Prepared in cooperation with the
INTERAGENCY ECOLOGICAL PROGRAM

Chinese Mitten Crab Surveys of San Joaquin River Basin and Suisun Marsh, California, 2000

U.S. Geological Survey Open-File Report 01-396

U.S. DEPARTMENT OF THE INTERIOR
U.S. GEOLOGICAL SURVEY

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by Jason T. May[1] *and* Larry R. Brown[2]

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[1]California State University Sacramento Foundation, 6000 J Street, Sacramento, CA 95819-6129

[2] U.S. Geological Survey, 6000 J Street, Sacramento, CA 95819-6129

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U.S. DEPARTMENT OF THE INTERIOR
GALE A. NORTON, Secretary

U.S. Geological Survey
Charles G. Groat, Director

For additional information write to:

District Chief
U.S. Geological Survey
Water Resources Division
Placer Hall, 6000 J Street
Sacramento, California 95819-6129

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CONVERSION FACTORS, VERTICAL DATUM, ACRONYMS, AND ABBREVIATIONS

Multiply	By	To obtain
centimer (cm)	0.3937	inch (in.)
meter (m)	1.094	yard (yd)
millimeter (mm)	0.03937	inch

Temperature in degrees Celsius (°C) may be converted to degrees Fahrenheit (°F) as follows:
°F = 1.8(°C) + 32

Sea level: In this report "sea level" refers to the National Geodetic Vertical Datum of 1929 (NGVD of 1929)—a geodetic datum derived from a general adjustment of the first-order level nets of both the United States and Canada, formerly called Sea Level Datum of 1929.

Specific conductance is given in microsiemens per centimeter (µS/cm).

Concentrations of chemical constituents in water are given in milligrams per liter (mg/L).

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ABSTRACT

Juvenile Chinese mitten crabs (*Eriocheir sinensis*) are known to use both brackish and freshwater habitats as rearing areas. The objectives of this study were to examine the habitat use and potential effects of mitten crabs in the freshwater habitats of the San Joaquin River drainage upstream of the Sacramento–San Joaquin Delta. After several unsuccessful attempts to catch or observe mitten crabs by trapping, electrofishing, and visual observations, the study was redirected to determine the presence of crabs in the San Joaquin River (in the vicinity of Mossdale) and Suisun Marsh.

Monthly surveys using baited traps in the San Joaquin River were done from June through November 2000 and in the Suisun Marsh from August through October 2000. No mitten crabs were caught in the San Joaquin River Basin and only one mitten crab was caught in Suisun Marsh. Surveys were conducted at 92 locations in the San Joaquin River Basin by deploying 352 traps for 10,752 hours of trapping effort; in Suisun Marsh, 34 locations were investigated by deploying 150 traps for 3,600 hours of trapping effort. The baited traps captured a variety of organisms, including catfishes (Ictularidae), yellowfin gobies (*Acanthogobius flavimanus*), and crayfish (Decapoda). It is unclear whether the failure to capture mitten crabs in the San Joaquin River Basin and Suisun Marsh was due to ineffective trapping methods, or represents a general downward trend in populations of juvenile mitten crabs in these potential rearing areas or a temporary decline related to year-class strength. Available data (since 1998) on the number of mitten crabs entrained at federal and state fish salvage facilities indicate a downward trend in the number of crabs, which may indicate a declining trend in use of the San Joaquin River Basin by juvenile mitten crabs. Continued monitoring for juvenile Chinese mitten crabs in brackish and freshwater portions of the Sacramento–San Joaquin River Basins is needed to better assess the potential population variability of this relatively new invasive species and the possible management strategies.

INTRODUCTION

Since the discovery of the Chinese mitten crab (*Eriocheir sinensis*) in South San Francisco Bay in 1992, the range and density of the mitten crab have rapidly increased (Veldhuizen and Hieb, 1998). The main focus of research on the Chinese mitten crab has been within the Sacramento–San Joaquin Delta and South San Francisco Bay, with few studies of the upstream portion of the life cycle (Kathy Hieb, California Department of Fish and Game, written commun., 2000). A large portion of the *E. sinensis* population is catadromous, with individuals spending approximately 90 percent of their life cycle in brackish and freshwater habitats and then returning to estuaries or the ocean to spawn (Veldhuizen and Stanish, 1999).

To better understand the freshwater habits and distribution of mitten crabs and to evaluate its potential effects on the ecosystem, including the Sacramento and San Joaquin Rivers, Sacramento–San Joaquin Delta, and the San Francisco Bay, a U.S. Geological Survey (USGS) study focused on the following questions: What habitat types (for example, open channel, back waters, woody debris, rip-rap, floating and submerged aquatic vegetation, and others) does *E. sinensis* use in the freshwater portions of the San Joaquin River

drainage? What are the relative abundances of *E. sinensis* among habitat types? What is the distribution of *E. sinensis* in selected watersheds that are of concern because of anadromous fish species?

After several unsuccessful attempts to catch or observe mitten crabs by trapping, electrofishing, and visual observations in upstream areas, sampling efforts were redirected toward the lower San Joaquin River (in the vicinity of Mossdale) and Suisun Marsh. This report presents results from the USGS sampling for juvenile mitten crabs at 92 locations in San Joaquin River Basin and 34 locations in Suisun Marsh from June through November 2000 (fig. 1).

METHODS FOR COLLECTION AND ANALYSIS

The primary method to assess the presence of mitten crabs was baited traps. Rectangular-shaped traps were constructed of a vinyl coated high tensile steel

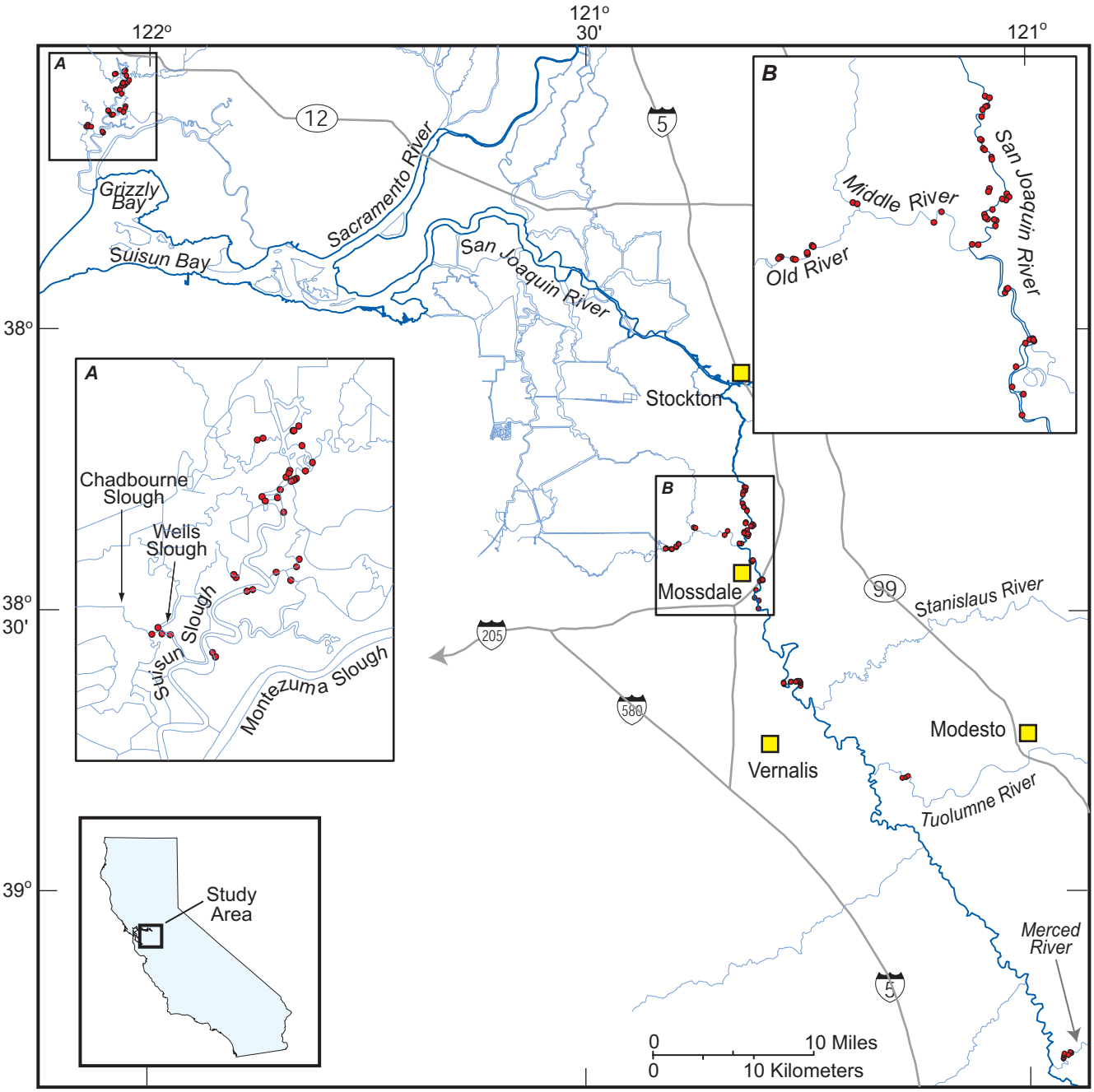

Figure 1. Map of Chinese mitten crab (*Eriocheir sinensis*) baited trap sampling locations within the San Joaquin River Basin and Suisun Marsh, California, 2000. (*A*) Suisun Marsh. (*B*) Lower San Joaquin River Basin.

frame with a 1.27 cm (0.5 in.) polyethylene mesh; overall dimensions of the traps were 61.0 × 45.7 × 20.3 cm (24 × 18 × 8 in.). These traps were similar to baited traps used by other mitten crab researchers in the Sacramento–San Joaquin Delta. Additional weights were added to the traps to ensure that they would stay on the bottom. These weights consisted of pieces of 1.27 cm (0.5 in.) diameter reinforcement bar (re-bar), zip-tied to the trap frame at both ends of the trap. The openings were modified with plastic zip-ties placed vertically across the opening approximately every 10 cm, to exclude larger organisms from the trap. Traps were baited with one Pacific sardine (*Sardinops sajax*) in a suspended bait bag. The traps were deployed by attaching a length of polyvinyl rope (5 or 7 m in length) to the trap with a single float at the opposite end. Traps were deployed at different depths within multiple habitat types, including open water, rip-rap, submerged woody debris, and emergent vegetation, for a minimum of 24 hours at monthly intervals. Captured organisms were held in water filled buckets until measured, then returned to the water alive.

Habitat parameters, including distance of traps from shore, substrate type, and habitat type, were visually estimated for each location. The depth of each trapping location was determined by a handheld depth finder. The latitude and longitude of each location was recorded by a global positioning system unit and compared with USGS 1:24,000 quadrangle maps to ensure proper placement of trapping locations on maps.

During most site visits, water samples were collected to determine general water-quality parameters such as specific conductance (in microsiemens per centimeter), dissolved oxygen (in milligrams per liter), and water temperature (Celsius). Water-quality characteristics were measured with electronic meters.

On a limited basis, beach seining and backpack electrofishing were used as supplemental techniques to determine whether mitten crabs were present and to verify the efficacy of baited traps. The beach seine used for this study was 15 m long with 6 mm mesh.

MITTEN CRAB SURVEYS IN THE SAN JOAQUIN RIVER BASIN AND SUISUN MARSH

Monthly surveys using baited traps in the San Joaquin River were undertaken from June through November 2000 and in the Suisun Marsh from August through October 2000. No mitten crabs were caught in the San Joaquin River Basin, and only one mitten crab was caught in Suisun Marsh (Chadborne Slough). Surveys were conducted at 92 locations in the San Joaquin River Basin by deploying 352 traps for 10,752 hours of trapping effort; in Suisun Marsh a total of 34 locations were investigated by deploying 150 traps for 3,600 hours of trapping effort. Most trapping locations were near-shore areas less than 2 m deep (table 1). Although only one mitten crab was caught by the baited traps in this study, these traps were successful at capturing a variety of organisms, including 2 species of crayfish, 12 species of fish, and 2 species of crabs (table 2).

Water-quality conditions varied among sites (table 3). Specific conductance was most variable ranging from 106 µS/cm at the Dry Creek near Modesto to 15,800 µS/cm for a sampling location in the tidally influence Suisun Marsh.

Supplemental efforts of beach seining and backpack electrofishing (tables 4 and 5, respectively) were only appropriate at a very limited number of locations within the study area. These methods yielded a variety of fish species and crayfish, but no mitten crabs.

Because of the limited results, this study was unable to determine whether juvenile Chinese mitten crabs presently inhabit the freshwater part of the San Joaquin River Basin. The absence of captures in the lower San Joaquin River and the single crab captured in the Suisun Marsh suggest low numbers throughout the Delta. Data (since 1998) from the state and federal fish salvage facilities on the number of mitten crab entrained show a reduction in their abundance (California Department of Fish and Game, accessed March 1, 2001). This result is complicated by the installation of new screening equipment intended to keep mitten crabs out of the fish salvage. Data from previous studies in the Suisun Marsh, and ongoing otter trawl monitoring programs by the state agencies and universities, also indicate a drop in the number of mitten crabs being caught; from high levels in 1998, mitten crabs continue to be captured consistently in low numbers (Kathy Hieb, California Department of Fish and Game, written commun., 2001). It is unclear whether the failure to capture mitten crabs in the San Joaquin River Basin and the Suisun Marsh represents ineffective trapping methods, a general downward trend in populations of juvenile mitten crabs using these potential rearing areas, a temporary decline in population related to year-class strength, or a population-wide decline.

