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SILVERY MINNOW EGG AND LARVAL FISH MONITORING IN CONSTRUCTED EMBAYMENTS: SUMMARY OF FINDINGS REPORT

FINAL REPORT

Prepared for

NEW MEXICO INTERSTATE STREAM COMMISSION

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NEW MEXICO INTERSTATE STREAM COMMISSION
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INTRODUCTION

As part of the effort to monitor use of constructed embayments by the Rio Grande silvery minnow (Hybognathus amarus; silvery minnow), New Mexico Interstate Stream Commission (NMISC) contracted with SWCA Environmental Consultants to conduct this NMISC Middle Rio Grande Riverine Habitat Restoration Project (Project) nursery habitat monitoring program. The primary objectives of this study were to determine if embayments constructed as part of the Project attract spawning Rio Grande silvery minnows (*Hybognathus amarus*; silvery minnow), particularly gravid females and/or larvae, as well as determine if these areas retain eggs. A secondary objective was to determine if silvery minnows actively seek areas of emergent or inundated terrestrial vegetation. Because of low spring flows in 2006, such areas did not exist within the study area, so this type of habitat was simulated using dried terrestrial vegetation (hay) in shallow, low-velocity areas within constructed embayments.

The NMISC Project applied several habitat restoration techniques in the Albuquerque Reach of the Middle Rio Grande (MRG) to create or improve habitat for the silvery minnow. The Project constructed egg-retention, larval-rearing, and over-wintering habitat for silvery minnow within three subreaches of the Albuquerque Reach. The Project was designed to facilitate evaluation of selected restoration techniques and was primarily funded by the State of New Mexico, with partial funding by the Middle Rio Grande Endangered Species Act Collaborative Program. The State of New Mexico funded the embayment monitoring effort.

The long-term goal of the Project is to promote egg retention, larval rearing, young-of-year, and over-wintering habitat for silvery minnow in support of Element S of the of the U.S. Fish and Wildlife's (USFWS's) Reasonable and Prudent Action in the March 2003 Biological Opinion (BO) (U.S. Fish and Wildlife Service [USFWS 2003]). The objective of the restoration process is to increase measurable habitat complexity in support of various life stages of silvery minnow by facilitating lateral migration of the river across islands, bars, and riverbanks at a variety of river flows.

The BO was released by the USFWS in 2003, covering the Bureau of Reclamation's (Reclamation's) water and river maintenance operations, the U.S. Army Corps of Engineer's flood control operations, and related non-federal actions on the MRG (USFWS 2003). The BO requires habitat restoration projects on the MRG that would improve survival of all life stages of the endangered silvery minnow and other endangered species. The 2003 MRG BO identified the need for increased availability of low-velocity habitat and silt and sand substrates to provide food, shelter, and sites for reproduction for silvery minnow and thereby alleviate jeopardy to the continued existence of the species in the MRG.

Crews worked to enhance an island near Alameda Bridge (river mile [RM] 192.2) to create areas of low-velocity habitat. The upstream half of the island was modified to create terraces of different elevations that could be inundated to help support various life stages of the silvery minnow. The three created terraces can be inundated at approximately 1,500, 2,500, and 3,500 cubic feet per second (cfs) discharge. Spoil from the terraces was used to create an embayment on the east side of the island that is inundated at low flows of less than 500 cfs.

A similar modification was performed on an island downstream of the South Diversion Channel (RM 176.5). Three terraces were also created on the upstream half of the island so that inundation can occur to help support various life stages of silvery minnow. The created terraces will be inundated at approximately 1,500, 2,500, and 3,500 cfs. The embayment created can be inundated at low flows, including less than 500 cfs. Excess vegetation gathered during grubbing was used to support the fill area around the embayment. Much of this vegetation was invasive Russian olive (*Elaeagnus angustifolia*) or immature salt cedar (*Tamarix* spp.). Scattered coyote willows (*Salix exigua)* or immature cottonwoods (*Populus deltoides*) were left throughout the modified area.

BACKGROUND

The silvery minnow is a moderate-sized, stout minnow, reaching 3.5 inches in total length, that spawns in the late spring and early summer, coinciding with high spring snowmelt flows (Sublette et al. 1990). Spawning also may be triggered by other high-flow events such as spring and summer thunderstorms. The species is a pelagic spawner, producing neutrally buoyant eggs that drift downstream with the current (Platania 1995). The eggs hatch in 2 to 3 days, and the larvae may continue to drift or become retained in backwaters or embayments. The species normally lives about 2 to 3 years in the wild. Natural flow regimes, movement within the limited remaining range, and habitat diversity are important to completion of the life cycle.

In 1994, the silvery minnow was classified as endangered by the USFWS (Federal Register [FR] 1994) and has been considered endangered at the state level since 1979. Historically, the silvery minnow was one of the most widespread and abundant fishes in New Mexico. The species has declined as a result of impacts from dewatering, channelization and flow regulation for irrigation, diminished water quality, and competition/predation by non-native species. The species is endemic to New Mexico, where it historically occupied large rivers with shifting sand substrates. The silvery minnow currently occupies less than 10 percent of its historic range and is found only in the Rio Grande from Cochiti Reservoir downstream to Elephant Butte Reservoir (Propst 1999) (Figure 1).

Silvery minnows prefer low-velocity (less than 0.1 m/s) and shallow water (<0.4 m) in areas over sand and silt substrates (Dudley and Platania 1997). Nursery habitat for larval fish would ideally consist of slow-velocity slackwaters found in inlets, floodplain depressions, and inundated arroyos (Porter and Massong 2004a). Early life stages (egg and larvae) are especially dependent on these low-velocity habitats (Porter and Massong 2004a, b). Previous studies using gellan beads to simulate silvery minnow eggs have shown that low-velocity inlets and shelves have retained higher numbers of beads than bankline or other high-velocity areas (Fluder et al. 2006). The presence of emergent vegetation in these shallow-water, low-velocity habitats also serves to retain beads, eggs, and larval fish (Fluder et al. 2006). In addition to this, emergent vegetation often slows flows and provides food for larvae and adults and cover from predators (Massong et al. 2004).

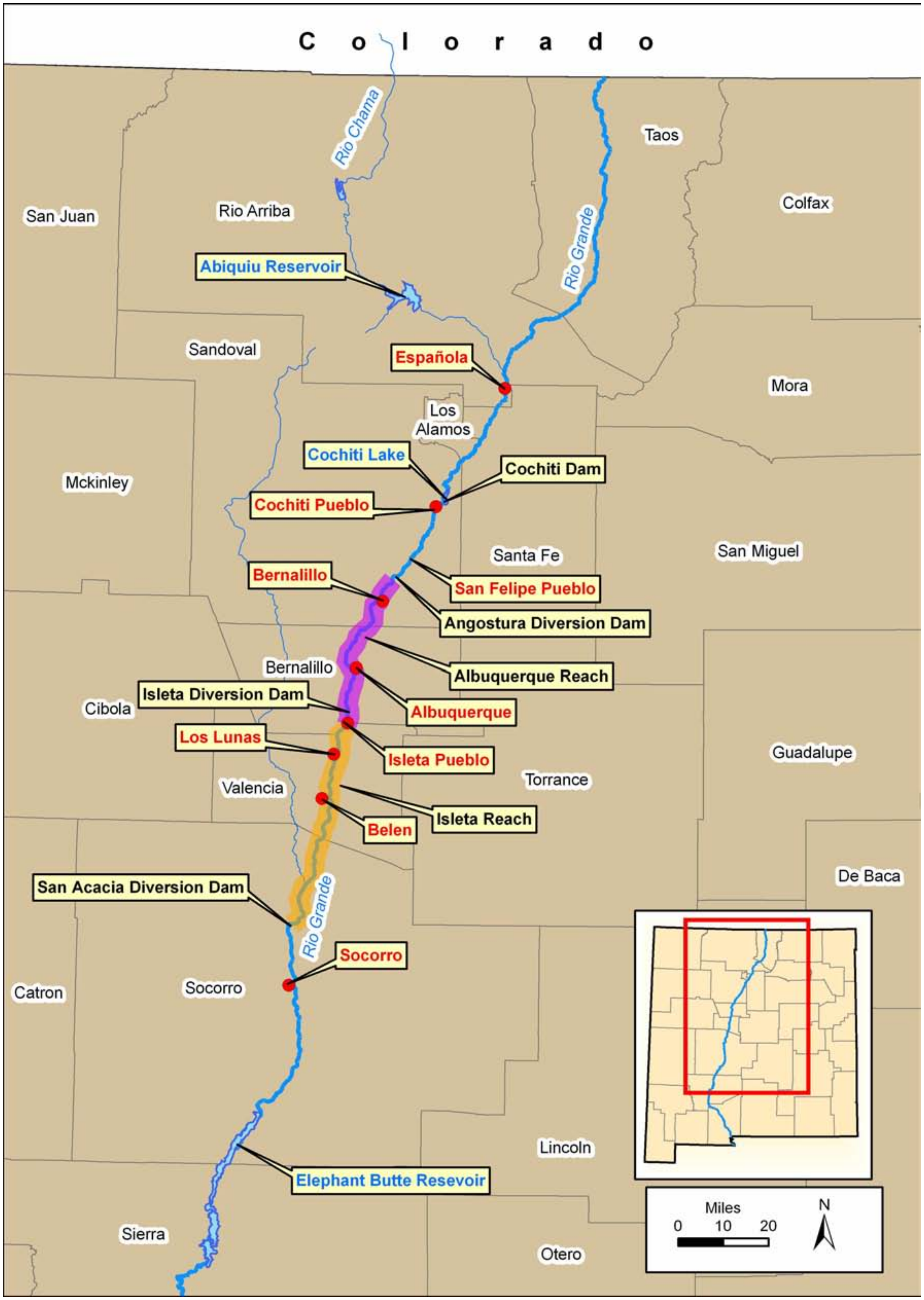

Figure 1. Overview of Middle Rio Grande. The Albuquerque Reach is highlighted in purple, the Isleta Reach in yellow.

Previous restoration efforts in the Middle Rio Grande sought to restore and create such habitats. Constructed inlets and embayments retain silvery minnow eggs and larvae as well as attract free-swimming fish (Massong et al. 2004). A drift zone (inundated area with neglible flow occurring in the back of the inlet) is especially important for egg retention (Massong et al. 2004). It can be assumed that the silvery minnow is using inundated, slow-velocity island and bar habitat similar to the way in which it would use historic floodplain habitat: as a means for the retention of eggs and during early life stages (Fluder et al. 2006). Silvery minnows do not typically occupy stream reaches dominated by straight, narrow, or incised channels with rapid flows (Sublette et al. 1990; Bestgen and Platania 1991). Critical habitat for the silvery minnow was designated by the USFWS and includes the Albuquerque Reach of the Rio Grande. This designation became effective February 19, 2003 (FR 2003).

Emergent or inundated terrestrial vegetation is one possible component of ideal habitat for silvery minnows. First, it is necessary to determine the mechanism by which minnows could seek out emergent vegetation. Although well studied, there are many components of the olfactory system in fish that are not completely understood. It is known that *Brycon cephalus* (a South American ray-finned fish) exhibit alarm reactions when exposed to a conspecific skin extract (Ide et al. 2003). Fathead minnows (Cyprinidae: *Pimephales promelas*) respond to skin extracts of both breeding and nonbreeding females, but only to skin extracts of nonbreeding males (Pollock et al. 2005). Other studies have demonstrated changes in the relative size and morphology of olfactory organs in zebra fish (Cyprinidae: *Danio rerio*) as they mature from larvae to adults (Poling and Brunjes 2000), suggesting that scent cues may play a more important role during periods of rapid development than in adult life. However, there is little research suggesting that Cyprinidae or related fishes respond to scent cues in seeking spawning habitat. Field observations of gravid and ready-to-spawn females in an area of inundated terrestrial vegetation suggest that silvery minnows may actively seek these areas of decreased flow and increased forage to spawn (M. Porter, personal communication 2006). It is possible that emergent or inundated vegetation could provide ideal habitat by way of lower flow, cover, and increased nutrients.

The University of New Mexico and the USFWS have monitored silvery minnow populations within this reach on an ongoing basis. Generally, the data collected indicate that silvery minnow are rare throughout the reach, with many of the individuals collected being adults (Dudley et al. 2003). This data set indicates that the population may benefit by retaining eggs, larvae, and juveniles in upstream areas like the Albuquerque Reach, where they can contribute to population growth and aid in the recovery of the species.

METHODS

Sites were selected at four locations within the Albuquerque Reach (Alameda, Montaño, I-40, and South Diversion Channel) and at one location in the Isleta Reach (Los Lunas) (Figure 2). The sites discussed in this report are Alameda and the South Diversion Channel; both contain embayments constructed by the NMISC (Figure 3, Figure 4, Figure 5). Methods used were those set forth by Mickey Porter of Reclamation (personal communication 2006). Ideal sites had low- or no-current velocity and depths between 0.2 and 0.3 m. Two rectangular hoop nets (0.5 m by 0.5 m, 6.4-mm mesh size) were placed side by side, and a nylon mesh bag of timothy hay was placed in the cod end of one of the two hoop nets ("experimental"), while the other net did not contain hay ("control"). Both were securely attached to the substrate. Two square quadrats (0.5 m by 0.5 m) fitted with 1-mm mesh were placed under the rear section of each hoop net. At each of the sites were two pairs of hoop nets, a total of four experimental and four control.

