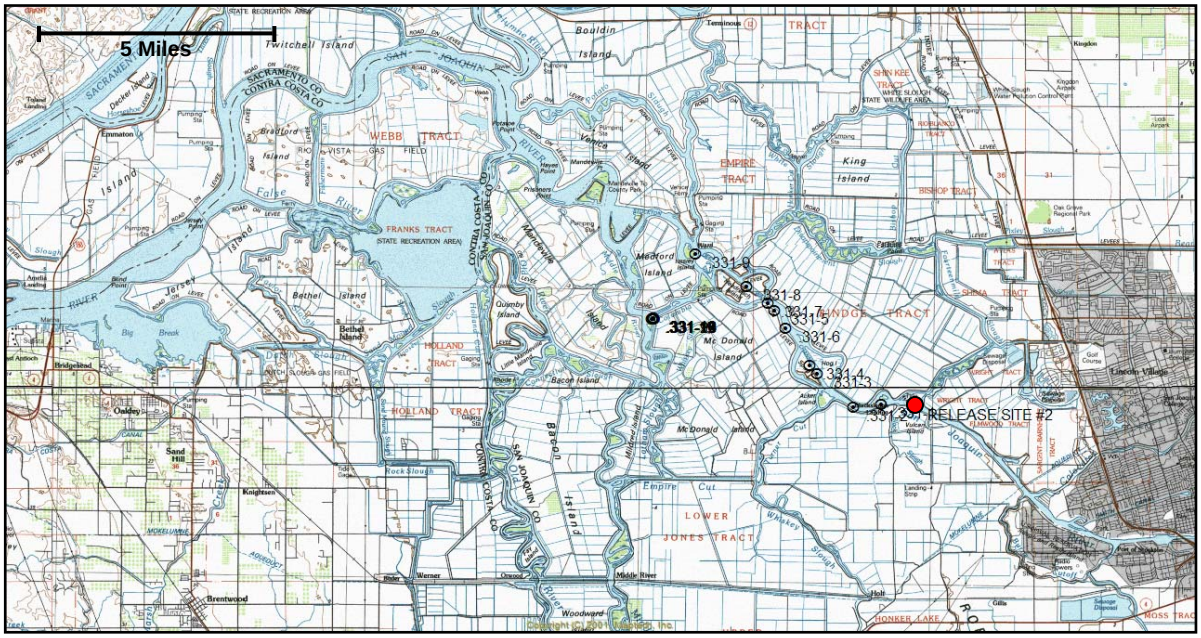
Release 2 – Fish 49.312 MHz – April 10, 2002 at 7:38

.312-1: 4/10/02 at 8:28
.312-2: 4/10/02 at 9:31
.312-3: 4/10/02 at 10:10
.312-4: 4/10/02 at 10:53
.312-5: 4/10/02 at 11:25
.312-6: 4/10/02 at 12:37
.312-7: 4/10/02 at 15:15
.312-8: 4/10/02 at 16:15
.312-9: 4/10/02 at 17:04
.312-10: 4/10/02 at 17:58
.312-11: 4/10/02 at 18:20
.312-12: 4/10/02 at 18:52
.312-13: 4/11/02 at 9:07
.312-14: 4/11/02 at 11:14
.312-15: 4/11/02 at 14:10
.312-16: 4/11/02 at 15:45
.312-17: 4/11/02 at 16:42
.312-18: 4/11/02 at 17:52
.312-19: 4/12/02 at 7:32
.312-20: 4/12/02 at 11:01
.312-99: 4/12/02 at 16:16



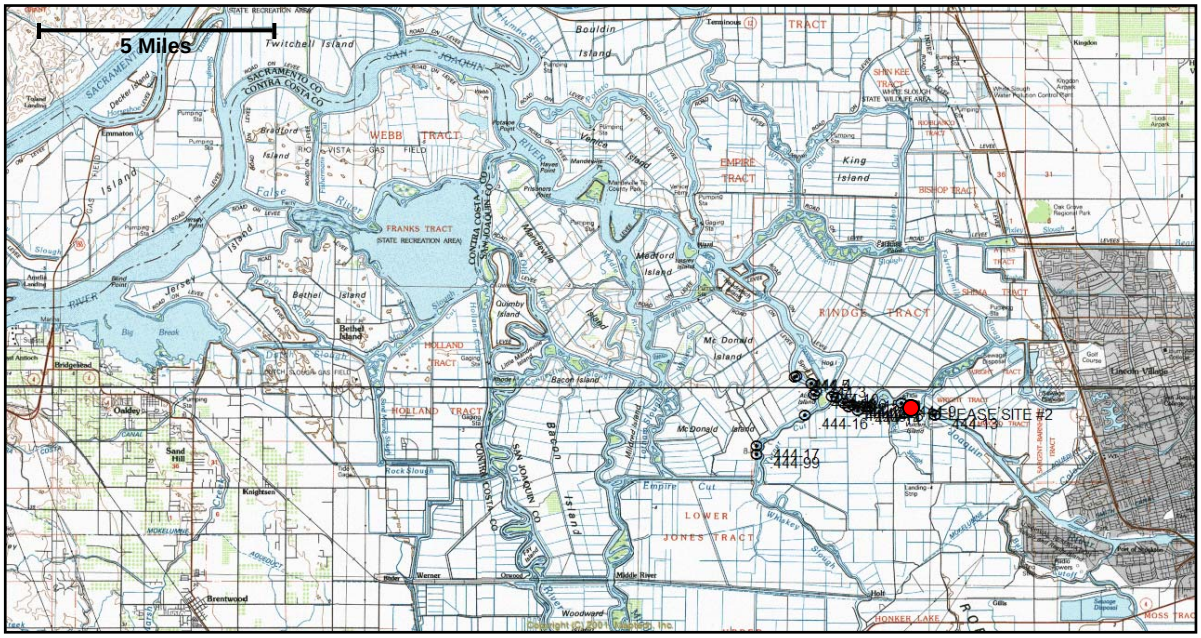
Release 2 – Fish 49.320 MHz – April 10, 2002 at 7:38

.320-1: 4/10/02 at 9:14
.320-2: 4/10/02 at 10:20
.320-3: 4/10/02 at 10:55
.320-4: 4/10/02 at 11:29
.320-5: 4/10/02 at 12:25
.320-6: 4/10/02 at 16:05
.320-7: 4/10/02 at 16:35
.320-8: 4/10/02 at 17:05
.320-99: 4/10/02 at 17:42



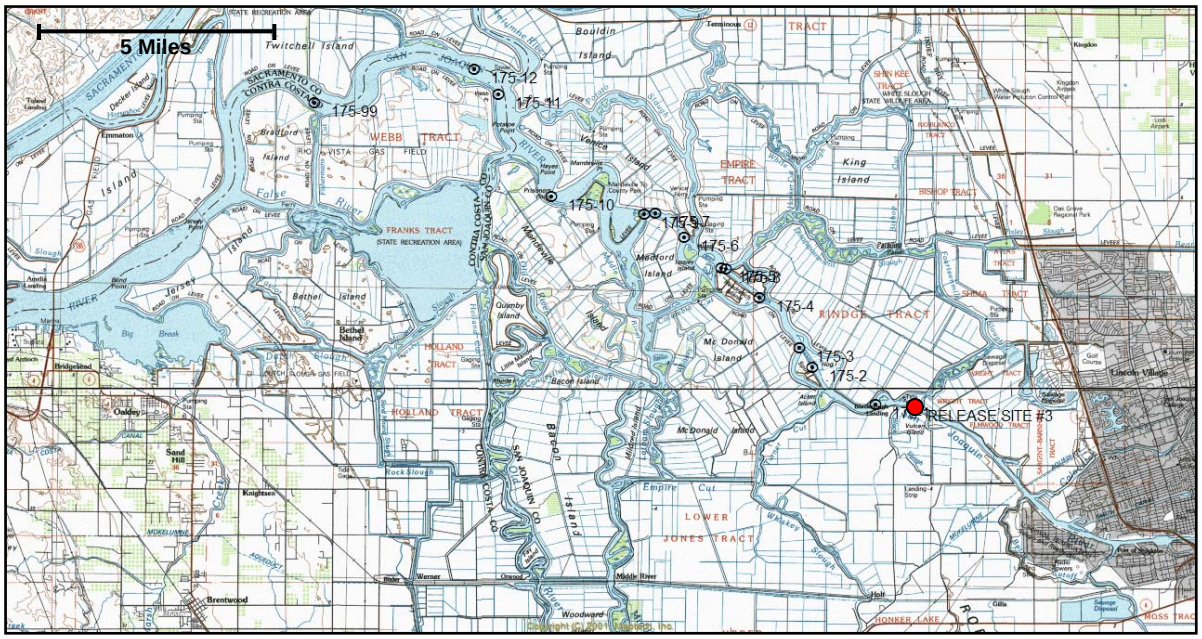
Release 2 – Fish 49.331 MHz – April 10, 2002 at 7:38

.331-1: 4/10/02 at 8:16	.331-8: 4/10/02 at 18:02	.331-15: 4/11/02 at 17:07
.331-2: 4/10/02 at 8:48	.331-9: 4/10/02 at 19:09	.331-16: 4/11/02 at 17:57
.331-3: 4/10/02 at 9:38	.331-10: 4/11/02 at 7:55	.331-17: 4/12/02 at 7:09
.331-4: 4/10/02 at 9:56	.331-11: 4/11/02 at 10:37	.331-18: 4/12/02 at 9:12
.331-5: 4/10/02 at 13:02	.331-12: 4/11/02 at 12:03	.331-19: 4/12/02 at 12:27
.331-6: 4/10/02 at 15:19	.331-13: 4/11/02 at 15:43	.331-20: 4/12/02 at 14:56
.331-7: 4/10/02 at 16:40	.331-14: 4/11/02 at 16:22	.331-99: 4/12/02 at 17:45



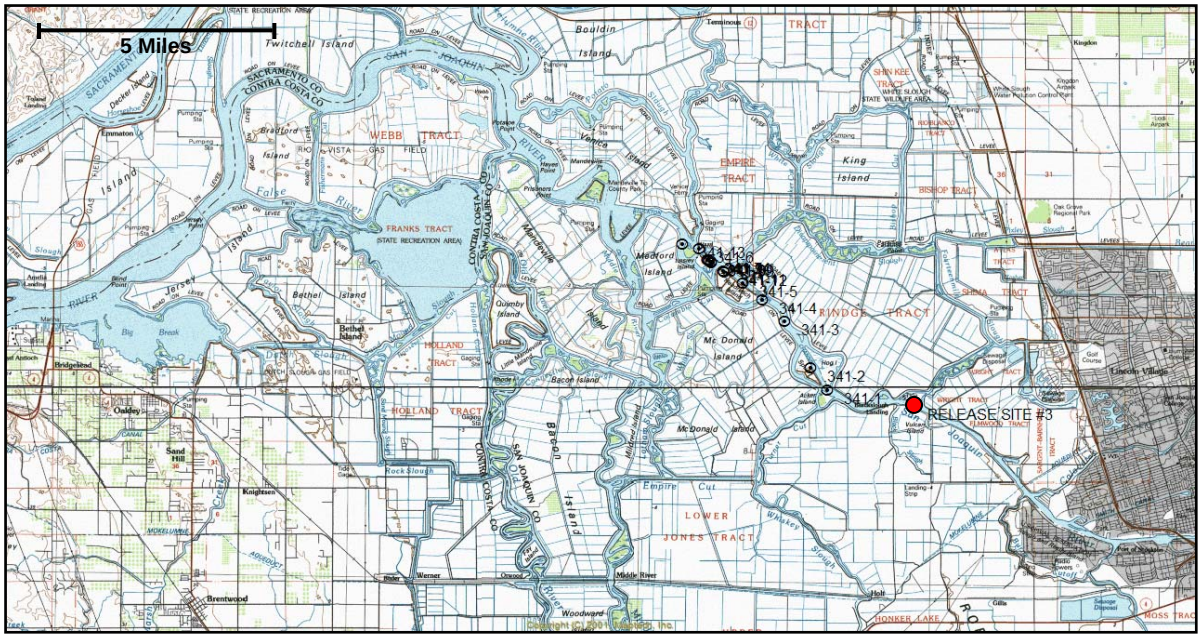
Release 2 – Fish 49.449 MHz – April 10, 2002 at 7:38

.444-1: 4/10/02 at 9:00	.444-7: 4/10/02 at 16:25	.444-13: 4/11/02 at 16:12
.444-2: 4/10/02 at 9:20	.444-8: 4/10/02 at 17:17	.444-14: 4/12/02 at 9:17
.444-3: 4/10/02 at 10:49	.444-9: 4/10/02 at 18:36	.444-15: 4/12/02 at 9:50
.444-4: 4/10/02 at 11:28	.444-10: 4/11/02 at 9:38	.444-16: 4/12/02 at 14:53
.444-5: 4/10/02 at 13:08	.444-11: 4/11/02 at 9:55	.444-17: 4/12/02 at 16:45
.444-6: 4/10/02 at 15:38	.444-12: 4/11/02 at 12:40	.444-99: 4/12/02 at 17:07



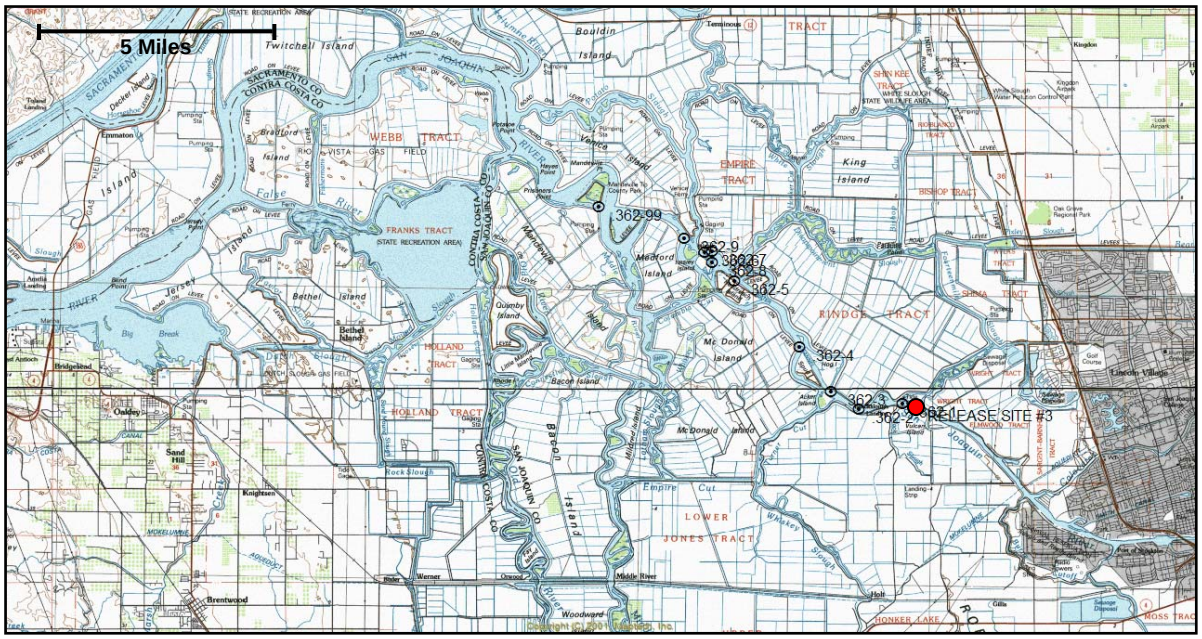
Release 3 – Fish 49.175 MHz – April 16, 2002 at 7:51

.175-1: 4/16/02 at 9:20
.175-2: 4/16/02 at 10:41
.175-3: 4/16/02 at 11:31
.175-4: 4/16/02 at 13:03
.175-5: 4/16/02 at 14:01
.175-6: 4/16/02 at 15:17
.175-7: 4/16/02 at 16:53
.175-8: 4/17/02 at 7:33
.175-9: 4/17/02 at 10:17
.175-10: 4/17/02 at 12:31
.175-11: 4/18/02 at 8:10
.175-12: 4/18/02 at 11:32
.175-99: 4/19/02 at 8:39



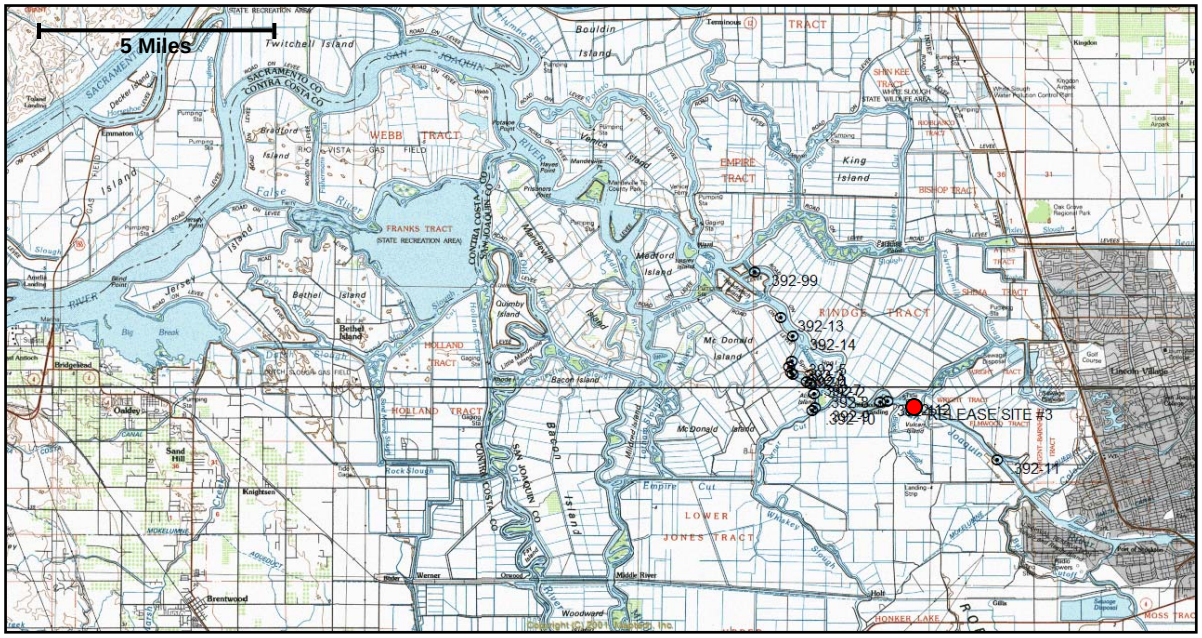
Release 3 – Fish 49.341 MHz – April 16, 2002 at 7:51

.341-1: 4/16/02 at 10:34
.341-2: 4/16/02 at 11:18
.341-3: 4/16/02 at 13:47
.341-4: 4/16/02 at 14:27
.341-5: 4/16/02 at 15:00
.341-6: 4/16/02 at 17:11
.341-7: 4/17/02 at 10:19
.341-8: 4/17/02 at 10:44
.341-9: 4/17/02 at 13:03
.341-10: 4/17/02 at 14:39
.341-11: 4/18/02 at 7:12
.341-12: 4/18/02 at 10:52
.341-13: 4/18/02 at 17:27
.341-14: 4/19/02 at 7:33
.341-99: 4/19/02 at 12:48



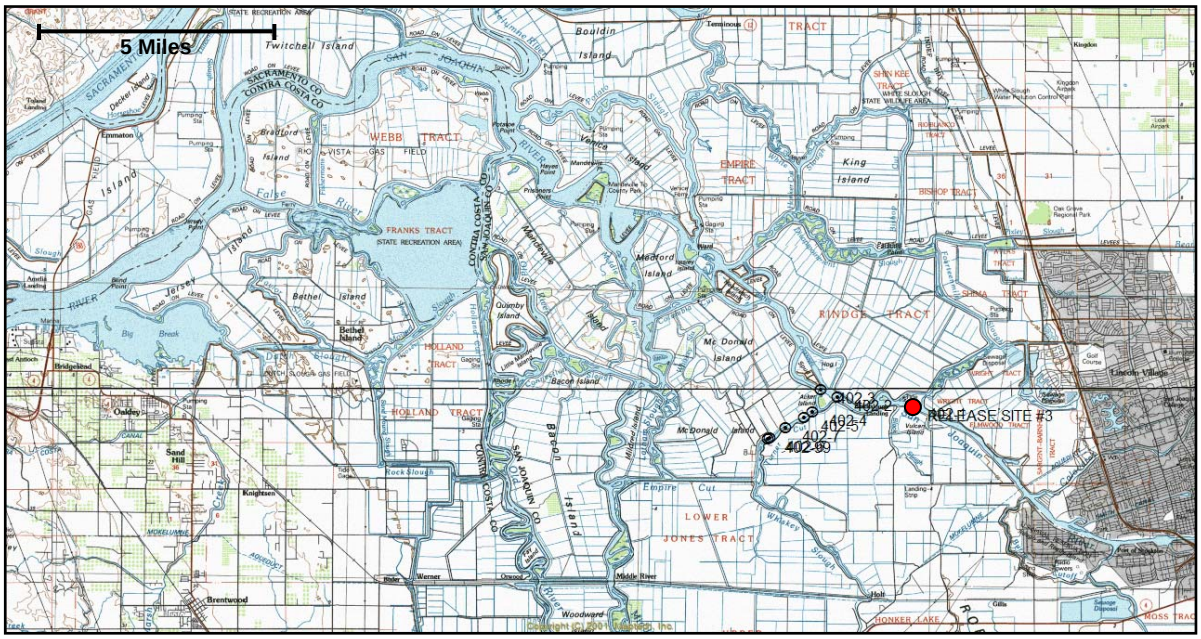
Release 3 – Fish 49.362 MHz – April 16, 2002 at 7:51

.362-1: 4/16/02 at 8:20
.362-2: 4/16/02 at 10:40
.362-3: 4/16/02 at 11:31
.362-4: 4/16/02 at 12:51
.362-5: 4/16/02 at 14:41
.362-6: 4/16/02 at 17:27
.362-7: 4/17/02 at 9:46
.362-8: 4/17/02 at 10::37
.362-9: 4/17/02 at 12:13
.362-99: 4/17/02 at 14:51



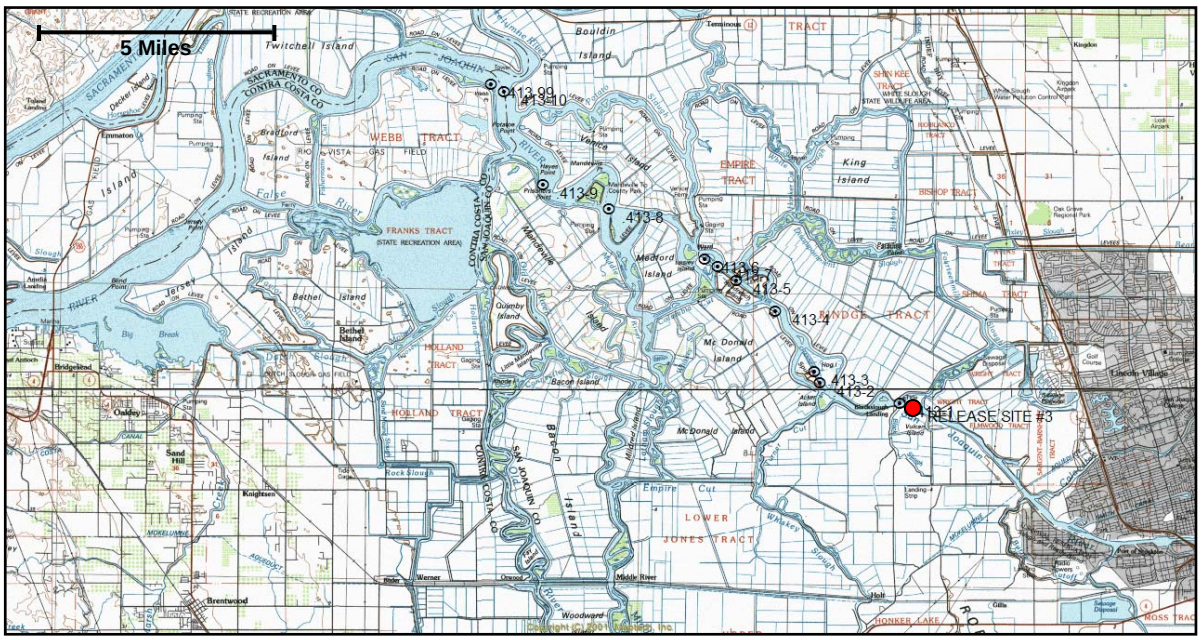
Release 3 – Fish 49.392 MHz – April 16, 2002 at 7:51

.392-1: 4/16/02 at 8:44
.392-2: 4/16/02 at 10:05
.392-3: 4/16/02 at 11:02
.392-4: 4/16/02 at 11:53
.392-5: 4/16/02 at 13:52
.392-6: 4/16/02 at 15:10
.392-7: 4/16/02 at 15:45
.392-8: 4/16/02 at 16:41
.392-9: 4/16/02 at 17:35
.392-10: 4/16/02 at 17:55
.392-11: 4/17/02 at 8:26
.392-12: 4/17/02 at 11:40
.392-13: 4/17/02 at 16:13
.392-14: 4/17/02 at 18:11
.392-99: 4/18/02 at 16:07



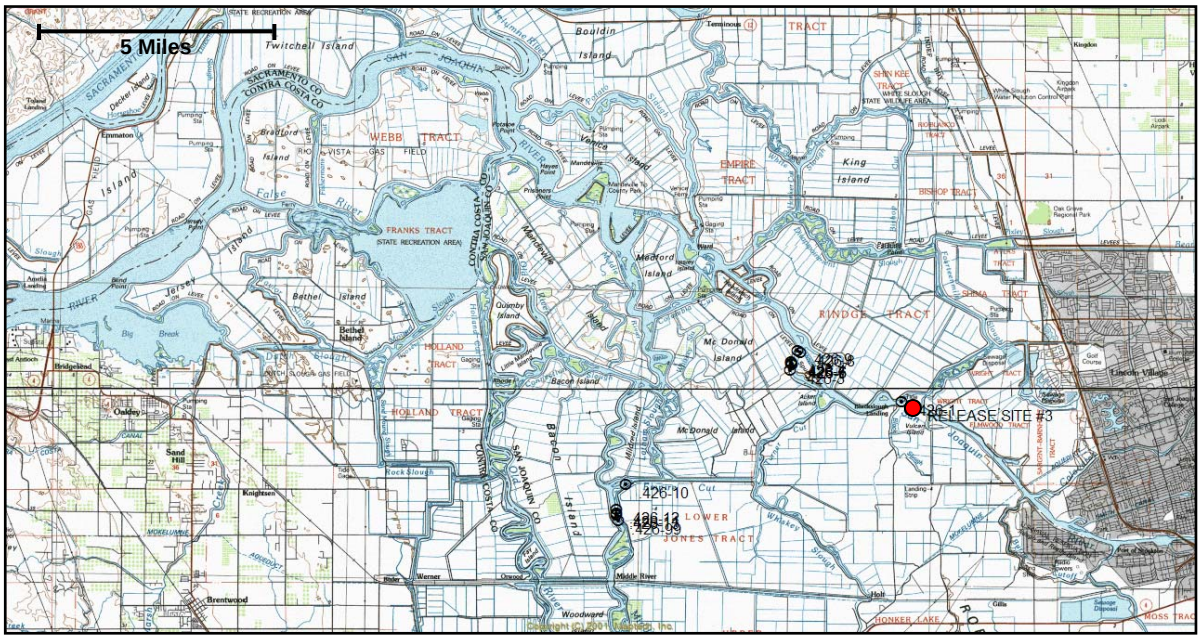
Release 3 – Fish 49.402 MHz – April 16, 2002 at 7:51