Continued monitoring of Chinese mitten crabs in freshwater habitats is necessary to detect future increases in the range or abundance of crabs and to better understand the ecology of this invading species in the Sacramento–San Joaquin River estuary system. Future efforts to assess the presence and population abundances of mitten crabs should use multiple techniques. The fact that the baited traps were successful at capturing a variety of other organisms suggests that

they would have captured mitten crabs if they had been present at the trapping sites.

SUMMARY AND CONCLUSIONS

This study caught no mitten crabs in the San Joaquin River Basin, and only one mitten crab in Suisun Marsh during the summer and autumn 2000. Apparently, because of low mitten crab populations, there was little potential for significant interactions between upstream migrating juvenile mitten crabs and juvenile anadromous fishes in 2000. Future sampling for mitten crabs should include multiple methods. Continued monitoring efforts are necessary to better understand the current and future status of the Chinese mitten crab population in the Sacramento–San Joaquin River estuary system.

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Table 1. Data for baited trap sampling locations from areas in the San Joaquin River Basin and Suisun Marsh, California, 2000

[Associated error (in depth), average depth, and estimated distance from shore are given in meters]

Location	Date	Number of traps	Trapping effort (hours)	Latitude			Longitude			Error	Habitat type	Average depth	Estimated distance from shore	Substrate type
				Degrees	Minutes	Seconds	Degrees	Minutes	Seconds					
San Joaquin River near Vernalis	6/8/00	3	48	37	41	16.3	121	15	36.4	7	Rip rap	0.61	1	sand
	6/8/00	2	48	37	41	14	121	16	2.1	7	Open water	0.30	20	sand
	6/8/00	2	48	37	41	14	121	16	2.1	7	Open water	1.22	20	sand
	6/8/00	2	48	37	41	14	121	16	2.1	7	Open water	2.74	5	sand
	6/8/00	3	48	37	41	6.4	121	16	30.5	5	Back water	1.22	10	sand
	6/8/00	3	48	37	41	16	121	15	26.2	8	Woody debris	1.31	3	sand
	6/8/00	3	48	37	41	13.3	121	15	24.3	6	Woody debris	1.31	2	sand
	6/8/00	3	48	37	41	9.8	121	15	22.2	6	Rip rap	0.70	2	sand
	6/8/00	3	48	37	41	0.3	121	15	22.3	8	Back water	0.52	2	sand
Merced River near River Road	6/8/00	3	48	37	21	17.4	120	57	38.1	8	Rip rap	0.82	1	sand
	6/8/00	3	48	37	21	19.7	120	57	32.7	8	Woody debris	1.43	3	sand
	6/8/00	3	48	37	21	26.1	120	57	33.3	8	Woody debris	0.91	3	sand
	6/8/00	3	48	37	21	29.7	120	57	32.8	8	Back water	0.61	2	sand
	6/8/00	3	48	37	21	29.7	120	57	32.3	8	Back water	2.35	3	sand
	6/8/00	3	48	37	21	27.2	120	57	16.8	8	Open water	0.61	2	sand
	6/8/00	3	48	37	21	28.3	120	57	13.6	8	Open water	0.61	2	sand
	6/8/00	3	48	37	21	33.7	120	57	6.9	8	Rip rap	0.82	2	sand
	6/28/00	3	48	37	21	34.9	120	57	9.5	8	Open water	0.61	15	sand
	6/28/00	3	48	37	21	34.9	120	57	10	8	Rip rap	0.61	1	sand
	6/28/00	3	48	37	21	29.3	120	57	13.9	5	Open water	0.30	6	sand
	6/28/00	3	48	37	21	27.7	120	57	15.8	6	Woody debris	0.61	2	sand
	6/28/00	3	48	37	21	29.1	120	57	33.1	5	Back water	1.37	8	sand
	6/28/00	3	48	37	21	19.7	120	57	33.1	5	Woody debris	0.76	3	sand
	6/28/00	3	48	37	21	18.6	120	57	37.7	7	Back water	0.76	2	sand
	6/28/00	3	48	37	21	15.2	120	57	37	5	Rip rap	0.61	1	sand
San Joaquin River near Vernalis	6/29/00	3	48	37	41	8.5	121	15	22.9	10	Rip rap	0.76	1	sand
	6/29/00	3	48	37	41	13.3	121	15	26.8	6	Open water	1.22	5	sand
	6/29/00	3	48	37	41	12.6	121	15	26.6	8	Woody debris	0.76	3	sand
	6/29/00	3	48	37	41	16.4	121	15	28.8	5	Woody debris	0.91	3	sand
	6/29/00	3	48	37	41	15.7	121	15	37.4	5	Rip rap	0.76	1	sand
	6/29/00	3	48	37	41	13.4	121	15	42.6	4	Open water	0.76	5	sand
	6/29/00	3	48	37	41	12.2	121	16	31.8	4	Back water	0.76	1	sand
	6/29/00	3	48	37	41	9.1	121	16	31.7	4	Back water	0.76	5	sand

Table 1. Data for baited trap sampling locations from areas in the San Joaquin River Basin and Suisun Marsh, California, 2000—*Continued*

Location	Date	Number of traps	Trapping effort (hours)	Latitude			Longitude			Error	Habitat type	Average depth	Estimated distance from shore	Substrate type
				Degrees	Minutes	Seconds	Degrees	Minutes	Seconds					
Tuolumne River near Shiloh Road	6/29/00	4	24	37	36	4.9	121	8	26.4	11	Woody debris	1.22	1	sand/silt
	6/29/00	3	24	37	36	7.5	121	8	11.3	5	Woody debris	1.22	1	sand/silt
	6/29/00	3	24	37	36	11.5	121	8	3	8	Rip rap	1.52	2	rip rap/sand
San Joaquin River near Mossdale	7/6/00	3	24	37	48	36.1	121	19	23.4	5	Rip rap	1.83	2	rip rap/sand
	7/6/00	3	24	37	48	59.5	121	18	56.3	6	Woody debris/open water	2.44	15	sand
	7/6/00	3	24	37	48	36.6	121	19	32.4	7	Woody debris	0.91	2	sand
	7/6/00	3	24	37	49	5.5	121	18	55.2	5	Rip rap	0.91	2	rip rap/sand
	7/6/00	3	24	37	49	3.4	121	20	32.8	4	Rip rap	1.22	3	rip rap/sand
	7/6/00	3	24	37	49	16.4	121	20	20.9	4	Rip rap	1.22	3	rip rap/sand
	7/6/00	3	24	37	45	34.2	121	18	12.6	7	Back water	1.22	2	sand
	7/6/00	3	24	37	45	42.9	121	18	30.4	7	Woody debris	0.91	2	sand
	7/6/00	3	24	37	45	8.7	121	18	15.1	5	Rip rap	1.22	2	rip rap/sand
	7/6/00	3	24	37	46	41.6	121	17	58.4	6	Rip rap	1.52	2	rip rap/sand
	7/6/00	3	24	37	46	36.1	121	18	9.7	4	Open water	1.52	15	sand
	7/6/00	3	24	37	46	40.3	121	18	2.7	5	Woody debris	0.91	2	sand
	8/3/00	6	24	37	49	28	121	22	39.2	8	Back water	1.52	2	silt/sand
	8/3/00	6	24	37	49	26.4	121	22	32.4	6	Back water	1.22	2	silt/sand
	8/3/00	6	24	37	48	21.5	121	24	31.8	7	Back water	0.91	5	silt/sand
	8/3/00	6	24	37	48	18.2	121	24	11.1	5	Rip rap	3.05	2	rip rap/sand
	8/3/00	6	24	37	48	34.5	121	23	42.9	4	Emergent vegetation	0.61	7	silt/sand
San Joaquin River near Mossdale	8/3/00	3	24	37	49	38.1	121	18	38.1	5	Emergent vegetation	0.61	2	silt/sand
	8/3/00	3	24	37	49	34.3	121	18	35	5	Rip rap	1.52	2	rip rap/sand
	8/3/00	3	24	37	49	30.2	121	18	39.2	6	Rip rap	1.83	2	rip rap/sand
	8/3/00	6	24	37	49	32.3	121	18	45.5	5	Rip rap	1.83	2	rip rap/sand
	8/3/00	6	24	37	49	19.2	121	19	0.7	7	Rip rap	1.52	3	rip rap/sand
	8/3/00	6	24	37	49	9.3	121	19	12.3	4	Rip rap	1.52	3	rip rap/sand
	8/3/00	3	24	37	49	11.3	121	19	12.2	6	Woody debris	1.83	5	silt/sand

Table 1. Data for baited trap sampling locations from areas in the San Joaquin River Basin and Suisun Marsh, California, 2000—*Continued*

Location	Date	Number of traps	Trapping effort (hours)	Latitude			Longitude			Error	Habitat type	Average depth	Estimated distance from shore	Substrate type
				Degrees	Minutes	Seconds	Degrees	Minutes	Seconds					
San Joaquin River near Mossdale	8/30/00	6	24	37	48	21.6	121	24	34.3	6	Back water	1.22	2	silt/sand
	8/30/00	6	24	37	48	19.4	121	24	36.5	5	Back water	1.22	2	silt/sand
	8/30/00	3	24	37	48	19	121	24	13.2	6	Rip rap	1.52	3	rip rap/sand
	8/30/00	3	24	37	48	18.4	121	24	9.8	5	Rip rap	2.13	3	rip rap/sand
	8/30/00	3	24	37	48	25.2	121	23	51	6	Rip rap	1.83	2	rip rap/sand
	8/30/00	3	24	37	48	26.9	121	23	51.3	6	Rip rap	1.83	2	rip rap/sand
	8/30/00	3	24	37	48	35.8	121	23	43.5	6	Emergent vegetation	0.91	2	sand/silt
	8/30/00	3	24	37	48	34.3	121	23	41.4	6	Emergent vegetation	0.91	2	sand/silt
Suisun Marsh	8/30/00	5	24	38	11	34.7	122	2	53.8	4	Emergent vegetation	3.05	1	silt/sand
	8/30/00	5	24	38	11	36.9	122	2	56.9	4	Emergent vegetation	3.05	1	silt/sand
	8/30/00	5	24	38	12	44.8	122	2	25.8	7	Emergent vegetation	1.22	2	silt/sand
	8/30/00	5	24	38	12	40.7	122	2	21.9	10	Emergent vegetation	1.83	1	silt/sand
	8/30/00	5	24	38	13	34.6	122	2	25.2	6	Emergent vegetation	4.57	3	silt/sand
	8/30/00	5	24	38	13	33.1	122	2	31.3	8	Emergent vegetation	3.05	1	silt/sand
	9/27/00	5	24	38	13	41.6	122	1	51.7	4	Rip rap/emergent vegetation	1.22	1	silt/sand
	9/27/00	5	24	38	13	45.7	122	1	44.9	6	Rip rap/emergent vegetation	1.22	1	silt/sand
	9/27/00	5	24	38	13	42	122	1	50.6	5	Rip rap/emergent vegetation	1.22	1	silt/sand
	9/27/00	5	24	38	11	22.9	122	2	41.6	4	Emergent vegetation	1.52	2	silt/sand
	9/27/00	5	24	38	11	24.3	122	2	35	4	Emergent vegetation	1.52	2	silt/sand
	9/27/00	2	24	38	13	0.3	122	1	47.3	6	Emergent vegetation	0.91	2	silt/sand
	9/27/00	2	24	38	12	59.4	122	1	49.5	5	Emergent vegetation	0.30	2	silt/sand
	9/27/00	2	24	38	12	59.5	122	1	50.6	4	Emergent vegetation	0.91	2	silt/sand
	9/27/00	2	24	38	12	58	122	1	53.1	4	Emergent vegetation	0.91	2	silt/sand
	9/27/00	3	24	38	13	1.4	122	1	58.8	4	Emergent vegetation	1.22	2	silt/sand
	9/27/00	2	24	38	13	6.9	122	1	54.3	7	Emergent vegetation	2.13	2	silt/sand
	9/27/00	2	24	38	13	4.8	122	1	55.4	8	Emergent vegetation	1.22	2	silt/sand
	9/27/00	5	24	38	11	51.1	122	1	43.3	8	Emergent vegetation	1.52	1	silt/sand
	9/27/00	5	24	38	11	44	122	1	46.7	5	Emergent vegetation	2.13	2	silt/sand
	9/27/00	5	24	38	11	32.8	122	1	53.2	4	Emergent vegetation	1.83	1	silt/sand
	9/27/00	5	24	38	11	39.5	122	2	9.4	4	Emergent vegetation	2.13	2	silt/sand

Table 1. Data for baited trap sampling locations from areas in the San Joaquin River Basin and Suisun Marsh, California, 2000—*Continued*