Sites were visited daily between 9 May 2006 and 27 May 2006. First, water quality data (dissolved oxygen, temperature, conductivity, specific conductance, and salinity) were recorded before water at the site was disturbed. Next, hoop nets were carefully untied and moved aside so that the quadrats underneath could be inspected for Rio Grande silvery minnow eggs. After that, hoop nets were inspected for the presence of fish. If fish were present, they were identified, counted, and released, with the presence of gravid silvery minnow females noted. Hoop nets were reset, and quadrats were replaced underneath. Finally, water depth and current velocity were recorded for each hoop net. Unknown fish, major changes in water level, and anything else of note was logged and photographed if appropriate. Appendix A contains photographs of each site.

RESULTS

Over the 18-day sample period, 77 silvery minnows were collected from the constructed embayments at Alameda and the South Diversion Channel; only one silvery minnow was a gravid female, and no silvery minnow eggs were collected at either site. In all, 259 total larvae (species undetermined) were collected at both sites. A summary table (Table 1) is provided below, and the full data set is available in an attached Excel spreadsheet.

Water quality data are summarized in Table 2. It should be noted that the sites were not visited at the same time each day, and some water quality parameters had large diel fluctuations. For example, during this study, the main channel at Alameda had an all-time low temperature of 14.6°C at 7:30 A.M. on the morning of May 12 and an all-time high of 25.5°C at 4:18 P.M. the afternoon of May 21. The USGS gage at Central Avenue indicated that flows ranged from about 550 cfs to about 750 cfs for the duration of the study (Figure 6). Within the main channel at Alameda, water quality ranges were as follows: temperature, 14.6–25.5°C; dissolved oxygen, 6.38–8.47 mg/L; conductivity, 240.2–333.9 µS/cm; specific conductance, 293.6–331.7 µS/cm; salinity, 0.1–0.2 ppt, water depth, 0.30–0.94 m; and current velocity, 0.57–1.14 m/sec. At the hoop nets, the temperature

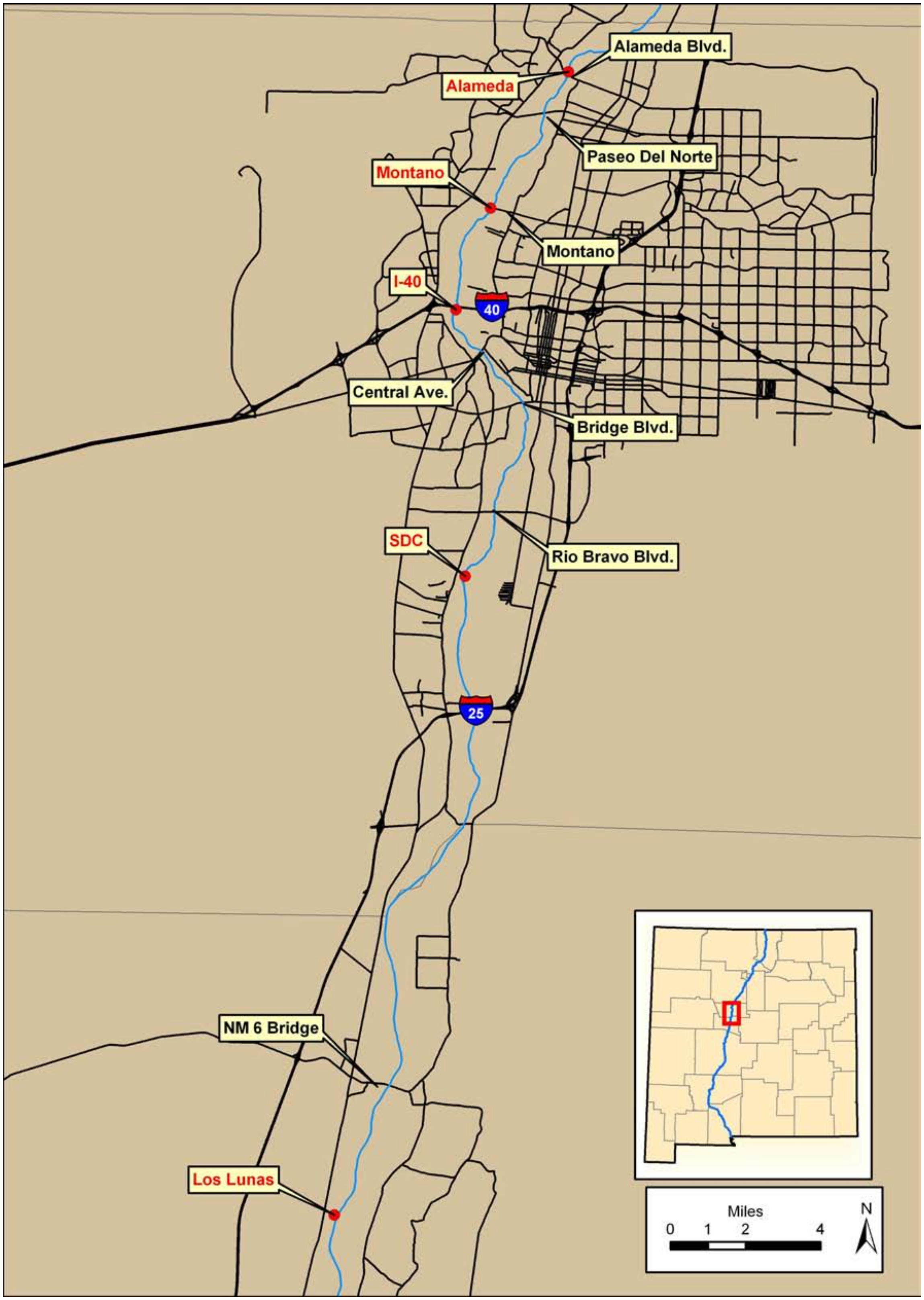

Figure 2. 2006 Middle Rio Grande. Nursery habitat monitoring sites are indicated by red font. NMISC-funded sites are Alameda and SDC.

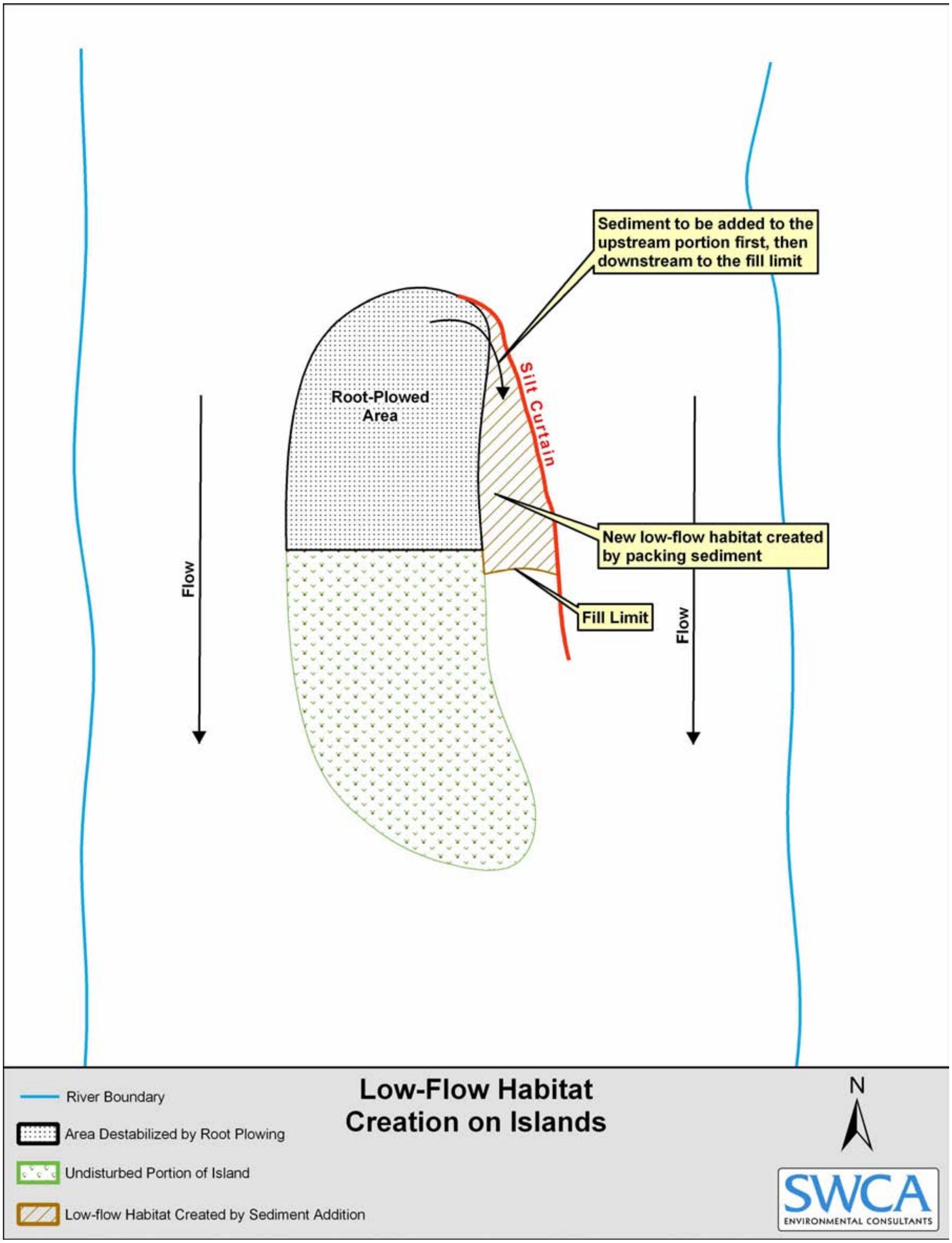

Figure 3. Hypothetical design for island modification and creating embayments within the Rio Grande.

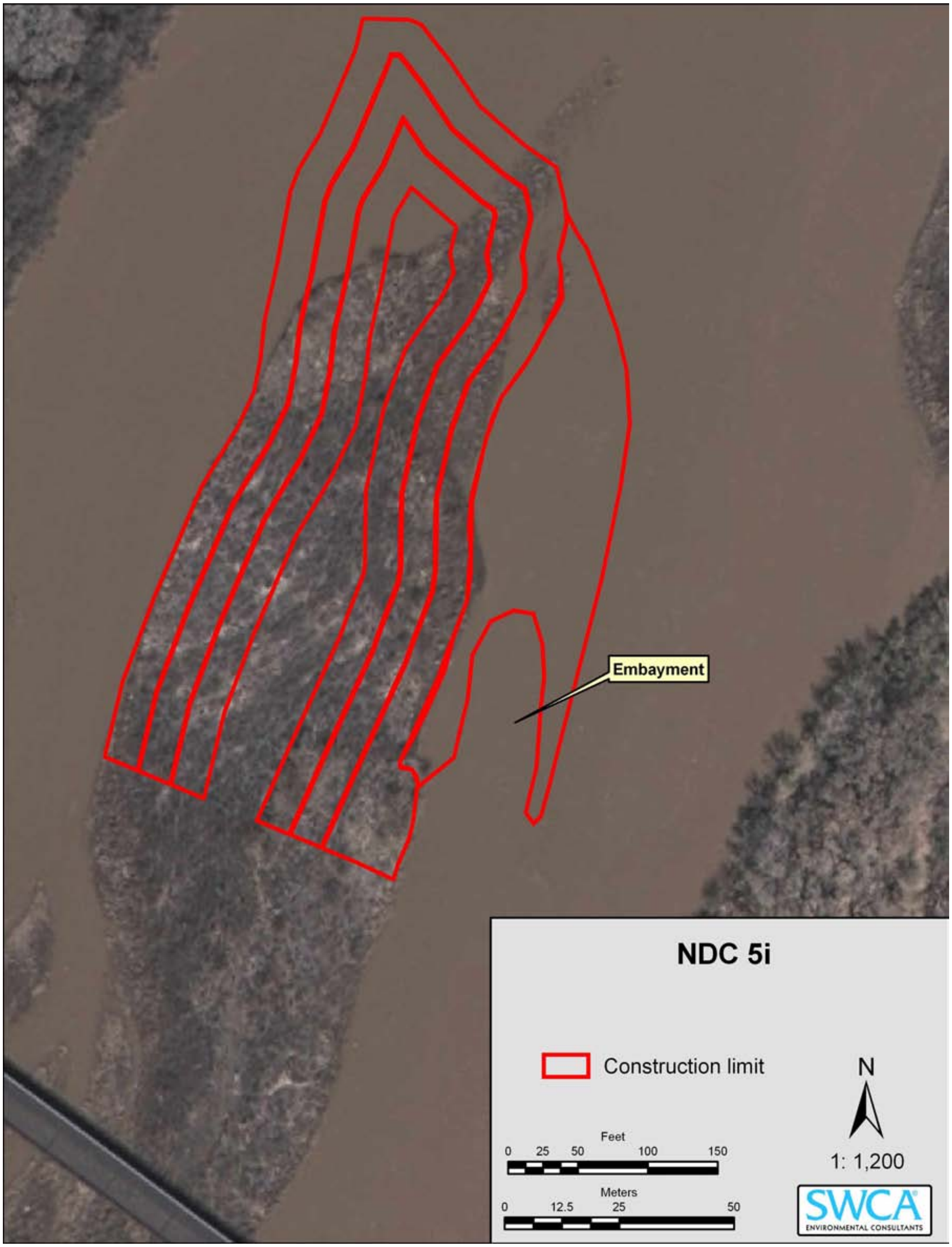

Figure 4. Constructed embayment at Alameda site.

