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California Bay - Delta Authority Fish Mercury Project

Year 2 Annual Report Sport Fish Sampling and Analysis

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CONTRIBUTION NO. 535
OCTOBER 2007

EXECUTIVE SUMMARY

The Fish Mercury Project (FMP) is a multifaceted three-year project to examine mercury in fish from the Bay-Delta watershed and increase public awareness of fish contamination issues, with the overall goal of reducing mercury exposure to humans and wildlife. The FMP has now completed a second year of data collection, and the final year of sampling is planned for 2007. Sport fish were collected in 2006 to meet the goals of 1) characterizing mercury concentrations in fish to support development of new consumption advisories and risk communication, and 2) assessing spatial and temporal trends in mercury concentration of fish in the Bay-Delta watershed.

In 2006, approximately 1400 fish from 30 species were collected from 47 popular sport fishing locations in the Bay-Delta watershed. Advisory sites comprised the bulk of sampling (45 of 47 sites), which focused on the Sacramento River watershed from the northern Delta to Lake Shasta. The data from these sites will be used to develop consumption advisories and communicate risk to stakeholders. Two restoration sites also were sampled to assess the potential changes in mercury concentrations in sport fish due to wetland restoration.

Sport fish were targeted to achieve the primary goals of the Project. To achieve the first goal, mercury was measured in a variety of popular sport fish species from across the region. To achieve the second goal, largemouth bass and channel catfish mercury concentrations were analyzed using a general linear mixed model to assess regional and site-specific differences in length:mercury relationships.

Mercury concentrations were elevated in many species and locations in the Sacramento River watershed. Largemouth bass were the most contaminated species, exceeding 0.5 ppm in 31 of 127 samples (24%), followed by channel catfish (9 of 55, 17%), Sacramento pikeminnow (4 of 22, 18%), common carp (15 of 122, 12%), and Sacramento sucker (2 of 63, 3%), in decreasing order of average concentrations. No bluegill or redear sunfish samples exceeded 0.5 ppm. In terms of mercury concentration, redear sunfish and bluegill are good consumption alternatives to larger species higher in mercury. However, these rankings are based only on mercury, as organic contaminants were not included in this study.

Clear regional patterns in sport fish mercury concentrations were apparent in some species. In general, mercury concentrations were highest at locations in the north Delta and in the southern portion of the Sacramento River (north of the Delta to Butte Creek) and its tributaries. Locations in the northern portion of the watershed (Butte Creek to Lake Shasta) had consistently lower concentrations. For example, largemouth bass mercury concentrations in the north Delta were typically around 0.5 ppm, with some locations along tributaries to the lower portion of the Sacramento River exceeding 0.6 ppm. In the northern portion of the watershed, however, the majority of locations ranged from 0.2 to 0.4 ppm.

The data collected in 2006 addressed the two Project goals well. Future analyses, when the final year of data has been collected, will allow for a rigorous treatment of inter-annual variation. Furthermore, the linkage between mercury from different trophic levels will be evaluated at locations sampled for both biosentinel and sport fish.

INTRODUCTION

Mercury is a heavy metal that is highly toxic in the organic form methylmercury, which is known to accumulate to concentrations of potential concern in food webs of the San Francisco Estuary, the Sacramento-San Joaquin Delta, and their watersheds. The most significant source by mass of total mercury in the region is from mining activity during the 1800s. Mercury was extensively mined in the Coast Range and transported to the Sierra Nevada for use in extracting gold from ore and placer deposits. Historical releases of mercury from gold mining areas were substantial (1.4 – 3.6 million kg; USGS 2000), and in many cases mercury continues to wash downstream from these areas today. Given the extent of the contamination and the long residence time of mercury in the aquatic environment, the mercury problem will likely affect California for decades, even if remediation actions are taken (Davis *et al.* 2003b).

The Fish Mercury Project (FMP) is a multifaceted, three-year project to examine mercury in fish from the Bay-Delta watershed and increase public awareness of fish contamination issues, with the overall goal of reducing mercury exposure to humans and wildlife. The FMP has completed a second year of data collection, and the final year of sampling is planned for 2007. The Project closely follows the recommendations of the California Bay Delta Authority (CBDA) "Mercury Strategy" (Wiener et al. 2003) relating to monitoring mercury in the watershed in support of adaptive management. The Project goals and objectives that relate to sport fish are:

1) Characterize mercury concentrations in fish to assess the health risks of consuming contaminated fish and communicate these risks to appropriate target audiences based on environmental justice principles (Project Goal 1, Objective 3; Table 1), and

2) Characterize spatial and temporal trends in mercury in fishery resources to determine how habitat restoration and mercury clean-up actions affect methylmercury accumulation in the food web (Project Goal 2, Objective 1).

To better achieve these goals, the Project established a Steering Committee (SC) and Local Stakeholder Advisory Group (LSAG) to facilitate:

1) Stakeholder input into the monitoring and risk communication activities based on environmental justice principles, and

2) Coordination with other major science, management, and outreach and communication efforts.

A final report in 2008 by the Department of Health Services-Environmental Health Investigations Branch (DHS-EHIB) will summarize the input received from SC and LSAG meetings, and other coordination and communication efforts over the three years of the Project.

Recent studies in the Bay–Delta watershed have found mercury and other contaminants at concentrations of concern for human health in striped bass, largemouth bass, white catfish, and other popular sport fish species. Extensive sampling was conducted in San Francisco Bay in 1994, 1997, 2000, and 2003 (Fairey et al. 1997, Davis et al. 2002, Greenfield et al. 2003, Davis

et al. 2006) and in the Sacramento-San Joaquin Delta in 1998, 1999, and 2000 (Davis *et al.* 2000, Davis *et al.* 2003a). In response to the 1994 results, an interim fish consumption advisory was issued for the Bay–Delta, due to concern over human exposure to methylmercury, PCBs, organochlorine pesticides, and dioxins (OEHHA 1994). This advisory remains in effect. The Office of Environmental Health Hazard Assessment (OEHHA) has also issued draft advisories for the lower Feather River, lower Cosumnes River, lower Mokelumne River, San Joaquin River and South Delta, and final advisories for Cache Creek, Bear Creek, Lake Natoma, Putah Creek, and the lower American River, due to potentially harmful levels of mercury. Additional advisories will be developed from information gathered by the Project for the Sacramento River and North Delta and other tributaries when separate consumption advice is required.

In addition to developing consumption advisories, information from the Project and previous studies will be used to assess spatial and temporal trends in mercury concentrations in the Bay-Delta watershed. Mercury concentrations in fish vary regionally throughout the Bay-Delta, with concentrations above 0.5 ppm in some Delta tributaries, including the Feather, Sacramento, American, and San Joaquin Rivers, and lower concentrations in the central Delta (Davis *et al.* 2000, Davis *et al.* 2003a, Grenier *et al.* 2007). The first year of FMP data showed similar patterns, with mercury concentrations higher in the Sacramento and San Joaquin Rivers and their tributaries, and lower in the central and southern Delta for most species (Grenier *et al.* 2007). Largemouth bass generally had the highest mercury concentrations of all species at sites where they were collected, and redear sunfish generally had the lowest mercury.

The Project has completed a second year of sampling and has one more sampling effort planned for 2007. In 2006, approximately 1400 fish from 30 species (Tables 2 and 3) were collected from 47 popular sport fishing locations in the Bay-Delta watershed (Table 3, Map 1). This report is a compilation of data from this Project and coordinated studies by the Central Valley Regional Water Quality Control Board (CVRWQCB). Collaboration with the CVRWQCB allowed for a greater geographic scope in sampling, and coordination ensured no duplication of effort. Coordination with the FMP biosentinel work led by Dr. Darell Slotton (UC Davis) has allowed us to collect sport fish and biosentinel fish from two overlapping locations in 2006: Toe Drain and Cosumnes River. A full-scale analysis of these overlapping sites from all three years will occur in our final report in 2008.

Striped bass data were not available at the time of writing this report. Analysis of these data will occur in a companion document to be completed in conjunction with recent striped bass collection efforts by the San Francisco Estuary Institute's Regional Monitoring Program.

METHODS

The sampling plan was designed to address the main goals and objectives of the sport fish component of the Project (see Introduction and Table 1). Advisory sites (45 of 47) comprised the bulk of sampling in 2006 (Table 3), which focused on the Sacramento River watershed from the northern Delta to Lake Shasta (Maps 1 and 2). Ten white sturgeon samples were collected at the MacAvoy Fish Derby (Map 1, MCVFD). These fish were collected between Ryer Island (Suisun Bay) and Browns Island (west Delta), however, individual locations were not separated due to

the wide home range of the species. There were two planned sites that were not sampled in 2006; Deer Creek near Lassen and Napa River at City of Napa. Deer Creek was a catch-and-release-only site, and salinity levels at the Napa River site were too high for electroshocking. In addition to the FMP sites, the Central Valley Regional Water Quality Control Board (CVRWQCB) also collected fish in the Project area. The CVRWQCB collected fish from American River at Nimbus Dam, Feather River at Gridley, Merced River at Hatfield State Park, and Sacramento River at Colusa. The data from all sites, including those of the CVRWQCB, will be used to develop consumption advisories and communicate risk to stakeholders. Furthermore, two restoration sites (Cosumnes River and Toe Drain in the Yolo Bypass) were sampled to assess the potential changes in mercury concentrations in sport fish due to wetland restoration. Index and intensive sites were not sampled for sport fish in 2006. See the Year 2 Sampling Plan (Gassel *et al.* 2006) for more information on sampling design.

Fish species were targeted for a variety of reasons. In general, primary target species were selected either because they were popular for human consumption (*e.g.,* channel catfish) or they were effective at documenting spatial trends in mercury (largemouth bass). Secondary target species were mainly chosen as species low in mercury that are potentially good alternatives for sport fishing and consumption (*e.g.,* redear sunfish and bluegill).

Largemouth bass and channel catfish were sampled at a wide range of lengths to model regional and site-specific differences in length:mercury relationships (Tremblay *et al.* 1995, Tremblay *et al.* 1998). Sacramento pikeminnow and Sacramento sucker were analyzed by Tremblay ANCOVA in 2005 and were therefore also evaluated for their use in the model this year. However, the sample sizes were insufficient; only a few pikeminnow (n = 2) and sucker (n = 4) sites sampled in 2006 met the minimum sample size and length range requirements. For these and all other species not included in the modeling procedure, we compared sites that had five or more fish within the size limits applied.

Field Collection and Laboratory Analyses

Sport fish were collected from locations in the Sacramento River watershed (rivers, lakes, and reservoirs) from May to early December 2006 (Map 1). Two anadromous species (striped bass and white sturgeon) were collected through spring 2007. Data from striped bass will be reported separately in a companion document. Fish were collected by Moss Landing Marine Laboratories (MLML) staff with an electrofisher boat and fyke nets. The crew remained on location until the desired number of primary target species was caught. The secondary target species caught during this time were also kept. Total length (longest length from tip of tail fin to tip of nose/mouth), fork length (longest length from fork to tip of nose/mouth), and weight (for larger fish) were measured in the field. Information on by-catch, including species and approximate numbers, was recorded. Fish were wrapped in chemically cleaned Teflon sheeting and frozen on dry ice for transportation to the laboratory.

Fish were kept frozen wrapped in Teflon in their original bags until the time of dissection. Dissection and compositing of muscle tissue samples were performed following USEPA guidance (USEPA 2000). At the time of dissection, fish were placed in a clean lab in their original bags to thaw. After thawing, fish were cleaned by rinsing with de-ionized (DI) and

ASTM Type II water, and were handled only by personnel wearing polyethylene or powder-free latex gloves (glove type is analyte dependent). Weights for individual fish, when not measured previously, were taken prior to dissection. All dissection materials were cleaned by scrubbing with Micro® detergent, rinsing with tap water, DI water, and finally ASTM Type II water. All fish were dissected skin-off, and only the fillet muscle tissue was used for analysis.

Total mercury in muscle tissue was measured by MLML. The lab analyzed all fish as individuals. Tissue samples were analyzed according to EPA 7473, "Mercury in Solids and Solutions by Thermal Decomposition, Amalgamation, and Atomic Absorption Spectrophotometry" using a Milestone Direct Mercury Analyzer (Model DMA-80). Samples, blanks, and standards were prepared using clean techniques. ASTM Type II water and analytical grade chemicals were used for all standard preparations. A continuing calibration verification (CCV) was performed after every 10 samples, and samples run between CCVs that drifted greater than 10% were rerun. Three blanks, a standard reference material (DORM-2), as well as a sample duplicate and a matrix spike pair were run with each set of samples.

The 2006 mercury samples were digested and analyzed in multiple batches. Batches consisted of 20 samples per batch. Standard Reference Material (NRC-DORM-2: dogfish muscle) recoveries, for the samples analyzed to date, were within the acceptable range of 75% – 125% recovery (range for all species 92% – 108%) established by the CalFed QAPP (Puckett and van Buuren 2000). The mercury matrix spike recoveries were all within the acceptable range of 75% – 120% (range for all species 90% – 114%) and all matrix spikes and matrix spike RPDs were within the acceptable range of less than 25% (range for all species 0% – 10%). All of the mercury lab duplicate RPDs were also in the acceptable range below 25% (range for all species 0% – 16%), and all method blanks were below the detection limit.

MLML participated in an inter-comparison (IC) study implemented for all CalFed mercury projects (van Buuren 2006). Three percent (3%) of MLML's tissue samples (40 samples) were sent to an independent laboratory (Frontier GeoSciences in Washington State) to assess the replicability of results. Preliminary unofficial analysis shows that the RPDs between labs for the field samples ranged from 0 – 28%. One sample was outside the acceptable range for replicate analyses. An official report summarizing the IC results will be released for the CalFed project.

Data Analysis

Concentration Categories

Mercury concentrations are presented in four categories. The lowest concentrations (less than 0.1 ppm) are in a range where consumption is strongly encouraged by OEHHA (Klasing and Brodberg 2006). OEHHA is the agency responsible for managing health risks due to consumption of contaminated sport fish in California. Locations with concentrations in this category are colored green in the maps and figures that follow. The highest concentrations (above 0.9 ppm) are in a range where OEHHA discourages consumption for women of childbearing age and children 17 and younger (Klasing and Brodberg 2006). Locations with concentrations in this category are colored red. Locations with concentrations between these endpoints are colored either yellow (between 0.1 and 0.5 ppm) or orange (between 0.5 and 0.9

ppm). The categories and colors applied in this report allow for a consistent interpretation of mercury concentrations between species. However, this approach is unrelated to that of OEHHA for the development of consumption advice.

Controlling for Length:Mercury Relationships and Predicting Mercury Concentrations

Several methods were used to control for the relationship of fish length to mercury concentration within species. A linear modeling approach was used when data were sufficient (see below). Size limits (Table 5) were applied, when comparing sites, to all other species that exhibited strong length:mercury relationships. USEPA guidance (USEPA 2000) specifies that the smallest fish in a composite should be no less than 75% the length of the largest. We used this compositing guidance in establishing the size limit categories for each species.

Evaluation of different model types was a recommendation of the Peer Review Panel after the first year of the Project. General linear mixed models (PROC MIXED in SAS v. 9.1; Littell *et al.* 1996) were used to examine both spatial variation in mercury concentrations and the support for length:mercury relationship in largemouth bass and channel catfish. In the description given below, the model procedure and model effects are capitalized for emphasis. Model structure in PROC MIXED is very similar to the general linear model (ANCOVA) approach that was implemented with the 2005 data (Grenier *et al.* 2007); however, PROC MIXED estimates model parameters (*i.e.,* slope and intercept) with numerical maximum likelihood techniques and allows for the rigorous modeling of random effects. This approach has two main advantages. First, the maximum likelihood model selection procedure allows non-nested models to be compared to each other. Second, treating sampling site as a random effect (see below) provides a basis for drawing inferences regarding similar habitats throughout the study area. Thus, the findings can be more confidently extrapolated to the full region rather than just to the particular sampling locations.

Large-scale spatial differences in mercury concentrations were examined by treating REGION as a fixed effect in the model, where regions represented the major river or water source for the area. Ten different regions were identified in the Project sample space, which encompassed the major rivers and tributaries of the Sacramento-San Joaquin Delta watershed (see below on data included). SITE was treated as a random effect (nested within REGION) under the assumption that the sampled sites were representative of the universe of possible sites within the Project space. Fish length (LENGTH) and a squared length term ($LENGTH^2$) were included as covariates to evaluate support for linear and quadratic relationships between LENGTH and MERCURY in the model. Finally, we included first-order interaction terms between both length terms and the SITE and REGION to model spatial variation in length:mercury relationships. The full model containing all effects can be expressed as:

$$MERCURY_{(ijk)} = \beta_0 + (\beta_{REGION(i)} * REGION_{(i)} + \varepsilon_{SITE_{(j)}(REGION_{(i)})}) + \beta_{LENGTH} * LENGTH_{(k)} +$$
$$\beta_{LENGTH^2} * LENGTH_{(k)}{}^2 + \beta_{REGION_{(i)}*LENGTH}(REGION_{(i)} * LENGTH_{(k)}) +$$
$$\varepsilon_{SITE_{(j)}(REGION_{(i)})*LENGTH}(SITE_{(j)} * LENGTH_{(k)}) + \beta_{REGION_{(i)}*LENGTH^2}(REGION_{(i)} * LENGTH^2_{(k)}) +$$
$$\varepsilon_{SITE_{(j)}(REGION_{(i)})*LENGTH^2}(SITE_{(j)} * LENGTH^2_{(k)}) + \varepsilon_{ijk}$$

where $MERCURY_{(ijk)}$ is the mercury concentration (ppm, wet wt) for fish *k* caught at site *j* of region *i*, β_0 is the model intercept, $\beta_{REGION(i)}$ is the effect of region *i* on mercury concentration, $REGION_{(i)}$ is the dummy variable associated with region *i*, β_{LENGTH} is the slope term for fish length, $LENGTH_{(k)}$ was the length (mm) of fish *k*, β_{LENGTH}^2 is the slope term for the square of fish length, $LENGTH_{(k)}^2$ was squared length of fish *k*, $\varepsilon_{SITE(j)(REGION(i))}$ is the random error in mercury concentration associated with site *j* nested within region *i*, $\varepsilon_{SITE(j)(REGION(i))*LENGTH}$ is the random error associated with the interaction between site *j* and fish length, $\varepsilon_{SITE(j)(REGION(i))*LENGTH}^2$ is the random error associated with the interaction between site *j* and the square of fish length, and ε_{ijk} is the random error associated fish *k* caught at site *j* of region *i.* The random errors are normally and independently distributed with a mean of zero.

A combined dataset including both 2005 and 2006 data was used in the linear model analysis. However, different sites were sampled in 2005 and 2006. Thus, spatial and temporal effects were to a certain extent confounded. Our approach was to treat site as a random factor and acknowledge that any temporal variation was included in the random site term. This methodology emphasized spatial over temporal effects. Only sites with at least nine samples and a 130 mm or more range in lengths were included in the analysis.

An information-theoretic approach (Burnham and Anderson 2002) was used to evaluate support for a suite of *a priori* models (see Appendix IIa for the list of competing models), where each model contained a different combination of the parameters described above. Specifically, Akaike's Information Criteria (AIC) corrected for small samples sizes (AIC_c) was used to rank each of the competing models based on the level of support from the data. AIC_c is a statistic used to estimate the relative distance between competing models and the unknown true model that generated the data. Therefore, the model with the smallest AIC_c value indicates the "closest" to unknown reality. Furthermore, in the calculation of AIC_c, models are penalized for the number of parameters. Thus, AIC_c selects the model that fits the data best and also has the smallest number of parameters (*i.e.,* simplicity and parsimony). In addition, AIC_c weights were computed to determine the strength of evidence for each competing model to supplement inferences made simply from AIC_c values. AIC_c weights represent the probability that a model being evaluated is the "best" among the suite of candidate models. AIC_c values and AIC_c model weights were calculated using the formulas given in Burnham and Anderson (2002).

The modeling procedure first estimated the level of support for different combinations of random effects, using restricted maximum likelihood methods. All fixed effects were included in this stage of the model. Once the appropriate random effects structure was identified, the procedure evaluated the level of support for models with different combinations of fixed effects. The model with the greatest AIC_c weight and lowest AIC_c value was selected for the final model, but models within 1-2 AIC_c values were considered to be competing models (Burnham and Anderson 2002).

The next step was to test whether the relationship between fish length and mercury concentrations differed among sites and regions. The method employs dummy variables to determine differences in means, slopes, and curve shapes among locations. The resulting regression equations (Appendix IIb and IIc) were used to calculate predicted mercury concentrations (mean and 95% confidence interval) for each location at a standard length (350 mm for largemouth bass and 425 mm for channel catfish) fish. Finally, the model tested for

differences between regions using linear contrasts of mean mercury concentration. This procedure consisted of a t-test comparing average mercury concentrations based on a standard length fish (*e.g.,* 350 mm for largemouth bass). The t-test assessed the probability that the difference in estimated mean mercury concentrations between regions was significantly different from zero.

Concerns of Type I and Type II Errors in the Mixed Model

Adjustment of the modeling approach due to concerns over Type I and Type II errors was not deemed necessary in the mixed model analysis. Type I errors arise from violating key assumptions, and thereby generating false positives (rejecting the null hypothesis when the results can be attributed to chance). Deviations from the assumption of normally distributed values were examined prior to running the model using the Kolmogorov-Smirnov test. For both species, the mercury data fit a normal distribution reasonably well, whereas the length data were $\log_{10}$ transformed to achieve normality. The procedure was robust to deviations from the normality assumption, and therefore the risk of Type I error was considered to be small. A power analysis to estimate the probability of committing a Type II error (falsely rejecting an alternative hypothesis) was not conducted, because the null hypotheses of no length:mercury relationship and no spatial differences in mercury concentrations were rejected (see Results and Discussion below).

Mapping and GIS Methods

The map figures were designed using ESRI ArcInfo 9.1 software and are in a California Teale Albers NAD 83 Projection. A connection to the GIS from the Project database (Microsoft Access 2003) was established to display the results of queries that calculated mean concentrations.

Three styles of maps were created. First, an individual map was created for each species analyzed, using a four-color graduated scheme (green, yellow, orange, red) to designate low, moderate, high, and very high average mercury concentrations at each site. The concentrations are represented as bars using the same scale across all species.

Second, the species that had the highest and lowest average mercury concentrations at each site are shown on two additional maps. Each species is represented with unique symbols. The same four-color graduated scheme was used to indicate the concentration category.

Finally, to depict variation in mercury among four species on the same map, a pie-chart-style symbology was used. Each of the four quadrants in the “pie” represents one of the four species, and the colors indicate the concentration categories.

RESULTS AND DISCUSSION

Over 1400 fish from 30 species (Tables 2 and 3) were collected from 47 locations in the Sacramento River watershed (Maps 1 and 2). This report provides a complete summary of these data with the exception of striped bass (Table 6, Appendix I). All data are presented on a parts-

per-million (ppm), wet weight basis. The fish that were primary and secondary target species constitute the majority of the analyses. These species were largemouth bass, channel catfish, common carp, Sacramento pikeminnow, Sacramento sucker, bluegill, and redear sunfish. The sampling locations spanned a wide geographic range, including the main-stem and tributaries of the Sacramento River, with more detailed sampling in numerous lakes and reservoirs where data gaps existed. Sample sizes for the primary target species largemouth bass were excellent, and often met the target of 12 individuals per site (Table 3). However, channel catfish were less abundant and only met primary target sample size goals at a few sites, although sufficient samples were obtained for the modeling procedure. Common carp and bluegill, secondary target species, were both sampled in relatively high numbers throughout the watershed. Sacramento pikeminnow were not widely distributed, and thus target sample sizes were not met at many sites. Sample sizes for Sacramento sucker and redear sunfish were generally good, and met goals at most sites.

Length:Mercury Relationships

Length:mercury relationships in target species varied greatly (Figures 1 – 7). Examining the relationship broadly within a species without regard to site showed that length:mercury relationships exist for certain species. Spearman's rank correlation (ρ) supported these patterns (Table 4). Largemouth bass was the most abundant species (n = 216) and appeared to have a strong relationship (Figure 1). Spearman's rank correlation exceeded 0.5 suggesting that a strong relationship exists ($\rho = 0.57$). Channel catfish, on the other hand, exhibited a weak relationship (Figure 2; $\rho = 0.27$). Mercury and length in common carp showed no obvious correlation ($\rho = 0.13$), even though a large size range was sampled (Figure 3). Sacramento pikeminnow and Sacramento sucker showed the strongest length:mercury relationship (Figures 4 and 5; $\rho = 0.72$ and $\rho = 0.54$, respectively), with a potentially curvilinear relationship in Sacramento sucker. There was an unclear relationship for bluegill and redear sunfish, possibly due to the narrow length range of these species (Figures 6 and 7; $\rho = 0.56$ and $\rho = 0.35$, respectively). The relatively high rho (ρ) for bluegill was driven by four fish with much higher mercury concentrations than the remainder of the samples. Most of the other species showed little to no length:mercury relationship (Figures 8, 9, 10B, 11, 12A-C, 13, 15, and 16). The exceptions were pumpkinseed, brown trout, spotted bass, and smallmouth bass (Table 4, Figures 10A, 12D, and 14). Clearer length:mercury relationships for some of these species may have been hindered by the small sample sizes. Results were as expected for many of the target species, especially largemouth bass, Sacramento pikeminnow, and redear sunfish. Largemouth bass collected by the Project in 2005 showed a strong relationship between mercury and fish length. Previous studies in the Project area *(e.g.,* Davis *et al.* 2000, Davis *et al.* 2003a) have documented similar relationships. Sacramento pikeminnow was the second highest mercury-contaminated species sampled in 2005, and exhibited a strong relationship between mercury and length. Redear sunfish are small fish (< 250 mm) with a relatively small range of sizes collected (~ 150 mm) over which changes in mercury related to length may not be apparent. Mercury may also vary with fish age, and this relationship will be assessed in the largemouth bass mechanistic mercury uptake model due for completion in December 2007. More detailed length:mercury relationships by site for each species are discussed below in the section on spatial patterns.

Characterizing Mercury Concentrations (Project Goal 1)

A key purpose of sport fish sampling was to characterize mercury concentrations in fish to provide information needed to assess the health risks of consuming contaminated fish (Project Goal 1, Objective 3; Table 1). The majority of sites targeted in 2006 were chosen to fill data gaps for advisory development. The data discussed in this report will be used by OEHHA in development of consumption advisories, and the risk of consuming contaminated fish will be communicated by DHS-EHIB to appropriate target audiences based on environmental justice principles.

The goal of this report is to facilitate technical review of the data. All 2006 data (Table 3, Map 1) were included in addressing this objective, including data from sites funded by CVRWQCB.

General Patterns in Mercury Concentration

Patterns in mercury concentration were assessed by determining the species with the highest and lowest mean concentration at each of the 41 sites (Table 5, Maps 3 and 4). Note that size limits were applied to the data in Maps 3 and 4; thus, not all sites with data available were included.

General patterns are discussed with respect to regions of the Delta and Sacramento River watershed. Lakes and reservoirs to the east and west of the Sacramento River main-stem are referred to as the eastern and western drainages, respectively. The phrase “southern portion of the Sacramento River watershed” is used to identify sampling locations from outside the Delta to Butte Creek (BCHWY, Map 1), while the “northern portion of the Sacramento River watershed” refers to locations north of Butte Creek up to Shasta Lake (SHLK). These delineations were not determined based on hydrologic boundaries of the Sacramento River watershed, but rather are used to distinguish locations that exhibit different ranges in fish mercury concentrations.

On a site-by-site basis, maximum concentrations were most often in the yellow 0.1 – 0.5 ppm category (26 of 41 sites, 63%; Map 3). These sites were distributed throughout the study area. Seven sites (17%) were in the green < 0.1 ppm category, and were distributed on the Sacramento River, Feather River, and in lakes on the eastern side of the watershed. Six sites were in the orange 0.5 – 0.9 ppm category, situated in the lower portion of the Sacramento River watershed and north Delta. The remaining two sites (5%) were in the red > 0.9 ppm category, located in Cosumnes River and Indian Valley Reservoir; spatial patterns of higher concentrations in the lower watershed compared to the upper extent will be discussed in more detail in a separate section below.

The species most often exhibiting the highest mean concentration at each site was largemouth bass (15 of 41 sites, 37%; Map 3). Of the eight sites with the highest mean concentrations in the orange and red categories, half of them represented largemouth bass. The next most frequent was Sacramento sucker (5 of 41, 12%), which occurred as the species with the highest mercury one-third as often as largemouth bass. Sacramento pikeminnow and smallmouth bass each had the highest mean concentration at four sites (10%). American shad and brown trout each exhibited the highest mean at two sites (5%). Nine species (black crappie, bluegill, chinook salmon, common carp, hitch, spotted bass, warmouth, white catfish, and white sturgeon) were each the

highest at a single site. Twenty-six sites had maximum concentrations from species other than largemouth bass, but only four of these sites had data for more than five bass within the applied size limits, and 19 sites lacked bass data completely. Sacramento sucker was the second-most-contaminated fish, but the mean concentrations never exceeded 0.5 ppm. However, Sacramento sucker also had the highest mean concentration at locations where few, if any, largemouth bass were caught. Furthermore, of the seven sites in the green category, none were represented by largemouth bass. Generally, at the green sites, none of the target or frequently collected species were represented, but various trout or anadromous species were common. Thus, across the majority of sites, largemouth bass was the most contaminated of the species analyzed in 2006.

The lowest species mean concentrations on a site-by-site basis were most often (23 of 41 sites, 56%; Map 4) in the green category. These locations were distributed throughout the study area, with relatively more green sites in the northern portion of the watershed. The rest of the sites (18 of 41, 44%) were in the yellow category, and were mostly located in the southern portion of the watershed.

Redear sunfish and rainbow trout exhibited equal frequency as the lowest species (8 of 41 sites, 20%). Bluegill was the next most common, occurring as the lowest species at six sites (15%), followed by American shad at five sites (12%). Five species (largemouth bass, brown bullhead, common carp, pumpkinseed, and Sacramento pikeminnow) each were the lowest at two sites (5%). Brook trout, channel catfish, Sacramento sucker, and white sturgeon were each the lowest at a single site. Rainbow trout represented the lowest concentration at all eight sites where it was sampled within the applied size limits. Redear sunfish was the lowest at two-thirds of sites (8 of 12) where it was sampled. These species have differing habitat distributions, and therefore represent the lowest species in different areas of the watershed. Rainbow trout were common in the lakes and reservoirs, and headwater streams of the watershed (Moyle *et al.* 2003), while redear sunfish were found in rivers on the Central Valley floor, foothills, and Delta (Moyle 2002). Of the 25 sites with a minimum concentration for a species other than redear or rainbow trout, only one site had more than three redear samples and none had any rainbow trout. Twenty-one sites did not have any redear sunfish or rainbow trout data at all. Bluegill was the next least contaminated species but was found at locations where no redear or rainbow trout were caught. Thus, redear sunfish and rainbow trout were equally the least contaminated species analyzed in 2006, with particularly low mercury at locations higher up on the Sacramento River and connected lakes.

Four species that represent varying degrees of mercury contamination are compared in Map 5. The same species that were selected for this comparison in the 2005 dataset (Grenier *et al.* 2007) are represented here. Largemouth bass was generally at the same or one contamination level higher than catfish and sucker. Redear sunfish was occasionally two levels lower than the others, but was mostly at the same level as catfish and sucker, and one level lower than bass. Largemouth bass and redear sunfish were at the same level at five sites. Four of these sites were located close together, in the southern portion of the Sacramento River watershed, and the other site was in the north Delta. All four species were collected at four sites (15%), with two locations each in the north Delta and southern portion of the Sacramento River. At these locations, all four species were at the same concentration category, except at Steamboat Slough where redear sunfish was in the green category, while the other species were yellow.

Mercury Concentrations by Species

Mercury concentrations were elevated in many of the target species. Largemouth bass was highly contaminated, relative to sunfish and bluegill (Table 5). Non-target species were low in mercury (*e.g.,* rainbow trout and American shad), with a few exceptions (*e.g.,* black crappie and spotted bass). Largemouth bass was the best sampled species (n = 127), with half of the samples (54%) corresponding to the yellow 0.1 – 0.5 ppm. category (note that size limits were applied to the data in Table 5). The remaining largemouth bass samples were distributed with 19% in the orange 0.5 – 0.9 ppm category and 12% in the red > 0.9 ppm category. No largemouth bass samples coincided with the green < 0.1 ppm category. Common carp, the next most highly sampled species (n = 122), also had the majority of samples (81%) corresponding to the yellow category. Note that the lack of an evident length:mercury relationship (Figure 3) made this the only species for which limits were not applied to account for the variation in mercury due to fish size. Redear sunfish and bluegill samples only corresponded to the green (48% and 35%, respectively), and yellow (52% and 65%, respectively) categories, suggesting a pattern of lower mercury in these species. Sacramento sucker samples also rarely exceeded 0.5 ppm, with the majority of samples (79%) corresponding to the yellow category. Channel catfish exhibited some high concentrations, but the bulk of samples (82%) were in the yellow category, and an additional 15% and 2% in the orange and red categories, respectively. Sacramento pikeminnow was a secondary target species, but only 22 samples were collected within the applied size limits. As with most of the other target species, the majority of samples (82%) fell in the yellow category. Rainbow trout and American shad appeared to have the lowest concentrations among secondary target species with sufficient samples (> 30) to draw inferences regarding contamination. Ninety-eight percent (98%) of rainbow trout and 94% of American shad samples corresponded to the green category. Among the non-target species, spotted bass and smallmouth bass tended to fall in the yellow category (54% and 64%, respectively). The remaining samples for smallmouth bass coincided with the orange (23%) and green (14%) categories. None of the samples were in the red category. For spotted bass, the next highest percentage (31%) was in the orange category, and the remaining samples (15%) were in the red category. Thus, of these two black bass species, it appears that spotted bass were more contaminated than smallmouth bass. Of the other species with relatively low samples sizes, black crappie (n = 17) stands out due to the relatively high proportion of samples (18%) in the red category. The remaining samples were < 0.5 ppm, corresponding to 53% and 29% in the yellow and green categories, respectively. In summary, largemouth bass was the most contaminated of the target species, followed in decreasing order by channel catfish, pikeminnow, carp, sucker, bluegill, and redear sunfish.

The same overall ranking held when size limits were not imposed (Figures 1 – 7). Many largemouth bass samples exceeded 0.9 ppm. (Figure 1), while catfish, pikeminnow, sucker, and carp each had three or fewer samples in the red category (Figures 2 - 5). Only one bluegill sample was in the red category, and only four corresponded to the orange category (Figure 6). Finally, no sunfish were in the red category, and only three were yellow (Figure 7).

Examination of mercury concentrations across sites yielded similar conclusions for relative contamination of the target species (Maps 6 – 12). The majority of sites (17 of 22, 77 %) sampled for largemouth bass corresponded to the yellow category (Map 6). The remaining sites were orange (3 of 22, 14%) and red (2 of 22, 9%) and were located in the southern portion of the

watershed. All but one of the channel catfish sites (11 of 12, 92%) were in the yellow category (Map 7), with the remaining site located in the north Delta corresponding to the orange category. Common carp were well distributed in both the rivers and reservoirs of the lower watershed (Map 8). Nearly all sites were in the yellow category (20 of 21, 95%) and one site was orange. Sacramento pikeminnow were not widely distributed in the watershed (Map 9), and consequently only eight sites had sufficient data to assess patterns in concentration. Mercury was always in the moderate yellow category, with only two sites having mean concentrations greater than 0.4 ppm. The majority (15 of 17, 88%) of Sacramento sucker sites were in the yellow category (Map 10). The remaining sites were green, located at the northern end of the Sacramento River and along the American River. Bluegill and redear sunfish were clearly lower in mercury concentration than other target species, based on the overall height of concentration bars (Maps 11 and 12). However, similar to other species, the majority of sites exhibited mean concentrations in the yellow category, which included 65% (n = 11) and 75% (n = 9) of bluegill and redear sunfish sites, respectively. The remaining sites fell in the green category, with six for bluegill and three for redear.

Although we controlled for length as much as possible using size limits, for a few species there is a possibility for one concentration category difference between sites due to the effect of size, rather than actual site differences. For maps depicting channel catfish, a few of the sites had a relatively high proportion of larger sized fish even though size limits were applied. This may have contributed to the slightly taller concentration bars near Butte Creek and East Park Reservoir (Map 7). Other species showed similar influences at certain sites, however, in nearly all cases this was unavoidable, as only a small number of fish (< 5) were caught.

Mercury concentrations for some of the lesser sampled species were examined across sites to further investigate their relative patterns in contamination (Maps 13 – 17). Rainbow trout and American shad were not widely distributed in the watershed (Maps 13 and 14), but were below 0.1 ppm at all sites (n = 8 and n = 5, respectively). Black crappie exhibited highly variable concentrations at the seven sites sampled (Map 15). Four sites (66%) corresponded to the yellow category, with two sites in the green and one in the red. The red site at Cosumnes River (north Delta) was the highest mean concentration (2.1 ppm) recorded for any species by the Project to date. Interestingly, spotted bass exhibited the second highest mean concentration (1.4 ppm) in the Project data set, also at Cosumnes River in 2006 (Map 16). Cosumnes River, however, was the only site that fell in the red category for this species. The remaining sites were yellow (2 of 4, 50%) and orange (1 of 4, 25%). Finally, smallmouth bass was distributed in a few reservoirs of the watershed (Map 17), where two locations were equally coincident (2 of 4, 50%) with the yellow and orange categories. Notably, the two reservoir sites were more than twice the concentration of Lake Britton and Whiskeytown Lake.

The relative degree of mercury contamination of the species sampled in 2006 was expected, based on their ecology and trophic positions. Largemouth bass are large sport fish (up to 535 mm in the 2006 samples) and are a top piscivorous predator in the Sacramento River watershed. Adults are known to consume all varieties of fish and large invertebrates that are found in their habitat (Moyle 2002). A high exposure to mercury was therefore anticipated in this species, given its size and position in the food web. Carp, sucker, and catfish also grow rather large (commonly > 500 mm in this study), but their diets do not primarily consist of fish. Rather,

detritus and benthic invertebrates are primary food items. These species were the least contaminated large fish sampled in 2006. Redear sunfish are relatively small in size and occupy a similarly low position in the food web (Moyle 2002), feeding primarily offshore on shelled invertebrates (particularly clams). The lower concentrations in sunfish may, therefore, be due to different food web exposure compared to other species sampled in the Project.

The original hypothesis from the Sampling Plan that redear sunfish and bluegill may be good alternatives, as species lower in mercury, for human consumers is supported by these 2006 data and results from 2005 sampling. Rainbow trout were consistently low in mercury as well, and the trout are distributed over a different range than the sunfish and bluegill. It is important to remember, however, that this conclusion is only based on mercury analyses; organic contaminants have not been measured in these fish. Redear sunfish, bluegill, and rainbow trout were clearly lower in mercury than any of the other highly sampled target species, particularly largemouth bass, pikeminnow, channel catfish, carp, and sucker.

Characterizing Spatial and Temporal Trends (Project Goal 2)

The second main purpose of sport fish sampling was to characterize spatial and temporal trends in mercury to determine how habitat restoration and mercury clean-up actions affect methylmercury accumulation in the food web (Project Goal 2, Objective 1; Table 1).

Regional Spatial Patterns

After the second year of sampling, only three sites have been sampled for sport fish in both years of the Project. None of the index and intensive sites were sampled in 2006. Currently, the patterns that can be assessed with the data in hand are general spatial trends across all sites, without reference to specific restoration projects or types of sites. All site types contributed to the spatial patterns documented below.

Mercury concentrations were higher at locations closer to the Delta, relative to the northern portion of the Sacramento River watershed. This pattern was apparent throughout the maps and spatial figures in this report (Figures 19 – 26; Maps 3 – 5) and was also observed by Davis et al. (2003a) and Grenier et al. (2007) in this region. The map illustrating maximum mean concentrations (Map 3) indicates areas of lesser impact (green and yellow categories) in the northern portion of the watershed, and higher impact (orange and red) in the southern portion and north Delta. Many of the mercury concentration maps by species (Maps 6 – 17) repeat this pattern.

Predicted Length:Mercury Relationships Based on Model Results

The ‘best’ model to predict length:mercury relationships in largemouth bass and channel catfish differed between species (Tables 7 and 8). The selected model for largemouth bass (lowest AIC_c value and highest AIC_c model weight in Table 7 for random and fixed effects) exhibited a curvilinear relationship of length:mercury (i.e., $length^2$), with variables for site and region also included. The ‘best’ model for channel catfish (Table 8) also indicated a curvilinear variable for length; however, the final model did not support a term for site, although region was included. There is a possibility that the larger sample size of largemouth bass supported the inclusion of

site as a variable explaining spatial variation, while the smaller catfish data set had only enough data to support region as an explanatory spatial variable. Repetition of this approach with all three years of data in the final report will provide the most fine-grained modeling, as data sets will be larger.

Because they include sampling site as a random spatial variable, these models allow the results to be inferred across the full study area. Thus, we can conclude that the areas not sampled from similar habitats within the study area are adequately represented by the outcome of the modeling. The most important finding from the mixed models is the complexity of the models supported. To be able to predict the mercury concentration in a given fish, we need a great deal of information: species, length, site, and region. This result confirms the complexity of the mercury problem in sport fish. Many variables interact to determine how much mercury a fish will bioaccumulate, which means that a fair amount of monitoring effort must be expended in order to characterize variability in mercury across the full population of sport fish and to detect trends.

The final model for each species (Appendix IIb and IIc) was used to evaluate the spatial patterns described below.

The length:mercury relationship varied by site for both species analyzed by the general linear mixed model (Figures 17 – 18). Despite the fact that a site parameter was not supported in the final model for channel catfish, a significant slope term for region was included, which subsequently influenced the site-specific predictions when applied to the fish lengths. Both 2005 and 2006 sites are represented on these figures, as the full Project dataset to date was used in this analysis. The regressions varied significantly in intercept and slope, which was indicated by the parameter estimates for each region or site (Appendix IIb and IIc). For largemouth bass, sites in the Sacramento River watershed are plotted north to south from the top of Figure 17, and the north Delta sites begin near the top of the second page. Sites in the north Delta and southern portion of the watershed had slightly higher intercepts and slopes compared to those in the northern watershed and on the Merced River (a tributary of the San Joaquin River).

Channel catfish also showed variation by site in the predicted length:mercury relationships (Figure 18). No locations in the Delta met the sample size and length range criteria to be included in this analysis. The two sites on the lower Sacramento River (Butte Creek at Colusa Hwy and Sacramento River at Knight's Landing) have much higher intercepts and steeper slopes than the three reservoir sites in the western drainages of the watershed (third row of plots). This pattern of lower mercury in the western drainages relative to further south in the watershed is also evident on Map 5, where the concentration bars are taller on the bottom compared to the middle and top of the map. Thus, the results of the modeling exercise for both species indicate that the higher mercury concentrations in the more southern reaches of the Sacramento River watershed may be due to a more rapid increase of mercury relative to length (steeper slope) and a higher set-point (higher intercept) to begin with, relative to other parts of the watershed.

Spatial Patterns Based on Estimates of Mercury at a Standard Length or Size Limits

Spatial differences in mean mercury of largemouth bass and channel catfish were assessed at a standard length to compare concentrations within species that were normalized for length. Regional differences were examined using linear contrasts of mean mercury concentrations.

Generally, for all other species not analyzed by the modeling approach, length and sample size limits were applied for this analysis. In Figures 21 – 26, confidence intervals that did not overlap between regions indicated significantly different estimates of the mean mercury concentration between those regions.

For largemouth bass, the spatial pattern in mercury concentrations was the same as has been described above, with further implications being evident through the combination of both 2005 and 2006 data (Figure 19). Mercury concentrations generally increased from the northern portion of the Sacramento River (0.4 ppm) towards Cosumnes River, Mokelumne River, and the north Delta (0.5 – 1.3 ppm). Mercury was low in the central Delta (0.2 ppm) and increased to approximately 0.4 ppm on the San Joaquin River (Figure 19), then declined to low levels again at the southern end of the San Joaquin. The statistical comparison of means indicated that locations along the American and Cosumnes/Mokelumne Rivers had significantly higher concentrations ($p << 0.05$) than locations in other regions of the Project area. Sites in the central Delta were significantly lower than locations on the Sacramento River ($p = 0.009$), but not compared to the San Joaquin River ($p = 0.13$). This spatial pattern somewhat mirrors that of previous studies in the region (*e.g.,* Davis et al. 2003). A clearer statistical significance in the San Joaquin River is likely hindered by the relatively small number of locations in the region compared to the central Delta and Sacramento River. Extensive sampling of this region of the watershed is planned for the final year of sampling in 2007. A largemouth bass bioaccumulation model is also in development. This model will use a variety of input parameters, such as largemouth bass mercury concentrations, prey mercury concentrations, and growth rates, to understand spatial differences of mercury in this species across the study area.

The channel catfish dataset was not adequate to support standard length concentration predictions by site for an evaluation of spatial patterns. The data were, however, adequate to support estimates for each region (Figure 20). The range in standard length mercury concentration (0.14 – 0.40 ppm) between regions was relatively small. However, the estimated concentrations on the western drainages were significantly lower than the eastern drainages ($p = 0.04$) and Sacramento River ($p = 0.009$).

A dataset of 18 locations for common carp was available for spatial comparison of mean mercury ± confidence interval (Figure 21). Size limits were not applied, and the same regional pattern as largemouth bass was shown by this species. Locations on the northern end of the Sacramento River were lower (0.2 ppm) than those on the southern Sacramento River, western drainages and north Delta (0.3 – 0.6 ppm).

Sacramento pikeminnow concentrations varied greatly within the watershed (Figure 22), and the sites with higher mean concentrations showed more variability (large confidence intervals). This phenomenon may be attributable to the small numbers of fish sampled. The regional pattern of higher mercury at locations lower in the watershed is not evident in this species. Although the highest mean concentration coincides with a Sacramento River site lower in the watershed, the second highest was in Whiskeytown Lake at Clear Creek, one of the most northern sites sampled in 2006. Interestingly, a very low concentration at Brandy Creek (0.05 ppm) was also from the Whiskeytown Lake area. The range in concentrations in the Sacramento River (0.05 – 0.6 ppm) did not differ greatly from that of the north Delta (0.05 – 0.45 ppm).

Regional patterns in mercury concentration for Sacramento sucker were consistent with that of largemouth bass and common carp (Figure 23). In general, mean mercury concentrations were lower in the northern portion of the Sacramento River and increased towards the Delta. However, as with other target species, a few locations appeared to go against this spatial trend. The two northern most sites near the Sacramento River were higher than other sites in this region, and sucker at Lake Almanor (above Feather River) exhibited wide confidence intervals around a mean concentration that was nearly twice that of any other site in the watershed.

Bluegill exhibited a somewhat unique spatial trend in mean mercury concentrations (Figure 24). Bluegill mercury in the Sacramento River was generally low, with only Butte Creek at Colusa Highway exceeding 0.2 ppm. Sites in the western drainages and Feather River were similarly low. Of the more southern locations, Cosumnes River exhibited an elevated concentration (0.65 ppm) compared to other sites in the Delta. The decrease in mercury concentration from 0.3 ppm in the Toe Drain to 0.1 ppm in Steamboat Slough is peculiar given the spatial patterns observed in other species.

Redear sunfish followed the same spatial pattern as the larger target species (Figure 25), although the differences were more subtle, which made sense given that sunfish were generally lower in mercury relative to the other species. As with bluegill, redear sunfish from the Sacramento River were generally low in mercury, with only a single site in the northern watershed area exceeding 0.2 ppm. Cosumnes River was also relatively high (0.6 ppm), as observed for bluegill. In the north Delta, mean mercury concentrations were also low and only slightly elevated over the concentrations in the Sacramento River.

Rainbow trout had few data from sufficient sites for a spatial comparison (Map 25), and only locations in the northern portion of the Sacramento River watershed were well sampled. Mean mercury was less than 0.05 ppm at all sites (Figure 26), and confidence intervals were generally small, suggesting relatively consistent concentrations.

The spatial patterns in mercury observed in 2006 were expected, given patterns previously documented by the Project and other Bay-Delta Studies (Davis *et al.* 2000, Davis *et al.* 2003a, Grenier *et al.* 2007). The reason for this pattern of higher mercury in the southern portion of the Sacramento River and north Delta, however, is an area of on-going research. The relationship between total (unfiltered) methylmercury concentrations in water with mercury in sport fish is one hypothesis currently being investigated. Data collected by the CVRWQCB have shown that locations on the middle of the Sacramento River (at Colusa), and its tributaries (*e.g.,* Feather River, Colusa Basin Drain, and American River) contribute the majority (~ 80%) of methylmercury entering the Delta (Foe and Louie 2006). Furthermore, methylmercury concentrations in water were three-times higher near Freeport, relative to Redding (240 river miles upstream of Freeport) (Stephenson *et al.* 2007). Approximately half of the downstream increase was attributed to inputs from small creeks draining the mountain ranges on both sides of the Central Valley. Therefore, the higher mercury concentrations that have been observed in sport fish may relate to the higher loadings of mercury from tributary and creek inputs that feed the Sacramento River and north Delta. Significant positive relationships between annually-averaged methylmercury concentrations in water and in 350 mm largemouth bass have been

shown for this region of the watershed (Wood *et al.* 2006). A number of process-oriented studies are currently underway in the region to further address the spatial mercury patterns (e.g., Marvin-DiPasquale *et al.* 2006, Windham *et al.* 2006, Stephenson *et al.* 2007).