.402-1: 4/16/02 at 8:28
.402-2: 4/16/02 at 10:30
.402-3: 4/16/02 at 11:13
.402-4: 4/16/02 at 12:37
.402-5: 4/16/02 at 14:10
.402-6: 4/16/02 at 15:22
.402-7: 4/16/02 at 16:33
.402-99: 4/16/02 at 17:43



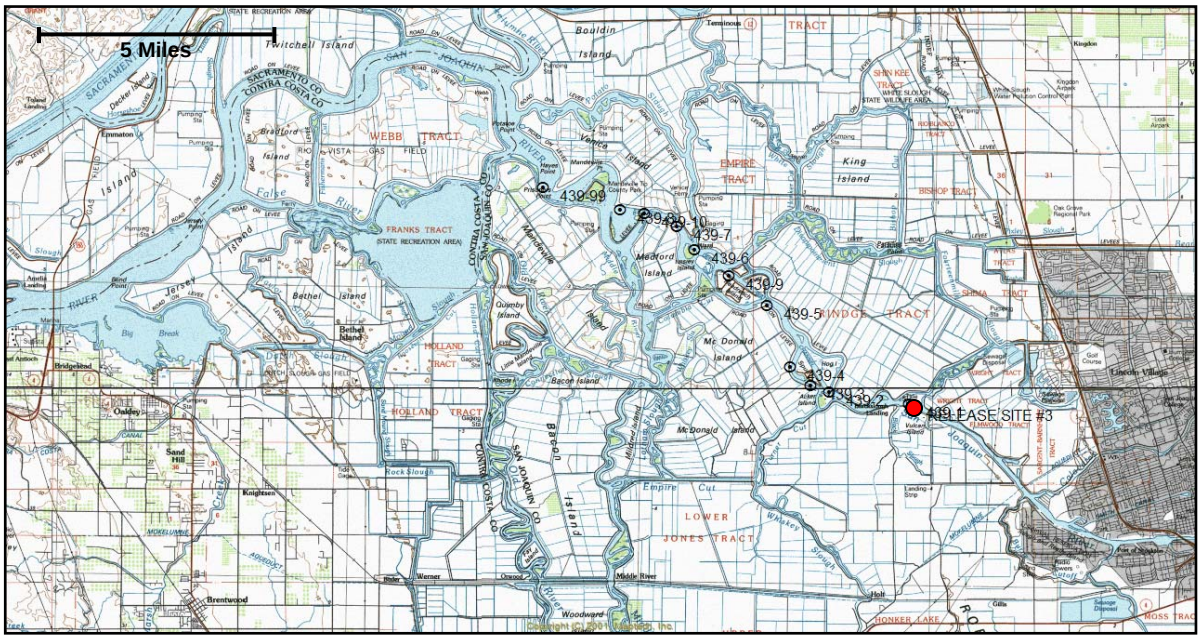
Release 3 – Fish 49.413 MHz – April 16, 2002 at 7:51

.413-1: 4/16/02 at 8:40
.413-2: 4/16/02 at 10:13
.413-3: 4/16/02 at 11:23
.413-4: 4/16/02 at 13:40
.413-5: 4/16/02 at 14:34
.413-6: 4/16/02 at 17:22
.413-7: 4/17/02 at 7:20
.413-8: 4/17/02 at 10:26
.413-9: 4/17/02 at 12:35
.413-10: 4/18/02 at 8:04
.413-99: 4/19/02 at 8:18



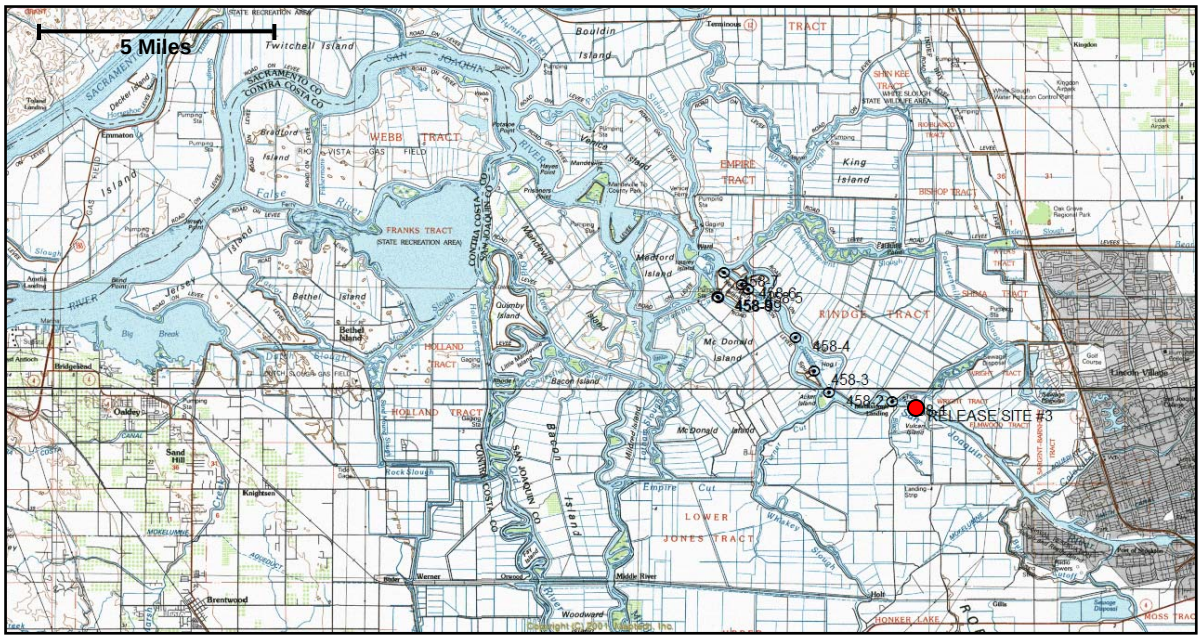
Release 3 – Fish 49.426 MHz – April 16, 2002 at 7:51

.426-1: 4/16/02 at 8:20
.426-2: 4/16/02 at 10:07
.426-3: 4/16/02 at 11:04
.426-4: 4/16/02 at 11:47
.426-5: 4/16/02 at 13:55
.426-6: 4/16/02 at 15:08
.426-7: 4/16/02 at 15:48
.426-8: 4/16/02 at 16:49
.426-9: 4/16/02 at 17:28
.426-10: 4/17/02 at 8:37
.426-11: 4/17/02 at 12:42
.426-12: 4/17/02 at 13:29
.426-13: 4/17/02 at 15:00
.426-99: 4/17/02 at 17:25



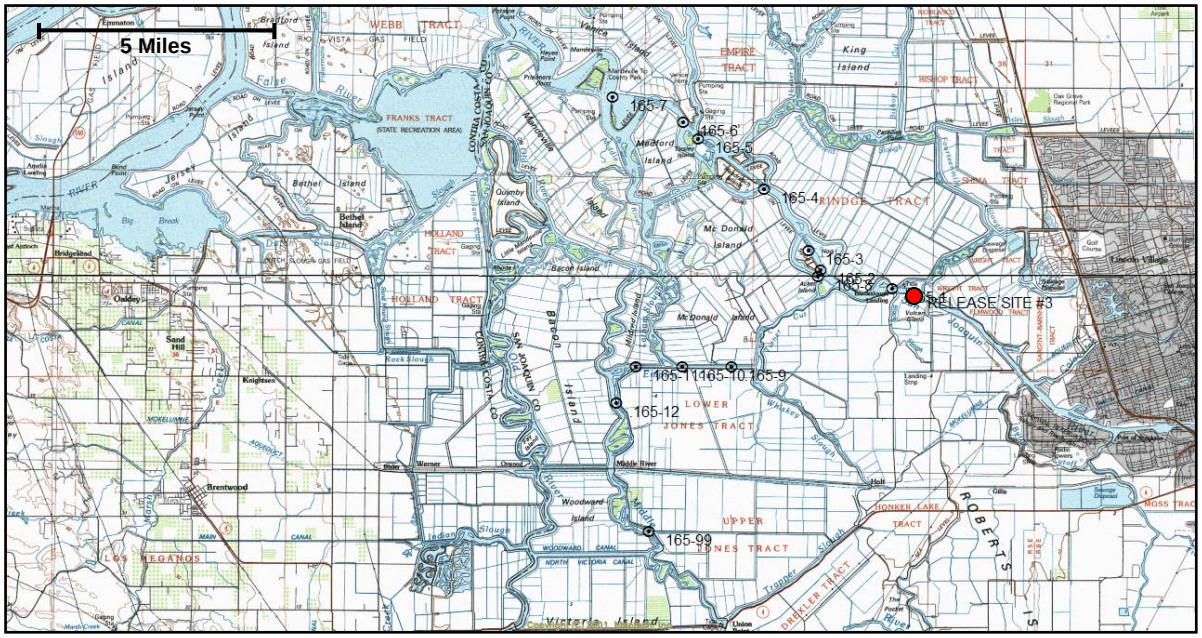
Release 3 – Fish 49.439 MHz – April 16, 2002 at 7:51

.439-1: 4/16/02 at 8:28
.439-2: 4/16/02 at 10:15
.439-3: 4/16/02 at 11:10
.439-4: 4/16/02 at 11:51
.439-5: 4/16/02 at 13:28
.439-6: 4/16/02 at 14:40
.439-7: 4/16/02 at 15:14
.439-8: 4/16/02 at 16:59
.439-9: 4/17/02 at 7:35
.439-10: 4/17/02 at 10:17
.439-99: 4/17/02 at 12:34



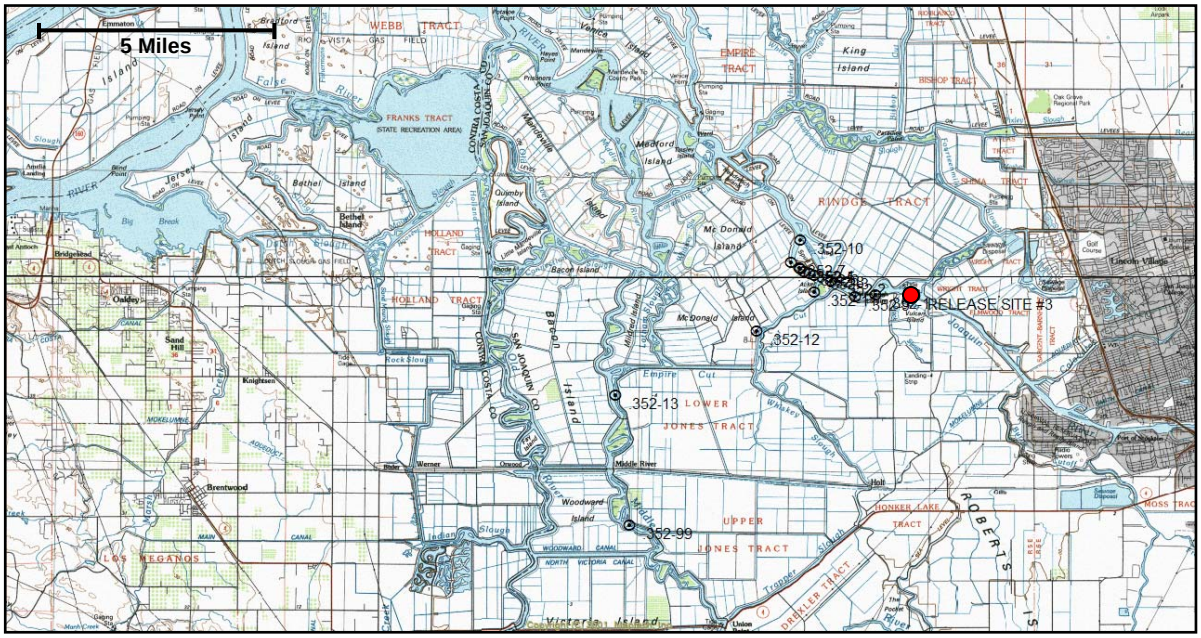
Release 3 – Fish 49.458 MHz – April 16, 2002 at 7:51

.458-1: 4/16/02 at 8:42
.458-2: 4/16/02 at 10:15
.458-3: 4/16/02 at 11:44
.458-4: 4/16/02 at 12:53
.458-5: 4/16/02 at 14:32
.458-6: 4/16/02 at 14:59
.458-7: 4/16/02 at 17:15
.458-8: 4/19/02 at 13:12
.458-9: 4/19/02 at 14:25
.458-99: 4/19/02 at 16:47



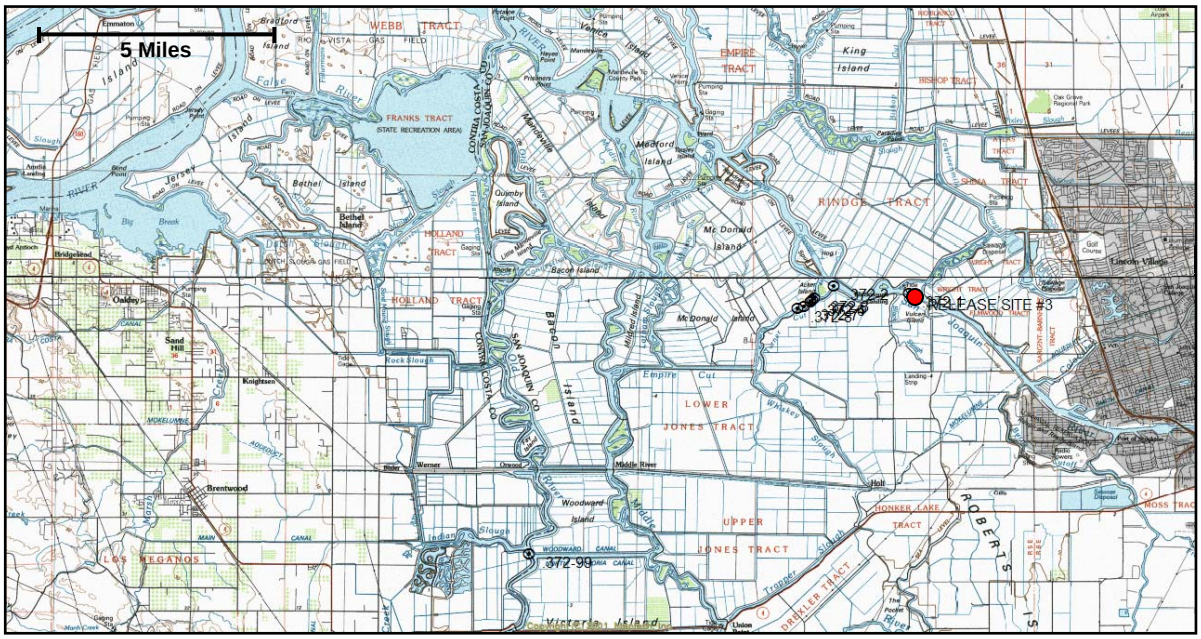
Release 3 – Fish 49.165 MHz – April 16, 2002 at 7:51

.165-1: 4/16/02 at 8:42
.165-2: 4/16/02 at 10:13
.165-3: 4/16/02 at 11:29
.165-4: 4/16/02 at 13:35
.165-5: 4/16/02 at 14:43
.165-6: 4/16/02 at 15:11
.165-7: 4/16/02 at 17:01
.165-8: 4/17/02 at 7:57
.165-9: 4/17/02 at 12/16
.165-10: 4/17/02 at 13:37
.165-11: 4/17/02 at 15:08
.165-12: 4/17/02 at 17:23
.165-99: 4/18/02 at 9:08



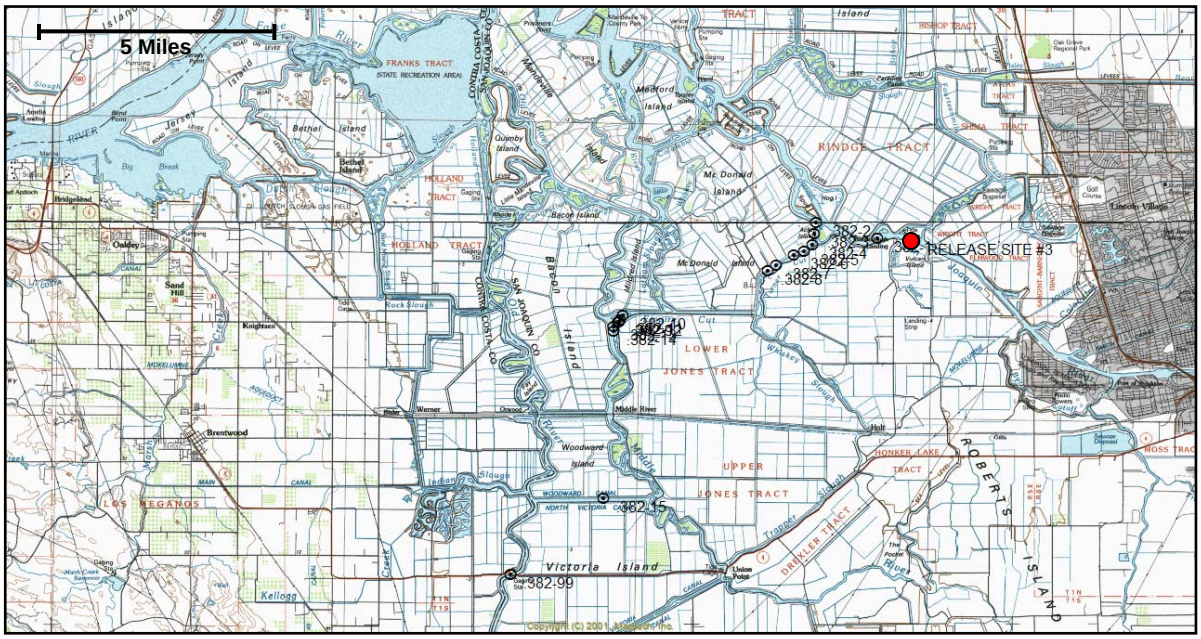
Release 3 – Fish 49.352 MHz – April 16, 2002 at 7:51

.352-1: 4/16/02 at 8:47	.352-8: 4/16/02 at 15:41
.352-2: 4/16/02 at 9:25	.352-9: 4/17/02 at 8:07
.352-3: 4/16/02 at 10:03	.352-10: 4/17/02 at 11:00
.352-4: 4/16/02 at 11:07	.352-11: 4/17/02 at 15:33
.352-5: 4/16/02 at 11:55	.352-12: 4/17/02 at 17:59
.352-6: 4/16/02 at 13:57	.352-13: 4/18/02 at 7:45
.352-7: 4/16/02 at 15:10	.352-99: 4/18/02 at 14:45



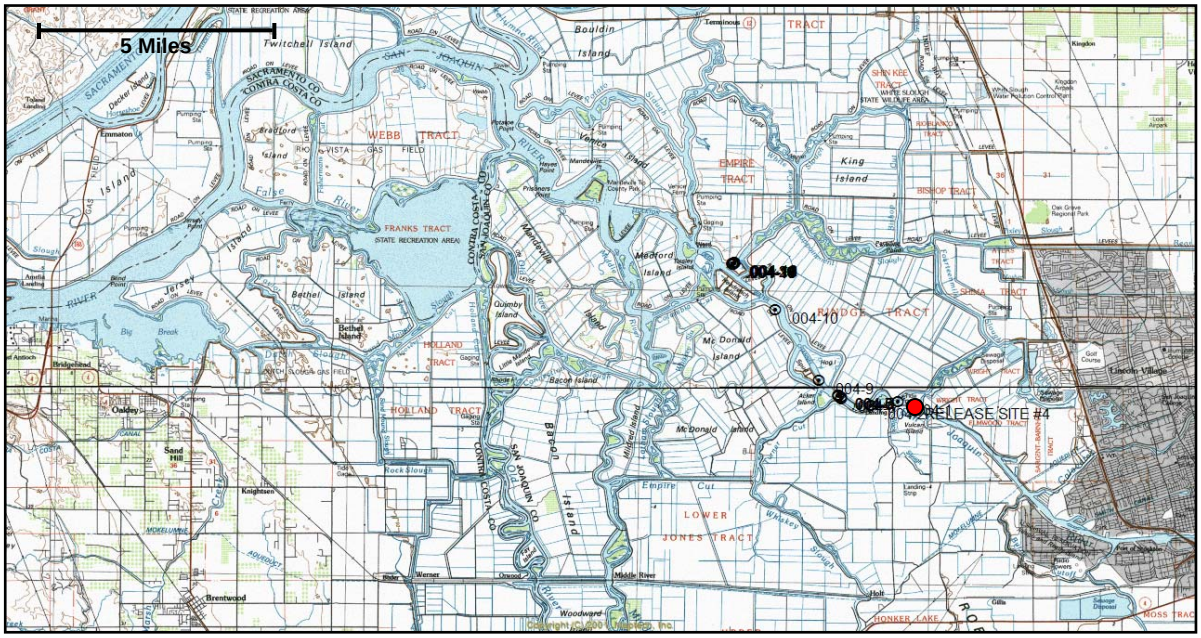
Release 3 – Fish 49.372 MHz – April 16, 2002 at 7:51

.372-1: 4/16/02 at 8:28	.372-6: 4/16/02 at 15:16
.372-2: 4/16/02 at 10:17	.372-7: 4/16/02 at 16:35
.372-3: 4/16/02 at 11:18	.372-8: 4/16/02 at 17:38
.372-4: 4/16/02 at 12:37	.372-99: 4/18/02 at 8:25
.372-5: 4/16/02 at 14:08	



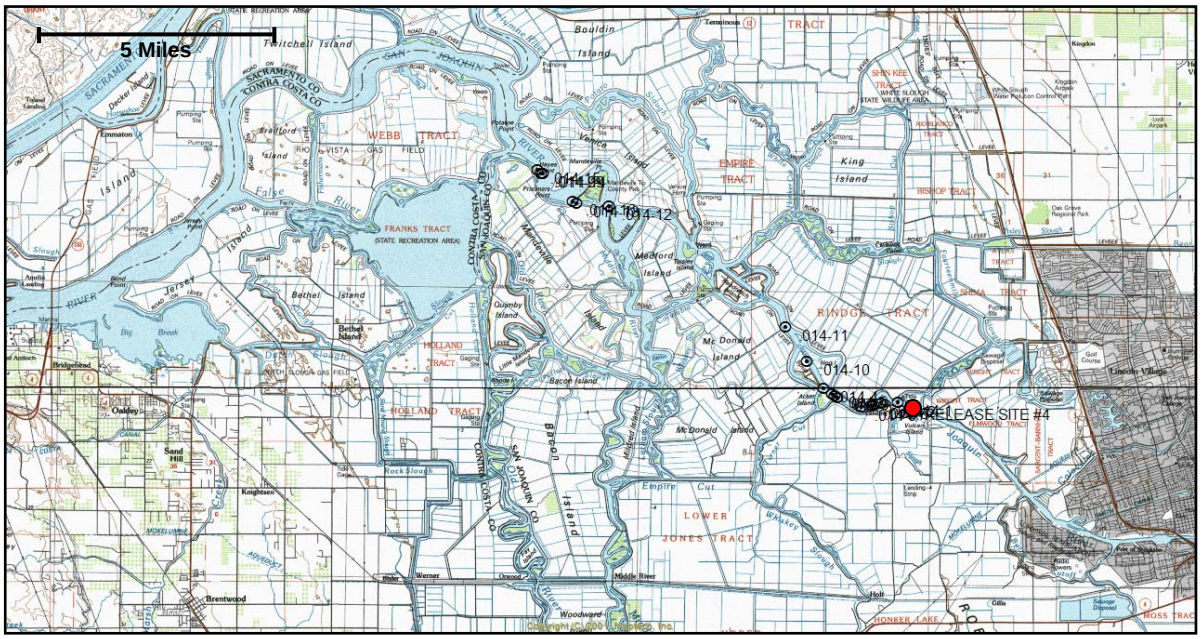
Release 3 – Fish 49.382 MHz – April 16, 2002 at 7:51

.382-1: 4/16/02 at 8:47
.382-2: 4/16/02 at 10:04
.382-3: 4/16/02 at 11:15
.382-4: 4/16/02 at 12:36
.382-5: 4/16/02 at 14:10
.382-6: 4/16/02 at 15:19
.382-7: 4/16/02 at 16:37
.382-8: 4/16/02 at 17:46
.382-9: 4/17/02 at 8:41
.382-10: 4/17/02 at 12:27
.382-11: 4/17/02 at 13:32
.382-12: 4/17/02 at 15:04
.382-13: 4/17/02 at 17:21
.382-14: 4/17/02 at 17:39
.382-15: 4/18/02 at 8:17
.382-99: 4/19/02 at 16:04



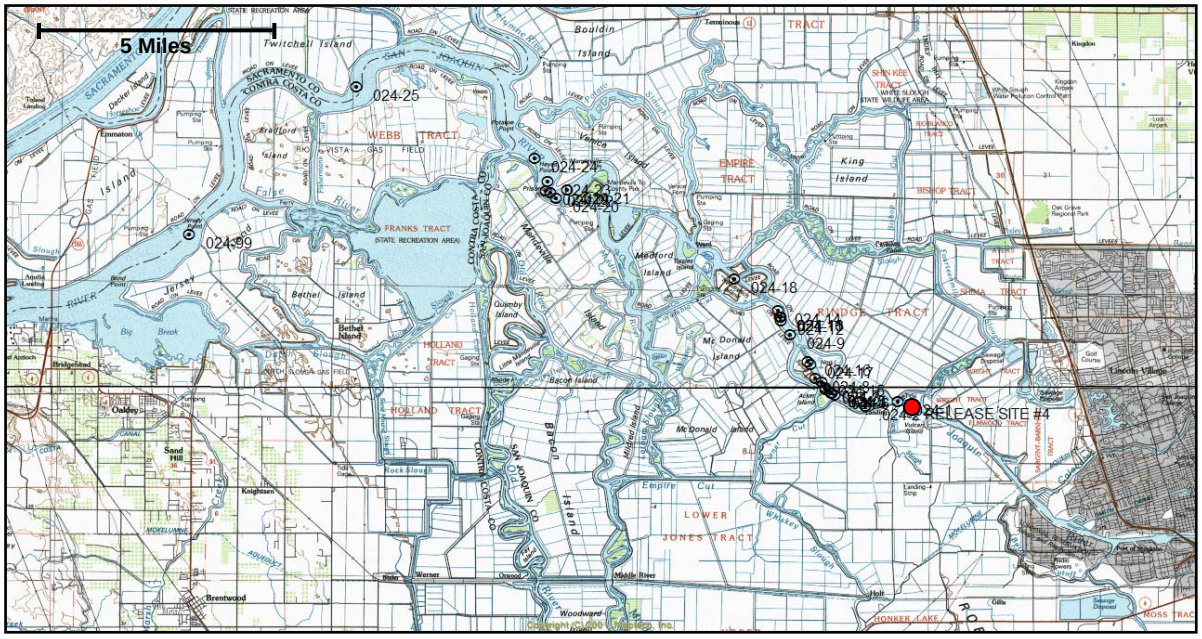
Release 4 – Fish 49.004 MHz – April 23, 2002 at 7:20

.004-1: 4/23/02 at 8:07
.004-2: 4/23/02 at 8:44
.004-3: 4/23/02 at 9:30
.004-4: 4/23/02 at 11:07
.004-5: 4/23/02 at 12:32
.004-6: 4/23/02 at 13:33
.004-7: 4/23/02 at 14:43
.004-8: 4/23/02 at 15:55
.004-9: 4/23/02 at 16:33
.004-10: 4/23/02 at 18:08
.004-11: 4/24/02 at 9:24
.004-12: 4/24/02 at 11:28
.004-13: 4/24/02 at 15:26
.004-14: 4/24/02 at 16:53
.004-15: 4/25/02 at 7:16
.004-16: 4/25/02 at 12:42
.004-17: 4/25/02 at 15:17
.004-18: 4/25/02 at 16:40
.004-19: 4/25/02 at 17:48
.004-20: 4/26/02 at 7:22
.004-21: 4/26/02 at 11:17
.004-99: 4/27/02 at 13:58