Location	Date	Number of traps	Trapping effort (hours)	Latitude			Longitude			Error	Habitat type	Average depth	Estimated distance from shore	Substrate type
				Degrees	Minutes	Seconds	Degrees	Minutes	Seconds					
San Joaquin River near Mossdale	9/29/00	5	24	37	49	13.1	121	19	13.14	6	Open water	2.13	10	silt/sand
	9/29/00	5	24	37	49	7.5	121	19	8.9	5	Rip rap	1.52	8	rip rap/sand
	9/29/00	5	24	37	49	9.4	121	19	11.8	5	Rip rap	1.52	8	rip rap/sand
	9/29/00	5	24	37	49	7.1	121	18	57.8	4	Open water	1.52	8	silt/sand
	9/29/00	5	24	37	49	44.3	121	19	5.8	4	Open water	1.83	10	silt/sand
	9/29/00	5	24	37	49	41.2	121	19	7.4	5	Rip rap	2.44	1	silt/sand
	9/29/00	5	24	37	46	38.4	121	17	56	4	Back water/rip rap	0.91	10	silt/sand
	9/29/00	5	24	37	46	40.1	121	17	57.1	4	Back water/rip rap	2.74	10	silt/sand
	9/29/00	5	24	37	46	7.3	121	18	24	5	Open water	2.13	50	silt/sand
	9/29/00	5	24	37	47	37.7	121	18	40.9	7	Natural bank/ open water	1.22	7	silt/sand
	9/29/00	5	24	37	47	42.3	121	18	38.5	7	Natural bank/ open water	2.74	5	silt/sand
	9/29/00	5	24	37	47	43.2	121	18	36.9	9	Natural bank/ open water	1.22	2	silt/sand
Suisun Marsh	10/11/00	5	24	38	10	45.2	122	4	27.2	4	Emergent vegetation	2.44	7	silt/sand
	10/11/00	5	24	38	10	51.1	122	4	20.8	4	Emergent vegetation	1.83	5	silt/sand
	10/11/00	5	24	38	10	45.8	122	4	15.9	7	Emergent vegetation	2.74	15	silt/sand
	10/11/00	5	24	38	10	44.7	122	4	6.9	11	Emergent vegetation	1.52	7	silt/sand
	10/11/00	5	24	38	10	26.4	122	3	16.5	7	Emergent vegetation	1.22	1	silt/sand
	10/11/00	5	24	38	10	30.1	122	3	19.5	7	Rip rap/emergent vegetation	1.52	7	silt/sand
	10/11/00	5	24	38	13	6.7	122	1	37.5	4	Emergent vegetation	2.13	10	silt/sand
	10/11/00	5	24	38	13	14.2	122	1	29.4	5	Open water/ emergent vegetation	1.52	20	silt/sand
	10/11/00	5	24	38	12	50.3	122	2	5.1	4	Natural bank/open water	1.83	15	silt/sand
	10/11/00	5	24	38	13	28.8	122	1	41.2	5	Rip rap/emergent vegetation	1.52	15	silt/sand
	10/11/00	5	24	38	12	43.9	122	2	8.1	4	Emergent vegetation	2.13	8	silt/sand
	10/11/00	5	24	38	12	31.3	122	2	0.8	4	Emergent vegetation	1.83	5	silt/sand

Table 1. Data for baited trap sampling locations from areas in the San Joaquin River Basin and Suisun Marsh, California, 2000—*Continued*

Location	Date	Number of traps	Trapping effort (hours)	Latitude			Longitude			Error	Habitat type	Average depth	Estimated distance from shore	Substrate type
				Degrees	Minutes	Seconds	Degrees	Minutes	Seconds					
San Joaquin River near Mossdale	11/1/00	5	24	37	51	37.4	121	19	11.9	4	Rip rap/emergent vegetation	0.91	5	silt/sand
	11/1/00	5	24	37	51	35.3	121	19	5.5	6	Rip rap	2.13	4	silt/sand
	11/1/00	5	24	37	51	25.1	121	19	9	7	Rip rap	0.61	5	silt/sand
	11/1/00	5	24	37	51	24.6	121	19	11.1	5	Rip rap	3.05	10	silt/sand
	11/1/00	5	24	37	51	20.9	121	19	15.8	5	Woody debris	1.83	7	silt/sand
	11/1/00	5	24	37	51	12.4	121	19	17.7	5	Rip rap	2.74	7	silt/sand
	11/1/00	5	24	37	50	43.5	121	19	17.9	4	Rip rap	1.52	2	silt/sand
	11/1/00	5	24	37	50	45	121	19	19.6	5	Rip rap	1.52	2	silt/sand
	11/1/00	5	24	37	50	33.7	121	19	15.4	5	Woody debris	1.52	6	silt/sand
	11/1/00	5	24	37	50	31.8	121	19	12.8	5	Woody debris	1.22	6	silt/sand
	11/1/00	5	24	37	50	22.8	121	19	1.8	5	Rip rap	1.83	7	silt/sand
	11/1/00	5	24	37	50	20.4	121	19	1.4	5	Rip rap	2.13	7	silt/sand

Table 2. Data for catch from bait trapping efforts in areas in the San Joaquin River Basin and Suisun Marsh, California, 2000

[m, meter; mm, millimeter. *NM, no measurement; —, no data available]

Location	Date	Number	Trapping effort (hours)	Latitude			Longitude			Error (m)	Common name	Species	Crab carapace width (mm)	Fish total length (mm)	Crayfish carapace length (mm)	Crayfish carapace width (mm)	Number unidentified jelly species	Number unidentified shrimp species
				Degrees	Minutes	Seconds	Degrees	Minutes	Seconds									
San Joaquin River near Vernalis	6/8/00	3	48	37	41	6.4	121	16	30.5	5	Black bullhead	*Ameiurus melas*	—	214	—	—	—	—
	6/8/00	3	48	37	41	6.4	121	16	30.5	5	Black bullhead	*Ameiurus melas*	—	228	—	—	—	—
	6/8/00	3	48	37	41	6.4	121	16	30.5	5	Black bullhead	*Ameiurus melas*	—	243	—	—	—	—
	6/8/00	3	48	37	41	6.4	121	16	30.5	5	Black bullhead	*Ameiurus melas*	—	230	—	—	—	—
	6/8/00	3	48	37	41	6.4	121	16	30.5	5	Black bullhead	*Ameiurus melas*	—	250	—	—	—	—
	6/8/00	3	48	37	41	6.4	121	16	30.5	5	Black bullhead	*Ameiurus melas*	—	240	—	—	—	—
	6/8/00	3	48	37	41	6.4	121	16	30.5	5	Black bullhead	*Ameiurus melas*	—	140	—	—	—	—
	6/8/00	3	48	37	41	6.4	121	16	30.5	5	Black bullhead	*Ameiurus melas*	—	240	—	—	—	—
	6/8/00	3	48	37	41	6.4	121	16	30.5	5	Black bullhead	*Ameiurus melas*	—	259	—	—	—	—
	6/8/00	3	48	37	41	6.4	121	16	30.5	5	Black bullhead	*Ameiurus melas*	—	259	—	—	—	—
	6/8/00	3	48	37	41	6.4	121	16	30.5	5	Black bullhead	*Ameiurus melas*	—	237	—	—	—	—
	6/8/00	3	48	37	41	6.4	121	16	30.5	5	Black bullhead	*Ameiurus melas*	—	236	—	—	—	—
	6/8/00	3	48	37	41	0.3	121	15	22.3	8	Black bullhead	*Ameiurus melas*	—	235	—	—	—	—
	6/8/00	3	48	37	41	0.3	121	15	22.3	8	Black bullhead	*Ameiurus melas*	—	185	—	—	—	—
Merced River near River Road	6/8/00	3	48	37	21	29.7	120	57	32.3	8	Black bullhead	*Ameiurus melas*	—	262	—	—	—	—
	6/8/00	3	48	37	21	29.7	120	57	32.3	8	Black bullhead	*Ameiurus melas*	—	285	—	—	—	—
	6/8/00	3	48	37	21	29.7	120	57	32.3	8	Red swamp crayfish	*Procambarus clarki*	—	—	35	11	—	—
	6/8/00	3	48	37	21	27.2	120	57	16.8	8	Channel catfish	*Ictalurus punctatus*	—	472	—	—	—	—
	6/8/00	3	48	37	21	28.3	120	57	13.6	8	Channel catfish	*Ictalurus punctatus*	—	391	—	—	—	—
	6/8/00	3	48	37	21	28.3	120	57	13.6	8	Channel catfish	*Ictalurus punctatus*	—	455	—	—	—	—
	6/8/00	3	48	37	21	28.3	120	57	13.6	8	Channel catfish	*Ictalurus punctatus*	—	382	—	—	—	—
	6/8/00	3	48	37	21	28.3	120	57	13.6	8	Channel catfish	*Ictalurus punctatus*	—	493	—	—	—	—
	6/8/00	3	48	37	21	33.7	120	57	6.9	8	Channel catfish	*Ictalurus punctatus*	—	386	—	—	—	—
	6/8/00	3	48	37	21	33.7	120	57	6.9	8	Channel catfish	*Ictalurus punctatus*	—	410	—	—	—	—
	6/8/00	3	48	37	21	33.7	120	57	6.9	8	Channel catfish	*Ictalurus punctatus*	—	468	—	—	—	—
	6/8/00	3	48	37	21	33.7	120	57	6.9	8	Channel catfish	*Ictalurus punctatus*	—	340	—	—	—	—
	6/8/00	3	48	37	21	33.7	120	57	6.9	8	Channel catfish	*Ictalurus punctatus*	—	492	—	—	—	—
	6/8/00	3	48	37	21	33.7	120	57	6.9	8	Channel catfish	*Ictalurus punctatus*	—	326	—	—	—	—
	6/8/00	3	48	37	21	33.7	120	57	6.9	8	Green sunfish	*Lepomis cyanellus*	—	*NM	—	—	—	—

Table 2. Data for catch from bait trapping efforts in areas in the San Joaquin River Basin and Suisun Marsh, California, 2000—*Continued*

Location	Date	Number	Trapping effort (hours)	Latitude			Longitude			Error (m)	Common name	Species	Crab carapace width (mm)	Fish total length (mm)	Crayfish carapace length (mm)	Crayfish carapace width (mm)	Number unidentified jelly species	Number unidentified shrimp species
				Degrees	Minutes	Seconds	Degrees	Minutes	Seconds									
Merced River near River Road—*Continued*	6/28/00	3	48	37	21	34.9	120	57	9.5	8	Channel catfish	*Ictalurus punctatus*	—	480	—	—	—	—
	6/28/00	3	48	37	21	34.9	120	57	9.5	8	Channel catfish	*Ictalurus punctatus*	—	600	—	—	—	—
	6/28/00	3	48	37	21	34.9	120	57	10	8	Channel catfish	*Ictalurus punctatus*	—	289	—	—	—	—
	6/28/00	3	48	37	21	34.9	120	57	10	8	Channel catfish	*Ictalurus punctatus*	—	403	—	—	—	—
	6/28/00	3	48	37	21	34.9	120	57	10	8	Red swamp crayfish	*Procambarus clarki*	—	—	45	14	—	—
	6/28/00	3	48	37	21	34.9	120	57	10	8	Red swamp crayfish	*Procambarus clarki*	—	—	45	13	—	—
	6/28/00	3	48	37	21	34.9	120	57	10	8	Red swamp crayfish	*Procambarus clarki*	—	—	36	14	—	—
	6/28/00	3	48	37	21	34.9	120	57	10	8	Red swamp crayfish	*Procambarus clarki*	—	—	35	12	—	—
	6/28/00	3	48	37	21	34.9	120	57	10	8	Red swamp crayfish	*Procambarus clarki*	—	—	42	14	—	—
	6/28/00	3	48	37	21	29.3	120	57	13.9	5	Channel catfish	*Ictalurus punctatus*	—	*NM	—	—	—	—
	6/28/00	3	48	37	21	29.3	120	57	13.9	5	Channel catfish	*Ictalurus punctatus*	—	329	—	—	—	—
	6/28/00	3	48	37	21	29.3	120	57	13.9	5	Channel catfish	*Ictalurus punctatus*	—	409	—	—	—	—
	6/28/00	3	48	37	21	27.7	120	57	15.8	6	Channel catfish	*Ictalurus punctatus*	—	387	—	—	—	—
	6/28/00	3	48	37	21	27.7	120	57	15.8	6	Channel catfish	*Ictalurus punctatus*	—	600	—	—	—	—
	6/28/00	3	48	37	21	29.1	120	57	33.1	5	Black bullhead	*Ameiurus melas*	—	167	—	—	—	—
	6/28/00	3	48	37	21	29.1	120	57	33.1	5	Black bullhead	*Ameiurus melas*	—	130	—	—	—	—
	6/28/00	3	48	37	21	29.1	120	57	33.1	5	Red swamp crayfish	*Procambarus clarki*	—	—	42	15	—	—
	6/28/00	3	48	37	21	19.7	120	57	33.1	5	Bluegill	*Lepomis macrochirus*	—	78	—	—	—	—
	6/28/00	3	48	37	21	19.7	120	57	33.1	5	Bluegill	*Lepomis macrochirus*	—	85	—	—	—	—
	6/28/00	3	48	37	21	19.7	120	57	33.1	5	Channel catfish	*Ictalurus punctatus*	—	204	—	—	—	—
	6/28/00	3	48	37	21	18.6	120	57	37.7	7	Bluegill	*Lepomis macrochirus*	—	90	—	—	—	—
	6/28/00	3	48	37	21	18.6	120	57	37.7	7	Red swamp crayfish	*Procambarus clarki*	—	—	49	16	—	—
	6/28/00	3	48	37	21	18.6	120	57	37.7	7	Red swamp crayfish	*Procambarus clarki*	—	—	45	11	—	—
	6/28/00	3	48	37	21	18.6	120	57	37.7	7	Red swamp crayfish	*Procambarus clarki*	—	—	32	11	—	—
	6/28/00	3	48	37	21	18.6	120	57	37.7	7	Red swamp crayfish	*Procambarus clarki*	—	—	43	14	—	—
	6/28/00	3	48	37	21	18.6	120	57	37.7	7	Red swamp crayfish	*Procambarus clarki*	—	—	27	9	—	—
	6/28/00	3	48	37	21	15.2	120	57	37	5	Channel catfish	*Ictalurus punctatus*	—	560	—	—	—	—
	6/28/00	3	48	37	21	15.2	120	57	37	5	Channel catfish	*Ictalurus punctatus*	—	365	—	—	—	—
	6/28/00	3	48	37	21	15.2	120	57	37	5	Channel catfish	*Ictalurus punctatus*	—	343	—	—	—	—
	6/28/00	3	48	37	21	15.2	120	57	37	5	Channel catfish	*Ictalurus punctatus*	—	402	—	—	—	—
	6/28/00	3	48	37	21	15.2	120	57	37	5	Channel catfish	*Ictalurus punctatus*	—	306	—	—	—	—
	6/28/00	3	48	37	21	15.2	120	57	37	5	Channel catfish	*Ictalurus punctatus*	—	279	—	—	—	—