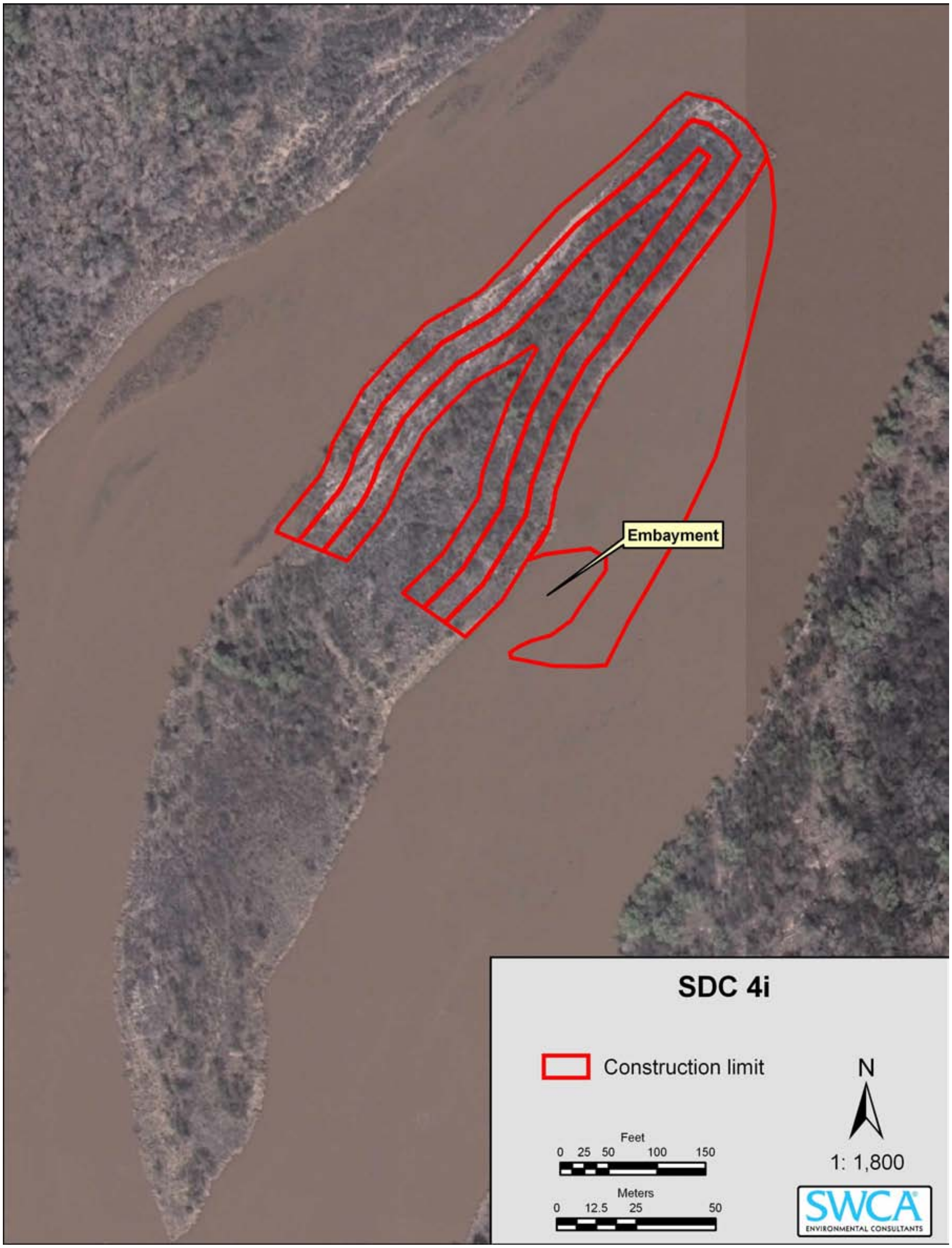

Figure 5. Constructed embayment at South Diversion Channel site.

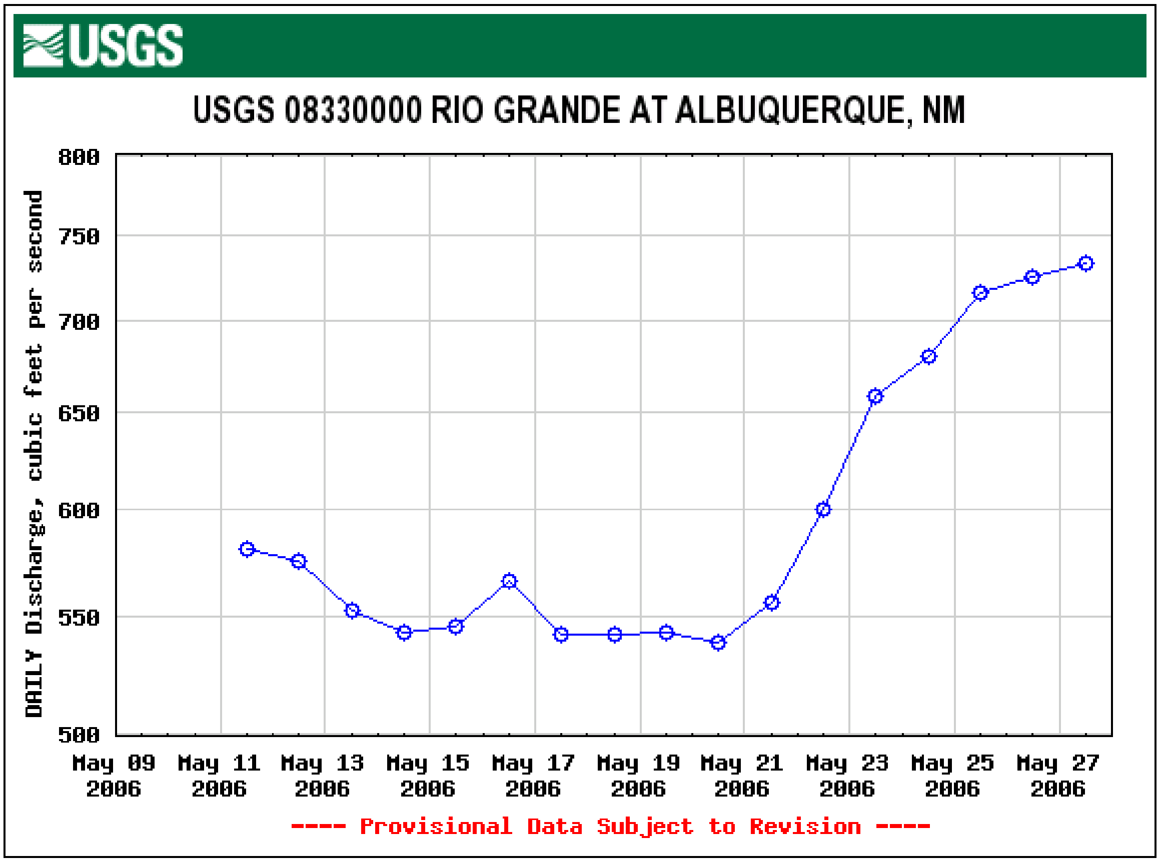

Figure 6. USGS hydrograph for the gage at Central Avenue for the study period.

Table 1. Summary of Fish and Egg Findings in Hoop Nets and Quadrats during 2006 Nursery Habitat Study

Site	Type	Silvery Minnow Adults	Gravid Silvery Minnow	Other Fish	Silvery Minnow Eggs	Larvae
Alameda	Experimental	49	1	177	0	59
	Control	17	0	130	0	118
South Diversion Channel	Experimental	10	0	144	0	21
	Control	1	0	96	0	61

Table 2. Average Water Quality and Flow Conditions for Both Main Channel and Hoop Net Sites during 2006 Nursery Habitat Study

Site	Type	Temp (°C)	Dissolved O_2 (mg/L)	Conduc-tivity (µS/cm)	Specific Conduc-tance (µS/cm)	Salinity (ppt)	Water Depth (m)	Water Velocity (m/s)
Alameda	Experimental	21.6	7.85	308.4	329.2	0.2	0.36	0.01
	Control	21.6	7.77	308.5	329.4	0.2	0.33	0.01
	Main Channel	21.1	7.55	296.9	319.5	0.2	0.66	0.86
South Diversion Channel	Experimental	20.9	7.21	303.0	333.9	0.2	0.32	0.05
	Control	20.9	7.20	302.9	333.9	0.2	0.29	0.04
	Main Channel	20.5	7.67	308.5	337.2	0.2	0.65	0.69

Range was 14.2–26.9°C; dissolved oxygen, 5.52–9.81 mg/L; conductivity, 257.6–347.7 µS/cm; specific conductance, 317.5–340.4 µS/cm; water depth, 0.21–0.45 m; and current velocity, 0–0.1 m/sec.

At the South Diversion Channel, water quality ranges in the main channel were: temperature, 17.1–23.8°C; dissolved oxygen, 6.00–8.80 mg/L; conductivity, 285.6–359.4 S/cm; 315.7–391.1 µS/cm; water depth, 0.39–0.94 m; and current velocity, 0.28–1.13 m/sec. Salinity was constant at 0.2 ppt throughout the duration of the study. At the hoop nets, temperature ranged from 17.3–24.7°C; dissolved oxygen, 4.95–8.87 mg/L; conductivity, 151.8–341.2 µS/cm; specific conductance, 241.9–348.9 µS/cm; salinity, 0.1–0.2 ppt; water depth, 0.03-0.61 m; and current velocity, 0–0.33 m/sec.

CONCLUSIONS

Future monitoring of constructed embayments should build upon the work completed in this study and would include more rigorous investigations and testing hypotheses. Little is known about how Cyprinidae respond to non-alarm scent cues, and even less is known about such cues and the silvery minnow. In order to explore this issue in the future, a greater number and more densely placed array of hoop nets or another method of capture should be placed within the embayments. A more methodical experimental design would allow investigators to ascertain whether or not silvery minnow are responding to dried terrestrial vegetation. If the dried vegetation aspect is not of concern, then a greater number of hoop nets placed within the embayment should determine whether or not silvery minnows are using these areas. Additionally, as restoration sites mature and support native riparian vegetation the conditions that support the life histories of silvery minnow could be present, and increased utilization of the restoration sites may occur by the fishery.

Previous studies (Porter and Massong 2004a; Porter and Massong 2005) have used gellan beads to simulate Rio Grande silvery minnow eggs in order to determine egg movement and settling in various mesohabitats. Using these artificial eggs would be an ideal way to determine if constructed embayments at the Alameda and South Diversion Channel sites retain silvery minnow eggs. Artificial eggs could be released upstream from the mouth of the embayment, and quadrats could be placed within the embayment with Moore egg collectors in the main channel. Comparisons could then be made as to the proportion of eggs released that successfully drift into the constructed low-velocity habitat.

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APPENDIX A
SITE PHOTOS

Figure A.1. Hoop net set up within the constructed embayment at Alameda. The hoop net on the left contains a nylon bag of hay, while the hoop net on the right does not. The main channel of the Rio Grande is on the right side, and the photograph was taken looking upstream.

Figure A.2. Both set-ups within the constructed embayment at Alameda.

Figure A.3. Both hoop net set-ups within constructed embayment at South Diversion Channel. The main channel of the Rio Grande is in the back half of the photograph, and the river is flowing from left to right.

Figure A.4. Westernmost set-up at South Diversion Channel. A medial sandbar has been deposited across the mouth of the embayment, and the water becomes substantially deeper behind the hoop nets.

APPENDIX B
EMBAYMENT MONITORING DATABASE 2006

The following sheets contain data collected in the 2006 Nursery Habitat Project

Two rectangular hoop nets (0.5 m x 0.5 m, 6.4 mm mesh size) were placed next to each other and within the silt fence embayment, where they were constructed. A nylon mesh bag of timothy hay was placed in the cod end of one of the two hoop nets and both were securely attached to the substrate. Two rectangular quadrats (0.5 m x 0.5 m) fitted with 1 mm mesh were placed under the rear section of each hoop net. At each of the five sites there were two pairs of hoop nets for a total of ten baited and ten unbaited.