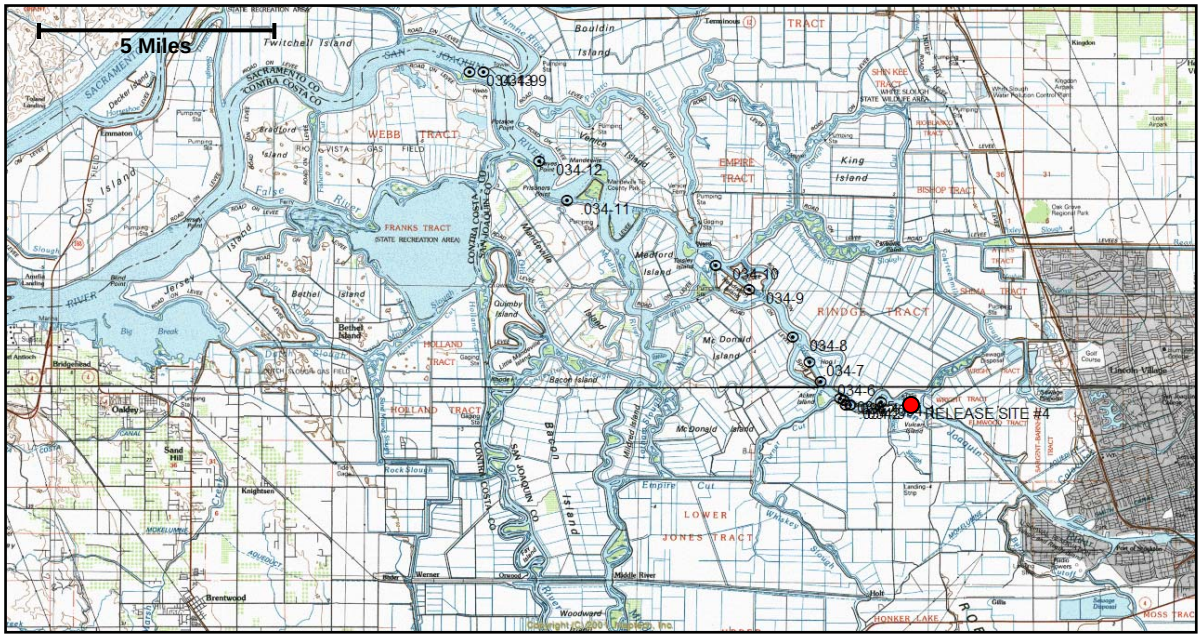
Release 4 – Fish 49.014 MHz – April 23, 2002 at 7:20

.014-1: 4/23/02 at 8:12
.014-2: 4/23/02 at 8:40
.014-3: 4/23/02 at 9:28
.014-4: 4/23/02 at 10:20
.014-5: 4/23/02 at 11:23
.014-6: 4/23/02 at 12:07
.014-7: 4/23/02 at 13:50
.014-8: 4/23/02 at 14:17
.014-9: 4/23/02 at 15:30
.014-10: 4/23/02 at 16:37
.014-11: 4/23/02 at 17:24
.014.12: 4/24/02 at 9:17
.014-13: 4/24/02 at 9:52
.014-14: 4/24/02 at 10:42
.014-15: 4/24/02 at 12:12
.014-16: 4/24/02 at 17:14
.014-99: 4/24/02 at 17:50



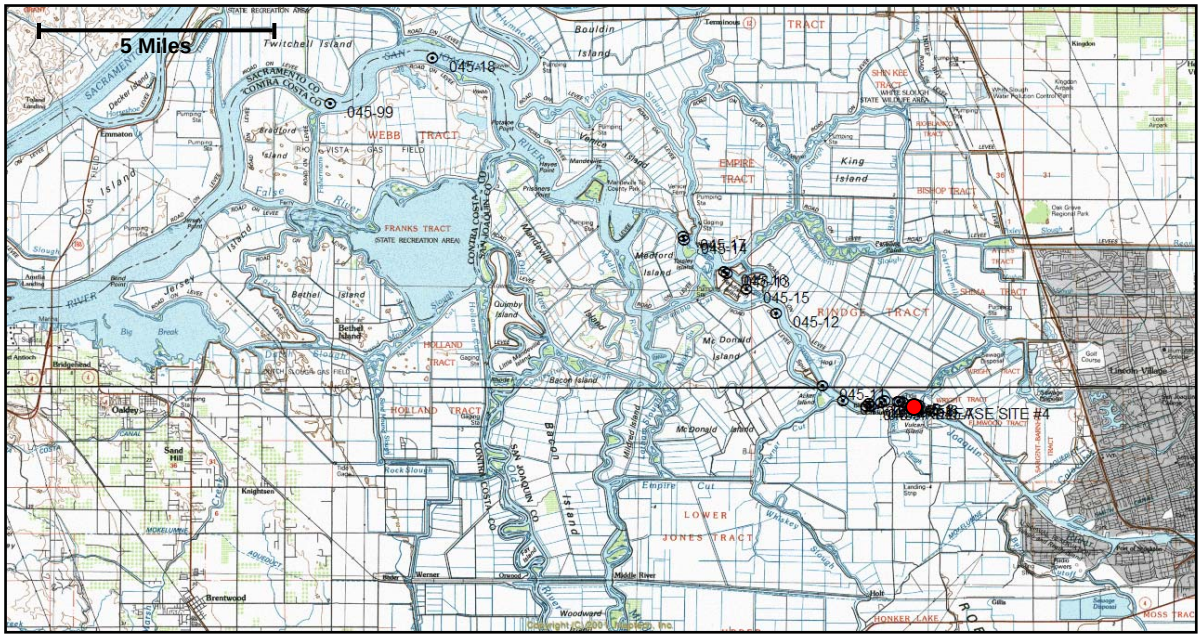
Release 4 – Fish 49.024 MHz – April 23, 2002 at 7:20

.024-1: 4/23/02 at 8:11	.024-10: 4/23/02 at 17:26	.024-19: 4/25/02 at 12:10
.024-2: 4/23/02 at 9:33	.024-11: 4/23/02 at 18:06	.024-20: 4/25/02 at 13:36
.024-3: 4/23/02 at 10:22	.024-12: 4/24/02 at 7:59	.024-21: 4/25/02 at 15:02
.024-4: 4/23/02 at 11:23	.024-13: 4/24/02 at 9:05	.024-22: 4/25/02 at 16:12
.024-5: 4/23/02 at 12:01	.024-14: 4/24/02 at 11:47	.024-23: 4/25/02 at 17:26
.024-6: 4/23/02 at 13:39	.024-15: 4/24/02 at 14:19	.024-24: 4/25/02 at 17:58
.024-7: 4/23/02 at 14:20	.024-16: 4/24/02 at 16:11	.024-25: 4/26/02 at 8:08
.024-8: 4/23/02 at 15:36	.024-17: 4/24/02 at 16:34	.024-99: 4/26/02 at 12:46
.024-9: 4/23/02 at 16:42	.024-18: 4/25/02 at 7:22	



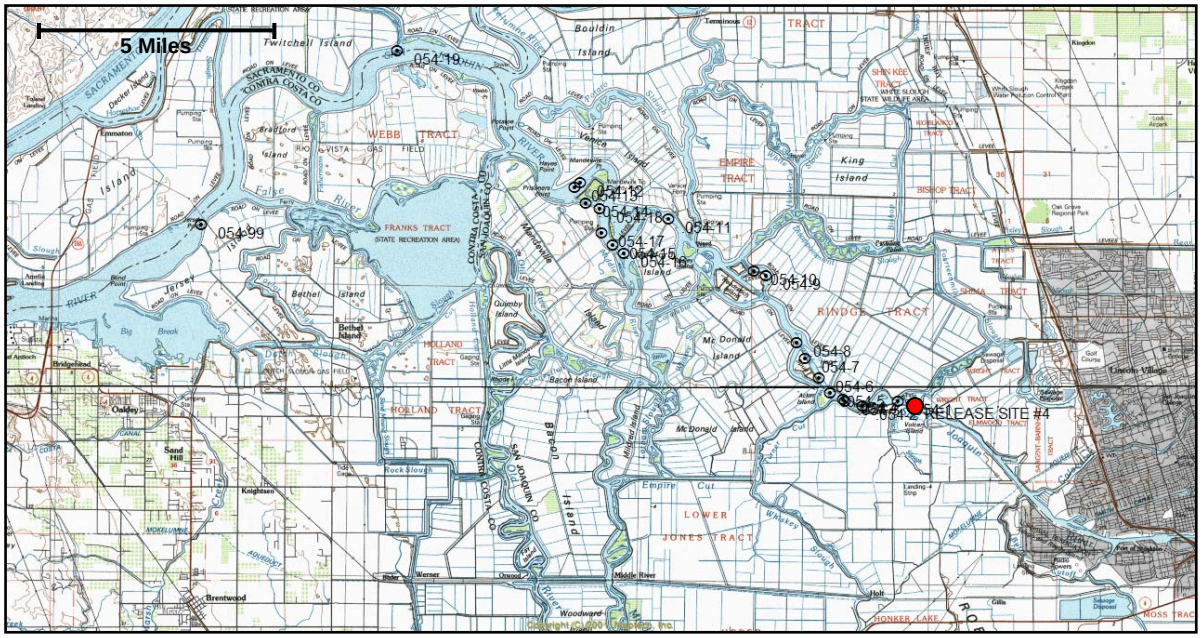
Release 4 – Fish 49.034 MHz – April 23, 2002 at 7:20

.034-1: 4/23/02 at 8:53	.034-6: 4/23/02 at 13:46	.034-11: 4/24/02 at 7:57
.034-2: 4/23/02 at 9:40	.034-7: 4/23/02 at 14:33	.034-12: 4/24/02 at 8:54
.034-3: 4/23/02 at 10:27	.034-8: 4/23/02 at 15:41	.034-13: 4/24/02 at 10:23
.034-4: 4/23/02 at 11:12	.034-9: 4/23/02 at 17:31	.034-99: 4/24/02 at 14:47
.034-5: 4/23/02 at 12:20	.034-10: 4/23/02 at 18:25	



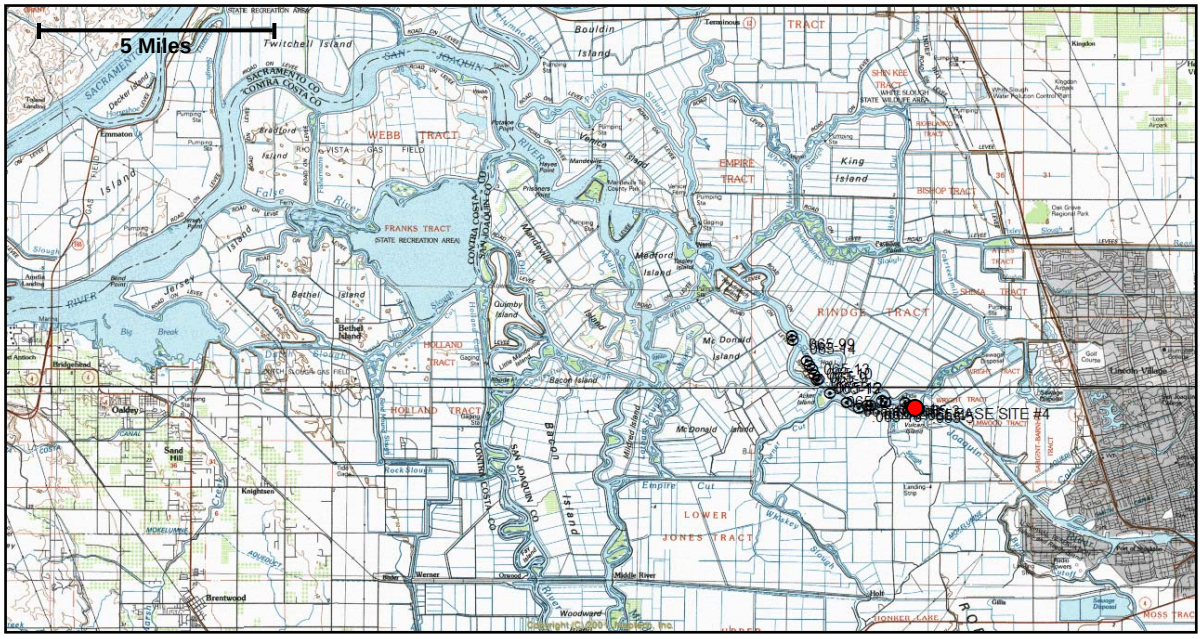
Release 4 – Fish 49.045 MHz – April 23, 2002 at 7:20

.045-1: 4/23/02 at 8:07
.045-2: 4/23/02 at 8:39
.045-3: 4/23/02 at 9:34
.045-4: 4/23/02 at 10:29
.045-5: 4/23/02 at 11:19
.045-6: 4/23/02 at 12:11
.045-7: 4/23/02 at 14:04
.045-8: 4/23/02 at 15:17
.045-9: 4/23/02 at 16:28
.045-10: 4/23/02 at 17:12
.045-11: 4/23/02 at 17:59
.045-12: 4/24/02 at 7:58
.045-13: 4/24/02 at 9:20
.045-14: 4/24/02 at 11:13
.045-15: 4/24/02 at 15:34
.045-16: 4/24/02 at 16:55
.045-17: 4/24/02 at 18:04
.045-18: 4/25/02 at 8:26
.045-99: 4/25/02 at 14:51



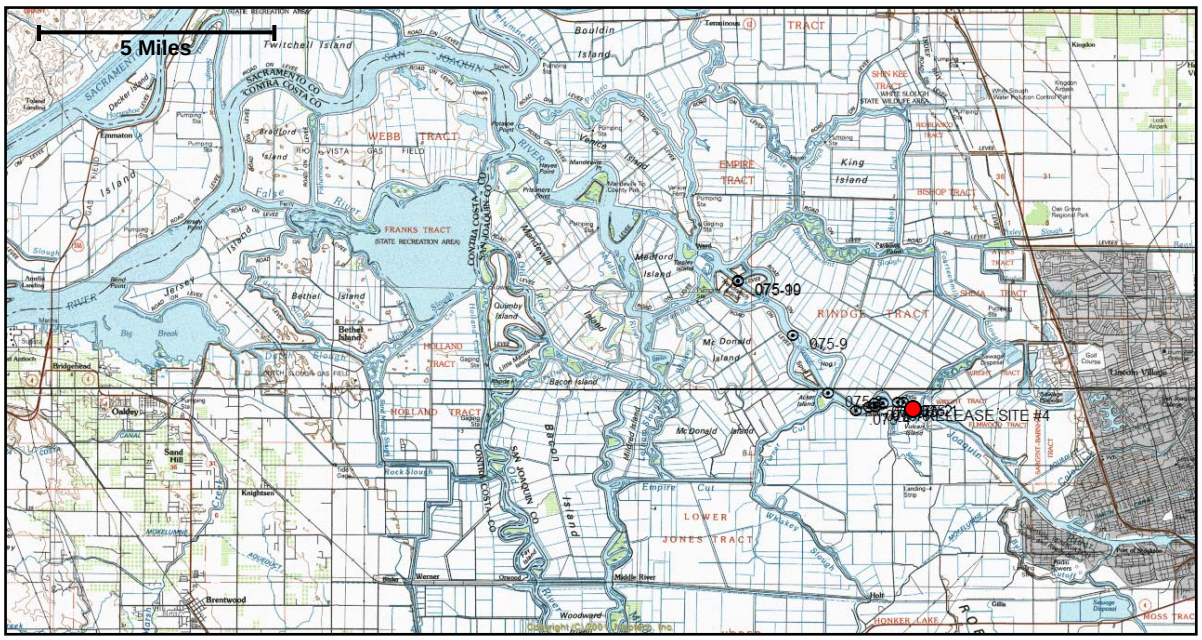
Release 4 – Fish 49.054 MHz – April 23, 2002 at 7:20

.054-1: 4/23/02 at 8:20
.054-2: 4/23/02 at 9:36
.054-3: 4/23/02 at 10:26
.054-4: 4/23/02 at 11:14
.054-5: 4/23/02 at 11:57
.054-6: 4/23/02 at 13:42
.054-7: 4/23/02 at 14:28
.054-8: 4/23/02 at 15:39
.054-9: 4/23/02 at 17:50
.054-10: 4/23/02 at 18:33
.054-11: 4/24/02 at 7:44
.054-12: 4/24/02 at 11:05
.054-13: 4/24/02 at 11:28
.054-14: 4/24/02 at 12:20
.054-15: 4/24/02 at 14:50
.054-16: 4/24/02 at 16:10
.054-17: 4/24/02 at 17:31
.054-18: 4/24/02 at 17:56
.054-19: 4/25/02 at 8:35
.054-99: 4/26/02 at 8:27



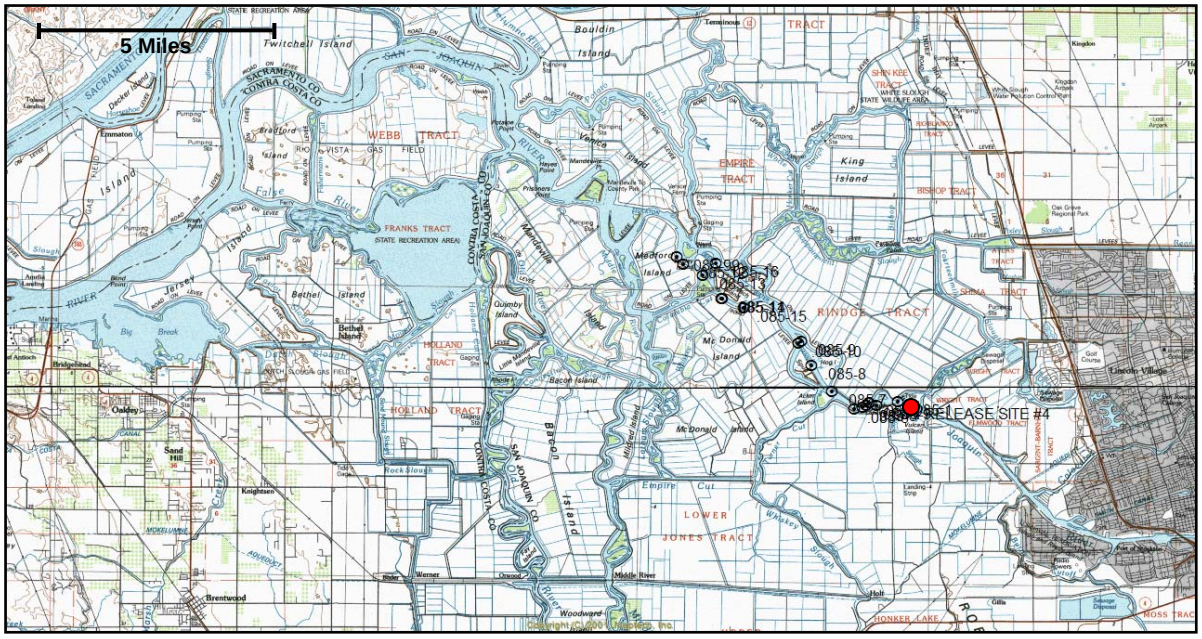
Release 4 – Fish 49.065 MHz – April 23, 2002 at 7:20

.065-1: 4/23/02 at 9:13	.065-7: 4/23/02 at 17:57	.065-13: 4/25/02 at 7:35
.065-2: 4/23/02 at 10:00	.065-8: 4/24/02 at 8:14	.065-14: 4/25/02 at 10:28
.065-3: 4/23/02 at 11:53	.065-9: 4/24/02 at 9:00	.065-15: 4/25/02 at 13:01
.065-4: 4/23/02 at 13:59	.065-10: 4/24/02 at 12:17	.065-16: 4/25/02 at 15:30
.065-5: 4/23/02 at 15:06	.065-11: 4/24/02 at 14:16	.065-17: 4/25/02 at 16:53
.065-6: 4/23/02 at 16:56	.065-12: 4/24/02 at 16:31	.065-99: 4/26/02 at 11:02



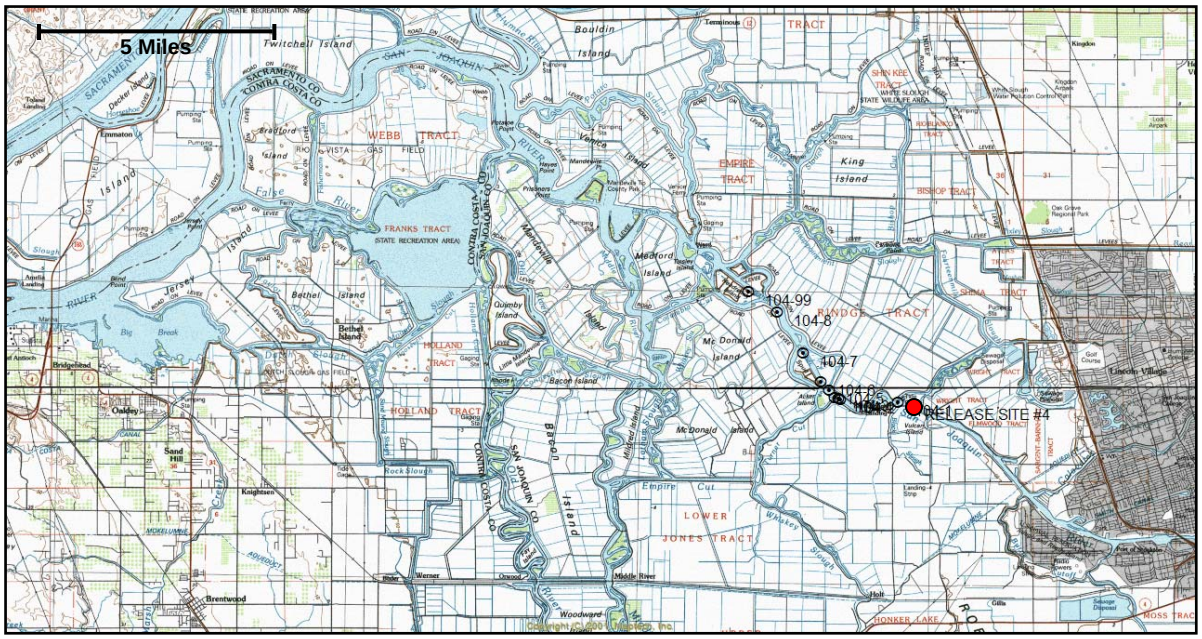
Release 4 – Fish 49.075 MHz – April 23, 2002 at 7:20

.075-1: 4/23/02 at 8:28	.075-7: 4/23/02 at 15:15
.075-2: 4/23/02 at 8:44	.075-8: 4/23/02 at 16:11
.075-3: 4/23/02 at 9:54	.075-9: 4/23/02 at 17:25
.075-4: 4/23/02 at 11:44	.075-10: 4/26/02 at 12:13
.075-5: 4/23/02 at 12:45	.075-99: 4/26/02 at 13:25
.075-6: 4/23/02 at 13:56	



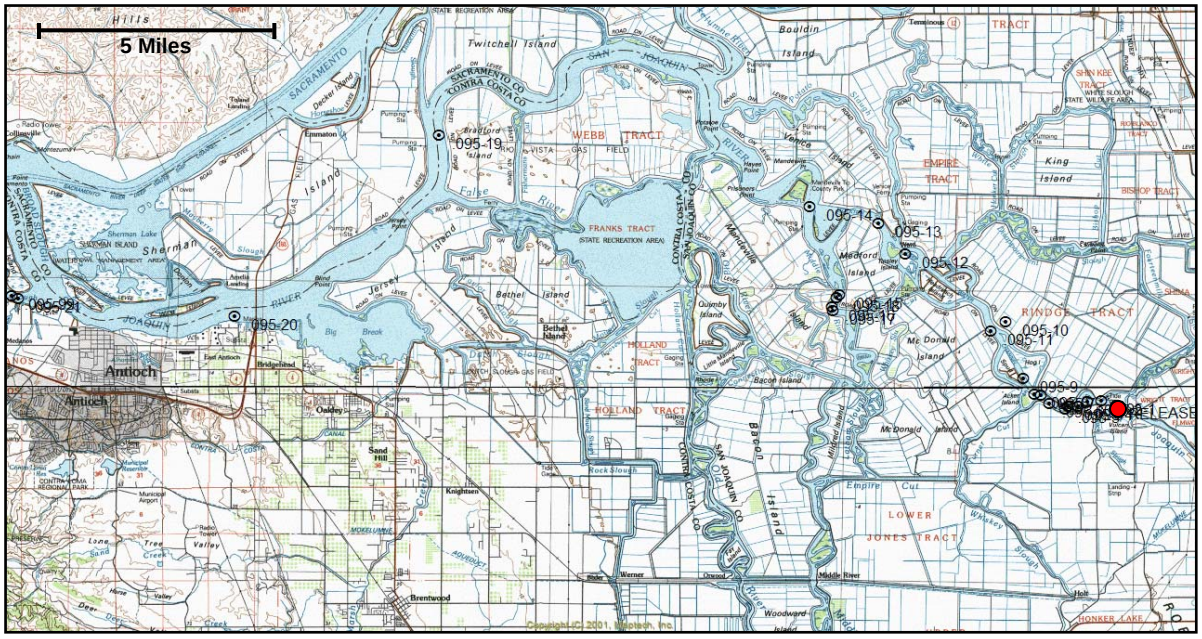
Release 4 – Fish 49.085 MHz – April 23, 2002 at 7:20

.085-1: 4/23/02 at 8:12
.085-2: 4/23/02 at 9:58
.085-3: 4/23/02 at 12:03
.085-4: 4/23/02 at 13:00
.085-5: 4/23/02 at 14:12
.085-6: 4/23/02 at 15:00
.085-7: 4/23/02 at 16:06
.085-8: 4/23/02 at 17:05
.085-9: 4/23/02 at 17:45
.085-10: 4/23/02 at 18:24
.085-11: 4/24/02 at 9:45
.085-12: 4/24/02 at 11:03
.085-13: 4/24/02 at 13:57
.085-14: 4/24/02 at 15:14
.085-15: 4/24/02 at 17:57
.085-16: 4/26/02 at 7:42
.085-99: 4/26/02 at 13:13



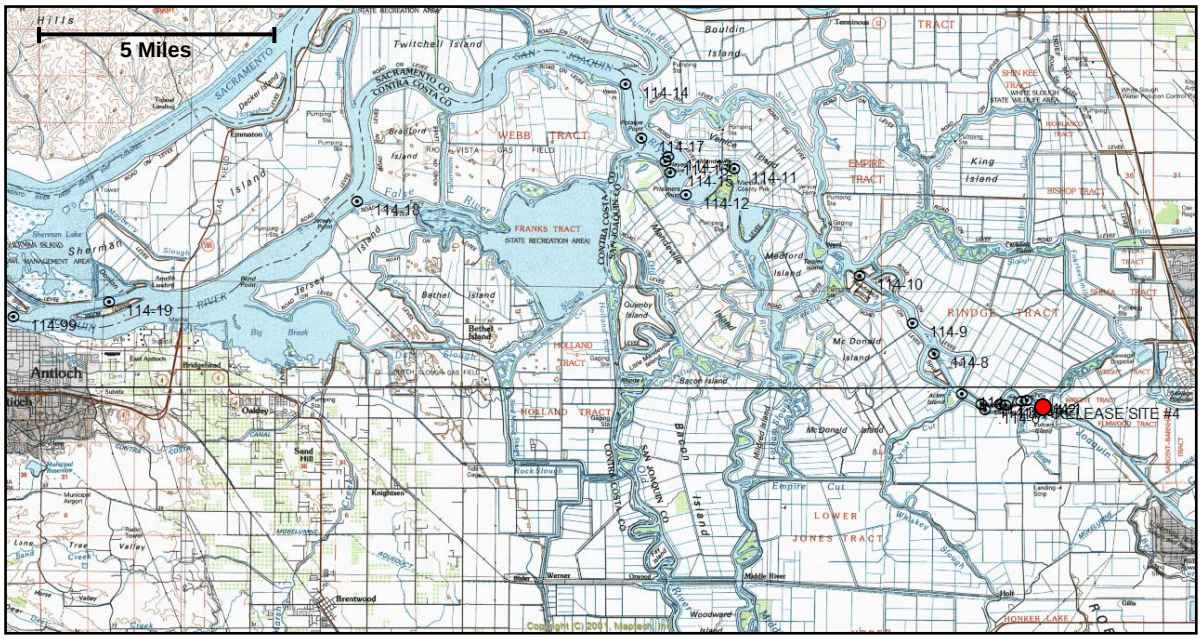
Release 4 – Fish 49.104 MHz – April 23, 2002 at 7:20