Table 2. Data for catch from bait trapping efforts in areas in the San Joaquin River Basin and Suisun Marsh, California, 2000—*Continued*

Location	Date	Number	Trapping effort (hours)	Latitude			Longitude			Error (m)	Common name	Species	Crab carapace width (mm)	Fish total length (mm)	Crayfish carapace length (mm)	Crayfish carapace width (mm)	Number unidentified jelly species	Number unidentified shrimp species
				Degrees	Minutes	Seconds	Degrees	Minutes	Seconds									
Merced River near River Road—*Continued*	6/28/00	3	48	37	21	15.2	120	57	37	5	Channel catfish	*Ictalurus punctatus*	—	375	—	—	—	—
	6/28/00	3	48	37	21	15.2	120	57	37	5	Channel catfish	*Ictalurus punctatus*	—	370	—	—	—	—
	6/28/00	3	48	37	21	15.2	120	57	37	5	Red swamp crayfish	*Procambarus clarki*	—	—	41	13	—	—
	6/28/00	3	48	37	21	15.2	120	57	37	5	Red swamp crayfish	*Procambarus clarki*	—	—	48	14	—	—
	6/28/00	3	48	37	21	15.2	120	57	37	5	Red swamp crayfish	*Procambarus clarki*	—	—	42	15	—	—
	6/28/00	3	48	37	21	15.2	120	57	37	5	Red swamp crayfish	*Procambarus clarki*	—	—	41	14	—	—
Tuolumne River near Shiloh Road	6/29/00	4	24	37	36	4.9	121	8	26.4	11	White catfish	*Ameiurus catus*	—	210	—	—	—	—
	6/29/00	4	24	37	36	4.9	121	8	26.4	11	Signal crayfish	*Pasifastacus leniusculus*	—	—	50	15	—	—
	6/29/00	3	24	37	36	7.5	121	8	11.3	5	Signal crayfish	*Pasifastacus leniusculus*	—	—	43	14	—	—
	6/29/00	3	24	37	36	7.5	121	8	11.3	5	Signal crayfish	*Pasifastacus leniusculus*	—	—	39	10	—	—
	6/29/00	3	24	37	36	7.5	121	8	11.3	5	Signal crayfish	*Pasifastacus leniusculus*	—	—	45	12	—	—
	6/29/00	3	24	37	36	7.5	121	8	11.3	5	Signal crayfish	*Pasifastacus leniusculus*	—	—	53	15	—	—
	6/29/00	3	24	37	36	7.5	121	8	11.3	5	Signal crayfish	*Pasifastacus leniusculus*	—	—	58	16	—	—
	6/29/00	3	24	37	36	11.5	121	8	3	8	Signal crayfish	*Pasifastacus leniusculus*	—	—	42	10	—	—
	6/29/00	3	24	37	36	11.5	121	8	3	8	Signal crayfish	*Pasifastacus leniusculus*	—	—	52	14	—	—
	6/29/00	3	24	37	36	11.5	121	8	3	8	Signal crayfish	*Pasifastacus leniusculus*	—	—	55	15	—	—
	6/29/00	3	24	37	36	11.5	121	8	3	8	Signal crayfish	*Pasifastacus leniusculus*	—	—	53	14	—	—
	6/29/00	3	24	37	36	11.5	121	8	3	8	Signal crayfish	*Pasifastacus leniusculus*	—	—	49	13	—	—
	6/29/00	3	24	37	36	11.5	121	8	3	8	Signal crayfish	*Pasifastacus leniusculus*	—	—	46	12	—	—
	6/29/00	3	24	37	36	11.5	121	8	3	8	Signal crayfish	*Pasifastacus leniusculus*	—	—	47	11	—	—
	6/29/00	3	24	37	36	11.5	121	8	3	8	Signal crayfish	*Pasifastacus leniusculus*	—	—	48	14	—	—
	6/29/00	3	24	37	36	11.5	121	8	3	8	Signal crayfish	*Pasifastacus leniusculus*	—	—	48	14	—	—
	6/29/00	3	24	37	36	11.5	121	8	3	8	Signal crayfish	*Pasifastacus leniusculus*	—	—	43	13	—	—
	6/29/00	3	24	37	36	11.5	121	8	3	8	Signal crayfish	*Pasifastacus leniusculus*	—	—	42	11	—	—
	6/29/00	3	24	37	36	11.5	121	8	3	8	Signal crayfish	*Pasifastacus leniusculus*	—	—	42	11	—	—
	6/29/00	3	24	37	36	11.5	121	8	3	8	Signal crayfish	*Pasifastacus leniusculus*	—	—	35	10	—	—

Table 2. Data for catch from bait trapping efforts in areas in the San Joaquin River Basin and Suisun Marsh, California, 2000—*Continued*

Location	Date	Number	Trapping effort (hours)	Latitude			Longitude			Error (m)	Common name	Species	Crab carapace width (mm)	Fish total length (mm)	Crayfish carapace length (mm)	Crayfish carapace width (mm)	Number unidentified jelly species	Number unidentified shrimp species
				Degrees	Minutes	Seconds	Degrees	Minutes	Seconds									
San Joaquin River near Mossdale	7/6/00	3	24	37	45	34.2	121	18	12.6	7	Black bullhead	*Ameiurus melas*	—	*NM	—	—	—	—
	7/6/00	3	24	37	45	34.2	121	18	12.6	7	Black bullhead	*Ameiurus melas*	—	*NM	—	—	—	—
	7/6/00	3	24	37	45	34.2	121	18	12.6	7	Black bullhead	*Ameiurus melas*	—	*NM	—	—	—	—
	7/6/00	3	24	37	45	34.2	121	18	12.6	7	Black bullhead	*Ameiurus melas*	—	*NM	—	—	—	—
	7/6/00	3	24	37	45	34.2	121	18	12.6	7	Black bullhead	*Ameiurus melas*	—	*NM	—	—	—	—
	7/6/00	3	24	37	46	41.6	121	17	58.4	6	Bluegill	*Lepomis macrochirus*	—	*NM	—	—	—	—
	7/6/00	3	24	37	46	36.1	121	18	9.7	4	Bluegill	*Lepomis macrochirus*	—	*NM	—	—	—	—
	7/6/00	3	24	37	46	36.1	121	18	9.7	4	Bluegill	*Lepomis macrochirus*	—	*NM	—	—	—	—
	7/6/00	3	24	37	46	40.3	121	18	2.7	5	Black bullhead	*Ameiurus melas*	—	*NM	—	—	—	—
	7/6/00	3	24	37	46	40.3	121	18	2.7	5	White catfish	*Ameiurus catus*	—	*NM	—	—	—	—
	8/3/00	6	24	37	48	18.2	121	24	11.1	5	Channel catfish	*Ictalurus punctatus*	—	305	—	—	—	—
	8/3/00	6	24	37	49	32.3	121	18	45.5	5	Bluegill	*Lepomis macrochirus*	—	159	—	—	—	—
	8/30/00	3	24	37	48	19	121	24	13.2	6	Big scale log perch	*Percina macrolepida*	—	*NM	—	—	—	—
	8/30/00	3	24	37	48	25.2	121	23	51	6	Bluegill	*Lepomis macrochirus*	—	*NM	—	—	—	—
	8/30/00	3	24	37	48	35.8	121	23	43.5	6	Threadfin shad	*Dorosoma petenense*	—	*NM	—	—	—	—
Suisun Marsh	8/30/00	5	24	38	11	34.7	122	2	53.8	4	—	—	—	—	—	—	5	4
	8/30/00	5	24	38	11	36.9	122	2	56.9	4	Prickly sculpin	*Cottus asper*	—	100	—	—	—	—
	8/30/00	5	24	38	11	36.9	122	2	56.9	4	Yellowfin goby	*Acanthogobius flavimanus*	—	129	—	—	—	—
	8/30/00	5	24	38	11	36.9	122	2	56.9	4	Yellowfin goby	*Acanthogobius flavimanus*	—	120	—	—	—	—
	8/30/00	5	24	38	11	36.9	122	2	56.9	4	Yellowfin goby	*Acanthogobius flavimanus*	—	95	—	—	—	—
	8/30/00	5	24	38	11	36.9	122	2	56.9	4	Yellowfin goby	*Acanthogobius flavimanus*	—	110	—	—	—	—
	8/30/00	5	24	38	11	36.9	122	2	56.9	4	Yellowfin goby	*Acanthogobius flavimanus*	—	120	—	—	—	—
	8/30/00	5	24	38	12	40.7	122	2	21.9	10	Yellowfin goby	*Acanthogobius flavimanus*	—	100	—	—	—	—
	8/30/00	5	24	38	12	40.7	122	2	21.9	10	Yellowfin goby	*Acanthogobius flavimanus*	—	120	—	—	—	—
	8/30/00	5	24	38	12	40.7	122	2	21.9	10	Yellowfin goby	*Acanthogobius flavimanus*	—	100	—	—	—	—
	8/30/00	5	24	38	12	40.7	122	2	21.9	10	Yellowfin goby	*Acanthogobius flavimanus*	—	90	—	—	—	—
	8/30/00	5	24	38	12	40.7	122	2	21.9	10	Yellowfin goby	*Acanthogobius flavimanus*	—	90	—	—	—	—
	8/30/00	5	24	38	12	40.7	122	2	21.9	10	Yellowfin goby	*Acanthogobius flavimanus*	—	80	—	—	—	—
	8/30/00	5	24	38	12	40.7	122	2	21.9	10	Yellowfin goby	*Acanthogobius flavimanus*	—	77	—	—	—	—

Table 2. Data for catch from bait trapping efforts in areas in the San Joaquin River Basin and Suisun Marsh, California, 2000—*Continued*