Temporal Trends

In this second year of sampling for the Project, 2006, no additional sites were sampled for the characterization of temporal trends in mercury. Therefore, there is no new information to report beyond what was discussed in the first Annual Report (Grenier *et al.* 2007). Index and intensive sites were selected for this purpose in 2005, and all of these sites will be revisited in 2007 for a second round of sampling. Thus, the Project will produce a data set to examine inter-annual trends between 2005 and 2007 and will add to the larger data set for long-term trends that was treated in depth in the 2005 Annual Report.

The detection of sport fish mercury reductions in response to management actions would require long-term monitoring datasets from fixed sites. The analysis presented in the 2005 Annual Report indicated a lack of such datasets in the watershed. The data generated by the three-year Project will provide a relatively short time frame to characterize such trends, and funding agencies should prioritize filling this data gap in the future.

CONCLUSIONS

- Mercury contamination of sport fish was widespread across the Sacramento River watershed and the north Delta. On a site-by-site basis, maximum concentrations among all species were most often in the moderate 0.1 – 0.5 ppm category (26 of 41 sites, 63%). These sites were distributed throughout the study area. Seven sites (17%) were in the low < 0.1 ppm category, and were distributed on the Sacramento River, Feather River, and in lakes on the eastern drainages of the watershed. Six sites were in the high 0.5 – 0.9 ppm category, situated in the lower portion of the Sacramento River watershed and north Delta. The remaining two sites (5%) were in the very high > 0.9 ppm category, and were located in Cosumnes River and Indian Valley Reservoir.

- Mercury varied by species. Largemouth bass was the most contaminated of the target species, followed by channel catfish, pikeminnow, carp, sucker, bluegill, and redear sunfish in decreasing order of concentration. Of all species sampled in 2006, redear sunfish, bluegill, and rainbow trout were identified as potentially being good alternatives for human consumers. This conclusion has the limitation that organic analyses were not conducted.

- Mercury varied spatially. Mercury concentrations were higher at locations in the southern portion of the Sacramento River watershed and in the north Delta. Lower concentrations were found in streams, lakes, and reservoirs, in the northern portion of the watershed.

Acknowledgements

This study was funded by CBDA Project # ERP 02D-P67.

The authors gratefully thank Zach Peery (Moss Landing Marine Laboratories) for his assistance with development of the statistical model and implementation of preliminary model runs.

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Table 1. Fish Mercury Project goals and objectives.

Project Goals

1) Protect human health in the short term by characterizing mercury concentrations in fish, developing safe consumption guidelines, and reducing exposure through risk communication based on environmental justice principles.
2) Through food web monitoring, determine how habitat restoration and mercury clean-up actions affect methylmercury accumulation in the food web.
3) Establish an organizational and technical foundation for cost-effective and scientifically defensible fish mercury monitoring that meets the identified needs of end users.
4) Coordinate with the major ongoing science, management, and risk communication efforts to achieve efficiencies of scale and scope.

Project Objectives

1) Characterize spatial and temporal trends in mercury in fishery resources.
2) Demonstrate the use of biosentinel species to link ecosystem restoration, contaminant clean-up, and other landscape changes with spatial and temporal patterns in food web mercury.
3) Assess health risks of consuming contaminated fish and communicate these risks to appropriate target audiences based on environmental justice principles.
4) Establish a Steering Committee and stakeholder advisory groups to facilitate:
a) stakeholder input into the monitoring and risk communication activities based on environmental justice principles, and
b) coordination with other major science, management, and outreach/communication efforts.

Table 2. Scientific and common names of fish species collected.

Common Name	Genus	Species
American Shad	*Alosa*	*sapidissima*
Black Crappie	*Pomoxis*	*nigromaculatus*
Bluegill	*Lepomis*	*macrochirus*
Brook Trout	*Salvelinus*	*fontinalis*
Brown Bullhead	*Ameiurus*	*nebulosus*
Brown Trout	*Salmo*	*trutta*
Carp	*Cyprinus*	*carpio*
Channel Catfish	*Ictalurus*	*punctatus*
Chinook Salmon	*Oncorhynchus*	*tshawytscha*
Goldfish	*Carassius*	*auratus*
Hardhead	*Mylopharodon*	*conocephalus*
Hitch	*Lavinia*	*exilicauda*
Largemouth Bass	*Micropterus*	*salmoides*
Pumpkinseed	*Lepomis*	*gibbosus*
Rainbow Trout	*Oncorhynchus*	*mykiss*
Redear Sunfish	*Lepomis*	*microlophus*
Sacramento Pikeminnow	*Ptychocheilus*	*grandis*
Sacramento Sucker	*Catostomus*	*occidentalis*
Smallmouth Bass	*Micropterus*	*dolomieu*
Spotted Bass	*Micropterus*	*punctulatus*
Steelhead Trout	*Oncorhynchus*	*mykiss*
Striped Bass	*Morone*	*saxatilis*
Tule Perch	*Archoplites*	*interruptus*
Warmouth	*Lepomis*	*gulosus*
White Catfish	*Ameiurus*	*catus*
White Sturgeon	*Acipenser*	*transmontanus*

Table 3. Number and species of fish collected at sampling locations in the Sacramento watershed and North Delta, 2006. Sites are ordered alphabetically. All fish were analyzed as individuals. Map Cell ID column indicates where sites are located on Map 1. Striped bass data were not available at the time of this report.

Site Code	Site Name	Map Cell ID	Site Type	American Shad	Bluegill	Brown Bullhead	Brook Trout	Brown Trout	Carp	Channel Catfish	Chinook Salmon	Crappie	Flathead Catfish	Goldfish	Hardhead	Hitch	Kokanee	Lake Trout	Largemouth Bass	Punkinseed	Rainbow Trout	Redear Sunfish	Sacramento Perch	Sacramento Pikeminnow	Sacramento Sucker	Smallmouth Bass	Spotted Bass	Steelhead	Striped Bass	Tule Perch	Warmouth	White Catfish	White Sturgeon
ARNIM06	American River at Nimbus Dam	C4	Advisory/CVRWQCB	10															3						10				1				
BMLAK	Baum Lake	B1	Advisory					3													12												
BKLAK	Bucks Lake	C2	Advisory					8										5			8												
BBRC	Bullards Bar Reservoir at Central	C3	Advisory		5																					13							
BBRE	Bullards Bar Reservoir at East Arm	C3	Advisory		5				11										1							11							
BCHWY	Butte Creek at Colusa Highway	B3	Advisory		5				10	12		1							12			4											
CCMOU06	Clear Creek Near Mouth	A2	Advisory																					15									
COSRM1	Cosumnes River at River Mile 1	Inset	Restoration		6				5	8		6							13			5					5		1			3	
CRSCNL	Cross Canal	B4	Advisory						5										12			5			5								
EPRSE	East Park Reservoir Southeast	A3	Advisory		5				5	12				4					10			5											
EPRSW	East Park Reservoir West	A3	Advisory		5				5	13		2		5					10														
FRGRCV	Feather River at Gridley	B3	CVRWQCB																9					10	10								
FRORO	Feather River at Oroville Outlet	B3	Advisory	10																													
FREWR	Fremont Weir	B4	Advisory	23																									31				
GEOSL	Georgiana Slough	Inset	Advisory						1										4			5		5	4		8						
HTCRK	Hat Creek	B1	Advisory													5					12									5			
INVRN	Indian Valley Reservoir North	A3	Advisory						5	7									12			5											
INVRS	Indian Valley Reservoir South	A3	Advisory																	5													
LKALN	Lake Almanor North	C2	Advisory																		1				5	2		12			5		
LKALS	Lake Almanor South	C2	Advisory			6																				4					1		
LKBRI	Lake Britton	B1	Advisory		5				5			5												5	5	12							
LIBIS	Liberty Island	Inset	Advisory																										17				
MCVFD	McAvoy Fish Derby	B5	Advisory																														10
MERHP	Merced River at Hatfield State Park	C5	CVRWQCB																10						10								
ORCCF	Old River at Cliffton Court Forebay	B5	Advisory																										10				
RIOVFD1	Rio Vista Derby1	Inset	Advisory																										1				
RIOVFD2	Rio Vista Derby2	Inset	Advisory																										1				
SACRM59	Sacramento River - West Sacramento at Rivermile 59	B4	Advisory						10										3			10		5	5		9		1				
SRBND06	Sacramento River at Bend Bridge Near Red Bluff	A2	Advisory																		12			2	5								
SACCSL	Sacramento River at Cache Slough	Inset	Advisory																										1				
SACCM33	Sacramento River at Channel Marker 33	B5	Advisory																														2
SRCOL06	Sacramento River at Colusa	B3	Advisory/CVRWQCB	2															9					1	10				14				
SACKL	Sacramento River at Knights Landing	B4	Advisory	5	4				5	11									5			5		5	5				13				
SACMS	Sacramento River at Miner Slough	Inset	Advisory																										11				
SACTIS	Sacramento River at Tisdale Boat Ramp AKA River Bend Marina	B3	Advisory						4		1													5	5				3				
SACDES	Sacramento River Near Deschutes Rd	A2	Advisory																		12			5	5								
SACSCOT	Sacramento River Near Hamilton (Scotty's Boat Landing)	B3	Advisory												5									5	5				3				
SACVER	Sacramento River Near Verona Marina, Village Resort AKA Joe's Place	B4	Advisory		5				5	1									2			5		9	5		4					2	
SHMCR	Shasta Lake at McCloud River	A1	Advisory						5	4									15	6													
SHSAC	Shasta Lake at Sacramento River	A1	Advisory		14															3							16						
SHMAIN	Shasta Lake Main Stem	A1	Advisory		17				6		10								22	15	11						4						
SNSL	Snodgrass Slough Near Delta Meadows	Inset	Advisory		5				5	1		3							12			5			5							5	
STSL	Steamboat Slough	Inset	Advisory		5				5	2		2							13			5		5	5								
SGORDM	Stony Gorge Reservoir at Dam	A3	Advisory		4				5	12				5					3														
SGORS	Stony Gorge Reservoir South	A3	Advisory		5				12	1				5					4														

Site Code	Site Name	Map Cell ID	Site Type	American Shad	Bluegill	Brown Bullhead	Brook Trout	Brown Trout	Carp	Channel Catfish	Chinook Salmon	Crappie	Flathead Catfish	Goldfish	Hardhead	Hitch	Kokanee	Lake Trout	Largemouth Bass	Punkinseed	Rainbow Trout	Redear Sunfish	Sacramento Perch	Sacramento Pikeminnow	Sacramento Sucker	Smallmouth Bass	Spotted Bass	Steelhead	Striped Bass	Tule Perch	Warmouth	White Catfish	White Sturgeon
SUBY	Sutter Bypass Below Kirkville Road	B4	Advisory		3				3			3							9			5										
TOED	Toe Drain	B4	Restoration	0	6				5	11		6		4					17										3			9	
WLKB	Whiskeytown Lake at Brandy Creek	A1	Advisory		13	7													5					5		3	4						
WLKCC	Whiskeytown Lake at Clear Creek	A1	Advisory				16												1					5	8		10						
			TOTAL	50	117	13	16	11	122	95	11	28	0	23	5	5	0	5	216	29	68	64	0	87	112	45	60	12	111	5	6	19	12

Table 4. Spearman's rank correlation statistic of length:mercury for each species sampled in 2006.

Species	Sample Size	Spearman's Correlation (ρ)
Largemouth Bass	185	0.57
Carp	122	0.13
Bluegill	117	0.56
Channel Catfish	95	0.27
Sacramento Pikeminnow	76	0.72
Sacramento Sucker	72	0.54
Rainbow Trout	68	0.50
Redear Sunfish	64	0.35
Spotted Bass	60	0.57
American Shad	50	-0.47
Smallmouth Bass	45	0.54
Pumpkinseed	29	0.63
BlackCrappie	28	0.47
White Catfish	19	-0.10
Brook Trout	16	-0.13
Brown Bullhead	13	0.62
SteelheadTrout	12	0.48
White Sturgeon	12	0.22
Brown Trout	11	0.47
Chinook Salmon	11	0.28
Warmouth	6	0.60
Hardhead	5	0.40
Hitch	5	-0.30
Lake Trout	5	-0.10
Tule Perch	5	0.37

Table 5. Sample sizes, size limits and percent of samples in each of four mercury concentration categories, by species.

Species	Number of Samples	Length Size Limits (mm)	<0.1 ppm %	> 0.1 – 0.5 ppm %	> 0.5 – 0.9 ppm %	> 0.9 ppm %
Largemouth Bass	127	305 -- 407	0	69	19	12
Carp	122	none	7	81	11	1
Bluegill	66	117 -- 156	48	52	0	0
Sacramento Sucker	63	367 -- 489	17	79	3	0
Channel Catfish	55	371 -- 495	2	82	15	2
Redear Sunfish	43	151 -- 202	35	65	0	0
Rainbow Trout	43	271 -- 361	98	2	0	0
American Shad	33	363 -- 484	94	6	0	0
Sacramento Pikeminnow	22	320 -- 425	0	82	18	0
Smallmouth Bass	22	305 -- 407	14	64	23	0
Black Crappie	17	191 -- 254	29	53	0	18
White Catfish	14	274 -- 366	0	50	50	0
Brook Trout	14	222 -- 296	100	0	0	0
Pumpkinseed	14	102 -- 136	86	14	0	0
Spotted Bass	13	305 – 407	0	54	31	15
Steelhead Trout	12	395 -- 527	50	50	0	0
Chinook Salmon	10	449 -- 599	0	100	0	0
White Sturgeon	10	1330 - 1774	0	100	0	0
Warmouth	6	178 -- 238	33	67	0	0
Brown Bullhead	5	260 -- 347	100	0	0	0
Brown Trout	5	323 -- 430	80	20	0	0
Hardhead	5	339 -- 452	0	80	20	0
Lake Trout	5	244 -- 325	100	0	0	0
Tule Perch	5	126 -- 168	100	0	0	0
Hitch	5	202 -- 269	100	0	0	0

Table 6. The mean, upper & lower confidence intervals, and standard deviation for mercury and total length for 2006 samples. Size limits were applied (Table 5).

Year	Species	Site Code	Site Name	Sample Size	Mean Total Length (mm)	Hg Lower Bound CI (95%)	Mean Hg (ppm)	Hg Upper Bound CI (95%)	Hg Std Dev
2006	American Shad	ARNIM06	American River at Nimbus Dam	10	439	0.033	0.048	0.063	0.024
2006	American Shad	FREWR	Fremont Weir	23	435	0.039	0.069	0.100	0.075
2006	American Shad	FRORO	Feather River @ Oroville Outlet	10	436	0.044	0.053	0.063	0.015
2006	American Shad	SACKL	Sacramento River at Knights Landing	5	382	0.050	0.068	0.086	0.021
2006	American Shad	SRCOL06	Sacramento River at Colusa	2	414	0.016	0.043	0.070	0.020
2006	BlackCrappie	BCHWY	Butte Creek at Colusa Highway	1	195		0.364		
2006	BlackCrappie	COSRM1	Cosumnes River at River Mile 1	6	233	1.700	1.898	2.097	0.248
2006	BlackCrappie	EPRSW	East Park Reservoir West	2	181	0.020	0.070	0.119	0.036
2006	BlackCrappie	LKBRI	Lake Britton	5	209	0.067	0.093	0.119	0.029
2006	BlackCrappie	SNSL	Snodgrass Slough Near Delta Meadows	3	236	0.345	0.514	0.683	0.149
2006	BlackCrappie	STSL	Steamboat Slough	2	198	0.235	0.268	0.300	0.023
2006	BlackCrappie	SUBY	Sutter Bypass Below Kirkville Road	3	312	0.227	0.345	0.463	0.105
2006	BlackCrappie	TOED	Toe Drain	6	215	0.164	0.263	0.362	0.124
2006	Bluegill	BBRC	Bullards Bar Reservoir at Central	5	138	0.084	0.109	0.134	0.029
2006	Bluegill	BBRE	Bullards Bar Reservoir at East Arm	5	176	0.075	0.179	0.283	0.118
2006	Bluegill	BCHWY	Butte Creek at Colusa Highway	5	138	0.189	0.266	0.343	0.088
2006	Bluegill	COSRM1	Cosumnes River at River Mile 1	6	174	0.482	0.679	0.876	0.247
2006	Bluegill	EPRSE	East Park Reservoir Southeast	5	135	0.056	0.064	0.072	0.009
2006	Bluegill	EPRSW	East Park Reservoir West	5	125	0.079	0.090	0.101	0.013
2006	Bluegill	LKBRI	Lake Britton	5	174	0.059	0.084	0.108	0.028
2006	Bluegill	SACKL	Sacramento River at Knights Landing	4	133	0.100	0.175	0.249	0.076
2006	Bluegill	SACVER	Sacramento River Near Verona Marina, Village Resort AKA Joe's Place	5	135	0.088	0.164	0.240	0.087
2006	Bluegill	SGORDM	Stony Gorge Reservoir at Dam	4	169	0.054	0.130	0.206	0.078
2006	Bluegill	SGORS	Stony Gorge Reservoir South	5	168	0.097	0.114	0.130	0.019
2006	Bluegill	SHMAIN	Shasta Lake Main Stem	17	120	0.042	0.052	0.062	0.021
2006	Bluegill	SHSAC	Shasta Lake at Sacramento River	14	118	0.070	0.075	0.080	0.010
2006	Bluegill	SNSL	Snodgrass Slough Near Delta Meadows	5	133	0.160	0.214	0.268	0.061
2006	Bluegill	STSL	Steamboat Slough	5	144	0.073	0.105	0.137	0.036
2006	Bluegill	SUBY	Sutter Bypass Below Kirkville Road	3	134	0.106	0.172	0.238	0.058
2006	Bluegill	TOED	Toe Drain	6	145	0.243	0.320	0.396	0.095
2006	Bluegill	WLKB	Whiskeytown Lake at Brandy Creek	13	132	0.061	0.090	0.118	0.052
2006	Brook Trout	WLKCC	Whiskeytown Lake at Clear Creek	16	263	0.023	0.025	0.026	0.003
2006	Brown Bullhead	LKALS	Lake Almanor South	6	335	0.041	0.078	0.115	0.046
2006	Brown Bullhead	WLKB	Whiskeytown Lake at Brandy Creek	7	285	0.030	0.038	0.045	0.010
2006	Brown Trout	BKLAK	Bucks Lake	8	348	0.019	0.071	0.123	0.074
2006	Brown Trout	BMLAK	Baum Lake	3	475	0.005	0.064	0.122	0.052
2006	Carp	BBRE	Bullards Bar Reservoir at East Arm	11	463	0.447	0.524	0.601	0.131
2006	Carp	BCHWY	Butte Creek at Colusa Highway	10	518	0.295	0.357	0.419	0.101
2006	Carp	COSRM1	Cosumnes River at River Mile 1	5	493	0.308	0.339	0.370	0.035
2006	Carp	CRSCNL	Cross Canal	5	415	0.079	0.146	0.213	0.076
2006	Carp	EPRSE	East Park Reservoir Southeast	5	415	0.172	0.246	0.319	0.084
2006	Carp	EPRSW	East Park Reservoir West	5	432	0.150	0.225	0.299	0.085
2006	Carp	GEOSL	Georgiana Slough	1	581		0.182		
2006	Carp	INVRN	Indian Valley Reservoir North	5	518	0.379	0.456	0.533	0.088
2006	Carp	LKBRI	Lake Britton	5	557	0.051	0.118	0.184	0.076
2006	Carp	SACKL	Sacramento River at Knights Landing	5	587	0.113	0.215	0.317	0.116
2006	Carp	SACRM59	Sacramento River - West Sacramento at Rivermile 59 - Between Discovery Park and Miller Park	10	602	0.219	0.298	0.377	0.128
2006	Carp	SACTIS	Sacramento River at Tisdale Boat Ramp AKA River Bend Marina	4	489	0.130	0.191	0.252	0.062
2006	Carp	SACVER	Sacramento River Near Verona Marina, Village Resort AKA Joe's Place	5	500	0.218	0.287	0.356	0.079
2006	Carp	SGORDM	Stony Gorge Reservoir at Dam	5	421	0.127	0.198	0.269	0.081
2006	Carp	SGORS	Stony Gorge Reservoir South	12	470	0.292	0.339	0.387	0.085
2006	Carp	SHMAIN	Shasta Lake Main Stem	6	588	0.108	0.188	0.267	0.099
2006	Carp	SHMCR	Shasta Lake at McCloud River	5	671	0.194	0.231	0.268	0.042
2006	Carp	SNSL	Snodgrass Slough Near Delta Meadows	5	621	0.201	0.315	0.429	0.130
2006	Carp	STSL	Steamboat Slough	5	574	0.327	0.393	0.459	0.075
2006	Carp	SUBY	Sutter Bypass Below Kirkville Road	3	451	0.068	0.141	0.215	0.065
2006	Carp	TOED	Toe Drain	5	482	0.177	0.462	0.747	0.325
2006	Channel Catfish	BCHWY	Butte Creek at Colusa Highway	12	499	0.313	0.400	0.486	0.153
2006	Channel Catfish	COSRM1	Cosumnes River at River Mile 1	8	427	0.662	0.834	1.005	0.248
2006	Channel Catfish	EPRSE	East Park Reservoir Southeast	12	439	0.142	0.171	0.200	0.051
2006	Channel Catfish	EPRSW	East Park Reservoir West	13	454	0.201	0.267	0.333	0.122
2006	Channel Catfish	INVRN	Indian Valley Reservoir North	7	393	0.255	0.436	0.617	0.244
2006	Channel Catfish	SACKL	Sacramento River at Knights Landing	11	362	0.196	0.270	0.344	0.124
2006	Channel Catfish	SACVER	Sacramento River Near Verona Marina, Village Resort AKA Joe's Place	1	428		0.436		
2006	Channel Catfish	SGORDM	Stony Gorge Reservoir at Dam	12	450	0.160	0.191	0.221	0.054
2006	Channel Catfish	SGORS	Stony Gorge Reservoir South	1	311		0.115		
2006	Channel Catfish	SHMCR	Shasta Lake at McCloud River	4	544	0.091	0.241	0.390	0.152
2006	Channel Catfish	SNSL	Snodgrass Slough Near Delta Meadows	1	490		0.229		

Year	Species	Site Code	Site Name	Sample Size	Mean Total Length (mm)	Hg Lower Bound CI (95%)	Mean Hg (ppm)	Hg Upper Bound CI (95%)	Hg Std Dev
2006	Channel Catfish	STSL	Steamboat Slough	2	414	0.303	0.340	0.376	0.026
2006	Channel Catfish	TOED	Toe Drain	11	439	0.356	0.405	0.454	0.083
2006	Chinook Salmon	SACTIS	Sacramento River at Tisdale Boat Ramp AKA River Bend Marina	1	806		0.094		
2006	Chinook Salmon	SHLK	Shasta Lake	10	505	0.273	0.300	0.327	0.044
2006	Goldfish	EPRSE	East Park Reservoir Southeast	4	336	0.085	0.122	0.160	0.038
2006	Goldfish	EPRSW	East Park Reservoir West	5	354	0.152	0.249	0.346	0.111
2006	Goldfish	SGORDM	Stony Gorge Reservoir at Dam	5	327	0.071	0.105	0.140	0.039
2006	Goldfish	SGORS	Stony Gorge Reservoir South	5	323	0.110	0.163	0.215	0.060
2006	Goldfish	TOED	Toe Drain	4	324	0.090	0.263	0.437	0.177
2006	Hardhead	SACSCOT	Sacramento River Near Hamilton (Scotty's Boat Landing)	5	402	0.114	0.297	0.481	0.209
2006	Hitch	HTCRK	Hat Creek	5	239	0.046	0.059	0.073	0.016
2006	Lake Trout	BKLAK	Bucks Lake	5	289	0.019	0.024	0.030	0.006
2006	Largemouth Bass	ARNIM06	American River at Nimbus Dam	3	383	0.221	0.601	0.982	0.336
2006	Largemouth Bass	BBRE	Bullards Bar Reservoir at East Arm	1	490		0.608		
2006	Largemouth Bass	BCHWY	Butte Creek at Colusa Highway	12	381	0.443	0.551	0.659	0.191
2006	Largemouth Bass	COSRM1	Cosumnes River at River Mile 1	13	336	1.110	1.295	1.480	0.340
2006	Largemouth Bass	CRSCNL	Cross Canal	12	392	0.396	0.469	0.543	0.130
2006	Largemouth Bass	EPRSE	East Park Reservoir Southeast	10	319	0.216	0.284	0.352	0.109
2006	Largemouth Bass	EPRSW	East Park Reservoir West	10	303	0.269	0.298	0.326	0.045
2006	Largemouth Bass	FRGRCV	Feather River at Gridley	9	262	0.115	0.188	0.261	0.112
2006	Largemouth Bass	GEOSL	Georgiana Slough	4	318	0.238	0.451	0.664	0.218
2006	Largemouth Bass	INVRN	Indian Valley Reservoir North	12	316	0.752	0.846	0.939	0.166
2006	Largemouth Bass	MERHP	Merced River at Hatfield State Park	10	352	0.287	0.389	0.492	0.165
2006	Largemouth Bass	SACKL	Sacramento River at Knights Landing	5	344	0.215	0.413	0.610	0.225
2006	Largemouth Bass	SACRM59	Sacramento River - West Sacramento at Rivermile 59 - Between Discovery Park and Miller Park	3	399	0.792	0.885	0.978	0.082
2006	Largemouth Bass	SACVER	Sacramento River Near Verona Marina, Village Resort AKA Joe's Place	2	298	0.301	0.389	0.476	0.063
2006	Largemouth Bass	SGORDM	Stony Gorge Reservoir at Dam	3	263	0.189	0.238	0.287	0.044
2006	Largemouth Bass	SGORS	Stony Gorge Reservoir South	4	301	0.219	0.276	0.333	0.058
2006	Largemouth Bass	SHMAIN	Shasta Lake Main Stem	22	342	0.233	0.290	0.347	0.137
2006	Largemouth Bass	SHMCR	Shasta Lake at McCloud River	15	327	0.242	0.294	0.346	0.102
2006	Largemouth Bass	SNSL	Snodgrass Slough Near Delta Meadows	12	352	0.391	0.442	0.493	0.090
2006	Largemouth Bass	SRCOL06	Sacramento River at Colusa	9	344	0.428	0.588	0.747	0.244
2006	Largemouth Bass	STSL	Steamboat Slough	13	346	0.418	0.581	0.744	0.299
2006	Largemouth Bass	SUBY	Sutter Bypass Below Kirkville Road	9	345	0.279	0.393	0.506	0.173
2006	Largemouth Bass	TOED	Toe Drain	17	324	0.268	0.378	0.488	0.231
2006	Largemouth Bass	WLKB	Whiskeytown Lake at Brandy Creek	5	244	0.089	0.099	0.109	0.012
2006	Largemouth Bass	WLKCC	Whiskeytown Lake at Clear Creek	1	405		0.294		
2006	Pumpkinseed	INVRS	Indian Valley Reservoir South	5	151	0.223	0.268	0.313	0.051
2006	Pumpkinseed	SHMAIN	Shasta Lake Main Stem	15	110	0.027	0.051	0.075	0.048
2006	Pumpkinseed	SHMCR	Shasta Lake at McCloud River	6	118	0.059	0.077	0.094	0.022
2006	Pumpkinseed	SHSAC	Shasta Lake at Sacramento River	3	137	0.026	0.110	0.194	0.074
2006	Rainbow Trout	BKLAK	Bucks Lake	8	260	0.020	0.026	0.031	0.008
2006	Rainbow Trout	BMLAK	Baum Lake	12	362	0.021	0.035	0.050	0.025
2006	Rainbow Trout	HTCRK	Hat Creek	12	307	0.019	0.022	0.025	0.005
2006	Rainbow Trout	LKALN	Lake Almanor North	1	356		0.077		
2006	Rainbow Trout	SACDES	Sacramento River Near Deschutes Rd	12	295	0.032	0.039	0.047	0.013
2006	Rainbow Trout	SHLK	Shasta Lake	10	372	0.030	0.057	0.085	0.044
2006	Rainbow Trout	SHMAIN	Shasta Lake Main Stem	1	332		0.031		
2006	Rainbow Trout	SRBND06	Sacramento River at Bend Bridge Near Red Bluff	12	315	0.032	0.040	0.048	0.014
2006	Redear Sunfish	BCHWY	Butte Creek at Colusa Highway	4	157	0.126	0.204	0.281	0.079
2006	Redear Sunfish	COSRM1	Cosumnes River at River Mile 1	5	205	0.383	0.581	0.779	0.226
2006	Redear Sunfish	CRSCNL	Cross Canal	5	160	0.088	0.148	0.208	0.068
2006	Redear Sunfish	EPRSE	East Park Reservoir Southeast	5	164	0.035	0.058	0.082	0.027
2006	Redear Sunfish	GEOSL	Georgiana Slough	5	194	0.028	0.182	0.337	0.176
2006	Redear Sunfish	INVRN	Indian Valley Reservoir North	5	155	0.202	0.279	0.356	0.087
2006	Redear Sunfish	SACKL	Sacramento River at Knights Landing	5	181	0.071	0.113	0.154	0.047
2006	Redear Sunfish	SACRM59	Sacramento River - West Sacramento at Rivermile 59 - Between Discovery Park and Miller Park	10	194	0.100	0.138	0.177	0.062
2006	Redear Sunfish	SACVER	Sacramento River Near Verona Marina, Village Resort AKA Joe's Place	5	164	0.075	0.133	0.192	0.067
2006	Redear Sunfish	SNSL	Snodgrass Slough Near Delta Meadows	5	181	0.086	0.171	0.256	0.097
2006	Redear Sunfish	STSL	Steamboat Slough	5	212	0.106	0.199	0.293	0.107
2006	Redear Sunfish	SUBY	Sutter Bypass Below Kirkville Road	5	168	0.070	0.111	0.153	0.047
2006	Sacramento Pikeminnow	CCMOU06	Clear Creek Near Mouth	15	152	0.128	0.150	0.172	0.043
2006	Sacramento Pikeminnow	FRGRCV	Feather River at Gridley	10	324	0.203	0.292	0.380	0.142
2006	Sacramento Pikeminnow	GEOSL	Georgiana Slough	5	213	0.075	0.093	0.110	0.020
2006	Sacramento Pikeminnow	LKBRI	Lake Britton	5	271	0.047	0.058	0.070	0.013
2006	Sacramento Pikeminnow	SACDES	Sacramento River Near Deschutes Rd	5	392	0.222	0.395	0.568	0.198
2006	Sacramento Pikeminnow	SACKL	Sacramento River at Knights Landing	5	541	0.647	0.804	0.961	0.179
2006	Sacramento Pikeminnow	SACRM59	Sacramento River - West Sacramento at Rivermile 59 - Between Discovery Park and Miller Park	5	232	0.087	0.202	0.317	0.131
2006	Sacramento Pikeminnow	SACSCOT	Sacramento River Near Hamilton (Scotty's Boat Landing)	5	400	0.253	0.316	0.378	0.071

Year	Species	Site Code	Site Name	Sample Size	Mean Total Length (mm)	Hg Lower Bound CI (95%)	Mean Hg (ppm)	Hg Upper Bound CI (95%)	Hg Std Dev
2006	Sacramento Pikeminnow	SACTIS	Sacramento River at Tisdale Boat Ramp AKA River Bend Marina	5	281	0.078	0.095	0.112	0.019
2006	Sacramento Pikeminnow	SACVER	Sacramento River Near Verona Marina, Village Resort AKA Joe's Place	9	335	0.285	0.388	0.492	0.158
2006	Sacramento Pikeminnow	SRBND06	Sacramento River at Bend Bridge Near Red Bluff	2	408	0.317	0.452	0.587	0.098
2006	Sacramento Pikeminnow	SRCOL06	Sacramento River at Colusa	1	370		0.221		
2006	Sacramento Pikeminnow	STSL	Steamboat Slough	5	232	0.274	0.443	0.612	0.192
2006	Sacramento Pikeminnow	WLKB	Whiskeytown Lake at Brandy Creek	5	150	0.045	0.049	0.053	0.005
2006	Sacramento Pikeminnow	WLKCC	Whiskeytown Lake at Clear Creek	5	645	0.429	0.635	0.840	0.234
2006	Sacramento Sucker	ARNIM06	American River at Nimbus Dam	10	355	0.065	0.146	0.228	0.132
2006	Sacramento Sucker	CRSCNL	Cross Canal	5	352	0.108	0.201	0.295	0.107
2006	Sacramento Sucker	FRGRCV	Feather River at Gridley	10	415	0.101	0.198	0.295	0.156
2006	Sacramento Sucker	GEOSL	Georgiana Slough	4	452	0.201	0.358	0.514	0.160
2006	Sacramento Sucker	LKALN	Lake Almanor North	5	565	0.457	0.825	1.192	0.419
2006	Sacramento Sucker	LKBRI	Lake Britton	5	520	0.235	0.361	0.487	0.144
2006	Sacramento Sucker	MERHP	Merced River at Hatfield State Park	10	478	0.298	0.366	0.435	0.110
2006	Sacramento Sucker	SACDES	Sacramento River Near Deschutes Rd	5	483	0.091	0.134	0.177	0.049
2006	Sacramento Sucker	SACKL	Sacramento River at Knights Landing	5	403	0.113	0.186	0.258	0.083
2006	Sacramento Sucker	SACRM59	Sacramento River - West Sacramento at Rivermile 59 - Between Discovery Park and Miller Park	5	419	0.207	0.314	0.420	0.121
2006	Sacramento Sucker	SACSCOT	Sacramento River Near Hamilton (Scotty's Boat Landing)	5	411	0.029	0.108	0.187	0.090
2006	Sacramento Sucker	SACTIS	Sacramento River at Tisdale Boat Ramp AKA River Bend Marina	5	428	0.185	0.236	0.286	0.057
2006	Sacramento Sucker	SACVER	Sacramento River Near Verona Marina, Village Resort AKA Joe's Place	5	383	0.181	0.231	0.281	0.057
2006	Sacramento Sucker	SNSL	Snodgrass Slough Near Delta Meadows	5	382	0.184	0.289	0.394	0.120
2006	Sacramento Sucker	SRBND06	Sacramento River at Bend Bridge Near Red Bluff	5	445	0.047	0.080	0.113	0.038
2006	Sacramento Sucker	SRCOL06	Sacramento River at Colusa	10	401	0.084	0.140	0.195	0.089
2006	Sacramento Sucker	STSL	Steamboat Slough	5	450	0.257	0.365	0.473	0.123
2006	Sacramento Sucker	WLKCC	Whiskeytown Lake at Clear Creek	8	521	0.340	0.435	0.531	0.138
2006	Smallmouth Bass	BBRC	Bullards Bar Reservoir at Central	13	298	0.317	0.388	0.459	0.131
2006	Smallmouth Bass	BBRE	Bullards Bar Reservoir at East Arm	11	293	0.342	0.447	0.553	0.179
2006	Smallmouth Bass	LKALN	Lake Almanor North	2	252	0.071	0.096	0.121	0.018
2006	Smallmouth Bass	LKALS	Lake Almanor South	4	278	0.054	0.073	0.091	0.019
2006	Smallmouth Bass	LKBRI	Lake Britton	12	287	0.148	0.184	0.219	0.063
2006	Smallmouth Bass	WLKB	Whiskeytown Lake at Brandy Creek	3	413	-0.001	0.364	0.729	0.323
2006	Spotted Bass	COSRM1	Cosumnes River at River Mile 1	5	307	1.281	1.390	1.499	0.124
2006	Spotted Bass	GEOSL	Georgiana Slough	8	249	0.269	0.341	0.413	0.104
2006	Spotted Bass	SACRM59	Sacramento River - West Sacramento at Rivermile 59 - Between Discovery Park and Miller Park	9	303	0.446	0.509	0.573	0.097
2006	Spotted Bass	SACVER	Sacramento River Near Verona Marina, Village Resort AKA Joe's Place	4	272	0.290	0.436	0.582	0.149
2006	Spotted Bass	SHMAIN	Shasta Lake Main Stem	4	195	0.053	0.072	0.091	0.020
2006	Spotted Bass	SHSAC	Shasta Lake at Sacramento River	16	292	0.171	0.257	0.344	0.176
2006	Spotted Bass	WLKB	Whiskeytown Lake at Brandy Creek	4	226	0.065	0.082	0.099	0.018
2006	Spotted Bass	WLKCC	Whiskeytown Lake at Clear Creek	10	286	0.073	0.094	0.116	0.035
2006	SteelheadTrout	LKALN	Lake Almanor North	12	468	0.080	0.096	0.112	0.028
2006	Striped Bass	ARNIM06	American River at Nimbus Dam	2	771	0.514	0.541	0.567	0.019
2006	Striped Bass	COSRM1	Cosumnes River at River Mile 1	1	593		1.850		
2006	Striped Bass	FREWR	Fremont Weir	27	678	0.339	0.372	0.405	0.088
2006	Striped Bass	LIBIS	Liberty Island	15	496	0.246	0.314	0.382	0.134
2006	Striped Bass	ORCCF	Old River at Cliffton Court Forebay	10	623	0.280	0.393	0.505	0.181
2006	Striped Bass	RIOVFD1	Rio Vista Fish Derby1	1	595		0.252		
2006	Striped Bass	RIOVFD2	Rio Vista Fish Derby2	1	742		0.337		
2006	Striped Bass	SACCSL	Sacramento River at Cache Slough	1	600		0.219		
2006	Striped Bass	SACKL	Sacramento River at Knights Landing	13	502	0.325	0.416	0.507	0.168
2006	Striped Bass	SACMS	Sacramento River at Miner Slough	4	428	0.138	0.224	0.310	0.088
2006	Striped Bass	SACSCOT	Sacramento River Near Hamilton (Scotty's Boat Landing)	3	487	0.181	0.374	0.566	0.170
2006	Striped Bass	SACTIS	Sacramento River at Tisdale Boat Ramp AKA River Bend Marina	3	572	0.301	0.525	0.750	0.198
2006	Striped Bass	SRCOL06	Sacramento River at Colusa	14	593	0.321	0.423	0.525	0.194
2006	Striped Bass	TOED	Toe Drain	3	602	0.260	0.388	0.515	0.112
2006	Tule Perch	HTCRK	Hat Creek	5	149	0.036	0.041	0.046	0.005
2006	Warmouth	LKALN	Lake Almanor North	5	218	0.094	0.111	0.128	0.019
2006	Warmouth	LKALS	Lake Almanor South	1	179		0.062		
2006	White Catfish	COSRM1	Cosumnes River at River Mile 1	3	300	0.599	0.696	0.793	0.086
2006	White Catfish	SACVER	Sacramento River Near Verona Marina, Village Resort AKA Joe's Place	2	440	0.015	0.464	0.913	0.324
2006	White Catfish	SNSL	Snodgrass Slough Near Delta Meadows	5	334	0.154	0.214	0.275	0.069
2006	White Catfish	TOED	Toe Drain	9	303	0.483	0.525	0.566	0.063
2006	White Sturgeon	MCVFD	McAvoy Fish Derby	10	1576	0.198	0.222	0.246	0.038

Table 7. Summary of candidate models and selection criteria for largemouth bass.
The model selection procedure ranked the random and fixed effects separately (see Methods).

Random Effects	**Log-likelihood**	**Number of Parameters[1]**	**AIC_c**	**deltaAIC_c**	**AIC_c Weight**
$Length^2$*Site(Region)	-475.9	2	-471.9	0.00	0.445
Site(Region) + $Length^2$*Site(Region)	-475.9	2	-471.9	0.00	0.445
Site(Region) + Length*Site(Region)	-471.7	2	-467.7	4.24	0.053
Length*Site(Region)	-471.7	2	-467.7	4.24	0.053
Site(Region)	-466.2	2	-462.1	9.79	0.003
Intercept	-179.9	1	-177.9	294.01	0.000
Fixed Effects					
Region + Length + $Length^2$ + $Length^2$*Region	-472.2	23	-424.3	0.00	0.551
Region + Length + $Length^2$ + Length*Region	-471.7	23	-423.9	0.46	0.438
Region + Length + $Length^2$ + Length*Region + $Length^2$*Region	-479.8	30	-416.6	7.73	0.012
Region + $Length^2$ + $Length^2$*Region	-448.8	22	-403.2	21.18	0.000
Region + Length + Length*Region	-443.9	22	-398.2	26.09	0.000
Length + $Length^2$	-361.6	5	-351.5	72.87	0.000
Region + Length + $Length^2$	-380.1	14	-351.4	72.96	0.000
Region + $Length^2$	-371.4	13	-344.8	79.50	0.000
$Length^2$	-352.2	4	-344.1	80.22	0.000
Region + Length	-368.8	13	-342.2	82.12	0.000
Length	-349.4	4	-341.3	83.00	0.000
Region	-124.4	12	-99.9	324.43	0.000
Intercept	-105.7	3	-99.6	324.72	0.000

[1] Number of parameters in the regression model plus 1 for variance (σ^2)

Table 8. Summary of candidate models and selection criteria for channel catfish.
The model selection procedure ranked the random and fixed effects separately (see Methods).

Random Effects	**Log-likelihood**	**Number of Parameters[1]**	**AIC_c**	**deltaAIC_c**	**AIC_cWeight**
Intercept Only	-143.3	1	-141.2	0.00	0.344
LengthSQ*Site(Region)	-143.5	2	-139.4	1.85	0.137
Site(Region) LengthSQ*Site(Region)	-143.5	2	-139.4	1.85	0.137
Length*Site(Region)	-143.4	2	-139.3	1.96	0.129
Site(Region) Length*Site(Region)	-143.4	2	-139.3	1.96	0.129
Site(Region)	-143.3	2	-139.2	2.04	0.124
Fixed Effects					
Region + $Length^2$ + $Length^2$*Region	-143.2	9	-123.8	0.00	0.330
Region + Length + Length*Region	-142.9	9	-123.4	0.34	0.278
Region + Length + $Length^2$ + $Length^2$*Region	-143.7	10	-121.9	1.90	0.128
Region + Length + $Length^2$ + Length*Region	-143.6	10	-121.8	1.98	0.123
Region + Length	-133.1	6	-120.4	3.36	0.061
Region + $Length^2$	-132.8	6	-120.1	3.62	0.054
Region + Length + $Length^2$	-133.5	7	-118.6	5.12	0.026
Length	-103.1	3	-97	26.80	0.000
$Length^2$	-103.1	3	-96.9	26.89	0.000
Region	-106.6	5	-96.2	27.61	0.000
Length + $Length^2$	-103.3	4	-95	28.78	0.000
Intercept	-89.5	2	-85.4	38.36	0.000

[1] Number of parameters in the regression model plus 1 for variance (σ^2)

Figure 1. Length versus mercury concentration in largemouth bass (n = 216), 2006. Horizontal colored lines represent ranges for low (green), moderate (yellow), high (orange), and very high (red) concentrations, as described in the Methods section.

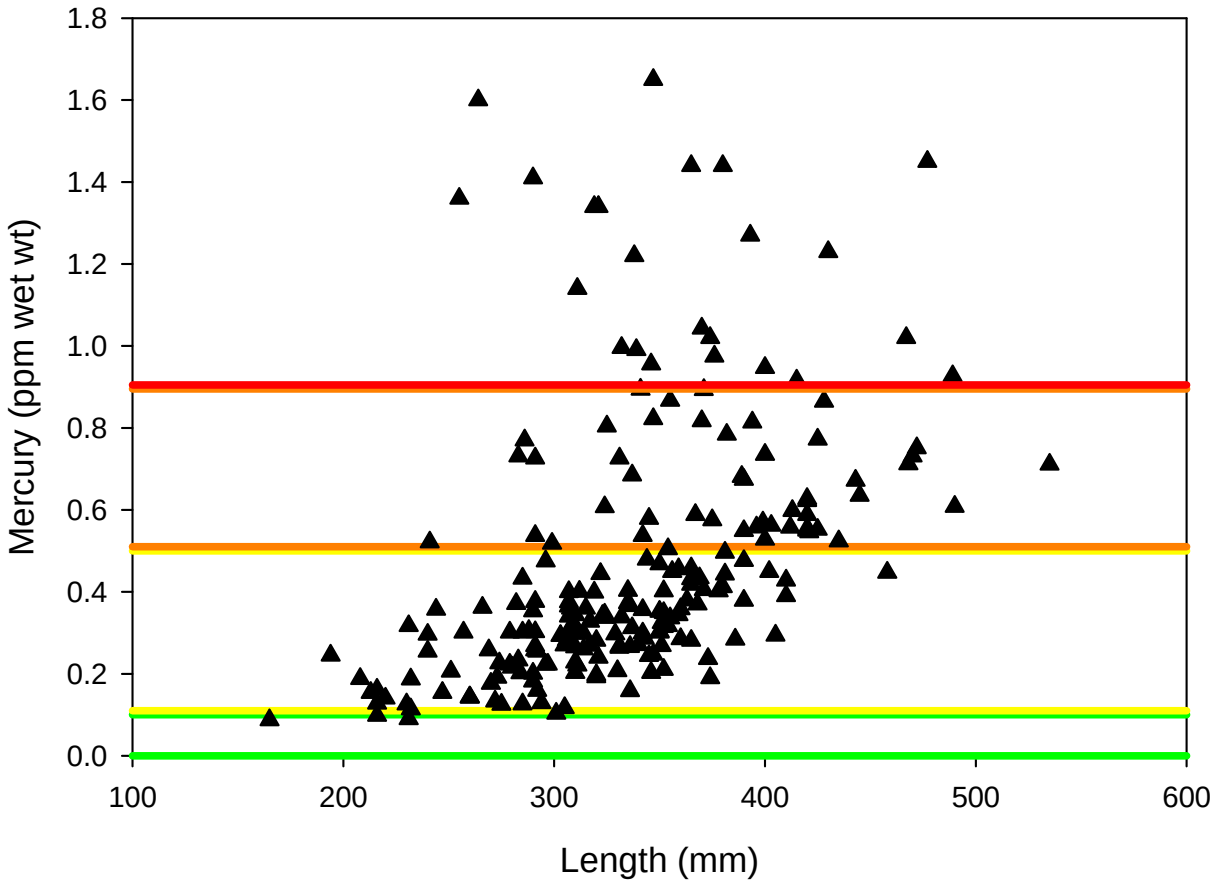


Figure 2. Length versus mercury concentrations in channel catfish (n = 95), 2006. Horizontal colored lines represent ranges for low (green), moderate (yellow), high (orange), and very high (red) concentrations, as described in the Methods section.

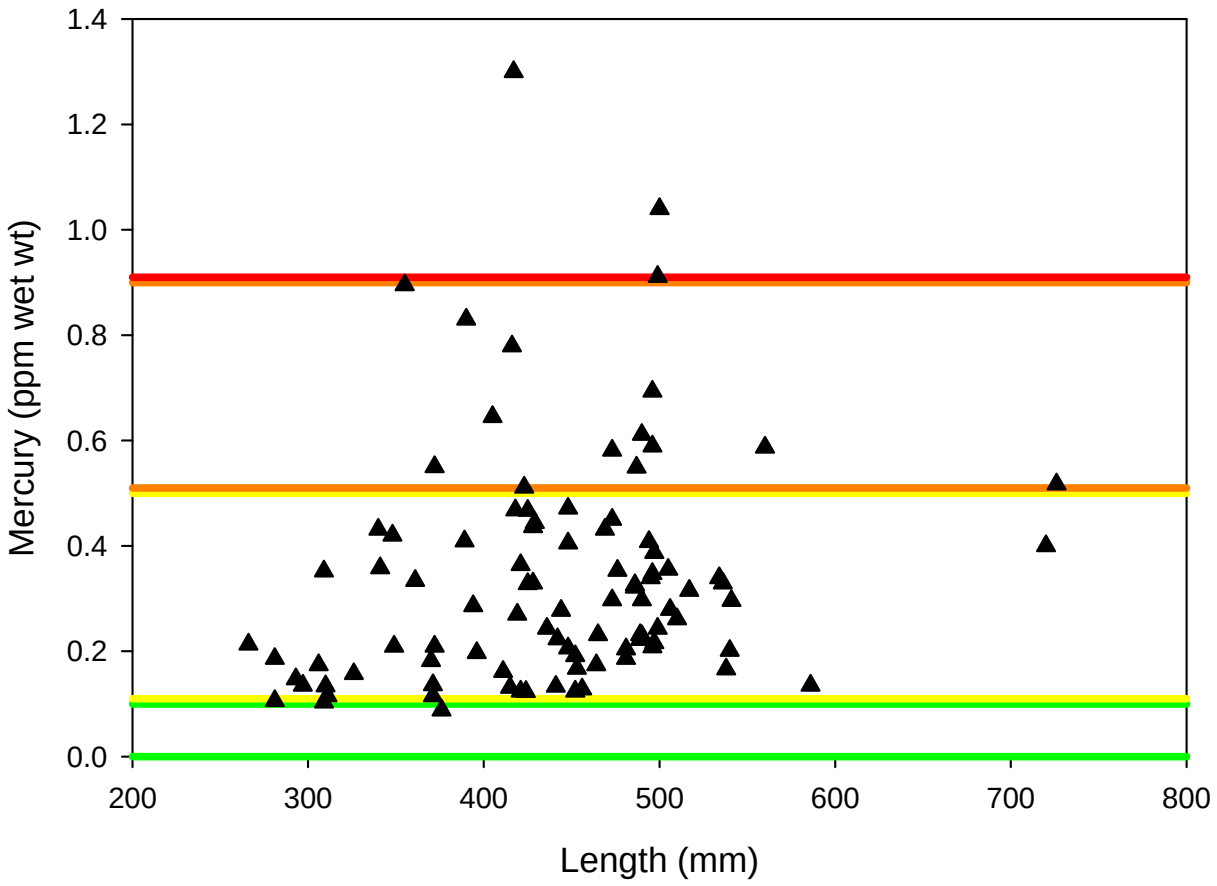


Figure 3. Length versus mercury concentrations in common carp (n = 122), 2006. Horizontal colored lines represent ranges for low (green), moderate (yellow), high (orange), and very high (red) concentrations, as described in the Methods section.