.104-1: 4/23/02 at 8:08
.104-2: 4/23/02 at 10:09
.104-3: 4/23/02 at 11:42
.104-4: 4/23/02 at 12:56
.104-5: 4/23/02 at 14:20
.104-6: 4/23/02 at 14:54
.104-7: 4/23/02 at 15:58
.104-8: 4/23/02 at 17:12
.104-99: 4/23/02 at 18:13



Release 4 – Fish 49.095 MHz – April 23, 2002 at 7:20

.095-1: 4/23/02 at 8:29	.095-9: 4/23/02 at 17:02	.095-16: 4/24/02 at 15:27
.095-2: 4/23/02 at 9:16	.095-10: 4/23/02 at 17:48	.095-17: 4/24/02 at 16:04
.095-3: 4/23/02 at 10:24	.095-11: 4/23/02 at 18:27	.095-18: 4/24/02 at 17:18
.095-4: 4/23/02 at 11:47	.095-12: 4/24/02 at 7:45	.095-19: 4/25/02 at 10:23
.095-5: 4/23/02 at 12:49	.095-13: 4/24/02 at 9:38	.095-20: 4/26/02 at 8:45
.095-6: 4/23/02 at 13:53	.095-14: 4/24/02 at 11:19	.095-21: 4/26/02 at 11:21
.095-7: 4/23/02 at 14:46	.095-15: 4/24/02 at 15:01	.095-99: 4/26/02 at 12:21
.095-8: 4/23/02 at 16:03		

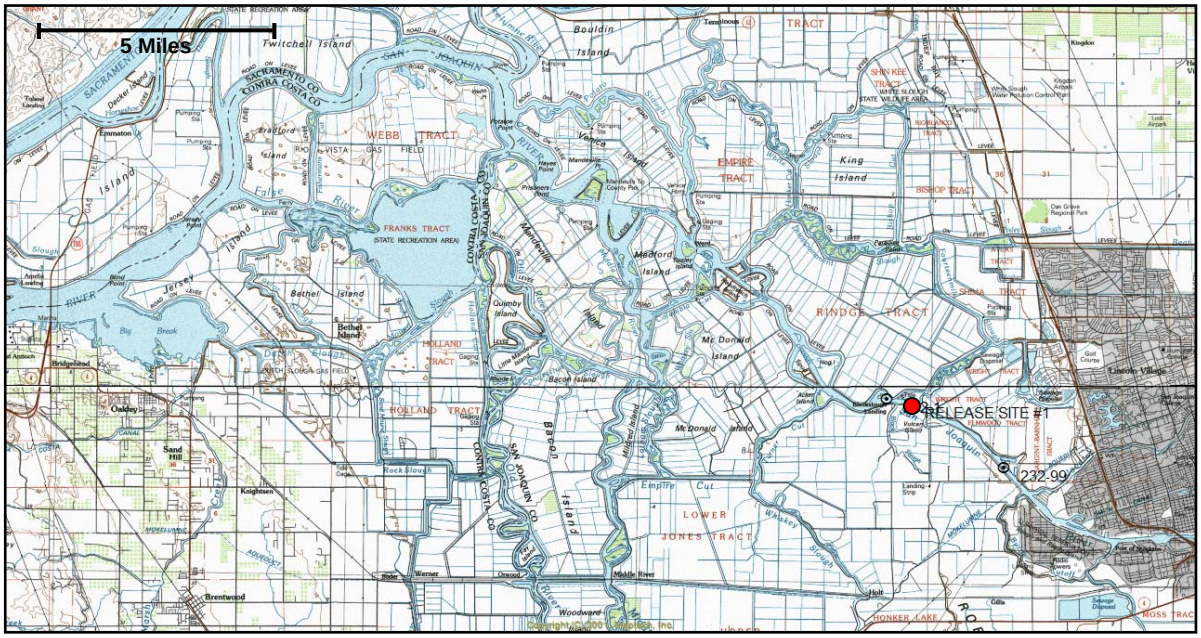


Release 4 – Fish 49.114 MHz – April 23, 2002 at 7:20

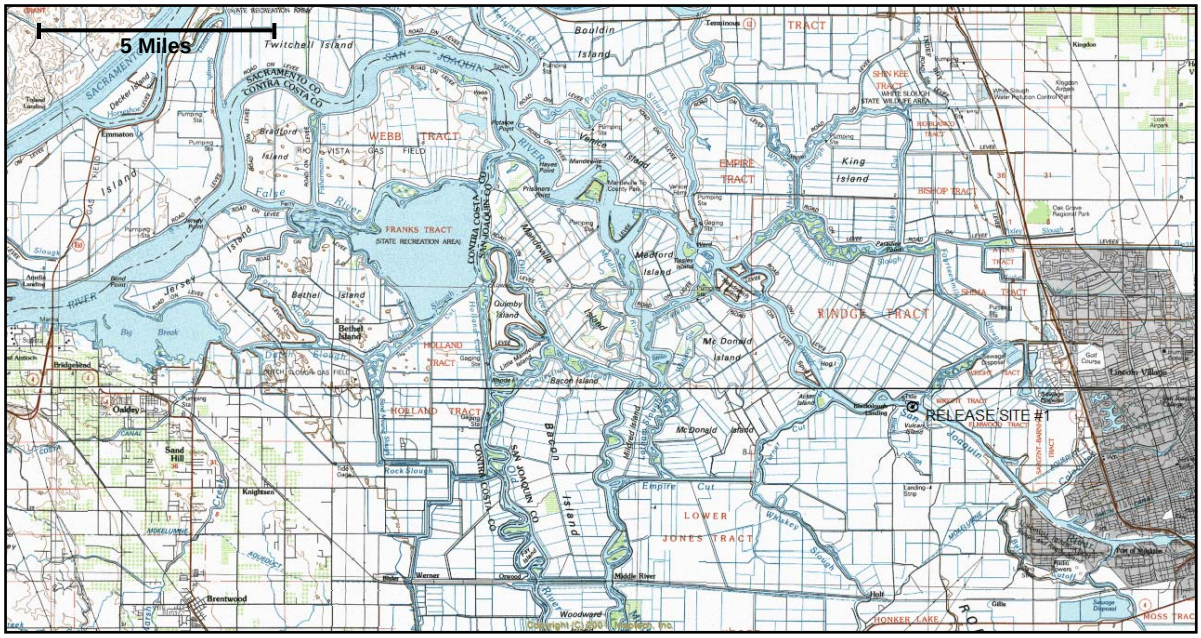
.114-1: 4/23/02 at 8:27	.114-8: 4/23/02 at 16:30	.114-15: 4/24/02 at 14:11
.114-2: 4/23/02 at 8:34	.114-9: 4/23/02 at 17:09	.114-16: 4/24/02 at 17:21
.114-3: 4/23/02 at 10:29	.114-10: 4/23/02 at 18:16	.114-17: 4/24/02 at 17:46
.114-4: 4/23/02 at 12:00	.114-11: 4/24/02 at 8:06	.114-18: 4/25/02 at 10:31
.114-5: 4/23/02 at 13:02	.114-12: 4/24/02 at 9:11	.114-19: 4/26/02 at 8:42
.114-6: 4/23/02 at 14:15	.114-13: 4/24/02 at 9:59	.114-99: 4/26/02 at 9:41
.114-7: 4/23/02 at 15:22	.114-14: 4/24/02 at 11:41	

APPENDIX K

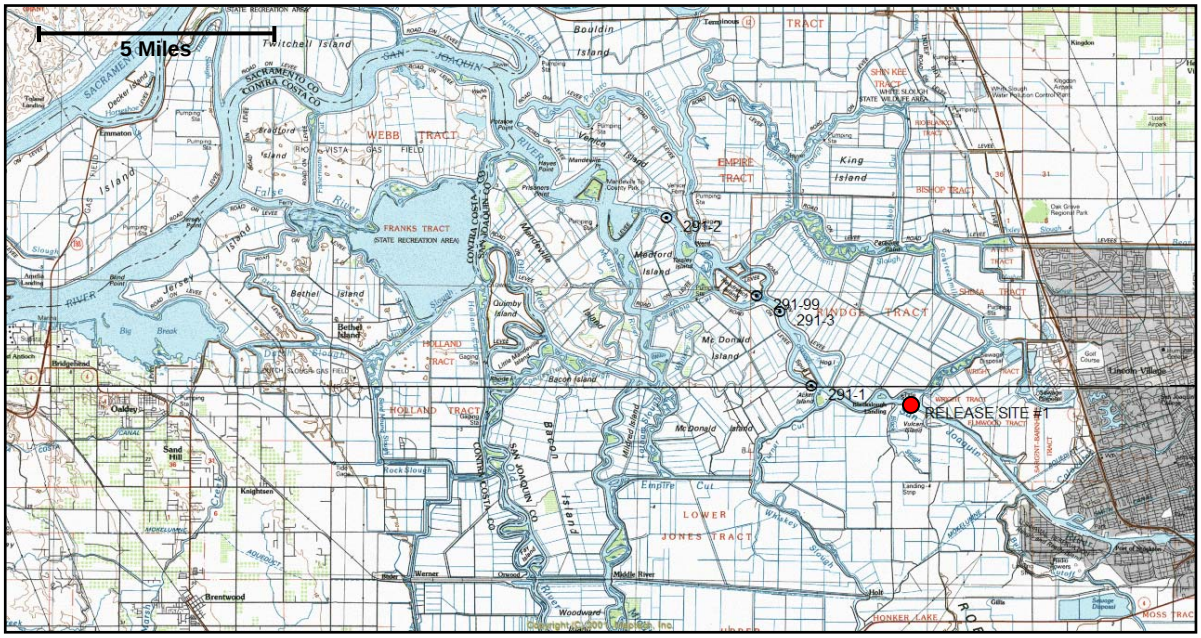
CENTRAL DELTA 2003 TELEMETRY LOCATION MAPS



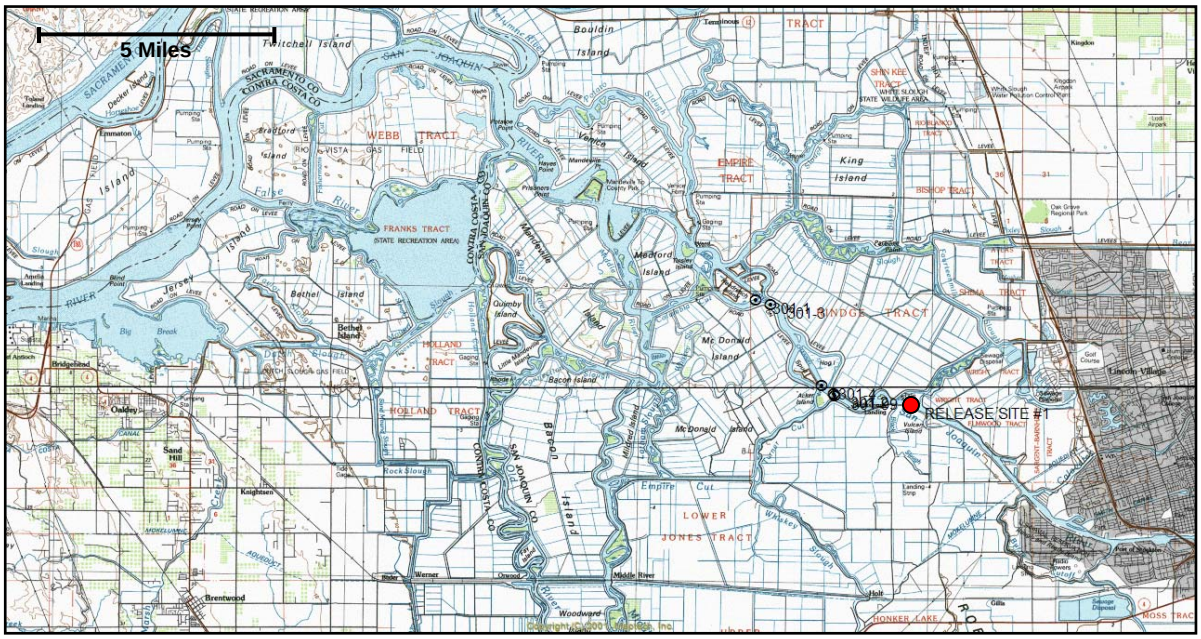
Release 1 – Fish 49.232 MHz – April 8, 2003 at 7:54
.232-1: 4/10/03 at 11:35
.232-99: 4/11/03 at 8:49



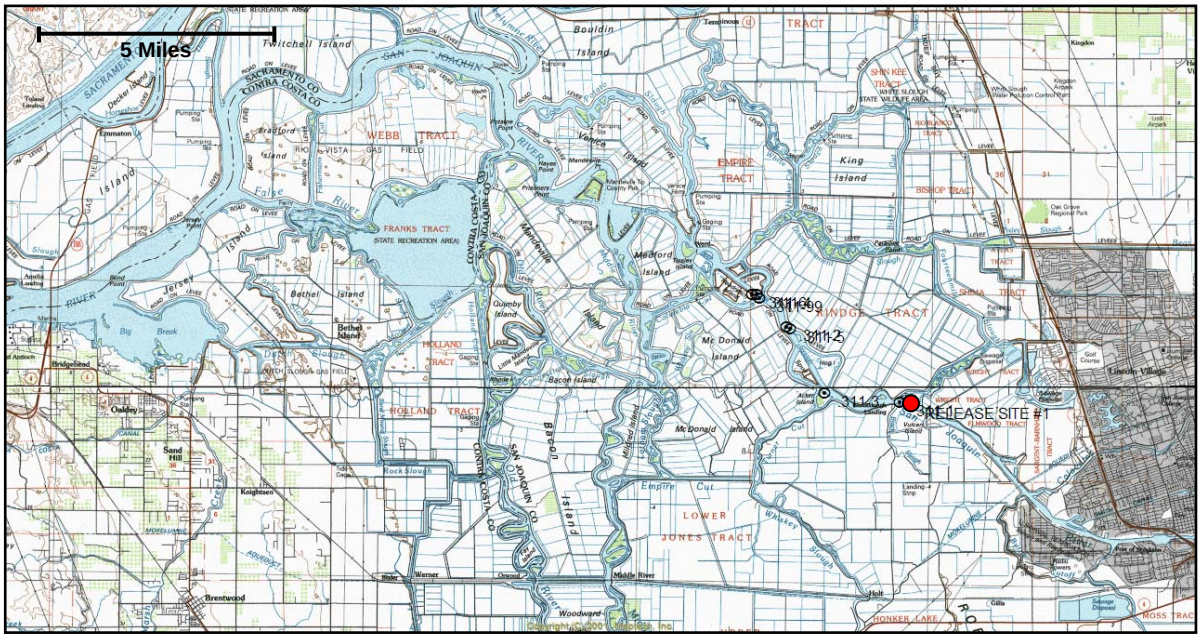
Release 1 – Fish 49.281 MHz – April 8, 2003 at 7:54



Release 1 – Fish 49.291 MHz – April 8, 2003 at 7:54
.291-1: 4/08/03 at 11:58
.291-2: 4/08/03 at 18:25
.291-3: 4/09/03 at 9:49
.291-99: 4/11/03 at 15:52

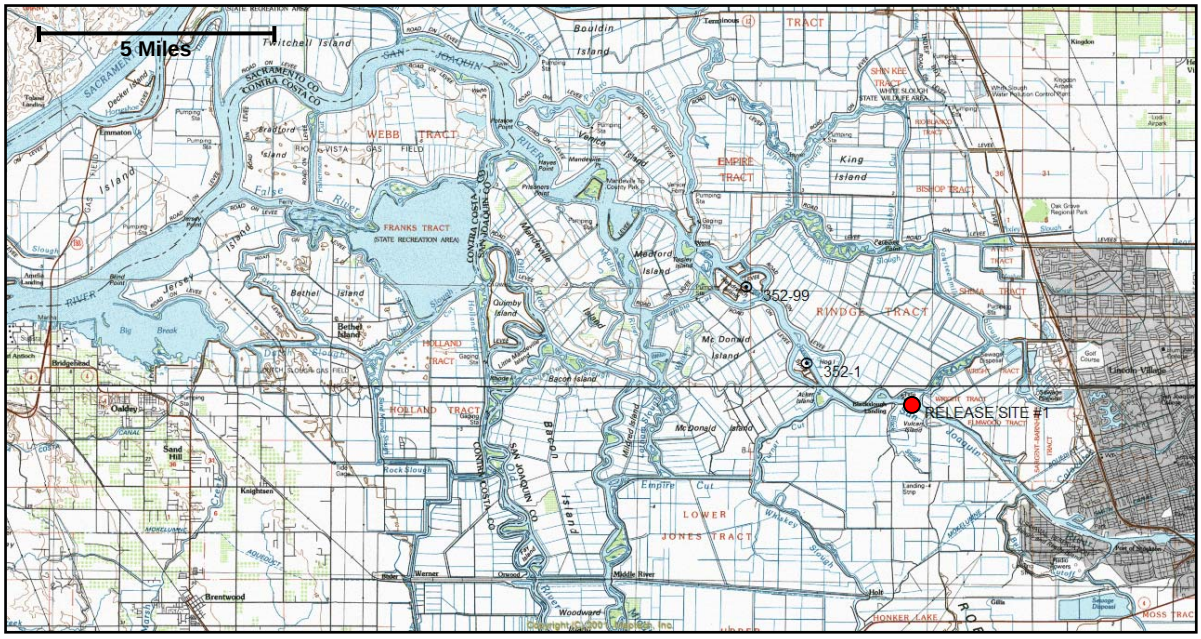


Release 1 – Fish 49.301 MHz – April 8, 2003 at 7:54
.301-1: 4/08/03 at 17:34
.301-2: 4/09/03 at 10:35
.301-3: 4/09/03 at 17:35
.301-4: 4/10/03 at 8:53
.301-99: 4/11/03 at 8:25



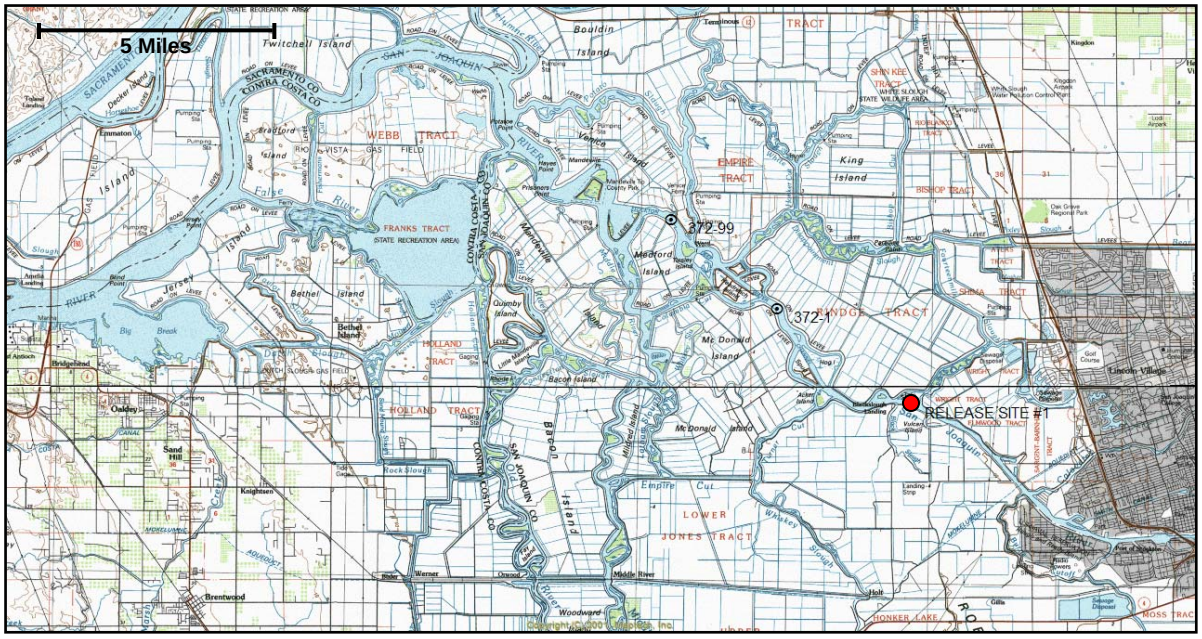
Release 1 – Fish 49.311 MHz – April 8, 2003 at 7:54

.311-1: 4/08/03 at 10:06
.311-2: 4/08/03 at 17:25
.311-3: 4/09/03 at 11:46
.311-4: 4/09/03 at 17:25
.311-5: 4/10/03 at 8:30
.311-6: 4/10/03 at 15:02
.311-99: 4/11/03 at 15:34

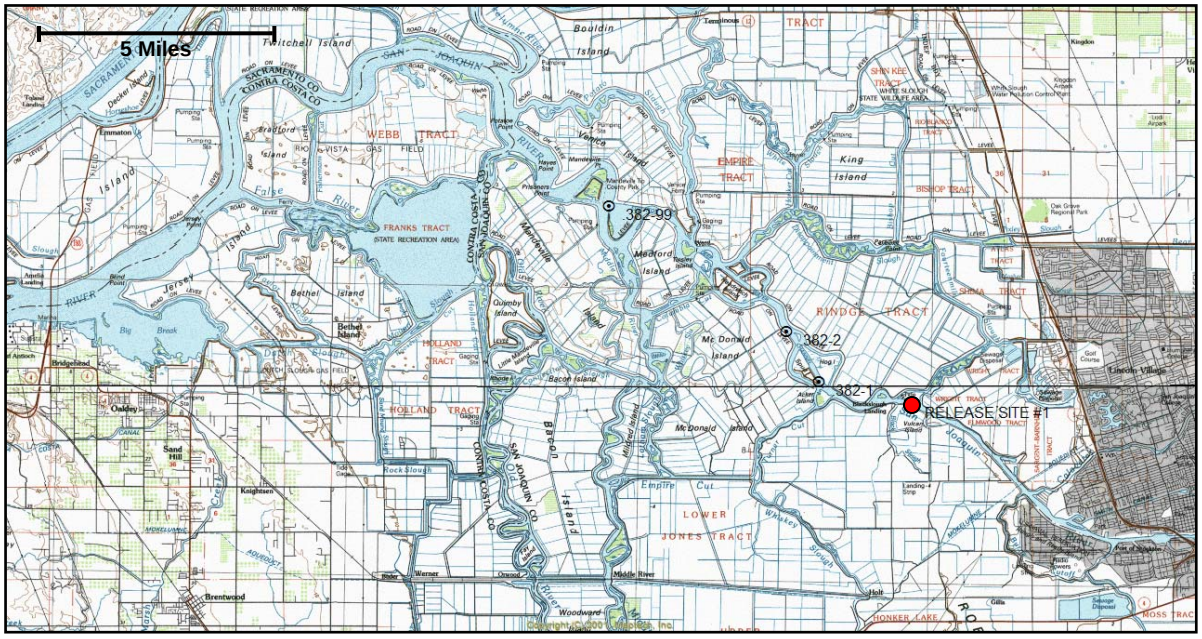


Release 1 – Fish 49.352 MHz – April 8, 2003 at 7:54

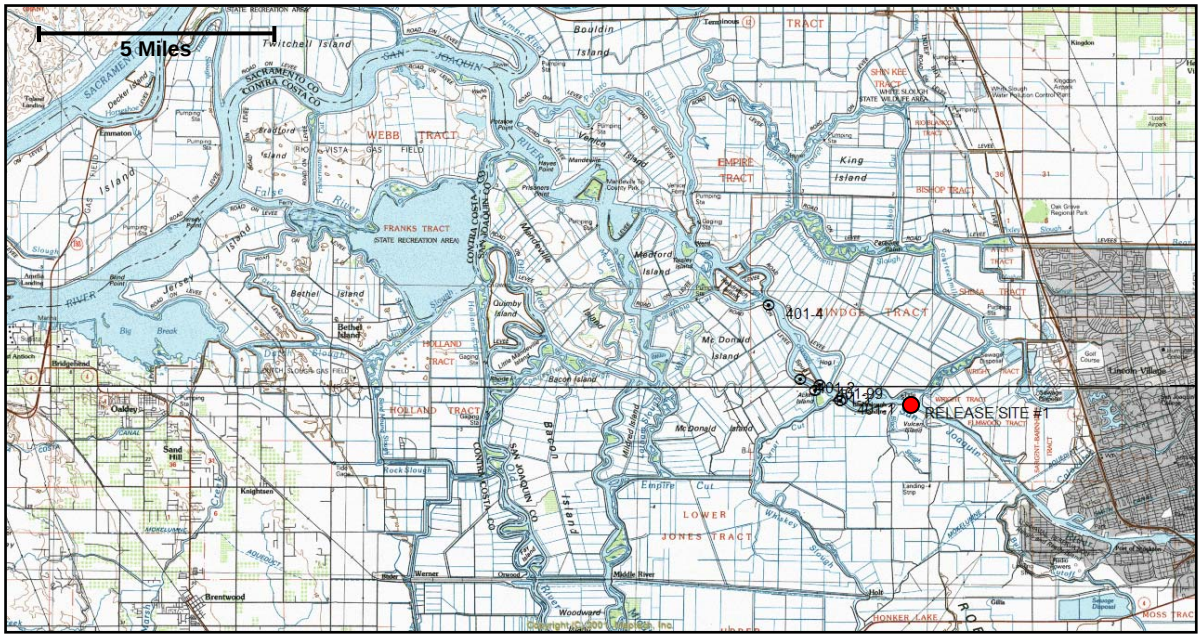
.352-1: 4/08/03 at 12:08
.352-99: 4/09/03 at 9:30