Location	Date	Number	Trapping effort (hours)	Latitude			Longitude			Error (m)	Common name	Species	Crab carapace width (mm)	Fish total length (mm)	Crayfish carapace length (mm)	Crayfish carapace width (mm)	Number unidentified jelly species	Number unidentified shrimp species
				Degrees	Minutes	Seconds	Degrees	Minutes	Seconds									
Suisun Marsh—*Continued*	8/30/00	5	24	38	12	40.7	122	2	21.9	10	Yellowfin goby	*Acanthogobius flavimanus*	—	*NM	—	—	—	—
	8/30/00	5	24	38	12	40.7	122	2	21.9	10	Yellowfin goby	*Acanthogobius flavimanus*	—	*NM	—	—	—	—
	8/30/00	5	24	38	13	34.6	122	2	25.2	6	—	—	—	—	—	—	7	—
	8/30/00	5	24	38	13	33.1	122	2	31.3	8	Black bullhead	*Ameiurus melas*	—	158	—	—	—	—
	8/30/00	5	24	38	13	33.1	122	2	31.3	8	Yellowfin goby	*Acanthogobius flavimanus*	—	110	—	—	—	—
	8/30/00	5	24	38	13	33.1	122	2	31.3	8	Yellowfin goby	*Acanthogobius flavimanus*	—	105	—	—	—	—
	8/30/00	5	24	38	13	33.1	122	2	31.3	8	Yellowfin goby	*Acanthogobius flavimanus*	—	100	—	—	—	—
	8/30/00	5	24	38	13	33.1	122	2	31.3	8	Yellowfin goby	*Acanthogobius flavimanus*	—	85	—	—	—	—
	8/30/00	5	24	38	13	33.1	122	2	31.3	8	Yellowfin goby	*Acanthogobius flavimanus*	—	*NM	—	—	—	—
	8/30/00	5	24	38	13	33.1	122	2	31.3	8	Yellowfin goby	*Acanthogobius flavimanus*	—	*NM	—	—	—	—
	9/27/00	5	24	38	13	41.6	122	1	51.7	4	Yellowfin goby	*Acanthogobius flavimanus*	—	*NM	—	—	—	—
	9/27/00	5	24	38	13	41.6	122	1	51.7	4	Yellowfin goby	*Acanthogobius flavimanus*	—	*NM	—	—	—	—
	9/27/00	5	24	38	13	41.6	122	1	51.7	4	Yellowfin goby	*Acanthogobius flavimanus*	—	*NM	—	—	—	—
	9/27/00	5	24	38	13	41.6	122	1	51.7	4	Yellowfin goby	*Acanthogobius flavimanus*	—	*NM	—	—	—	—
	9/27/00	5	24	38	13	42	122	1	50.6	5	Yellowfin goby	*Acanthogobius flavimanus*	—	190	—	—	—	—
	9/27/00	5	24	38	13	42	122	1	50.6	5	Yellowfin goby	*Acanthogobius flavimanus*	—	110	—	—	—	—
	9/27/00	5	24	38	13	42	122	1	50.6	5	Yellowfin goby	*Acanthogobius flavimanus*	—	90	—	—	—	—
	9/27/00	5	24	38	13	42	122	1	50.6	5	Yellowfin goby	*Acanthogobius flavimanus*	—	*NM	—	—	—	—
	9/27/00	5	24	38	13	42	122	1	50.6	5	Yellowfin goby	*Acanthogobius flavimanus*	—	*NM	—	—	—	—
	9/27/00	5	24	38	13	42	122	1	50.6	5	Yellowfin goby	*Acanthogobius flavimanus*	—	*NM	—	—	—	—
	9/27/00	5	24	38	13	42	122	1	50.6	5	Yellowfin goby	*Acanthogobius flavimanus*	—	*NM	—	—	—	—
	9/27/00	5	24	38	13	42	122	1	50.6	5	Yellowfin goby	*Acanthogobius flavimanus*	—	—	—	—	—	—
	9/27/00	5	24	38	11	24.3	122	2	35	4	Yellowfin goby	*Acanthogobius flavimanus*	—	70	—	—	—	—
	9/27/00	3	24	38	13	1.4	122	1	58.8	4	White catfish	*Ameiurus catus*	—	232	—	—	—	—
	9/27/00	2	24	38	13	4.8	122	1	55.4	8	Yellowfin goby	*Acanthogobius flavimanus*	—	95	—	—	—	—
	9/27/00	2	24	38	13	4.8	122	1	55.4	8	Yellowfin goby	*Acanthogobius flavimanus*	—	86	—	—	—	—
	9/27/00	2	24	38	13	4.8	122	1	55.4	8	Yellowfin goby	*Acanthogobius flavimanus*	—	93	—	—	—	—
	9/27/00	2	24	38	13	4.8	122	1	55.4	8	Yellowfin goby	*Acanthogobius flavimanus*	—	85	—	—	—	—
	9/27/00	2	24	38	13	4.8	122	1	55.4	8	Yellowfin goby	*Acanthogobius flavimanus*	—	69	—	—	—	—
	9/27/00	2	24	38	13	4.8	122	1	55.4	8	Yellowfin goby	*Acanthogobius flavimanus*	—	103	—	—	—	—

Table 2. Data for catch from bait trapping efforts in areas in the San Joaquin River Basin and Suisun Marsh, California, 2000—*Continued*

Location	Date	Number	Trapping effort (hours)	Latitude			Longitude			Error (m)	Common name	Species	Crab carapace width (mm)	Fish total length (mm)	Crayfish carapace length (mm)	Crayfish carapace width (mm)	Number unidentified jelly species	Number unidentified shrimp species
				Degrees	Minutes	Seconds	Degrees	Minutes	Seconds									
Suisun Marsh—*Continued*	9/27/00	2	24	38	13	4.8	122	1	55.4	8	Yellowfin goby	*Acanthogobius flavimanus*	—	107	—	—	—	—
	9/27/00	5	24	38	11	51.1	122	1	43.3	8	Striped bass	*Morone saxatilis*	—	135	—	—	—	—
	9/27/00	5	24	38	11	51.1	122	1	43.3	8	Yellowfin goby	*Acanthogobius flavimanus*	—	105	—	—	—	—
	9/27/00	5	24	38	11	51.1	122	1	43.3	8	Red swamp crayfish	*Procambarus clarki*	—	—	40	15	—	—
	9/27/00	5	24	38	11	51.1	122	1	43.3	8	Red swamp crayfish	*Procambarus clarki*	—	—	40	15	—	—
	9/27/00	5	24	38	11	44	122	1	46.7	5	Yellowfin goby	*Acanthogobius flavimanus*	—	87	—	—	—	—
	9/27/00	5	24	38	11	44	122	1	46.7	5	Yellowfin goby	*Acanthogobius flavimanus*	—	104	—	—	—	—
	9/27/00	5	24	38	11	44	122	1	46.7	5	Yellowfin goby	*Acanthogobius flavimanus*	—	95	—	—	—	—
	9/27/00	5	24	38	11	44	122	1	46.7	5	Harris mud crab	*Rithropanopeus harrisii*	21	—	—	—	—	—
	9/27/00	5	24	38	11	32.8	122	1	53.2	4	—	—	—	—	—	—	—	—
	9/27/00	5	24	38	11	39.5	122	2	9.4	4	—	—	—	—	—	—	4	—
	9/27/00	5	24	38	11	39.5	122	2	9.4	4	Splittail	*Pogonichtys macrolepidotus*	—	95	—	—	—	—
	9/27/00	5	24	38	11	39.5	122	2	9.4	4	Striped bass	*Morone saxatilis*	—	185	—	—	—	—
	9/27/00	5	24	38	11	39.5	122	2	9.4	4	Yellowfin goby	*Acanthogobius flavimanus*	—	150	—	—	—	—
	9/27/00	5	24	38	11	39.5	122	2	9.4	4	Yellowfin goby	*Acanthogobius flavimanus*	—	101	—	—	—	—
	9/27/00	5	24	38	11	39.5	122	2	9.4	4	Yellowfin goby	*Acanthogobius flavimanus*	—	87	—	—	—	—
	9/27/00	5	24	38	11	39.5	122	2	9.4	4	Yellowfin goby	*Acanthogobius flavimanus*	—	109	—	—	—	—
	9/27/00	5	24	38	11	39.5	122	2	9.4	4	Yellowfin goby	*Acanthogobius flavimanus*	—	120	—	—	—	—
	9/27/00	5	24	38	11	39.5	122	2	9.4	4	Yellowfin goby	*Acanthogobius flavimanus*	—	110	—	—	—	—
	9/27/00	5	24	38	11	39.5	122	2	9.4	4	Harris mud crab	*Rithropanopeus harrisii*	15	—	—	—	—	—
San Joaquin River near Mossdale	9/29/00	5	24	37	49	7.5	121	19	8.9	5	Yellowfin goby	*Acanthogobius flavimanus*	—	175	—	—	—	—
	9/29/00	5	24	37	46	38.4	121	17	56	4	Black bullhead	*Ameiurus melas*	—	245	—	—	—	—
	9/29/00	5	24	37	46	38.4	121	17	56	4	Black bullhead	*Ameiurus melas*	—	163	—	—	—	—
	9/29/00	5	24	37	46	40.1	121	17	57.1	4	Black bullhead	*Ameiurus melas*	—	203	—	—	—	—
	9/29/00	5	24	37	46	40.1	121	17	57.1	4	Black bullhead	*Ameiurus melas*	—	212	—	—	—	—
	9/29/00	5	24	37	46	7.3	121	18	24	5	Striped bass	*Morone saxatilis*	—	123	—	—	—	—

Table 2. Data for catch from bait trapping efforts in areas in the San Joaquin River Basin and Suisun Marsh, California, 2000—*Continued*

Location	Date	Number	Trapping effort (hours)	Latitude			Longitude			Error (m)	Common name	Species	Crab carapace width (mm)	Fish total length (mm)	Crayfish carapace length (mm)	Crayfish carapace width (mm)	Number unidentified jelly species	Number unidentified shrimp species
				Degrees	Minutes	Seconds	Degrees	Minutes	Seconds									
Suisun Marsh	10/11/00	5	24	38	10	45.2	122	4	27.2	4	Black bullhead	*Ameiurus melas*	—	209	—	—	—	—
	10/11/00	5	24	38	10	45.2	122	4	27.2	4	Black bullhead	*Ameiurus melas*	—	166	—	—	—	—
	10/11/00	5	24	38	10	45.2	122	4	27.2	4	Yellowfin goby	*Acanthogobius flavimanus*	—	112	—	—	—	—
	10/11/00	5	24	38	10	45.2	122	4	27.2	4	—	—	—	—	—	—	14	—
	10/11/00	5	24	38	10	45.2	122	4	27.2	4	—	—	—	—	—	—	—	2
	10/11/00	5	24	38	10	51.1	122	4	20.8	4	Black bullhead	*Ameiurus melas*	—	193	—	—	—	—
	10/11/00	5	24	38	10	51.1	122	4	20.8	4	Yellowfin goby	*Acanthogobius flavimanus*	—	129	—	—	—	—
	10/11/00	5	24	38	10	51.1	122	4	20.8	4	Yellowfin goby	*Acanthogobius flavimanus*	—	91	—	—	—	—
	10/11/00	5	24	38	10	51.1	122	4	20.8	4	Yellowfin goby	*Acanthogobius flavimanus*	—	148	—	—	—	—
	10/11/00	5	24	38	10	51.1	122	4	20.8	4	Prickly sculpin	*Cottus asper*	—	66	—	—	—	—
	10/11/00	5	24	38	10	51.1	122	4	20.8	4	—	—	—	—	—	—	12	—
	10/11/00	5	24	38	10	51.1	122	4	20.8	4	—	—	—	—	—	—	—	2
	10/11/00	5	24	38	10	45.8	122	4	15.9	7	Prickly sculpin	*Cottus asper*	—	63	—	—	—	—
	10/11/00	5	24	38	10	45.8	122	4	15.9	7	Prickly sculpin	*Cottus asper*	—	67	—	—	—	—
	10/11/00	5	24	38	10	45.8	122	4	15.9	7	Yellowfin goby	*Acanthogobius flavimanus*	—	102	—	—	—	—
	10/11/00	5	24	38	10	45.8	122	4	15.9	7	Yellowfin goby	*Acanthogobius flavimanus*	—	126	—	—	—	—
	10/11/00	5	24	38	10	45.8	122	4	15.9	7	Yellowfin goby	*Acanthogobius flavimanus*	—	89	—	—	—	—
	10/11/00	5	24	38	10	45.8	122	4	15.9	7	Yellowfin goby	*Acanthogobius flavimanus*	—	99	—	—	—	—
	10/11/00	5	24	38	10	45.8	122	4	15.9	7	Yellowfin goby	*Acanthogobius flavimanus*	—	82	—	—	—	—
	10/11/00	5	24	38	10	45.8	122	4	15.9	7	Yellowfin goby	*Acanthogobius flavimanus*	—	90	—	—	—	—
	10/11/00	5	24	38	10	45.8	122	4	15.9	7	Yellowfin goby	*Acanthogobius flavimanus*	—	82	—	—	—	—
	10/11/00	5	24	38	10	45.8	122	4	15.9	7	Chinese mitten crab	*Eriocheir sinensis*	16	—	—	—	—	—
	10/11/00	5	24	38	10	45.8	122	4	15.9	7	—	—	—	—	—	—	13	—
	10/11/00	5	24	38	10	45.8	122	4	15.9	7	—	—	—	—	—	—	—	6
	10/11/00	5	24	38	10	44.7	122	4	6.9	11	Yellowfin goby	*Acanthogobius flavimanus*	—	123	—	—	—	—
	10/11/00	5	24	38	10	44.7	122	4	6.9	11	Yellowfin goby	*Acanthogobius flavimanus*	—	128	—	—	—	—
	10/11/00	5	24	38	10	44.7	122	4	6.9	11	Yellowfin goby	*Acanthogobius flavimanus*	—	124	—	—	—	—
	10/11/00	5	24	38	10	44.7	122	4	6.9	11	Yellowfin goby	*Acanthogobius flavimanus*	—	85	—	—	—	—
	10/11/00	5	24	38	10	44.7	122	4	6.9	11	Yellowfin goby	*Acanthogobius flavimanus*	—	78	—	—	—	—
	10/11/00	5	24	38	10	44.7	122	4	6.9	11	Yellowfin goby	*Acanthogobius flavimanus*	—	103	—	—	—	—
	10/11/00	5	24	38	10	44.7	122	4	6.9	11	Yellowfin goby	*Acanthogobius flavimanus*	—	118	—	—	—	—
	10/11/00	5	24	38	10	44.7	122	4	6.9	11	Yellowfin goby	*Acanthogobius flavimanus*	—	103	—	—	—	—

Table 2. Data for catch from bait trapping efforts in areas in the San Joaquin River Basin and Suisun Marsh, California, 2000—*Continued*