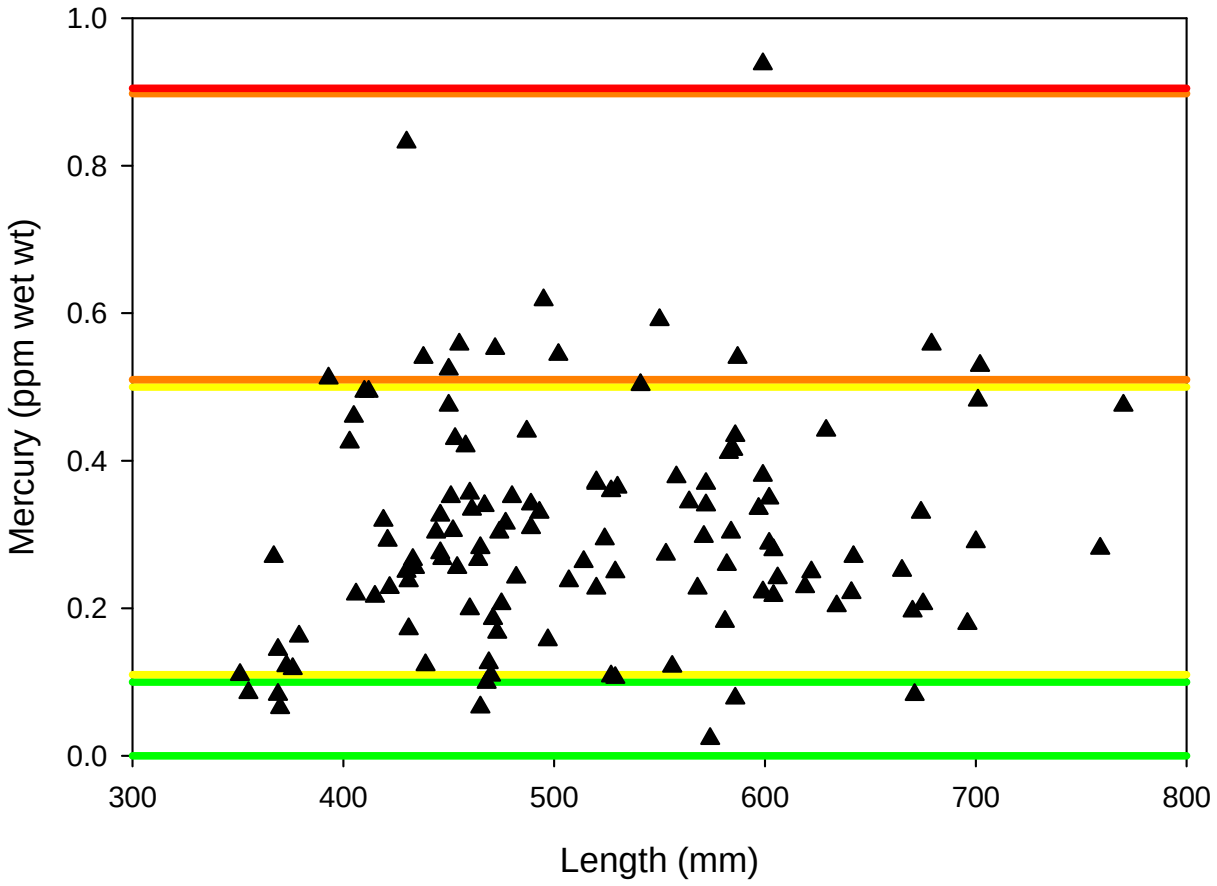


Figure 4. Length versus mercury concentrations in Sacramento pikeminnow (n = 87), 2006. Horizontal colored lines represent ranges for low (green), moderate (yellow), high (orange), and very high (red) concentrations, as described in the Methods section.

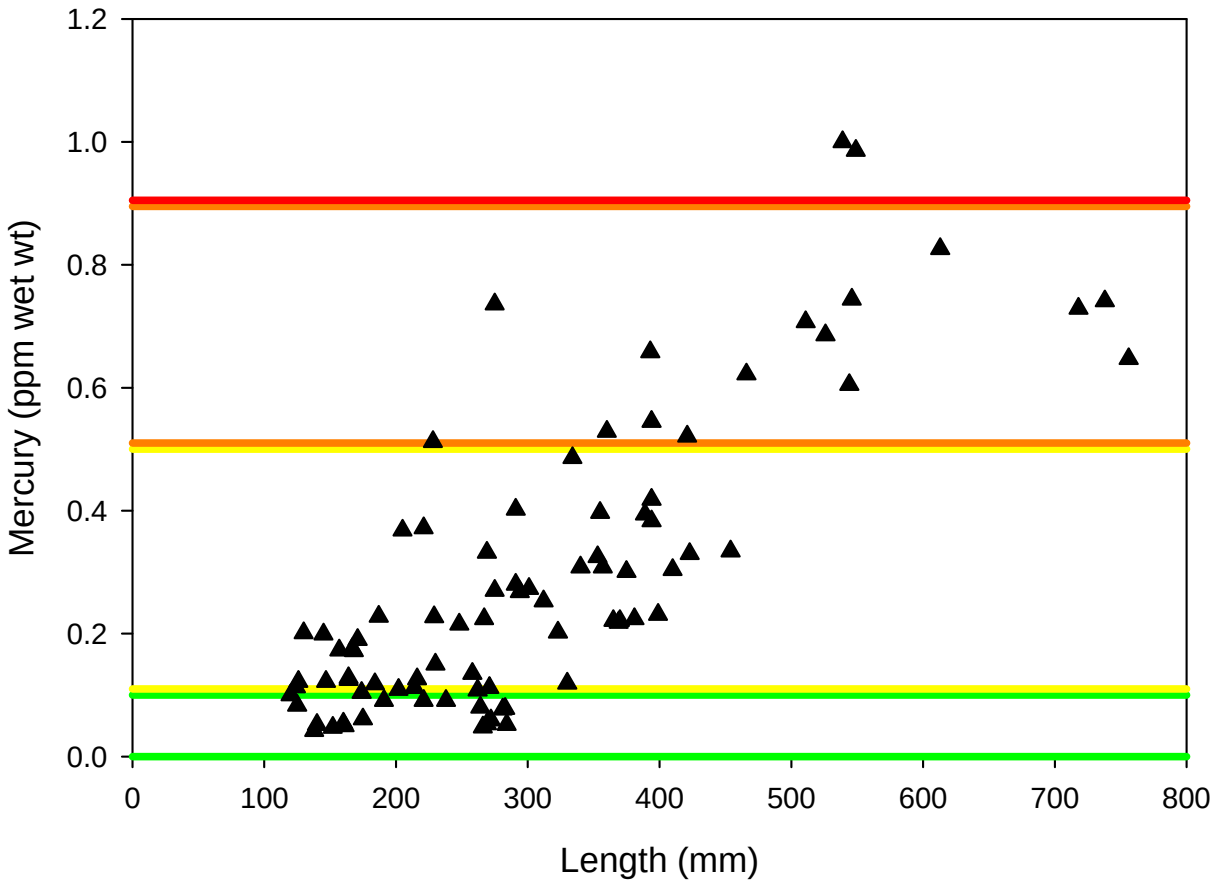


Figure 5. Length versus mercury concentrations in Sacramento sucker (n = 112), 2006. Horizontal colored lines represent ranges for low (green), moderate (yellow), high (orange), and very high (red) concentrations, as described in the Methods section.

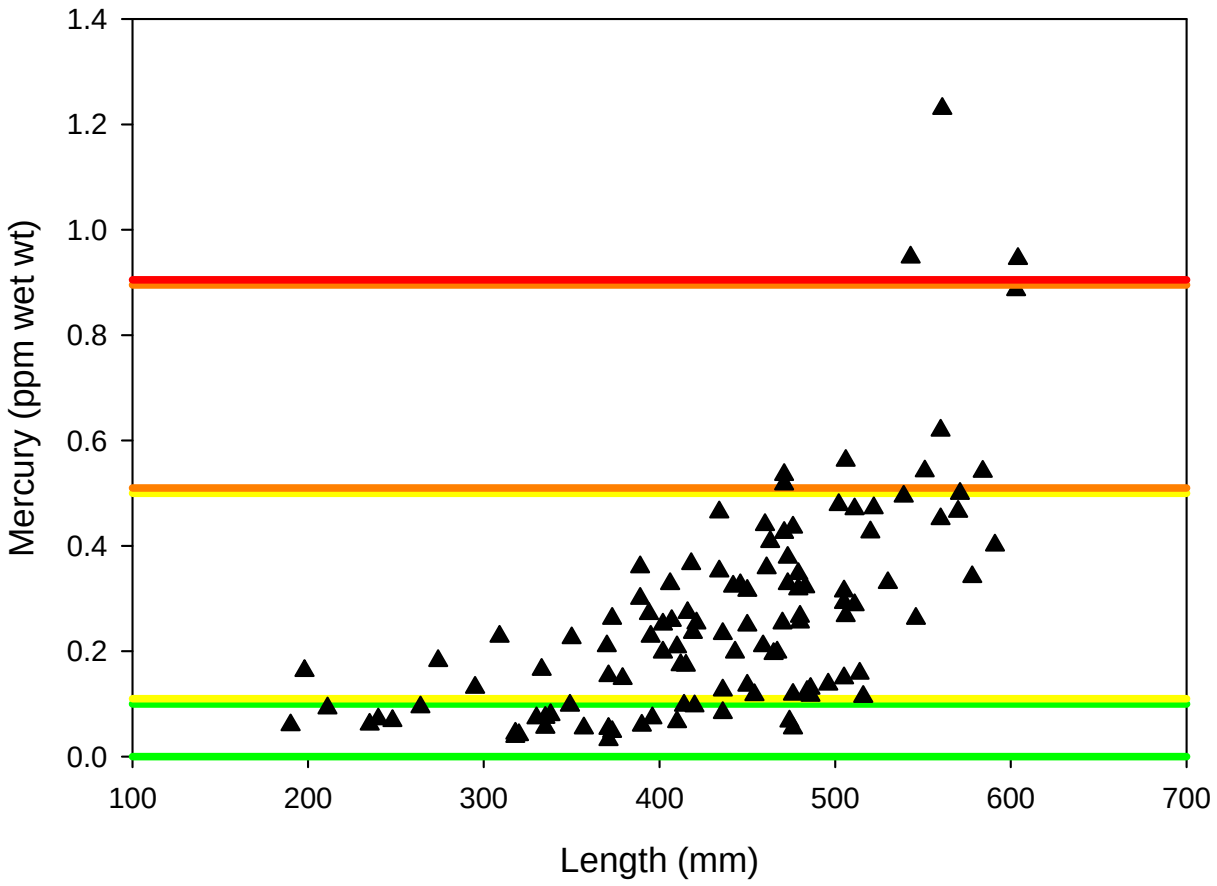


Figure 6. Length versus mercury concentrations in bluegill (n = 117), 2006. Horizontal colored lines represent ranges for low (green), moderate (yellow), high (orange), and very high (red) concentrations, as described in the Methods section.

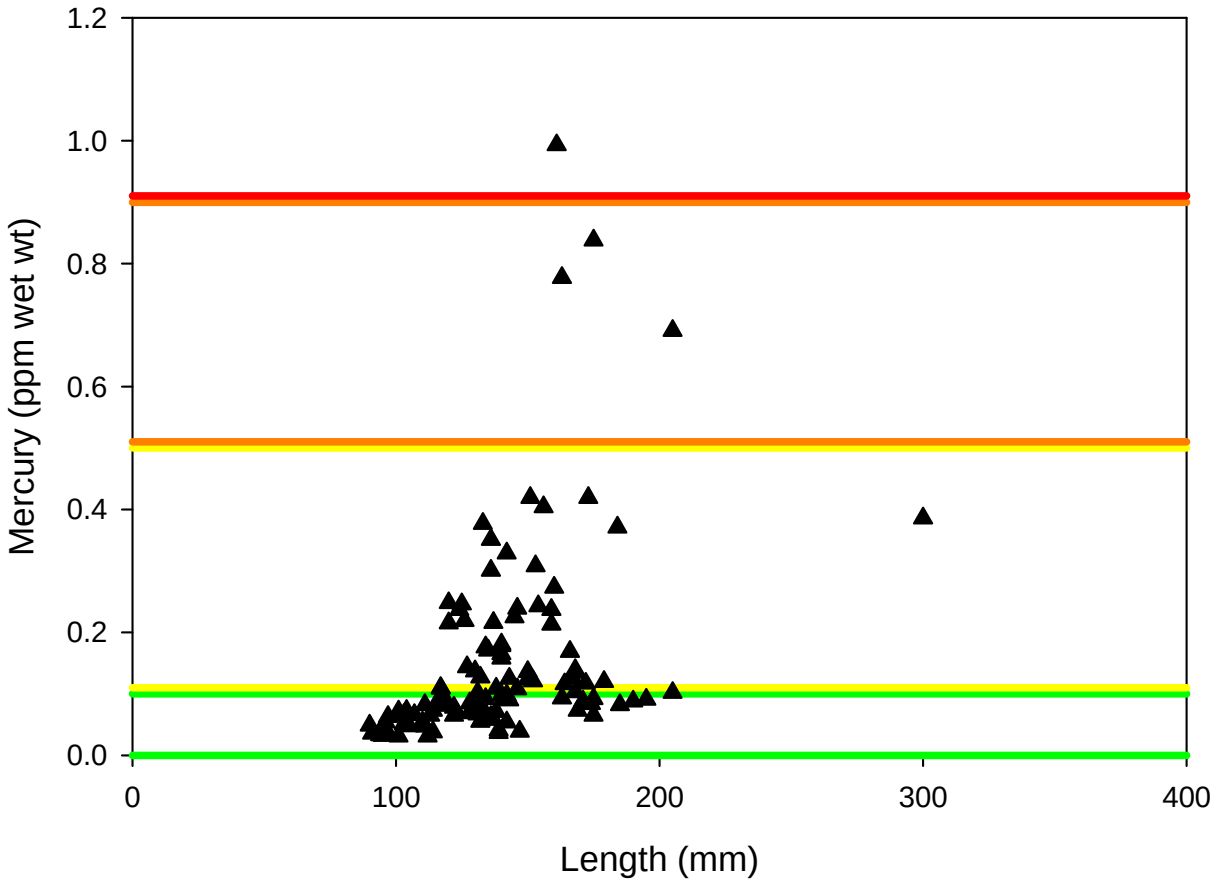


Figure 7. Length versus mercury concentrations in redear sunfish (n = 64), 2006. Horizontal colored lines represent ranges for low (green), moderate (yellow), high (orange), and very high (red) concentrations, as described in the Methods section.

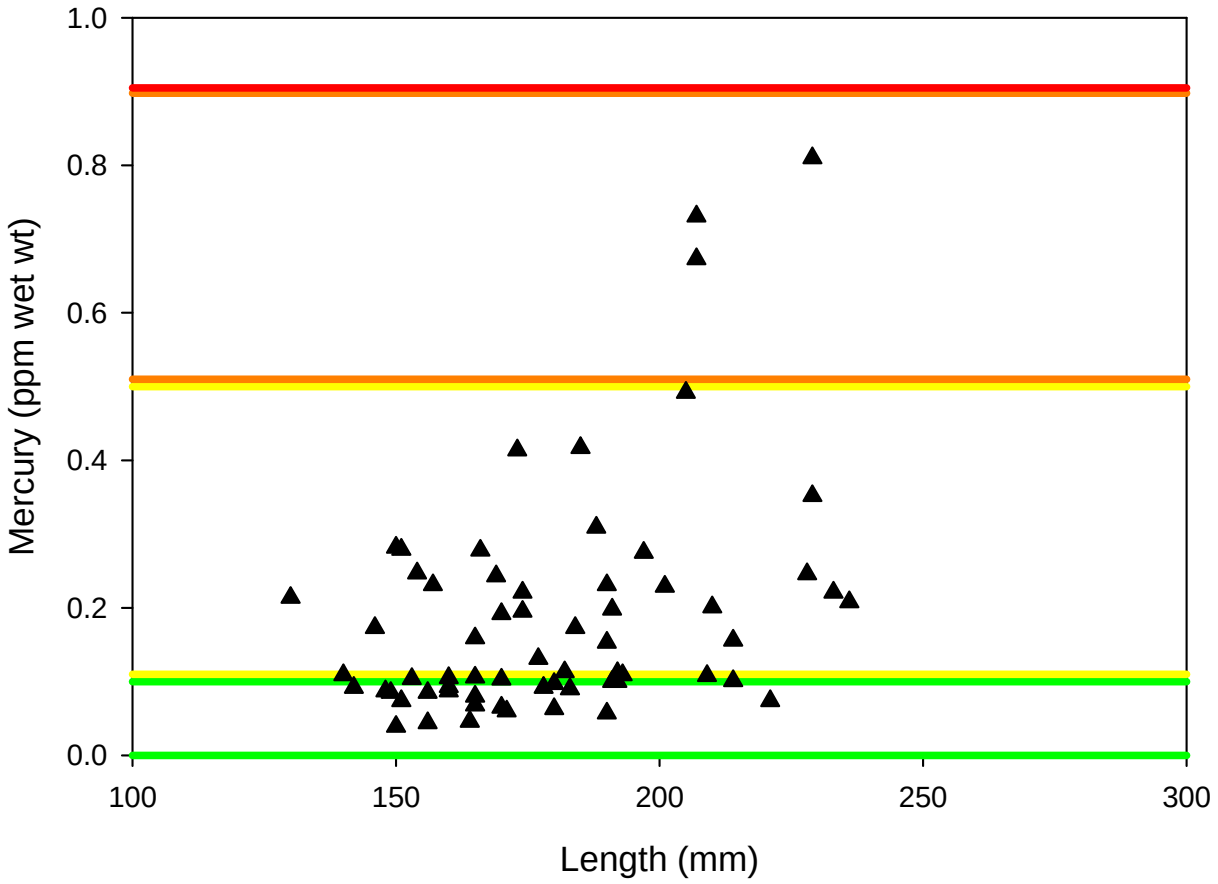


Figure 8. Length versus mercury concentrations in rainbow trout (n = 68), 2006. Horizontal colored lines represent ranges for low (green), moderate (yellow), high (orange), and very high (red) concentrations, as described in the Methods section.

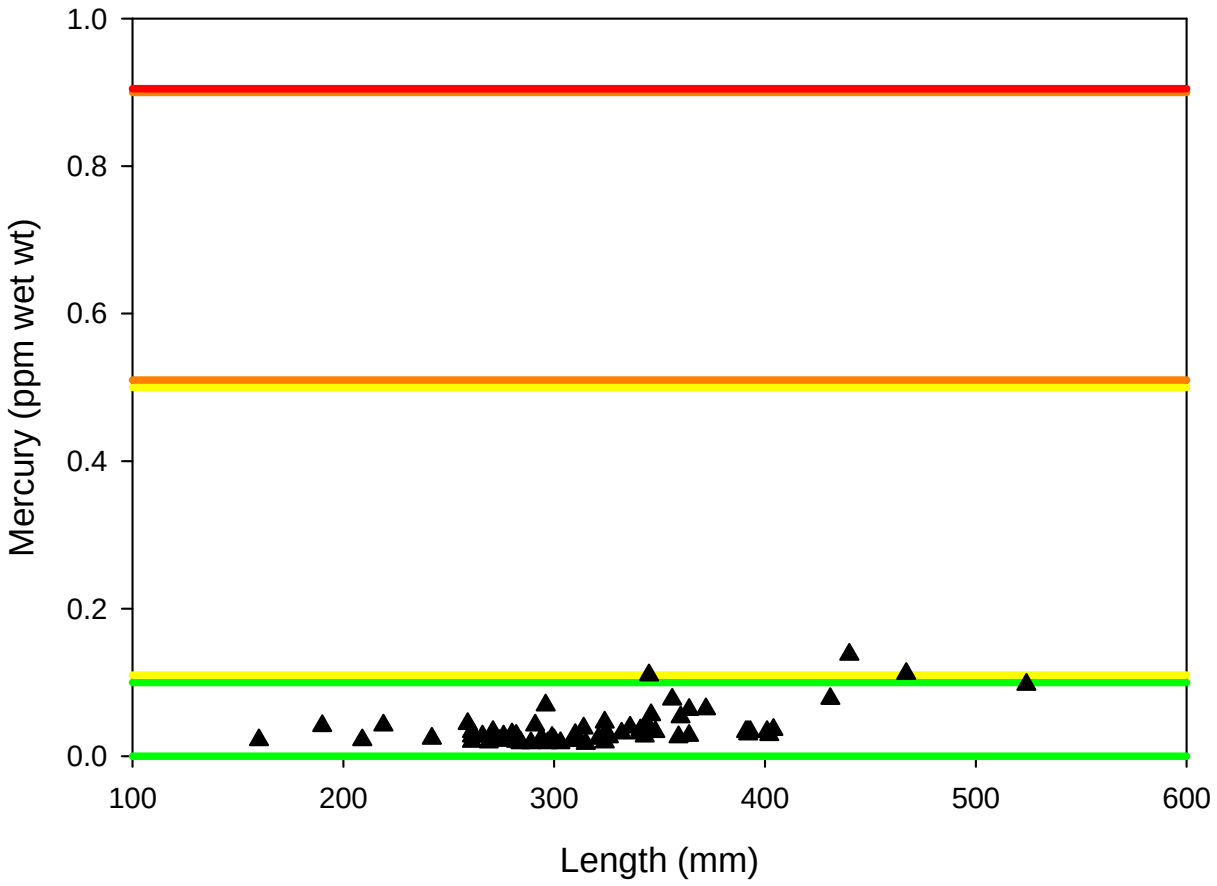


Figure 9. Length versus mercury concentrations in American shad (n = 50), 2006. Horizontal colored lines represent ranges for low (green), moderate (yellow), high (orange), and very high (red) concentrations, as described in the Methods section.

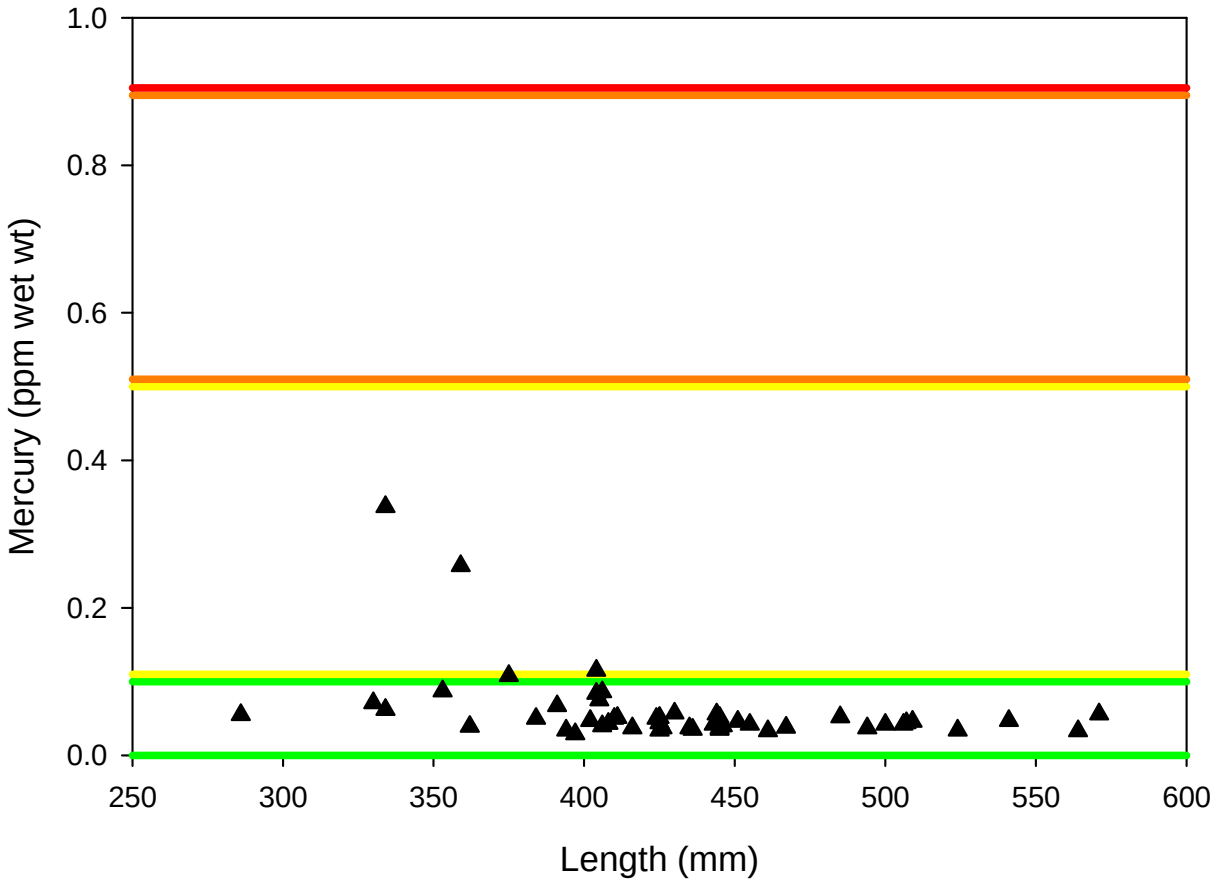


Figure 10. Length versus mercury concentrations in A) pumpkinseed (n = 29) and B) black crappie (n = 28), 2006. Horizontal colored lines represent ranges for low (green), moderate (yellow), high (orange), and very high (red) concentrations, as described in the Methods section.

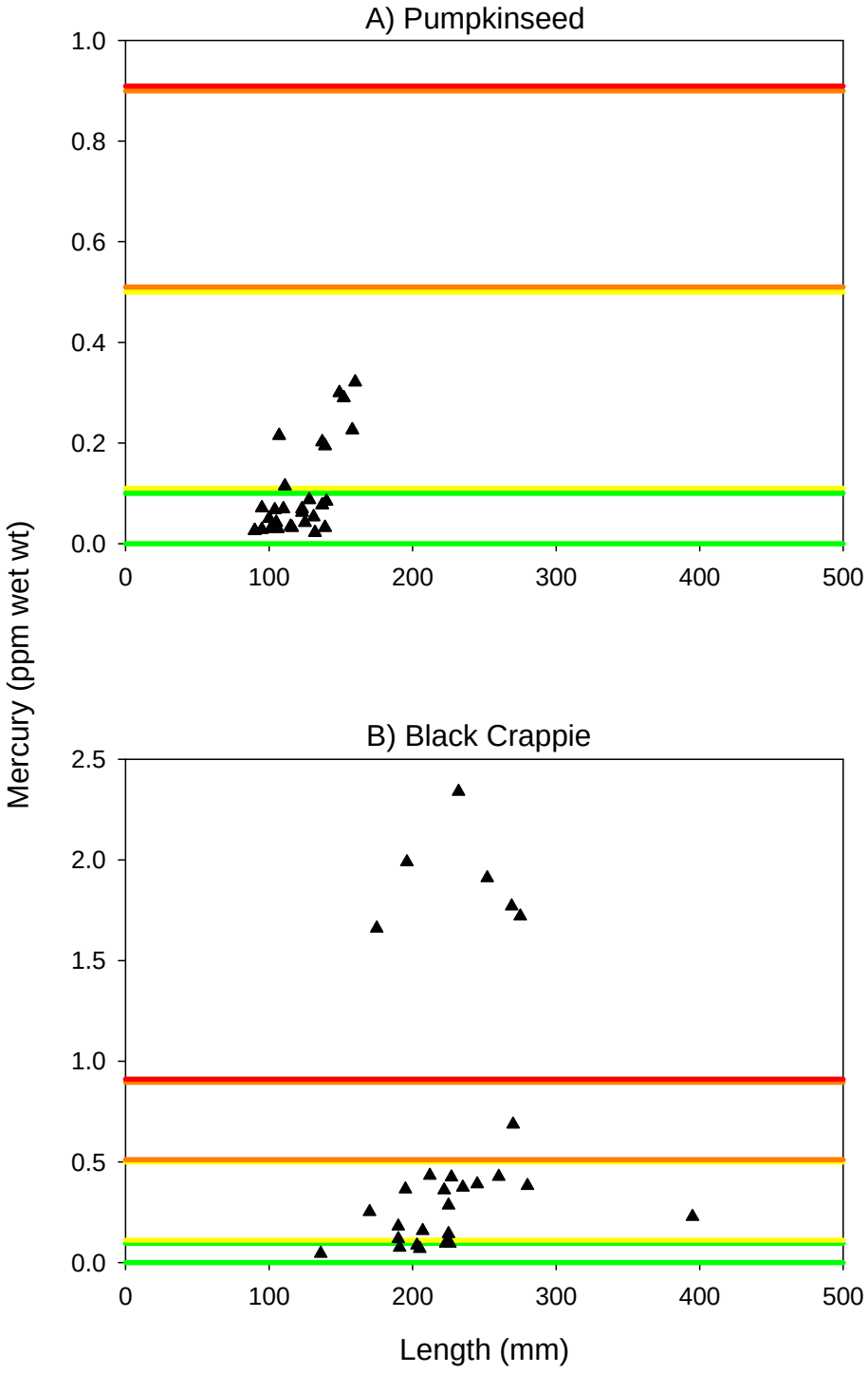


Figure 11. Length versus mercury concentrations in A) brown bullhead (n = 13) and B) hardhead (n = 5), 2006. Horizontal colored lines represent ranges for low (green), moderate (yellow), high (orange), and very high (red) concentrations, as described in the Methods section.

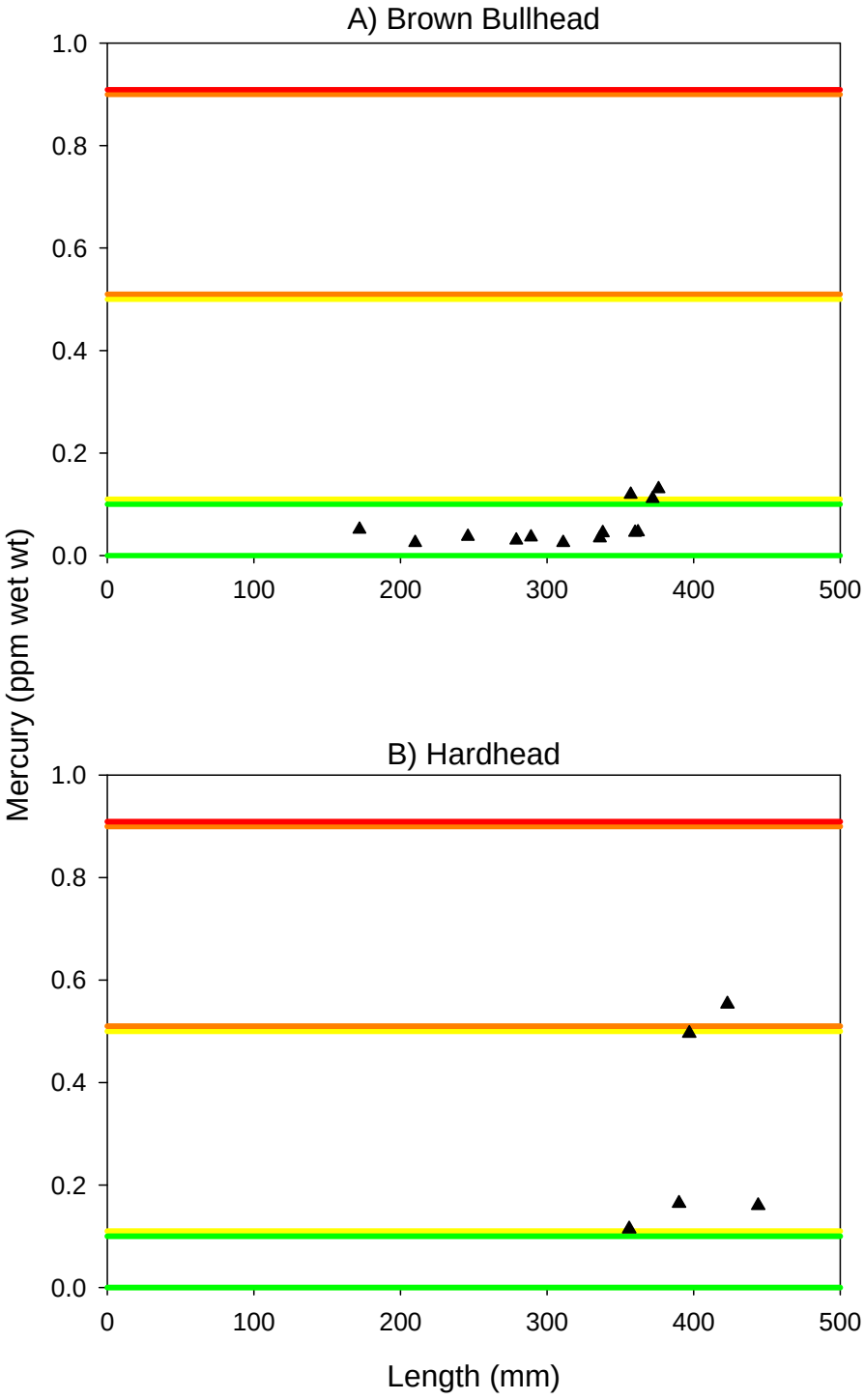


Figure 12. Length versus mercury concentrations in A) brook trout (n = 16), B) steelhead trout (n = 12), C) lake trout (n = 5), and D) brown trout (n = 11), 2006. Horizontal colored lines represent ranges for low (green), moderate (yellow), high (orange), and very high (red) concentrations, as described in the Methods section.

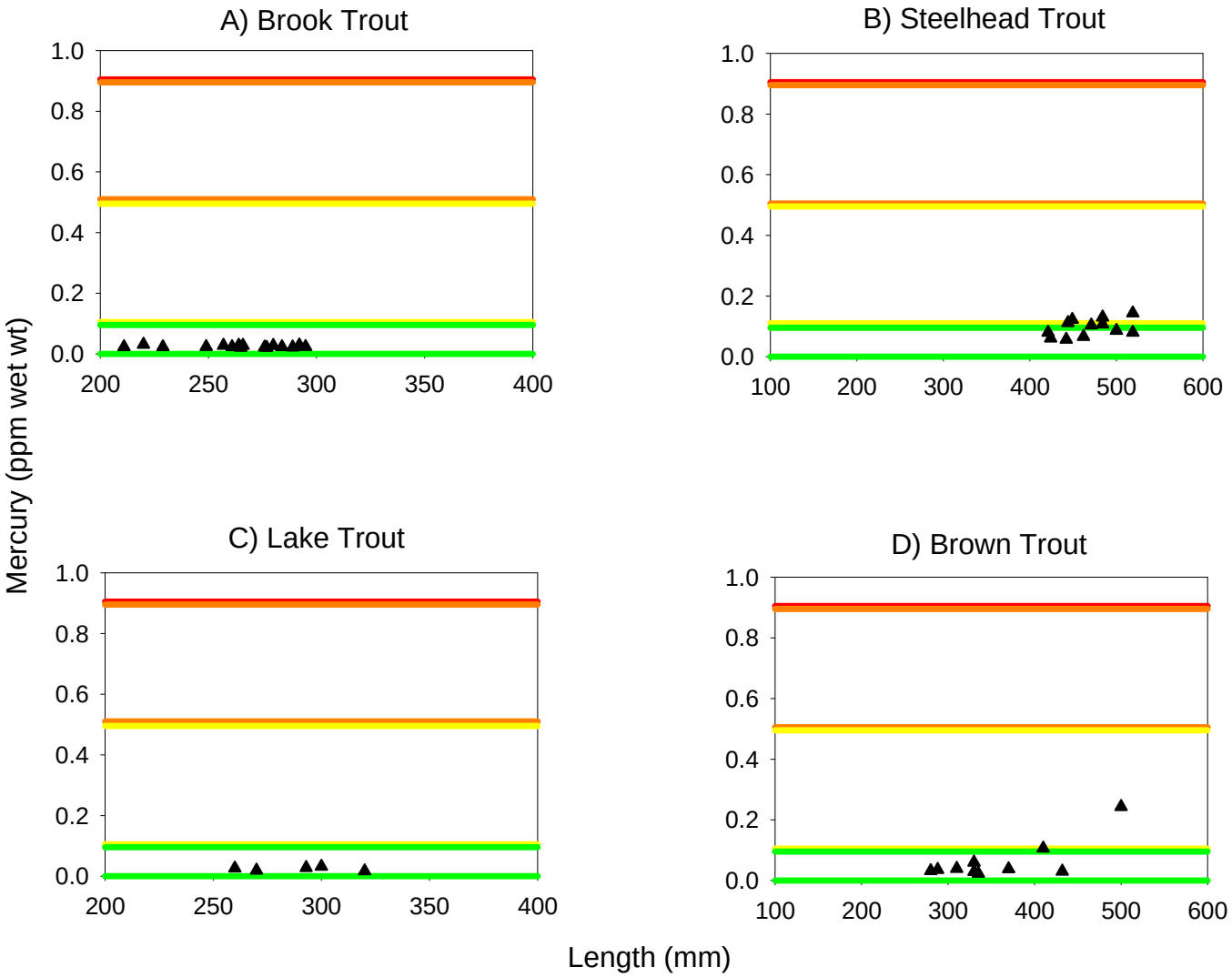


Figure 13. Length versus mercury concentrations in A) white catfish (n = 19) and B) chinook salmon (n = 11), 2006. Horizontal colored lines represent ranges for low (green), moderate (yellow), high (orange), and very high (red) concentrations, as described in the Methods section.

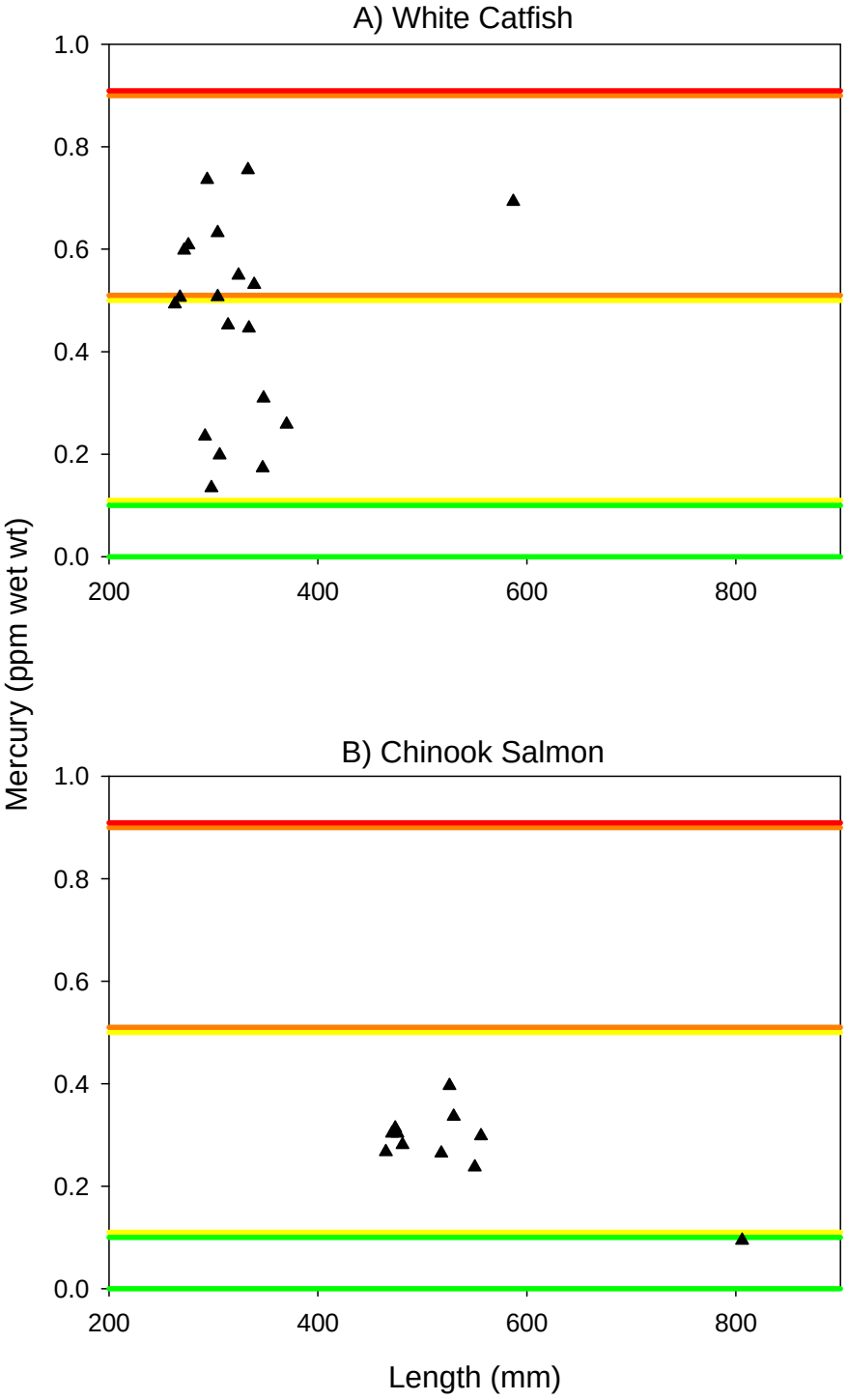


Figure 14. Length versus mercury concentrations in A) spotted bass (n = 60) and B) smallmouth bass (n = 45), 2006. Horizontal colored lines represent ranges for low (green), moderate (yellow), high (orange), and very high (red) concentrations, as described in the Methods section.

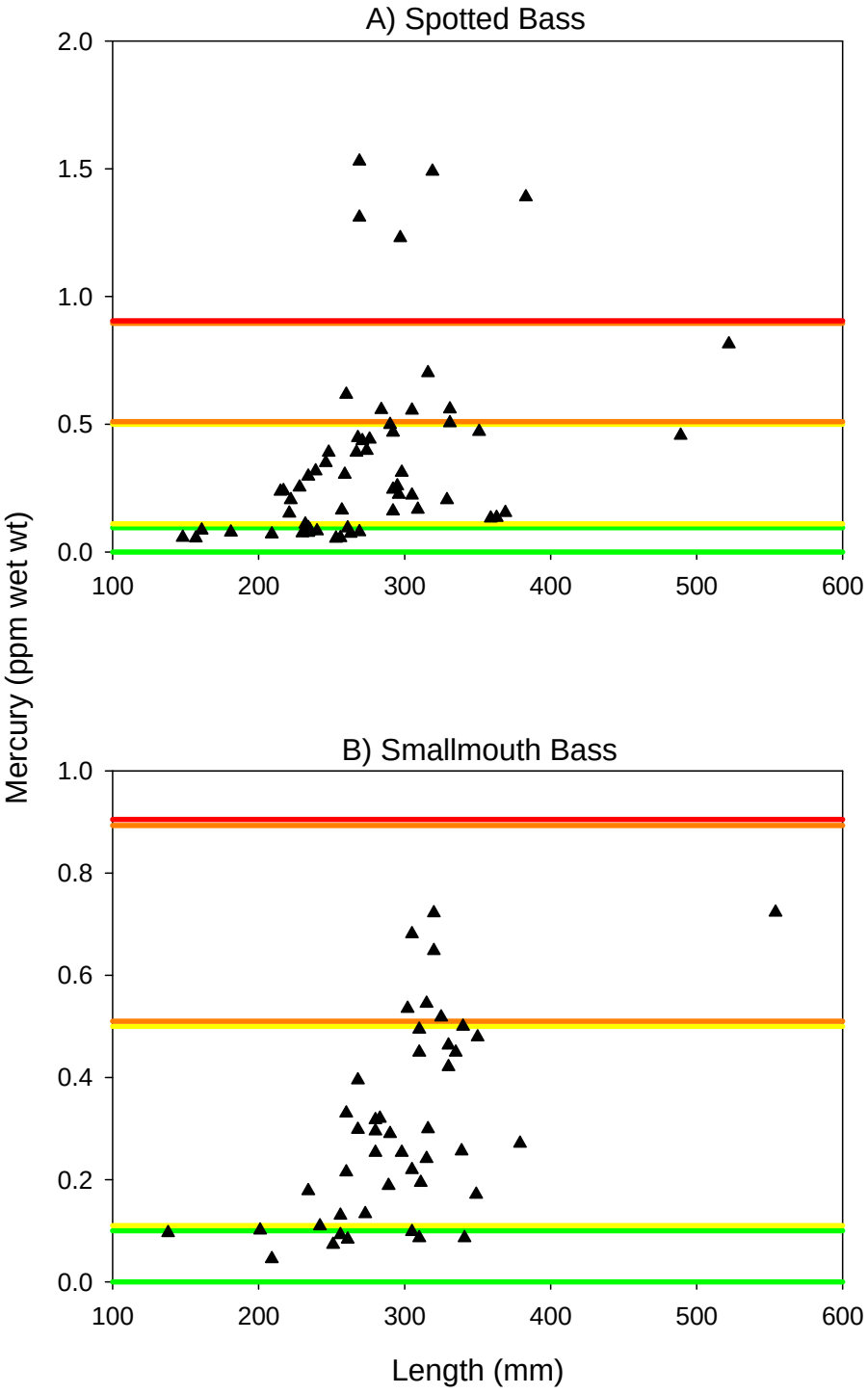


Figure 15. Length versus mercury concentrations in A) tule perch (n = 5), B) warmouth (n = 6), and C) hitch (n = 5), 2006. Horizontal colored lines represent ranges for low (green), moderate (yellow), high (orange), and very high (red) concentrations, as described in the Methods section.