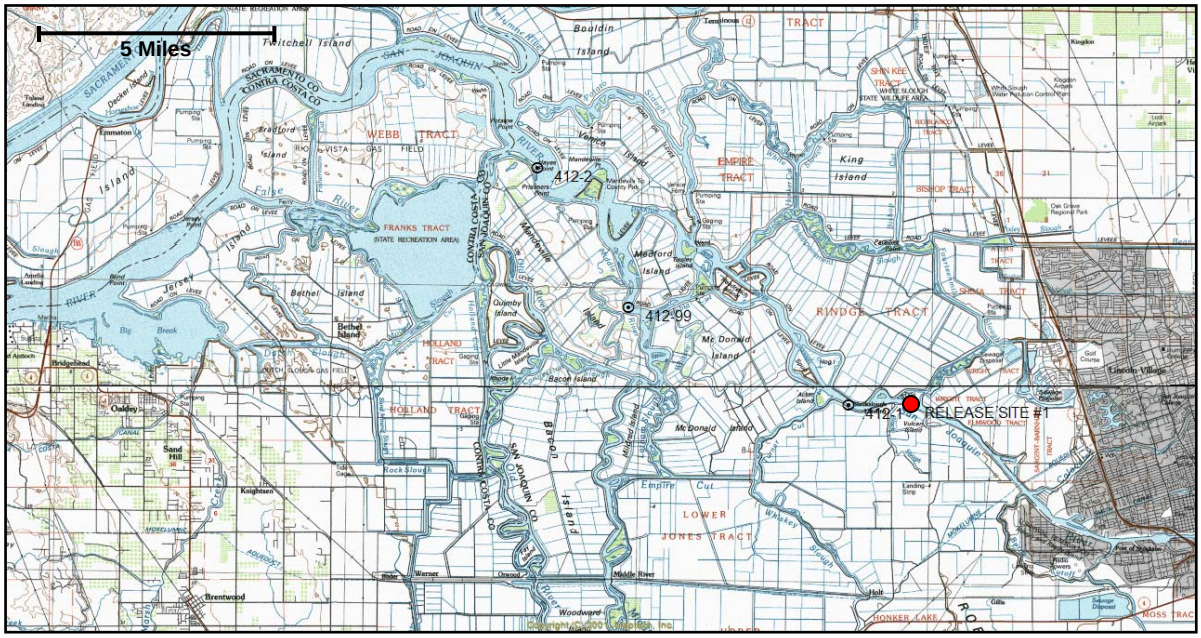
Release 1 – Fish 49.372 MHz – April 8, 2003 at 7:54
.372-1: 4/08/03 at 14:01
.372-99: 4/08/03 at 18:08



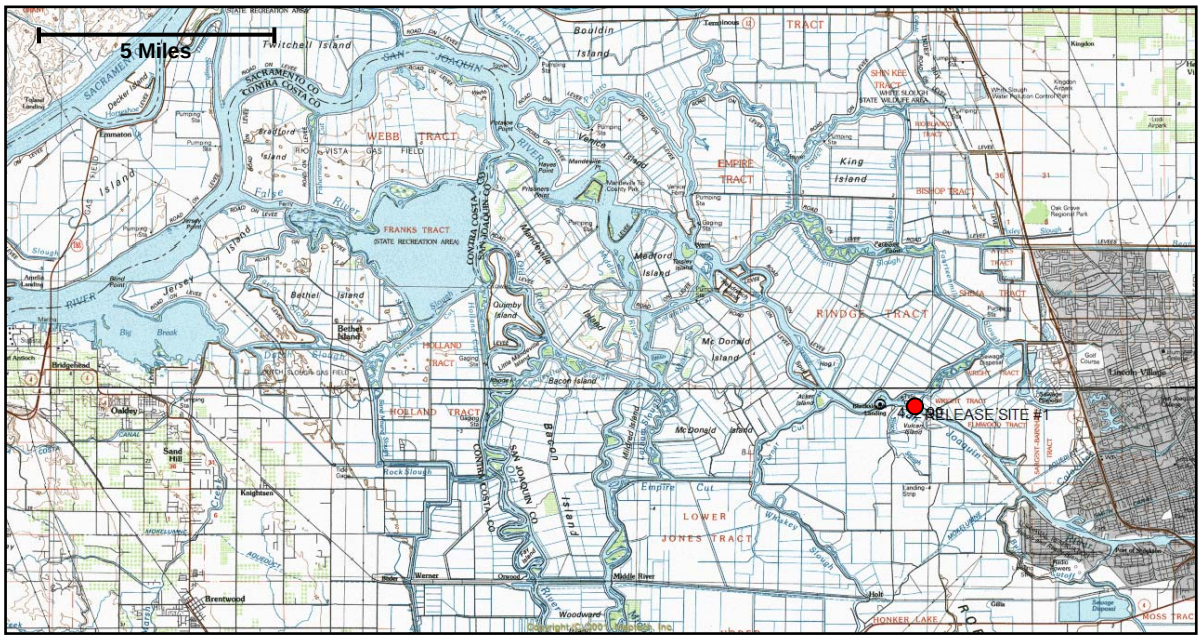
Release 1 – Fish 49.382 MHz – April 8, 2003 at 7:54
.382-1: 4/09/03 at 13:16
.382-2: 4/10/03 at 8:43
.382-99: 4/11/03 at 8:33



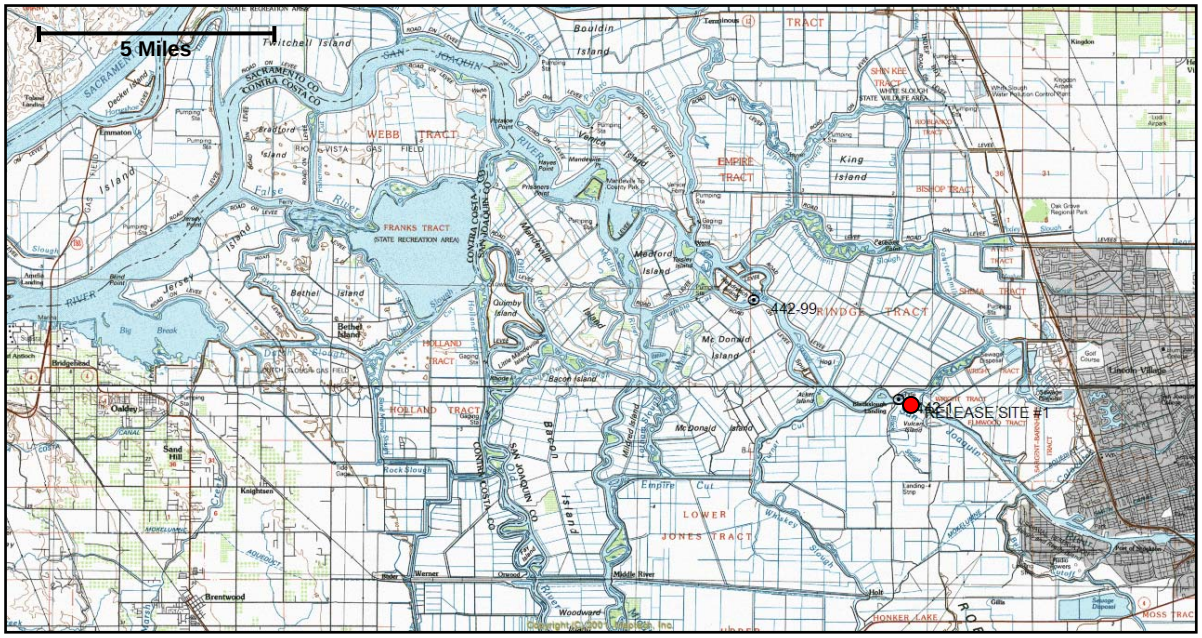
Release 1 – Fish 49.401 MHz – April 8, 2003 at 7:54
.401-1: 4/08/03 at 12:17
.401-2: 4/08/03 at 16:11
.401-3: 4/09/03 at 11:15
.401-4: 4/09/03 at 17:41
.401-99: 4/11/03 at 9:33



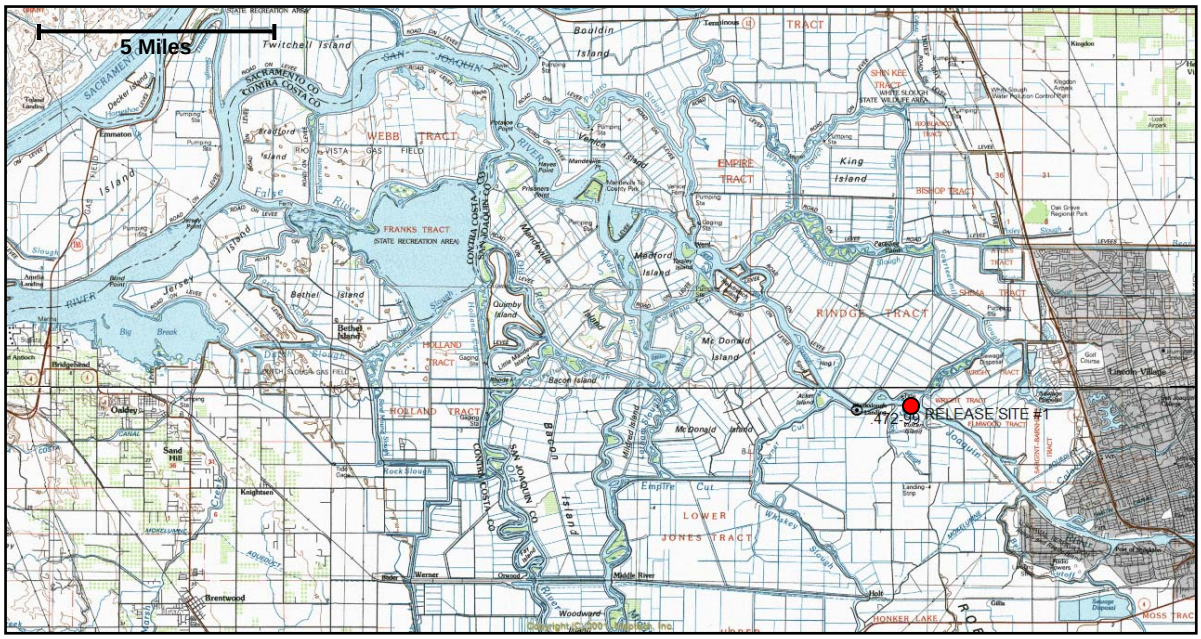
Release 1 – Fish 49.412 MHz – April 8, 2003 at 7:54
.412-1: 4/08/03 at 10:33
.412-2: 4/08/03 at 18:54
.412-99: 4/09/03 at 14:05



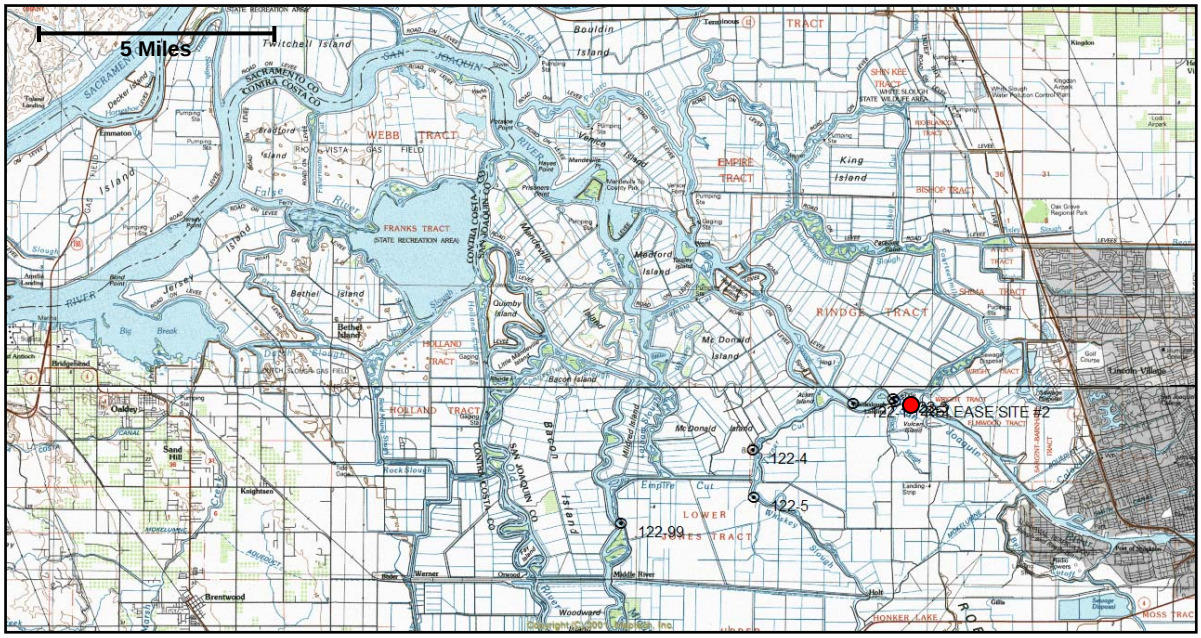
Release 1 – Fish 49.432 MHz – April 8, 2003 at 7:54
.432-99: 4/08/03 at 12:38



Release 1 – Fish 49.442 MHz – April 8, 2003 at 7:54
.442-1: 4/08/03 at 9:56
.442-99: 4/08/03 at 17:37

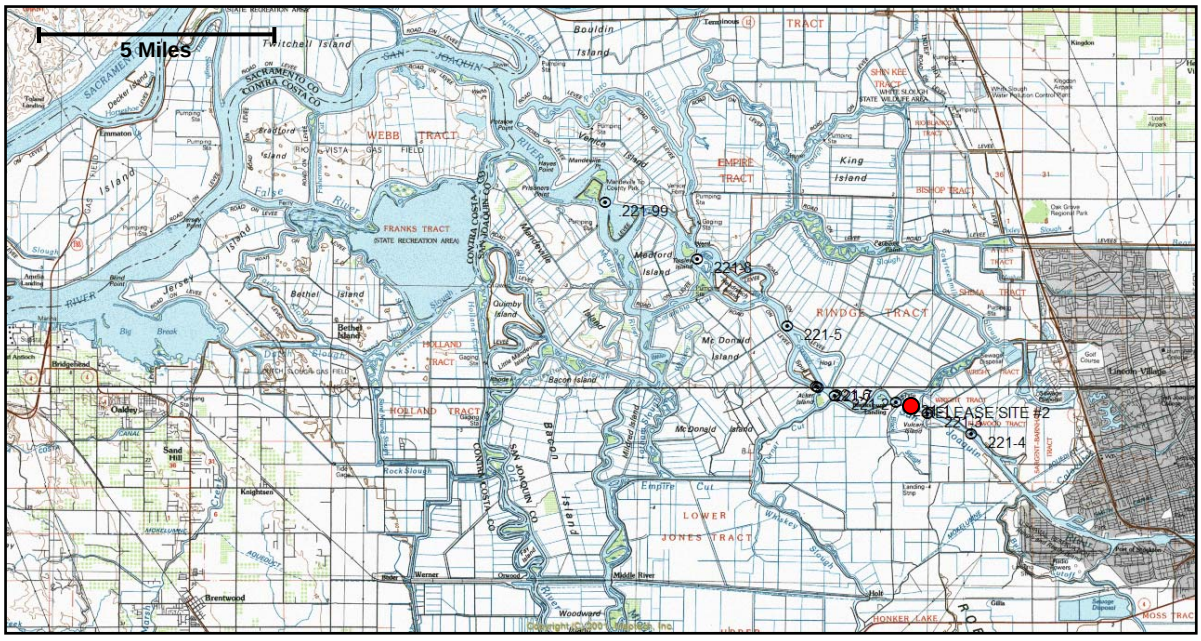


Release 1 – Fish 49.472 MHz – April 8, 2003 at 7:54
.472.99: 4/08/03 at 16:25



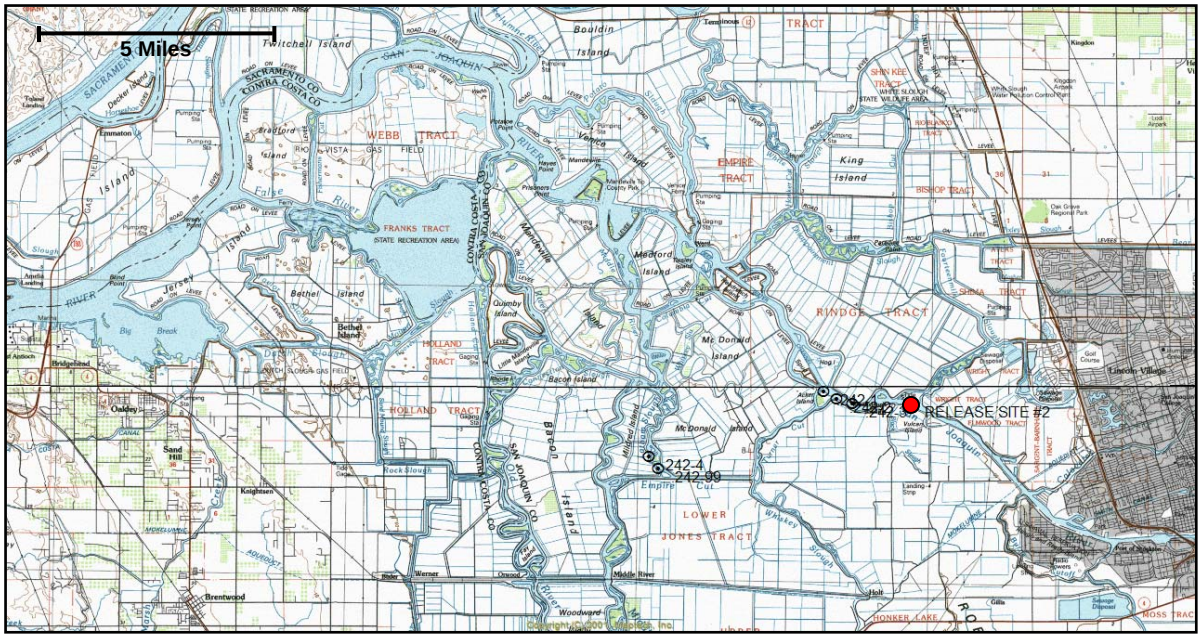
Release 2 – Fish 49.122 MHz – April 15, 2003 at 8:19

.122-1: 4/15/03 at 11:14
.122-2: 4/15/03 at 14:16
.122-3: 4/15/03 at 15:43
.122-4: 4/16/03 at 11:40
.122-5: 4/16/03 at 13:46
.122-99: 4/17/03 at 16:00

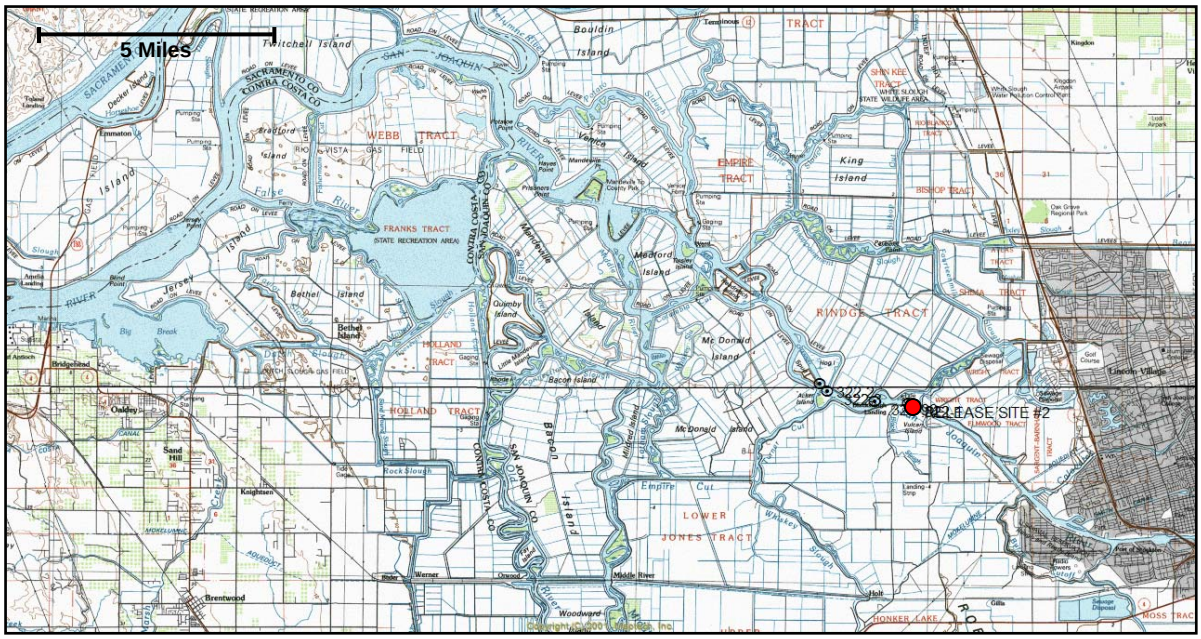


Release 2 – Fish 49.221 MHz – April 15, 2003 at 8:19

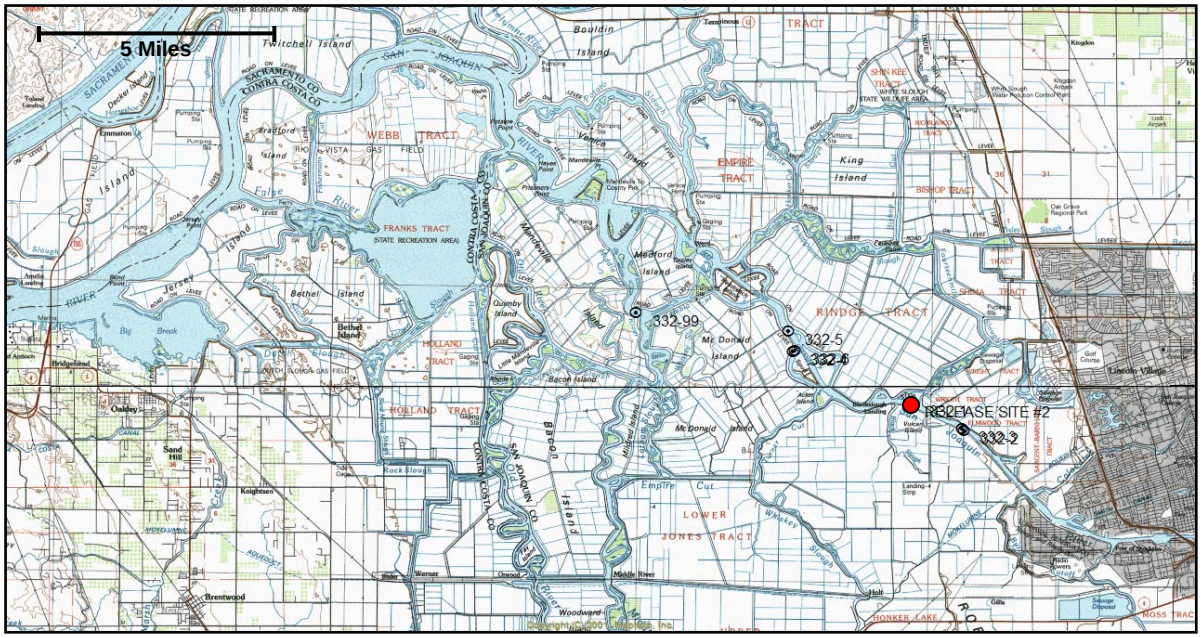
.221-1: 4/15/03 at 9:45
.221-2: 4/15/03 at 13:39
.221-3: 4/15/03 at 16:20
.221-4: 4/16/03 at 8:41
.221-5: 4/16/03 at 15:48
.221-6: 4/16/03 at 18:36
.221-7: 4/17/03 at 8:14
.221-8: 4/17/03 at 18:40
.221-99: 4/18/03 at 11:31



Release 2 – Fish 49.242 MHz – April 15, 2003 at 8:19
.242-1: 4/15/03 at 13:26
.242-2: 4/15/03 at 15:27
.242-3: 4/15/03 at 16:05
.242-4: 4/16/03 at 13:48
.242-99: 4/16/03 at 14:15

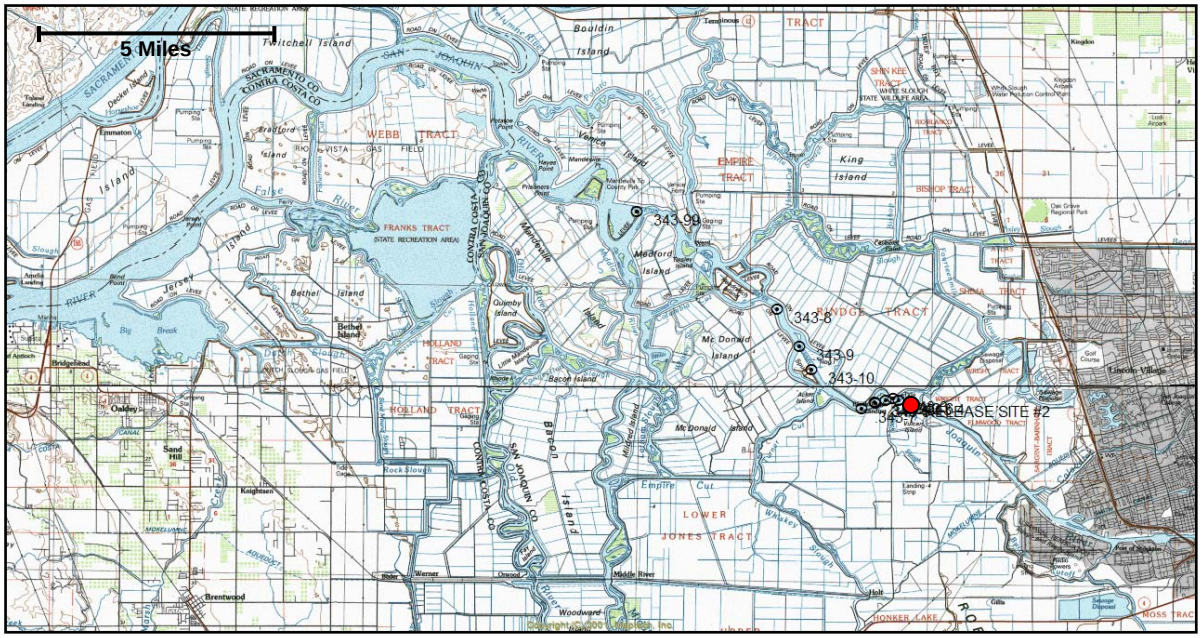


Release 2 – Fish 49.322 MHz – April 15, 2003 at 8:19
.322-1: 4/15/03 at 8:44
.322-2: 4/15/03 at 14:12
.322-3: 4/15/03 at 15:10
.322-99: 4/16/03 at 17:39



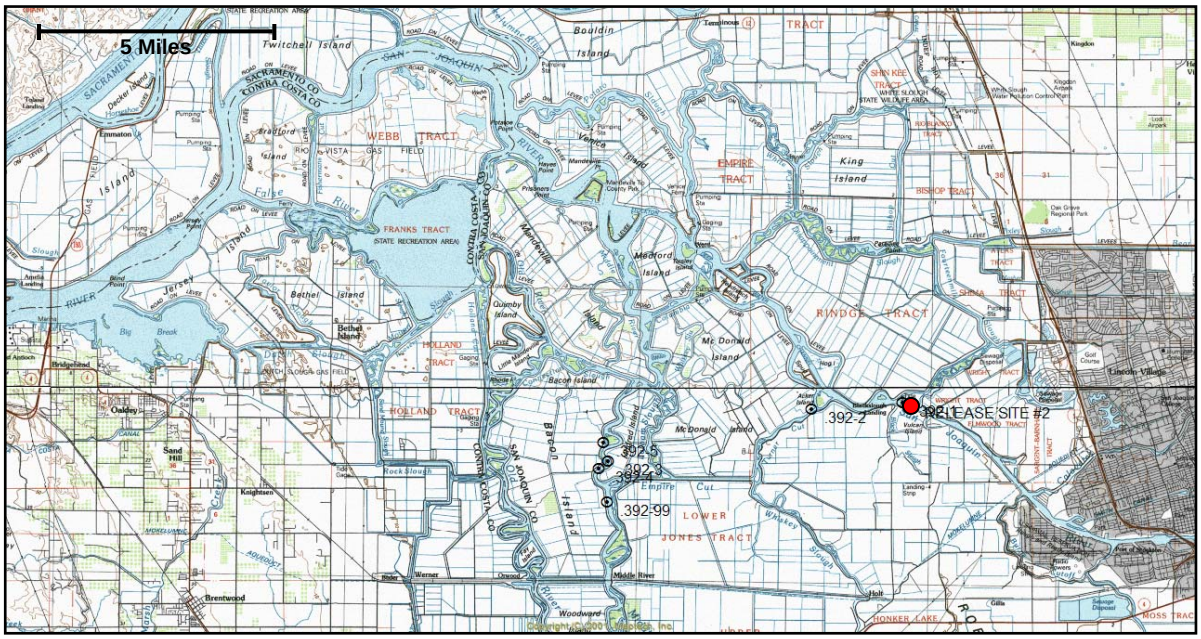
Release 2 – Fish 49.332 MHz – April 15, 2003 at 8:19