Location	Date	Number	Trapping effort (hours)	Latitude			Longitude			Error (m)	Common name	Species	Crab carapace width (mm)	Fish total length (mm)	Crayfish carapace length (mm)	Crayfish carapace width (mm)	Number unidentified jelly species	Number unidentified shrimp species
				Degrees	Minutes	Seconds	Degrees	Minutes	Seconds									
Suisun Marsh—*Continued*	10/11/00	5	24	38	10	44.7	122	4	6.9	11	Yellowfin goby	*Acanthogobius flavimanus*	—	110	—	—	—	—
	10/11/00	5	24	38	10	44.7	122	4	6.9	11	Yellowfin goby	*Acanthogobius flavimanus*	—	104	—	—	—	—
	10/11/00	5	24	38	10	44.7	122	4	6.9	11	Yellowfin goby	*Acanthogobius flavimanus*	—	120	—	—	—	—
	10/11/00	5	24	38	10	44.7	122	4	6.9	11	—	—	—	—	—	—	21	—
	10/11/00	5	24	38	10	26.4	122	3	16.5	7	Yellowfin goby	*Acanthogobius flavimanus*	—	132	—	—	—	—
	10/11/00	5	24	38	10	26.4	122	3	16.5	7	Yellowfin goby	*Acanthogobius flavimanus*	—	117	—	—	—	—
	10/11/00	5	24	38	10	26.4	122	3	16.5	7	—	—	—	—	—	—	5	—
	10/11/00	5	24	38	10	30.1	122	3	19.5	7	Yellowfin goby	*Acanthogobius flavimanus*	—	159	—	—	—	—
	10/11/00	5	24	38	10	30.1	122	3	19.5	7	Yellowfin goby	*Acanthogobius flavimanus*	—	85	—	—	—	—
	10/11/00	5	24	38	13	6.7	122	1	37.5	4	Yellowfin goby	*Acanthogobius flavimanus*	—	127	—	—	—	—
	10/11/00	5	24	38	13	6.7	122	1	37.5	4	Yellowfin goby	*Acanthogobius flavimanus*	—	85	—	—	—	—
	10/11/00	5	24	38	13	6.7	122	1	37.5	4	Yellowfin goby	*Acanthogobius flavimanus*	—	79	—	—	—	—
	10/11/00	5	24	38	13	6.7	122	1	37.5	4	—	—	—	—	—	—	6	—
	10/11/00	5	24	38	13	14.2	122	1	29.4	5	Yellowfin goby	*Acanthogobius flavimanus*	—	92	—	—	—	—
	10/11/00	5	24	38	13	14.2	122	1	29.4	5	Red swamp crayfish	*Procambarus clarki*	—	—	49	17	—	—
	10/11/00	5	24	38	12	50.3	122	2	5.1	4	Yellowfin goby	*Acanthogobius flavimanus*	—	93	—	—	—	—
	10/11/00	5	24	38	12	50.3	122	2	5.1	4	Yellowfin goby	*Acanthogobius flavimanus*	—	121	—	—	—	—
	10/11/00	5	24	38	12	50.3	122	2	5.1	4	Yellowfin goby	*Acanthogobius flavimanus*	—	103	—	—	—	—
	10/11/00	5	24	38	12	50.3	122	2	5.1	4	Yellowfin goby	*Acanthogobius flavimanus*	—	105	—	—	—	—
	10/11/00	5	24	38	12	50.3	122	2	5.1	4	Yellowfin goby	*Acanthogobius flavimanus*	—	87	—	—	—	—
	10/11/00	5	24	38	12	50.3	122	2	5.1	4	Yellowfin goby	*Acanthogobius flavimanus*	—	111	—	—	—	—
	10/11/00	5	24	38	12	50.3	122	2	5.1	4	Yellowfin goby	*Acanthogobius flavimanus*	—	103	—	—	—	—
	10/11/00	5	24	38	12	50.3	122	2	5.1	4	Yellowfin goby	*Acanthogobius flavimanus*	—	87	—	—	—	—
	10/11/00	5	24	38	13	28.8	122	1	41.2	5	Yellowfin goby	*Acanthogobius flavimanus*	—	150	—	—	—	—
	10/11/00	5	24	38	13	28.8	122	1	41.2	5	Yellowfin goby	*Acanthogobius flavimanus*	—	89	—	—	—	—
	10/11/00	5	24	38	13	28.8	122	1	41.2	5	Yellowfin goby	*Acanthogobius flavimanus*	—	112	—	—	—	—
	10/11/00	5	24	38	12	43.9	122	2	8.1	4	Yellowfin goby	*Acanthogobius flavimanus*	—	97	—	—	—	—
	10/11/00	5	24	38	12	43.9	122	2	8.1	4	Yellowfin goby	*Acanthogobius flavimanus*	—	115	—	—	—	—
	10/11/00	5	24	38	12	43.9	122	2	8.1	4	Yellowfin goby	*Acanthogobius flavimanus*	—	180	—	—	—	—
	10/11/00	5	24	38	12	43.9	122	2	8.1	4	Yellowfin goby	*Acanthogobius flavimanus*	—	85	—	—	—	—
	10/11/00	5	24	38	12	43.9	122	2	8.1	4	—	—	—	—	—	—	27	—
	10/11/00	5	24	38	12	31.3	122	2	0.8	4	Tule perch	*Hysterocarpus traski*	—	105	—	—	—	—

Table 2. Data for catch from bait trapping efforts in areas in the San Joaquin River Basin and Suisun Marsh, California, 2000—*Continued*

Location	Date	Number	Trapping effort (hours)	Latitude			Longitude			Error (m)	Common name	Species	Crab carapace width (mm)	Fish total length (mm)	Crayfish carapace length (mm)	Crayfish carapace width (mm)	Number unidentified jelly species	Number unidentified shrimp species
				Degrees	Minutes	Seconds	Degrees	Minutes	Seconds									
San Joaquin River near Mossdale	11/1/00	5	24	37	51	37.4	121	19	11.9	4	Black bullhead	*Ameiurus melas*	—	130	—	—	—	—
	11/1/00	5	24	37	51	24.6	121	19	11.1	5	Black bullhead	*Ameiurus melas*	—	143	—	—	—	—
	11/1/00	5	24	37	51	24.6	121	19	11.1	5	Black bullhead	*Ameiurus melas*	—	136	—	—	—	—
	11/1/00	5	24	37	51	24.6	121	19	11.1	5	Black bullhead	*Ameiurus melas*	—	125	—	—	—	—
	11/1/00	5	24	37	51	24.6	121	19	11.1	5	Yellowfin goby	*Acanthogobius flavimanus*	—	158	—	—	—	—
	11/1/00	5	24	37	51	24.6	121	19	11.1	5	Yellowfin goby	*Acanthogobius flavimanus*	—	140	—	—	—	—
	11/1/00	5	24	37	51	24.6	121	19	11.1	5	Yellowfin goby	*Acanthogobius flavimanus*	—	159	—	—	—	—
	11/1/00	5	24	37	51	24.6	121	19	11.1	5	Striped bass	*Morone saxatilis*	—	94	—	—	—	—
	11/1/00	5	24	37	51	24.6	121	19	11.1	5	Striped bass	*Morone saxatilis*	—	116	—	—	—	—
	11/1/00	5	24	37	51	24.6	121	19	11.1	5	Striped bass	*Morone saxatilis*	—	129	—	—	—	—
	11/1/00	5	24	37	51	24.6	121	19	11.1	5	Striped bass	*Morone saxatilis*	—	99	—	—	—	—
	11/1/00	5	24	37	51	24.6	121	19	11.1	5	Striped bass	*Morone saxatilis*	—	95	—	—	—	—
	11/1/00	5	24	37	51	24.6	121	19	11.1	5	Striped bass	*Morone saxatilis*	—	98	—	—	—	—
	11/1/00	5	24	37	51	24.6	121	19	11.1	5	Striped bass	*Morone saxatilis*	—	79	—	—	—	—
	11/1/00	5	24	37	51	20.9	121	19	15.8	5	Yellowfin goby	*Acanthogobius flavimanus*	—	135	—	—	—	—
	11/1/00	5	24	37	51	12.4	121	19	17.7	5	Black bullhead	*Ameiurus melas*	—	143	—	—	—	—
	11/1/00	5	24	37	50	43.5	121	19	17.9	4	Bluegill	*Lepomis macrochirus*	—	119	—	—	—	—
	11/1/00	5	24	37	50	45	121	19	19.6	5	Yellowfin goby	*Acanthogobius flavimanus*	—	159	—	—	—	—
	11/1/00	5	24	37	50	45	121	19	19.6	5	Yellowfin goby	*Acanthogobius flavimanus*	—	145	—	—	—	—
	11/1/00	5	24	37	50	45	121	19	19.6	5	Yellowfin goby	*Acanthogobius flavimanus*	—	140	—	—	—	—
	11/1/00	5	24	37	50	45	121	19	19.6	5	Striped bass	*Morone saxatilis*	—	105	—	—	—	—

Table 3. Water-quality data collected from select areas in the San Joaquin River Basin and Suisun Marsh, California, 2000

[μS/cm, microsiemens per centimeter; mg/L, milligram per liter; °C, degrees Celsius; *NM, no measurement collected]

Location	Date	Time	Latitude			Longitude			Error (meters)	Specific conductance (μS/cm)	Dissolved oxygen (mg/L)	Temperature (°C)
			Degrees	Minutes	Seconds	Degrees	Minutes	Seconds				
San Joaquin River near Vernalis	6/7/00	1340	37	41	13.3	121	15	24.3	6	537	9.65	20.8
Merced River near River Road	6/7/00	830	37	21	33.7	120	57	6.9	8	238	6.69	21.8
San Joaquin River near Vernalis	6/29/00	1540	37	43	6.7	121	15	35.9	8	686	10.1	25.6
Tuolumne River near Shiloh Road	6/29/00	1440	37	36	4.9	121	8	26.4	11	237	7.7	26.4
Merced River near River Road	6/28/00	1130	37	21	33.7	120	57	6.9	8	288	7.35	26.5
Dry Creek near Modesto	6/29/00	900	37	38	7.8	120	59	5.4	7	106	6.63	24.8
San Joaquin River near Mossdale	7/7/00	*NM	*NM	*NM	*NM	*NM	*NM	*NM	*NM	*NM	*NM	*NM
	8/3/00	*NM	*NM	*NM	*NM	*NM	*NM	*NM	*NM	*NM	*NM	*NM
	8/30/00	1210	37	48	34.3	121	23	41.4	6	465	8.3	21.1
Suisun Marsh	8/31/00	1730	38	11	36.9	122	2	56.9	4	7,070	9.09	19.1
	8/31/00	1420	38	12	40.7	122	2	29.9	10	7,700	7.29	20.1
	9/28/00	1330	38	11	22.9	122	2	41.6	6	7,080	*NM	19.6
	9/28/00	1210	38	13	45.7	122	1	44.9	6	6,020	*NM	18.7
	9/28/00	1600	38	11	39.3	122	2	11.6	6	7,600	*NM	19.6
	9/28/00	1650	38	11	24.3	122	2	39.8	6	9,000	*NM	20.4
	9/30/00	1530	37	47	43.2	121	18	36.9	8	566	*NM	20.4
	10/11/00	1110	38	10	44.9	122	4	28.5	4	14,500	6.61	17.7
	10/11/00	1240	38	10	30.1	122	3	19.5	7	15,800	7.49	18.2
	10/11/00	1500	38	13	28.8	122	1	41.2	5	10,300	5.86	17.7
	10/11/00	1530	38	12	43.9	122	2	8.1	4	11,200	5.61	16.9
San Joaquin River near Mossdale	11/1/00	1240	37	51	12.4	121	19	17.7	5	445	8.55	14.9

Table 4. Data for seining efforts in select areas in the San Joaquin River Basin, California, 2000

[mm, millimeter. —, no data available]

Location	Date	Number of sein hauls	Latitude			Longitude			Error (meters)	Common name	Species	Fish total length	Count (mm)
			Degrees	Minutes	Seconds	Degrees	Minutes	Seconds					
San Joaquin River near Vernalis	6/7/00	6	37	41	6.4	121	16	30.5	5	Redear sunfish	*Lepomis microlophus*	216	1
	6/7/00	6	37	41	6.4	121	16	30.5	5	Redear sunfish	*Lepomis microlophus*	122	1
	6/7/00	6	37	41	6.4	121	16	30.5	5	Redear sunfish	*Lepomis microlophus*	111	1
	6/7/00	6	37	41	6.4	121	16	30.5	5	Redear sunfish	*Lepomis microlophus*	110	1
	6/7/00	6	37	41	6.4	121	16	30.5	5	Inland silverside	*Menidia beryllina*	81	1
	6/7/00	6	37	41	6.4	121	16	30.5	5	Inland silverside	*Menidia beryllina*	64	1
	6/7/00	6	37	41	6.4	121	16	30.5	5	Inland silverside	*Menidia beryllina*	92	1
	6/7/00	6	37	41	6.4	121	16	30.5	5	Inland silverside	*Menidia beryllina*	61	1
	6/7/00	6	37	41	6.4	121	16	30.5	5	Inland silverside	*Menidia beryllina*	69	1
	6/7/00	6	37	41	6.4	121	16	30.5	5	Inland silverside	*Menidia beryllina*	78	1
	6/7/00	6	37	41	6.4	121	16	30.5	5	Inland silverside	*Menidia beryllina*	69	1
	6/7/00	6	37	41	6.4	121	16	30.5	5	Inland silverside	*Menidia beryllina*	84	1
	6/7/00	6	37	41	6.4	121	16	30.5	5	Inland silverside	*Menidia beryllina*	77	1
	6/7/00	6	37	41	6.4	121	16	30.5	5	Inland silverside	*Menidia beryllina*	—	1
	6/7/00	6	37	41	6.4	121	16	30.5	5	Red shiner	*Cyprinella lutrensis*	57	1
	6/7/00	6	37	41	6.4	121	16	30.5	5	Red shiner	*Cyprinella lutrensis*	55	1
	6/7/00	6	37	41	6.4	121	16	30.5	5	Red shiner	*Cyprinella lutrensis*	55	1
	6/7/00	6	37	41	6.4	121	16	30.5	5	Red shiner	*Cyprinella lutrensis*	49	1
	6/7/00	6	37	41	6.4	121	16	30.5	5	Red shiner	*Cyprinella lutrensis*	50	1
	6/7/00	6	37	41	6.4	121	16	30.5	5	Red shiner	*Cyprinella lutrensis*	51	1
	6/7/00	6	37	41	6.4	121	16	30.5	5	Red shiner	*Cyprinella lutrensis*	—	43
	6/7/00	6	37	41	6.4	121	16	30.5	5	Splittail	*Pogonichthys macrolepidotus*	50	1
	6/7/00	6	37	41	6.4	121	16	30.5	5	Splittail	*Pogonichthys macrolepidotus*	60	1
	6/7/00	6	37	41	6.4	121	16	30.5	5	Splittail	*Pogonichthys macrolepidotus*	62	1
	6/7/00	6	37	41	6.4	121	16	30.5	5	Common Carp	*Cyprinus carpio*	61	1
	6/7/00	6	37	41	6.4	121	16	30.5	5	Common Carp	*Cyprinus carpio*	56	1
	6/7/00	6	37	41	6.4	121	16	30.5	5	Common Carp	*Cyprinus carpio*	56	1
	6/7/00	6	37	41	6.4	121	16	30.5	5	Common Carp	*Cyprinus carpio*	69	1
	6/7/00	6	37	41	6.4	121	16	30.5	5	Common Carp	*Cyprinus carpio*	58	1
	6/7/00	6	37	41	6.4	121	16	30.5	5	Common Carp	*Cyprinus carpio*	70	1
	6/7/00	6	37	41	6.4	121	16	30.5	5	Common Carp	*Cyprinus carpio*	54	1