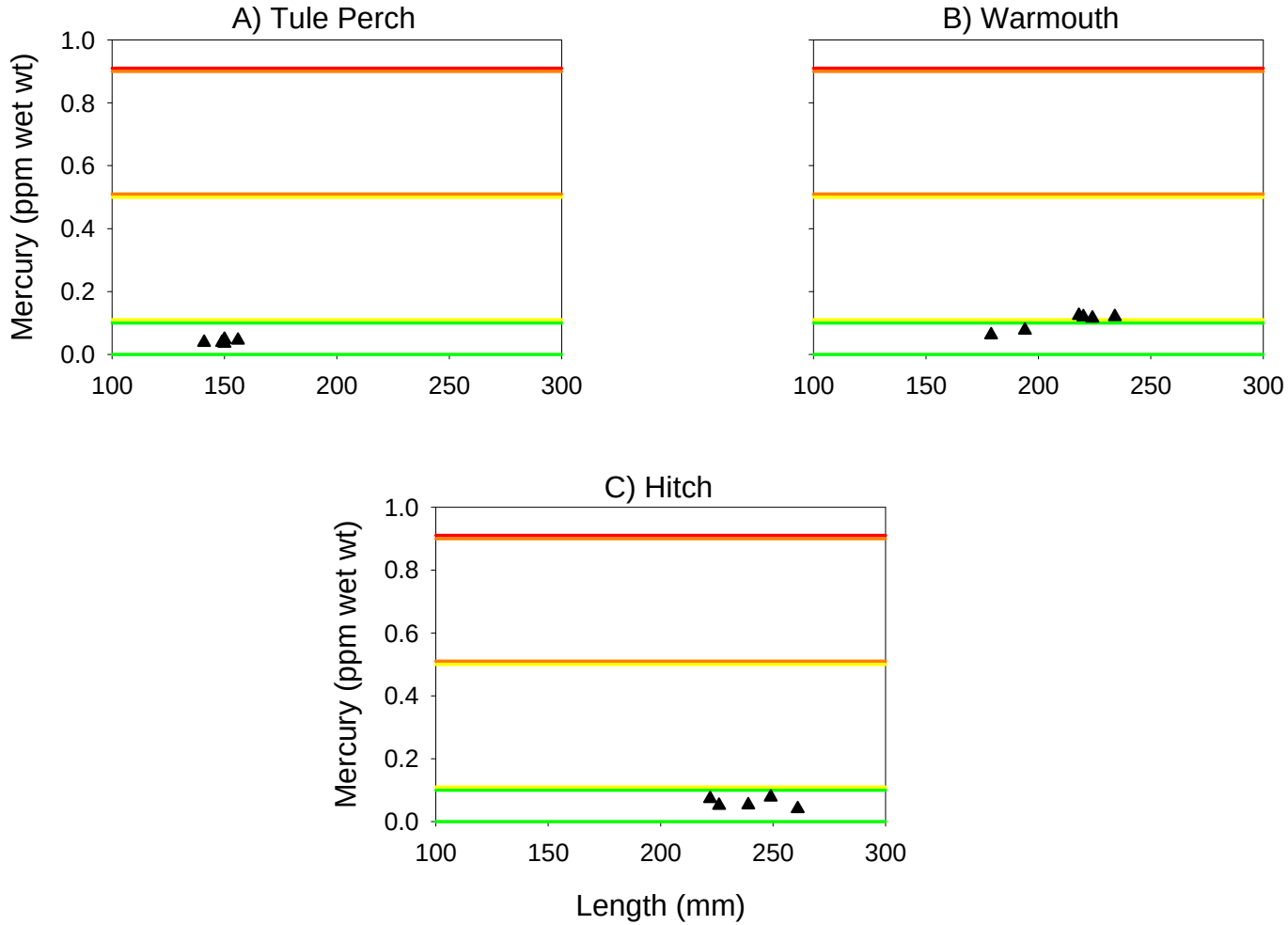


Figure 16. Length versus mercury concentrations in white sturgeon (n = 12), 2006. Horizontal colored lines represent ranges for low (green), moderate (yellow), high (orange), and very high (red) concentrations, as described in the Methods section.

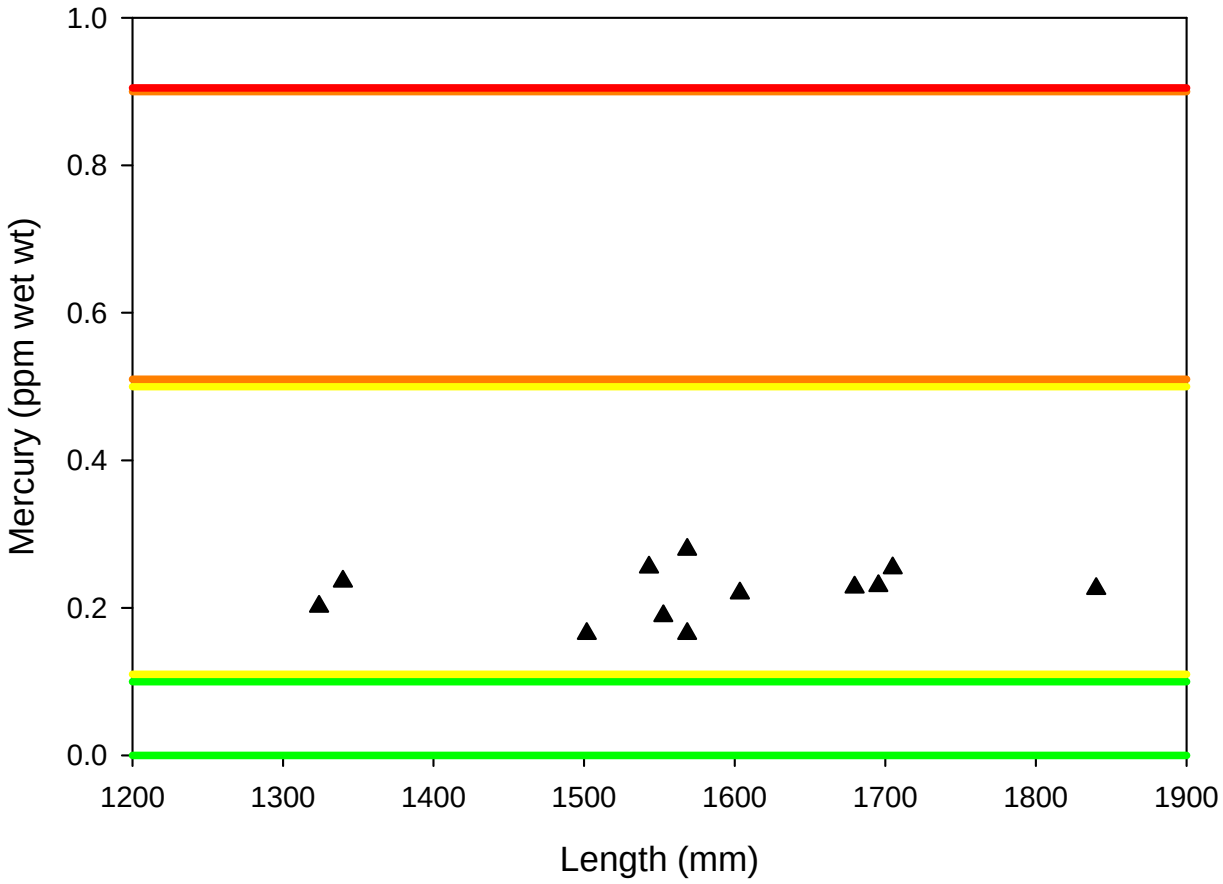


Figure 17. Length versus mercury concentration in largemouth bass at each sampling location, 2006. Regression lines at each site resulted from the general linear mixed model. Regression equation: Hg = Region + Length + Length^2 + Length^2*Region + Length^2*Site(Region). Regression lines not shown for sites excluded from analysis due to insufficient data. Note log scale of length axis.

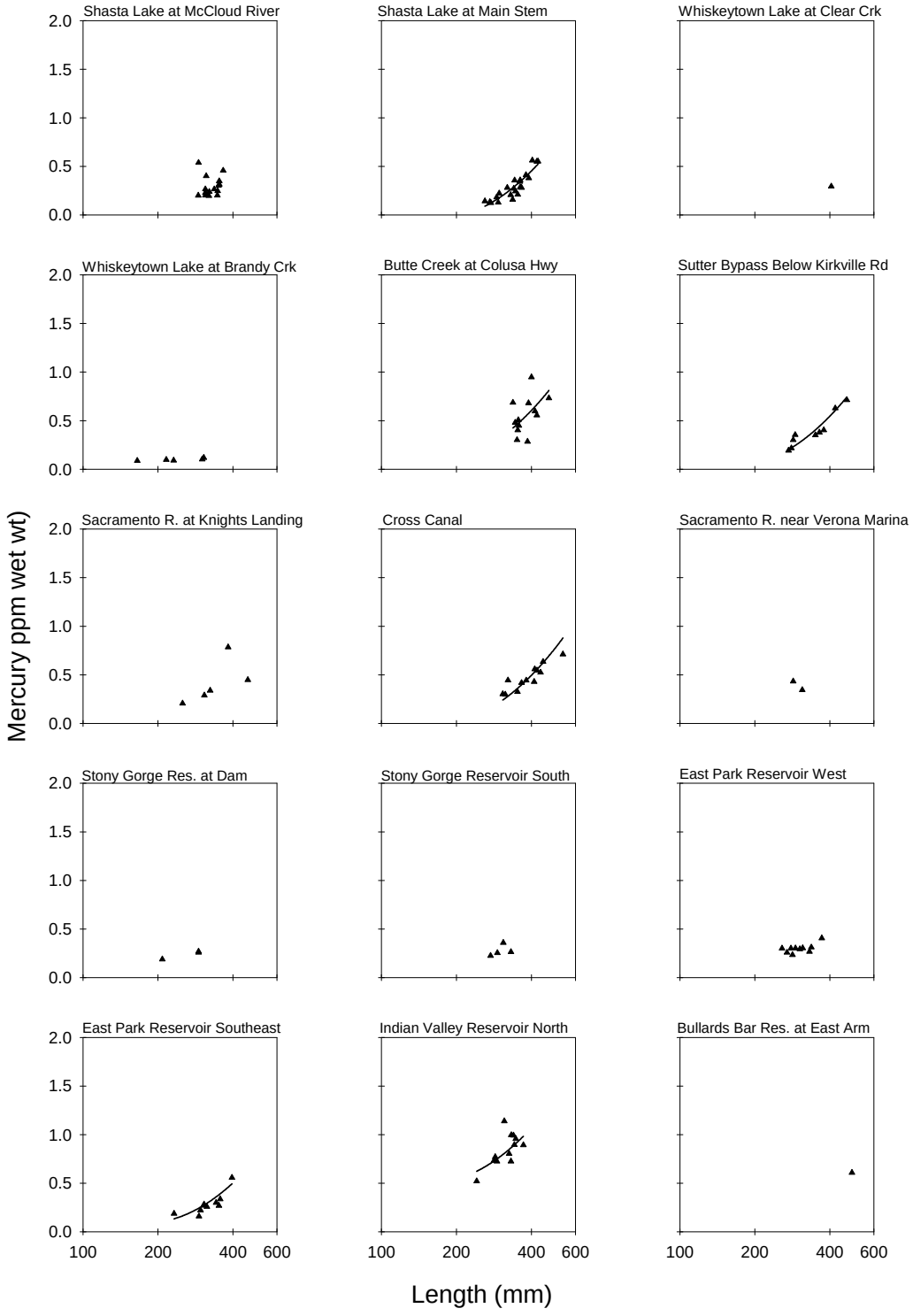


Figure 17 (cont'd).

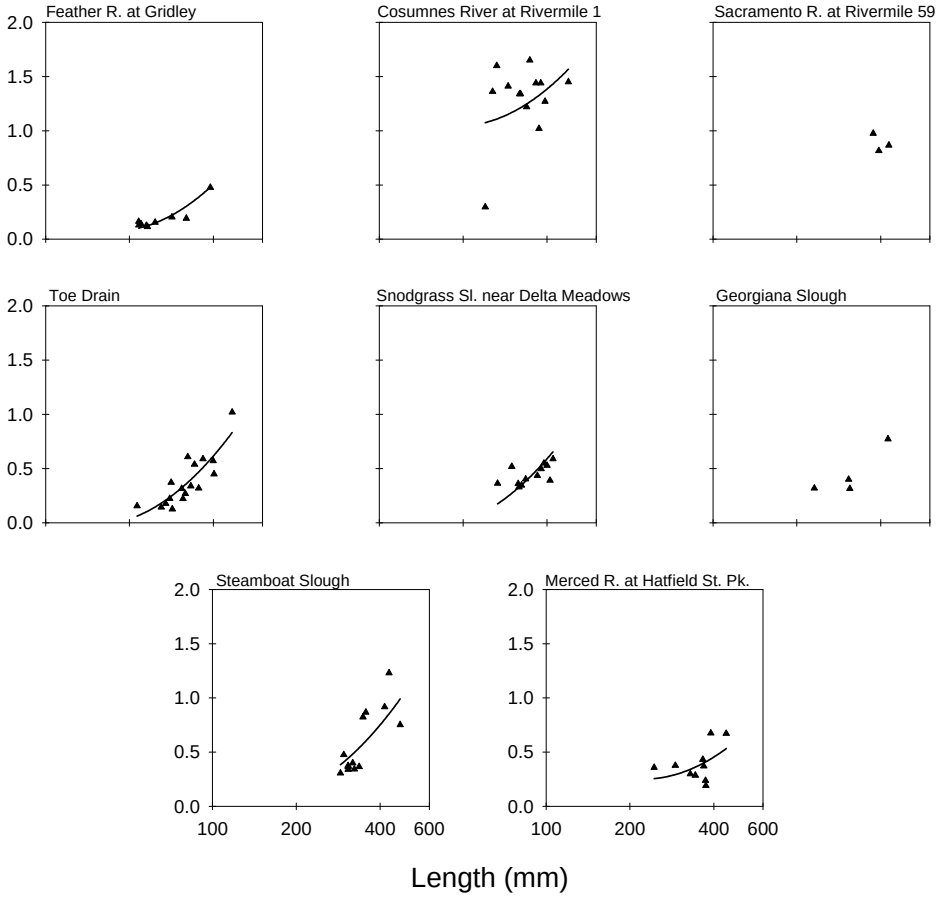


Figure 18. Length versus mercury concentration in channel catfish at each sampling location, 2006. Regression lines at each site resulted from the general linear mixed model. Regression equation: Hg = Region + Length^2 + Length^2*Region. Regression lines not shown for sites excluded from analysis due to insufficient data. Note log scale of length axis.

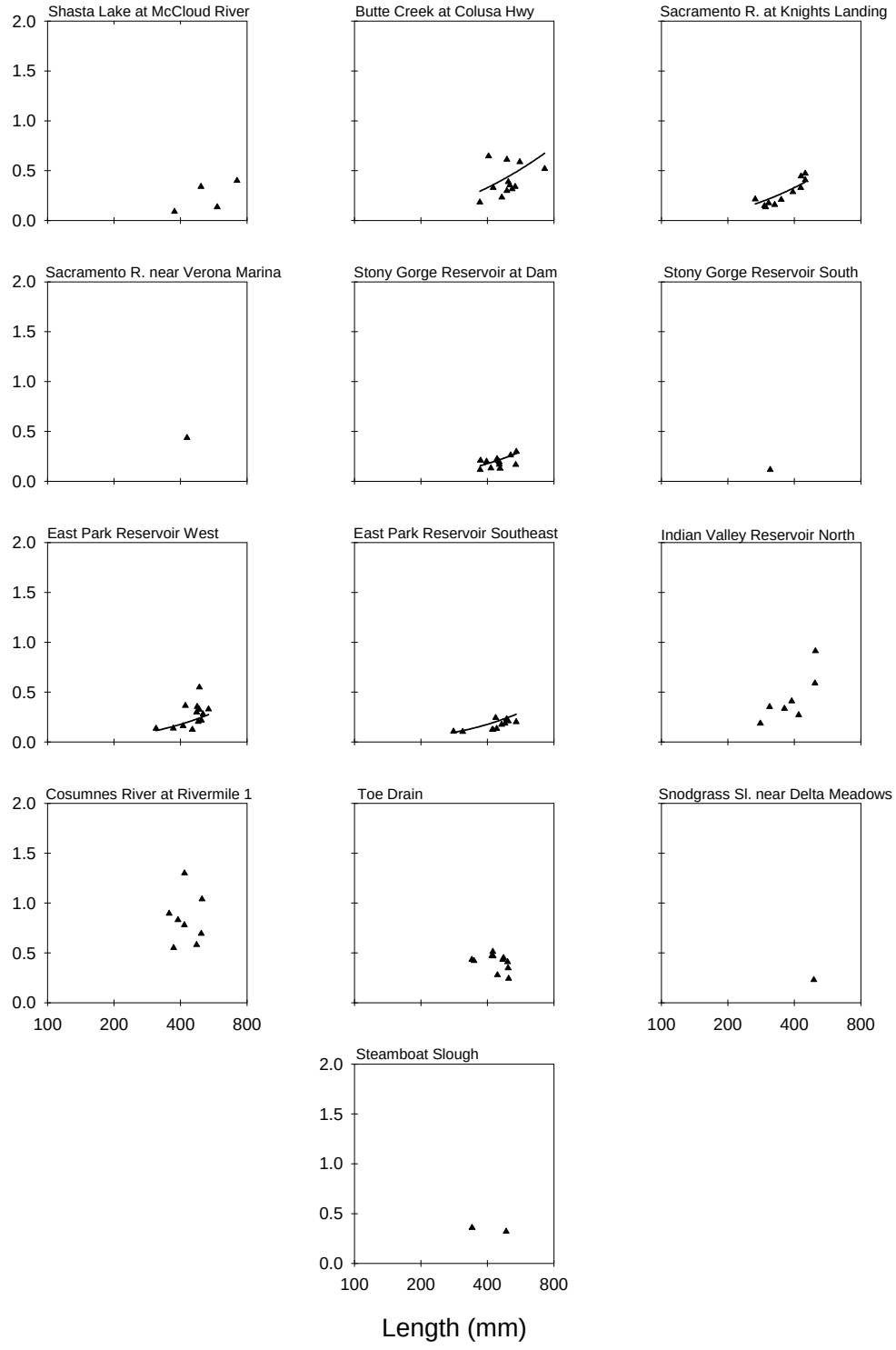


Figure 19. Spatial comparison of largemouth bass mercury concentrations estimated at a standard length of 350 mm (mean and 95% confidence interval). Locations are grouped by watershed sub-areas from north (top) to south (bottom).

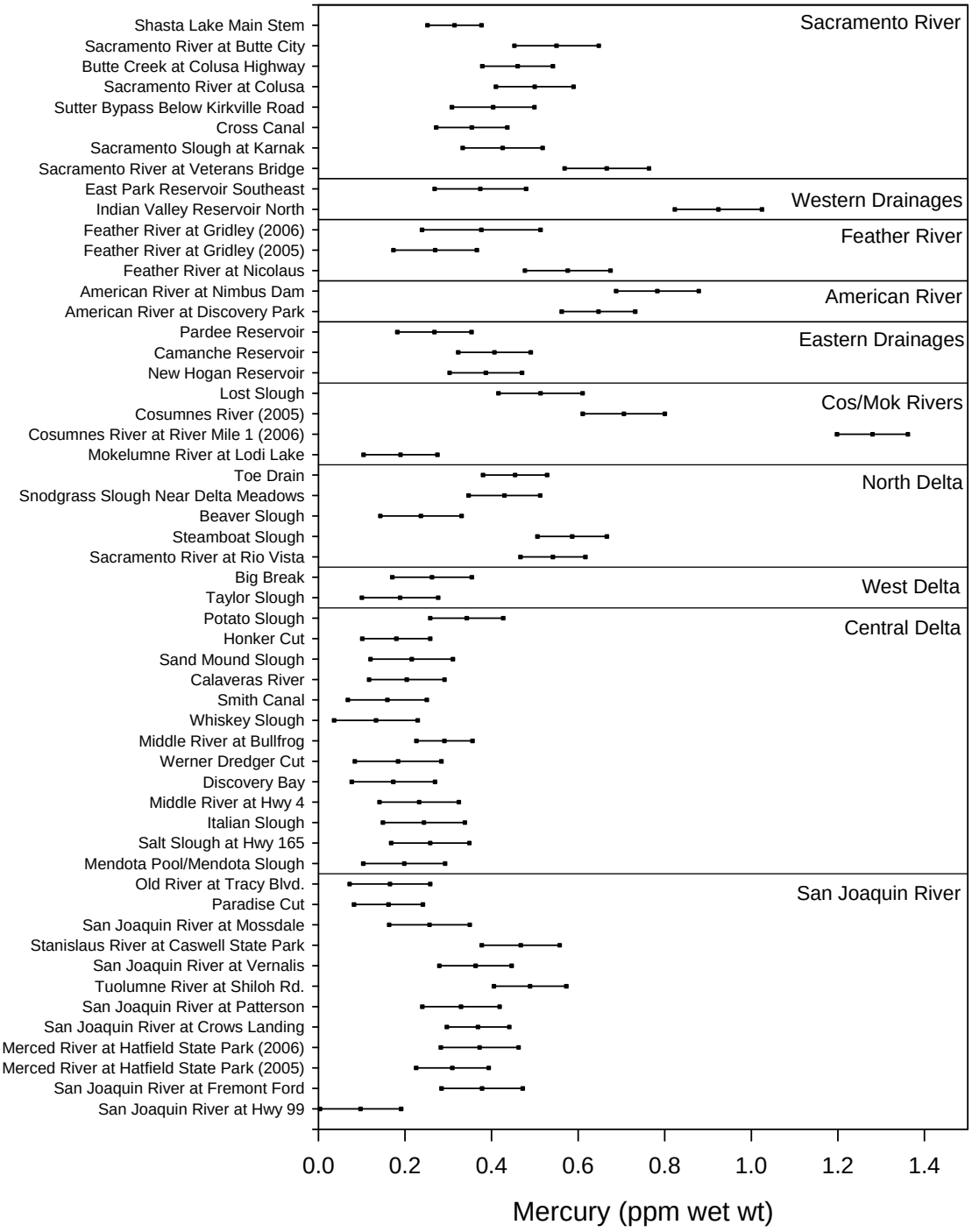


Figure 20. Spatial comparison of channel catfish mercury concentrations estimated at a standard length of 425 mm (mean and 95% confidence interval). Data were not sufficient for estimates by location; concentrations for each watershed sub-area from north (top) to south (bottom) are shown.

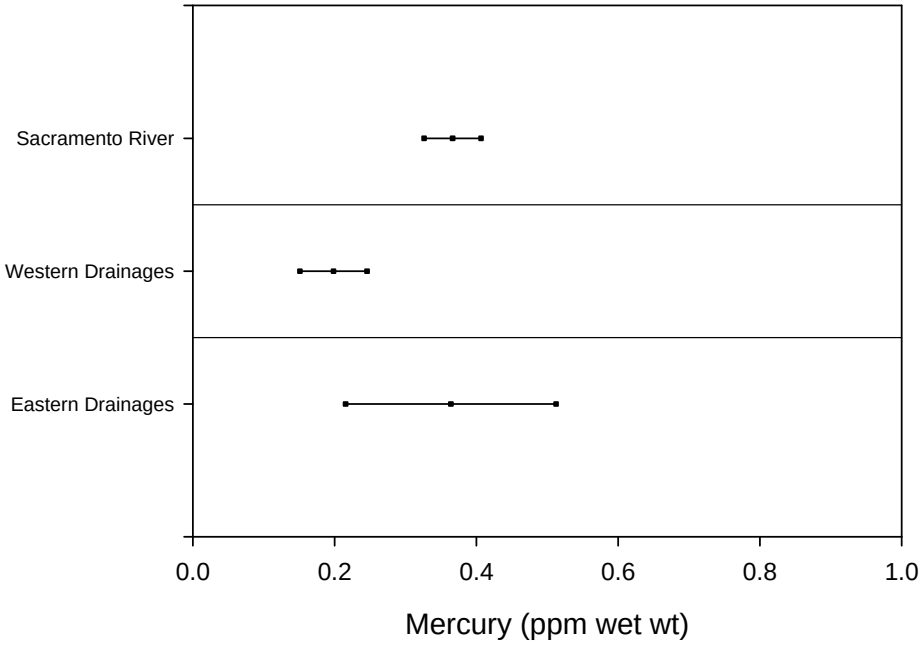


Figure 21. Spatial comparison of common carp mercury concentrations. Data represent mean and 95% confidence interval. Locations are grouped by watershed sub-areas from north (top) to south (bottom). Size limits were not applied to this species due to lack of an obvious length: mercury relationship. Sites shown have sample sizes of five or more fish.

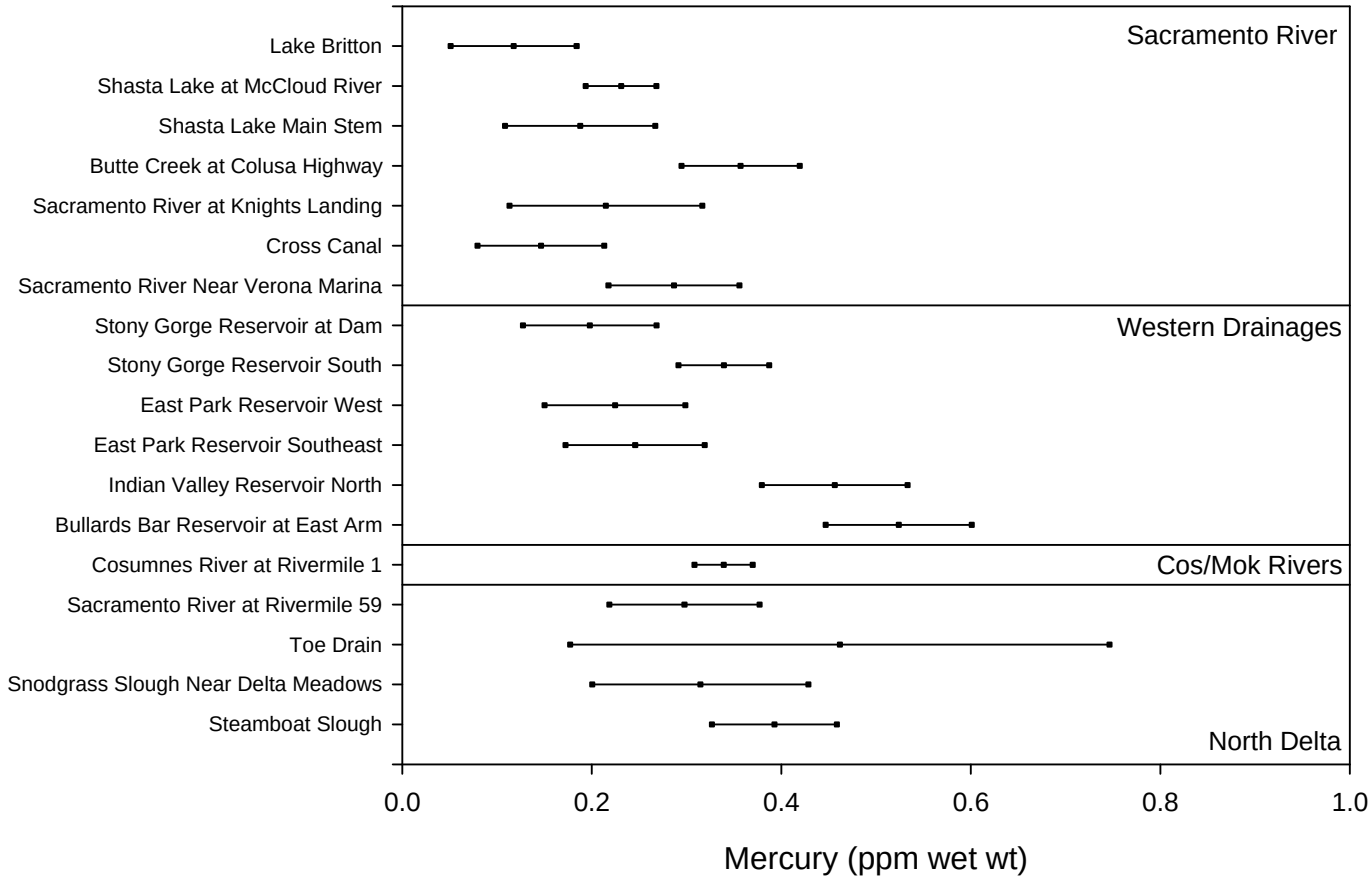


Figure 22. Spatial comparison of Sacramento pikeminnow mercury concentrations. Data represent mean and 95% confidence interval. Locations are grouped by watershed sub-areas from north (top) to south (bottom). Size limits were applied (Table 5). Sites shown have sample sizes of five or more fish.

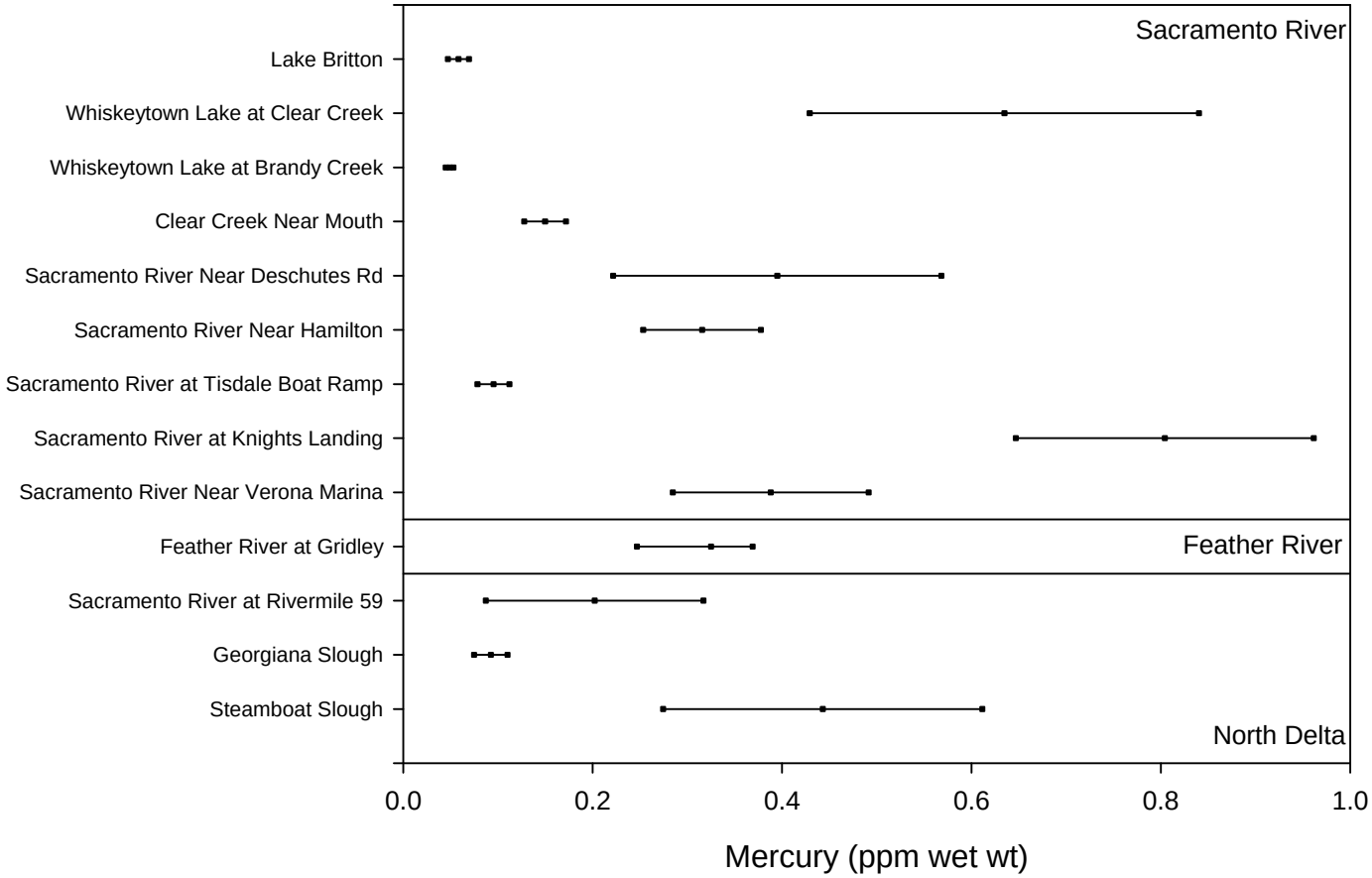


Figure 23. Spatial comparison of Sacramento sucker mercury concentrations. Data represent mean and 95% confidence interval. Locations are grouped by watershed sub-areas from north (top) to south (bottom). Size limits were applied (Table 5). Sites shown have sample sizes of five or more fish.

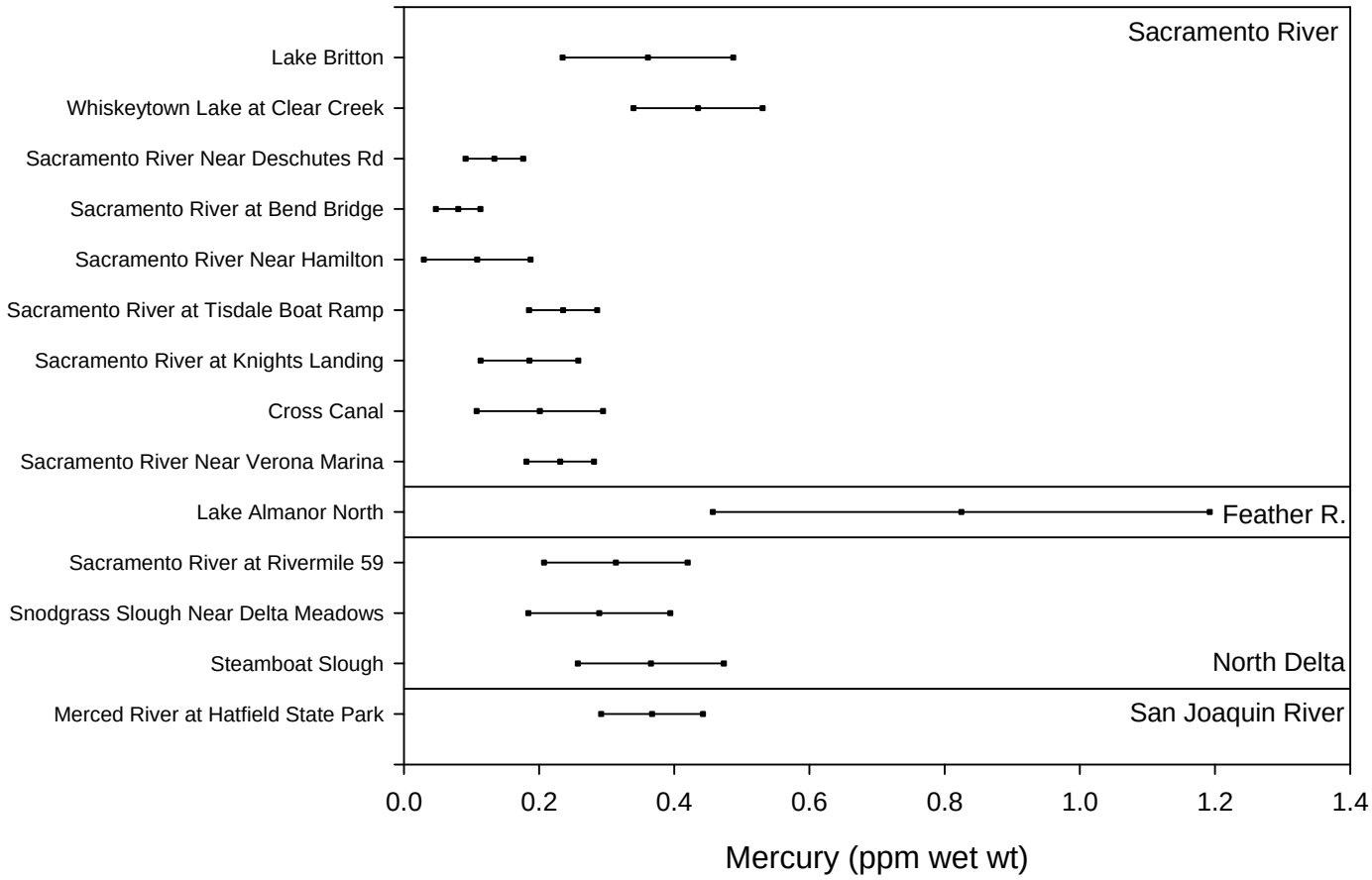


Figure 24. Spatial comparison of bluegill mercury concentrations. Data represent mean and 95% confidence interval. Locations are grouped by watershed sub-areas from north (top) to south (bottom). Size limits were applied (Table 5). Sites shown have sample sizes of five or more fish.

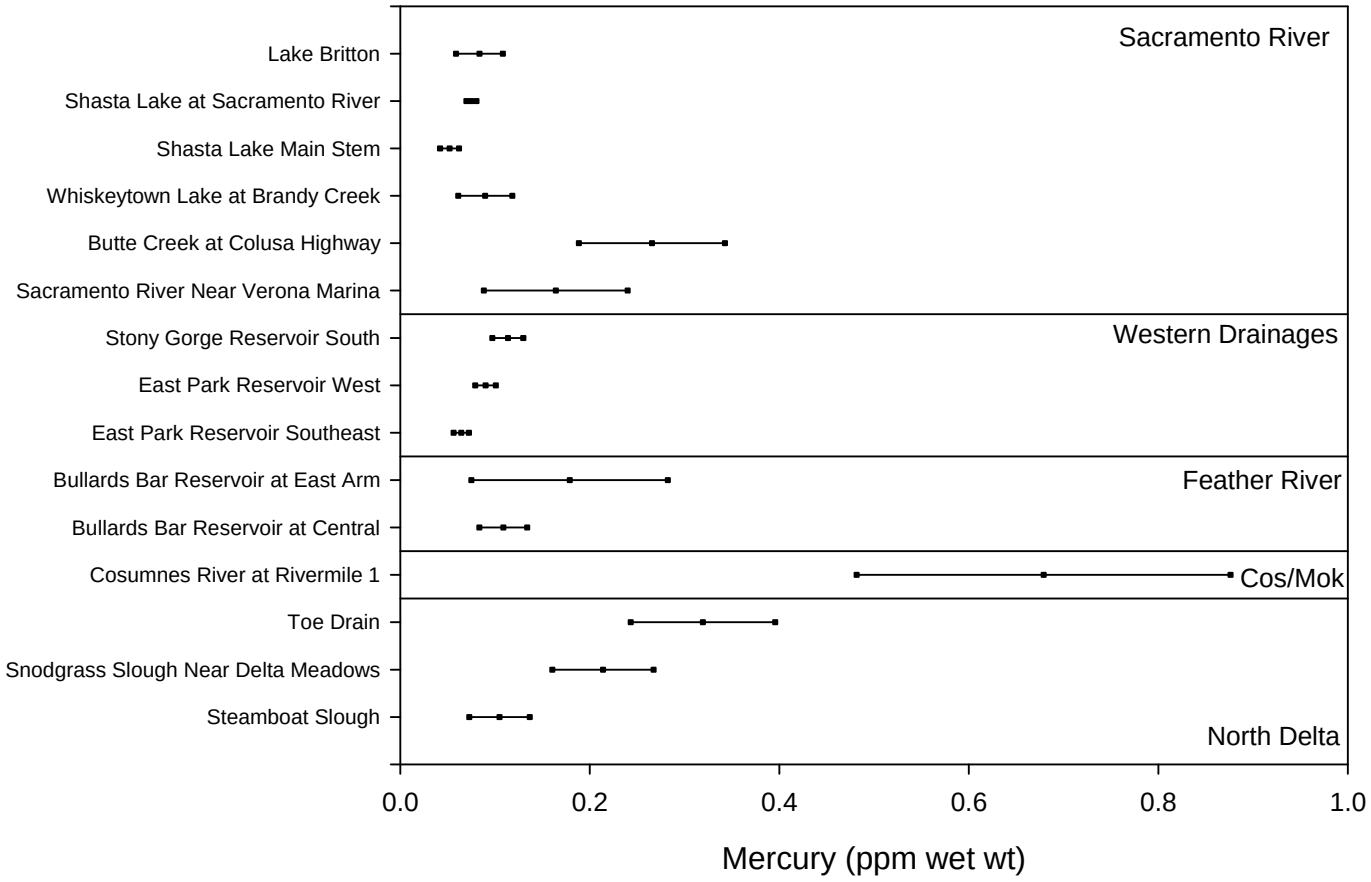


Figure 25. Spatial comparison of redear sunfish mercury concentrations. Data represent mean and 95% confidence interval. Locations are grouped by watershed sub-areas from north (top) to south (bottom). Size limits were applied (Table 5). Sites shown have sample sizes of five or more fish.

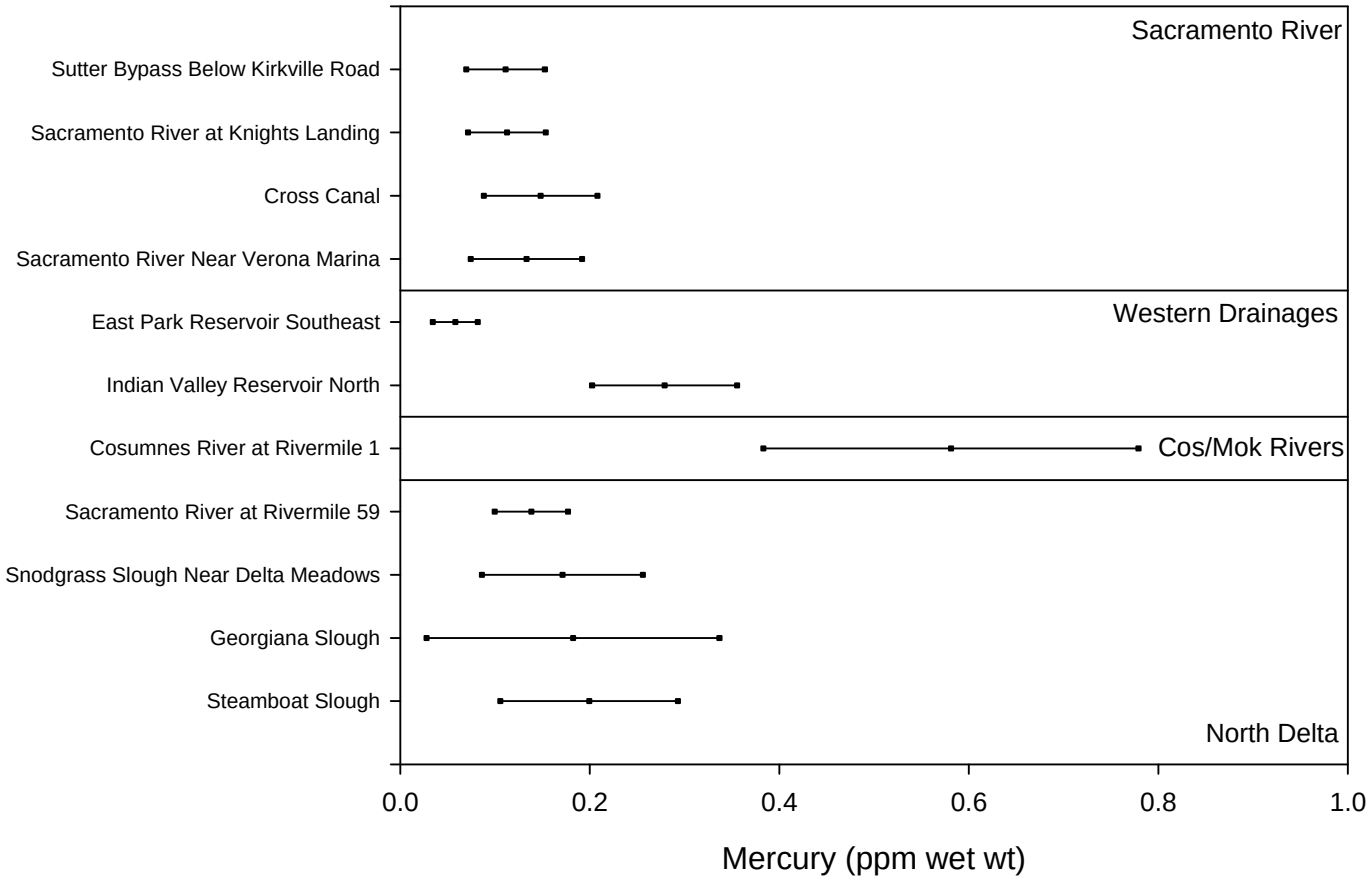
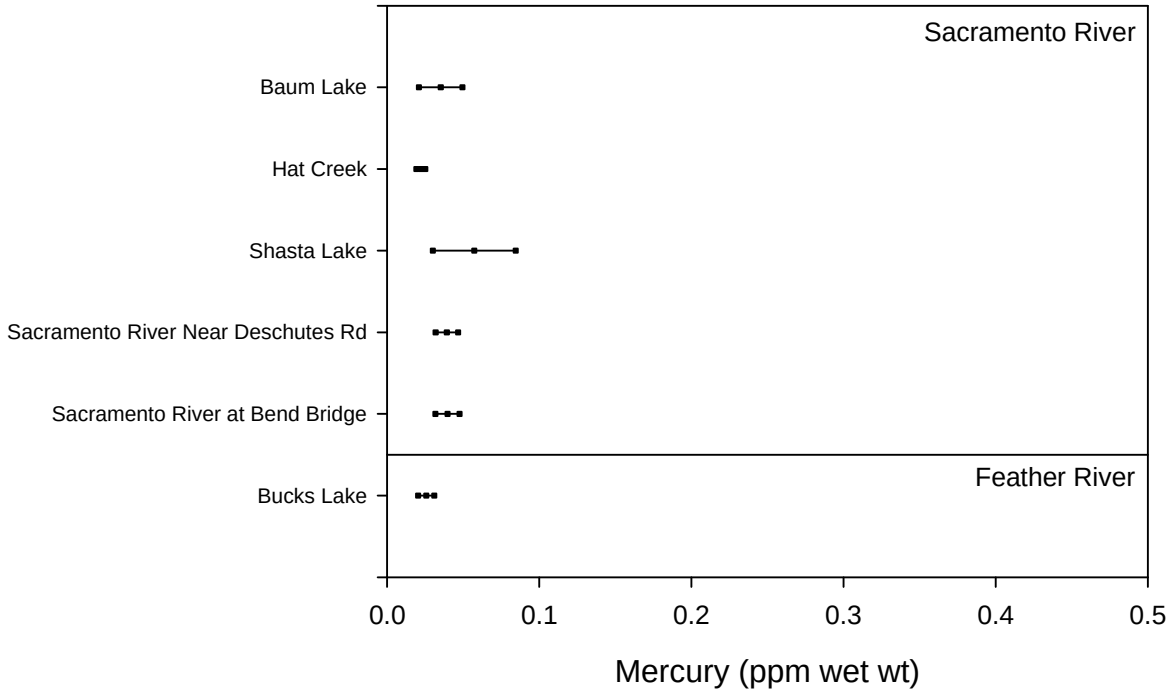
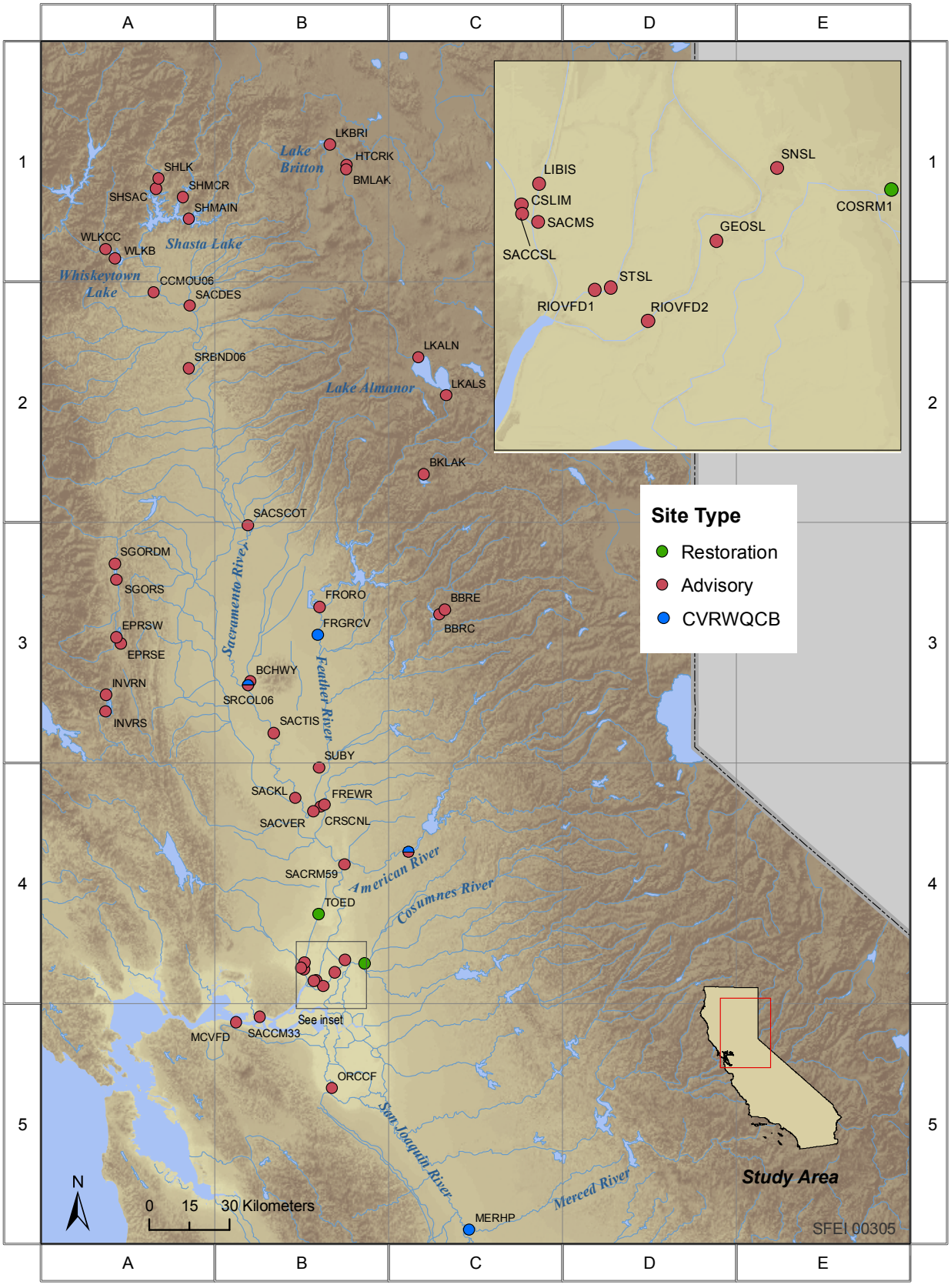
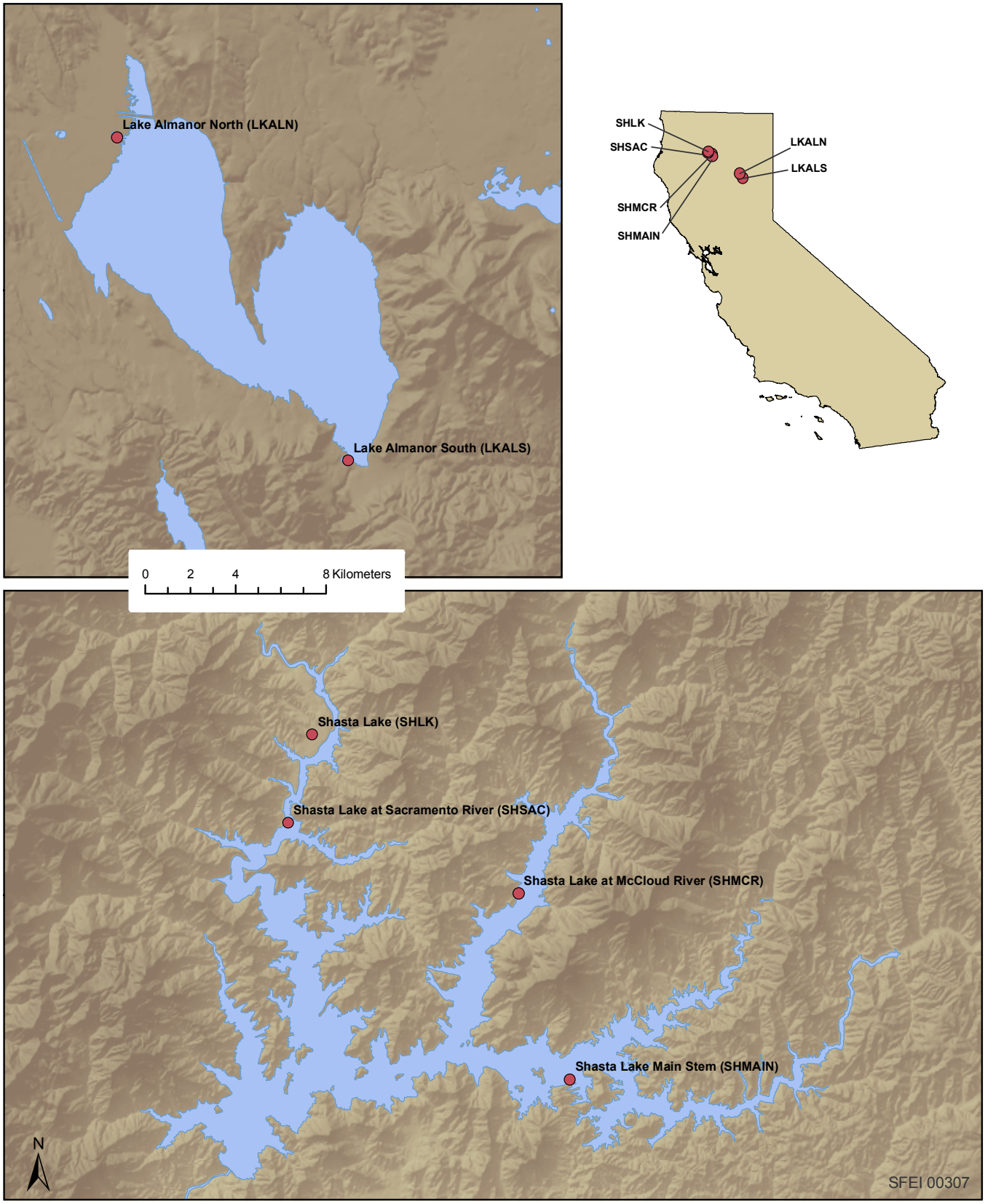


Figure 26. Spatial comparison of rainbow trout mercury concentrations. Data represent mean and 95% confidence interval. Locations are grouped by watershed sub-areas from north (top) to south (bottom). Size limits were applied (Table 5). Sites shown have sample sizes of five or more fish.