.332-1: 4/15/03 at 9:25
.332-2: 4/15/03 at 14:24
.332-3: 4/15/03 at 16:32
.332-4: 4/16/03 at 10:34
.332-5: 4/16/03 at 15:45
.332-6: 4/16/03 at 18:42
.332-99: 4/17/03 at 9:12



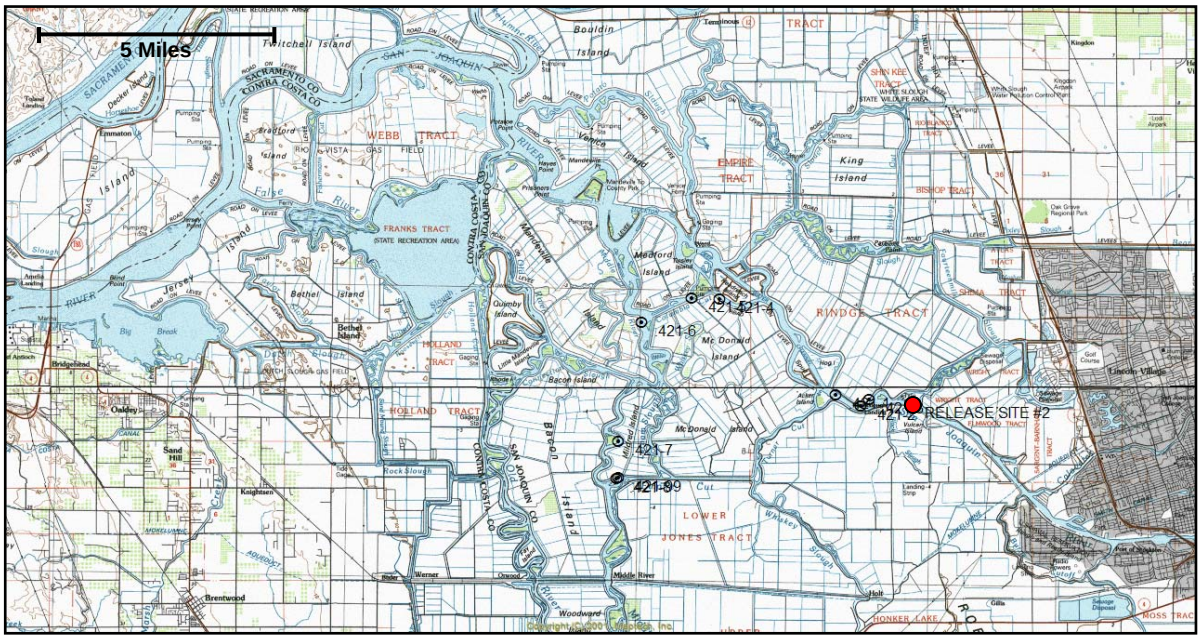
Release 2 – Fish 49.343 MHz – April 15, 2003 at 8:19

.343-1: 4/15/03 at 10:00
.343-2: 4/15/03 at 14:13
.343-3: 4/15/03 at 15:46
.343-4: 4/15/03 at 17:20
.343-5: 4/16/03 at 15:21
.343-6: 4/16/03 at 17:25
.343-7: 4/17/03 at 8:27
.343-8: 4/17/03 at 12:45
.343-9: 4/17/03 at 17:55
.343-10: 4/18/03 at 7:45
.343-99: 4/18/03 at 15:32



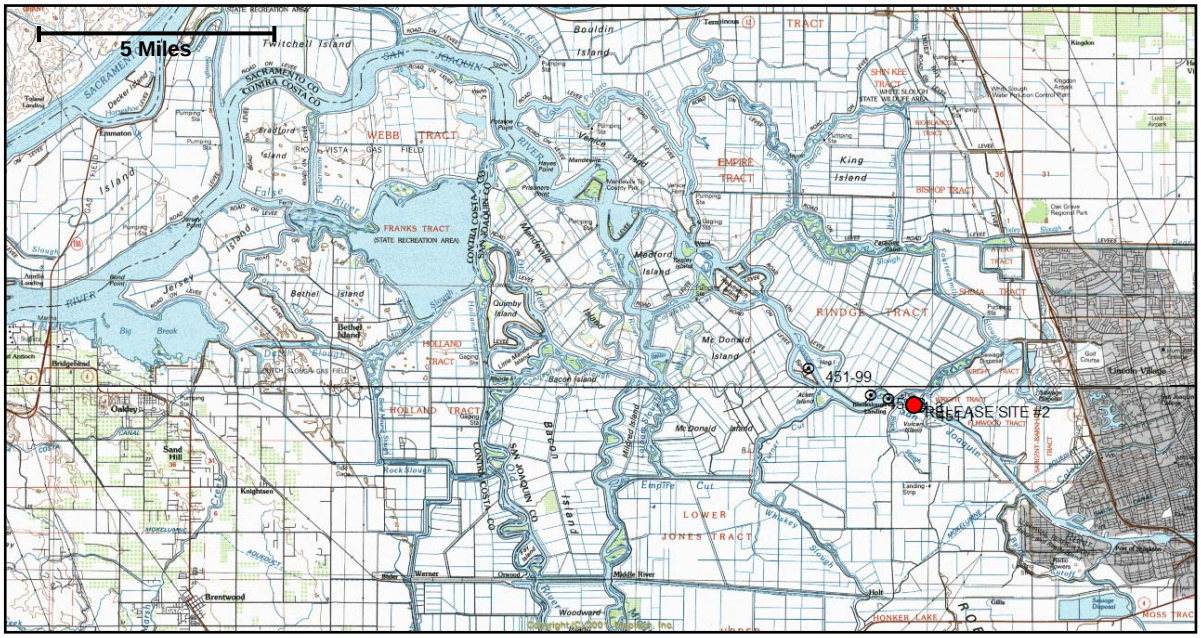
Release 2 – Fish 49.392 MHz – April 15, 2003 at 8:19

.392-1: 4/15/03 at 8:51
.392-2: 4/15/03 at 14:27
.392-3: 4/16/03 at 17:21
.392-4: 4/17/03 at 9:24
.392-5: 4/17/03 at 15:28
.392-99: 4/17/03 at 17:45

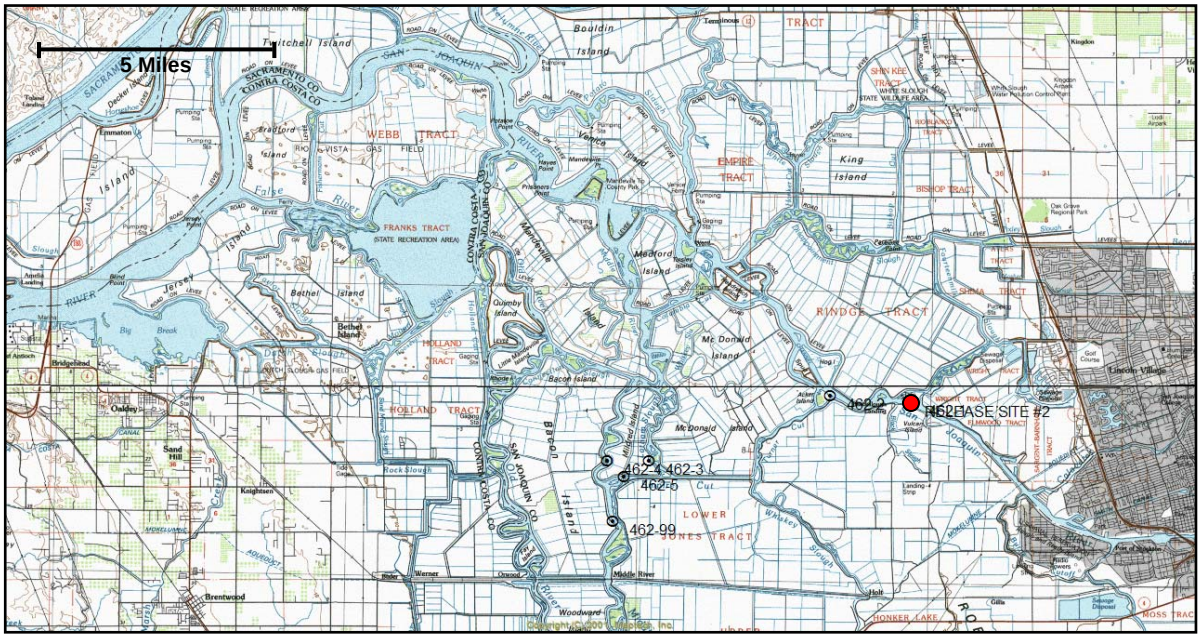


Release 2 – Fish 49. 421 MHz – April 15, 2003 at 8:19

.421-1: 4/15/03 at 13:34
.421-2: 4/15/03 at 16:15
.421-3: 4/15/03 at 17:41
.421-4: 4/16/03 at 10:13
.421-5: 4/16/03 at 14:30
.421-6: 4/16/03 at 18:11
.421-7: 4/17/03 at 9:42
.421-8: 4/17/03 at 14:23
.421-99: 4/17/03 at 17:56

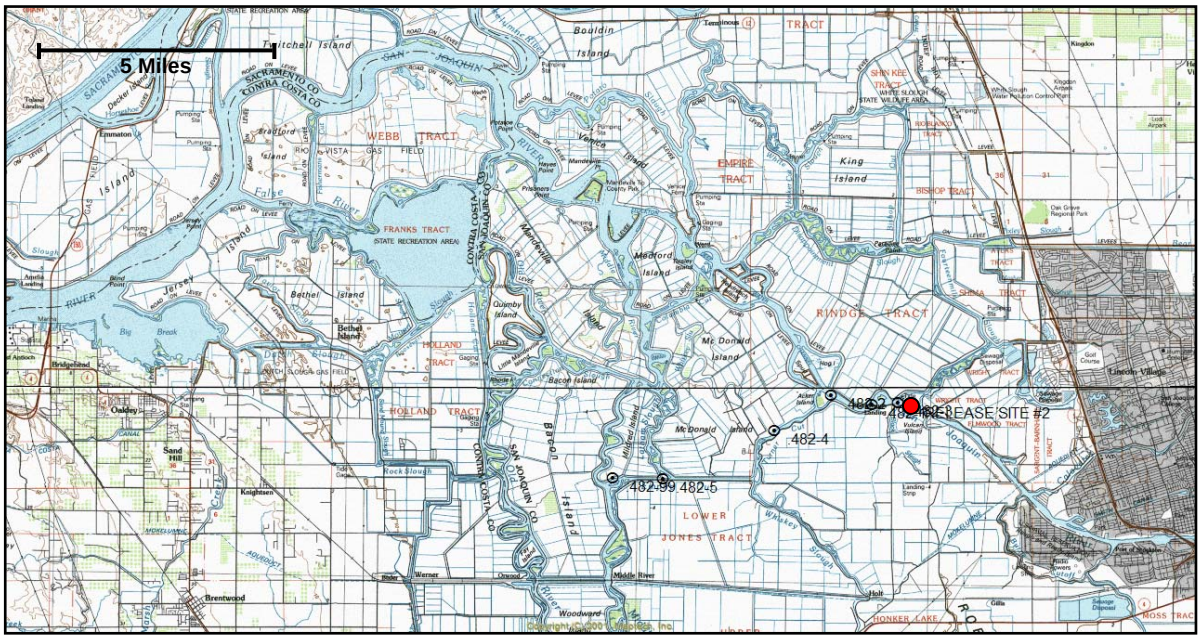


Release 2 – Fish 49.451 MHz – April 15, 2003 at 8:19
.451-1: 4/15/03 at 9:50
.451-2: 4/15/03 at 14:18
.451-3: 4/15/03 at 15:38
.451-99: 4/18/03 at 16:30



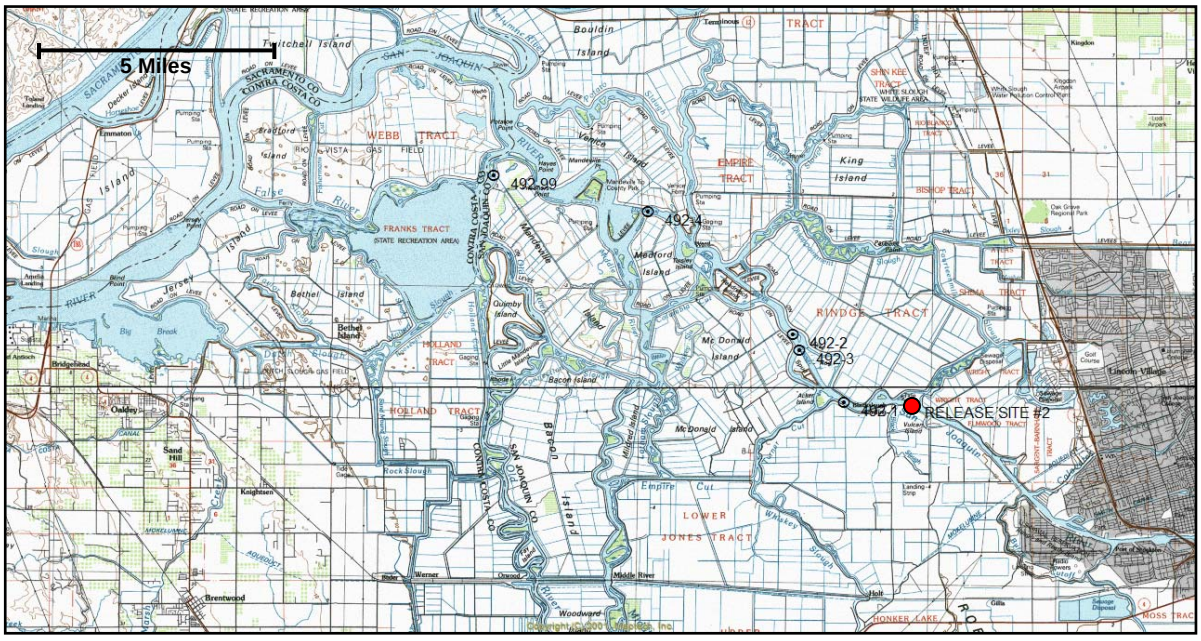
Release 2 – Fish 49. 462 MHz – April 15, 2003 at 8:19

.462-1: 4/15/03 at 9:12	.462-4: 4/16/03 at 17:29
.462-2: 4/15/03 at 14:03	.462-5: 4/17/03 at 14:27
.462-3: 4/16/03 at 13:54	.462-99: 4/17/03 at 17:40



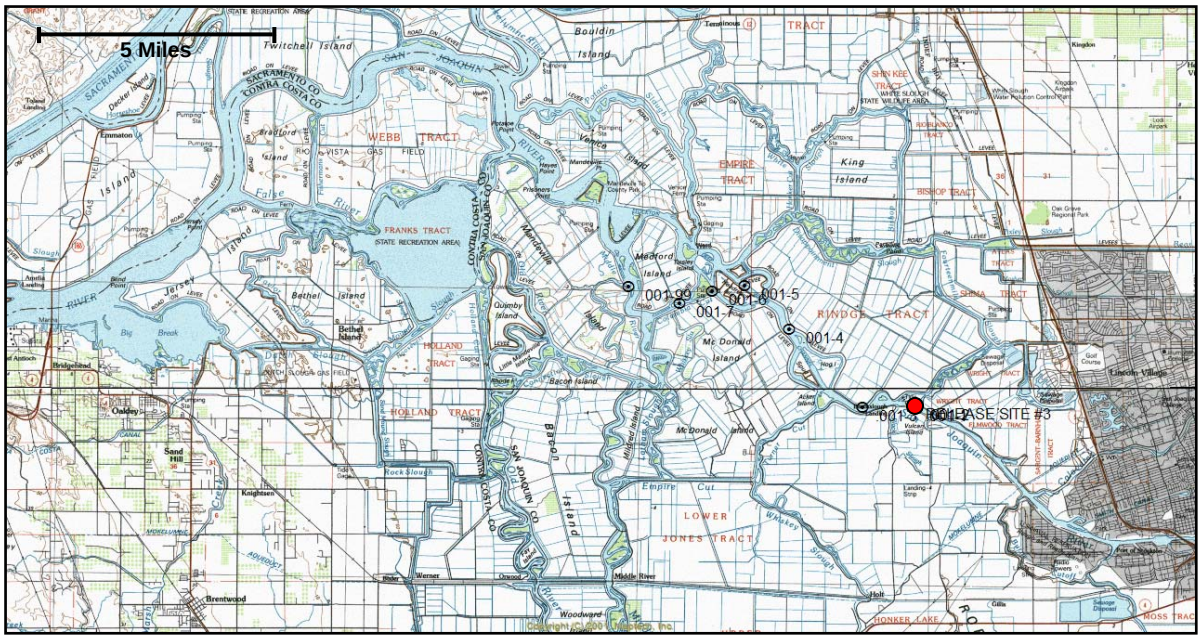
Release 2 – Fish 49.482 MHz – April 15, 2003 at 8:19

.482-1: 4/15/03 at 10:18	.482-4: 4/16/03 at 11:27
.482-2: 4/15/03 at 13:52	.482-5: 4/16/03 at 17:57
.482-3: 4/15/03 at 15:53	.482-99: 4/17/03 at 14:34



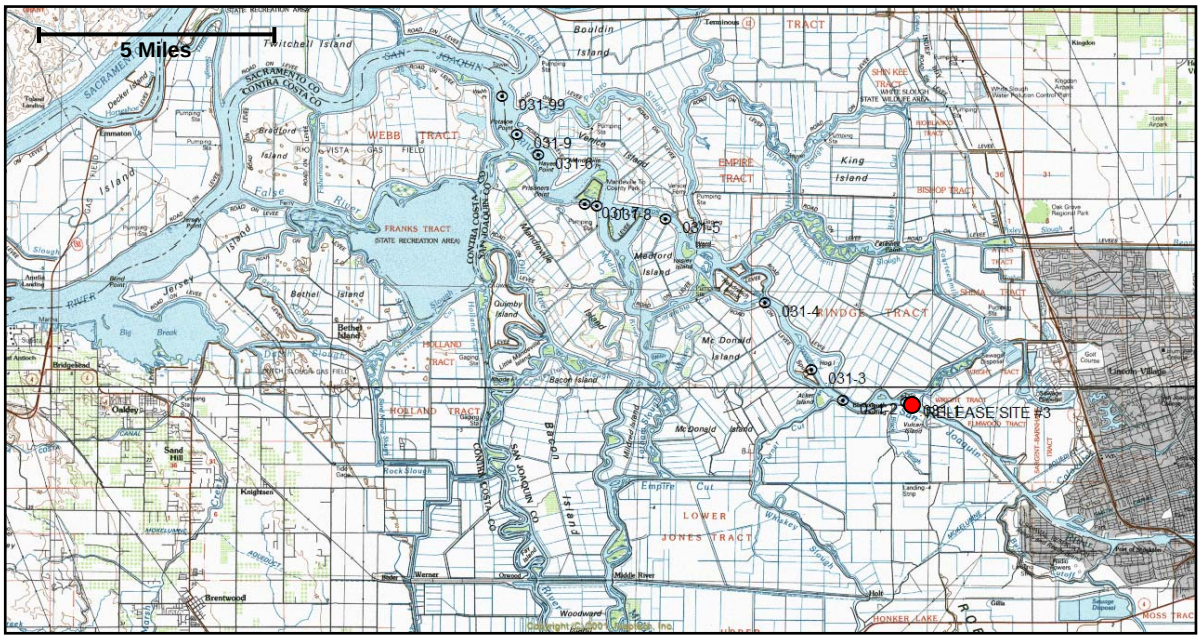
Release 2 – Fish 49. 492 MHz – April 15, 2003 at 8:19

.492-1: 4/15/03 at 10:34	.492-4: 4/16/03 at 8:15
.492-2: 4/15/03 at 14:01	.492-99: 4/16/03 at 15:52
.492-3: 4/15/03 at 15:45	



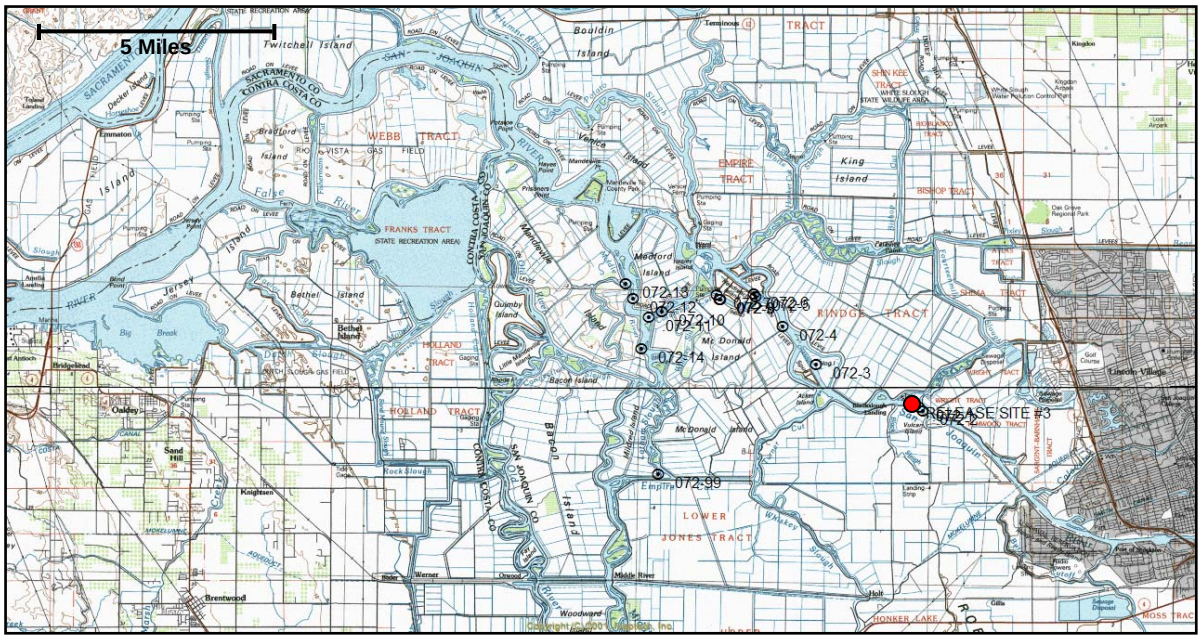
Release 3 – Fish 49.001 MHz – April 22, 2003 at 8:27

.001-1: 4/22/03 at 9:41	.001-5: 4/22/03 at 18:21
.001-2: 4/22/03 at 11:03	.001-6: 4/23/03 at 10:41
.001-3: 4/22/03 at 14:06	.001-7: 4/23/03 at 11:48
.001-4: 4/22/03 at 16:58	.001-99: 4/23/03 at 14:01



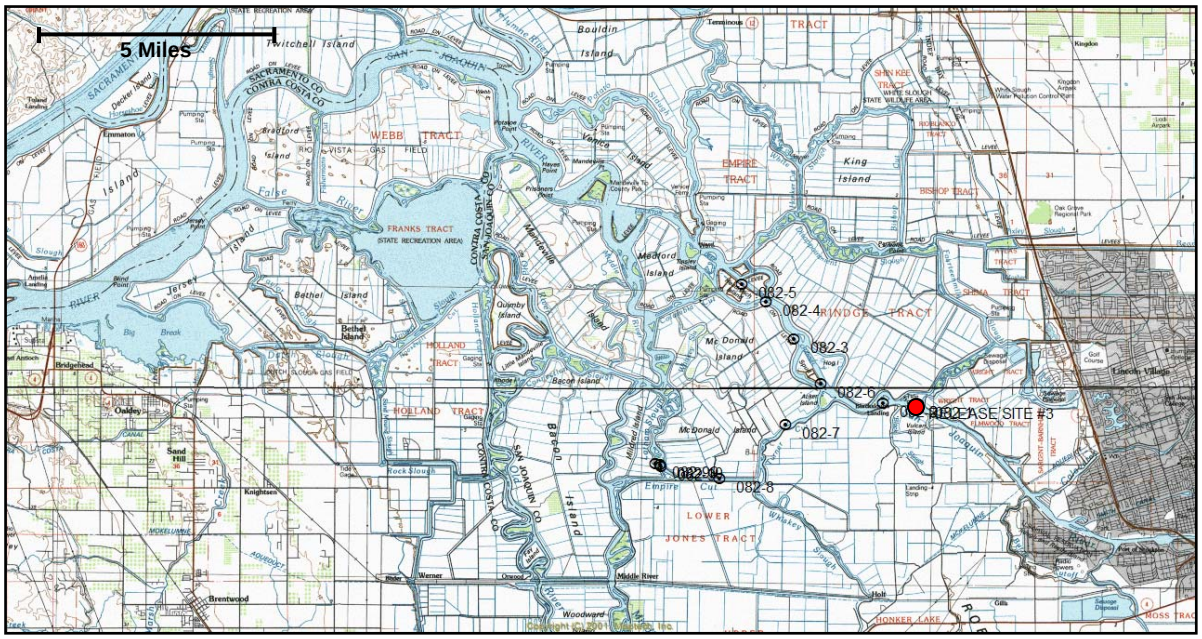
Release 3 – Fish 49.031 MHz – April 22, 2003 at 8:27

.031-1: 4/22/03 at 9:02	.031-6: 4/22/03 at 17:26
.031-2: 4/22/03 at 11:03	.031-7: 4/23/03 at 8:33
.031-3: 4/22/03 at 11:40	.031-8: 4/23/03 at 11:32
.031-4: 4/22/03 at 13:18	.031-9: 4/23/03 at 15:13
.031-5: 4/22/03 at 15:13	.031-99: 4/24/03 at 13:36



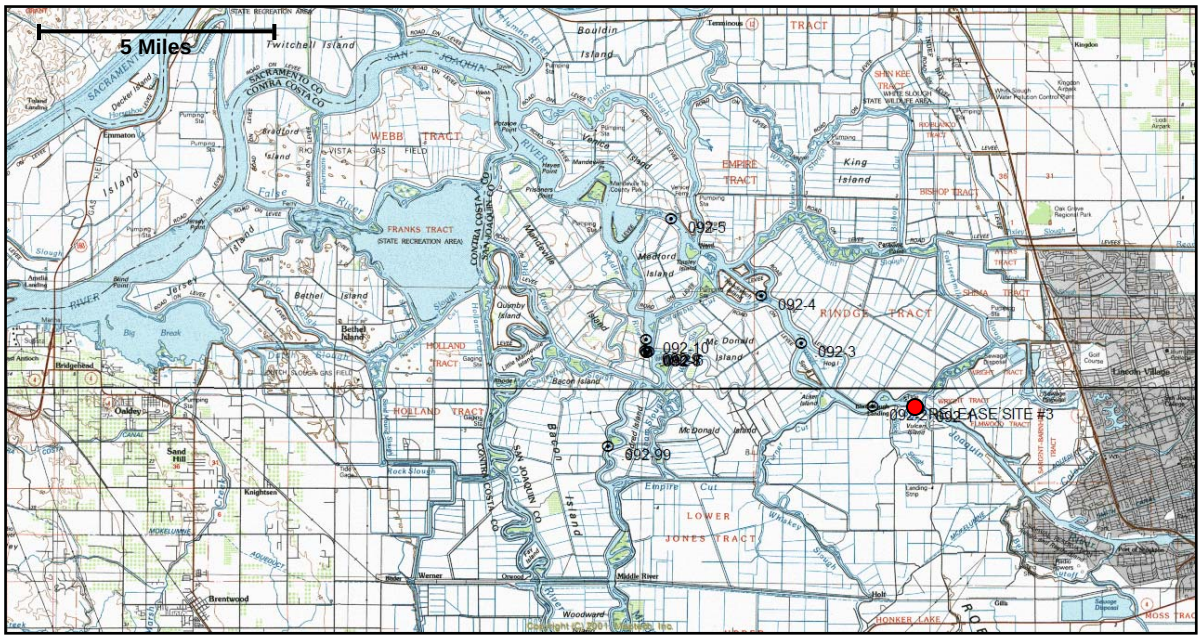
Release 3 – Fish 49.072 MHz – April 22, 2003 at 8:27