Control hoop nets represent those that did contain hay

Experimental hoop nets represent those that did contain hay

ALAMEDA Site Information				Adult Fish		Other eggs		RGSM eggs		Larval fish		Tadpoles		Mouth of Enclosure							Inside Enclosure (if applicable)							Main Channel							Fish	Comments
Site (1 or 2)	Date	Time arrived	Experiment or Control	RGSM present	other fish (check Comments)	front quadrat	back quadrat	front quadrat	back quadrat	front quadrat	back quadrat	front quadrat	back quadrat	water temp (oC)	DO (mg/L)	conduct (uS)	spec cond (uS)	salinity (ppt)	water depth (10th of foot)	current velocity (m/s)	water temp (oC)	DO (mg/L)	conduct (uS)	spec cond (uS)	salinity (ppt)	water depth (10th of foot)	current velocity (m/s)	water temp (oC)	DO (mg/L)	conduct (uS)	spec cond (uS)	salinity (ppt)	water depth (10th of foot)	current velocity (m/s)		
				66	307	321	378	0	0	77	100	288	214																							
2	5/10/2006	900	control	2	12	3	0	0	0	0	0	0	0	14.3	5.52	259.4	327	0.2										16.9	6.38	240.2	294	0.1			5 PIMPRO, 7 PLAGRA	water quality data at mouth of enclosure measured at 0915, water qual in main channel measured at 1051
1	5/10/2006	950	control	0	1	1	0	0	0	0	0	0	0	15.2	5.62	268.9	330	0.1										16.9	6.38	240.2	294	0.1			PIMPRO	
1	5/10/2006	950	experiment	0	0	n/a	n/a	n/a	n/a	n/a	n/a	0	0	15.2	5.62	268.9	330	0.1										16.9	6.38	240.2	294	0.1				because no fish were present, we did not look for eggs
2	5/10/2006	900	experiment	0	1	0	4	0	0	0	0	0	0	14.3	5.52	259.4	327	0.2										16.9	6.38	240.2	294	0.1			PIMPRO	water quality data at mouth of enclosure measured at 0915, water qual in main channel measured at 1050
1	5/11/2006	900	Control	0	1	0	0	0	0	0	0	0	0	14.6	6.83	267	334	0.2	0.8	0								15.9	8.05	256.7	311	0.1	2.1	1.09	1 PIMPRO	recalibrated DO prior to site data, air bubble on DO tip
2	5/11/2006	945	Control	2	7	0	0	0	0	0	0	0	0	15.5	6.95	272	333	0.2	1.3	0								15.9	8.05	256.7	311	0.1	2.1	1.09		
1	5/11/2006	900	Experiment	1	9	0	0	0	0	0	0	0	0	14.6	6.83	267	334	0.2	1.3	0								15.9	8.05	256.7	311	0.1	2.1	1.09	1 CARCAR, 1 LEPCYA, 3 PLAGRA, 4 PIMPRO	
2	5/11/2006	945	Experiment	6	3	0	0	0	0	0	0	0	0	15.5	6.95	272	333	0.2	1.3	0								15.9	8.05	256.7	311	0.1	2.1	1.09		1 gravid rgsm
1	5/12/2006	730	control	0	0	0	0	0	0	3	0	0	0	14.3	6.04	264	332	0.2	0.9	0								14.6	8.17	251.4	313	0.2	3.1	0.93		
2	5/12/2006	815	control	0	13	0	0	0	0	0	0	0	0	14.2	7.03	257.6	324	0.2	1.3	0								14.6	8.17	251.4	313	0.2	3.1	0.93	1 LEPCYA, 12 PIMPRO	
1	5/12/2006	730	experiment	0	9	7	0	0	0	0	0	0	0	14.3	6.04	264	332	0.2	1.4	0								14.6	8.17	251.4	313	0.2	3.1	0.93	9 PIMPRO	
2	5/12/2006	815	experiment	7	3	1	0	0	0	0	0	0	0	14.2	7.03	257.6	324	0.2	1	0								14.6	8.17	251.4	313	0.2	3.1	0.93	3 PIMPRO	
1	5/13/2006	1241	control	0	1	0	0	0	0	0	0	0	0	20.8	5.96	297.1	324	0.2	1.2	0								21.2	7.29	288.6	312	0.2	2.5	0.8	1 PIMPRO	softshell turtle in hoopnet, approx 4" x 3"
2	5/13/2006	1228	control	0	6	0	0	0	0	0	0	0	0	20.6	7.56	300.6	328	0.2	1	0								21.2	7.29	288.6	312	0.2	2.5	0.8	6 PIMPRO	
1	5/13/2006	1241	experiment	0	16	0	0	0	0	0	0	0	0	20.8	5.96	297.1	324	0.2	1.3	0								21.2	7.29	288.6	312	0.2	2.5	0.8	16 PIMPRO	
2	5/13/2006	1228	experiment	2	2	0	0	0	0	0	0	0	0	20.6	7.56	300.6	328	0.2	1	0								21.2	7.29	288.6	312	0.2	2.5	0.8	1 PIMPRO, 1 PLAGRA	
1	5/14/2006	835	control	1	0	10	50	0	0	15	10	0	0	17.8	7.34	289.7	336	0.2	0.85	0								17.2	8.47	266.3	313	0.2	2.3	1.1		
2	5/14/2006	901	control	1	8	0	0	0	0	0	0	0	0	17.7	7.58	286.3	333	0.2	1.2	0								17.2	8.47	266.3	313	0.2	2.3	1.1	8 PIMPRO	
1	5/14/2006	835	experiment	0	9	3	0	0	0	0	1	0	0	17.8	7.34	289.7	336	0.2	1.2	0								17.2	8.47	266.3	313	0.2	2.3	1.1	7 PIMPRO, 2 LEPCYA	
2	5/14/2006	901	experiment	19	6	0	0	0	0	0	1	0	0	17.7	7.58	286.3	333	0.2	0.95	0								17.2	8.47	266.3	313	0.2	2.3	1.1	1 CARCAR, 4 PIMPRO, 1 CYPLUT	
1	5/15/2006	1415	control	0	0	50	50	0	0	0	0	0	0	21	9.7	302.5	328	0.2	0.9	0.01								19.8	7.7	292	324	0.2	2.3	0.89		hoop net front loose from t-posts
2	5/15/2006	1447	control	1	9	20	0	0	0	0	0	0	0	21	8.77	302	327	0.2	1.2	0								19.8	7.7	292	324	0.2	2.3	0.89	7 PIMPRO, 1 CYPLUT, 1 CATCOM	
1	5/15/2006	1415	experiment	0	5	20	10	0	0	0	0	0	0	21	9.7	302.5	328	0.2	1.35	0								19.8	7.7	292	324	0.2	2.3	0.89	4 PIMPRO, 1 CYPLUT	hoop net collapsed, 2 large holes in holding section. I patched it up and reset it.
2	5/15/2006	1447	experiment	0	6	1	15	0	0	0	1	0	0	21	8.77	302	327	0.2	1	0.01								19.8	7.7	292	324	0.2	2.3	0.89	1 GAMAFF, 5 PIMPRO	
1	5/16/2006	1457	control	0	2	20	30	0	0	2	0	0	0	25	9.81	332.4	335	0.2	0.9	0.1								23	7.24	315.8	328	0.2	2.5	1.14	1 PIMPRO, 1 CYPLUT	calibrated DO sensor
2	5/16/2006	1517	control	0	10	50	0	0	0	0	0	0	0	23.7	10.9	320.9	328	0.2	1.3	0.02								23	7.24	315.8	328	0.2	2.5	1.14	2 CYPLUT, 8 PIMPRO	DO still acting funny, swirled it around in the water, no change
1	5/16/2006	1457	experiment	0	23	0	0	0	0	0	0	0	0	24.4	12.5	326.4	326	0.2	1.4	0.02								23	7.24	315.8	328	0.2	2.5	1.14	19 CYPLUT, 4 PIMPRO	DO sensor is acting funny
2	5/16/2006	1517	experiment	0	0	0	0	0	0	0	0	0	0	23.7	10.9	320.9	328	0.2	1	0.02								23	7.24	315.8	328	0.2	2.5	1.14		
1	5/17/2006	1442	control	0	1	12	1	0	0	0	0	0	0	25	8.75	334.7	328	0.2	0.9	0								23.7	7.6	318.3	326	0.2	2.5	1.04	1 PIMPRO	1 large bullfrog tadpole in hoopnet
2	5/17/2006		control	0	6	35	75	0	0	0	0	0	0	24.3	8.24	325.7	326	0.2	1.2	0								23.7	7.6	318.3	326	0.2	2.5	1.04	5 PIMPRO, 1 CYPLUT	
1	5/17/2006	1442	experiment	0	7	20	100	0	0	0	0	4	0	25	8.75	334.7	328	0.2	1.3	0								23.7	7.6	318.3	326	0.2	2.5	1.04	6 PIMPRO, 1 CYPLUT	
2	5/17/2006		experiment	0	3	30	15	0	0	0	1	0	1	24.3	8.24	325.7	326	0.2	1	0.01								23.7	7.6	318.3	326	0.2	2.5	1.04	2 PIMPRO, 1 CYPLUT	
1	5/18/2006	1404	control	0	0	20	2	0	0	0	0	0	1	25.4	8.07	332.7	332	0.2	0.9	0								23.7	7.55	320.6	328	0.2	2.5	0.88		
2	5/18/2006	1409	control	0	3	0	0	0	0	0	0	0	0	25.5	7.61	332.8	330	0.2	1.3	0.01								23.7	7.55	320.6	328	0.2	2.5	0.88	3 PIMPRO	
1	5/18/2006	1404	experiment	1	0	0	0	0	0	0	0	0	0	25.4	8.07	332.7	332	0.2	1.4	0.03								23.7	7.55	320.6	328	0.2	2.5	0.88		
2	5/18/2006	1409	experiment	0	7	1	0	0	0	0	0	1	1	25.5	7.61	332.8	330	0.2	1	0.02								23.7	7.55	320.6	328	0.2	2.5	0.88	7 PIMPRO	
1	5/19/2006		control	0	1	0	0	0	0	0	0	3	2	24.5	8.55	336.2	336	0.2	0.9	0.01								23	7.11	313.7	325	0.2	1.9	0.67	1 PIMPRO	
2	5/19/2006	1335	control	2	7	0	0	0	0	0	0	0	0	24.9	9.25	330.6	332	0.2	1.4	0								23	7.11	313.7	325	0.2	1.9	0.67	6 PIMPRO, 1 CYPLUT	quadrats slightly overlapped
1	5/19/2006		experiment	1	16	0	0	0	0	0	0	2	1	24.5	8.55	336.2	336	0.2	1.3	0.01								23	7.11	313.7	325	0.2	1.9	0.67	15 PIMPRO, 1 PLAGRA	
2	5/19/2006	1335	experiment	0	5	0	0	0	0	0	0	0	1	24.9	9.25	330.6	332	0.2	1	0								23	7.11	313.7	325	0.2	1.9	0.67	5 PIMPRO	
1	5/20/2006	1330	control	0	0	0	1	0	0	3	1	30	13	25.6	7.27	343.3	340	0.2	0.7	0								23.4	7.45	309.7	319	0.2	2.1	0.81		
2	5/20/2006	1328	control	8	14	15	1	0	0	0	0	0	0	25.4	7.91	340.2	338	0.2	1.3	0.01								23.4	7.45	309.7	319	0.2	2.1	0.81	14 PIMPRO	
1	5/20/2006	1330	experiment	10	5	0	3	0	0	0	0	0	1	25.6	7.27	343.3	340	0.2	1.3	0.02								23.4	7.45	309.7	319	0.2	2.1	0.81	5 PIMPRO	
2	5/20/2006	1328	experiment	0	1	0	0	0	0	0	3	8	9	25.4	7.91	340.2	338	0.2	1	0.01								23.4	7.45	309.7	319	0.2	2.1	0.81	1 PIMPRO	rear quadrat upside down
1	5/21/2006		control	0	0	0	0	0	0	0	0	50	20	26.9	8.85	347.7	336	0.2	0.9	0.01								25.5	7.51	333.9	311	0.2	2.1	0.86		
2	5/21/2006	1618	control	0	12	2	0	0	0	0	0	3	5		7.99	339.2	331	0.2	1.4	0								25.5	7.51	333.9	311	0.2	2.1	0.86	12 PIMPRO	
1	5/21/2006		experiment	1	2	0	0	0	0	0	0	2	0	26.9	8.85	347.7	336	0.2	1.4	0.02								25.5	7.51	333.9	311	0.2	2.1	0.86	2 PIMPRO	
2	5/21/2006	1618	experiment	0	2	0	0	0	0	0	0	7	5		7.99	339.2	331	0.2	0.9	0.01								25.5	7.51	333.9	311	0.2	2.1	0.86	2 PIMPRO	
1	5/22/2006	1505	control	0	7	0	0	0	0	0	0	8	8	23	8.04	312.4	325	0.2	0.9	0								22.6	7.2	309.7	325	0.2	1.9	0.78	5 PIMPRO, 1 AMENAT, 1 CYPLUT	quadrats askew
2	5/22/2006	1505	control	0	2	0	0	0	0	0	0	2	1	22.9	7.3	294.4	326	0.2	1.4	0								22.6	7.2	309.7	325	0.2	1.9	0.78	2 PIMPRO	
1	5/22/2006	1505	experiment	0	5	0	0	0	0	1	0	1	6	23	8.04	312.4	325	0.2	1.4	0								22.6	7.2	309.7	325	0.2	1.9	0.78	4 PIMPRO, 1 LEPCYA	
2	5/22/2006	1505	experiment	0	4	0	0	0	0	0	0	8	27	22.9	7.3	294.4	326	0.2	1	0								22.6	7.2	309.7	325	0.2	1.9	0.78	4 PIMPRO	quadrats askew
1	5/23/2006		control	0	0	0	0	0	0	0	0	80	20	22.2	8.28	309.8	326	0.2	1	0								21.3	7.58	305	328	0.2	1	0.63		
2	5/23/2006	1406	control	0	0	0	0	0	0	1	0	0	0	21.8	8.73	305.3	325	0.2	1.4	0.01								21.3	7.58	305	328	0.2	1	0.63		
1	5/23/2006		experiment	0	2	0	0	0	0	0	0	4	0	22.2	8.28	309.8	326	0.2	1.5	0.01								21.3	7.58	305	328	0.2	1	0.63	2 PIMPRO	
2	5/23/2006	1406	experiment	0	0	0	0	0	0	0	0	1	4	21.8	8.73	305.3	325	0.2	1	0.02								21.3	7.58	305	328	0.2	1	0.63		
1	5/24/2006	1605	control	0	0	0	0	0	0	5	4	10	20	26.2	7.01	334.3	331	0.2	1	0.02								23.9	8.38	318.5	326	0.2	1.7	0.73		
2	5/24/2006	1553	control	0	1	0	0	0	0	0	0	0	0	25.1	7.1	333.3	330	0.2	1.4	0								23.9	8.38	318.5	326	0.2	1.7	0.73	1 PIMPRO	
1	5/24/2006	1605	experiment	1	4	0	1	0	0	5	0	1	5	26.2	7.01	334.3	331	0.2	1.4	0								23.9	8.38	318.5	326	0.2	1.7	0.73	3 PIMPRO, 1 CYPLUT	
2	5/24/2006	1553	experiment	0	4	0	0	0	0	0	0	30	20	25.1	7.1	333.3	330	0.2	1	0								23.9	8.38	318.5	326	0.2	1.7	0.73	4 PIMPRO	
1	5/25/2006	830	control	0	0	0	0	0	0	3	1	15	11	17.6	6.98	277.7	325	0.2	0.9	0								18.1	7.78	271.5	313	0.2	2.4	0.95		
2	5/25/2006	843	control	0	1	0	0	0	0	0	3	3	0	17.5	7.52	272.8	318	0.2	1.3	0								18.1	7.78	271.5	313	0.2	2.4	0.95	1 PIMPRO	quadrats slightly overlapped
1	5/25/2006	830	experiment	0	3	0	0	0	0	6	0	3	5	17.6	6.98	277.7	325	0.2	1.5	0								18.1	7.78	271.5	313	0.2	2.4	0.95	1 PIMPRO, 1 CYPLUT	
2	5/25/2006	843	experiment	0	1	0	0	0	0	10	11	3	12	17.5	7.52	272.8	318	0.2	1	0								18.1	7.78	271.5	313	0.2	2.4	0.95	1 PIMPRO	
1	5/26/2006	1319	control	0	0	0	0	0	0	11	7	7	8	23.9	7.29	317.5	324	0.2	1	0.01								23.4	7.07	315.7	325	0.2	2.1	0.68		USGS employee informed us cfs is 791 at 1346
2	5/26/2006	1316	control	0	4	0	0	0	0	0	0	0	1	23.8	8.04	312.8	321	0.2	1.4	0.01								23.4	7.07	315.7	325	0.2	2.1	0.68	1 PIMPRO, 1 CYPLUT, 1 PLAGRA, 1 MICSAL	
1	5/26/2006	1319	experiment	0	3	0	0	0	0	0	3	0	1	23.9	7.29	317.5	324	0.2	1.5	0								23.4	7.07	315.7	325	0.2	2.1	0.68	1 PIMPRO, 1 LEPMAC, 1 CYPLUT	quadrats overlapped
2	5/26/2006	1316	experiment	0	6	0	20	0	0	3	1	0	2	23.8	8.04	312.8	321	0.2	1.1	0.02								23.4	7.07	315.7	325	0.2	2.1	0.68	1 CYPLUT, 5 PIMPRO	
1	5/27/2006	1728	control	0	0	0	0	0	0	8	40	2	3	24.4	7.93	328.2	332	0.2	1	0.02								22.5	7.34	316	332	0.2	1.9	0.57		
2	5/27/2006		control	0	1	0	0	0	0	0	1	0	0	24	7.44	325.3	332	0.2	1.5	0.01								22.5	7.34	316	332	0.2	1.9	0.57	1 ICTPUN	ICTPUN approx 18 inches
1	5/27/2006	1728	experiment	0	0	0	0	0	0	0	1	0	0	24.4	7.93	328.2	332	0.2	1.5	0.01								22.5	7.34	316	332	0.2	1.9	0.57	9 PIMPRO, 8 CYPLUT, 1 CYPCAR	CYPCAR approx 18 inches
2	5/27/2006		experiment	0	5	0	0	0	0	1	10	0	0	24	7.44	325.3	332	0.2	1.1	0.01								22.5	7.34	316	332	0.2	1.9	0.57	1 LEPCYA, 3 PIMPRO, 1 CYPLUT	