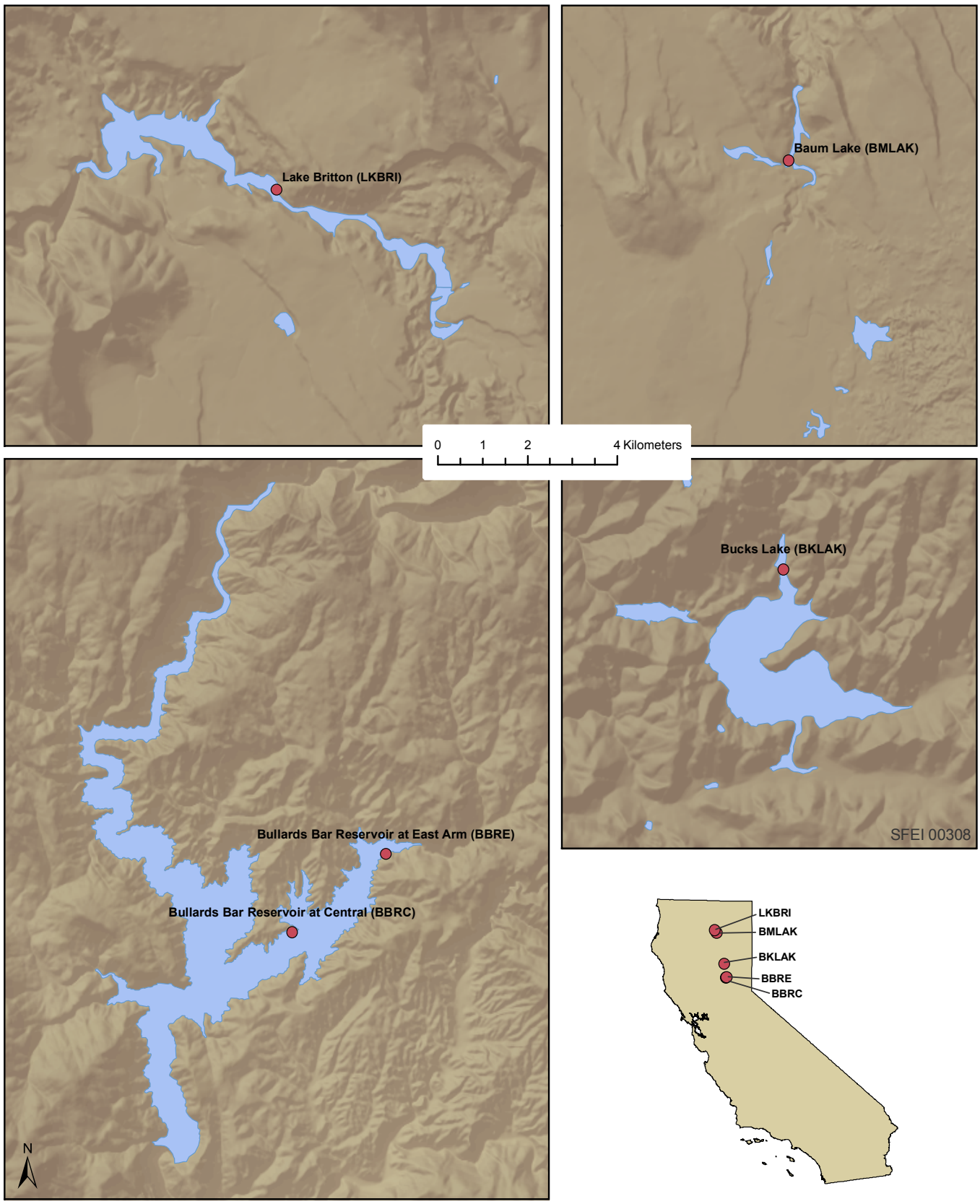




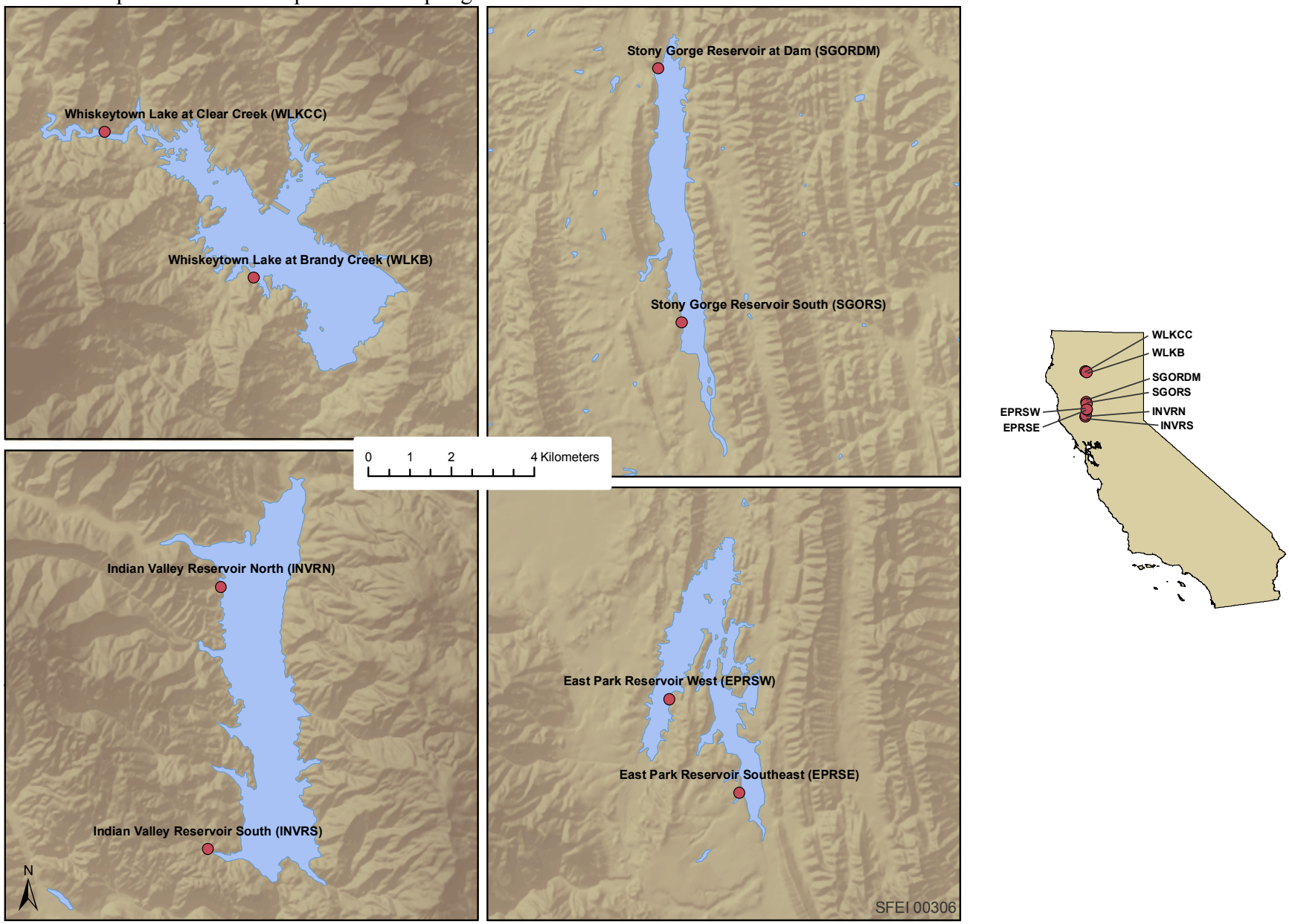
Map 1. Sport fish sampling locations for FMP 2006. See Table 3 for site names corresponding to site codes above.



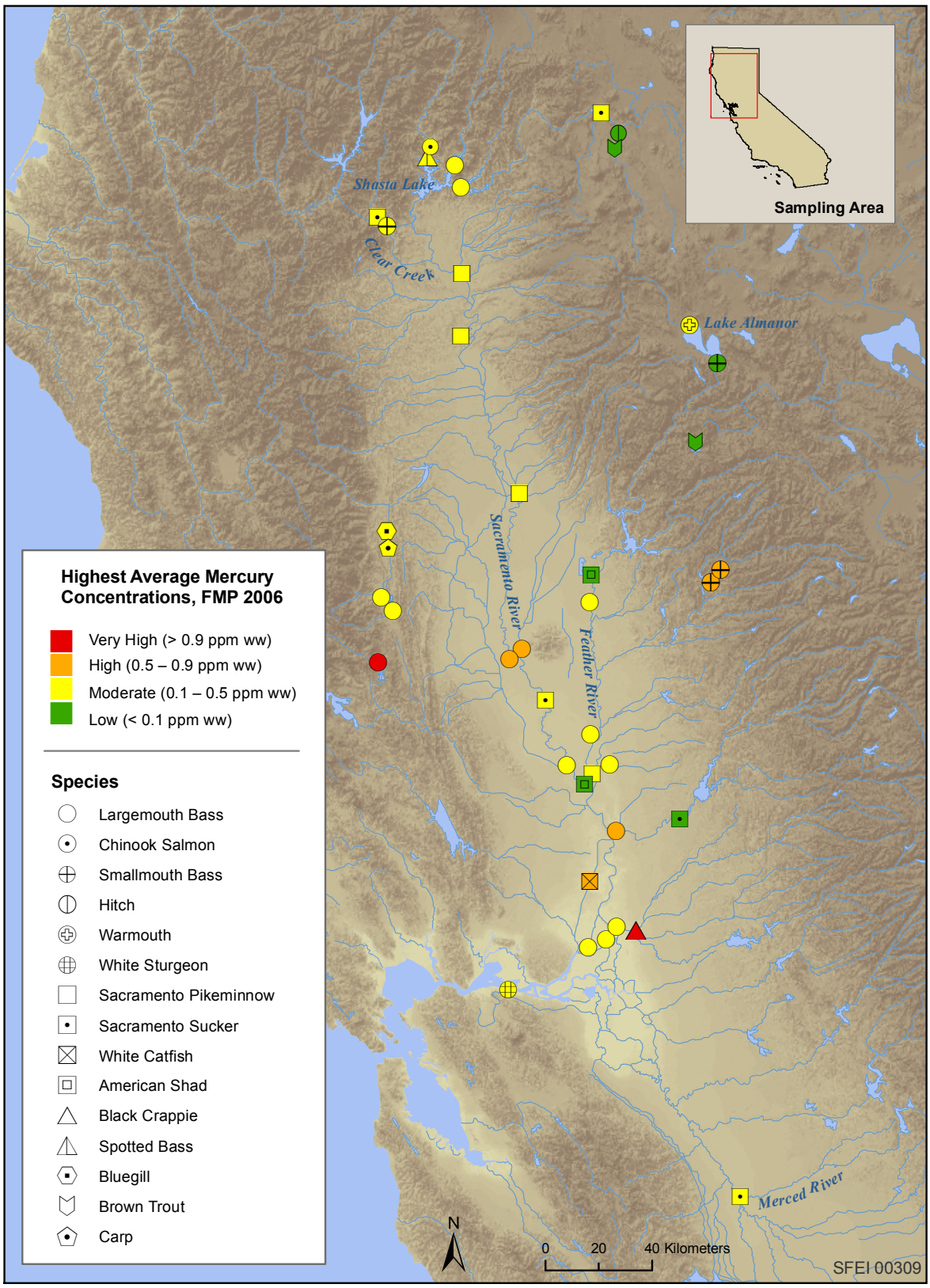
Map 2a. Sport fish sampling locations in lakes and reservoirs.



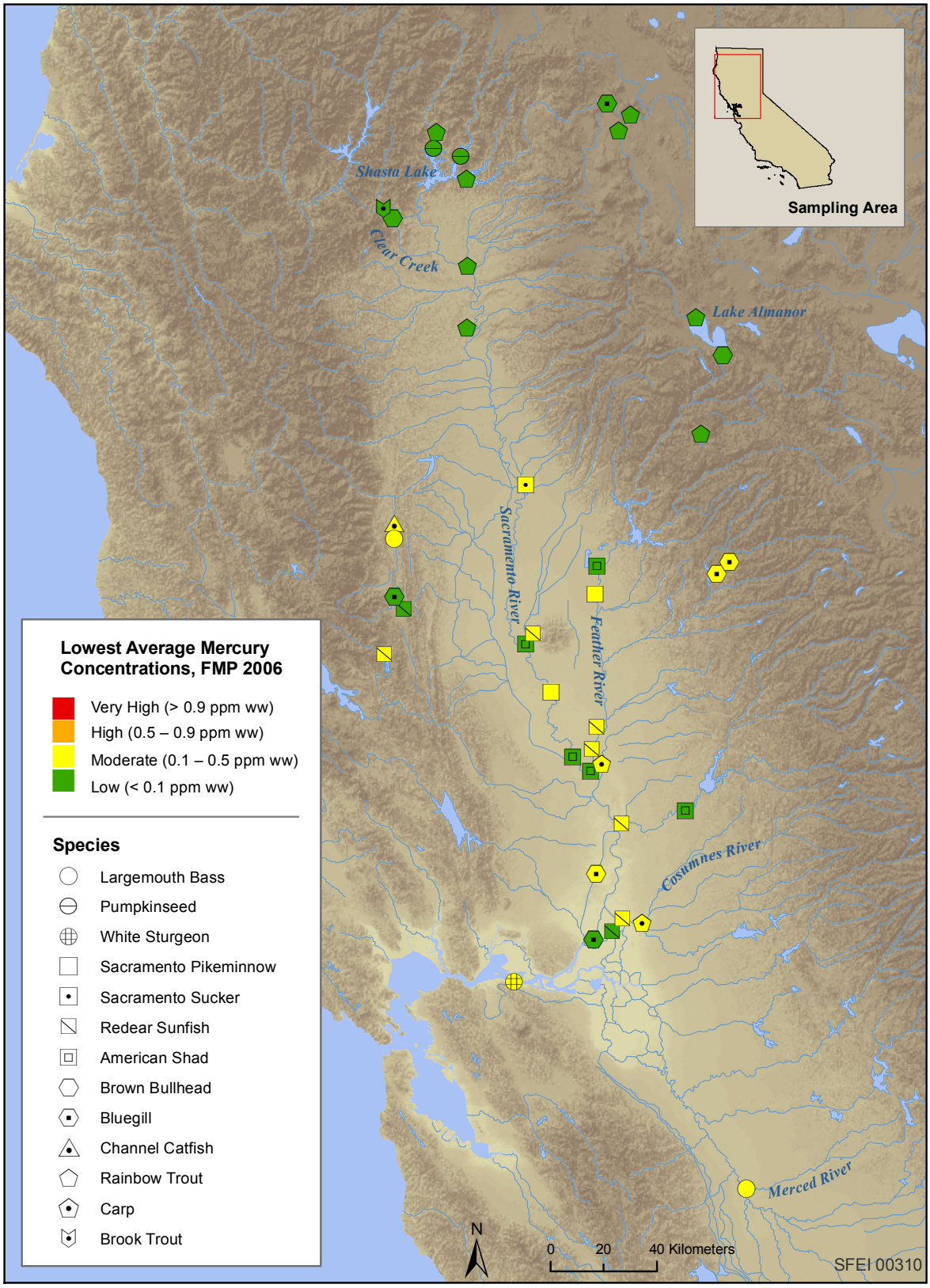
Map 2b. Sport fish sampling locations in lakes and reservoirs.



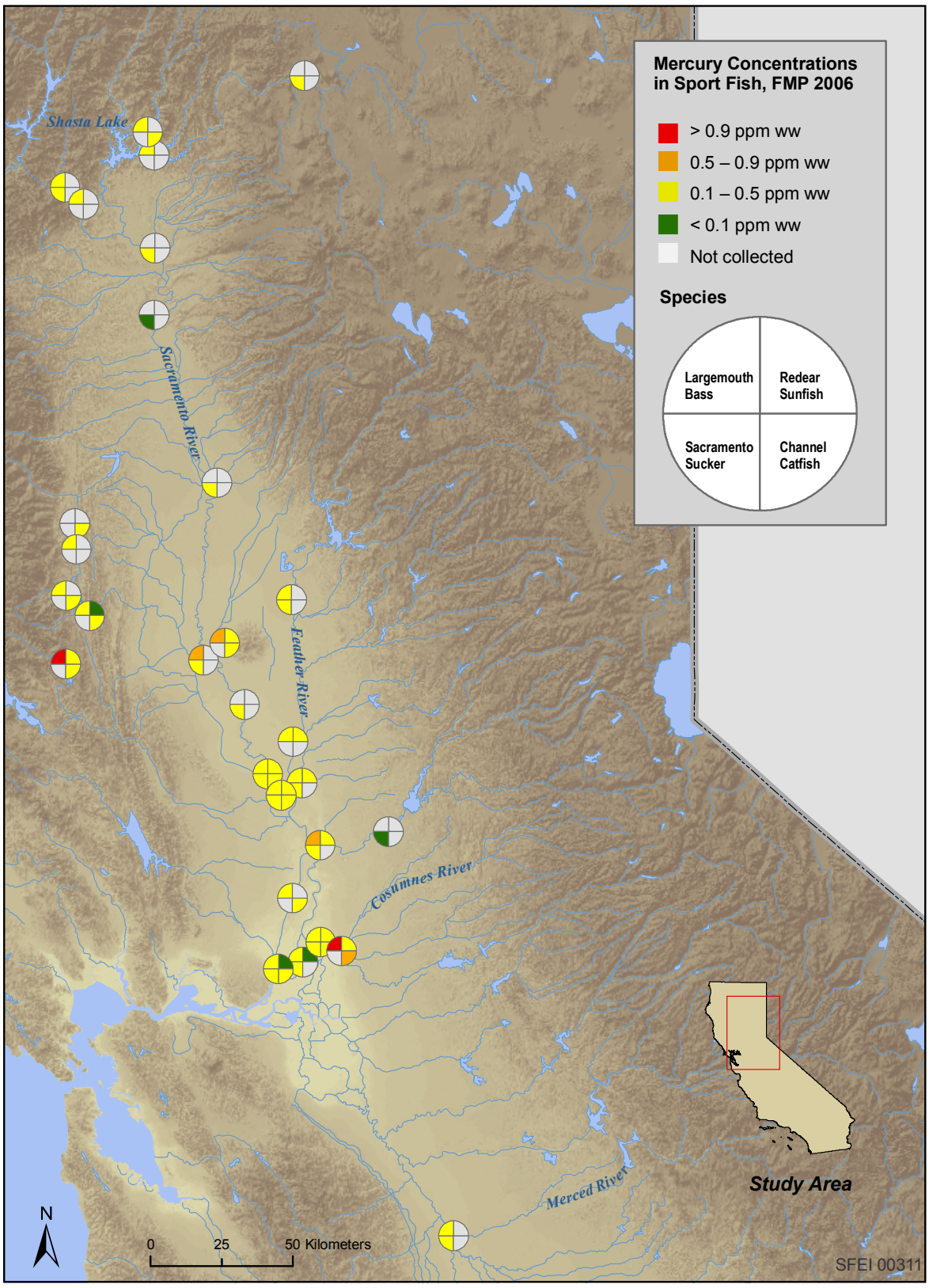
Map 2c. Sport fish sampling locations in lakes and reservoirs.



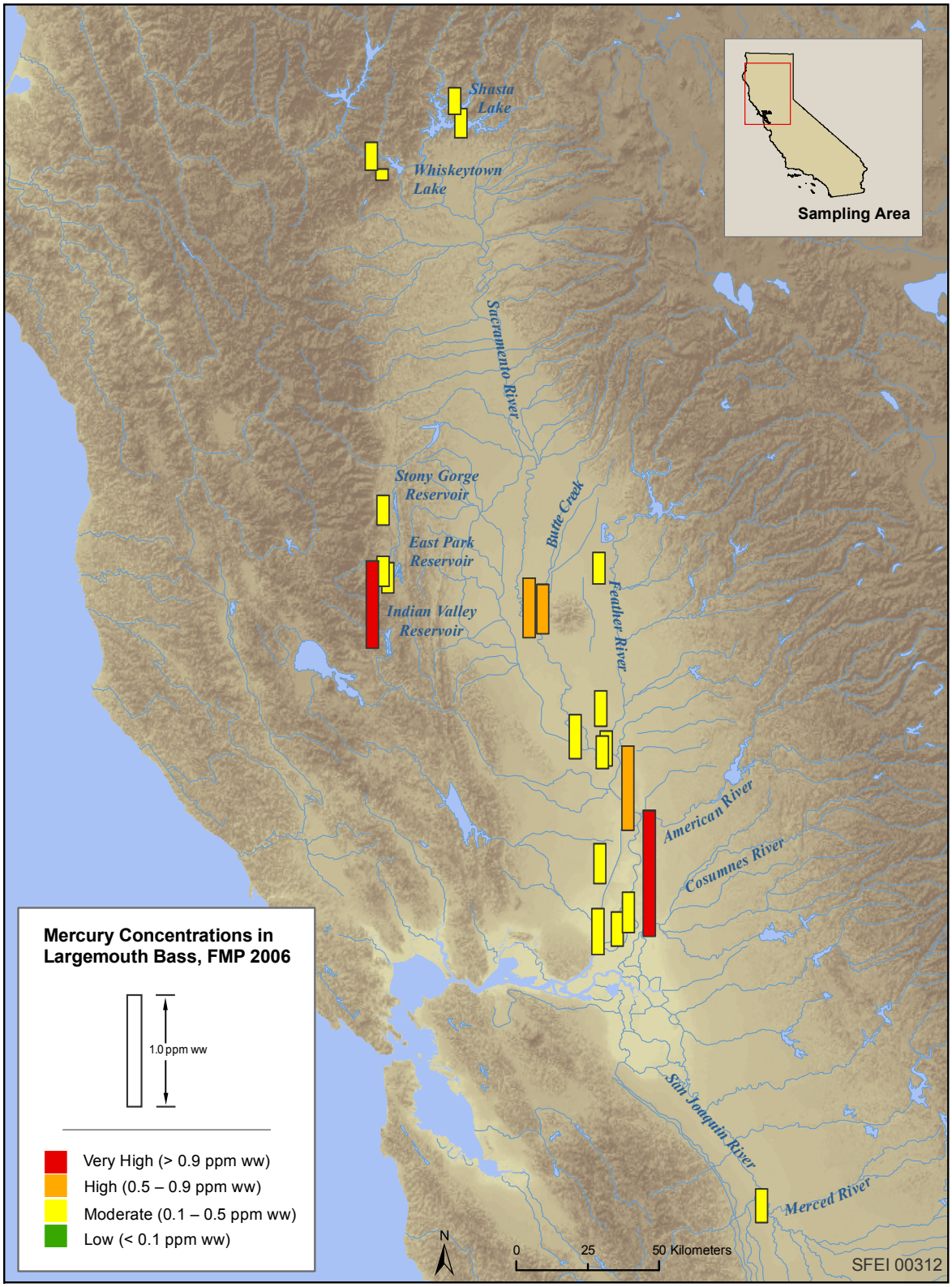
Map 3. The species at each sampling site with the highest average mercury concentration (ppm wet weight) in 2006 is shown. Symbol types represent species, and colors represent average mercury concentration (see legend). Size limits were applied (Table 5).



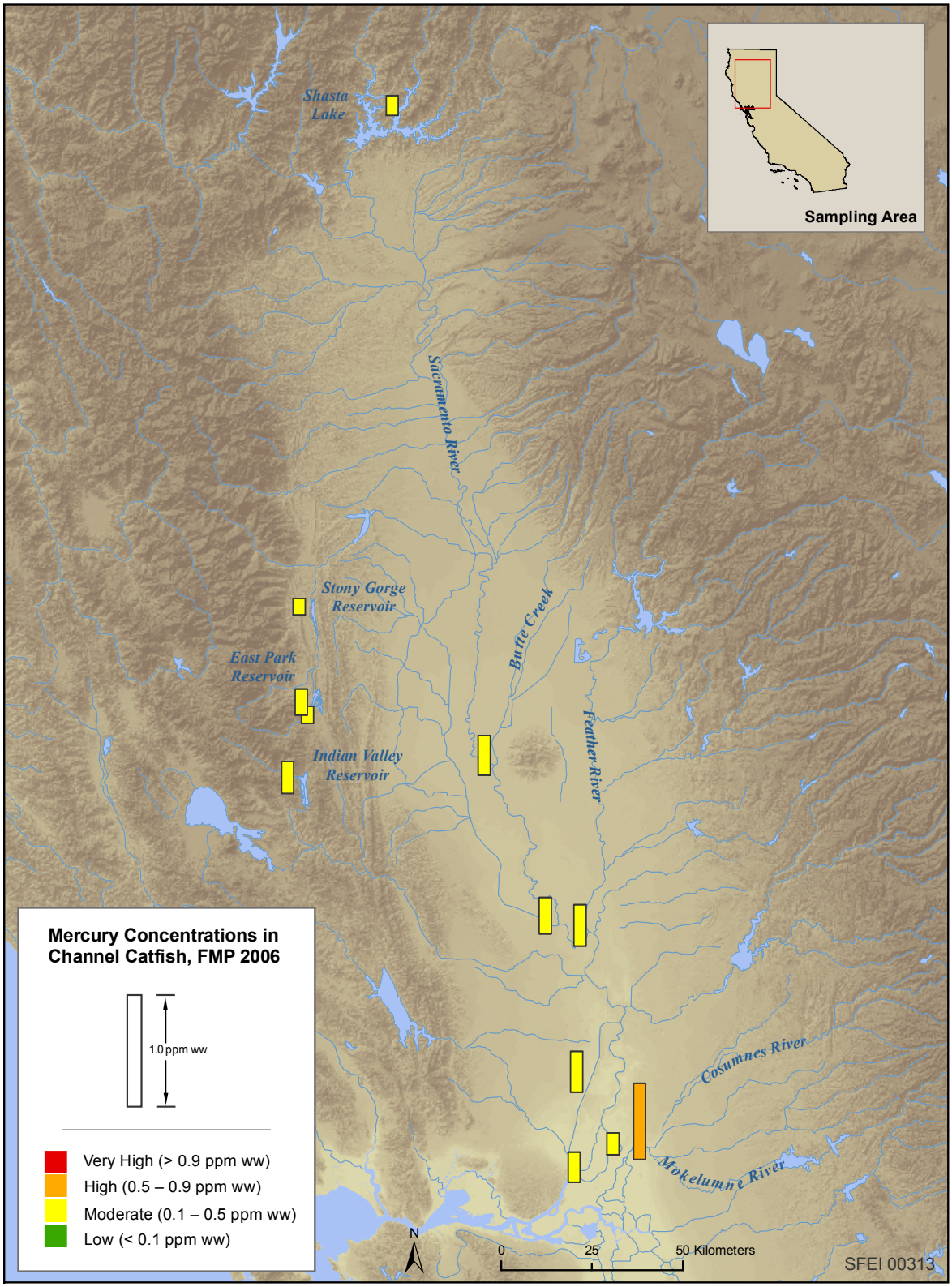
Map 4. The species at each sampling site with the lowest average mercury concentration (ppm wet weight) in 2006 is shown. Symbol types represent species, and colors represent average mercury concentration (see legend). Size limits were applied (Table 5).



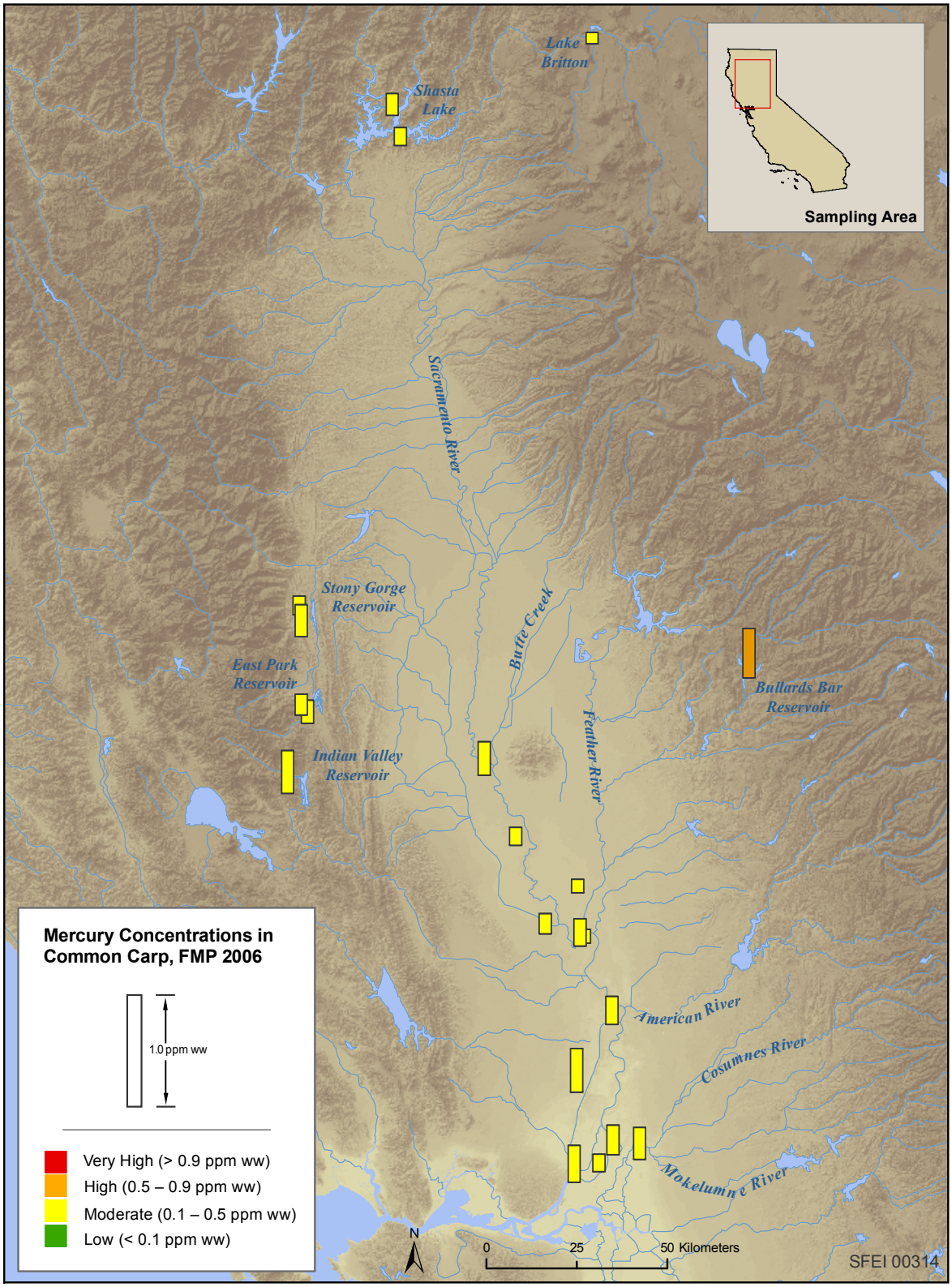
Map 5. Mercury concentrations (ppm wet weight) in sport fish at FMP sampling locations. Quadrants indicate species, and colors represent mercury concentration ranges (see legend). Size limits were applied (Table 5).



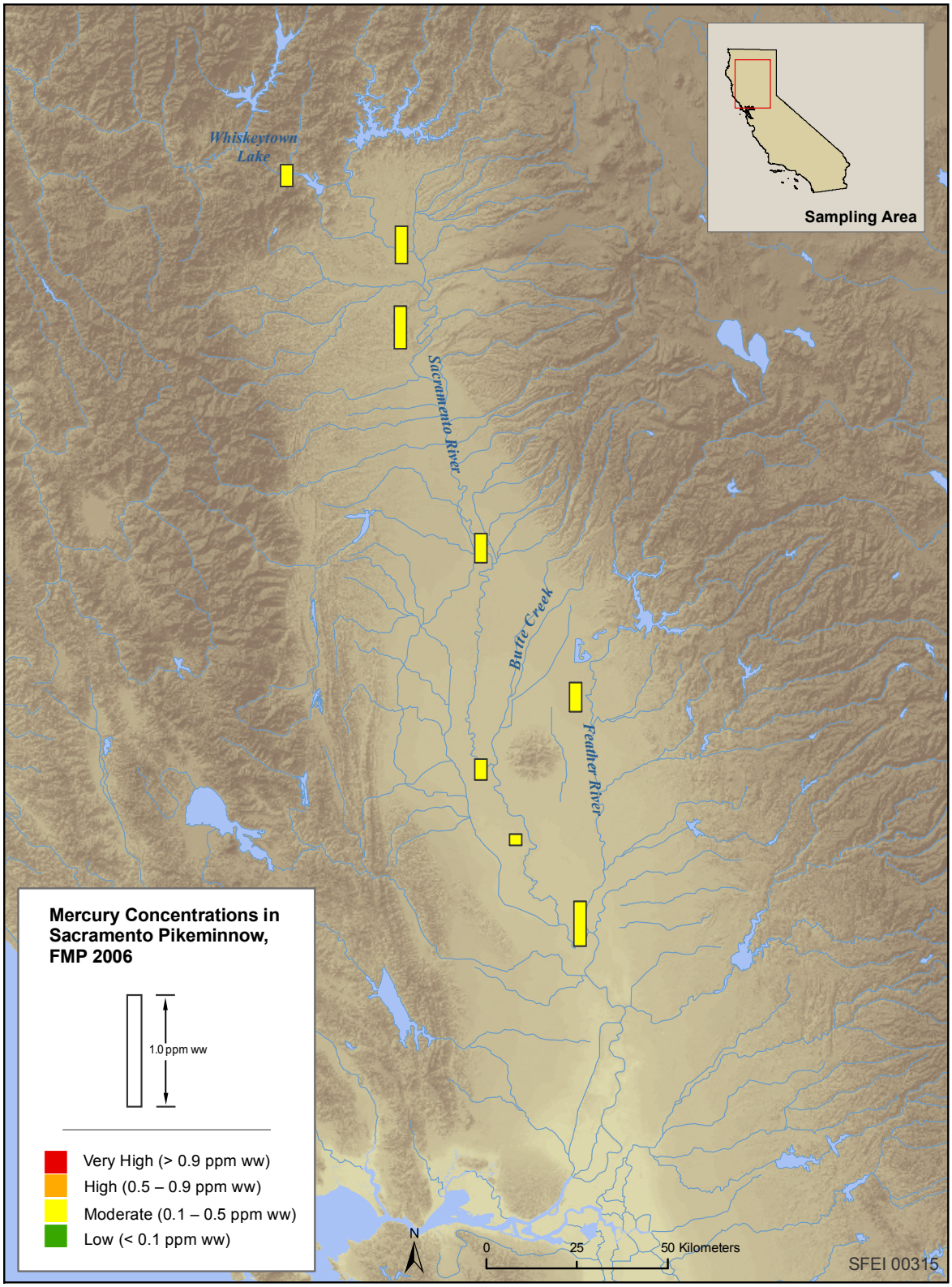
Map 6. Average mercury concentrations in largemouth bass at 2006 FMP sampling sites. Colors represent mercury concentration categories (see legend). Size limits were applied (305 – 407 mm).



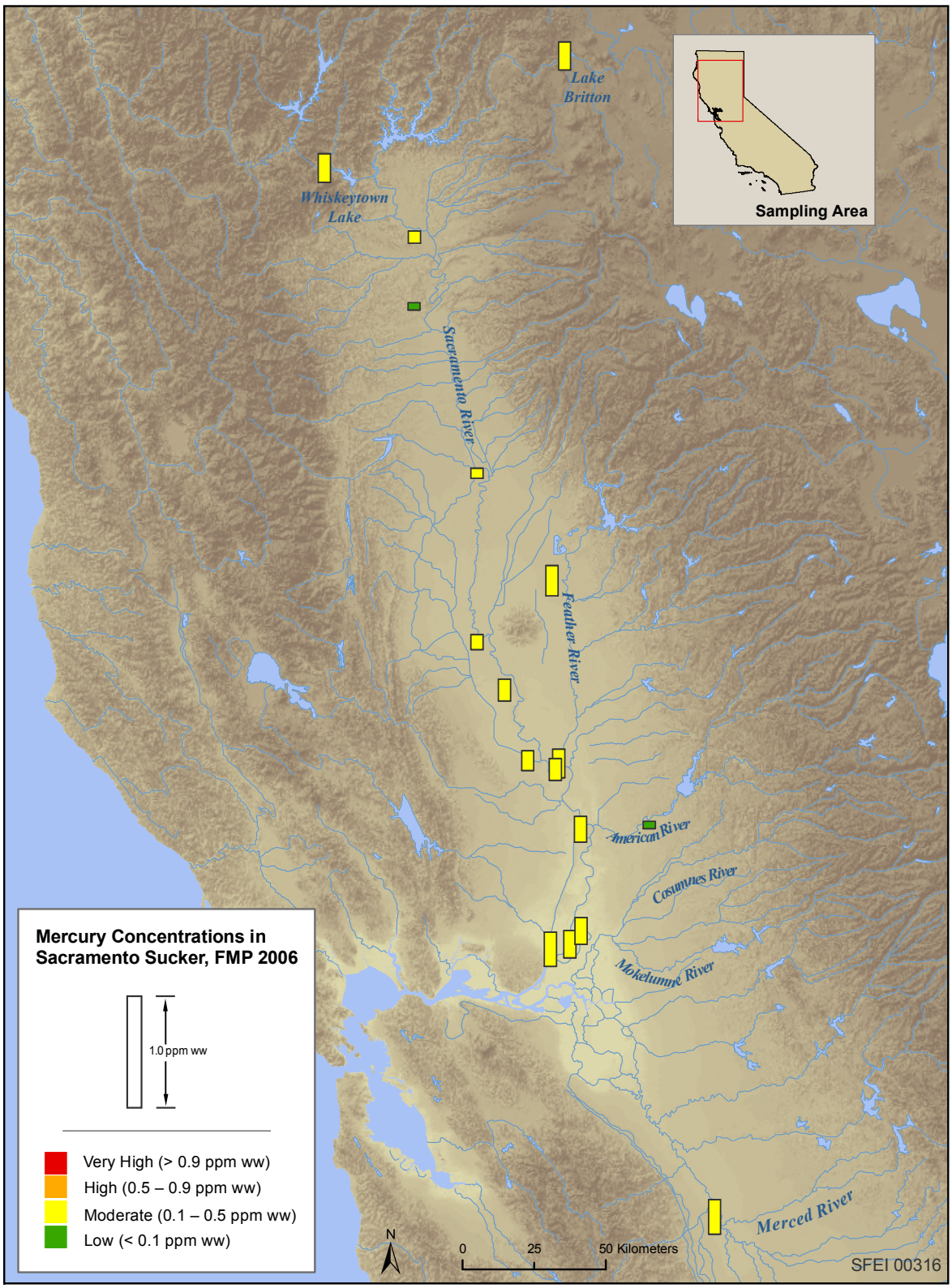
Map 7. Average mercury concentrations in channel catfish at 2006 FMP sampling sites. Colors represent mercury concentration categories (see legend). Size limits were applied (371 – 495 mm).



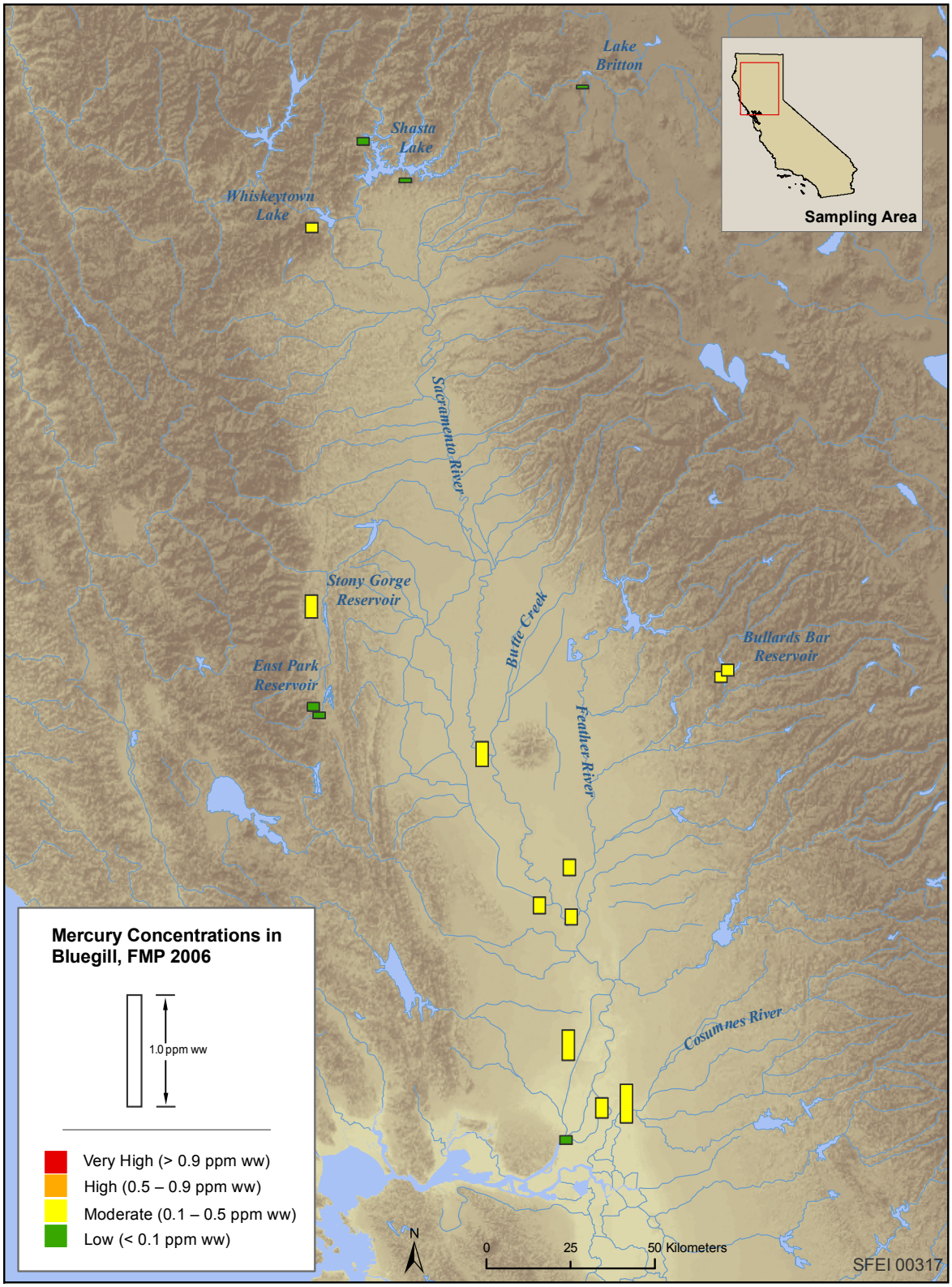
Map 8. Average mercury concentrations in common carp at 2006 FMP sampling sites. Colors represent mercury concentration categories (see legend). Size limits were not applied.