.072-1: 4/22/03 at 10:07	.072-6: 4/22/03 at 18:13	.072-11: 4/24/03 at 9:46
.072-2: 4/22/03 at 10:20	.072-7: 4/23/03 at 9:19	.072-12: 4/24/03 at 14:53
.072-3: 4/22/03 at 14:00	.072-8: 4/23/03 at 10:46	.072-13: 4/24/03 at 17:39
.072-4: 4/22/03 at 15:47	.072-9: 4/23/03 at 11:07	.072-14: 4/25/03 at 9:02
.072-5: 4/22/03 at 18:12	.072-10: 4/23/03 at 13:23	.072-99: 4/25/03 at 13:57



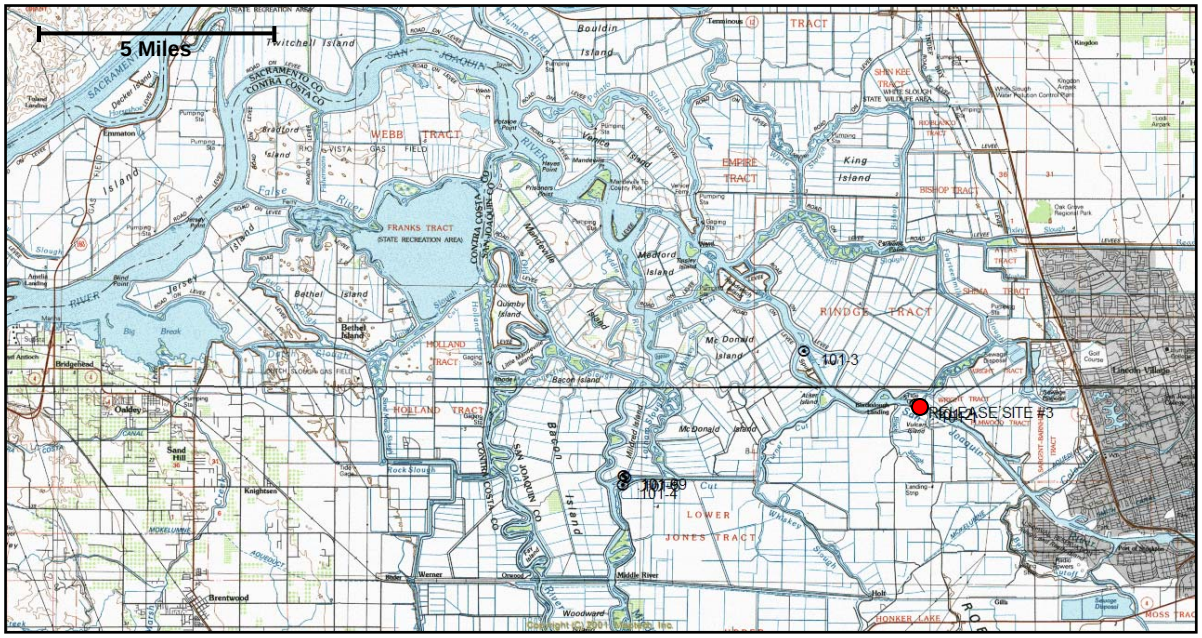
Release 3 – Fish 49.082 MHz – April 22, 2003 at 8:27

.082-1: 4/22/03 at 9:15	.082-7: 4/23/03 at 11:32
.082-2: 4/22/03 at 10:53	.082-8: 4/23/03 at 13:56
.082-3: 4/22/03 at 13:19	.082-9: 4/23/03 at 17:43
.082-4: 4/22/03 at 15:23	.082-10: 4/24/03 at 9:20
.082-5: 4/22/03 at 17:41	.082-99: 4/24/03 at 15:20
.082-6: 4/23/03 at 8:12	



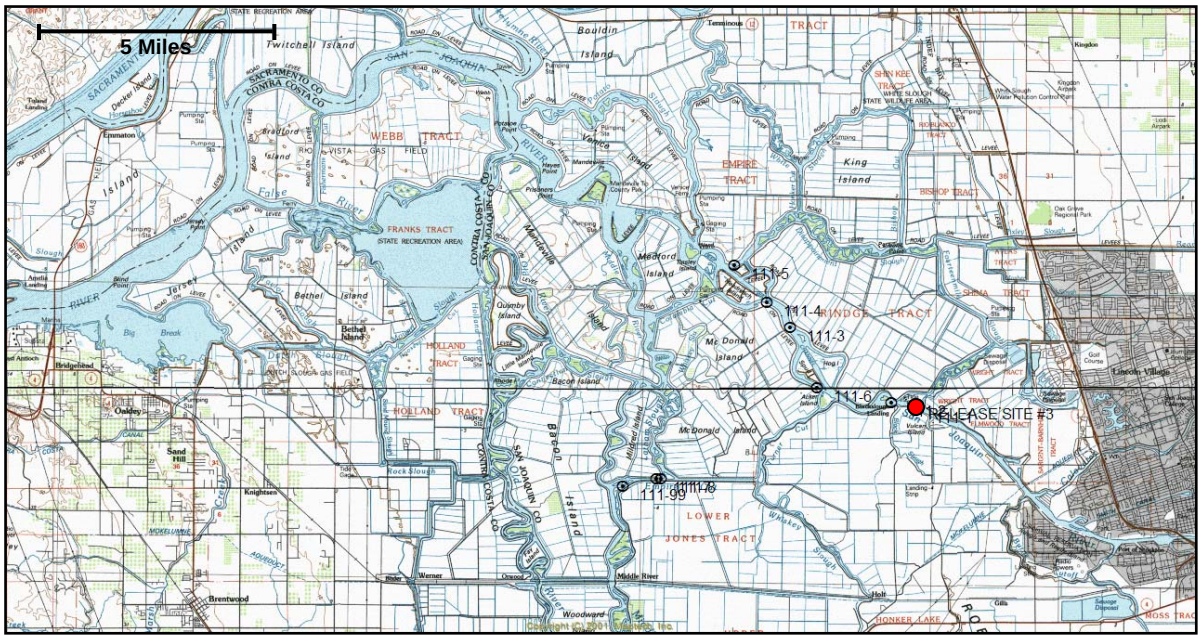
Release 3 – Fish 49.092 MHz – April 22, 2003 at 8:27

.092-1: 4/22/03 at 9:37
.092-2: 4/22/03 at 10:57
.092-3: 4/22/03 at 13:37
.092-4: 4/22/03 at 15:28
.092-5: 4/22/03 at 17:57
.092-6: 4/23/03 at 10:18
.092-7: 4/23/03 at 13:32
.092-8: 4/23/03 at 14:40
.092-9: 4/23/03 at 16:30
.092-10: 4/23/03 at 17:52
.092-99: 4/25/03 at 9:55



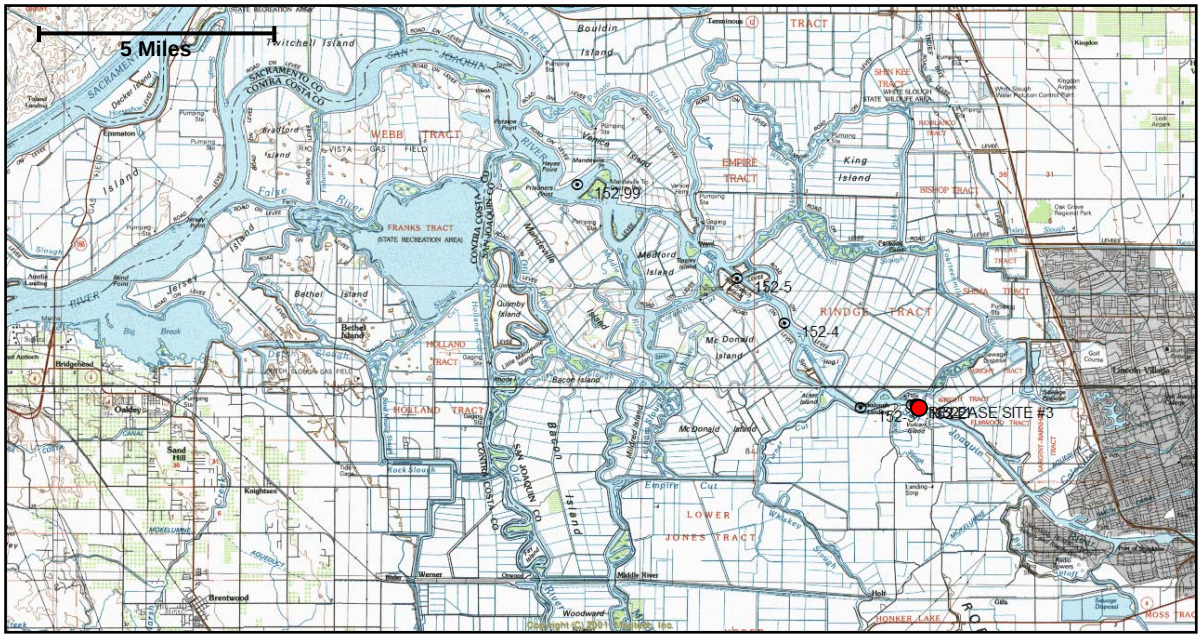
Release 3 – Fish 49.101 MHz – April 22, 2003 at 8:27

.101-1: 4/22/03 at 9:56
.101-2: 4/22/03 at 10:43
.101-3: 4/22/03 at 13:27
.101-4: 4/23/03 at 10:00
.101-5: 4/23/03 at 14:13
.101-6: 4/23/03 at 17:11
.101-99: 4/24/03 at 15:31



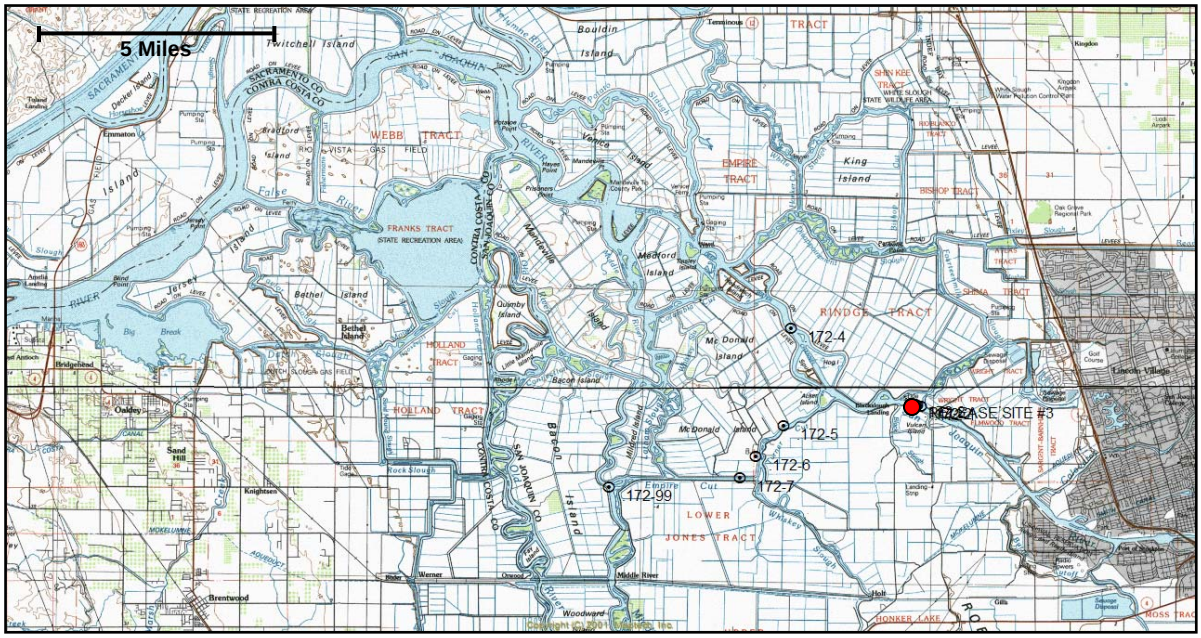
Release 3 – Fish 49.111 MHz – April 22, 2003 at 8:27

.111-1: 4/22/03 at 9:46
.111-2: 4/22/03 at 10:48
.111-3: 4/22/03 at 13:47
.111-4: 4/22/03 at 15:47
.111-5: 4/22/03 at 18:27
.111-6: 4/23/03 at 9:00
.111-7: 4/23/03 at 16:54
.111-8: 4/23/03 at 17:28
.111-99: 4/24/03 at 13:59



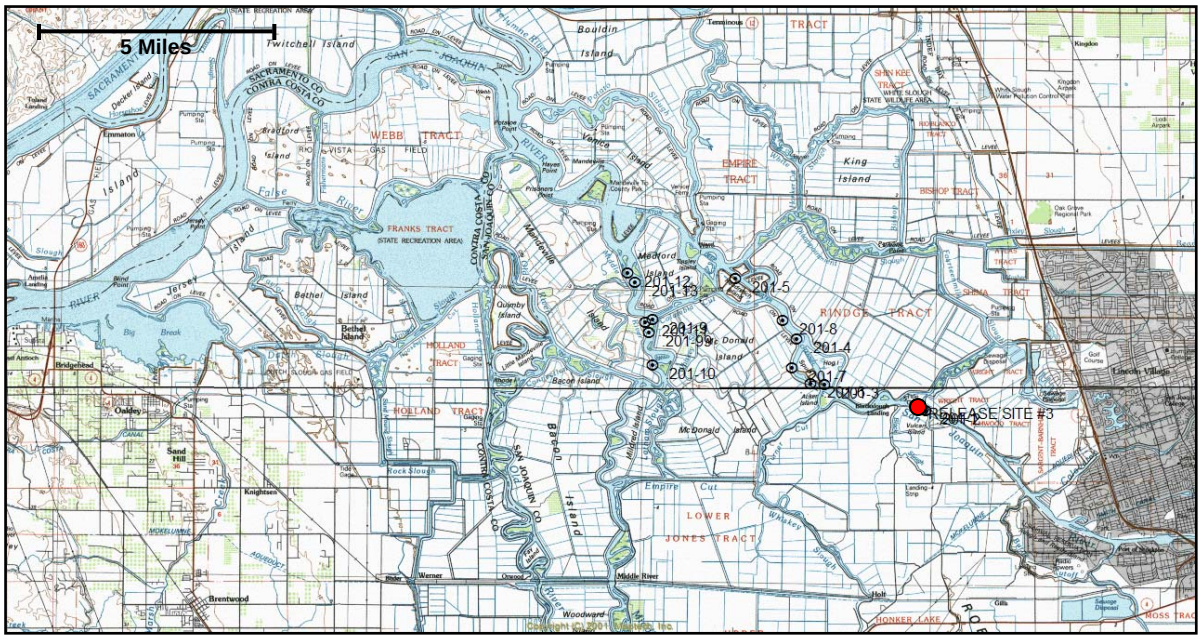
Release 3 – Fish 49.152 MHz – April 22, 2003 at 8:27

.152-1: 4/22/03 at 10:17
.152-2: 4/22/03 at 11:14
.152-3: 4/22/03 at 14:12
.152-4: 4/22/03 at 16:26
.152-5: 4/22/03 at 17:45
.152-99: 4/23/03 at 15:35



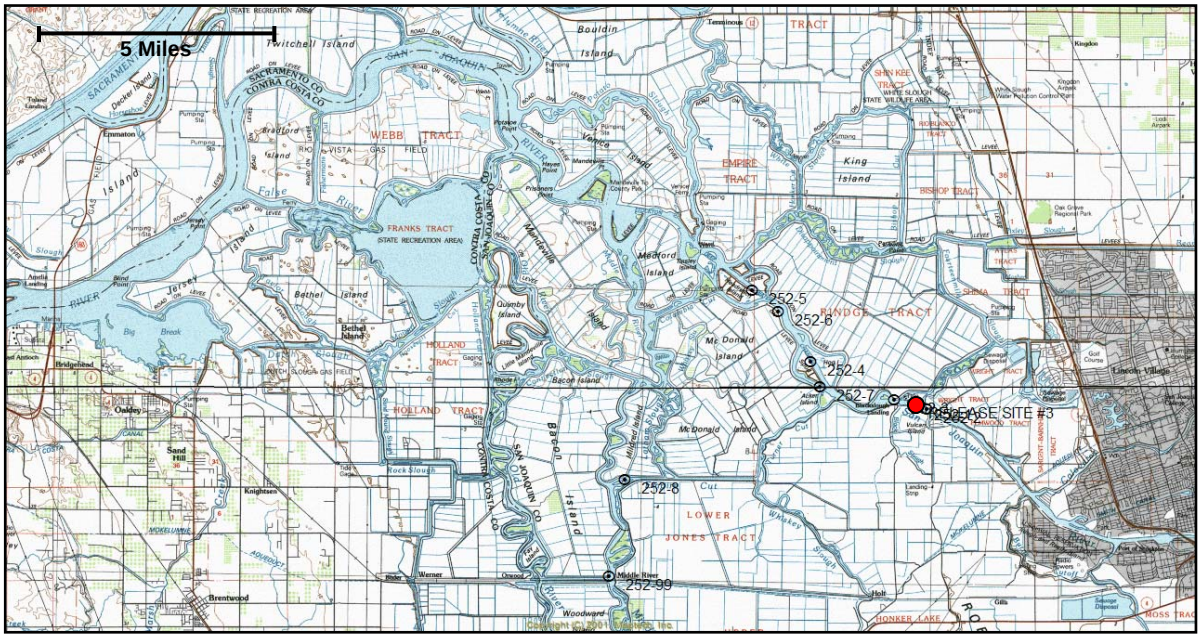
Release 3 – Fish 49.172 MHz – April 22, 2003 at 8:27

.172-1: 4/22/03 at 9:28
.172-2: 4/22/03 at 10:40
.172-3: 4/22/03 at 10:58
.172-4: 4/22/03 at 16:11
.172-5: 4/23/03 at 9:12
.172-6: 4/23/03 at 13:50
.172-7: 4/23/03 at 17:18
.172-99: 4/24/03 at 15:45



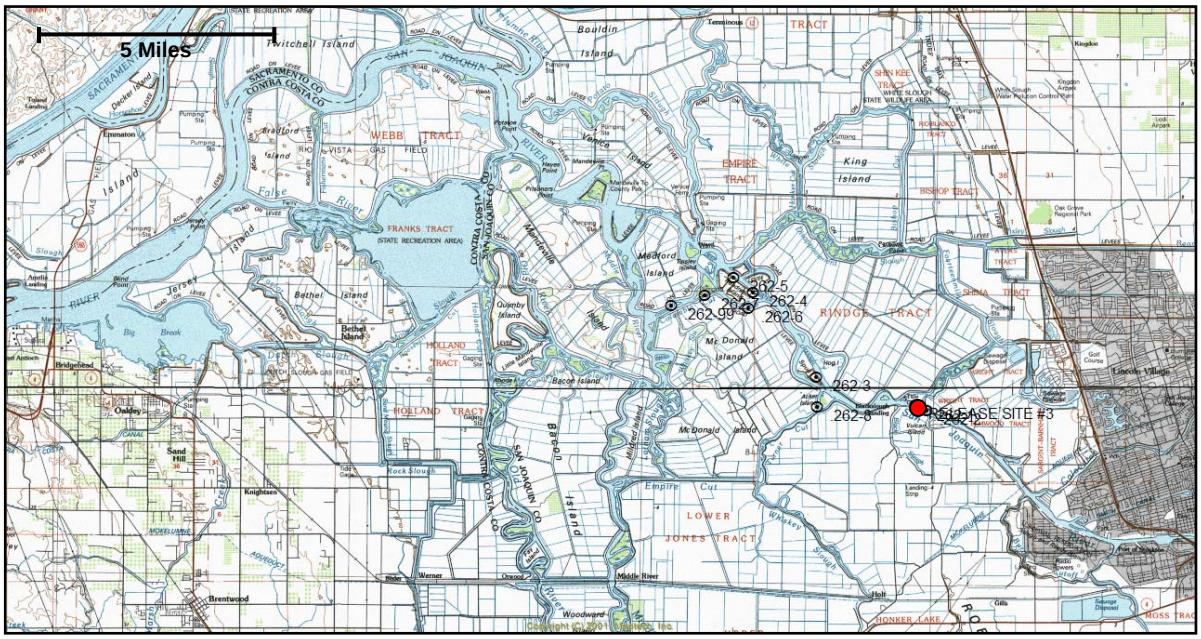
Release 3 – Fish 49.201 MHz – April 22, 2003 at 8:27

.201-1: 4/22/03 at 9:54
.201-2: 4/22/03 at 10:26
.201-3: 4/22/03 at 14:35
.201-4: 4/22/03 at 15:59
.201-5: 4/22/03 at 17:51
.201-6: 4/23/03 at 9:47
.201-7: 4/23/03 at 11:21
.201-8: 4/23/03 at 13:22
.201-9: 4/24/03 at 9:43
.201-10: 4/24/03 at 14:32
.201-11: 4/24/03 at 16:25
.201-12: 4/25/03 at 9:20
.201-13: 4/25/03 at 9:56
.201-99: 4/25/03 at 15:36



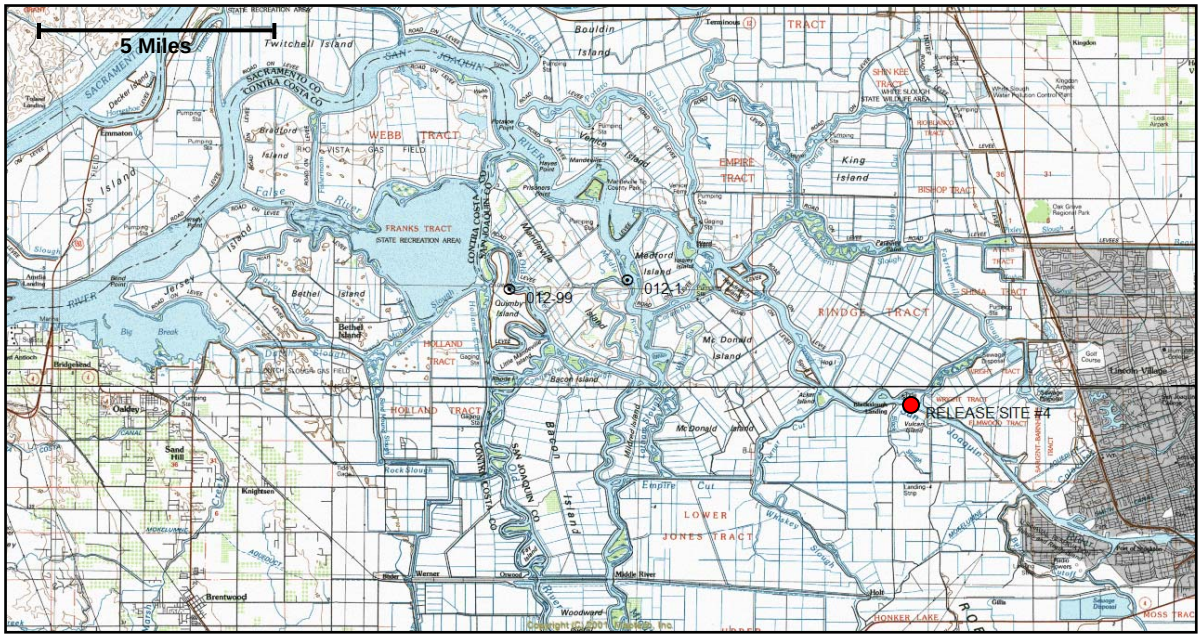
Release 3 – Fish 49.252 MHz – April 22, 2003 at 8:27

.252-1: 4/22/03 at 8:51
.252-2: 4/22/03 at 10:15
.252-3: 4/22/03 at 14:28
.252-4: 4/22/03 at 16:12
.252-5: 4/22/03 at 17:56
.252-6: 4/23/03 at 7:37
.252-7: 4/23/03 at 15:37
.252-8: 4/24/03 at 9:36
.252-99: 4/24/03 at 16:17

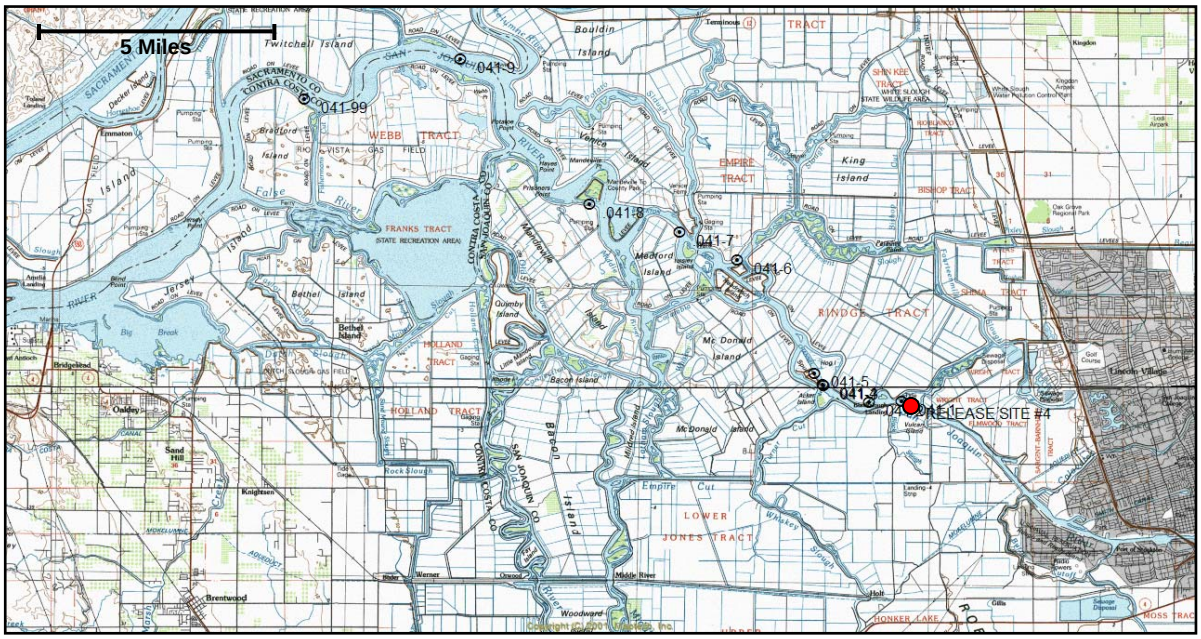


Release 3 – Fish 49.262 MHz – April 22, 2003 at 8:27

.262-1: 4/22/03 at 9:26
.262-2: 4/22/03 at 10:24
.262-3: 4/22/03 at 14:01
.262-4: 4/22/03 at 16:34
.262-5: 4/22/03 at 17:37
.262-6: 4/23/03 at 9:31
.262-7: 4/23/03 at 10:57
.262-8: 4/23/03 at 16:59
.262-99: 4/24/03 at 17:20