Silvery Minnow/Fish Data (Adult Fish, Other eggs, RGSM eggs, Larval fish, Tadpoles); Water Quality Data (Mouth of Enclosure, Inside Enclosure (if applicable), Main Channel)

MONTANO Site Information				Silvery Minnow/Fish Data: Adult Fish										Water Quality Data: Mouth of Enclosure							Inside Enclosure (if applicable)							Main Channel							Fish	Comments
				Adult Fish		Other eggs		RGSM eggs		Larval fish		Tadpoles																								
Site (1 or 2)	Date	Time arrived	Experiment or Control	RGSM present	other fish (check Comments)	front quadrat	back quadrat	front quadrat	back quadrat	front quadrat	back quadrat	front quadrat	back quadrat	water temp (oC)	DO (mg/L)	conduct (uS)	spec cond (uS)	salinity (ppt)	water depth (10th of foot)	current velocity (m/s)	water temp (oC)	DO (mg/L)	conduct (uS)	spec cond (uS)	salinity (ppt)	water depth (10th of foot)	current velocity (m/s)	water temp (oC)	DO (mg/L)	conduct (uS)	spec cond (uS)	salinity (ppt)	water depth (10th of foot)	current velocity (m/s)		
				8	23	22	88	0	0	4	0	2	2																							
1	5/10/2006	1145	control	0	0	n/a	n/a	n/a	n/a	n/a	n/a	0	0	17.5	6.39	270.8	315.7	0.2	1.05	0.09						0.6	0.08	17.8	6.46	272.3	315.4	0.2	0.7	0.38		lots of sediment deposited in here, we did not look in quadrats for eggs. We removed quadrats
1	5/10/2006	1145	experiment	0	0	n/a	n/a	n/a	n/a	n/a	n/a	0	0	17.5	6.39	270.8	315.7	0.2	1.05	0.09						0.6	0.08	17.8	6.46	272.3	315.4	0.2	0.7	0.38		
2	5/10/2006	1204	control	0	0	n/a	n/a	n/a	n/a	n/a	n/a	0	0	18.5	6.26	278.4	316.8	0.2	0.8	0.01								18.3	6.31	274.8	315.2	0.1	0.7	0.19		
2	5/10/2006	1204	experiment	0	0	n/a	n/a	n/a	n/a	n/a	n/a	0	0	18.5	6.26	278.4	316.8	0.2	0.8	0.01								18.3	6.31	274.8	315.2	0.1	0.7	0.19		
1	5/11/2006	1055	control	0	0	n/a	n/a	n/a	n/a	n/a	n/a	0	0	16.7	7.79	266.4	316.5	0.2	0.9	0.02	16.8	7.55	266.1	315.3	0.2	0.7	0.03	16.6	8	264.6	312.5	0.2	0.8	0.46		Conductivity is bouncing, velocity is strange directly behind silt fence.
1	5/11/2006	1055	Experiment	0	0	n/a	n/a	n/a	n/a	n/a	n/a	0	0	16.7	7.79	266.4	316.5	0.2	0.7	0.11	16.8	7.55	266.1	315.3	0.2	0.7	0.03	16.6	8	264.6	312.5	0.2	0.8	0.46		
2	5/11/2006	1115	control	0	0	2	4	0	0	0	0	0	0	17.9	7.52	273.7	316.5	0.2	0.6	0								17.2	7.97	268.3	315.5	0.2	0.9	0.5		Most likely amphibian eggs
2	5/11/2006	1115	Experiment	0	0	2	2	0	0	0	0	0	0	17.9	7.52	273.7	316.5	0.2	0.65	0.08								17.2	7.97	268.3	315.5	0.2	0.9	0.5		Most likely amphibian eggs
1	5/12/2006	915	control	0	0	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	15	8.12	258.4	318.9	0.2	0.7	0.05	15.1	8.15	258.2	318.6	0.2	0.7	0.03	15.1	8.28	258.2	318.6	0.2	0.5	0.4		silt fence seems to create strange currents
1	5/12/2006	915	experiment	0	0	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	15	8.12	258.4	318.9	0.2	0.7	0.06								15.1	8.28	258.2	318.6	0.2	0.5	0.4		
2	5/12/2006	940	control	0	0	0	0	0	0	0	0	0	0	16	8.26	264.4	319	0.2	0.65	0								15.5	8.22	260.4	317.8	0.2	1.1	0.32		
2	5/12/2006	940	experiment	0	0	1	13	0	0	0	0	0	0	16	8.14	263.6	318.6	0.2	0.65	0.03								15.5	8.22	260.4	317.8	0.2	1.1	0.32		Most likely amphibian eggs
1	5/13/2006	1118	control	0	0	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	19	8.12	262.6	296.1	0.1	0.7	0.06								19	6.7	205.1	226.5	0.1	0.7	0.57		
1	5/13/2006	1118	experiment	0	1	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	19	7.43	260.3	293	0.1	0.7	0.5								19	6.7	205.1	226.5	0.1	0.7	0.57	1 CYPLUT	
2	5/13/2006	1056	control	0	0	0	0	0	0	0	0	0	0	19.6	5.82	283.2	315.7	0.2	0.6	0.01								18.6	7.68	277.7	316.4	0.2	0.9	0.4		hoopnet entrance not fully submerged
2	5/13/2006	1056	experiment	0	0	0	0	0	0	0	0	0	0	19.2	6.03	281.9	316.7	0.2	0.6	0								18.6	7.68	277.7	316.4	0.2	0.9	0.4		hoopnet entrance not fully submerged
1	5/14/2006	1125	control	0	0	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	21	7.9	291.7	316.9	0.2	0.4	0.06	20.8	7.5	286.8	316.1	0.2	0.5	0.05	20.6	7.47	291.1	318	0.2	0.6	0.63		
1	5/14/2006	1125	experiment	0	0	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	21	7.9	291.7	316.9	0.2	0.4	0.06	20.8	7.5	286.8	316.1	0.2	0.5	0.05	20.6	7.47	291.1	318	0.2	0.6	0.63		
2	5/14/2006	1139	control	0	0	0	0	0	0	1	0	0	0	22.5	7.6	304.8	319.6	0.2	0.6	0								20.9	7.23	292.9	317.3	0.2	1.3	0.51		
2	5/14/2006	1139	experiment	0	1	2	2	0	0	2	0	0	0	21.8	7.26	300	319	0.2	0.7	0								20.9	7.23	292.9	317.3	0.2	1.3	0.51	1 PIMPRO	
1	5/15/2006	1307	control	0	0	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	20.6	8.23	288.3	315	0.2	0.5	0.04	20.7	8.72	288.4	314.6	0.2	0.7	0.04	20.6	7.61	288.9	316.8	0.2	0.9	0.57		
1	5/15/2006	1307	experiment	0	0	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	20.6	8.23	288.3	315	0.2	0.5	0.07	20.7	8.72	288.4	314.6	0.2	0.7	0.04	20.6	7.61	288.9	316.8	0.2	0.9	0.57		
2	5/15/2006	1323	control	1	1	0	0	0	0	0	0	0	1	20.9	8.11	290.6	315	0.2	0.65	0.1								20.5	7.22	288	315.5	0.2	0.6	0.46	1 PLAGRA	silvery minnow gravid
2	5/15/2006	1323	experiment	0	1	0	0	0	0	0	0	1	0	20.7	7.3	289.5	315.5	0.2	0.8	0.04								20.5	7.22	288	315.5	0.2	0.6	0.46	1 PIMPRO	
1	5/16/2006	1345	control	0	0	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	22.8	6.93	308.2	321.8	0.2	0.5	0.08	22.8	6.33	308.2	321.6	0.2	1	0.03	22.8	7.4	307.6	320.9	0.2	1.1	0.49		
1	5/16/2006	1345	experiment	0	0	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	22.8	6.93	308.2	321.8	0.2	0.5	0.06	22.8	6.33	308.2	321.6	0.2	1	0.03	22.8	7.4	307.6	320.9	0.2	1.1	0.49		
2	5/16/2006	1317	control	0	0	1	5	0	0	0	0	0	0	23.1	7.2	310.3	322.4	0.2	0.6	0.03								22.2	6.96	304.4	321.3	0.2	0.6	0.51		most likely amphibian eggs
2	5/16/2006	1317	experiment	1	0	0	17	0	0	0	0	0	0	23.1	7.84	309.6	321.8	0.2	0.7	0.01								22.2	6.96	304.4	321.3	0.2	0.6	0.51		most likely amphibian eggs
1	5/17/2006	1359	control	0	0	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	24.2	6.72	311.1	317.7	0.2	0.6	0	24.1	6.38	311.5	316.3	0.2	0.7	0.01	24.3	7.31	311.5	315.7	0.2	0.9	0.44		
1	5/17/2006	1359	experiment	0	0	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	24.2	6.72	311.1	317.7	0.2	0.5	0	24.1	6.38	311.5	316.3	0.2	0.7	0.01	24.3	7.31	311.5	315.7	0.2	0.9	0.44		
2	5/17/2006	1340	control	0	0	0	3	0	0	0	0	0	0	24.9	7.39	315.5	318.3	0.2	0.6	0.05								23.6	6.85	307.8	316.3	0.2	0.7	0.4		amphib eggs, quadrats partially buried
2	5/17/2006	1340	experiment	0	0	8	15	0	0	0	0	0	0	24.8	7.3	315.3	316.9	0.2	0.7	0.07								23.6	6.85	307.8	316.3	0.2	0.7	0.4		amphib eggs, quadrats partially buried
1	5/18/2006	1326	control	0	0	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	23.5	6.48	309.7	318.5	0.2	0.5	0.05	23.4	6.05	309.9	319.4	0.2	0.5	0.02	23.6	6.75	239	316.6	0.2	0.8	0.51		
1	5/18/2006	1326	experiment	0	0	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	23.5	6.48	309.7	318.5	0.2	0.5	0.01	23.4	6.05	309.9	319.4	0.2	0.5	0.02	23.6	6.75	239	316.6	0.2	0.8	0.51		
2	5/18/2006	1301	control	0	0	2	5	0	0	1	0	0	0	24.5	7.28	314.5	318.4	0.2	0.6	0.02								23	6.74	305.2	317.2	0.2	0.8	0.4		Most likely amphibian eggs
2	5/18/2006	1301	experiment	0	1	3	10	0	0	0	0	0	0	24.2	7.34	296.6	317.8	0.2	0.7	0.1								23	6.74	305.2	317.2	0.2	0.8	0.4	1 PIMPRO	Most likely amphibian eggs
1	5/19/2006	1231	control	0	0	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	22.7	6.46	305.1	282.6	0.1	0.5	0.01	22.9	6.82	306.9	320.3	0.2	0.6	0.01	22.6	7.18	303.3	318.1	0.2	0.5	0.57		
1	5/19/2006	1231	experiment	0	0	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	22.7	6.46	305.1	282.6	0.1	0.5	0.01	22.9	6.82	306.9	320.3	0.2	0.6	0.01	22.6	7.18	303.3	318.1	0.2	0.5	0.57		
2	5/19/2006	1243	control	0	0	0	0	0	0	0	0	1	0	24.4	6.99	228.9	252.9	0.1	0.6	0.01								22.8	6.78	304.5	317.5	0.2	0.8	0.62		
2	5/19/2006	1243	experiment	0	0	0	0	0	0	0	0	0	0	24	6.74	313.2	313.9	0.1	0.8	0.03								22.8	6.78	304.5	317.5	0.2	0.8	0.62		
1	5/20/2006	1255	control	0	0	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	23.7	6.9	312.3	319.5	0.2	0.5	0.01	23.7	6.69	312.4	320.5	0.2	0.5	0.01	23.9	7.66	312	318.7	0.2	1	0.52		
1	5/20/2006	1255	experiment	0	0	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	23.7	6.9	312.3	319.5	0.2	0.6	0.01								23.9	7.66	312	318.7	0.2	1	0.52		
2	5/20/2006	1231	control	0	0	1	1	0	0	0	0	0	0	25	7.23	321.5	321.3	0.2	0.6	0.01								22.9	6.7	308.3	319.2	0.2	1.3	0.53		
2	5/20/2006	1231	experiment	0	0	0	11	0	0	0	0	0	0	24.6	6.78	317.9	320.5	0.2	0.7	0.08								22.9	6.7	308.3	319.2	0.2	1.3	0.53		10 of the 11 eggs amphibian
1	5/21/2006	1458	control	0	0	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	26.6	5.15	326.3	316.7	0.2	0.5	0.07	26.6	5.38	326.3	315.9	0.2	1.4	0.25	26.5	5.58	326.3	316.4	0.2	0.6	0.6		
1	5/21/2006	1458	experiment	0	2	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	26.6	5.15	326.3	316.7	0.2	0.6	0.07	26.6	5.38	326.3	315.9	0.2	1.4	0.25	26.5	5.58	326.3	316.4	0.2	0.6	0.6	1 PIMPRO, 1 CYPLUT	
2	5/21/2006	1500	control	0	0	0	0	0	0	0	0	0	0	27.5	6.28	334.5	318.9	0.2	0.6	0.01								26.9	6.45	327.9	316.7	0.2	0.9	0.21		
2	5/21/2006	1500	experiment	0	2	0	0	0	0	0	0	0	0	27.4	5.62	331.8	317.5	0.2	0.7	0.03								26.9	6.45	327.9	316.7	0.2	0.9	0.21	2 PLAGRA	
1	5/22/2006	1340	control	0	0	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	22.2	7.24	296.4	313.6	0.2	0.6	0.09	22.2	7.63	295.9	312	0.2	1.5	0.13	22.2	7.08	296.7	313.8	0.2	0.8	0.47		
1	5/22/2006	1340	experiment	0	0	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	22.2	7.24	296.4	313.6	0.2	0.7	0.1	22.2	7.63	295.9	312	0.2	1.5	0.13	22.2	7.08	296.7	313.8	0.2	0.8	0.47		
2	5/22/2006	1358	control	0	1	0	0	0	0	0	0	0	0	23	7.19	302.2	314.4	0.2	0.6	0.04								22.5	7.02	299.3	314.3	0.2	1.1	0.55	1 PLAGRA	1 of 1 PLAGRA on front quadrat
2	5/22/2006	1358	experiment	5	0	0	0	0	0	0	0	0	1	22.7	7.1	300.5	314.4	0.2	0.8	0								22.5	7.02	299.3	314.3	0.2	1.1	0.55		
1	5/23/2006	1322	control	0	0	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	21.3	8	295.3	317.4	0.2	0.6	0.01	21.1	7.52	295	317.3	0.2	1.7	0.07	21.3	8.9	294.9	317.3	0.2	0.9	0.32		east side of silt fence down
1	5/23/2006	1322	experiment	0	0	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	21.3	8	295.3	317.4	0.2	0.7	0	21.1	7.52	295	317.3	0.2	1.7	0.07	21.3	8.9	294.9	317.3	0.2	0.9	0.32		east side of silt fence down
2	5/23/2006	1311	control	0	0	0	0	0	0	0	0	0	0	21.4	6.29	296	317.3	0.2	0.7	0.01								22	8.39	294.7	316.2	0.2	0.8	0.3		
2	5/23/2006	1311	experiment	0	0	0	0	0	0	0	0	0	0	21.6	6.34	289.2	321.6	0.2	0.8	0.02								22	8.39	294.7	316.2	0.2	0.8	0.3		
1	5/24/2006	1431	control	0	2	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	24.7	6.89	314.5	316.4	0.1	1	0.09	24.8	7.03	314.4	316.3	0.2	1	0.15	24.7	7.16	314.6	316.2	0.2	1	0.47	1 PLAGRA, 1 CYPLUT	
1	5/24/2006	1431	experiment	0	0	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	24.7	6.89	314.5	316.4	0.1	0.6	0	24.8	7.03	314.4	316.3	0.2	1	0.15	24.7	7.16	314.6	316.2	0.2	1	0.47		
2	5/24/2006	1455	control	0	0	0	0	0	0	0	0	0	0	25.3	7.36	319.8	318.1	0.2	0.7	0.02								25	7.06	317.1	317.2	0.2	1.4	0.56		
2	5/24/2006	1455	experiment	0	0	0	0	0	0	0	0	0	0	25.1	6.66	318.2	318.1	0.2	0.8	0.06								25	7.06	317.1	317.2	0.2	1.4	0.56		
1	5/25/2006	945	control	0	0	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	18.6	7.77	270.5	318.8	0.2	0.7	0.01	18.5	7.69	279.9	319.5	0.2	0.9	0.01	18.5	7.24	279.3	317.6	0.2	1.3	0.55		
1	5/25/2006	945	experiment	0	0	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	18.6	7.77	270.5	318.8	0.2	0.6	0.03	18.5	7.69	279.9	319.5	0.2	0.9	0.01	18.5	7.24	279.3	317.6	0.2	1.3	0.55		
2	5/25/2006	1002	control	0	0	0	0	0	0	0	0	0	0	19.1	7.4	283.2	319.1	0.2	0.7	0.03								18.8	7.32	281.1	318.4	0.2	1.4	0.49		approx 9 inch koi outside of hoop nets
2	5/25/2006	1002	experiment	0	0	0	0	0	0	0	0	0	0	19.2	7.39	283.8	319.1	0.2	0.8	0.09								18.8	7.32	281.1	318.4	0.2	1.4	0.49		
1	5/26/2006	1231	control	0	11	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	22.5	6.65	303.6	317	0.2	0.8	0.01	22.8	6.98	304.2	317.5	0.2	1.1	0.01	21.7	6.9	303.6	317.8	0.2	0.7	0.6	9 CYPLUT, 1 PLAGRA, 1 PIMPRO	
1	5/26/2006	1231	experiment	0	0	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	22.5	6.65	303.6	317	0.2	0.6	0.02	22.8	6.98	304.2	317.5	0.2	1.1	0.01	21.7	6.9	303.6	317.8	0.2	0.7	0.6		
2	5/26/2006	1216	control	0	0	0	0	0	0	0	0	0	0	22.5	6.91	302.4	317.4	0.2	0.7	0.04								22.7	8.02	300.9	314.9	0.2	1.5	0.54		
2	5/26/2006	1216	experiment	1	0	0	0	0	0	0	0	0	0	22.4	6.89	301.9	317.1	0.2	0.8	0.11								22.7	8.02	300.9	314.9	0.2	1.5	0.54		
1	5/27/2006	1505	control	0	0	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	23.8	6.8	310.8	317.9	0.2	0.8	0.01	23.6	6.8	310.5	318.6	0.2	1.4	0.01	23.7	7	306.3	311.4	0.1	1	0.56		
1	5/27/2006	1505	experiment	0	0	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	23.8	6.8	310.8	317.9	0.2	0.65	0.01	23.6	6.8	310.5	318.6	0.2	1.4	0.01	23.7	7	306.3	311.4	0.1	1	0.56		
2	5/27/2006	1607	control	0	0	0	0	0	0	0	0	0	0	24.5	6	315.9	318.9	0.2	0.8	0.16								24	6.7	314.1	319.9	0.2	1.1	0.47		
2	5/27/2006	1607	experiment	0	0	0	0	0	0	0	0	0	0	24.1	6.67	314.2	319.8	0.2	0.9	0.1								24	6.7	314.1	319.9	0.2	1.1	0.47		