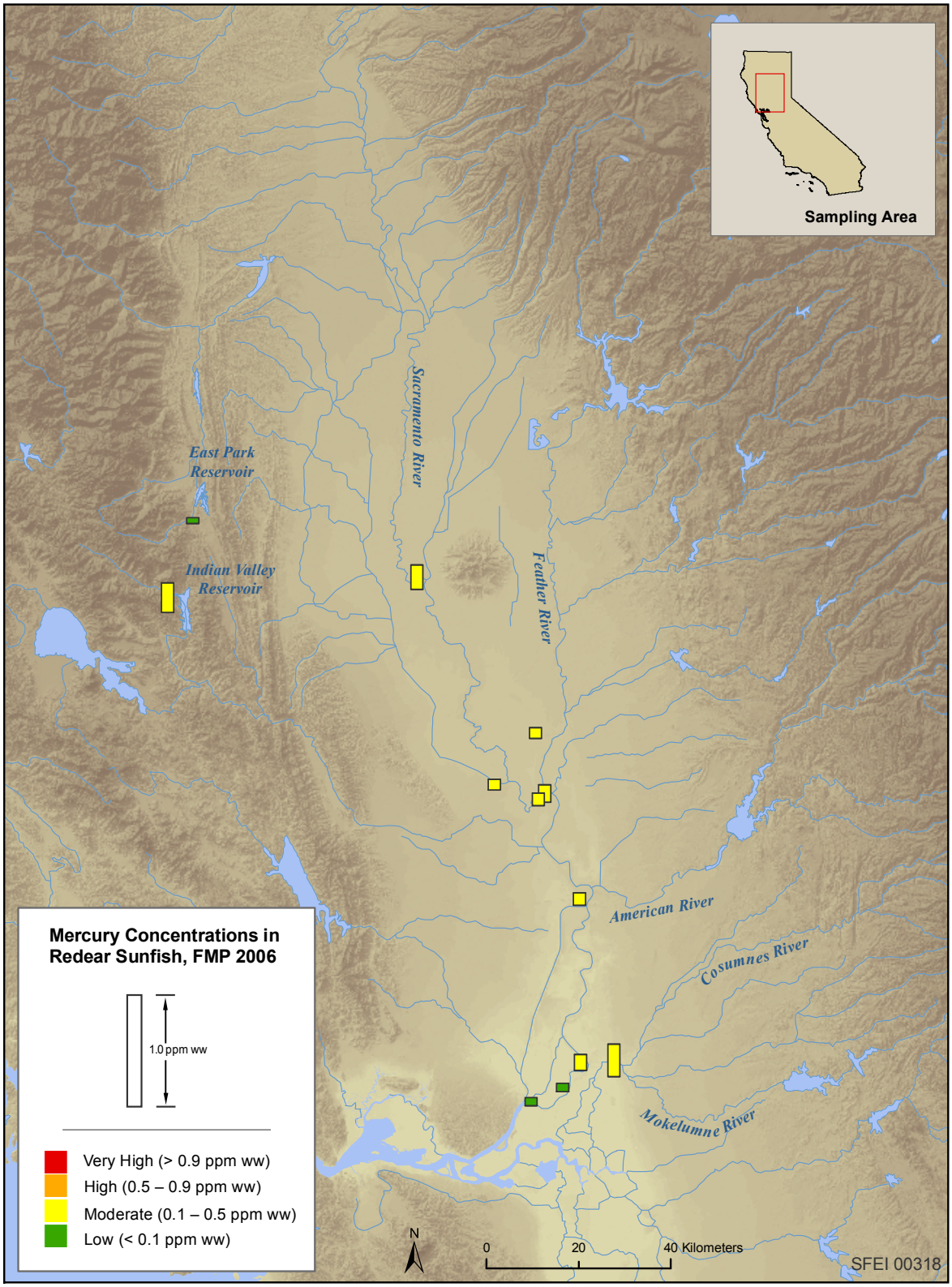
Map 9. Average mercury concentrations in Sacramento pikeminnow at 2006 FMP sampling sites. Colors represent mercury concentration categories (see legend). Size limits were applied (320 – 425 mm).



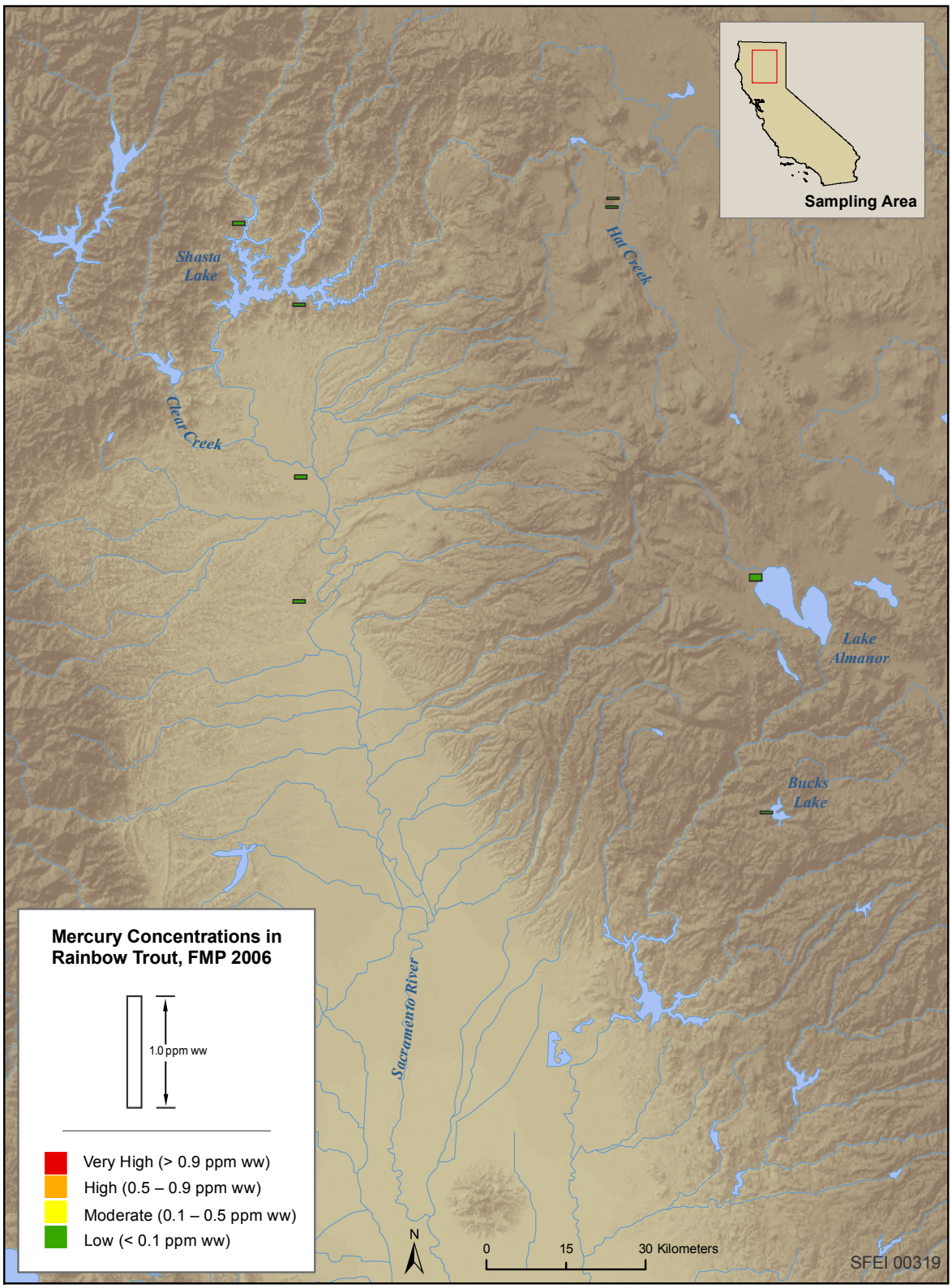
Map 10. Average mercury concentrations in Sacramento sucker at 2006 FMP sampling sites. Colors represent mercury concentration categories (see legend). Size limits were applied (367 – 489 mm).



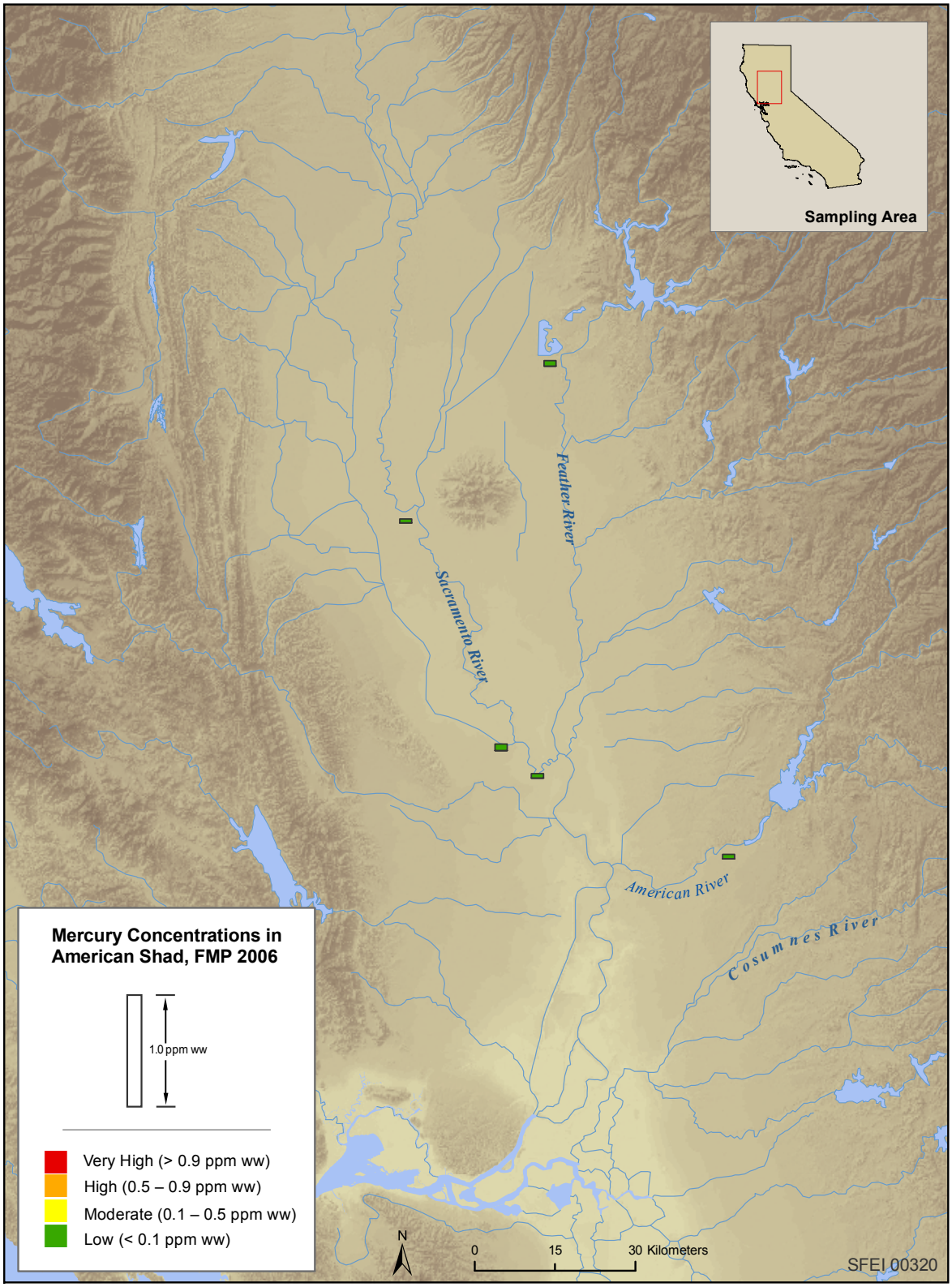
Map 11. Average mercury concentrations in bluegill at 2006 FMP sampling sites. Colors represent mercury concentration categories (see legend). Size limits were applied (117 – 156 mm).



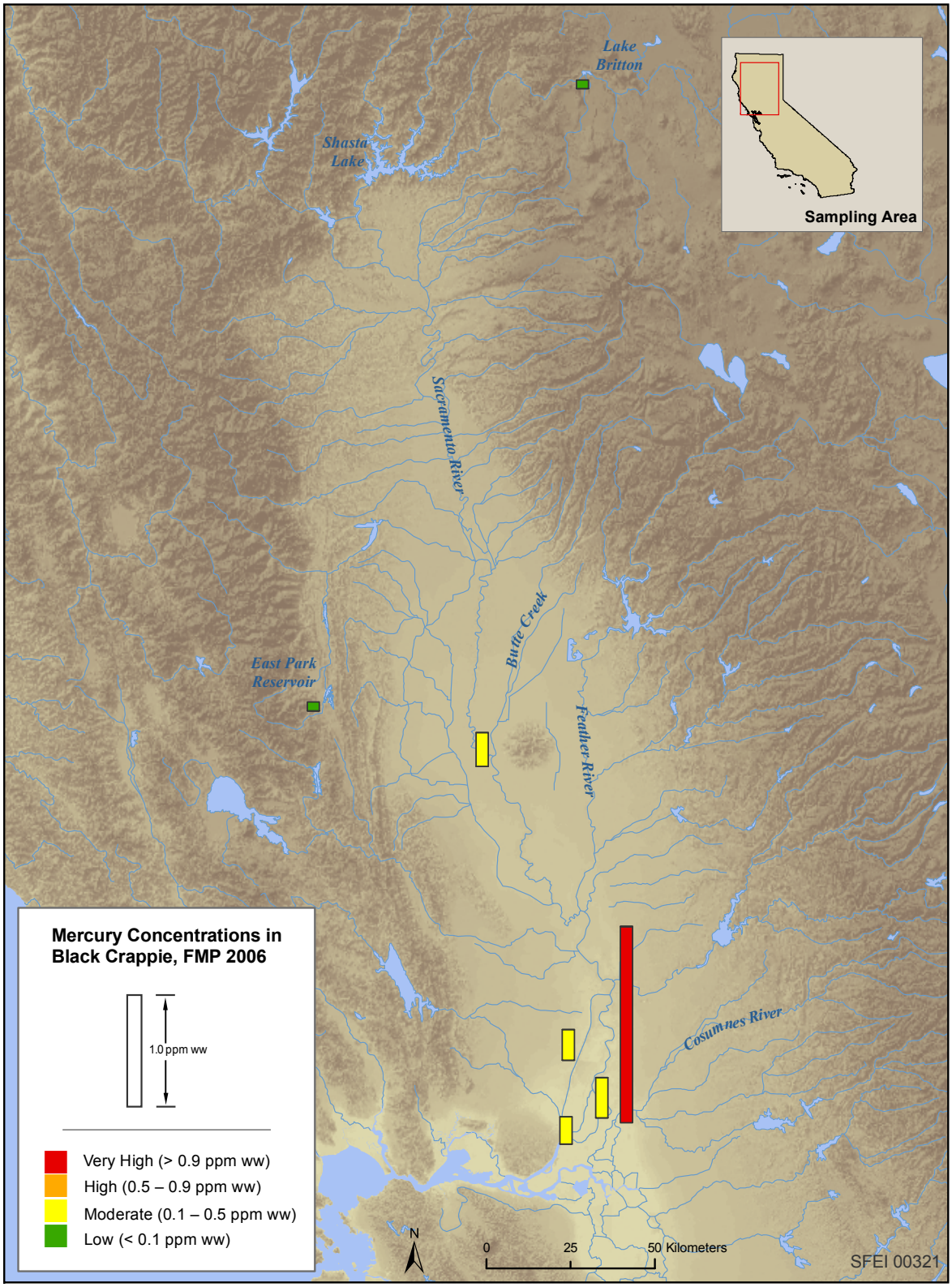
Map 12. Average mercury concentrations in redear sunfish at 2006 FMP sampling sites. Colors represent mercury concentration categories (see legend). Size limits were applied (151 – 202 mm).



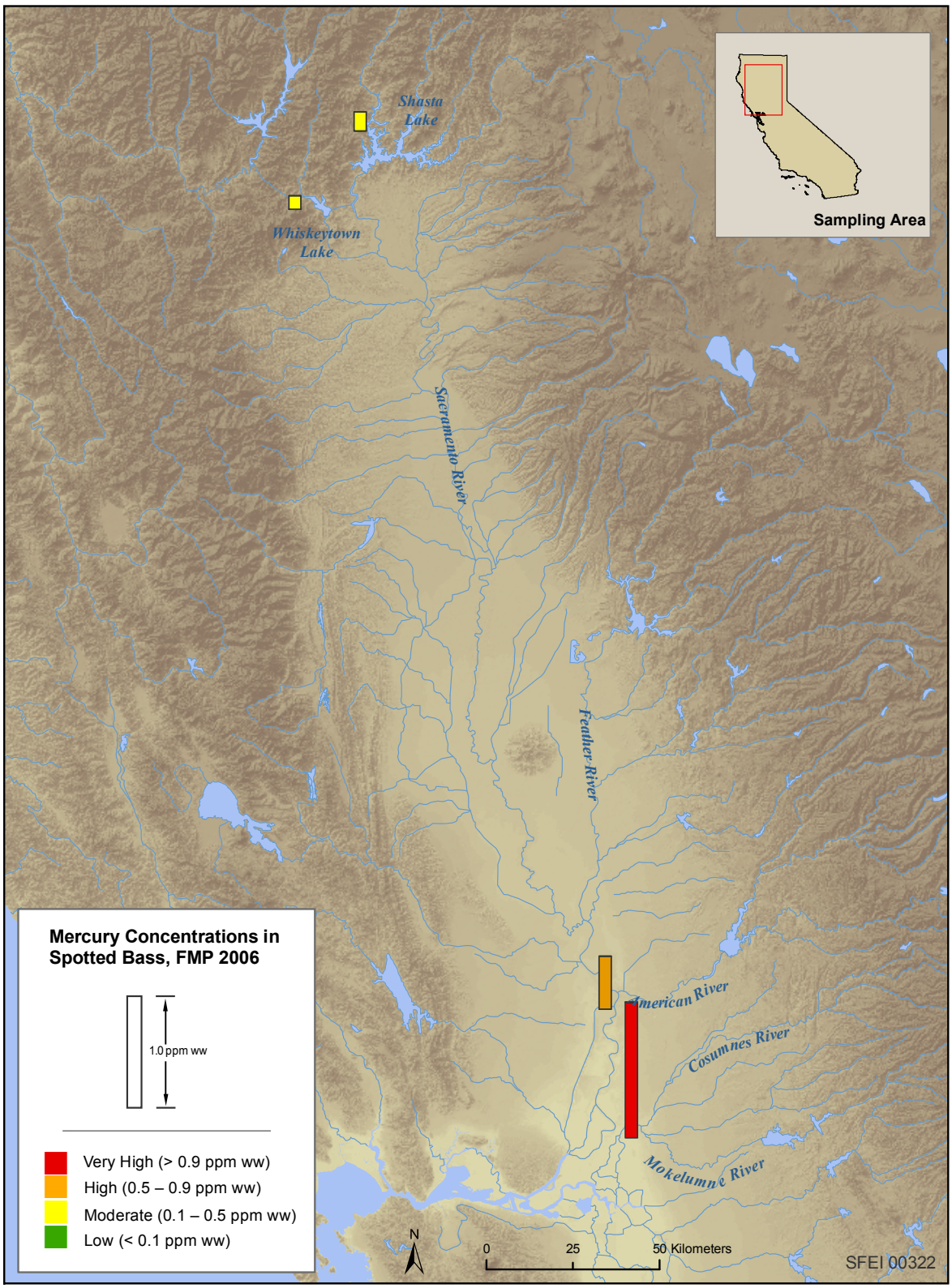
Map 13. Average mercury concentrations in rainbow trout at 2006 FMP sampling sites. Colors represent mercury concentration categories (see legend). Size limits were applied (271 – 361 mm).



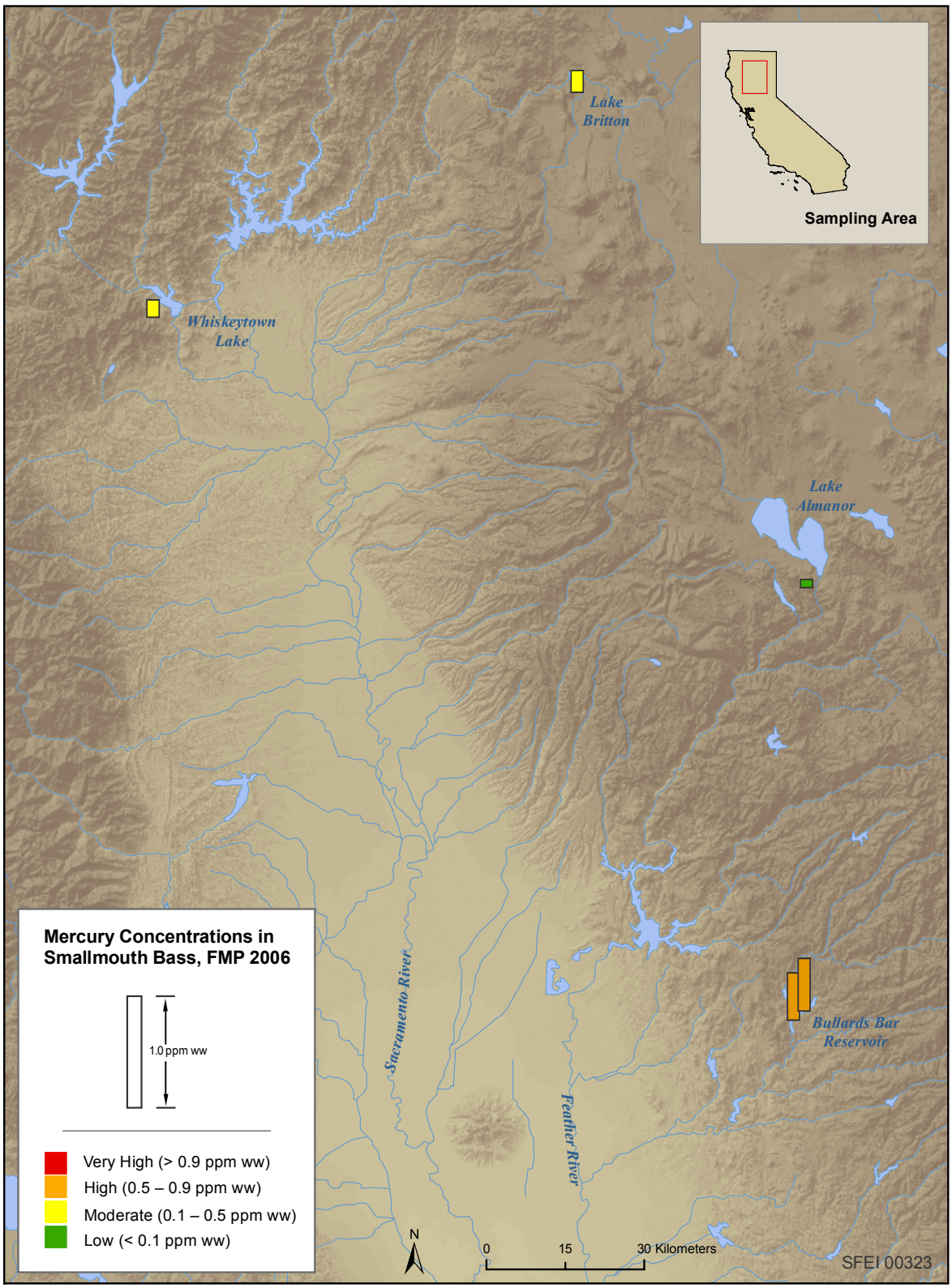
Map 14. Average mercury concentrations in American shad at 2006 FMP sampling sites. Colors represent mercury concentration categories (see legend). Size limits were applied (363 – 484 mm).



Map 15. Average mercury concentrations in black crappie at 2006 FMP sampling sites. Colors represent mercury concentration categories (see legend). Size limits were applied (191 – 254 mm).



Map 16. Average mercury concentrations in spotted bass at 2006 FMP sampling sites. Colors represent mercury concentration categories (see legend). Size limits were applied (305 – 407 mm).



Map 17. Average mercury concentrations in smallmouth bass at 2006 FMP sampling sites. Colors represent mercury concentration categories (see legend). Size limits were applied (305 – 407 mm).

Appendix I. All individual data from fish collected during 2006.

Year	Species	Site Code	Site Name	Total Length (mm)	Hg Concentration (ppm)	Comment
2006	American Shad	ARNIM06	American River at Nimbus Dam	404	0.115	
2006	American Shad	ARNIM06	American River at Nimbus Dam	406	0.04	
2006	American Shad	ARNIM06	American River at Nimbus Dam	408	0.043	
2006	American Shad	ARNIM06	American River at Nimbus Dam	410	0.05	
2006	American Shad	ARNIM06	American River at Nimbus Dam	425	0.034	
2006	American Shad	ARNIM06	American River at Nimbus Dam	435	0.037	
2006	American Shad	ARNIM06	American River at Nimbus Dam	445	0.035	
2006	American Shad	ARNIM06	American River at Nimbus Dam	455	0.042	
2006	American Shad	ARNIM06	American River at Nimbus Dam	494	0.037	
2006	American Shad	ARNIM06	American River at Nimbus Dam	507	0.044	
2006	American Shad	FRORO	Feather River @ Oroville Outlet	402	0.047	
2006	American Shad	FRORO	Feather River @ Oroville Outlet	404	0.084	
2006	American Shad	FRORO	Feather River @ Oroville Outlet	405	0.075	
2006	American Shad	FRORO	Feather River @ Oroville Outlet	411	0.051	
2006	American Shad	FRORO	Feather River @ Oroville Outlet	416	0.037	
2006	American Shad	FRORO	Feather River @ Oroville Outlet	443	0.042	
2006	American Shad	FRORO	Feather River @ Oroville Outlet	444	0.056	
2006	American Shad	FRORO	Feather River @ Oroville Outlet	451	0.046	
2006	American Shad	FRORO	Feather River @ Oroville Outlet	485	0.052	
2006	American Shad	FRORO	Feather River @ Oroville Outlet	500	0.042	
2006	American Shad	FREWR	Fremont Weir	286	0.055	
2006	American Shad	FREWR	Fremont Weir	330	0.071	
2006	American Shad	FREWR	Fremont Weir	334	0.337	
2006	American Shad	FREWR	Fremont Weir	359	0.257	
2006	American Shad	FREWR	Fremont Weir	362	0.039	
2006	American Shad	FREWR	Fremont Weir	375	0.108	
2006	American Shad	FREWR	Fremont Weir	384	0.05	
2006	American Shad	FREWR	Fremont Weir	394	0.034	
2006	American Shad	FREWR	Fremont Weir	424	0.05	
2006	American Shad	FREWR	Fremont Weir	425	0.051	
2006	American Shad	FREWR	Fremont Weir	425	0.044	
2006	American Shad	FREWR	Fremont Weir	436	0.035	
2006	American Shad	FREWR	Fremont Weir	445	0.051	
2006	American Shad	FREWR	Fremont Weir	445	0.037	
2006	American Shad	FREWR	Fremont Weir	446	0.04	

Year	Species	Site Code	Site Name	Total Length (mm)	Hg Concentration (ppm)	Comment
2006	American Shad	FREWR	Fremont Weir	461	0.033	
2006	American Shad	FREWR	Fremont Weir	467	0.038	
2006	American Shad	FREWR	Fremont Weir	506	0.042	
2006	American Shad	FREWR	Fremont Weir	509	0.046	
2006	American Shad	FREWR	Fremont Weir	524	0.034	
2006	American Shad	FREWR	Fremont Weir	541	0.047	
2006	American Shad	FREWR	Fremont Weir	564	0.033	
2006	American Shad	FREWR	Fremont Weir	571	0.056	
2006	American Shad	SRCOL06	Sacramento River at Colusa	397	0.029	
2006	American Shad	SRCOL06	Sacramento River at Colusa	430	0.057	
2006	American Shad	SACKL	Sacramento River at Knights Landing	334	0.062	
2006	American Shad	SACKL	Sacramento River at Knights Landing	353	0.087	
2006	American Shad	SACKL	Sacramento River at Knights Landing	391	0.067	
2006	American Shad	SACKL	Sacramento River at Knights Landing	406	0.086	
2006	American Shad	SACKL	Sacramento River at Knights Landing	426	0.037	
2006	BlackCrappie	BCHWY	Butte Creek at Colusa Highway	195	0.364	
2006	BlackCrappie	COSRM1	Cosumnes River at Rivermile 1	175	1.66	
2006	BlackCrappie	COSRM1	Cosumnes River at Rivermile 1	196	1.99	
2006	BlackCrappie	COSRM1	Cosumnes River at Rivermile 1	232	2.34	
2006	BlackCrappie	COSRM1	Cosumnes River at Rivermile 1	252	1.91	
2006	BlackCrappie	COSRM1	Cosumnes River at Rivermile 1	269	1.77	
2006	BlackCrappie	COSRM1	Cosumnes River at Rivermile 1	275	1.72	
2006	BlackCrappie	EPRSW	East Park Reservoir West	136	0.044	
2006	BlackCrappie	EPRSW	East Park Reservoir West	226	0.095	
2006	BlackCrappie	LKBRI	Lake Britton	191	0.075	
2006	BlackCrappie	LKBRI	Lake Britton	203	0.085	
2006	BlackCrappie	LKBRI	Lake Britton	205	0.068	
2006	BlackCrappie	LKBRI	Lake Britton	223	0.095	
2006	BlackCrappie	LKBRI	Lake Britton	225	0.142	
2006	BlackCrappie	SNSL	Snodgrass Slough Near Delta Meadows	212	0.432	
2006	BlackCrappie	SNSL	Snodgrass Slough Near Delta Meadows	227	0.424	
2006	BlackCrappie	SNSL	Snodgrass Slough Near Delta Meadows	270	0.686	
2006	BlackCrappie	STSL	Steamboat Slough	170	0.251	
2006	BlackCrappie	STSL	Steamboat Slough	225	0.284	
2006	BlackCrappie	SUBY	Sutter Bypass Below Kirkville Road	260	0.426	
2006	BlackCrappie	SUBY	Sutter Bypass Below Kirkville Road	280	0.382	
2006	BlackCrappie	SUBY	Sutter Bypass Below Kirkville Road	395	0.227	

Year	Species	Site Code	Site Name	Total Length (mm)	Hg Concentration (ppm)	Comment
2006	BlackCrappie	TOED	Toe Drain	190	0.18	
2006	BlackCrappie	TOED	Toe Drain	190	0.117	
2006	BlackCrappie	TOED	Toe Drain	207	0.158	
2006	BlackCrappie	TOED	Toe Drain	222	0.359	
2006	BlackCrappie	TOED	Toe Drain	235	0.373	
2006	BlackCrappie	TOED	Toe Drain	245	0.39	
2006	Bluegill	BBRC	Bullards Bar Reservoir at Central	128	0.085	
2006	Bluegill	BBRC	Bullards Bar Reservoir at Central	138	0.109	
2006	Bluegill	BBRC	Bullards Bar Reservoir at Central	140	0.158	
2006	Bluegill	BBRC	Bullards Bar Reservoir at Central	142	0.094	
2006	Bluegill	BBRC	Bullards Bar Reservoir at Central	142	0.098	
2006	Bluegill	BBRE	Bullards Bar Reservoir at East Arm	140	0.165	
2006	Bluegill	BBRE	Bullards Bar Reservoir at East Arm	140	0.098	
2006	Bluegill	BBRE	Bullards Bar Reservoir at East Arm	150	0.124	
2006	Bluegill	BBRE	Bullards Bar Reservoir at East Arm	152	0.121	
2006	Bluegill	BBRE	Bullards Bar Reservoir at East Arm	300	0.386	
2006	Bluegill	BCHWY	Butte Creek at Colusa Highway	120	0.248	
2006	Bluegill	BCHWY	Butte Creek at Colusa Highway	132	0.127	
2006	Bluegill	BCHWY	Butte Creek at Colusa Highway	136	0.351	
2006	Bluegill	BCHWY	Butte Creek at Colusa Highway	142	0.329	
2006	Bluegill	BCHWY	Butte Creek at Colusa Highway	160	0.273	
2006	Bluegill	COSRM1	Cosumnes River at Rivermile 1	156	0.404	
2006	Bluegill	COSRM1	Cosumnes River at Rivermile 1	161	0.993	
2006	Bluegill	COSRM1	Cosumnes River at Rivermile 1	163	0.777	
2006	Bluegill	COSRM1	Cosumnes River at Rivermile 1	175	0.838	
2006	Bluegill	COSRM1	Cosumnes River at Rivermile 1	184	0.371	
2006	Bluegill	COSRM1	Cosumnes River at Rivermile 1	205	0.691	
2006	Bluegill	EPRSE	East Park Reservoir Southeast	128	0.07	
2006	Bluegill	EPRSE	East Park Reservoir Southeast	131	0.077	
2006	Bluegill	EPRSE	East Park Reservoir Southeast	136	0.063	
2006	Bluegill	EPRSE	East Park Reservoir Southeast	137	0.058	
2006	Bluegill	EPRSE	East Park Reservoir Southeast	142	0.054	
2006	Bluegill	EPRSW	East Park Reservoir West	117	0.091	
2006	Bluegill	EPRSW	East Park Reservoir West	118	0.096	
2006	Bluegill	EPRSW	East Park Reservoir West	123	0.069	
2006	Bluegill	EPRSW	East Park Reservoir West	131	0.102	
2006	Bluegill	EPRSW	East Park Reservoir West	134	0.092	

Year	Species	Site Code	Site Name	Total Length (mm)	Hg Concentration (ppm)	Comment
2006	Bluegill	LKBRI	Lake Britton	147	0.039	
2006	Bluegill	LKBRI	Lake Britton	172	0.117	
2006	Bluegill	LKBRI	Lake Britton	175	0.092	
2006	Bluegill	LKBRI	Lake Britton	185	0.082	
2006	Bluegill	LKBRI	Lake Britton	190	0.088	
2006	Bluegill	SACKL	Sacramento River at Knights Landing	124	0.237	
2006	Bluegill	SACKL	Sacramento River at Knights Landing	131	0.067	
2006	Bluegill	SACKL	Sacramento River at Knights Landing	137	0.216	
2006	Bluegill	SACKL	Sacramento River at Knights Landing	140	0.178	
2006	Bluegill	SACVER	Sacramento River Near Verona Marina	117	0.109	
2006	Bluegill	SACVER	Sacramento River Near Verona Marina	130	0.137	
2006	Bluegill	SACVER	Sacramento River Near Verona Marina	134	0.176	
2006	Bluegill	SACVER	Sacramento River Near Verona Marina	141	0.091	
2006	Bluegill	SACVER	Sacramento River Near Verona Marina	153	0.308	
2006	Bluegill	SHSAC	Shasta Lake at Sacramento River	97	0.063	
2006	Bluegill	SHSAC	Shasta Lake at Sacramento River	101	0.072	
2006	Bluegill	SHSAC	Shasta Lake at Sacramento River	103	0.066	
2006	Bluegill	SHSAC	Shasta Lake at Sacramento River	111	0.082	
2006	Bluegill	SHSAC	Shasta Lake at Sacramento River	113	0.065	
2006	Bluegill	SHSAC	Shasta Lake at Sacramento River	114	0.073	
2006	Bluegill	SHSAC	Shasta Lake at Sacramento River	116	0.089	
2006	Bluegill	SHSAC	Shasta Lake at Sacramento River	117	0.091	
2006	Bluegill	SHSAC	Shasta Lake at Sacramento River	117	0.081	
2006	Bluegill	SHSAC	Shasta Lake at Sacramento River	122	0.078	
2006	Bluegill	SHSAC	Shasta Lake at Sacramento River	130	0.069	
2006	Bluegill	SHSAC	Shasta Lake at Sacramento River	133	0.062	
2006	Bluegill	SHSAC	Shasta Lake at Sacramento River	138	0.071	
2006	Bluegill	SHSAC	Shasta Lake at Sacramento River	143	0.09	
2006	Bluegill	SHMAIN	Shasta Lake Main Stem	91	0.036	
2006	Bluegill	SHMAIN	Shasta Lake Main Stem	94	0.037	
2006	Bluegill	SHMAIN	Shasta Lake Main Stem	94	0.033	
2006	Bluegill	SHMAIN	Shasta Lake Main Stem	95	0.032	
2006	Bluegill	SHMAIN	Shasta Lake Main Stem	96	0.054	
2006	Bluegill	SHMAIN	Shasta Lake Main Stem	101	0.031	
2006	Bluegill	SHMAIN	Shasta Lake Main Stem	104	0.073	
2006	Bluegill	SHMAIN	Shasta Lake Main Stem	105	0.048	
2006	Bluegill	SHMAIN	Shasta Lake Main Stem	107	0.066	

Year	Species	Site Code	Site Name	Total Length (mm)	Hg Concentration (ppm)	Comment
2006	Bluegill	SHMAIN	Shasta Lake Main Stem	111	0.047	
2006	Bluegill	SHMAIN	Shasta Lake Main Stem	114	0.038	
2006	Bluegill	SHMAIN	Shasta Lake Main Stem	122	0.065	
2006	Bluegill	SHMAIN	Shasta Lake Main Stem	132	0.055	
2006	Bluegill	SHMAIN	Shasta Lake Main Stem	139	0.041	
2006	Bluegill	SHMAIN	Shasta Lake Main Stem	139	0.037	
2006	Bluegill	SHMAIN	Shasta Lake Main Stem	195	0.091	
2006	Bluegill	SHMAIN	Shasta Lake Main Stem	205	0.102	
2006	Bluegill	SNSL	Snodgrass Slough Near Delta Meadows	120	0.215	
2006	Bluegill	SNSL	Snodgrass Slough Near Delta Meadows	127	0.144	
2006	Bluegill	SNSL	Snodgrass Slough Near Delta Meadows	135	0.171	
2006	Bluegill	SNSL	Snodgrass Slough Near Delta Meadows	136	0.301	
2006	Bluegill	SNSL	Snodgrass Slough Near Delta Meadows	146	0.239	
2006	Bluegill	STSL	Steamboat Slough	130	0.085	
2006	Bluegill	STSL	Steamboat Slough	131	0.095	
2006	Bluegill	STSL	Steamboat Slough	132	0.082	
2006	Bluegill	STSL	Steamboat Slough	163	0.093	
2006	Bluegill	STSL	Steamboat Slough	166	0.169	
2006	Bluegill	SGORDM	Stony Gorge Reservoir at Dam	154	0.243	
2006	Bluegill	SGORDM	Stony Gorge Reservoir at Dam	169	0.073	
2006	Bluegill	SGORDM	Stony Gorge Reservoir at Dam	174	0.084	
2006	Bluegill	SGORDM	Stony Gorge Reservoir at Dam	179	0.12	
2006	Bluegill	SGORS	Stony Gorge Reservoir South	164	0.116	
2006	Bluegill	SGORS	Stony Gorge Reservoir South	167	0.126	
2006	bluegill	SGORS	Stony Gorge Reservoir South	168	0.103	
2006	bluegill	SGORS	Stony Gorge Reservoir South	168	0.135	
2006	Bluegill	SGORS	Stony Gorge Reservoir South	171	0.088	
2006	Bluegill	SUBY	Sutter Bypass Below Kirkville Road	117	0.11	
2006	Bluegill	SUBY	Sutter Bypass Below Kirkville Road	140	0.181	
2006	Bluegill	SUBY	Sutter Bypass Below Kirkville Road	145	0.225	
2006	Bluegill	TOED	Toe Drain	125	0.246	
2006	Bluegill	TOED	Toe Drain	126	0.219	
2006	Bluegill	TOED	Toe Drain	133	0.377	
2006	Bluegill	TOED	Toe Drain	151	0.419	
2006	Bluegill	TOED	Toe Drain	159	0.237	
2006	Bluegill	TOED	Toe Drain	173	0.419	
2006	Bluegill	WLKB	Whiskeytown Lake at Brandy Creek	90	0.049	

Year	Species	Site Code	Site Name	Total Length (mm)	Hg Concentration (ppm)	Comment
2006	Bluegill	WLKB	Whiskeytown Lake at Brandy Creek	97	0.036	
2006	Bluegill	WLKB	Whiskeytown Lake at Brandy Creek	103	0.051	
2006	Bluegill	WLKB	Whiskeytown Lake at Brandy Creek	110	0.054	
2006	Bluegill	WLKB	Whiskeytown Lake at Brandy Creek	112	0.031	
2006	Bluegill	WLKB	Whiskeytown Lake at Brandy Creek	130	0.078	
2006	Bluegill	WLKB	Whiskeytown Lake at Brandy Creek	130	0.082	
2006	Bluegill	WLKB	Whiskeytown Lake at Brandy Creek	143	0.125	
2006	Bluegill	WLKB	Whiskeytown Lake at Brandy Creek	146	0.108	
2006	Bluegill	WLKB	Whiskeytown Lake at Brandy Creek	150	0.136	
2006	Bluegill	WLKB	Whiskeytown Lake at Brandy Creek	159	0.213	
2006	Bluegill	WLKB	Whiskeytown Lake at Brandy Creek	168	0.139	
2006	Bluegill	WLKB	Whiskeytown Lake at Brandy Creek	175	0.065	
2006	Brook Trout	WLKCC	Whiskeytown Lake at Clear Creek	211	0.023	
2006	Brook Trout	WLKCC	Whiskeytown Lake at Clear Creek	220	0.031	
2006	Brook Trout	WLKCC	Whiskeytown Lake at Clear Creek	229	0.023	
2006	Brook Trout	WLKCC	Whiskeytown Lake at Clear Creek	249	0.024	
2006	Brook Trout	WLKCC	Whiskeytown Lake at Clear Creek	257	0.028	
2006	Brook Trout	WLKCC	Whiskeytown Lake at Clear Creek	261	0.023	
2006	Brook Trout	WLKCC	Whiskeytown Lake at Clear Creek	264	0.028	
2006	Brook Trout	WLKCC	Whiskeytown Lake at Clear Creek	265	0.021	
2006	Brook Trout	WLKCC	Whiskeytown Lake at Clear Creek	266	0.028	
2006	Brook Trout	WLKCC	Whiskeytown Lake at Clear Creek	276	0.022	
2006	Brook Trout	WLKCC	Whiskeytown Lake at Clear Creek	277	0.021	
2006	Brook Trout	WLKCC	Whiskeytown Lake at Clear Creek	280	0.027	
2006	Brook Trout	WLKCC	Whiskeytown Lake at Clear Creek	284	0.023	
2006	Brook Trout	WLKCC	Whiskeytown Lake at Clear Creek	289	0.022	
2006	Brook Trout	WLKCC	Whiskeytown Lake at Clear Creek	292	0.029	
2006	Brook Trout	WLKCC	Whiskeytown Lake at Clear Creek	295	0.024	
2006	Brown Bullhead	LKALS	Lake Almanor South	279	0.03	
2006	Brown Bullhead	LKALS	Lake Almanor South	289	0.036	
2006	Brown Bullhead	LKALS	Lake Almanor South	338	0.044	
2006	Brown Bullhead	LKALS	Lake Almanor South	357	0.119	
2006	Brown Bullhead	LKALS	Lake Almanor South	372	0.111	
2006	Brown Bullhead	LKALS	Lake Almanor South	376	0.13	
2006	Brown Bullhead	WLKB	Whiskeytown Lake at Brandy Creek	172	0.051	
2006	Brown Bullhead	WLKB	Whiskeytown Lake at Brandy Creek	210	0.025	
2006	Brown Bullhead	WLKB	Whiskeytown Lake at Brandy Creek	246	0.037	

Year	Species	Site Code	Site Name	Total Length (mm)	Hg Concentration (ppm)	Comment
2006	Brown Bullhead	WLKB	Whiskeytown Lake at Brandy Creek	311	0.025	
2006	Brown Bullhead	WLKB	Whiskeytown Lake at Brandy Creek	336	0.034	
2006	Brown Bullhead	WLKB	Whiskeytown Lake at Brandy Creek	360	0.0448	
2006	Brown Bullhead	WLKB	Whiskeytown Lake at Brandy Creek	362	0.046	
2006	Brown Trout	BMLAK	Baum Lake	370	0.038	
2006	Brown Trout	BMLAK	Baum Lake	432	0.03	
2006	Brown Trout	BMLAK	Baum Lake	622	0.123	
2006	Brown Trout	BKLAK	Bucks Lake	280	0.032	
2006	Brown Trout	BKLAK	Bucks Lake	288	0.036	
2006	Brown Trout	BKLAK	Bucks Lake	310	0.039	
2006	Brown Trout	BKLAK	Bucks Lake	330	0.06	
2006	Brown Trout	BKLAK	Bucks Lake	330	0.029	
2006	Brown Trout	BKLAK	Bucks Lake	335	0.023	
2006	Brown Trout	BKLAK	Bucks Lake	410	0.106	
2006	Brown Trout	BKLAK	Bucks Lake	500	0.243	
2006	Carp	BBRE	Bullards Bar Reservoir at East Arm	405	0.46	
2006	Carp	BBRE	Bullards Bar Reservoir at East Arm	410	0.494	
2006	Carp	BBRE	Bullards Bar Reservoir at East Arm	430	0.832	
2006	Carp	BBRE	Bullards Bar Reservoir at East Arm	438	0.54	
2006	Carp	BBRE	Bullards Bar Reservoir at East Arm	450	0.524	
2006	Carp	BBRE	Bullards Bar Reservoir at East Arm	450	0.475	
2006	Carp	BBRE	Bullards Bar Reservoir at East Arm	455	0.558	
2006	Carp	BBRE	Bullards Bar Reservoir at East Arm	472	0.552	
2006	Carp	BBRE	Bullards Bar Reservoir at East Arm	495	0.618	
2006	Carp	BBRE	Bullards Bar Reservoir at East Arm	520	0.371	
2006	Carp	BBRE	Bullards Bar Reservoir at East Arm	572	0.34	
2006	Carp	BCHWY	Butte Creek at Colusa Highway	367	0.27	
2006	Carp	BCHWY	Butte Creek at Colusa Highway	403	0.425	
2006	Carp	BCHWY	Butte Creek at Colusa Highway	430	0.25	
2006	Carp	BCHWY	Butte Creek at Colusa Highway	474	0.303	
2006	Carp	BCHWY	Butte Creek at Colusa Highway	475	0.206	
2006	Carp	BCHWY	Butte Creek at Colusa Highway	487	0.44	
2006	Carp	BCHWY	Butte Creek at Colusa Highway	489	0.309	
2006	Carp	BCHWY	Butte Creek at Colusa Highway	583	0.411	
2006	Carp	BCHWY	Butte Creek at Colusa Highway	701	0.482	
2006	Carp	BCHWY	Butte Creek at Colusa Highway	770	0.475	
2006	Carp	COSRM1	Cosumnes River at Rivermile 1	460	0.356	

Year	Species	Site Code	Site Name	Total Length (mm)	Hg Concentration (ppm)	Comment
2006	Carp	COSRM1	Cosumnes River at Rivermile 1	465	0.282	
2006	Carp	COSRM1	Cosumnes River at Rivermile 1	493	0.33	
2006	Carp	COSRM1	Cosumnes River at Rivermile 1	520	0.369	
2006	Carp	COSRM1	Cosumnes River at Rivermile 1	527	0.359	
2006	Carp	CRSCNL	Cross Canal	373	0.122	
2006	Carp	CRSCNL	Cross Canal	379	0.162	
2006	Carp	CRSCNL	Cross Canal	421	0.059	
2006	Carp	CRSCNL	Cross Canal	439	0.123	
2006	Carp	CRSCNL	Cross Canal	464	0.266	
2006	Carp	EPRSE	East Park Reservoir Southeast	351	0.11	
2006	Carp	EPRSE	East Park Reservoir Southeast	406	0.219	
2006	Carp	EPRSE	East Park Reservoir Southeast	421	0.292	
2006	Carp	EPRSE	East Park Reservoir Southeast	444	0.303	
2006	Carp	EPRSE	East Park Reservoir Southeast	452	0.305	
2006	Carp	EPRSW	East Park Reservoir West	376	0.118	
2006	Carp	EPRSW	East Park Reservoir West	431	0.172	
2006	Carp	EPRSW	East Park Reservoir West	431	0.237	
2006	Carp	EPRSW	East Park Reservoir West	434	0.255	
2006	Carp	EPRSW	East Park Reservoir West	489	0.341	
2006	Carp	GEOSL	Georgiana Slough	581	0.182	
2006	Carp	INVRN	Indian Valley Reservoir North	453	0.43	
2006	Carp	INVRN	Indian Valley Reservoir North	461	0.334	
2006	Carp	INVRN	Indian Valley Reservoir North	502	0.544	
2006	Carp	INVRN	Indian Valley Reservoir North	586	0.434	
2006	Carp	INVRN	Indian Valley Reservoir North	587	0.54	
2006	Carp	LKBRI	Lake Britton	497	0.157	
2006	Carp	LKBRI	Lake Britton	527	0.108	
2006	Carp	LKBRI	Lake Britton	574	0.023	
2006	Carp	LKBRI	Lake Britton	586	0.078	
2006	Carp	LKBRI	Lake Britton	599	0.222	
2006	Carp	SACKL	Sacramento River at Knights Landing	529	0.106	
2006	Carp	SACKL	Sacramento River at Knights Landing	529	0.249	
2006	Carp	SACKL	Sacramento River at Knights Landing	602	0.349	
2006	Carp	SACKL	Sacramento River at Knights Landing	602	0.288	
2006	Carp	SACKL	Sacramento River at Knights Landing	671	0.0827	
2006	Carp	SACRM59	Sacramento River at Rivermile 59	520	0.227	
2006	Carp	SACRM59	Sacramento River at Rivermile 59	530	0.364	