Table 4. Data for seining efforts in select areas in the San Joaquin River Basin, California, 2000—*Continued*

Location	Date	Number of sein hauls	Latitude			Longitude			Error (meters)	Common name	Species	Fish total length	Count (mm)
			Degrees	Minutes	Seconds	Degrees	Minutes	Seconds					
San Joaquin River near Vernalis—*Continued*	6/7/00	6	37	41	6.4	121	16	30.5	5	Common Carp	*Cyprinus carpio*	56	1
	6/7/00	6	37	41	6.4	121	16	30.5	5	Common Carp	*Cyprinus carpio*	—	1
	6/7/00	6	37	41	6.4	121	16	30.5	5	Common Carp	*Cyprinus carpio*	—	12
	6/7/00	6	37	41	6.4	121	16	30.5	5	Sacramento sucker	*Catostomus occidentalis*	43	1
	6/7/00	6	37	41	6.4	121	16	30.5	5	Sacramento sucker	*Catostomus occidentalis*	37	1
	6/7/00	6	37	41	6.4	121	16	30.5	5	Sacramento sucker	*Catostomus occidentalis*	60	1
	6/7/00	6	37	41	6.4	121	16	30.5	5	Largemouth bass	*Micropterus salmoides*	119	1
	6/7/00	6	37	41	6.4	121	16	30.5	5	Largemouth bass	*Micropterus salmoides*	135	1
	6/7/00	6	37	41	6.4	121	16	30.5	5	Largemouth bass	*Micropterus salmoides*	147	1
	6/7/00	6	37	41	6.4	121	16	30.5	5	Black bullhead	*Ameiurus melas*	233	1
	6/7/00	6	37	41	6.4	121	16	30.5	5	White catfish	*Ameiurus catus*	197	1
	6/7/00	6	37	41	6.4	121	16	30.5	5	Bluegill	*Lepomis macrochirus*	98	1
	6/7/00	6	37	41	6.4	121	16	30.5	5	Bluegill	*Lepomis macrochirus*	93	1
	6/7/00	6	37	41	6.4	121	16	30.5	5	Bluegill	*Lepomis macrochirus*	84	1
	6/7/00	6	37	41	6.4	121	16	30.5	5	Tule perch	*Hysterocarpus traski*	52	1
	6/7/00	6	37	41	6.4	121	16	30.5	5	Tule perch	*Hysterocarpus traski*	61	1
	6/7/00	6	37	41	6.4	121	16	30.5	5	Sacramento pike-minnow	*Ptychochelius grandis*	76	1
	6/7/00	6	37	41	6.4	121	16	30.5	5	Sacramento pike-minnow	*Ptychochelius grandis*	128	1
	6/7/00	3	37	41	0.3	121	15	22.3	8	Sacramento sucker	*Catostomus occidentalis*	38	1
	6/7/00	3	37	41	0.3	121	15	22.3	8	Sacramento sucker	*Catostomus occidentalis*	51	1
	6/7/00	3	37	41	0.3	121	15	22.3	8	Sacramento sucker	*Catostomus occidentalis*	34	1
	6/7/00	3	37	41	0.3	121	15	22.3	8	Sacramento sucker	*Catostomus occidentalis*	45	1
	6/7/00	3	37	41	0.3	121	15	22.3	8	Sacramento sucker	*Catostomus occidentalis*	36	1
	6/7/00	3	37	41	0.3	121	15	22.3	8	Sacramento sucker	*Catostomus occidentalis*	42	1
	6/7/00	3	37	41	0.3	121	15	22.3	8	Sacramento sucker	*Catostomus occidentalis*	41	1
	6/7/00	3	37	41	0.3	121	15	22.3	8	Sacramento sucker	*Catostomus occidentalis*	33	1
	6/7/00	3	37	41	0.3	121	15	22.3	8	Sacramento sucker	*Catostomus occidentalis*	—	31
	6/7/00	3	37	41	0.3	121	15	22.3	8	Tule perch	*Hysterocarpus traski*	47	1
	6/7/00	3	37	41	0.3	121	15	22.3	8	Tule perch	*Hysterocarpus traski*	46	1
	6/7/00	3	37	41	0.3	121	15	22.3	8	Tule perch	*Hysterocarpus traski*	46	1
	6/7/00	3	37	41	0.3	121	15	22.3	8	Tule perch	*Hysterocarpus traski*	46	1

Table 4. Data for seining efforts in select areas in the San Joaquin River Basin, California, 2000—*Continued*

Location	Date	Number of sein hauls	Latitude			Longitude			Error (meters)	Common name	Species	Fish total length	Count (mm)
			Degrees	Minutes	Seconds	Degrees	Minutes	Seconds					
San Joaquin River near Vernalis—*Continued*	6/7/00	3	37	41	0.3	121	15	22.3	8	Tule perch	*Hysterocarpus traski*	50	1
	6/7/00	3	37	41	0.3	121	15	22.3	8	Tule perch	*Hysterocarpus traski*	47	1
	6/7/00	3	37	41	0.3	121	15	22.3	8	Tule perch	*Hysterocarpus traski*	—	2
	6/7/00	3	37	41	0.3	121	15	22.3	8	Sacramento pike-minnow	*Ptychochelius grandis*	84	1
	6/7/00	3	37	41	0.3	121	15	22.3	8	Sacramento pike-minnow	*Ptychochelius grandis*	84	1
	6/7/00	3	37	41	0.3	121	15	22.3	8	Sacramento pike-minnow	*Ptychochelius grandis*	98	1
	6/7/00	3	37	41	0.3	121	15	22.3	8	Red shiner	*Cyprinella lutrensis*	42	1
	6/7/00	3	37	41	0.3	121	15	22.3	8	Red shiner	*Cyprinella lutrensis*	—	21
	6/7/00	3	37	41	0.3	121	15	22.3	8	Western mosquito fish	*Gambusia affinis*	39	1
	6/7/00	3	37	41	0.3	121	15	22.3	8	Western mosquito fish	*Gambusia affinis*	43	1
	6/7/00	3	37	41	0.3	121	15	22.3	8	Fathead minnow	*Pimephales promelas*	57	1
	6/7/00	3	37	41	0.3	121	15	22.3	8	Common Carp	*Cyprinus carpio*	—	31
Merced River near River Road	6/7/00	4	37	21	27.2	120	57	16.8	8	Largemouth bass	*Micropterus salmoides*	104	1
	6/7/00	4	37	21	27.2	120	57	16.8	8	Largemouth bass	*Micropterus salmoides*	90	1
	6/7/00	4	37	21	27.2	120	57	16.8	8	Largemouth bass	*Micropterus salmoides*	100	1
	6/7/00	4	37	21	27.2	120	57	16.8	8	Largemouth bass	*Micropterus salmoides*	99	1
	6/7/00	4	37	21	27.2	120	57	16.8	8	Largemouth bass	*Micropterus salmoides*	100	1
	6/7/00	4	37	21	27.2	120	57	16.8	8	Largemouth bass	*Micropterus salmoides*	100	1
	6/7/00	4	37	21	27.2	120	57	16.8	8	Largemouth bass	*Micropterus salmoides*	87	1
	6/7/00	4	37	21	27.2	120	57	16.8	8	Sacramento sucker	*Catostomus occidentalis*	39	1
San Joaquin River near Vernalis	6/29/00	5	37	43	6.7	121	15	35.9	8	White catfish	*Ameiurus catus*	209	1
	6/29/00	5	37	43	6.7	121	15	35.9	8	Inland silverside	*Menidia beryllina*	75	1
	6/29/00	5	37	43	6.7	121	15	35.9	8	Largemouth bass	*Micropterus salmoides*	45	1
	6/29/00	5	37	43	6.7	121	15	35.9	8	Largemouth bass	*Micropterus salmoides*	44	1
	6/29/00	5	37	43	6.7	121	15	35.9	8	Largemouth bass	*Micropterus salmoides*	51	1
	6/29/00	5	37	43	6.7	121	15	35.9	8	Largemouth bass	*Micropterus salmoides*	60	1
	6/29/00	5	37	43	6.7	121	15	35.9	8	Largemouth bass	*Micropterus salmoides*	44	1

Table 4. Data for seining efforts in select areas in the San Joaquin River Basin, California, 2000—*Continued*

Location	Date	Number of sein hauls	Latitude			Longitude			Error (meters)	Common name	Species	Fish total length	Count (mm)
			Degrees	Minutes	Seconds	Degrees	Minutes	Seconds					
San Joaquin River near Vernalis—*Continued*	6/29/00	5	37	43	6.7	121	15	35.9	8	Largemouth bass	*Micropterus salmoides*	—	1
	6/29/00	5	37	43	6.7	121	15	35.9	8	Sacramento sucker	*Catostomus occidentalis*	38	1
	6/29/00	5	37	43	6.7	121	15	35.9	8	Sacramento sucker	*Catostomus occidentalis*	57	1
	6/29/00	5	37	43	6.7	121	15	35.9	8	Sacramento sucker	*Catostomus occidentalis*	40	1
	6/29/00	5	37	43	6.7	121	15	35.9	8	Sacramento sucker	*Catostomus occidentalis*	47	1
	6/29/00	5	37	43	6.7	121	15	35.9	8	Red shiner	*Cyprinella lutrensis*	52	1
	6/29/00	5	37	43	6.7	121	15	35.9	8	Red shiner	*Cyprinella lutrensis*	49	1
	6/29/00	5	37	43	6.7	121	15	35.9	8	Red shiner	*Cyprinella lutrensis*	51	1
	6/29/00	5	37	43	6.7	121	15	35.9	8	Red shiner	*Cyprinella lutrensis*	50	1
	6/29/00	5	37	43	6.7	121	15	35.9	8	Red shiner	*Cyprinella lutrensis*	—	17
	6/29/00	5	37	43	6.7	121	15	35.9	8	Bluegill	*Lepomis macrochirus*	66	1
	6/29/00	5	37	43	6.7	121	15	35.9	8	Bluegill	*Lepomis macrochirus*	61	1
	6/29/00	5	37	43	6.7	121	15	35.9	8	Bigscale log perch	*Percinia macrolepida*	62	1
	6/29/00	5	37	43	6.7	121	15	35.9	8	Common Carp	*Cyprinus carpio*	54	1
	6/29/00	5	37	43	6.7	121	15	35.9	8	Common Carp	*Cyprinus carpio*	55	1
	6/29/00	5	37	43	6.7	121	15	35.9	8	Common Carp	*Cyprinus carpio*	54	1
	6/29/00	5	37	43	6.7	121	15	35.9	8	Common Carp	*Cyprinus carpio*	44	1
	6/29/00	5	37	43	6.7	121	15	35.9	8	Common Carp	*Cyprinus carpio*	48	1
San Joaquin River near Mossdale	9/30/00	3	37	46	37.3	121	18	0.7	4	Inland silverside	*Menidia beryllina*	68	1
	9/30/00	3	37	46	37.3	121	18	0.7	4	Inland silverside	*Menidia beryllina*	66	1
	9/30/00	3	37	46	37.3	121	18	0.7	4	Inland silverside	*Menidia beryllina*	73	1
	9/30/00	3	37	46	37.3	121	18	0.7	4	Inland silverside	*Menidia beryllina*	68	1
	9/30/00	3	37	46	37.3	121	18	0.7	4	Inland silverside	*Menidia beryllina*	64	1
	9/30/00	3	37	46	37.3	121	18	0.7	4	Inland silverside	*Menidia beryllina*	64	1
	9/30/00	3	37	46	37.3	121	18	0.7	4	Inland silverside	*Menidia beryllina*	63	1
	9/30/00	3	37	46	37.3	121	18	0.7	4	Inland silverside	*Menidia beryllina*	78	1
	9/30/00	3	37	46	37.3	121	18	0.7	4	Inland silverside	*Menidia beryllina*	77	1
	9/30/00	3	37	46	37.3	121	18	0.7	4	Inland silverside	*Menidia beryllina*	71	1
	9/30/00	3	37	46	37.3	121	18	0.7	4	Inland silverside	*Menidia beryllina*	71	1
	9/30/00	3	37	46	37.3	121	18	0.7	4	Inland silverside	*Menidia beryllina*	61	1
	9/30/00	3	37	46	37.3	121	18	0.7	4	Inland silverside	*Menidia beryllina*	74	1