I-40 Site Information				Adult Fish		Silvery Minnow/Fish Data Other eggs		RGSM eggs		Larval fish		Tadpoles		Water Quality Data Mouth of Enclosure							Inside Enclosure (if applicable)							Main Channel							Fish	Comments
Site (1 or 2)	Date	Time arrived	Experiment or Control	RGSM present	other fish (check Comments)	front quadrat	back quadrat	front quadrat	back quadrat	front quadrat	back quadrat	front quadrat	back quadrat	water temp (oC)	DO (mg/L)	conduct (uS)	spec cond (uS)	salinity (ppt)	water depth (10th of foot)	current velocity (m/s)	water temp (oC)	DO (mg/L)	conduct (uS)	spec cond (uS)	salinity (ppt)	water depth (10th of foot)	current velocity (m/s)	water temp (oC)	DO (mg/L)	conduct (uS)	spec cond (uS)	salinity (ppt)	water depth (10th of foot)	current velocity (m/s)		
				1	102	12	14	0	0	5	19	931	955																							
1	5/10/2006	1250	control	0	0	n/a	n/a	n/a	n/a	n/a	n/a	0	0	19.8	5.38	297	322.6	0.2			19.8	5.38	297	322.6	0.2	0.6	0.06						0.7	0.38		large male spadefoot toad in trap net.
1	5/10/2006	1250	experiment	1	0	0	0	0	0	0	0	0	0	19.8	5.38	297	322.6	0.2			19.8	5.38	297	322.6	0.2	0.6	0.06						0.7	0.38		minnow has VIE tag, orange on right dorsal
2	5/10/2006	1315	experiment	0	0	n/a	n/a	n/a	n/a	n/a	n/a	0	0	19.8	5.69	290.2	156.4	0.1	0.6	0.06								19.9	6.28			0.1	0.5	0.38		because no fish were present, we did not check quadrats for eggs. Conductivity values screwy
2	5/10/2006	1315	control	0	0	n/a	n/a	n/a	n/a	n/a	n/a	0	0	19.8	5.69	290.2	156.4	0.1	0.6	0.06	19.8	5.82	148.5	156.2	0.1	0.5	0.28	19.9	6.28			0.1	0.5	0.38		because no fish were present, we did not check quadrats for eggs. Conductivity values screwy
1	5/11/2006	1225	Control	0	0	3	3	0	0	0	0	1	1	19.6	6.83	290.2	323.6	0.2	0.6	0.01								18.7	7.83	283.5	322.5	0.2	0.7	0.27		conductivity bouncing around, amphibian eggs
1	5/11/2006	1225	Experiment	0	0	2	3	0	0	0	0	1	1	19.4	6.7	289.1	323.5	0.2	0.7	0.04								18.7	7.83	283.5	322.5	0.2	0.7	0.27		amphibian eggs
2	5/11/2006	1300	Control	0	0	0	0	0	0	0	0	0	0	20.1	6.6	292.2	322	0.2	0.55	0.03	19.8	7.44	290.1	322	0.2	0.55	0.06	19.8	7.44	289.7	321.8	0.2	0.6	0.3		
2	5/11/2006	1300	Experiment	0	0	0	0	0	0	0	0	0	0	19.8	7.01	289.4	321.8	0.2	0.5	0.06								19.8	7.44	289.7	321.8	0.2	0.6	0.3		1 dead minnow (not sure if RGSM) in hoopnet
1	5/12/2006	1045	control	0	0	0	0	0	0	0	0	0	1	17.5	8.68	275.8	322	0.2	0.6	0.01								16.6	8.25	270.6	322.6	0.2	0.9	0.41		spadefoot toad in hoop net
1	5/12/2006	1045	Experiment	0	0	0	0	0	0	0	0	1	3	17.5	8.16	275	322.9	0.2	0.7	0.02								16.6	8.25	270.6	322.6	0.2	0.9	0.41		
2	5/12/2006	1110	control	0	0	0	0	0	0	0	0	0	0	18.1	8.38	270	322.4	0.2	0.55	0.05								17.5	8.07	276.4	322	0.2	0.6	0.31		
2	5/12/2006	1110	Experiment	0	0	0	0	0	0	0	0	0	0	17.5	8.04	276.3	318.7	0.2	0.5	0.08	17.5	8.01	277.3	322.8	0.2	1.35	0.07	17.5	8.07	276.4	322	0.2	0.6	0.31		
1	5/13/2006	1001	control	0	0	0	0	0	0	0	0	0	0	18.2	7.88	304.9	350	0.2	0.7	0.02								16.8	8.36	279.8	331.6	0.2	1	0.39		both quads buried in silt
1	5/13/2006	1001	experiment	0	0	0	0	0	0	0	0	0	0	17.2	7.63	275	322.4	0.2	0.7	0.01								16.8	8.36	279.8	331.6	0.2	1	0.39		quads full of silt, but not buried
2	5/13/2006	1016	control	0	1	0	0	0	0	0	0	0	0	17.2	7.55	274.5	322.7	0.2	0.6	0.06								17.2	7.75	267.4	314.5	0.1	0.5	0.5	1 PIMPRO	hoopnets not fully submerged
2	5/13/2006	1016	experiment	0	0	0	0	0	0	0	0	0	0	17	8.04	270	319.7	0.2	0.6	0.27								17.3	7.76	256.5	283.4	0.1	2.9	0.66		hoopnets not fully submerged
1	5/14/2006	1015	control	0	4	0	0	0	0	0	2	50	20	20.2	8.05	294.8	325.8	0.2	0.5	0								18.2	7.94	281.7	324.1	0.2	0.7	0.44	3 GAMAFF, 1 PIMPRO	entrance to trap not under water
1	5/14/2006	1015	experiment	0	0	3	0	0	0	0	0	3	5	18.8	7.9	284.1	324	0.2	0.7	0.07								18.2	7.94	281.7	324.1	0.2	0.7	0.44		amphibian eggs
2	5/14/2006	1035	control	0	0	0	0	0	0	0	12	50	15	19.3	8.6	288.9	323.9	0.2	0.55	0.04								18.7	7.68	272.9	311.9	0.2	0.45	0.37		entrance to trap not under water
2	5/14/2006	1035	experiment	0	0	1	0	0	0	0	3	0	0	18.9	7.98	285.8	324	0.2	0.4	0.02	18.9	7.65	287.1	324.4	0.2	1.25	0.03	18.7	7.68	272.9	311.9	0.2	0.45	0.37		
1	5/15/2006	1214	control	0	0	0	0	0	0	0	0	100	75	21.2	8.3	302.9	326.7	0.2	0.6	0								19.4	7.93	289.4	323.7	0.2	0.6	0.4		
1	5/15/2006	1214	experiment	0	0	0	0	0	0	0	0	20	2	19.9	7.63	292.8	324.1	0.2	0.7	0.01								19.4	7.93	289.4	323.7	0.2	0.6	0.4		
2	5/15/2006	1225	control	0	0	0	0	0	0	0	0	20	30	20.6	7.6	296.7	323	0.2	0.5	0.02								20.1	7.19	293.9	324.3	0.2	0.5	0.43		
2	5/15/2006	1225	experiment	0	0	0	0	0	0	0	0	0	0	20.2	7.46	294.2	323.8	0.2	0.35	0.04	20.3	7.44	295.3	324.1	0.2	0.7	.0.7	20.1	7.19	293.9	324.3	0.2	0.5	0.43		
1	5/16/2006	1248	control	0	0	0	0	0	0	3	0	20	50	23.7	7.77	319.6	327.3	0.2	0.7	0.01								21.8	7.16	306.5	326.5	0.2	0.75	0.43		
1	5/16/2006	1248	experiment	0	0	1	0	0	0	0	0	2	12	22.2	8.38	308.8	326	0.2	0.7	0.02								21.8	7.16	306.5	326.5	0.2	0.75	0.43		most likely an amphibian egg
2	5/16/2006	1240	control	0	0	0	0	0	0	0	1	30	30	22.5	6.5	311	325.8	0.2	0.55	0								22.1	6.8	309.2	327	0.2	0.5	0.46		
2	5/16/2006	1240	experiment	0	3	0	0	0	0	0	0	0	0	22.1	6.9	309.1	327.1	0.2	0.45	0.03	22.1	7.11	309.7	326.9	0.2	0.5	0.13	22.1	6.8	309.2	327	0.2	0.5	0.46	2 CYPLUT, 1 PIMPRO	
1	5/17/2006	1246	control	0	2	0	0	0	0	0	0	50	100	24.8	7.9	324.5	325.2	0.2	0.6	0								22.4	7.33	307.7	323.6	0.2	0.9	0.46	1 GAMAFF, 1 PIMPRO	
1	5/17/2006	1246	experiment	0	1	0	2	0	0	0	0	2	5	23	7.86	310.5	323.3	0.2	0.7	0								22.4	7.33	307.7	323.6	0.2	0.9	0.46	1 GAMAFF	
2	5/17/2006		control	0	0	0	0	0	0	0	0	11	75	23.4	6.14	314.5	324.7	0.2	0.5	0.01								23.1	7.69	311.3	323.2	0.2	0.5	0.44		
2	5/17/2006		experiment	0	1	0	0	0	0	0	0	0	0	23.1	7.43	312.1	324.1	0.2	0.4	0.02	23.1	7.59	312.1	323.7	0.2	1.3	0.01	23.1	7.69	311.3	323.2	0.2	0.5	0.44	1 CYPLUT	