Year	Species	Site Code	Site Name	Total Length (mm)	Hg Concentration (ppm)	Comment
2006	Carp	SACRM59	Sacramento River at Rivermile 59	556	0.121	
2006	Carp	SACRM59	Sacramento River at Rivermile 59	582	0.259	
2006	Carp	SACRM59	Sacramento River at Rivermile 59	604	0.217	
2006	Carp	SACRM59	Sacramento River at Rivermile 59	606	0.241	
2006	Carp	SACRM59	Sacramento River at Rivermile 59	629	0.441	
2006	Carp	SACRM59	Sacramento River at Rivermile 59	641	0.221	
2006	Carp	SACRM59	Sacramento River at Rivermile 59	674	0.33	
2006	Carp	SACRM59	Sacramento River at Rivermile 59	679	0.558	
2006	Carp	SACTIS	Sacramento River at Tisdale Boat Ramp	460	0.199	
2006	Carp	SACTIS	Sacramento River at Tisdale Boat Ramp	469	0.126	
2006	Carp	SACTIS	Sacramento River at Tisdale Boat Ramp	473	0.167	
2006	Carp	SACTIS	Sacramento River at Tisdale Boat Ramp	553	0.273	
2006	Carp	SACVER	Sacramento River Near Verona Marina	422	0.228	
2006	Carp	SACVER	Sacramento River Near Verona Marina	467	0.339	
2006	Carp	SACVER	Sacramento River Near Verona Marina	471	0.186	
2006	Carp	SACVER	Sacramento River Near Verona Marina	558	0.378	
2006	Carp	SACVER	Sacramento River Near Verona Marina	584	0.303	
2006	Carp	SHMCR	Shasta Lake at McCloud River	619	0.229	
2006	Carp	SHMCR	Shasta Lake at McCloud River	665	0.251	
2006	Carp	SHMCR	Shasta Lake at McCloud River	675	0.206	
2006	Carp	SHMCR	Shasta Lake at McCloud River	696	0.179	
2006	Carp	SHMCR	Shasta Lake at McCloud River	700	0.29	
2006	Carp	SHMAIN	Shasta Lake Main Stem	370	0.065	
2006	Carp	SHMAIN	Shasta Lake Main Stem	465	0.066	
2006	Carp	SHMAIN	Shasta Lake Main Stem	622	0.249	
2006	Carp	SHMAIN	Shasta Lake Main Stem	642	0.27	
2006	Carp	SHMAIN	Shasta Lake Main Stem	670	0.196	
2006	Carp	SHMAIN	Shasta Lake Main Stem	759	0.281	
2006	Carp	SNSL	Snodgrass Slough Near Delta Meadows	568	0.227	
2006	Carp	SNSL	Snodgrass Slough Near Delta Meadows	597	0.335	
2006	Carp	SNSL	Snodgrass Slough Near Delta Meadows	604	0.279	
2006	Carp	SNSL	Snodgrass Slough Near Delta Meadows	634	0.203	
2006	Carp	SNSL	Snodgrass Slough Near Delta Meadows	702	0.529	
2006	Carp	STSL	Steamboat Slough	541	0.503	
2006	Carp	STSL	Steamboat Slough	571	0.297	
2006	Carp	STSL	Steamboat Slough	572	0.369	
2006	Carp	STSL	Steamboat Slough	585	0.415	

Year	Species	Site Code	Site Name	Total Length (mm)	Hg Concentration (ppm)	Comment
2006	Carp	STSL	Steamboat Slough	599	0.38	
2006	Carp	SGORDM	Stony Gorge Reservoir at Dam	369	0.144	
2006	Carp	SGORDM	Stony Gorge Reservoir at Dam	369	0.083	
2006	Carp	SGORDM	Stony Gorge Reservoir at Dam	433	0.266	
2006	Carp	SGORDM	Stony Gorge Reservoir at Dam	454	0.255	
2006	Carp	SGORDM	Stony Gorge Reservoir at Dam	482	0.242	
2006	Carp	SGORS	Stony Gorge Reservoir South	393	0.511910675	
2006	Carp	SGORS	Stony Gorge Reservoir South	412	0.494	
2006	Carp	SGORS	Stony Gorge Reservoir South	419	0.319	
2006	Carp	SGORS	Stony Gorge Reservoir South	446	0.326	
2006	Carp	SGORS	Stony Gorge Reservoir South	447	0.267	
2006	Carp	SGORS	Stony Gorge Reservoir South	451	0.351	
2006	Carp	SGORS	Stony Gorge Reservoir South	477	0.315	
2006	Carp	SGORS	Stony Gorge Reservoir South	480	0.351	
2006	Carp	SGORS	Stony Gorge Reservoir South	507	0.237	
2006	Carp	SGORS	Stony Gorge Reservoir South	514	0.263	
2006	Carp	SGORS	Stony Gorge Reservoir South	524	0.294	
2006	Carp	SGORS	Stony Gorge Reservoir South	564	0.344	
2006	Carp	SUBY	Sutter Bypass Below Kirkville Road	415	0.216	
2006	Carp	SUBY	Sutter Bypass Below Kirkville Road	468	0.0994	
2006	Carp	SUBY	Sutter Bypass Below Kirkville Road	470	0.109	
2006	Carp	TOED	Toe Drain	355	0.0853	
2006	Carp	TOED	Toe Drain	446	0.275	
2006	Carp	TOED	Toe Drain	458	0.42	
2006	Carp	TOED	Toe Drain	550	0.591	
2006	Carp	TOED	Toe Drain	599	0.938	
2006	Channel Catfish	BCHWY	Butte Creek at Colusa Highway	370	0.182	
2006	Channel Catfish	BCHWY	Butte Creek at Colusa Highway	405	0.645	
2006	Channel Catfish	BCHWY	Butte Creek at Colusa Highway	425	0.328	
2006	Channel Catfish	BCHWY	Butte Creek at Colusa Highway	465	0.231	
2006	Channel Catfish	BCHWY	Butte Creek at Colusa Highway	490	0.297	
2006	Channel Catfish	BCHWY	Butte Creek at Colusa Highway	490	0.611	
2006	Channel Catfish	BCHWY	Butte Creek at Colusa Highway	497	0.387	
2006	Channel Catfish	BCHWY	Butte Creek at Colusa Highway	505	0.355	
2006	Channel Catfish	BCHWY	Butte Creek at Colusa Highway	517	0.315	
2006	Channel Catfish	BCHWY	Butte Creek at Colusa Highway	534	0.339	
2006	Channel Catfish	BCHWY	Butte Creek at Colusa Highway	560	0.587	

Year	Species	Site Code	Site Name	Total Length (mm)	Hg Concentration (ppm)	Comment
2006	Channel Catfish	BCHWY	Butte Creek at Colusa Highway	726	0.517	
2006	Channel Catfish	COSRM1	Cosumnes River at Rivermile 1	355	0.895	
2006	Channel Catfish	COSRM1	Cosumnes River at Rivermile 1	372	0.55	
2006	Channel Catfish	COSRM1	Cosumnes River at Rivermile 1	390	0.83	
2006	Channel Catfish	COSRM1	Cosumnes River at Rivermile 1	416	0.779	
2006	Channel Catfish	COSRM1	Cosumnes River at Rivermile 1	417	1.3	
2006	Channel Catfish	COSRM1	Cosumnes River at Rivermile 1	473	0.581	
2006	Channel Catfish	COSRM1	Cosumnes River at Rivermile 1	496	0.693	
2006	Channel Catfish	COSRM1	Cosumnes River at Rivermile 1	500	1.04	
2006	Channel Catfish	EPRSE	East Park Reservoir Southeast	281	0.106	
2006	Channel Catfish	EPRSE	East Park Reservoir Southeast	309	0.103	
2006	Channel Catfish	EPRSE	East Park Reservoir Southeast	421	0.124	
2006	Channel Catfish	EPRSE	East Park Reservoir Southeast	424	0.123	
2006	Channel Catfish	EPRSE	East Park Reservoir Southeast	436	0.243	
2006	Channel Catfish	EPRSE	East Park Reservoir Southeast	441	0.133	
2006	Channel Catfish	EPRSE	East Park Reservoir Southeast	464	0.174	
2006	Channel Catfish	EPRSE	East Park Reservoir Southeast	481	0.186	
2006	Channel Catfish	EPRSE	East Park Reservoir Southeast	489	0.231	
2006	Channel Catfish	EPRSE	East Park Reservoir Southeast	489	0.222	
2006	Channel Catfish	EPRSE	East Park Reservoir Southeast	496	0.208	
2006	Channel Catfish	EPRSE	East Park Reservoir Southeast	540	0.201	
2006	Channel Catfish	EPRSW	East Park Reservoir West	310	0.134	
2006	Channel Catfish	EPRSW	East Park Reservoir West	371	0.136	
2006	Channel Catfish	EPRSW	East Park Reservoir West	411	0.161	
2006	Channel Catfish	EPRSW	East Park Reservoir West	421	0.364	
2006	Channel Catfish	EPRSW	East Park Reservoir West	452	0.124	
2006	Channel Catfish	EPRSW	East Park Reservoir West	473	0.297	
2006	Channel Catfish	EPRSW	East Park Reservoir West	476	0.353	
2006	Channel Catfish	EPRSW	East Park Reservoir West	481	0.204	
2006	Channel Catfish	EPRSW	East Park Reservoir West	486	0.326	
2006	Channel Catfish	EPRSW	East Park Reservoir West	487	0.549	
2006	Channel Catfish	EPRSW	East Park Reservoir West	497	0.216	
2006	Channel Catfish	EPRSW	East Park Reservoir West	506	0.279	
2006	Channel Catfish	EPRSW	East Park Reservoir West	536	0.329	
2006	Channel Catfish	INVRN	Indian Valley Reservoir North	281	0.186	
2006	Channel Catfish	INVRN	Indian Valley Reservoir North	309	0.352	
2006	Channel Catfish	INVRN	Indian Valley Reservoir North	361	0.334	

Year	Species	Site Code	Site Name	Total Length (mm)	Hg Concentration (ppm)	Comment
2006	Channel Catfish	INVRN	Indian Valley Reservoir North	389	0.409	
2006	Channel Catfish	INVRN	Indian Valley Reservoir North	419	0.27	
2006	Channel Catfish	INVRN	Indian Valley Reservoir North	496	0.589	
2006	Channel Catfish	INVRN	Indian Valley Reservoir North	499	0.911	
2006	Channel Catfish	SACKL	Sacramento River at Knights Landing	266	0.213	
2006	Channel Catfish	SACKL	Sacramento River at Knights Landing	293	0.147	
2006	Channel Catfish	SACKL	Sacramento River at Knights Landing	297	0.135	
2006	Channel Catfish	SACKL	Sacramento River at Knights Landing	306	0.174	
2006	Channel Catfish	SACKL	Sacramento River at Knights Landing	326	0.157	
2006	Channel Catfish	SACKL	Sacramento River at Knights Landing	349	0.209	
2006	Channel Catfish	SACKL	Sacramento River at Knights Landing	394	0.286	
2006	Channel Catfish	SACKL	Sacramento River at Knights Landing	428	0.329	
2006	Channel Catfish	SACKL	Sacramento River at Knights Landing	429	0.444	
2006	Channel Catfish	SACKL	Sacramento River at Knights Landing	448	0.405	
2006	Channel Catfish	SACKL	Sacramento River at Knights Landing	448	0.471	
2006	Channel Catfish	SACVER	Sacramento River Near Verona Marina	428	0.436	
2006	Channel Catfish	SHMCR	Shasta Lake at McCloud River	376	0.088	
2006	Channel Catfish	SHMCR	Shasta Lake at McCloud River	495	0.339	
2006	Channel Catfish	SHMCR	Shasta Lake at McCloud River	586	0.135	
2006	Channel Catfish	SHMCR	Shasta Lake at McCloud River	720	0.4	
2006	Channel Catfish	SNSL	Snodgrass Slough Near Delta Meadows	490	0.229	
2006	Channel Catfish	STSL	Steamboat Slough	341	0.358	
2006	Channel Catfish	STSL	Steamboat Slough	486	0.321	
2006	Channel Catfish	SGORDM	Stony Gorge Reservoir at Dam	371	0.115	
2006	Channel Catfish	SGORDM	Stony Gorge Reservoir at Dam	372	0.209	
2006	Channel Catfish	SGORDM	Stony Gorge Reservoir at Dam	396	0.197	
2006	Channel Catfish	SGORDM	Stony Gorge Reservoir at Dam	415	0.131	
2006	Channel Catfish	SGORDM	Stony Gorge Reservoir at Dam	442	0.223	
2006	Channel Catfish	SGORDM	Stony Gorge Reservoir at Dam	448	0.206	
2006	Channel Catfish	SGORDM	Stony Gorge Reservoir at Dam	452	0.191	
2006	Channel Catfish	SGORDM	Stony Gorge Reservoir at Dam	453	0.167	
2006	Channel Catfish	SGORDM	Stony Gorge Reservoir at Dam	456	0.128	
2006	Channel Catfish	SGORDM	Stony Gorge Reservoir at Dam	510	0.261	
2006	Channel Catfish	SGORDM	Stony Gorge Reservoir at Dam	538	0.166	
2006	Channel Catfish	SGORDM	Stony Gorge Reservoir at Dam	541	0.296	
2006	Channel Catfish	SGORS	Stony Gorge Reservoir South	311	0.115	
2006	Channel Catfish	TOED	Toe Drain	340	0.431	

Year	Species	Site Code	Site Name	Total Length (mm)	Hg Concentration (ppm)	Comment
2006	Channel Catfish	TOED	Toe Drain	348	0.42	
2006	Channel Catfish	TOED	Toe Drain	418	0.468	
2006	Channel Catfish	TOED	Toe Drain	423	0.511	
2006	Channel Catfish	TOED	Toe Drain	425	0.467	
2006	Channel Catfish	TOED	Toe Drain	444	0.277	
2006	Channel Catfish	TOED	Toe Drain	469	0.431	
2006	Channel Catfish	TOED	Toe Drain	473	0.45	
2006	Channel Catfish	TOED	Toe Drain	494	0.408	
2006	Channel Catfish	TOED	Toe Drain	496	0.347	
2006	Channel Catfish	TOED	Toe Drain	499	0.243	
2006	Chinook Salmon	SACTIS	Sacramento River at Tisdale Boat Ramp	806	0.094	
2006	Chinook Salmon	SHLK	Shasta Lake	465	0.267	
2006	Chinook Salmon	SHLK	Shasta Lake	471	0.303	
2006	Chinook Salmon	SHLK	Shasta Lake	474	0.313	
2006	Chinook Salmon	SHLK	Shasta Lake	476	0.303	
2006	Chinook Salmon	SHLK	Shasta Lake	481	0.281	
2006	Chinook Salmon	SHLK	Shasta Lake	518	0.264	
2006	Chinook Salmon	SHLK	Shasta Lake	526	0.396	
2006	Chinook Salmon	SHLK	Shasta Lake	530	0.336	
2006	Chinook Salmon	SHLK	Shasta Lake	550	0.237	
2006	Chinook Salmon	SHLK	Shasta Lake	556	0.298	
2006	Goldfish	EPRSE	East Park Reservoir Southeast	311	0.092	
2006	Goldfish	EPRSE	East Park Reservoir Southeast	322	0.091	
2006	Goldfish	EPRSE	East Park Reservoir Southeast	347	0.135	
2006	Goldfish	EPRSE	East Park Reservoir Southeast	364	0.171	
2006	Goldfish	EPRSW	East Park Reservoir West	296	0.08	
2006	Goldfish	EPRSW	East Park Reservoir West	343	0.316	
2006	Goldfish	EPRSW	East Park Reservoir West	364	0.231	
2006	Goldfish	EPRSW	East Park Reservoir West	382	0.244	
2006	Goldfish	EPRSW	East Park Reservoir West	386	0.375	
2006	Goldfish	SGORDM	Stony Gorge Reservoir at Dam	282	0.049	
2006	Goldfish	SGORDM	Stony Gorge Reservoir at Dam	333	0.126	
2006	Goldfish	SGORDM	Stony Gorge Reservoir at Dam	336	0.096	
2006	Goldfish	SGORDM	Stony Gorge Reservoir at Dam	339	0.102	
2006	Goldfish	SGORDM	Stony Gorge Reservoir at Dam	344	0.154	
2006	Goldfish	SGORS	Stony Gorge Reservoir South	310	0.126	
2006	Goldfish	SGORS	Stony Gorge Reservoir South	314	0.14	

Year	Species	Site Code	Site Name	Total Length (mm)	Hg Concentration (ppm)	Comment
2006	Goldfish	SGORS	Stony Gorge Reservoir South	326	0.136	
2006	Goldfish	SGORS	Stony Gorge Reservoir South	329	0.141	
2006	Goldfish	SGORS	Stony Gorge Reservoir South	334	0.27	
2006	Goldfish	TOED	Toe Drain	265	0.163	
2006	Goldfish	TOED	Toe Drain	290	0.087	
2006	Goldfish	TOED	Toe Drain	367	0.315	
2006	Goldfish	TOED	Toe Drain	375	0.488	
2006	Hardhead	SACSCOT	Sacramento River Near Hamilton	356	0.114	
2006	Hardhead	SACSCOT	Sacramento River Near Hamilton	390	0.164	
2006	Hardhead	SACSCOT	Sacramento River Near Hamilton	397	0.496	
2006	Hardhead	SACSCOT	Sacramento River Near Hamilton	423	0.553	
2006	Hardhead	SACSCOT	Sacramento River Near Hamilton	444	0.16	
2006	Hitch	HTCRK	Hat Creek	222	0.073	
2006	Hitch	HTCRK	Hat Creek	226	0.052	
2006	Hitch	HTCRK	Hat Creek	239	0.053	
2006	Hitch	HTCRK	Hat Creek	249	0.078	
2006	Hitch	HTCRK	Hat Creek	261	0.041	
2006	Lake Trout	BKLAK	Bucks Lake	260	0.026	
2006	Lake Trout	BKLAK	Bucks Lake	270	0.019	
2006	Lake Trout	BKLAK	Bucks Lake	293	0.028	
2006	Lake Trout	BKLAK	Bucks Lake	300	0.032	
2006	Lake Trout	BKLAK	Bucks Lake	320	0.017	
2006	Largemouth Bass	ARNIM06	American River at Nimbus Dam	240	0.255	Chris Foe data
2006	Largemouth Bass	ARNIM06	American River at Nimbus Dam	420	0.622	Chris Foe data
2006	Largemouth Bass	ARNIM06	American River at Nimbus Dam	489	0.927	Chris Foe data
2006	Largemouth Bass	BBRE	Bullards Bar Reservoir at East Arm	490	0.608	
2006	Largemouth Bass	BCHWY	Butte Creek at Colusa Highway	337	0.685	
2006	Largemouth Bass	BCHWY	Butte Creek at Colusa Highway	344	0.479	
2006	Largemouth Bass	BCHWY	Butte Creek at Colusa Highway	350	0.301	
2006	Largemouth Bass	BCHWY	Butte Creek at Colusa Highway	352	0.402	
2006	Largemouth Bass	BCHWY	Butte Creek at Colusa Highway	354	0.505	
2006	Largemouth Bass	BCHWY	Butte Creek at Colusa Highway	356	0.449	
2006	Largemouth Bass	BCHWY	Butte Creek at Colusa Highway	386	0.284	
2006	Largemouth Bass	BCHWY	Butte Creek at Colusa Highway	389	0.681	
2006	Largemouth Bass	BCHWY	Butte Creek at Colusa Highway	400	0.947	
2006	Largemouth Bass	BCHWY	Butte Creek at Colusa Highway	413	0.598	
2006	Largemouth Bass	BCHWY	Butte Creek at Colusa Highway	420	0.554	

Year	Species	Site Code	Site Name	Total Length (mm)	Hg Concentration (ppm)	Comment
2006	Largemouth Bass	BCHWY	Butte Creek at Colusa Highway	470	0.731	
2006	Largemouth Bass	COSRM1	Cosumnes River at Rivermile 1	240	0.296	
2006	Largemouth Bass	COSRM1	Cosumnes River at Rivermile 1	255	1.36	
2006	Largemouth Bass	COSRM1	Cosumnes River at Rivermile 1	264	1.6	
2006	Largemouth Bass	COSRM1	Cosumnes River at Rivermile 1	290	1.41	
2006	Largemouth Bass	COSRM1	Cosumnes River at Rivermile 1	319	1.34	
2006	Largemouth Bass	COSRM1	Cosumnes River at Rivermile 1	321	1.34	
2006	Largemouth Bass	COSRM1	Cosumnes River at Rivermile 1	338	1.22	
2006	Largemouth Bass	COSRM1	Cosumnes River at Rivermile 1	347	1.65	
2006	Largemouth Bass	COSRM1	Cosumnes River at Rivermile 1	365	1.44	
2006	Largemouth Bass	COSRM1	Cosumnes River at Rivermile 1	374	1.02	
2006	Largemouth Bass	COSRM1	Cosumnes River at Rivermile 1	380	1.44	
2006	Largemouth Bass	COSRM1	Cosumnes River at Rivermile 1	393	1.27	
2006	Largemouth Bass	COSRM1	Cosumnes River at Rivermile 1	477	1.45	
2006	Largemouth Bass	CRSCNL	Cross Canal	307	0.303	
2006	Largemouth Bass	CRSCNL	Cross Canal	314	0.298	
2006	Largemouth Bass	CRSCNL	Cross Canal	322	0.444	
2006	Largemouth Bass	CRSCNL	Cross Canal	351	0.325	
2006	Largemouth Bass	CRSCNL	Cross Canal	365	0.418	
2006	Largemouth Bass	CRSCNL	Cross Canal	381	0.443	
2006	Largemouth Bass	CRSCNL	Cross Canal	410	0.428	
2006	Largemouth Bass	CRSCNL	Cross Canal	412	0.557	
2006	Largemouth Bass	CRSCNL	Cross Canal	421	0.546	
2006	Largemouth Bass	CRSCNL	Cross Canal	435	0.524	
2006	Largemouth Bass	CRSCNL	Cross Canal	445	0.635	
2006	Largemouth Bass	CRSCNL	Cross Canal	535	0.711	
2006	Largemouth Bass	EPRSE	East Park Reservoir Southeast	232	0.187	
2006	Largemouth Bass	EPRSE	East Park Reservoir Southeast	292	0.159	
2006	Largemouth Bass	EPRSE	East Park Reservoir Southeast	296	0.223	
2006	Largemouth Bass	EPRSE	East Park Reservoir Southeast	305	0.27	
2006	Largemouth Bass	EPRSE	East Park Reservoir Southeast	306	0.282	
2006	Largemouth Bass	EPRSE	East Park Reservoir Southeast	314	0.26	
2006	Largemouth Bass	EPRSE	East Park Reservoir Southeast	342	0.299	
2006	Largemouth Bass	EPRSE	East Park Reservoir Southeast	351	0.268	
2006	Largemouth Bass	EPRSE	East Park Reservoir Southeast	355	0.336	
2006	Largemouth Bass	EPRSE	East Park Reservoir Southeast	396	0.558	
2006	Largemouth Bass	EPRSW	East Park Reservoir West	257	0.301	

Year	Species	Site Code	Site Name	Total Length (mm)	Hg Concentration (ppm)	Comment
2006	Largemouth Bass	EPRSW	East Park Reservoir West	269	0.258	
2006	Largemouth Bass	EPRSW	East Park Reservoir West	279	0.301	
2006	Largemouth Bass	EPRSW	East Park Reservoir West	283	0.233	
2006	Largemouth Bass	EPRSW	East Park Reservoir West	291	0.302	
2006	Largemouth Bass	EPRSW	East Park Reservoir West	303	0.293	
2006	Largemouth Bass	EPRSW	East Park Reservoir West	311	0.304	
2006	Largemouth Bass	EPRSW	East Park Reservoir West	331	0.267	
2006	Largemouth Bass	EPRSW	East Park Reservoir West	337	0.312	
2006	Largemouth Bass	EPRSW	East Park Reservoir West	371	0.405	
2006	Largemouth Bass	FRGRCV	Feather River at Gridley	216	0.162	Chris Foe data
2006	Largemouth Bass	FRGRCV	Feather River at Gridley	216	0.128	Chris Foe data
2006	Largemouth Bass	FRGRCV	Feather River at Gridley	220	0.14	Chris Foe data
2006	Largemouth Bass	FRGRCV	Feather River at Gridley	230	0.126	Chris Foe data
2006	Largemouth Bass	FRGRCV	Feather River at Gridley	232	0.114	Chris Foe data
2006	Largemouth Bass	FRGRCV	Feather River at Gridley	247	0.154	Chris Foe data
2006	Largemouth Bass	FRGRCV	Feather River at Gridley	284	0.202	Chris Foe data
2006	Largemouth Bass	FRGRCV	Feather River at Gridley	320	0.192	Chris Foe data
2006	Largemouth Bass	FRGRCV	Feather River at Gridley	390	0.476	Chris Foe data
2006	Largemouth Bass	GEOSL	Georgiana Slough	231	0.317	
2006	Largemouth Bass	GEOSL	Georgiana Slough	307	0.4	
2006	Largemouth Bass	GEOSL	Georgiana Slough	310	0.315	
2006	Largemouth Bass	GEOSL	Georgiana Slough	425	0.772	
2006	Largemouth Bass	INVRN	Indian Valley Reservoir North	241	0.521	
2006	Largemouth Bass	INVRN	Indian Valley Reservoir North	283	0.731	
2006	Largemouth Bass	INVRN	Indian Valley Reservoir North	286	0.77	
2006	Largemouth Bass	INVRN	Indian Valley Reservoir North	291	0.726	
2006	Largemouth Bass	INVRN	Indian Valley Reservoir North	311	1.14	
2006	Largemouth Bass	INVRN	Indian Valley Reservoir North	325	0.804	
2006	Largemouth Bass	INVRN	Indian Valley Reservoir North	331	0.726	
2006	Largemouth Bass	INVRN	Indian Valley Reservoir North	332	0.996	
2006	Largemouth Bass	INVRN	Indian Valley Reservoir North	339	0.991	
2006	Largemouth Bass	INVRN	Indian Valley Reservoir North	341	0.894	
2006	Largemouth Bass	INVRN	Indian Valley Reservoir North	346	0.956	
2006	Largemouth Bass	INVRN	Indian Valley Reservoir North	371	0.893	
2006	Largemouth Bass	MERHP	Merced River at Hatfield State Park	244	0.357	Chris Foe data
2006	Largemouth Bass	MERHP	Merced River at Hatfield State Park	291	0.376	Chris Foe data
2006	Largemouth Bass	MERHP	Merced River at Hatfield State Park	329	0.297	Chris Foe data

Year	Species	Site Code	Site Name	Total Length (mm)	Hg Concentration (ppm)	Comment
2006	Largemouth Bass	MERHP	Merced River at Hatfield State Park	343	0.286	Chris Foe data
2006	Largemouth Bass	MERHP	Merced River at Hatfield State Park	365	0.432	Chris Foe data
2006	Largemouth Bass	MERHP	Merced River at Hatfield State Park	368	0.37	Chris Foe data
2006	Largemouth Bass	MERHP	Merced River at Hatfield State Park	373	0.237	Chris Foe data
2006	Largemouth Bass	MERHP	Merced River at Hatfield State Park	374	0.19	Chris Foe data
2006	Largemouth Bass	MERHP	Merced River at Hatfield State Park	390	0.674	Chris Foe data
2006	Largemouth Bass	MERHP	Merced River at Hatfield State Park	443	0.672	Chris Foe data
2006	Largemouth Bass	SRCOL06	Sacramento River at Colusa	194	0.245	Chris Foe data
2006	Largemouth Bass	SRCOL06	Sacramento River at Colusa	335	0.373	Chris Foe data
2006	Largemouth Bass	SRCOL06	Sacramento River at Colusa	345	0.579	Chris Foe data
2006	Largemouth Bass	SRCOL06	Sacramento River at Colusa	350	0.468	Chris Foe data
2006	Largemouth Bass	SRCOL06	Sacramento River at Colusa	359	0.456	Chris Foe data
2006	Largemouth Bass	SRCOL06	Sacramento River at Colusa	370	1.043	Chris Foe data
2006	Largemouth Bass	SRCOL06	Sacramento River at Colusa	370	0.817	Chris Foe data
2006	Largemouth Bass	SRCOL06	Sacramento River at Colusa	375	0.575	Chris Foe data
2006	Largemouth Bass	SRCOL06	Sacramento River at Colusa	400	0.735	Chris Foe data
2006	Largemouth Bass	SACKL	Sacramento River at Knights Landing	251	0.206	
2006	Largemouth Bass	SACKL	Sacramento River at Knights Landing	307	0.289	
2006	Largemouth Bass	SACKL	Sacramento River at Knights Landing	324	0.337	
2006	Largemouth Bass	SACKL	Sacramento River at Knights Landing	382	0.784	
2006	Largemouth Bass	SACKL	Sacramento River at Knights Landing	458	0.447	
2006	Largemouth Bass	SACRM59	Sacramento River at Rivermile 59	376	0.975	
2006	Largemouth Bass	SACRM59	Sacramento River at Rivermile 59	394	0.814	
2006	Largemouth Bass	SACRM59	Sacramento River at Rivermile 59	428	0.865	
2006	Largemouth Bass	SACVER	Sacramento River Near Verona Marina	285	0.433	
2006	Largemouth Bass	SACVER	Sacramento River Near Verona Marina	310	0.344	
2006	Largemouth Bass	SHMCR	Shasta Lake at McCloud River	290	0.201	
2006	Largemouth Bass	SHMCR	Shasta Lake at McCloud River	291	0.537	
2006	Largemouth Bass	SHMCR	Shasta Lake at McCloud River	310	0.228	
2006	Largemouth Bass	SHMCR	Shasta Lake at McCloud River	310	0.203	
2006	Largemouth Bass	SHMCR	Shasta Lake at McCloud River	310	0.265	
2006	Largemouth Bass	SHMCR	Shasta Lake at McCloud River	312	0.401	
2006	Largemouth Bass	SHMCR	Shasta Lake at McCloud River	320	0.197	
2006	Largemouth Bass	SHMCR	Shasta Lake at McCloud River	321	0.24	
2006	Largemouth Bass	SHMCR	Shasta Lake at McCloud River	336	0.266	
2006	Largemouth Bass	SHMCR	Shasta Lake at McCloud River	346	0.203	
2006	Largemouth Bass	SHMCR	Shasta Lake at McCloud River	347	0.247	

Year	Species	Site Code	Site Name	Total Length (mm)	Hg Concentration (ppm)	Comment
2006	Largemouth Bass	SHMCR	Shasta Lake at McCloud River	350	0.303	
2006	Largemouth Bass	SHMCR	Shasta Lake at McCloud River	352	0.315	
2006	Largemouth Bass	SHMCR	Shasta Lake at McCloud River	352	0.349	
2006	Largemouth Bass	SHMCR	Shasta Lake at McCloud River	365	0.458	
2006	Largemouth Bass	SHMAIN	Shasta Lake Main Stem	260	0.143	
2006	Largemouth Bass	SHMAIN	Shasta Lake Main Stem	272	0.133	
2006	Largemouth Bass	SHMAIN	Shasta Lake Main Stem	275	0.125	
2006	Largemouth Bass	SHMAIN	Shasta Lake Main Stem	290	0.182	
2006	Largemouth Bass	SHMAIN	Shasta Lake Main Stem	294	0.129	
2006	Largemouth Bass	SHMAIN	Shasta Lake Main Stem	297	0.223	
2006	Largemouth Bass	SHMAIN	Shasta Lake Main Stem	320	0.281	
2006	Largemouth Bass	SHMAIN	Shasta Lake Main Stem	330	0.207	
2006	Largemouth Bass	SHMAIN	Shasta Lake Main Stem	336	0.158	
2006	Largemouth Bass	SHMAIN	Shasta Lake Main Stem	340	0.271	
2006	Largemouth Bass	SHMAIN	Shasta Lake Main Stem	342	0.356	
2006	Largemouth Bass	SHMAIN	Shasta Lake Main Stem	345	0.244	
2006	Largemouth Bass	SHMAIN	Shasta Lake Main Stem	352	0.21	
2006	Largemouth Bass	SHMAIN	Shasta Lake Main Stem	359	0.344	
2006	Largemouth Bass	SHMAIN	Shasta Lake Main Stem	360	0.285	
2006	Largemouth Bass	SHMAIN	Shasta Lake Main Stem	360	0.358	
2006	Largemouth Bass	SHMAIN	Shasta Lake Main Stem	365	0.281	
2006	Largemouth Bass	SHMAIN	Shasta Lake Main Stem	380	0.412	
2006	Largemouth Bass	SHMAIN	Shasta Lake Main Stem	390	0.379	
2006	Largemouth Bass	SHMAIN	Shasta Lake Main Stem	403	0.562	
2006	Largemouth Bass	SHMAIN	Shasta Lake Main Stem	420	0.55	
2006	Largemouth Bass	SHMAIN	Shasta Lake Main Stem	425	0.552	
2006	Largemouth Bass	SNSL	Snodgrass Slough Near Delta Meadows	266	0.362	
2006	Largemouth Bass	SNSL	Snodgrass Slough Near Delta Meadows	299	0.518	
2006	Largemouth Bass	SNSL	Snodgrass Slough Near Delta Meadows	315	0.36	
2006	Largemouth Bass	SNSL	Snodgrass Slough Near Delta Meadows	317	0.328	
2006	Largemouth Bass	SNSL	Snodgrass Slough Near Delta Meadows	324	0.345	
2006	Largemouth Bass	SNSL	Snodgrass Slough Near Delta Meadows	335	0.403	
2006	Largemouth Bass	SNSL	Snodgrass Slough Near Delta Meadows	369	0.434	
2006	Largemouth Bass	SNSL	Snodgrass Slough Near Delta Meadows	381	0.496	
2006	Largemouth Bass	SNSL	Snodgrass Slough Near Delta Meadows	390	0.549	
2006	Largemouth Bass	SNSL	Snodgrass Slough Near Delta Meadows	400	0.528	
2006	Largemouth Bass	SNSL	Snodgrass Slough Near Delta Meadows	410	0.39	

Year	Species	Site Code	Site Name	Total Length (mm)	Hg Concentration (ppm)	Comment
2006	Largemouth Bass	SNSL	Snodgrass Slough Near Delta Meadows	420	0.588	
2006	Largemouth Bass	STSL	Steamboat Slough	288	0.305	
2006	Largemouth Bass	STSL	Steamboat Slough	296	0.475	
2006	Largemouth Bass	STSL	Steamboat Slough	307	0.375	
2006	Largemouth Bass	STSL	Steamboat Slough	307	0.34	
2006	Largemouth Bass	STSL	Steamboat Slough	307	0.365	
2006	Largemouth Bass	STSL	Steamboat Slough	319	0.399	
2006	Largemouth Bass	STSL	Steamboat Slough	323	0.342	
2006	Largemouth Bass	STSL	Steamboat Slough	336	0.366	
2006	Largemouth Bass	STSL	Steamboat Slough	347	0.822	
2006	Largemouth Bass	STSL	Steamboat Slough	355	0.867	
2006	Largemouth Bass	STSL	Steamboat Slough	415	0.916	
2006	Largemouth Bass	STSL	Steamboat Slough	430	1.23	
2006	Largemouth Bass	STSL	Steamboat Slough	472	0.751	
2006	Largemouth Bass	SGORDM	Stony Gorge Reservoir at Dam	208	0.188	
2006	Largemouth Bass	SGORDM	Stony Gorge Reservoir at Dam	291	0.258	
2006	Largemouth Bass	SGORDM	Stony Gorge Reservoir at Dam	291	0.268	
2006	Largemouth Bass	SGORS	Stony Gorge Reservoir South	274	0.226	
2006	Largemouth Bass	SGORS	Stony Gorge Reservoir South	292	0.255	
2006	Largemouth Bass	SGORS	Stony Gorge Reservoir South	308	0.36	
2006	Largemouth Bass	SGORS	Stony Gorge Reservoir South	331	0.264	
2006	Largemouth Bass	SUBY	Sutter Bypass Below Kirkville Road	273	0.191	
2006	Largemouth Bass	SUBY	Sutter Bypass Below Kirkville Road	280	0.216	
2006	Largemouth Bass	SUBY	Sutter Bypass Below Kirkville Road	285	0.301	
2006	Largemouth Bass	SUBY	Sutter Bypass Below Kirkville Road	290	0.353	
2006	Largemouth Bass	SUBY	Sutter Bypass Below Kirkville Road	350	0.352	
2006	Largemouth Bass	SUBY	Sutter Bypass Below Kirkville Road	363	0.38	
2006	Largemouth Bass	SUBY	Sutter Bypass Below Kirkville Road	378	0.402	
2006	Largemouth Bass	SUBY	Sutter Bypass Below Kirkville Road	420	0.627	
2006	Largemouth Bass	SUBY	Sutter Bypass Below Kirkville Road	468	0.712	
2006	Largemouth Bass	TOED	Toe Drain	213	0.154	
2006	Largemouth Bass	TOED	Toe Drain	260	0.142	
2006	Largemouth Bass	TOED	Toe Drain	270	0.176	
2006	Largemouth Bass	TOED	Toe Drain	279	0.223	
2006	Largemouth Bass	TOED	Toe Drain	282	0.371	
2006	Largemouth Bass	TOED	Toe Drain	285	0.126	
2006	Largemouth Bass	TOED	Toe Drain	308	0.315	

Year	Species	Site Code	Site Name	Total Length (mm)	Hg Concentration (ppm)	Comment
2006	Largemouth Bass	TOED	Toe Drain	311	0.221	
2006	Largemouth Bass	TOED	Toe Drain	317	0.269	
2006	Largemouth Bass	TOED	Toe Drain	324	0.607	
2006	Largemouth Bass	TOED	Toe Drain	332	0.338	
2006	Largemouth Bass	TOED	Toe Drain	342	0.537	
2006	Largemouth Bass	TOED	Toe Drain	354	0.317	
2006	Largemouth Bass	TOED	Toe Drain	367	0.588	
2006	Largemouth Bass	TOED	Toe Drain	399	0.57	
2006	Largemouth Bass	TOED	Toe Drain	402	0.449	
2006	Largemouth Bass	TOED	Toe Drain	467	1.02	
2006	Largemouth Bass	WLKB	Whiskeytown Lake at Brandy Creek	165	0.087	
2006	Largemouth Bass	WLKB	Whiskeytown Lake at Brandy Creek	216	0.098	
2006	Largemouth Bass	WLKB	Whiskeytown Lake at Brandy Creek	231	0.09	
2006	Largemouth Bass	WLKB	Whiskeytown Lake at Brandy Creek	301	0.103	
2006	Largemouth Bass	WLKB	Whiskeytown Lake at Brandy Creek	305	0.117	
2006	Largemouth Bass	WLKCC	Whiskeytown Lake at Clear Creek	405	0.294	
2006	Pumpkinseed	INVRS	Indian Valley Reservoir South	137	0.202	
2006	Pumpkinseed	INVRS	Indian Valley Reservoir South	149	0.3	
2006	Pumpkinseed	INVRS	Indian Valley Reservoir South	152	0.29	
2006	Pumpkinseed	INVRS	Indian Valley Reservoir South	158	0.226	
2006	Pumpkinseed	INVRS	Indian Valley Reservoir South	160	0.321	
2006	Pumpkinseed	SHMCR	Shasta Lake at McCloud River	100	0.05	
2006	Pumpkinseed	SHMCR	Shasta Lake at McCloud River	110	0.069	
2006	Pumpkinseed	SHMCR	Shasta Lake at McCloud River	111	0.114	
2006	Pumpkinseed	SHMCR	Shasta Lake at McCloud River	123	0.062	
2006	Pumpkinseed	SHMCR	Shasta Lake at McCloud River	128	0.087	
2006	Pumpkinseed	SHMCR	Shasta Lake at McCloud River	137	0.077	
2006	Pumpkinseed	SHSAC	Shasta Lake at Sacramento River	131	0.053	
2006	Pumpkinseed	SHSAC	Shasta Lake at Sacramento River	139	0.194	
2006	Pumpkinseed	SHSAC	Shasta Lake at Sacramento River	140	0.084	
2006	Pumpkinseed	SHMAIN	Shasta Lake Main Stem	90	0.026	
2006	Pumpkinseed	SHMAIN	Shasta Lake Main Stem	90	0.026	
2006	Pumpkinseed	SHMAIN	Shasta Lake Main Stem	95	0.028	
2006	Pumpkinseed	SHMAIN	Shasta Lake Main Stem	95	0.071	
2006	Pumpkinseed	SHMAIN	Shasta Lake Main Stem	101	0.029	
2006	Pumpkinseed	SHMAIN	Shasta Lake Main Stem	104	0.067	
2006	Pumpkinseed	SHMAIN	Shasta Lake Main Stem	105	0.042	

Year	Species	Site Code	Site Name	Total Length (mm)	Hg Concentration (ppm)	Comment
2006	Pumpkinseed	SHMAIN	Shasta Lake Main Stem	106	0.03	
2006	Pumpkinseed	SHMAIN	Shasta Lake Main Stem	107	0.215	
2006	Pumpkinseed	SHMAIN	Shasta Lake Main Stem	115	0.034	
2006	Pumpkinseed	SHMAIN	Shasta Lake Main Stem	116	0.032	
2006	Pumpkinseed	SHMAIN	Shasta Lake Main Stem	123	0.069	
2006	Pumpkinseed	SHMAIN	Shasta Lake Main Stem	125	0.042	
2006	Pumpkinseed	SHMAIN	Shasta Lake Main Stem	132	0.022	
2006	Pumpkinseed	SHMAIN	Shasta Lake Main Stem	139	0.032	
2006	Rainbow Trout	BMLAK	Baum Lake	269	0.019	
2006	Rainbow Trout	BMLAK	Baum Lake	274	0.021	
2006	Rainbow Trout	BMLAK	Baum Lake	299	0.019	
2006	Rainbow Trout	BMLAK	Baum Lake	312	0.021	
2006	Rainbow Trout	BMLAK	Baum Lake	321	0.024	
2006	Rainbow Trout	BMLAK	Baum Lake	324	0.019	
2006	Rainbow Trout	BMLAK	Baum Lake	392	0.03	
2006	Rainbow Trout	BMLAK	Baum Lake	393	0.033	
2006	Rainbow Trout	BMLAK	Baum Lake	401	0.033	
2006	Rainbow Trout	BMLAK	Baum Lake	402	0.029	
2006	Rainbow Trout	BMLAK	Baum Lake	431	0.078	
2006	Rainbow Trout	BMLAK	Baum Lake	524	0.097	
2006	Rainbow Trout	BKLAK	Bucks Lake	160	0.022	
2006	Rainbow Trout	BKLAK	Bucks Lake	190	0.041	
2006	Rainbow Trout	BKLAK	Bucks Lake	242	0.024	
2006	Rainbow Trout	BKLAK	Bucks Lake	276	0.027	
2006	Rainbow Trout	BKLAK	Bucks Lake	282	0.028	
2006	Rainbow Trout	BKLAK	Bucks Lake	303	0.018	
2006	Rainbow Trout	BKLAK	Bucks Lake	310	0.029	
2006	Rainbow Trout	BKLAK	Bucks Lake	315	0.017	
2006	Rainbow Trout	HTCRK	Hat Creek	261	0.02	
2006	Rainbow Trout	HTCRK	Hat Creek	282	0.02	
2006	Rainbow Trout	HTCRK	Hat Creek	284	0.018	
2006	Rainbow Trout	HTCRK	Hat Creek	284	0.019	
2006	Rainbow Trout	HTCRK	Hat Creek	289	0.018	
2006	Rainbow Trout	HTCRK	Hat Creek	294	0.024	
2006	Rainbow Trout	HTCRK	Hat Creek	297	0.018	
2006	Rainbow Trout	HTCRK	Hat Creek	300	0.022	
2006	Rainbow Trout	HTCRK	Hat Creek	310	0.021	

Year	Species	Site Code	Site Name	Total Length (mm)	Hg Concentration (ppm)	Comment
2006	Rainbow Trout	HTCRK	Hat Creek	310	0.023	
2006	Rainbow Trout	HTCRK	Hat Creek	364	0.028	
2006	Rainbow Trout	HTCRK	Hat Creek	404	0.036	
2006	Rainbow Trout	LKALN	Lake Almanor North	356	0.077	
2006	Rainbow Trout	SRBND06	Sacramento River at Bend Bridge	209	0.022	
2006	Rainbow Trout	SRBND06	Sacramento River at Bend Bridge	219	0.042	
2006	Rainbow Trout	SRBND06	Sacramento River at Bend Bridge	271	0.033	
2006	Rainbow Trout	SRBND06	Sacramento River at Bend Bridge	282	0.027	
2006	Rainbow Trout	SRBND06	Sacramento River at Bend Bridge	324	0.03	
2006	Rainbow Trout	SRBND06	Sacramento River at Bend Bridge	336	0.039	
2006	Rainbow Trout	SRBND06	Sacramento River at Bend Bridge	341	0.035	
2006	Rainbow Trout	SRBND06	Sacramento River at Bend Bridge	344	0.043	
2006	Rainbow Trout	SRBND06	Sacramento River at Bend Bridge	359	0.026	
2006	Rainbow Trout	SRBND06	Sacramento River at Bend Bridge	360	0.053	
2006	Rainbow Trout	SRBND06	Sacramento River at Bend Bridge	364	0.063	
2006	Rainbow Trout	SRBND06	Sacramento River at Bend Bridge	372	0.064	
2006	Rainbow Trout	SACDES	Sacramento River Near Deschutes Rd	259	0.044	
2006	Rainbow Trout	SACDES	Sacramento River Near Deschutes Rd	261	0.027	
2006	Rainbow Trout	SACDES	Sacramento River Near Deschutes Rd	261	0.033	
2006	Rainbow Trout	SACDES	Sacramento River Near Deschutes Rd	266	0.027	
2006	Rainbow Trout	SACDES	Sacramento River Near Deschutes Rd	280	0.03	
2006	Rainbow Trout	SACDES	Sacramento River Near Deschutes Rd	291	0.042	
2006	Rainbow Trout	SACDES	Sacramento River Near Deschutes Rd	296	0.069	
2006	Rainbow Trout	SACDES	Sacramento River Near Deschutes Rd	299	0.025	
2006	Rainbow Trout	SACDES	Sacramento River Near Deschutes Rd	314	0.038	
2006	Rainbow Trout	SACDES	Sacramento River Near Deschutes Rd	324	0.046	
2006	Rainbow Trout	SACDES	Sacramento River Near Deschutes Rd	341	0.035	
2006	Rainbow Trout	SACDES	Sacramento River Near Deschutes Rd	346	0.056	
2006	Rainbow Trout	SHLK	Shasta Lake	325	0.03	
2006	Rainbow Trout	SHLK	Shasta Lake	326	0.026	
2006	Rainbow Trout	SHLK	Shasta Lake	341	0.031	
2006	Rainbow Trout	SHLK	Shasta Lake	343	0.027	
2006	Rainbow Trout	SHLK	Shasta Lake	345	0.11	
2006	Rainbow Trout	SHLK	Shasta Lake	348	0.033	
2006	Rainbow Trout	SHLK	Shasta Lake	391	0.033	
2006	Rainbow Trout	SHLK	Shasta Lake	392	0.033	
2006	Rainbow Trout	SHLK	Shasta Lake	440	0.138	

Year	Species	Site Code	Site Name	Total Length (mm)	Hg Concentration (ppm)	Comment
2006	Rainbow Trout	SHLK	Shasta Lake	467	0.112	
2006	Rainbow Trout	SHMAIN	Shasta Lake Main Stem	332	0.031	
2006	Redear Sunfish	BCHWY	Butte Creek at Colusa Highway	130	0.214	
2006	Redear Sunfish	BCHWY	Butte Creek at Colusa Highway	142	0.092	
2006	Redear Sunfish	BCHWY	Butte Creek at Colusa Highway	166	0.278	
2006	Redear Sunfish	BCHWY	Butte Creek at Colusa Highway	190	0.231	
2006	Redear Sunfish	COSRM1	Cosumnes River at Rivermile 1	185	0.417	
2006	Redear Sunfish	COSRM1	Cosumnes River at Rivermile 1	197	0.275	
2006	Redear Sunfish	COSRM1	Cosumnes River at Rivermile 1	207	0.673	
2006	Redear Sunfish	COSRM1	Cosumnes River at Rivermile 1	207	0.731	
2006	Redear Sunfish	COSRM1	Cosumnes River at Rivermile 1	229	0.81	
2006	Redear Sunfish	CRSCNL	Cross Canal	140	0.109	
2006	Redear Sunfish	CRSCNL	Cross Canal	148	0.087	
2006	Redear Sunfish	CRSCNL	Cross Canal	153	0.104	
2006	Redear Sunfish	CRSCNL	Cross Canal	169	0.243	
2006	Redear Sunfish	CRSCNL	Cross Canal	191	0.198	
2006	Redear Sunfish	EPRSE	East Park Reservoir Southeast	150	0.039	
2006	Redear Sunfish	EPRSE	East Park Reservoir Southeast	156	0.044	
2006	Redear Sunfish	EPRSE	East Park Reservoir Southeast	160	0.105	
2006	Redear Sunfish	EPRSE	East Park Reservoir Southeast	164	0.046	
2006	Redear Sunfish	EPRSE	East Park Reservoir Southeast	190	0.057	
2006	Redear Sunfish	GEOSL	Georgiana Slough	178	0.092	
2006	Redear Sunfish	GEOSL	Georgiana Slough	180	0.063	
2006	Redear Sunfish	GEOSL	Georgiana Slough	193	0.109	
2006	Redear Sunfish	GEOSL	Georgiana Slough	205	0.492	
2006	Redear Sunfish	GEOSL	Georgiana Slough	214	0.156	
2006	Redear Sunfish	INVRN	Indian Valley Reservoir North	146	0.173	
2006	Redear Sunfish	INVRN	Indian Valley Reservoir North	150	0.282	
2006	Redear Sunfish	INVRN	Indian Valley Reservoir North	151	0.279	
2006	Redear Sunfish	INVRN	Indian Valley Reservoir North	154	0.247	
2006	Redear Sunfish	INVRN	Indian Valley Reservoir North	173	0.414	
2006	Redear Sunfish	SACKL	Sacramento River at Knights Landing	160	0.087	
2006	Redear Sunfish	SACKL	Sacramento River at Knights Landing	165	0.08	
2006	Redear Sunfish	SACKL	Sacramento River at Knights Landing	174	0.195	
2006	Redear Sunfish	SACKL	Sacramento River at Knights Landing	191	0.1	
2006	Redear Sunfish	SACKL	Sacramento River at Knights Landing	214	0.101	
2006	Redear Sunfish	SACRM59	Sacramento River at Rivermile 59	149	0.085	