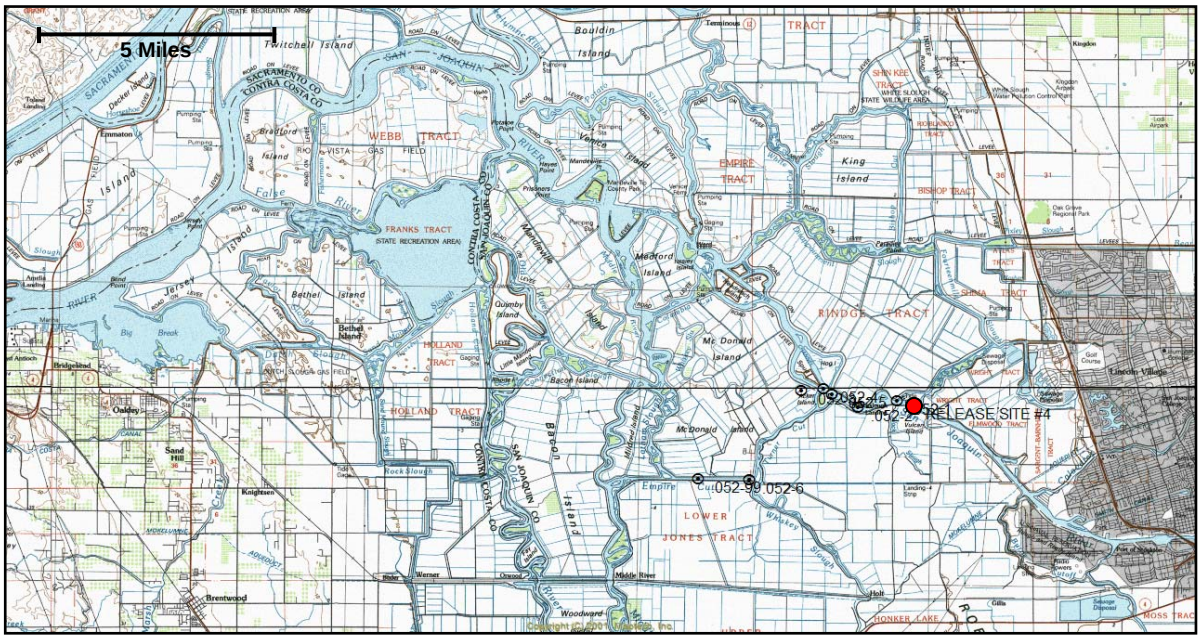


Release 4 – Fish 49.012 MHz – April 29, 2003 at 8:07
.012-1: 5/1/03 at 11:54
.012-99: 5/2/03 at 10:51



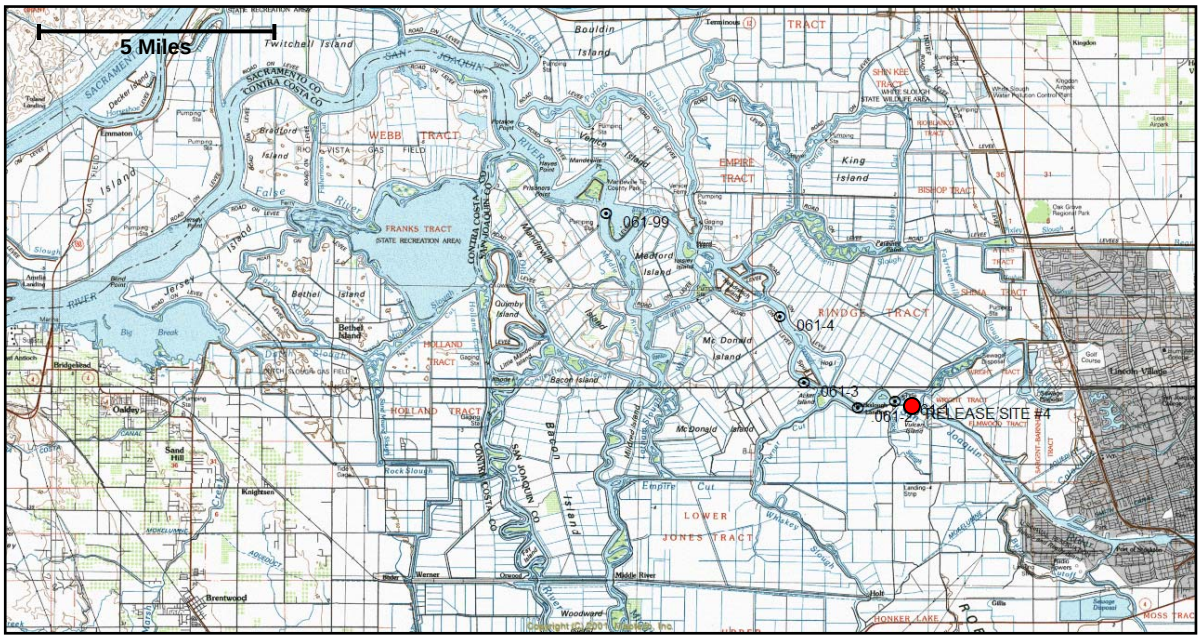
Release 4 – Fish 49.041 MHz – April 29, 2003 at 8:07

.041-1: 4/29/03 at 8:42	.041-6: 4/30/03 at 13:59
.041-2: 4/29/03 at 9:56	.041-7: 5/1/03 at 7:52
.041-3: 4/29/03 at 11:25	.041-8: 5/1/03 at 17:24
.041-4: 4/29/03 at 14:38	.041-9: 5/3/03 at 9:59
.041-5: 4/29/03 at 18:11	.041-99: 5/3/03 at 12:08



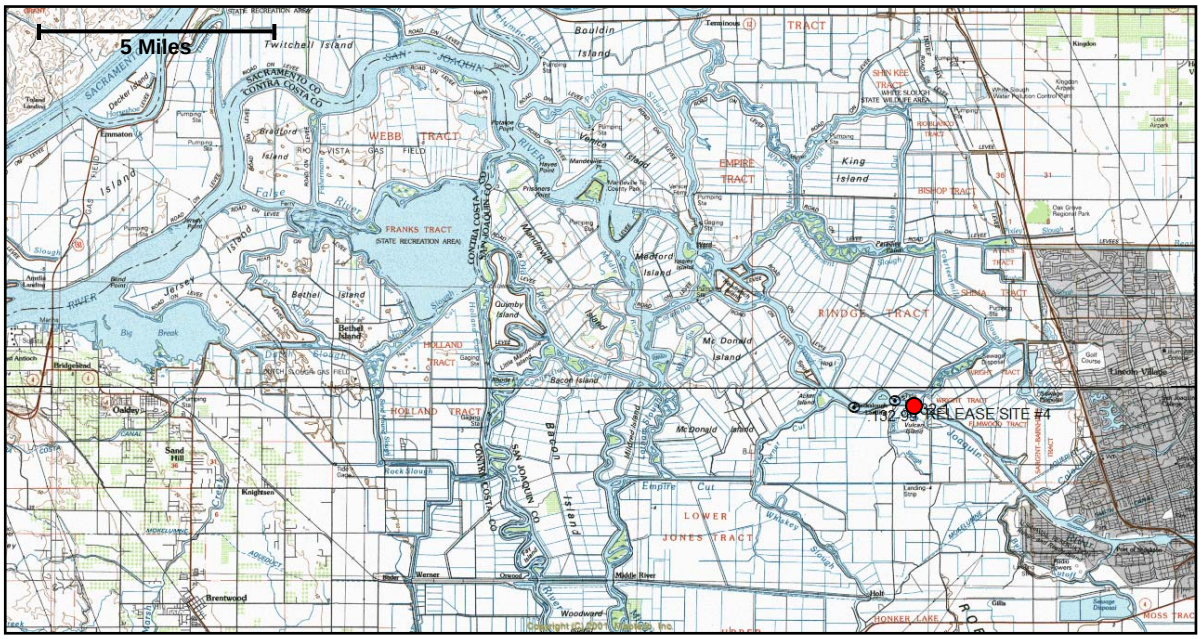
Release 4 – Fish 49.052 MHz – April 29, 2003 at 8:07

.052-1: 4/29/03 at 8:45
.052-2: 4/29/03 at 10:22
.052-3: 4/29/03 at 11:11
.052-4: 4/29/03 at 14:33
.052-5: 4/29/03 at 17:05
.052-6: 4/30/03 at 11:15
.052-99: 4/30/03 at 17:08

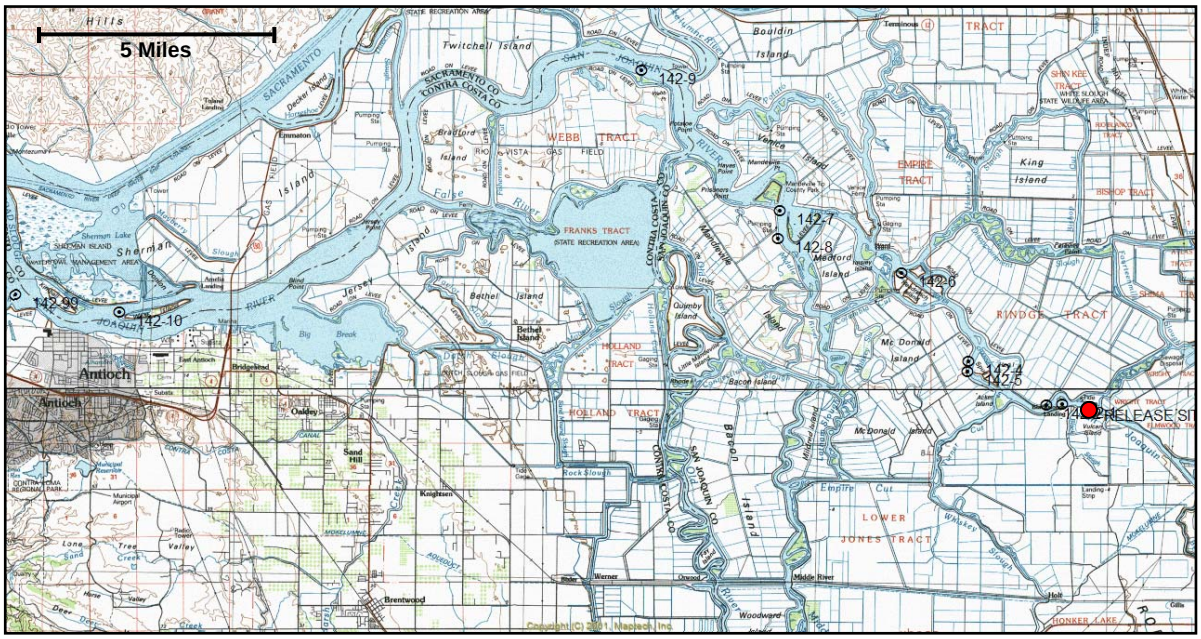


Release 4 – Fish 49.061 MHz – April 29, 2003 at 8:07

.061-1: 4/29/03 at 9:06
.061-2: 4/29/03 at 10:02
.061-3: 4/29/03 at 14:17
.061-4: 4/29/03 at 17:27
.061-99: 4/30/03 at 16:27

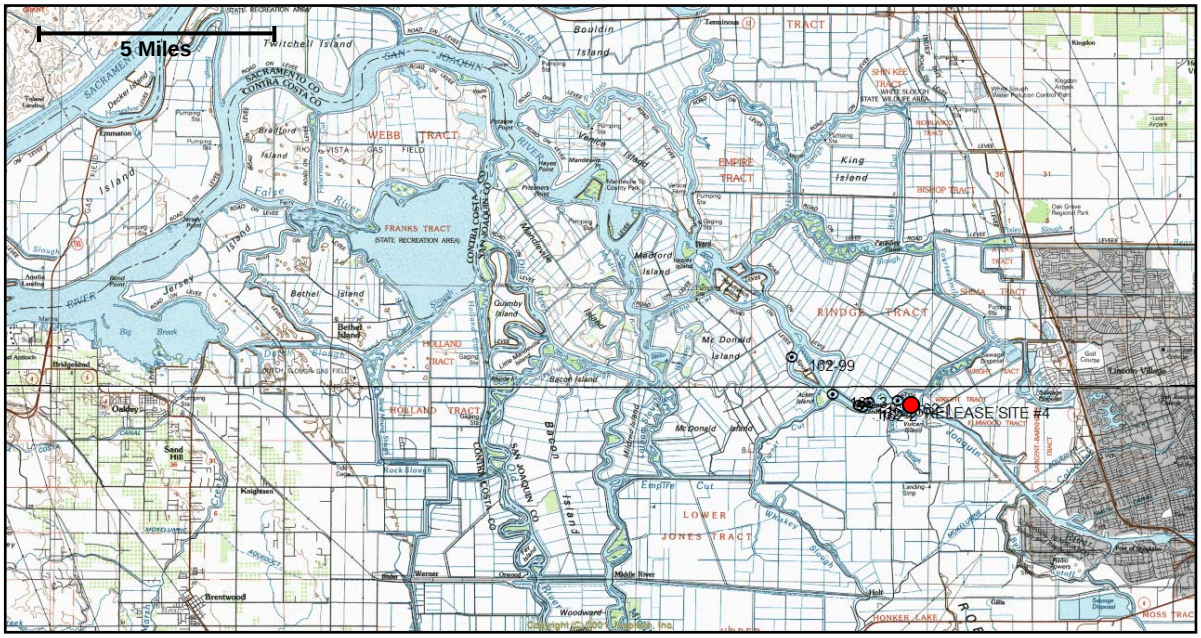


Release 4 – Fish 49.132 MHz – April 29, 2003 at 8:07
.132-1: 4/29/03 at 9:14
.132-99: 4/29/03 at 10:35



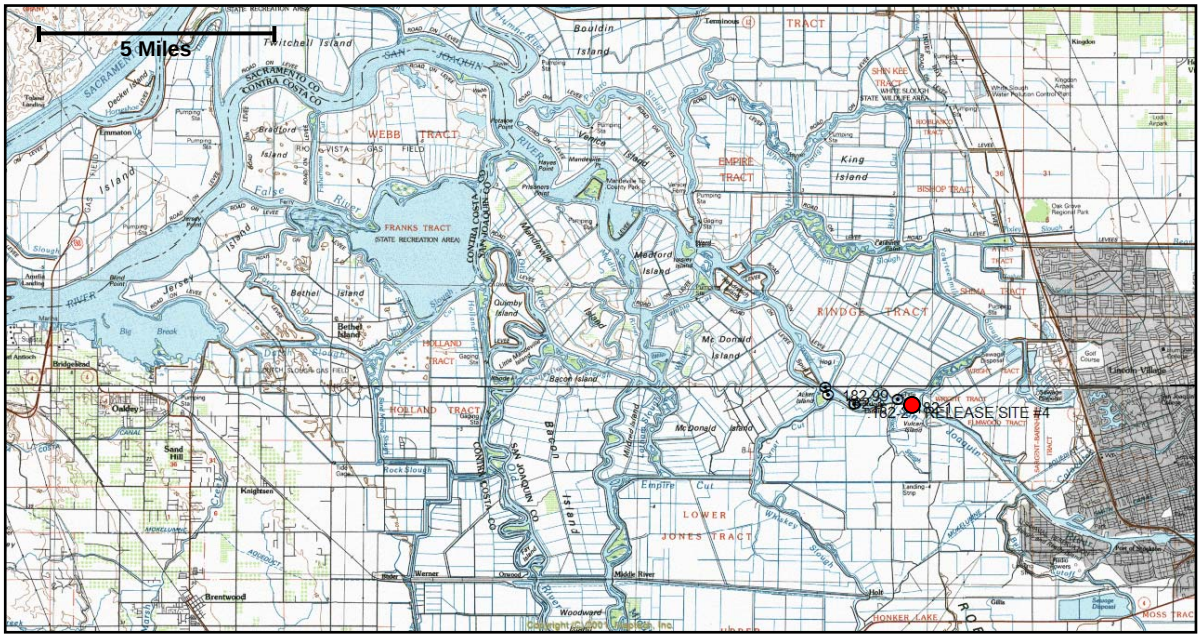
Release 4 – Fish 49.142 MHz – April 29, 2003 at 8:07

.142-1: 4/29/03 at 9:14
.142-2: 4/29/03 at 9:59
.142-3: 4/29/03 at 11:37
.142-4: 4/29/03 at 14:08
.142-5: 4/29/03 at 16:48
.142-6: 4/30/03 at 8:09
.142-7: 4/30/03 at 16:34
.142-8: 4/30/03 at 18:15
.142-9: 5/1/03 at 10:13
.142-10: 5/3/03 at 10:33
.142-99: 5/3/03 at 11:37



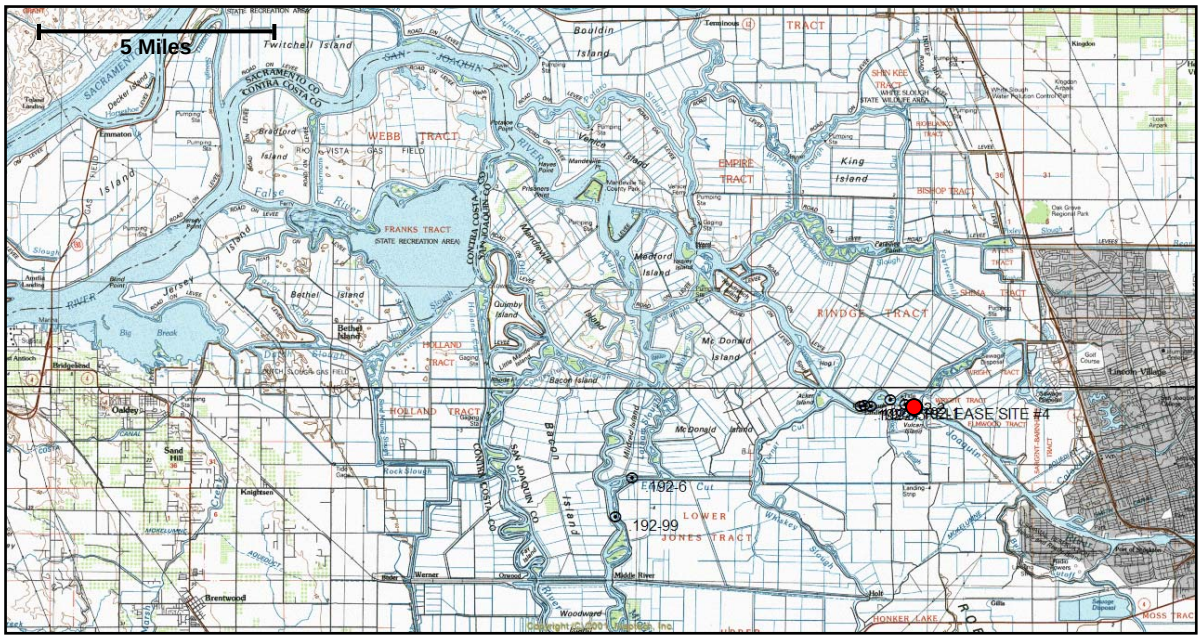
Release 4 – Fish 49.162 MHz – April 29, 2003 at 8:07

.162-1: 4/29/03 at 8:47	.162-4: 4/29/03 at 14:49
.162-2: 4/29/03 at 10:04	.162-5: 4/29/03 at 17:45
.162-3: 4/29/03 at 11:35	.162-99: 5/1/03 at 10:41



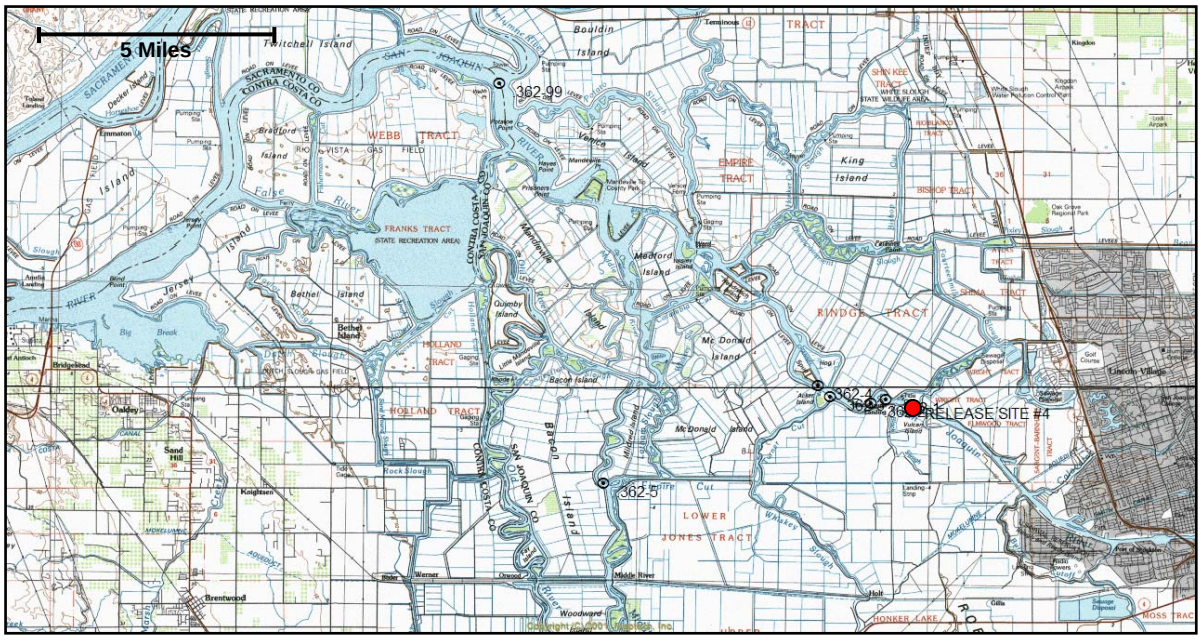
Release 4 – Fish 49.182 MHz – April 29, 2003 at 8:07

.182-1: 4/29/03 at 8:50
.182-2: 4/29/03 at 9:55
.182-3: 4/29/03 at 11:12
.182-99: 4/29/03 at 14:30



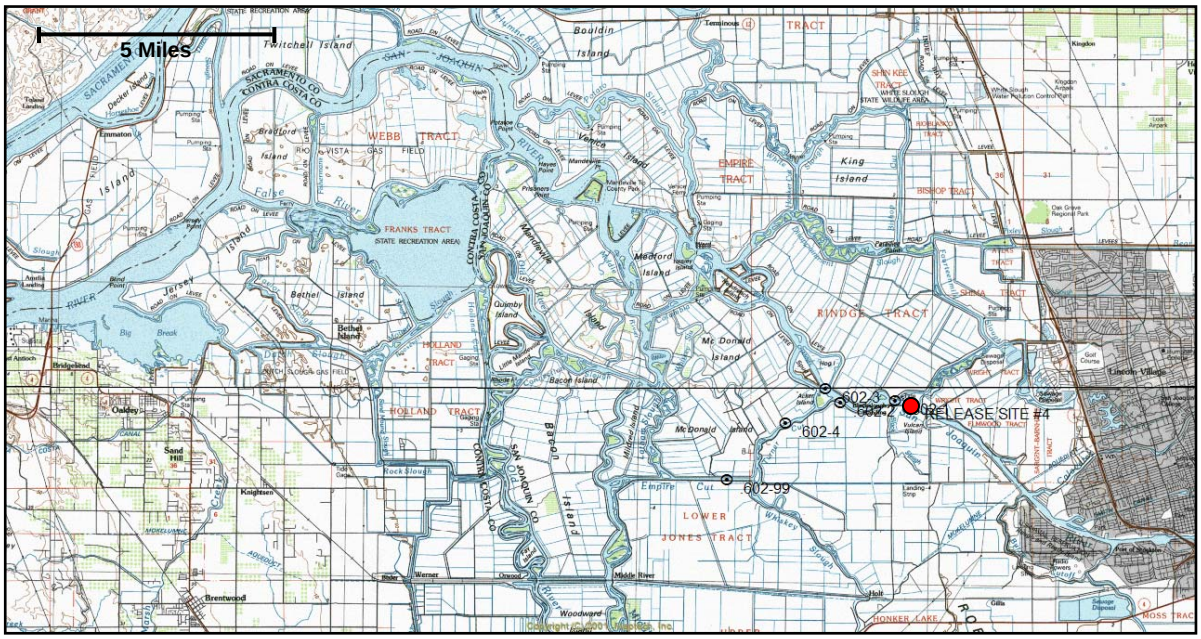
Release 4 – Fish 49.192 MHz – April 29, 2003 at 8:07

.192-1: 4/29/03 at 8:55
.192-2: 4/29/03 at 10:29
.192-3: 4/29/03 at 11:49
.192-4: 4/29/03 at 14:37
.192-5: 4/29/03 at 17:41
.192-6: 4/30/03 at 11:26
.192-99: 4/30/03 at 14:14

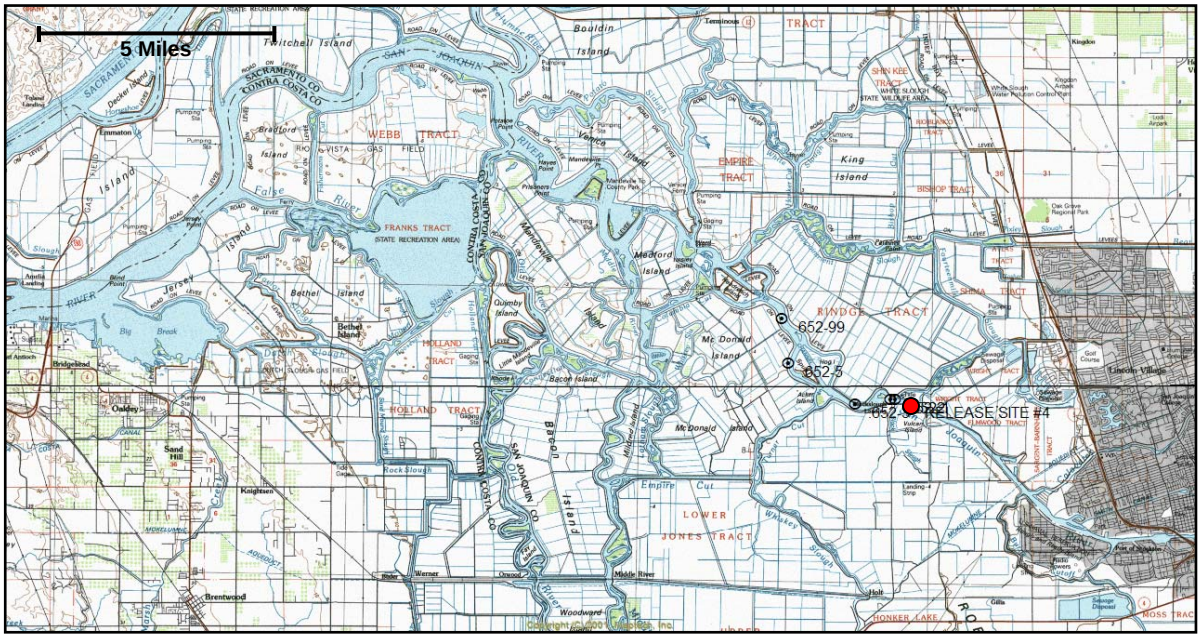


Release 4 – Fish 49.362 MHz – April 29, 2003 at 8:07

.362-1: 4/29/03 at 9:30
.362-2: 4/29/03 at 10:14
.362-3: 4/29/03 at 11:43
.362-4: 4/29/03 at 14:45
.362-5: 5/1/03 at 11:29
.362-99: 5/2/03 at 9:30



Release 4 – Fish 49.602 MHz – April 29, 2003 at 8:07
.602-1: 4/29/03 at 8:59
.602-2: 4/29/03 at 10:28
.602-3: 4/29/03 at 11:32
.602-4: 4/29/03 at 15:03
.602-99: 4/29/03 at 17:11



Release 4 – Fish 49.652 MHz – April 29, 2003 at 8:07
.652-1: 4/29/03 at 9:12
.652-2: 4/29/03 at 9:20
.652-3: 4/29/03 at 10:10
.652-4: 4/29/03 at 11:47
.652-5: 4/29/03 at 14:25
.652-99: 4/29/03 at 16:30