1	5/18/2006	1214	Control	0	0	0	0	0	0	0	0	20	150	25	7.48	330.7	331.9	0.2	0.6	0.01								22.3	7.9	306	321.8	0.2	0.8	0.43		
1	5/18/2006	1214	experiment	0	0	0	5	0	0	0	0	12	20	22.7	7.5	310.1	325.1	0.2	0.6	0.01								22.3	7.9	306	321.8	0.2	0.8	0.43		most likely amphib eggs, front quadrat buried
2	5/18/2006	1228	Control	0	0	0	0	0	0	0	0	25	100	23.1	7.58	312.5	324.5	0.2	0.4	0.03								22.6	6.92	309.8	325.3	0.2	0.5	0.44		trap appears to be too high above waterline. Reposition?
2	5/18/2006	1228	experiment	0	0	0	0	0	0	0	0	0	0	22.7	6.65	306	324.7	0.2	0.4	0.01	22.7	7.22	310.6	325.1	0.2	1.1	0.1	22.6	6.92	309.8	325.3	0.2	0.5	0.44		
1	5/19/2006	1200	control	0	1	0	0	0	0	0	0	100	30	23.6	5.63	320.5	333.3	0.2	0.7	0.02								21.8	8.35	305.2	326	0.2	0.7	0.46	1 GAMAFF	
1	5/19/2006	1200	experiment	0	1	0	0	0	0	0	0	3	20	22	6.81	308.6	326.8	0.2	0.7	0								21.8	8.35	305.2	326	0.2	0.7	0.46	1 PIMPRO	
2	5/19/2006	1146	control	0	0	0	0	0	0	0	0	50	12	21.7	7.67	306.4	326.6	0.2	0.5	0.01								21.5	8.46	302.6	324.8	0.2	1.5	0.51		
2	5/19/2006	1146	experiment	0	0	0	0	0	0	0	0	0	0	21.4	7.43	296.1	311.9	0.1	0.4	0	21.5	7.38	279.7	303.6	0.1	0.3	0.19	21.5	8.46	302.6	324.8	0.2	1.5	0.51		
1	5/20/2006	1046	control	0	0	0	0	0	0	0	0	30	40	23.8	6.89	321.2	328.3	0.2	0.7	0.01								22.1	7.82	306.9	324.1	0.2	0.8	0.47		
1	5/20/2006	1046	experiment	0	1	2	0	0	0	0	0	0	0	22.5	7.11	310	325.7	0.2	0.7	0.01								22.1	7.82	306.9	324.1	0.2	0.8	0.47	1 PIMPRO	amphibian eggs
2	5/20/2006	1202	control	0	0	0	0	0	0	0	0	20	40	22.8	7.06	312.3	325.8	0.2	0.4	0.02								22.3	7	309.5	326.8	0.2	0.5	0.44		
2	5/20/2006	1202	experiment	0	1	0	0	0	0	0	0	0	0	22.3	7.49	303.9	325.7	0.2	0.4	0.01	22.3	7.28	309	327.2	0.2	1.3	0	22.3	7	309.5	326.8	0.2	0.5	0.44	1 CYPLUT	
1	5/21/2005	1417	control	0	0	0	0	0	0	1	1	100	45	27.5	6.34	339.8	325.5	0.2	0.4	0.03								26.1	6.81	330.4	323.3	0.2	0.7	0.46		trap net had collapsed
1	5/21/2006	1417	experiment	0	0	0	0	0	0	0	0	50	10		6.04	332.8	322.7	0.2	0.7	0.02								26.1	6.81	330.4	323.3	0.2	0.7	0.46		both quads buried in silt
2	5/21/2006	1430	control	0	0	0	0	0	0	0	0	40	10	26.6	1.26	337.3	327	0.2	0.5	0.02																DO suspect
2	5/21/2006	1430	experiment	0	0	0	0	0	0	0	0	0	0	26.6	6.59	332.1	323.2	0.2	0.4	0.01	26.4	7.32	329.9	321.1	0.2	1.3	0.08	26.4	6.36	332	323.3	0.2	0.6	0.46		
1	5/22/2006	1226	control	0	10	0	0	0	0	0	0	13	3	21.5	7.63	301.5	323.3	0.2	0.6	0								20.9	7.37	296.9	322.3	0.2	0.55	0.36	5 CYPCAR, 5 PIMPRO	
1	5/22/2006	1226	experiment	0	1	0	0	0	0	0	0	1	5	21.3	7.75	300.1	322.7	0.2	0.75	0								20.9	7.37	296.9	322.3	0.2	0.55	0.36	1 PIMPRO	1 of 1 PIMPRO in back quadrat
2	5/22/2006	1253	control	0	0	0	0	0	0	0	0	12	7	21.6	7.61	299.6	320.3	0.2	0.6	0.01								21.3	7.37	298.7	321.7	0.2	0.6	0.55		mouth of trap net out of water when we arrived
2	5/22/2006	1253	experiment	0	2	0	0	0	0	0	0	1	0	21.4	7.77	299.1	321.4	0.2	0.4	0.1	21.4	7.61	299.1	321.4	0.2	0.5	0	21.3	7.37	298.7	321.7	0.2	0.6	0.55	2 CYPLUT	
1	5/23/2006	1226	control	0	1	0	0	0	0	0	0	2	3	20.2	7.4	296.4	324.4	0.2	0.8	0								20.1	8.54	291.9	322.9	0.2	0.9	0.51	1 CYPCAR	
1	5/23/2006	1226	experiment	0	0	0	0	0	0	0	0	0	0	20.5	7.1	296.1	323.7	0.2	0.8	0.02								20.1	8.54	291.9	322.9	0.2	0.9	0.51		
2	5/23/2006	1242	control	0	0	0	0	0	0	0	0	25	27	21	8.52	297.4	323.6	0.2	0.6	0								20.5	7.04	295.7	323.4	0.2	0.7	0.55		
2	5/23/2006	1242	experiment	0	0	0	0	0	0	0	0	0	0	20.6	9.34	296.4	323.8	0.2	0.5	0.04	20.4	7.4	295.5	323.5	0.2	0.7	0.18	20.5	7.04	295.7	323.4	0.2	0.7	0.55		
1	5/24/2006	1330	control	0	3	0	0	0	0	0	0	0	0	23.9	6.03	317	324.8	0.2	0.7	0								23.4	7.05	311.1	321.1	0.2	0.9	0.22	2 PIMPRO, 1 GAMAFF	
1	5/24/2006	1330	experiment	0	4	0	0	0	0	0	0	0	0	23.8	6.58	314.4	321.9	0.2	0.9	0.04								23.4	7.05	311.1	321.1	0.2	0.9	0.22	2 PIMPRO, 2 CYPCAR	
2	5/24/2006	1349	control	0	0	0	0	0	0	0	0	25	5	24.4	6.87	319.3	323.1	0.2	0.7	0								24.1	6.74	315.2	321	0.2	1.5	0.67		
2	5/24/2006	1349	experiment	0	0	0	0	0	0	0	0	0	0	24.1	5.7	316.2	321.7	0.2	0.5	0.02	24.1	6.57	315.5	320.9	0.2	0.9	0.24	24.1	6.74	315.2	321	0.2	1.5	0.67		
1	5/25/2006	1059	control	0	6	0	0	0	0	0	0	0	0	20.3	7.51	294.4	324.2	0.2	0.8	0.03								19.6	7.45	290.1	323.2	0.2	1.2	0.41	3 PIMPRO, 2 CYPCAR, 1 GAMAFF	
1	5/25/2006	1059	experiment	0	2	0	0	0	0	0	0	0	0	20.1	7.28	293.3	324.1	0.2	0.8	0.01								19.6	7.45	290.1	323.2	0.2	1.2	0.41	1 GAMAFF, 1 PIMPRO	
2	5/25/2006	1122	control	0	3	0	0	0	0	0	0	40	2	20.7	7.75	296.1	323.7	0.2	0.6	0.01								20.5	7.45	295.3	323.3	0.2	0.7	0.6	1 CYPCAR, 2 CYPLUT	
2	5/25/2006	1122	experiment	0	19	0	0	0	0	1	0	1	1	20.4	7.22	294.7	323.3	0.2	0.6	0.07	20.4	7.05	294.8	323.4	0.2	1.4	0.18	20.5	7.45	295.3	323.3	0.2	0.7	0.6	18 CYPLUT, 1 CYPCAR	
1	5/26/2006	1127	control	0	9	0	0	0	0	0	0	0	0	21.2	7.43	300.2	324.3	0.2	0.8	0.02								20.8	7.34	296.2	323.5	0.2	0.9	0.29	5 PIMPRO, 1 CYPLUT, 1 GAMAFF, 2 CYPCAR	
1	5/26/2006	1127	experiment	0	1	0	1	0	0	0	0	0	0	21.5	7.69	301.1	324.2	0.2	0.9	0.01								20.8	7.34	296.2	323.5	0.2	0.9	0.29	1 PIMPRO	amphibian eggs
2	5/26/2006	1140	control	0	6	0	0	0	0	0	0	0	0	21.4	7.29	299.3	324.5	0.1	0.7	0.03								21.2	7.29	301.1	324.2	0.2	0.9	0.29	1 PLAGRA, 4 CYPLUT, 1 CYPCAR	
2	5/26/2006	1140	experiment	0	9	0	0	0	0	0	0	0	0	21.2	6.95	299.9	324.3	0.1	0.7	0.03	21.2	6.99	300.4	324.3	0.2	1.2	0.26	21.2	7.29	301.1	324.2	0.2	0.9	0.29	1 PLAGRA, 8 CYPLUT	
1	5/27/2006	1320	control	0	0	0	0	0	0	0	0	0	0	22.5	7.52	306.9	322.3	0.2	0.85	0.01								22.4	6.8	305.9	322.6	0.2	1.4	0.24		
1	5/27/2006	1320	experiment	0	0	0	0	0	0	0	0	0	0	22.5	7.08	307.1	322.7	0.2	0.45	0.09								22.4	6.8	305.9	322.6	0.2	1.4	0.24		
2	5/27/2006	1341	control	0	1	0	0	0	0	0	0	0	0	23.1	7.5	310.3	322.1	0.2	0.6	0.1								22.9	7.13	309.3	322.3	0.2	0.8	0.53	1 PLAGRA	1 of 1 PLAGRA in front quad
2	5/27/2006	1341	experiment	0	9	0	0	0	0	0	0	0	0	22.9	7.14	309.3	322.2	0.2	0.75	0.02	22.9	7.07	309.5	322.9	0.2	2	0.09	22.9	7.13	309.3	322.3	0.2	0.8	0.53	9 CYPLUT	