Year	Species	Site Code	Site Name	Total Length (mm)	Hg Concentration (ppm)	Comment
2006	Redear Sunfish	SACRM59	Sacramento River at Rivermile 59	165	0.159	
2006	Redear Sunfish	SACRM59	Sacramento River at Rivermile 59	170	0.065	
2006	Redear Sunfish	SACRM59	Sacramento River at Rivermile 59	177	0.131	
2006	Redear Sunfish	SACRM59	Sacramento River at Rivermile 59	192	0.1	
2006	Redear Sunfish	SACRM59	Sacramento River at Rivermile 59	192	0.112	
2006	Redear Sunfish	SACRM59	Sacramento River at Rivermile 59	201	0.229	
2006	Redear Sunfish	SACRM59	Sacramento River at Rivermile 59	221	0.074	
2006	Redear Sunfish	SACRM59	Sacramento River at Rivermile 59	233	0.221	
2006	Redear Sunfish	SACRM59	Sacramento River at Rivermile 59	236	0.208	
2006	Redear Sunfish	SACVER	Sacramento River Near Verona Marina	151	0.074	
2006	Redear Sunfish	SACVER	Sacramento River Near Verona Marina	156	0.085	
2006	Redear Sunfish	SACVER	Sacramento River Near Verona Marina	157	0.231	
2006	Redear Sunfish	SACVER	Sacramento River Near Verona Marina	170	0.103	
2006	Redear Sunfish	SACVER	Sacramento River Near Verona Marina	184	0.173	
2006	Redear Sunfish	SNSL	Snodgrass Slough Near Delta Meadows	171	0.06	
2006	Redear Sunfish	SNSL	Snodgrass Slough Near Delta Meadows	174	0.221	
2006	Redear Sunfish	SNSL	Snodgrass Slough Near Delta Meadows	182	0.113	
2006	Redear Sunfish	SNSL	Snodgrass Slough Near Delta Meadows	188	0.309	
2006	Redear Sunfish	SNSL	Snodgrass Slough Near Delta Meadows	190	0.153	
2006	Redear Sunfish	STSL	Steamboat Slough	183	0.09	
2006	Redear Sunfish	STSL	Steamboat Slough	209	0.108	
2006	Redear Sunfish	STSL	Steamboat Slough	210	0.201	
2006	Redear Sunfish	STSL	Steamboat Slough	228	0.246	
2006	Redear Sunfish	STSL	Steamboat Slough	229	0.352	
2006	Redear Sunfish	SUBY	Sutter Bypass Below Kirkville Road	160	0.093	
2006	Redear Sunfish	SUBY	Sutter Bypass Below Kirkville Road	165	0.106	
2006	Redear Sunfish	SUBY	Sutter Bypass Below Kirkville Road	165	0.068	
2006	Redear Sunfish	SUBY	Sutter Bypass Below Kirkville Road	170	0.192	
2006	Redear Sunfish	SUBY	Sutter Bypass Below Kirkville Road	180	0.097	
2006	Sacramento Pikeminnow	CCMOU06	Clear Creek Near Mouth	120	0.1	
2006	Sacramento Pikeminnow	CCMOU06	Clear Creek Near Mouth	124	0.113	
2006	Sacramento Pikeminnow	CCMOU06	Clear Creek Near Mouth	125	0.083	
2006	Sacramento Pikeminnow	CCMOU06	Clear Creek Near Mouth	126	0.122	
2006	Sacramento Pikeminnow	CCMOU06	Clear Creek Near Mouth	130	0.201	
2006	Sacramento Pikeminnow	CCMOU06	Clear Creek Near Mouth	145	0.199	
2006	Sacramento Pikeminnow	CCMOU06	Clear Creek Near Mouth	147	0.122	
2006	Sacramento Pikeminnow	CCMOU06	Clear Creek Near Mouth	157	0.173	

Year	Species	Site Code	Site Name	Total Length (mm)	Hg Concentration (ppm)	Comment
2006	Sacramento Pikeminnow	CCMOU06	Clear Creek Near Mouth	164	0.125	
2006	Sacramento Pikeminnow	CCMOU06	Clear Creek Near Mouth	164	0.128	
2006	Sacramento Pikeminnow	CCMOU06	Clear Creek Near Mouth	167	0.175	
2006	Sacramento Pikeminnow	CCMOU06	Clear Creek Near Mouth	168	0.172	
2006	Sacramento Pikeminnow	CCMOU06	Clear Creek Near Mouth	171	0.19	
2006	Sacramento Pikeminnow	CCMOU06	Clear Creek Near Mouth	184	0.118	
2006	Sacramento Pikeminnow	CCMOU06	Clear Creek Near Mouth	187	0.228	
2006	Sacramento Pikeminnow	FRGRCV	Feather River at Gridley	230	0.15	Chris Foe data
2006	Sacramento Pikeminnow	FRGRCV	Feather River at Gridley	248	0.215	Chris Foe data
2006	Sacramento Pikeminnow	FRGRCV	Feather River at Gridley	258	0.135	Chris Foe data
2006	Sacramento Pikeminnow	FRGRCV	Feather River at Gridley	312	0.253	Chris Foe data
2006	Sacramento Pikeminnow	FRGRCV	Feather River at Gridley	323	0.202	Chris Foe data
2006	Sacramento Pikeminnow	FRGRCV	Feather River at Gridley	340	0.308	Chris Foe data
2006	Sacramento Pikeminnow	FRGRCV	Feather River at Gridley	353	0.325	Chris Foe data
2006	Sacramento Pikeminnow	FRGRCV	Feather River at Gridley	355	0.397	Chris Foe data
2006	Sacramento Pikeminnow	FRGRCV	Feather River at Gridley	357	0.308	Chris Foe data
2006	Sacramento Pikeminnow	FRGRCV	Feather River at Gridley	466	0.622	Chris Foe data
2006	Sacramento Pikeminnow	GEOSL	Georgiana Slough	175	0.061	
2006	Sacramento Pikeminnow	GEOSL	Georgiana Slough	191	0.091	
2006	Sacramento Pikeminnow	GEOSL	Georgiana Slough	214	0.112	
2006	Sacramento Pikeminnow	GEOSL	Georgiana Slough	221	0.091	
2006	Sacramento Pikeminnow	GEOSL	Georgiana Slough	262	0.108	
2006	Sacramento Pikeminnow	LKBRI	Lake Britton	264	0.08	
2006	Sacramento Pikeminnow	LKBRI	Lake Britton	266	0.048	
2006	Sacramento Pikeminnow	LKBRI	Lake Britton	269	0.053	
2006	Sacramento Pikeminnow	LKBRI	Lake Britton	272	0.059	
2006	Sacramento Pikeminnow	LKBRI	Lake Britton	284	0.052	
2006	Sacramento Pikeminnow	SRBND06	Sacramento River at Bend Bridge	394	0.383	
2006	Sacramento Pikeminnow	SRBND06	Sacramento River at Bend Bridge	421	0.521	
2006	Sacramento Pikeminnow	SRCOL06	Sacramento River at Colusa	370	0.221	Chris Foe data
2006	Sacramento Pikeminnow	SACKL	Sacramento River at Knights Landing	526	0.686	
2006	Sacramento Pikeminnow	SACKL	Sacramento River at Knights Landing	539	1	
2006	Sacramento Pikeminnow	SACKL	Sacramento River at Knights Landing	544	0.605	
2006	Sacramento Pikeminnow	SACKL	Sacramento River at Knights Landing	546	0.744	
2006	Sacramento Pikeminnow	SACKL	Sacramento River at Knights Landing	549	0.986	
2006	Sacramento Pikeminnow	SACRM59	Sacramento River at Rivermile 59	174	0.104	
2006	Sacramento Pikeminnow	SACRM59	Sacramento River at Rivermile 59	202	0.109	

Year	Species	Site Code	Site Name	Total Length (mm)	Hg Concentration (ppm)	Comment
2006	Sacramento Pikeminnow	SACRM59	Sacramento River at Rivermile 59	216	0.126	
2006	Sacramento Pikeminnow	SACRM59	Sacramento River at Rivermile 59	275	0.27	
2006	Sacramento Pikeminnow	SACRM59	Sacramento River at Rivermile 59	291	0.402	
2006	Sacramento Pikeminnow	SACTIS	Sacramento River at Tisdale Boat Ramp	238	0.091	
2006	Sacramento Pikeminnow	SACTIS	Sacramento River at Tisdale Boat Ramp	271	0.112	
2006	Sacramento Pikeminnow	SACTIS	Sacramento River at Tisdale Boat Ramp	281	0.077	
2006	Sacramento Pikeminnow	SACTIS	Sacramento River at Tisdale Boat Ramp	283	0.078	
2006	Sacramento Pikeminnow	SACTIS	Sacramento River at Tisdale Boat Ramp	330	0.119	
2006	Sacramento Pikeminnow	SACDES	Sacramento River Near Deschutes Rd	369	0.218	
2006	Sacramento Pikeminnow	SACDES	Sacramento River Near Deschutes Rd	381	0.224	
2006	Sacramento Pikeminnow	SACDES	Sacramento River Near Deschutes Rd	393	0.658	
2006	Sacramento Pikeminnow	SACDES	Sacramento River Near Deschutes Rd	394	0.545	
2006	Sacramento Pikeminnow	SACDES	Sacramento River Near Deschutes Rd	423	0.33	
2006	Sacramento Pikeminnow	SACSCOT	Sacramento River Near Hamilton	365	0.221	
2006	Sacramento Pikeminnow	SACSCOT	Sacramento River Near Hamilton	375	0.301	
2006	Sacramento Pikeminnow	SACSCOT	Sacramento River Near Hamilton	394	0.418	
2006	Sacramento Pikeminnow	SACSCOT	Sacramento River Near Hamilton	410	0.304	
2006	Sacramento Pikeminnow	SACSCOT	Sacramento River Near Hamilton	454	0.334	
2006	Sacramento Pikeminnow	SACVER	Sacramento River Near Verona Marina	267	0.224	
2006	Sacramento Pikeminnow	SACVER	Sacramento River Near Verona Marina	269	0.332	
2006	Sacramento Pikeminnow	SACVER	Sacramento River Near Verona Marina	291	0.28	
2006	Sacramento Pikeminnow	SACVER	Sacramento River Near Verona Marina	294	0.268	
2006	Sacramento Pikeminnow	SACVER	Sacramento River Near Verona Marina	301	0.273	
2006	Sacramento Pikeminnow	SACVER	Sacramento River Near Verona Marina	334	0.486	
2006	Sacramento Pikeminnow	SACVER	Sacramento River Near Verona Marina	360	0.529	
2006	Sacramento Pikeminnow	SACVER	Sacramento River Near Verona Marina	389	0.394	
2006	Sacramento Pikeminnow	SACVER	Sacramento River Near Verona Marina	511	0.707	
2006	Sacramento Pikeminnow	STSL	Steamboat Slough	205	0.368	
2006	Sacramento Pikeminnow	STSL	Steamboat Slough	221	0.372	
2006	Sacramento Pikeminnow	STSL	Steamboat Slough	228	0.512	
2006	Sacramento Pikeminnow	STSL	Steamboat Slough	229	0.227	
2006	Sacramento Pikeminnow	STSL	Steamboat Slough	275	0.736	
2006	Sacramento Pikeminnow	WLKB	Whiskeytown Lake at Brandy Creek	138	0.042	
2006	Sacramento Pikeminnow	WLKB	Whiskeytown Lake at Brandy Creek	140	0.052	
2006	Sacramento Pikeminnow	WLKB	Whiskeytown Lake at Brandy Creek	152	0.047	
2006	Sacramento Pikeminnow	WLKB	Whiskeytown Lake at Brandy Creek	160	0.054	
2006	Sacramento Pikeminnow	WLKB	Whiskeytown Lake at Brandy Creek	161	0.05	

Year	Species	Site Code	Site Name	Total Length (mm)	Hg Concentration (ppm)	Comment
2006	Sacramento Pikeminnow	WLKCC	Whiskeytown Lake at Clear Creek	399	0.231	
2006	Sacramento Pikeminnow	WLKCC	Whiskeytown Lake at Clear Creek	613	0.826	
2006	Sacramento Pikeminnow	WLKCC	Whiskeytown Lake at Clear Creek	718	0.729	
2006	Sacramento Pikeminnow	WLKCC	Whiskeytown Lake at Clear Creek	738	0.741	
2006	Sacramento Pikeminnow	WLKCC	Whiskeytown Lake at Clear Creek	756	0.647	
2006	Sacramento Sucker	ARNIM06	American River at Nimbus Dam	198	0.163	Chris Foe data
2006	Sacramento Sucker	ARNIM06	American River at Nimbus Dam	211	0.092	Chris Foe data
2006	Sacramento Sucker	ARNIM06	American River at Nimbus Dam	235	0.061	Chris Foe data
2006	Sacramento Sucker	ARNIM06	American River at Nimbus Dam	248	0.068	Chris Foe data
2006	Sacramento Sucker	ARNIM06	American River at Nimbus Dam	357	0.054	Chris Foe data
2006	Sacramento Sucker	ARNIM06	American River at Nimbus Dam	371	0.053	Chris Foe data
2006	Sacramento Sucker	ARNIM06	American River at Nimbus Dam	420	0.096	Chris Foe data
2006	Sacramento Sucker	ARNIM06	American River at Nimbus Dam	496	0.137	Chris Foe data
2006	Sacramento Sucker	ARNIM06	American River at Nimbus Dam	506	0.267	Chris Foe data
2006	Sacramento Sucker	ARNIM06	American River at Nimbus Dam	511	0.47	Chris Foe data
2006	Sacramento Sucker	CRSCNL	Cross Canal	264	0.094	
2006	Sacramento Sucker	CRSCNL	Cross Canal	295	0.131	
2006	Sacramento Sucker	CRSCNL	Cross Canal	333	0.165	
2006	Sacramento Sucker	CRSCNL	Cross Canal	407	0.258	
2006	Sacramento Sucker	CRSCNL	Cross Canal	461	0.358	
2006	Sacramento Sucker	FRGRCV	Feather River at Gridley	240	0.071	Chris Foe data
2006	Sacramento Sucker	FRGRCV	Feather River at Gridley	318	0.044	Chris Foe data
2006	Sacramento Sucker	FRGRCV	Feather River at Gridley	318	0.038	Chris Foe data
2006	Sacramento Sucker	FRGRCV	Feather River at Gridley	320	0.041	Chris Foe data
2006	Sacramento Sucker	FRGRCV	Feather River at Gridley	335	0.074	Chris Foe data
2006	Sacramento Sucker	FRGRCV	Feather River at Gridley	483	0.322	Chris Foe data
2006	Sacramento Sucker	FRGRCV	Feather River at Gridley	505	0.292	Chris Foe data
2006	Sacramento Sucker	FRGRCV	Feather River at Gridley	520	0.426	Chris Foe data
2006	Sacramento Sucker	FRGRCV	Feather River at Gridley	530	0.33	Chris Foe data
2006	Sacramento Sucker	FRGRCV	Feather River at Gridley	578	0.341	Chris Foe data
2006	Sacramento Sucker	GEOSL	Georgiana Slough	412	0.174	
2006	Sacramento Sucker	GEOSL	Georgiana Slough	418	0.366	
2006	Sacramento Sucker	GEOSL	Georgiana Slough	473	0.328	
2006	Sacramento Sucker	GEOSL	Georgiana Slough	506	0.562	
2006	Sacramento Sucker	LKALN	Lake Almanor North	516	0.114	
2006	Sacramento Sucker	LKALN	Lake Almanor North	543	0.948	
2006	Sacramento Sucker	LKALN	Lake Almanor North	561	1.23	

Year	Species	Site Code	Site Name	Total Length (mm)	Hg Concentration (ppm)	Comment
2006	Sacramento Sucker	LKALN	Lake Almanor North	603	0.886	
2006	Sacramento Sucker	LKALN	Lake Almanor North	604	0.945	
2006	Sacramento Sucker	LKBRI	Lake Britton	476	0.435	
2006	Sacramento Sucker	LKBRI	Lake Britton	479	0.347	
2006	Sacramento Sucker	LKBRI	Lake Britton	484	0.123	
2006	Sacramento Sucker	LKBRI	Lake Britton	571	0.499	
2006	Sacramento Sucker	LKBRI	Lake Britton	591	0.401	
2006	Sacramento Sucker	MERHP	Merced River at Hatfield State Park	419	0.235	Chris Foe data
2006	Sacramento Sucker	MERHP	Merced River at Hatfield State Park	434	0.464	Chris Foe data
2006	Sacramento Sucker	MERHP	Merced River at Hatfield State Park	446	0.326	Chris Foe data
2006	Sacramento Sucker	MERHP	Merced River at Hatfield State Park	450	0.315	Chris Foe data
2006	Sacramento Sucker	MERHP	Merced River at Hatfield State Park	471	0.535	Chris Foe data
2006	Sacramento Sucker	MERHP	Merced River at Hatfield State Park	473	0.378	Chris Foe data
2006	Sacramento Sucker	MERHP	Merced River at Hatfield State Park	479	0.318	Chris Foe data
2006	Sacramento Sucker	MERHP	Merced River at Hatfield State Park	511	0.288	Chris Foe data
2006	Sacramento Sucker	MERHP	Merced River at Hatfield State Park	546	0.262	Chris Foe data
2006	Sacramento Sucker	MERHP	Merced River at Hatfield State Park	551	0.542	Chris Foe data
2006	Sacramento Sucker	SRBND06	Sacramento River at Bend Bridge	371	0.032	
2006	Sacramento Sucker	SRBND06	Sacramento River at Bend Bridge	436	0.083	
2006	Sacramento Sucker	SRBND06	Sacramento River at Bend Bridge	454	0.117	
2006	Sacramento Sucker	SRBND06	Sacramento River at Bend Bridge	476	0.054	
2006	Sacramento Sucker	SRBND06	Sacramento River at Bend Bridge	486	0.116	
2006	Sacramento Sucker	SRCOL06	Sacramento River at Colusa	190	0.06	Chris Foe data
2006	Sacramento Sucker	SRCOL06	Sacramento River at Colusa	330	0.073	Chris Foe data
2006	Sacramento Sucker	SRCOL06	Sacramento River at Colusa	335	0.055	Chris Foe data
2006	Sacramento Sucker	SRCOL06	Sacramento River at Colusa	349	0.097	Chris Foe data
2006	Sacramento Sucker	SRCOL06	Sacramento River at Colusa	410	0.066	Chris Foe data
2006	Sacramento Sucker	SRCOL06	Sacramento River at Colusa	450	0.135	Chris Foe data
2006	Sacramento Sucker	SRCOL06	Sacramento River at Colusa	465	0.195	Chris Foe data
2006	Sacramento Sucker	SRCOL06	Sacramento River at Colusa	470	0.253	Chris Foe data
2006	Sacramento Sucker	SRCOL06	Sacramento River at Colusa	505	0.149	Chris Foe data
2006	Sacramento Sucker	SRCOL06	Sacramento River at Colusa	505	0.314	Chris Foe data
2006	Sacramento Sucker	SACKL	Sacramento River at Knights Landing	338	0.079	
2006	Sacramento Sucker	SACKL	Sacramento River at Knights Landing	402	0.198	
2006	Sacramento Sucker	SACKL	Sacramento River at Knights Landing	416	0.273	
2006	Sacramento Sucker	SACKL	Sacramento River at Knights Landing	421	0.253	
2006	Sacramento Sucker	SACKL	Sacramento River at Knights Landing	436	0.126	

Year	Species	Site Code	Site Name	Total Length (mm)	Hg Concentration (ppm)	Comment
2006	Sacramento Sucker	SACRM59	Sacramento River at Rivermile 59	373	0.262	
2006	Sacramento Sucker	SACRM59	Sacramento River at Rivermile 59	379	0.148	
2006	Sacramento Sucker	SACRM59	Sacramento River at Rivermile 59	406	0.328	
2006	Sacramento Sucker	SACRM59	Sacramento River at Rivermile 59	434	0.352	
2006	Sacramento Sucker	SACRM59	Sacramento River at Rivermile 59	502	0.478	
2006	Sacramento Sucker	SACTIS	Sacramento River at Tisdale Boat Ramp	402	0.251	
2006	Sacramento Sucker	SACTIS	Sacramento River at Tisdale Boat Ramp	415	0.173	
2006	Sacramento Sucker	SACTIS	Sacramento River at Tisdale Boat Ramp	436	0.233	
2006	Sacramento Sucker	SACTIS	Sacramento River at Tisdale Boat Ramp	442	0.323	
2006	Sacramento Sucker	SACTIS	Sacramento River at Tisdale Boat Ramp	443	0.198	
2006	Sacramento Sucker	SACDES	Sacramento River Near Deschutes Rd	467	0.198	
2006	Sacramento Sucker	SACDES	Sacramento River Near Deschutes Rd	474	0.067	
2006	Sacramento Sucker	SACDES	Sacramento River Near Deschutes Rd	476	0.118	
2006	Sacramento Sucker	SACDES	Sacramento River Near Deschutes Rd	486	0.129	
2006	Sacramento Sucker	SACDES	Sacramento River Near Deschutes Rd	514	0.158	
2006	Sacramento Sucker	SACSCOT	Sacramento River Near Hamilton	373	0.047	
2006	Sacramento Sucker	SACSCOT	Sacramento River Near Hamilton	390	0.059	
2006	Sacramento Sucker	SACSCOT	Sacramento River Near Hamilton	396	0.073	
2006	Sacramento Sucker	SACSCOT	Sacramento River Near Hamilton	414	0.097	
2006	Sacramento Sucker	SACSCOT	Sacramento River Near Hamilton	480	0.266	
2006	Sacramento Sucker	SACVER	Sacramento River Near Verona Marina	350	0.225	
2006	Sacramento Sucker	SACVER	Sacramento River Near Verona Marina	371	0.153	
2006	Sacramento Sucker	SACVER	Sacramento River Near Verona Marina	389	0.3	
2006	Sacramento Sucker	SACVER	Sacramento River Near Verona Marina	394	0.271	
2006	Sacramento Sucker	SACVER	Sacramento River Near Verona Marina	410	0.208	
2006	Sacramento Sucker	SNSL	Snodgrass Slough Near Delta Meadows	274	0.182	
2006	Sacramento Sucker	SNSL	Snodgrass Slough Near Delta Meadows	309	0.228	
2006	Sacramento Sucker	SNSL	Snodgrass Slough Near Delta Meadows	370	0.21	
2006	Sacramento Sucker	SNSL	Snodgrass Slough Near Delta Meadows	389	0.36	
2006	Sacramento Sucker	SNSL	Snodgrass Slough Near Delta Meadows	570	0.465	
2006	Sacramento Sucker	STSL	Steamboat Slough	395	0.228	
2006	Sacramento Sucker	STSL	Steamboat Slough	450	0.249	
2006	Sacramento Sucker	STSL	Steamboat Slough	463	0.408	
2006	Sacramento Sucker	STSL	Steamboat Slough	471	0.425	
2006	Sacramento Sucker	STSL	Steamboat Slough	471	0.517	
2006	Sacramento Sucker	WLKCC	Whiskeytown Lake at Clear Creek	459	0.21	
2006	Sacramento Sucker	WLKCC	Whiskeytown Lake at Clear Creek	460	0.44	

Year	Species	Site Code	Site Name	Total Length (mm)	Hg Concentration (ppm)	Comment
2006	Sacramento Sucker	WLKCC	Whiskeytown Lake at Clear Creek	480	0.255	
2006	Sacramento Sucker	WLKCC	Whiskeytown Lake at Clear Creek	522	0.472	
2006	Sacramento Sucker	WLKCC	Whiskeytown Lake at Clear Creek	539	0.494	
2006	Sacramento Sucker	WLKCC	Whiskeytown Lake at Clear Creek	560	0.619	
2006	Sacramento Sucker	WLKCC	Whiskeytown Lake at Clear Creek	560	0.451	
2006	Sacramento Sucker	WLKCC	Whiskeytown Lake at Clear Creek	584	0.541	
2006	Smallmouth Bass	BBRC	Bullards Bar Reservoir at Central	260	0.215	
2006	Smallmouth Bass	BBRC	Bullards Bar Reservoir at Central	268	0.298	
2006	Smallmouth Bass	BBRC	Bullards Bar Reservoir at Central	268	0.395	
2006	Smallmouth Bass	BBRC	Bullards Bar Reservoir at Central	280	0.253	
2006	Smallmouth Bass	BBRC	Bullards Bar Reservoir at Central	280	0.295	
2006	Smallmouth Bass	BBRC	Bullards Bar Reservoir at Central	283	0.32	
2006	Smallmouth Bass	BBRC	Bullards Bar Reservoir at Central	298	0.253	
2006	Smallmouth Bass	BBRC	Bullards Bar Reservoir at Central	305	0.681	
2006	Smallmouth Bass	BBRC	Bullards Bar Reservoir at Central	310	0.494	
2006	Smallmouth Bass	BBRC	Bullards Bar Reservoir at Central	310	0.449	
2006	Smallmouth Bass	BBRC	Bullards Bar Reservoir at Central	330	0.463	
2006	Smallmouth Bass	BBRC	Bullards Bar Reservoir at Central	335	0.449	
2006	Smallmouth Bass	BBRC	Bullards Bar Reservoir at Central	350	0.479	
2006	Smallmouth Bass	BBRE	Bullards Bar Reservoir at East Arm	138	0.096	
2006	Smallmouth Bass	BBRE	Bullards Bar Reservoir at East Arm	260	0.33	
2006	Smallmouth Bass	BBRE	Bullards Bar Reservoir at East Arm	280	0.317	
2006	Smallmouth Bass	BBRE	Bullards Bar Reservoir at East Arm	290	0.29	
2006	Smallmouth Bass	BBRE	Bullards Bar Reservoir at East Arm	302	0.535	
2006	Smallmouth Bass	BBRE	Bullards Bar Reservoir at East Arm	315	0.545	
2006	Smallmouth Bass	BBRE	Bullards Bar Reservoir at East Arm	320	0.648	
2006	Smallmouth Bass	BBRE	Bullards Bar Reservoir at East Arm	320	0.722	
2006	Smallmouth Bass	BBRE	Bullards Bar Reservoir at East Arm	325	0.518	
2006	Smallmouth Bass	BBRE	Bullards Bar Reservoir at East Arm	330	0.421	
2006	Smallmouth Bass	BBRE	Bullards Bar Reservoir at East Arm	340	0.5	
2006	Smallmouth Bass	LKALN	Lake Almanor North	242	0.109	
2006	Smallmouth Bass	LKALN	Lake Almanor North	261	0.083	
2006	Smallmouth Bass	LKALS	Lake Almanor South	209	0.045	
2006	Smallmouth Bass	LKALS	Lake Almanor South	251	0.073	
2006	Smallmouth Bass	LKALS	Lake Almanor South	310	0.086	
2006	Smallmouth Bass	LKALS	Lake Almanor South	341	0.086	
2006	Smallmouth Bass	LKBRI	Lake Britton	201	0.101	

Year	Species	Site Code	Site Name	Total Length (mm)	Hg Concentration (ppm)	Comment
2006	Smallmouth Bass	LKBRI	Lake Britton	234	0.178	
2006	Smallmouth Bass	LKBRI	Lake Britton	256	0.092	
2006	Smallmouth Bass	LKBRI	Lake Britton	256	0.13	
2006	Smallmouth Bass	LKBRI	Lake Britton	273	0.133	
2006	Smallmouth Bass	LKBRI	Lake Britton	289	0.188	
2006	Smallmouth Bass	LKBRI	Lake Britton	305	0.219	
2006	Smallmouth Bass	LKBRI	Lake Britton	311	0.194	
2006	Smallmouth Bass	LKBRI	Lake Britton	315	0.241	
2006	Smallmouth Bass	LKBRI	Lake Britton	316	0.299	
2006	Smallmouth Bass	LKBRI	Lake Britton	339	0.256	
2006	Smallmouth Bass	LKBRI	Lake Britton	349	0.171	
2006	Smallmouth Bass	WLKB	Whiskeytown Lake at Brandy Creek	305	0.098	
2006	Smallmouth Bass	WLKB	Whiskeytown Lake at Brandy Creek	379	0.271	
2006	Smallmouth Bass	WLKB	Whiskeytown Lake at Brandy Creek	554	0.723	
2006	Spotted Bass	COSRM1	Cosumnes River at Rivermile 1	269	1.31	
2006	Spotted Bass	COSRM1	Cosumnes River at Rivermile 1	269	1.53	
2006	Spotted Bass	COSRM1	Cosumnes River at Rivermile 1	297	1.23	
2006	Spotted Bass	COSRM1	Cosumnes River at Rivermile 1	319	1.49	
2006	Spotted Bass	COSRM1	Cosumnes River at Rivermile 1	383	1.39	
2006	Spotted Bass	GEOSL	Georgiana Slough	217	0.24	
2006	Spotted Bass	GEOSL	Georgiana Slough	222	0.204	
2006	Spotted Bass	GEOSL	Georgiana Slough	228	0.253	
2006	Spotted Bass	GEOSL	Georgiana Slough	234	0.296	
2006	Spotted Bass	GEOSL	Georgiana Slough	248	0.39	
2006	Spotted Bass	GEOSL	Georgiana Slough	271	0.435	
2006	Spotted Bass	GEOSL	Georgiana Slough	276	0.441	
2006	Spotted Bass	GEOSL	Georgiana Slough	292	0.468	
2006	Spotted Bass	SACRM59	Sacramento River at Rivermile 59	267	0.39	
2006	Spotted Bass	SACRM59	Sacramento River at Rivermile 59	268	0.447	
2006	Spotted Bass	SACRM59	Sacramento River at Rivermile 59	274	0.397	
2006	Spotted Bass	SACRM59	Sacramento River at Rivermile 59	284	0.557	
2006	Spotted Bass	SACRM59	Sacramento River at Rivermile 59	305	0.555	
2006	Spotted Bass	SACRM59	Sacramento River at Rivermile 59	316	0.701	
2006	Spotted Bass	SACRM59	Sacramento River at Rivermile 59	331	0.505	
2006	Spotted Bass	SACRM59	Sacramento River at Rivermile 59	331	0.559	
2006	Spotted Bass	SACRM59	Sacramento River at Rivermile 59	351	0.471	
2006	Spotted Bass	SACVER	Sacramento River Near Verona Marina	239	0.317	

Year	Species	Site Code	Site Name	Total Length (mm)	Hg Concentration (ppm)	Comment
2006	Spotted Bass	SACVER	Sacramento River Near Verona Marina	260	0.617	
2006	Spotted Bass	SACVER	Sacramento River Near Verona Marina	290	0.498	
2006	Spotted Bass	SACVER	Sacramento River Near Verona Marina	298	0.311	
2006	Spotted Bass	SHSAC	Shasta Lake at Sacramento River	161	0.085	
2006	Spotted Bass	SHSAC	Shasta Lake at Sacramento River	181	0.077	
2006	Spotted Bass	SHSAC	Shasta Lake at Sacramento River	215	0.237	
2006	Spotted Bass	SHSAC	Shasta Lake at Sacramento River	221	0.151	
2006	Spotted Bass	SHSAC	Shasta Lake at Sacramento River	246	0.349	
2006	Spotted Bass	SHSAC	Shasta Lake at Sacramento River	257	0.163	
2006	Spotted Bass	SHSAC	Shasta Lake at Sacramento River	259	0.303	
2006	Spotted Bass	SHSAC	Shasta Lake at Sacramento River	292	0.16	
2006	Spotted Bass	SHSAC	Shasta Lake at Sacramento River	292	0.245	
2006	Spotted Bass	SHSAC	Shasta Lake at Sacramento River	295	0.258	
2006	Spotted Bass	SHSAC	Shasta Lake at Sacramento River	296	0.225	
2006	Spotted Bass	SHSAC	Shasta Lake at Sacramento River	305	0.222	
2006	Spotted Bass	SHSAC	Shasta Lake at Sacramento River	309	0.166	
2006	Spotted Bass	SHSAC	Shasta Lake at Sacramento River	329	0.204	
2006	Spotted Bass	SHSAC	Shasta Lake at Sacramento River	489	0.456	
2006	Spotted Bass	SHSAC	Shasta Lake at Sacramento River	522	0.814	
2006	Spotted Bass	SHMAIN	Shasta Lake Main Stem	148	0.057	
2006	Spotted Bass	SHMAIN	Shasta Lake Main Stem	157	0.054	
2006	Spotted Bass	SHMAIN	Shasta Lake Main Stem	234	0.095	
2006	Spotted Bass	SHMAIN	Shasta Lake Main Stem	240	0.082	
2006	Spotted Bass	WLKB	Whiskeytown Lake at Brandy Creek	209	0.07	
2006	Spotted Bass	WLKB	Whiskeytown Lake at Brandy Creek	230	0.074	
2006	Spotted Bass	WLKB	Whiskeytown Lake at Brandy Creek	232	0.108	
2006	Spotted Bass	WLKB	Whiskeytown Lake at Brandy Creek	234	0.076	
2006	Spotted Bass	WLKCC	Whiskeytown Lake at Clear Creek	235	0.083	
2006	Spotted Bass	WLKCC	Whiskeytown Lake at Clear Creek	235	0.087	
2006	Spotted Bass	WLKCC	Whiskeytown Lake at Clear Creek	253	0.0534	
2006	Spotted Bass	WLKCC	Whiskeytown Lake at Clear Creek	256	0.0555	
2006	Spotted Bass	WLKCC	Whiskeytown Lake at Clear Creek	261	0.093	
2006	Spotted Bass	WLKCC	Whiskeytown Lake at Clear Creek	263	0.0728	
2006	Spotted Bass	WLKCC	Whiskeytown Lake at Clear Creek	269	0.078	
2006	Spotted Bass	WLKCC	Whiskeytown Lake at Clear Creek	359	0.132	
2006	Spotted Bass	WLKCC	Whiskeytown Lake at Clear Creek	363	0.135	
2006	Spotted Bass	WLKCC	Whiskeytown Lake at Clear Creek	369	0.154	

Year	Species	Site Code	Site Name	Total Length (mm)	Hg Concentration (ppm)	Comment
2006	SteelheadTrout	LKALN	Lake Almanor North	421	0.08	
2006	SteelheadTrout	LKALN	Lake Almanor North	424	0.061	
2006	SteelheadTrout	LKALN	Lake Almanor North	442	0.057	
2006	SteelheadTrout	LKALN	Lake Almanor North	444	0.112	
2006	SteelheadTrout	LKALN	Lake Almanor North	449	0.122	
2006	SteelheadTrout	LKALN	Lake Almanor North	462	0.066	
2006	SteelheadTrout	LKALN	Lake Almanor North	471	0.104	
2006	SteelheadTrout	LKALN	Lake Almanor North	484	0.107	
2006	SteelheadTrout	LKALN	Lake Almanor North	484	0.13	
2006	SteelheadTrout	LKALN	Lake Almanor North	500	0.086	
2006	SteelheadTrout	LKALN	Lake Almanor North	519	0.144	
2006	SteelheadTrout	LKALN	Lake Almanor North	519	0.08	
2006	Tule Perch	HTCRK	Hat Creek	141	0.038	
2006	Tule Perch	HTCRK	Hat Creek	149	0.038	
2006	Tule Perch	HTCRK	Hat Creek	150	0.035	
2006	Tule Perch	HTCRK	Hat Creek	150	0.048	
2006	Tule Perch	HTCRK	Hat Creek	156	0.045	
2006	Warmouth	LKALN	Lake Almanor North	194	0.077	
2006	Warmouth	LKALN	Lake Almanor North	218	0.124	
2006	Warmouth	LKALN	Lake Almanor North	220	0.119	
2006	Warmouth	LKALN	Lake Almanor North	224	0.115	
2006	Warmouth	LKALN	Lake Almanor North	234	0.12	
2006	Warmouth	LKALS	Lake Almanor South	179	0.062	
2006	White Catfish	COSRM1	Cosumnes River at Rivermile 1	272	0.598	
2006	White Catfish	COSRM1	Cosumnes River at Rivermile 1	294	0.736	
2006	White Catfish	COSRM1	Cosumnes River at Rivermile 1	333	0.755	
2006	White Catfish	SACVER	Sacramento River Near Verona Marina	292	0.235	
2006	White Catfish	SACVER	Sacramento River Near Verona Marina	587	0.693	
2006	White Catfish	SNSL	Snodgrass Slough Near Delta Meadows	298	0.134	
2006	White Catfish	SNSL	Snodgrass Slough Near Delta Meadows	306	0.198	
2006	White Catfish	SNSL	Snodgrass Slough Near Delta Meadows	347	0.173	
2006	White Catfish	SNSL	Snodgrass Slough Near Delta Meadows	348	0.309	
2006	White Catfish	SNSL	Snodgrass Slough Near Delta Meadows	370	0.258	
2006	White Catfish	TOED	Toe Drain	263	0.493	
2006	White Catfish	TOED	Toe Drain	268	0.506	
2006	White Catfish	TOED	Toe Drain	276	0.608	
2006	White Catfish	TOED	Toe Drain	304	0.507	

Year	Species	Site Code	Site Name	Total Length (mm)	Hg Concentration (ppm)	Comment
2006	White Catfish	TOED	Toe Drain	304	0.632	
2006	White Catfish	TOED	Toe Drain	314	0.452	
2006	White Catfish	TOED	Toe Drain	324	0.549	
2006	White Catfish	TOED	Toe Drain	334	0.446	
2006	White Catfish	TOED	Toe Drain	339	0.531	
2006	White Sturgeon	MCVFD	McAvoy Fish Derby	1502	0.165	
2006	White Sturgeon	MCVFD	McAvoy Fish Derby	1340	0.236	
2006	White Sturgeon	MCVFD	McAvoy Fish Derby	1680	0.228	
2006	White Sturgeon	MCVFD	McAvoy Fish Derby	1603	0.220	
2006	White Sturgeon	MCVFD	McAvoy Fish Derby	1543	0.255	
2006	White Sturgeon	MCVFD	McAvoy Fish Derby	1568	0.279	
2006	White Sturgeon	MCVFD	McAvoy Fish Derby	1568	0.165	
2006	White Sturgeon	MCVFD	McAvoy Fish Derby	1695	0.230	
2006	White Sturgeon	MCVFD	McAvoy Fish Derby	1705	0.254	
2006	White Sturgeon	MCVFD	McAvoy Fish Derby	1553	0.189	
2006	White Sturgeon	SACCM33	Sacramento River at Channel Marker 33	1324	0.202	
2006	White Sturgeon	SACCM33	Sacramento River at Channel Marker 33	1840	0.226	

Appendix II a. List of *a priori* hypothesized models used to relate random and fixed effects of the length:mercury relatiionship in largemouth bass and channel catfish.

Random Effects	**Fixed Effects**
Intercept Only	Intercept Only
Site(Region)	Region
Site(Region)*Length	Length
Site(Region)*Length^2	Length^2
Site(Region) + Site(Region)*Length	Region + Length
Site(Region) + Site(Region)*Length^2	Region + Length^2
Site(Region) + Site(Region)*Length + Site(Region)*Length^2	Region + Length + Length^2
	Length + Length^2
	Region + Length + Region*Length
	Region + Length^2 + Region*Length^2
	Region + Length + Length^2 + Region*Length
	Region + Length + Length^2 + Region*Length^2
	Region + Length + Length^2 + Region*Length + Region*Length^2

Appendix II b. Final model equation and parameter estimates for each site modeled for largemouth bass. See Table 3 for site names.

General Model Equation **Region + Length + Length^2 + Region*Length + Site(Region)*Length^2**

Region	Site Code	Region Intercept	Length Intercept	Length^2 Intercept	Region*Length^2 (slope)	Site(Region)*Length^2 (slope)
American River	ARDP	16.06	-15.03	3.38	0.15	-0.01
American River	ARNIM	16.06	-15.03	3.38	0.15	0.01
Central Delta	CARV	18.42	-15.03	3.38	-0.29	-0.0019
Central Delta	DBAY	18.42	-15.03	3.38	-0.29	-0.0066
Central Delta	HCUT	18.42	-15.03	3.38	-0.29	-0.0056
Central Delta	ITSL	18.42	-15.03	3.38	-0.29	0.0041
Central Delta	MMSL	18.42	-15.03	3.38	-0.29	-0.0028
Central Delta	MRHW4	18.42	-15.03	3.38	-0.29	0.0024
Central Delta	MRIND	18.42	-15.03	3.38	-0.29	0.011
Central Delta	POTSL	18.42	-15.03	3.38	-0.29	0.019
Central Delta	SALTSL	18.42	-15.03	3.38	-0.29	0.0063
Central Delta	SMCNL	18.42	-15.03	3.38	-0.29	-0.0087
Central Delta	SMSL	18.42	-15.03	3.38	-0.29	-0.0002
Central Delta	WDCUT	18.42	-15.03	3.38	-0.29	-0.005
Central Delta	WHSL	18.42	-15.03	3.38	-0.29	-0.013
Cos/Mok Rivers	COS	18.17	-15.03	3.38	-0.18	0.005
Cos/Mok Rivers	COSRM	18.17	-15.03	3.38	-0.18	0.093
Cos/Mok Rivers	LOSL	18.17	-15.03	3.38	-0.18	-0.024
Cos/Mok Rivers	MRLL	18.17	-15.03	3.38	-0.18	-0.074
Eastern Drainages	CMRES	17.85	-15.03	3.38	-0.18	0.008
Eastern Drainages	NHRES	17.85	-15.03	3.38	-0.18	0.005
Eastern Drainages	PARES	17.85	-15.03	3.38	-0.18	-0.013
Feather River	1FRGR	16.93	-15.03	3.38	-0.028	-0.0047
Feather River	FRGR	16.93	-15.03	3.38	-0.028	-0.021
Feather River	FRNI	16.93	-15.03	3.38	-0.028	0.026
Northern Delta	BVSL	16.3	-15.03	3.38	0.076	-0.032
Northern Delta	SACRI	16.3	-15.03	3.38	0.076	0.014
Northern Delta	SNSL	16.3	-15.03	3.38	0.076	-0.0031
Northern Delta	STSL	16.3	-15.03	3.38	0.076	0.021
Northern Delta	TOED	16.3	-15.03	3.38	0.076	0.0007
Sacramento River	BCHWY	16.65	-15.03	3.38	0.023	0.0002
Sacramento River	CRSCN	16.65	-15.03	3.38	0.023	-0.016
Sacramento River	SHMAI	16.65	-15.03	3.38	0.023	-0.022
Sacramento River	SRBUT	16.65	-15.03	3.38	0.023	0.014
Sacramento River	SRCOL	16.65	-15.03	3.38	0.023	-0.0062
Sacramento River	SRVB	16.65	-15.03	3.38	0.023	0.031

Region	Site Code	Region Intercept	Length Intercept	Length^2 Intercept	Region*Length^2 (slope)	Site(Region)*Length^2 (slope)
Sacramento River	SSLK	16.65	-15.03	3.38	0.023	-0.0051
Sacramento River	SUBY	16.65	-15.03	3.38	0.023	-0.0084
San Joaquin River	1MERH	17.91	-15.03	3.38	-0.19	0.009
San Joaquin River	MER3H	17.91	-15.03	3.38	-0.19	-0.0006
San Joaquin River	ORTB	17.91	-15.03	3.38	-0.19	-0.023
San Joaquin River	PCUT	17.91	-15.03	3.38	-0.19	-0.023
San Joaquin River	SJCL	17.91	-15.03	3.38	-0.19	0.0085
San Joaquin River	SJFF	17.91	-15.03	3.38	-0.19	0.01
San Joaquin River	SJH99	17.91	-15.03	3.38	-0.19	-0.033
San Joaquin River	SJMO	17.91	-15.03	3.38	-0.19	-0.0086
San Joaquin River	SJPAT	17.91	-15.03	3.38	-0.19	0.0025
San Joaquin River	SJVER	17.91	-15.03	3.38	-0.19	0.0076
San Joaquin River	SRCSP	17.91	-15.03	3.38	-0.19	0.023
San Joaquin River	TUO3S	17.91	-15.03	3.38	-0.19	0.027
Western Delta	BIGB	18.46	-15.03	3.38	-0.29	0.0056
Western Delta	TYSL	18.46	-15.03	3.38	-0.29	-0.0056
Western Drainages	1EPRS	16.99	-15.03	3.38	0	-0.042
Western Drainages	INVRN	16.99	-15.03	3.38	0	0.042

Appendix II c. Final model equation and parameter estimates for each region modeled for channel catfish

General Model Equation: Mercury = Region + Length^2 + Region*Length^2

Region	Region Intercept	Length^2 Intercept	Region*Length^2 (slope)
Eastern Drainages	0.88	0.13	-0.20
Sacramento River	-1.08	0.13	0.08
Western Drainages	-0.69	0.13	0.00

	Task	Recommendation from PRP and SC	Response from Authors
1	Analysis	Were significant site differences due to the inclusion of larger fish at certain sites? Do the data presented in the maps reflect potenital size effects? Concern over the application of the EPA 75% rule. Evaluate effect of larger fish on estimates over using a pre-determined size range. A general discussion of the effect of size distributions on the observed differences is recommended.	Response to these comments was added to the discussion of mercury concentrations by species. We evaluated size limits and contribution of size to differences in mercury concentration in a number of ways. First, we seperated the size limit for each species into four categories, and evaluated the number of fish that fell within each category by region, site and species. Secondly, we evaluated whether the concentration category differed between fish at the low end of the size limit, relative to the high end. This was done by species and by site. Generally, a higher proportion of larger fish was not considered to contribute to spatial differences in mercury concentration. Although, for a few species there is a possibility for one concentration category difference between sites due to the effect of size, rather than actual site differences.
2	Analysis	Do the differences between locations shown in these maps reflect statistically significant results?	Maps do not represent statistical differences. No changes were made.
3	Analysis	What is the power of the test? What is the minimum difference in mercury concentrations that can be detected between locations or over time with the monitoring design utilized and the level of natural variability that exists in the dataset?	The implication of power to detect long-term trends will be evaluated in the modeling of inter-annual variation in the final report next year.
4	Analysis	Including additional factors on physical factors or processes specific to a waterbody may enhance the ability to predict mercury concentrations	We did not evaluate this. We do not feel there would be enough site specific information to do this in the current model. No changes were made.
5	Analysis	Future interpretation of biosentinel to sport fish relationships	Planned for final project report / journal publication
6	Analysis	Show correlation statistics for length:mercury relationships	A table of correlation statistics of length: mercury relationships was added.
7	Analysis/Reporting	Description of statistical models is not easily accessible to an audience with broader interests. Use additional description and graphics to show how the different types of data characteristics are accounted for. Graphics could include how a general linear model was modified to handle the additional types of data included.	This was not deemed a high priority at this time. No changes were made.
8	Reporting	It is not clear how coordination with other major science (etc.) is being implemented. A discussion of how that coordination will take place in the final report should be included.	This will be addressed by DHS-EHIB in a final project report. Text to clarify this was added to the Introduction.
9	Reporting	Discuss relevant hypotheses to explain trends in fish Hg, put results in context of ecosystem function. Include results from other Bay-Delta research projects.	We did this in the 2005 report. We do not feel there is any further work to be added at this time.
10	Reporting	What is the contribution of the samples from species caught in low numbers? What contribution do you think these samples have made to the FMP?	Species sampled in low numbers are not generally targeted by fishers. These data have been documented in tables and low high concentration maps if applicable. No changes were made.
11	Reporting	Further explanation and consistency in discussing "high" mercury concentrations would be useful.	High concentrations were defined better in the text.
12	Reporting	Definition of terms. Reference to portions of the watershed (upper, lower) need to be defined.	A description of the our defintions of different areas of the watershed was added.
13	Reporting	Color coding definition appear to be linked to consumption. Explain colors are used to facilitate interpretation and are different to those used by OEHHA	Text was modified. Next year's report will use a different color scheme to avoid confusion with OEHHA.
14	Reporting	Explanation of the goal of this report needs to be clarified.	Text was clarified
15	Reporting	Clarify ranking of species and sites in text.	Text was clarified
16	Reporting	Why is bluegill omitted as a species low in mercury	Bluegill was added to discussion of low mercury spp.
17	Reporting	Be more explicit in documenting what changes have been made in one component of the FMP based on results from another component. e.g., Fishing Activities report recommended sampling in non-traditional sites, every county, etc.	Adaptive management changes were made in the final 2005 report. Not applicable to 2006 report.