Table 4. Data for seining efforts in select areas in the San Joaquin River Basin, California, 2000—*Continued*

Location	Date	Number of sein hauls	Latitude			Longitude			Error (meters)	Common name	Species	Fish total length	Count (mm)
			Degrees	Minutes	Seconds	Degrees	Minutes	Seconds					
San Joaquin River near Mossdale—*Continued*	9/30/00	3	37	46	37.3	121	18	0.7	4	Inland silverside	*Menidia beryllina*	57	1
	9/30/00	3	37	46	37.3	121	18	0.7	4	Inland silverside	*Menidia beryllina*	69	1
	9/30/00	3	37	46	37.3	121	18	0.7	4	Inland silverside	*Menidia beryllina*	38	1
	9/30/00	3	37	46	37.3	121	18	0.7	4	Inland silverside	*Menidia beryllina*	68	1
	9/30/00	3	37	46	37.3	121	18	0.7	4	Inland silverside	*Menidia beryllina*	—	92
	9/30/00	3	37	46	37.3	121	18	0.7	4	Golden shiner	*Notemigonus cyrsoleucas*	39	1
	9/30/00	3	37	46	37.3	121	18	0.7	4	Golden shiner	*Notemigonus cyrsoleucas*	34	1
	9/30/00	3	37	46	37.3	121	18	0.7	4	Golden shiner	*Notemigonus cyrsoleucas*	21	1
	9/30/00	3	37	46	37.3	121	18	0.7	4	Golden shiner	*Notemigonus cyrsoleucas*	21	1
	9/30/00	3	37	46	37.3	121	18	0.7	4	Bluegill	*Lepomis macrochirus*	47	1
	9/30/00	3	37	46	37.3	121	18	0.7	4	Bluegill	*Lepomis macrochirus*	35	1
	9/30/00	3	37	46	37.3	121	18	0.7	4	Bluegill	*Lepomis macrochirus*	28	1
	9/30/00	3	37	46	37.3	121	18	0.7	4	Bluegill	*Lepomis macrochirus*	30	1
	9/30/00	3	37	46	37.3	121	18	0.7	4	Bluegill	*Lepomis macrochirus*	25	1
	9/30/00	3	37	46	37.3	121	18	0.7	4	Bluegill	*Lepomis macrochirus*	35	1
	9/30/00	3	37	46	37.3	121	18	0.7	4	Bluegill	*Lepomis macrochirus*	33	1
	9/30/00	3	37	46	37.3	121	18	0.7	4	Bluegill	*Lepomis macrochirus*	33	1
	9/30/00	3	37	46	37.3	121	18	0.7	4	Bluegill	*Lepomis macrochirus*	31	1
	9/30/00	3	37	46	37.3	121	18	0.7	4	Bluegill	*Lepomis macrochirus*	32	1
	9/30/00	3	37	46	37.3	121	18	0.7	4	Bluegill	*Lepomis macrochirus*	30	1
	9/30/00	3	37	46	37.3	121	18	0.7	4	Bluegill	*Lepomis macrochirus*	—	3
	9/30/00	3	37	46	37.3	121	18	0.7	4	Largemouth bass	*Micropterus salmoides*	88	1
	9/30/00	3	37	46	37.3	121	18	0.7	4	Threadfin shad	*Dorosoma petenense*	45	1
	9/30/00	3	37	46	37.3	121	18	0.7	4	Threadfin shad	*Dorosoma petenense*	68	1
	9/30/00	3	37	46	37.3	121	18	0.7	4	Threadfin shad	*Dorosoma petenense*	40	1
	9/30/00	3	37	46	37.3	121	18	0.7	4	Threadfin shad	*Dorosoma petenense*	35	1
	9/30/00	3	37	46	37.3	121	18	0.7	4	Threadfin shad	*Dorosoma petenense*	44	1
	9/30/00	3	37	46	37.3	121	18	0.7	4	Threadfin shad	*Dorosoma petenense*	39	1
	9/30/00	3	37	46	37.3	121	18	0.7	4	Western mosquito fish	*Gambusia affinis*	34	1

Table 5. Data for backpack electrofishing in select areas in the San Joaquin River Basin, California, 2000

[mm, millimeter. —, no data available]

Location	Date	Time	Shocking time (seconds)	Latitude			Longitude			Error (meters)	Common name	Species	Fish total length (mm)	Crayfish carapace		Count
				Degrees	Minutes	Seconds	Degrees	Minutes	Seconds					Width (mm)	Length (mm)	
Merced River near River Road	6/8/00	1030	1500	37	21	17.4	120	57	38.1	7	Bluegill	*Lepomis macrochirus*	73	—	—	1
	6/8/00	1030	1500	37	21	17.4	120	57	38.1	7	Bluegill	*Lepomis macrochirus*	81	—	—	1
	6/8/00	1030	1500	37	21	17.4	120	57	38.1	7	Bluegill	*Lepomis macrochirus*	74	—	—	1
	6/8/00	1030	1500	37	21	17.4	120	57	38.1	7	Bluegill	*Lepomis macrochirus*	60	—	—	1
	6/8/00	1030	1500	37	21	17.4	120	57	38.1	7	Bluegill	*Lepomis macrochirus*	—	—	—	34
	6/8/00	1030	1500	37	21	17.4	120	57	38.1	7	Goldfish	*Carassius auratus*	68	—	—	1
	6/8/00	1030	1500	37	21	17.4	120	57	38.1	7	Goldfish	*Carassius auratus*	67	—	—	1
	6/8/00	1030	1500	37	21	17.4	120	57	38.1	7	Goldfish	*Carassius auratus*	67	—	—	1
	6/8/00	1030	1500	37	21	17.4	120	57	38.1	7	Green sunfish	*Lepomis cynellus*	140	—	—	1
	6/8/00	1030	1500	37	21	17.4	120	57	38.1	7	Green sunfish	*Lepomis cynellus*	114	—	—	1
	6/8/00	1030	1500	37	21	17.4	120	57	38.1	7	Green sunfish	*Lepomis cynellus*	75	—	—	1
	6/8/00	1030	1500	37	21	17.4	120	57	38.1	7	Green sunfish	*Lepomis cynellus*	99	—	—	1
	6/8/00	1030	1500	37	21	17.4	120	57	38.1	7	Largemouth bass	*Micropterus salmoides*	103	—	—	1
	6/8/00	1030	1500	37	21	17.4	120	57	38.1	7	Largemouth bass	*Micropterus salmoides*	109	—	—	1
	6/8/00	1030	1500	37	21	17.4	120	57	38.1	7	Largemouth bass	*Micropterus salmoides*	136	—	—	1
	6/8/00	1030	1500	37	21	17.4	120	57	38.1	7	Largemouth bass	*Micropterus salmoides*	120	—	—	1
	6/8/00	1030	1500	37	21	17.4	120	57	38.1	7	Largemouth bass	*Micropterus salmoides*	109	—	—	1
	6/8/00	1030	1500	37	21	17.4	120	57	38.1	7	Largemouth bass	*Micropterus salmoides*	96	—	—	1
	6/8/00	1030	1500	37	21	17.4	120	57	38.1	7	Prickly sculpin	*Cottus asper*	80	—	—	1
	6/8/00	1030	1500	37	21	17.4	120	57	38.1	7	Prickly sculpin	*Cottus asper*	50	—	—	1
	6/8/00	1030	1500	37	21	17.4	120	57	38.1	7	Prickly sculpin	*Cottus asper*	56	—	—	1
	6/8/00	1030	1500	37	21	17.4	120	57	38.1	7	Sacramento pike-minnow	*Ptychochelius grandis*	125	—	—	1
	6/8/00	1030	1500	37	21	17.4	120	57	38.1	7	White catfish	*Ameiurus catus*	143	—	—	1
	6/8/00	1030	1500	37	21	17.4	120	57	38.1	7	White catfish	*Ameiurus catus*	130	—	—	1
	6/8/00	1030	1500	37	21	17.4	120	57	38.1	7	Unidentified lamprey	*Lampetra sp.*	—	—	—	1
	6/8/00	1030	1500	37	21	17.4	120	57	38.1	7	Unidentified lamprey	*Lampetra sp.*	—	—	—	1
	6/8/00	1030	1500	37	21	17.4	120	57	38.1	7	Unidentified lamprey	*Lampetra sp.*	—	—	—	1
	6/8/00	1030	1500	37	21	17.4	120	57	38.1	7	Unidentified lamprey	*Lampetra sp.*	—	—	—	1
	6/8/00	1030	1500	37	21	17.4	120	57	38.1	7	Red swamp crayfish	*Procamburus clarki*	—	14	40	1
	6/8/00	1030	1500	37	21	17.4	120	57	38.1	7	Red swamp crayfish	*Procamburus clarki*	—	13	40	1
	6/8/00	1030	1500	37	21	17.4	120	57	38.1	7	Red swamp crayfish	*Procamburus clarki*	—	8	24	1

Table 5. Data for backpack electrofishing in select areas in the San Joaquin River Basin, California, 2000—*Continued*

Location	Date	Time	Shocking time (seconds)	Latitude			Longitude			Error (meters)	Common name	Species	Fish total length (mm)	Crayfish carapace		Count
Dry Creek near Modesto	6/29/00	830	563	37	38	7.8	120	59	5.4	7	Bluegill	*Lepomis macrochirus*	75	—	—	1
	6/29/00	830	563	37	38	7.8	120	59	5.4	7	Bluegill	*Lepomis macrochirus*	71	—	—	1
	6/29/00	830	563	37	38	7.8	120	59	5.4	7	Bluegill	*Lepomis macrochirus*	68	—	—	1
	6/29/00	830	563	37	38	7.8	120	59	5.4	7	Bluegill	*Lepomis macrochirus*	84	—	—	1
	6/29/00	830	563	37	38	7.8	120	59	5.4	7	Bluegill	*Lepomis macrochirus*	85	—	—	1
	6/29/00	830	563	37	38	7.8	120	59	5.4	7	Bluegill	*Lepomis macrochirus*	72	—	—	1
	6/29/00	830	563	37	38	7.8	120	59	5.4	7	Bluegill	*Lepomis macrochirus*	48	—	—	1
	6/29/00	830	563	37	38	7.8	120	59	5.4	7	Bluegill	*Lepomis macrochirus*	79	—	—	1
	6/29/00	830	563	37	38	7.8	120	59	5.4	7	Bluegill	*Lepomis macrochirus*	85	—	—	1
	6/29/00	830	563	37	38	7.8	120	59	5.4	7	Green sunfish	*Lepomis cynellus*	150	—	—	1
	6/29/00	830	563	37	38	7.8	120	59	5.4	7	Green sunfish	*Lepomis cynellus*	142	—	—	1
	6/29/00	830	563	37	38	7.8	120	59	5.4	7	Green sunfish	*Lepomis cynellus*	93	—	—	1
	6/29/00	830	563	37	38	7.8	120	59	5.4	7	Green sunfish	*Lepomis cynellus*	171	—	—	1
	6/29/00	830	563	37	38	7.8	120	59	5.4	7	Largemouth bass	*Micropterus salmoides*	110	—	—	1
	6/29/00	830	563	37	38	7.8	120	59	5.4	7	Largemouth bass	*Micropterus salmoides*	136	—	—	1
	6/29/00	830	563	37	38	7.8	120	59	5.4	7	Largemouth bass	*Micropterus salmoides*	128	—	—	1
	6/29/00	830	563	37	38	7.8	120	59	5.4	7	Largemouth bass	*Micropterus salmoides*	68	—	—	1
	6/29/00	830	563	37	38	7.8	120	59	5.4	7	Redear sunfish	*Lepomis microlophus*	161	—	—	1
	6/29/00	830	563	37	38	7.8	120	59	5.4	7	Sacramento sucker	*Catostomus Occidentalis*	187	—	—	1
	6/29/00	830	563	37	38	7.8	120	59	5.4	7	Sacramento sucker	*Catostomus Occidentalis*	172	—	—	1
	6/29/00	830	563	37	38	7.8	120	59	5.4	7	White catfish	*Ameiurus catus*	91	—	—	1
	6/29/00	830	563	37	38	7.8	120	59	5.4	7	White catfish	*Ameiurus catus*	190	—	—	1
	6/29/00	830	563	37	38	7.8	120	59	5.4	7	White catfish	*Ameiurus catus*	170	—	—	1
	6/29/00	830	563	37	38	7.8	120	59	5.4	7	White catfish	*Ameiurus catus*	185	—	—	1
	6/29/00	830	563	37	38	7.8	120	59	5.4	7	Red swamp crayfish	*Procamburus clarki*	—	—	—	1
	6/29/00	830	563	37	38	7.8	120	59	5.4	7	Red swamp crayfish	*Procamburus clarki*	—	11	31	1