SDC Site Information				Silvery Minnow/Fish Data: Adult Fish		Other eggs		RGSM eggs		Larval fish		Tadpoles		Water Quality Data: Mouth of Enclosure							Inside Enclosure (if applicable)							Main Channel							Fish	Comments
Site (1 or 2)	Date	Time arrived	Experiment or Control	RGSM present	other fish (check Comments)	front quadrat	back quadrat	front quadrat	back quadrat	front quadrat	back quadrat	front quadrat	back quadrat	water temp (oC)	DO (mg/L)	conduct (uS)	spec cond (uS)	salinity (ppt)	water depth (10th of foot)	current velocity (m/s)	water temp (oC)	DO (mg/L)	conduct (uS)	spec cond (uS)	salinity (ppt)	water depth (10th of foot)	current velocity (m/s)	water temp (oC)	DO (mg/L)	conduct (uS)	spec cond (uS)	salinity (ppt)	water depth (10th of foot)	current velocity (m/s)		
				11	240	115	52	0	0	61	21	84	92																							
2	5/11/2005	1435	Control	0	1	0	3	0	0	0	0	0	0	21.5	6.59	315.1	338	0.2	0.3	0.04								20.7	7.7	308.7	335.8	0.2	2.4	1.07	1 PIMPRO	Amphibian eggs
2	5/11/2005	1435	Experiment	0	1	0	0	0	0	0	0	0	0	21.5	6.59	315.1	338	0.2	0.3	0.04								20.7	7.7	308.7	335.8	0.2	2.4	1.07	1 LEPCYA	
1	5/11/2006	1405	Control	0	1	0	0	0	0	0	0	0	0	21.4	5.7	315.8	338.8	0.2	1.6	0								20.7	7.7	308.7	335.8	0.2	2.4	1.07	1 PIMPRO	
1	5/11/2006	1405	Experiment	0	1	0	0	0	0	0	1	0	0	21.4	5.7	315.8	338.8	0.2	1.7	0								20.7	7.7	308.7	335.8	0.2	2.4	1.07	1 GAMAFF	larval fish was dead
1	5/12/2006	1240	Control	0	8	1	40	0	0	1	0	0	0	23	7	319.7	339.8	0.2	1.6	0.02								21.1	7.71	289.5	315.7	0.2	3.1	1.13	6 PIMPRO, 1 CYPLUT, 1 CATCOM	
1	5/12/2006	1240	Experiment	0	5	100	3	0	0	1	0	0	0	23	7	319.7	339.8	0.2	1.7	0								21.1	7.71	289.5	315.7	0.2	3.1	1.13	5 PIMPRO	
2	5/12/2006	1300	Control	0	0	0	0	0	0	0	0	0	0	22	7.39	301.3	330.7	0.2	0.4	0.04								21.1	7.71	289.5	315.7	0.2	3.1	1.13		
2	5/12/2006	1300	Experiment	1	8	3	2	0	0	0	0	1	0	22	7.39	301.3	330.7	0.2	0.6	0.06								21.1	7.71	289.5	315.7	0.2	3.1	1.13	5 PIMPRO, 2 CYPLUT, 1 LEPCYA	eggs most like amphibian
1	5/13/2006	825	Control	0	16	0	0	0	0	15	0	0	0	17.3	7.46	287.2	336.9	0.2	0.4	0.27	17.5	5.68	290.9	340	0.2	2	0	17.1	8.8	285.6	336	0.2	2.8	0.95	1 PLAGRA, 5 CYPLUT, 3 GAMAFF, 3 PIMPRO	PLAGRA in quad
1	5/13/2006	825	Experiment	0	4	0	0	0	0	0	0	0	0	17.3	7.46	287.2	336.9	0.2	0.4	0.27								17.1	8.8	285.6	336	0.2	2.8	0.95	1 PIMPRO, 1 PLAGRA, 1 CYPLUT,	1 juvenile longnose dace? In front quad
2	5/13/2006	855	Control	0	2	0	0	0	0	0	0	0	0	17.4	5.76	286.6	338.2	0.2	0.9	0.01								17.1	8.8	285.6	336	0.2	2.8	0.95	2 PLAGRA	
2	5/13/2006	855	Experiment	0	1	0	0	0	0	0	0	0	0	17.4	5.76	286.6	338.2	0.2	0.9	0.01								17.1	8.8	285.6	336	0.2	2.8	0.95	1 PIMPRO	lots of silt and leaf litter in quads
1	5/14/2006	1244	Control	0	5	0	0	0	0	5	0	3	0	23.5	7.66	329.3	339.5	0.2	1.2	0								23.1	7.36	323.5	335.9	0.2	3.1	0.88	3 PIMPRO, 2 GAMAFF	
1	5/14/2006	1244	experiment	1	4	0	0	0	0	0	0	0	0	23.5	7.66	329.3	339.5	0.2	1.2	0								23.1	7.36	323.5	335.9	0.2	3.1	0.88	2 PIMPRO, 1 GAMAFF, 1 CYPLUT	
2	5/14/2006	1303	Control	0	3	0	0	0	0	0	0	3	0	23.9	7.23	328.2	336	0.2	0.3	0								23.1	7.36	323.5	335.9	0.2	3.1	0.88	3 PIMPRO	
2	5/14/2006	1303	experiment	2	3	0	0	0	0	1	0	0	1	23.9	7.23	328.2	336	0.2	0.35	0.33								23.1	7.36	323.5	335.9	0.2	3.1	0.88	2 CYPLUT, 1 PIMPRO	
1	5/15/2006	1052	Control	0	9	0	0	0	0	0	0	1	0	17.9	8.87	290.4	337.1	0.2	1.6	0.01								17.6	8.11	287.2	334.8	0.2	2.6	0.75	6 PIMPRO, 1 CYPLUT, 1 PLAGRA, 1 GAMAFF	
1	5/15/2006	1052	experiment	0	9	0	0	0	0	1	0	0	0	17.9	8.87	290.4	337.1	0.2	1.6	0.02								17.6	8.11	287.2	334.8	0.2	2.6	0.75	3 PIMPRO, 5 CYPLUT, 1 PLAGRA	
2	5/15/2006	1111	Control	0	1	0	0	0	0	0	0	0	0	17.6	8.21	286.5	333.6	0.2	0.25	0.01								17.6	8.11	287.2	334.8	0.2	2.6	0.75	1 PIMPRO	both quadrats buried in sand. Mouth of hoop net clogged with leaves
2	5/15/2006	1111	experiment	1	4	0	0	0	0	0	0	0	0	17.6	8.21	286.5	333.6	0.2	0.2	0.26								17.6	8.11	287.2	334.8	0.2	2.6	0.75	3 PIMPRO, 1 CYPLUT	both quadrats buried in sand
1	5/16/2006	1132	Control	0	7	0	0	0	0	0	0	0	0	20.3	7.2	307.8	337.4	0.2	1.5	0.04								19.9	7.1	300.4	331.9	0.2	2.8	0.75	2 GAMAFF, 4 PIMPRO, 1 CYPLUT	
1	5/16/2006	1132	experiment	0	3	0	0	0	0	4	3	1	0	20.3	7.2	307.8	337.4	0.2	1.7	0.02								19.9	7.1	300.4	331.9	0.2	2.8	0.75	2 PIMPRO, 1 CYPLUT	
2	5/16/2006	1148	Control	0	2	0	0	0	0	0	0	0	0	20	8.06	299.8	330.8	0.2	0.4	0.06								19.9	7.1	300.4	331.9	0.2	2.8	0.75	1 RHICAT, 1 PIMPRO	both quadrats buried
2	5/16/2006	1148	experiment	0	13	0	0	0	0	0	0	0	0	20	8.06	299.8	330.8	0.2	0.6	0.13								19.9	7.1	300.4	331.9	0.2	2.8	0.75	9 PIMPRO, 4 CYPLUT	both quadrats buried
1	5/17/2006	1108	Control	0	2	1	0	0	0	5	1	3	5	20.7	8.14	307.7	334.4	0.2	1.5	0.01								20.2	7.43	301.7	332	0.2	1.9	0.42	2 PIMPRO	
1	5/17/2006	1108	experiment	1	6	0	0	0	0	0	0	8	2	20.7	8.14	307.7	334.4	0.2	1.7	0.01								20.2	7.43	301.7	332	0.2	1.9	0.42	1 CYPLUT, 4 PIMPRO, 1 CARCAR	tadpoles throughout bank area but blocked off by net
2	5/17/2006	1108	Control	0	4	4	0	0	0	0	0	0	0	20.3	7.44	300.9	331.4	0.2	0.4	0.14								20.2	7.43	301.7	332	0.2	1.9	0.42	1 AMEMEL, 3 PIMPRO	
2	5/17/2006	1108	experiment	0	3	0	0	0	0	0	0	0	0	20.3	7.44	300.9	331.4	0.2	0.6	0.04								20.2	7.43	301.7	332	0.2	1.9	0.42	3 PIMPRO	quadrats buried
1	5/18/2006	1048	Control	0	0	0	0	0	0	0	0	2	0	21	6.98	312.8	337.7	0.2	1.6	0.01								20.6	8.25	303	330.9	0.2	2.3	0.45		
1	5/18/2006	1048	experiment	0	8	0	0	0	0	1	0	5	4	21	6.98	312.8	337.7	0.2	1.8	0								20.6	8.25	303	330.9	0.2	2.3	0.45	5 CYPLUT, 3 PIMPRO	
2	5/18/2006	1105	Control	0	3	2	0	0	0	0	0	0	0	21	7.12	309.8	336.2	0.2	0.4	0.03								20.6	8.25	303	330.9	0.2	2.3	0.45	1 CYPLUT, 2 PIMPRO	most likely amphib eggs
2	5/18/2006	1105	experiment	0	2	0	1	0	0	0	1	0	1	21	7.12	309.8	336.2	0.2	0.7	0								20.6	8.25	303	330.9	0.2	2.3	0.45	2 PIMPRO	most likely amphib eggs
1	5/19/2006		Control	0	2	0	0	0	0	0	0	2	4	20.9	6.72	310.6	338.6	0.2	1.4	0								20.9	8.77	305.3	331.8	0.2	2.4	0.53	1 ICTPUN, 1 PIMPRO	ICTPUN dead
1	5/19/2006		experiment	0	9	0	0	0	0	0	0	1	5	20.9	6.72	310.6	338.6	0.2	1.6	0								20.9	8.77	305.3	331.8	0.2	2.4	0.53	7 CYPLUT, 1 CATCOM, 1 PIMPRO	CATCOM big
2	5/19/2006	1028	Control	0	4	1	2	0	0	0	0	0	0	21	7.23	151.8	335.8	0.2	0.4	0								20.9	8.77	305.3	331.8	0.2	2.4	0.53	4 PIMPRO	conductivity suspect, amphib eggs
2	5/19/2006	1028	experiment	0	8	1	0	0	0	0	0	0	0	21	7.23	151.8	335.8	0.2	0.9	0								20.9	8.77	305.3	331.8	0.2	2.4	0.53	8 PIMPRO	quadrat drifted somewhat, amphib eggs
1	5/20/2006	1029	Control	0	2	0	0	0	0	1	3	2	3	21.6	6.75	322.8	341.1	0.2	1.4	0.02								20.9	7.87	322.9	349.4	0.2	1.3	0.66	1 PIMPRO, 1 GAMAFF	
1	5/20/2006	1029	experiment	0	2	0	0	0	0	1	0	4	20	21.6	6.75	322.8	341.1	0.2	1.5	0.01								20.9	7.87	322.9	349.4	0.2	1.3	0.66	2 PIMPRO	
2	5/20/2006	1031	Control	0	5	0	0	0	0	0	0	0	0	21.6	6.95	318.2	340.8	0.2	0.4	0								20.9	7.87	322.9	349.4	0.2	1.3	0.66	5 PIMPRO	
2	5/20/2006	1031	experiment	0	10	0	0	0	0	0	0	0	0	21.6	6.95	318.2	340.8	0.2	0.6	0.01								20.9	7.87	322.9	349.4	0.2	1.3	0.66	3 CARCAR, 1 LEPCYA, 6 PIMPRO	
1	5/21/2006		Control	0	2	0	0	0	0	1	0	0	4	23.9	4.95	341.2	348.9	0.2	1.4	0.02								23.8	6	330.8	336.6	0.2	1.4	0.48	1 RHYCAT, 1 CYPLUT	
1	5/21/2006		experiment	0	5	0	0	0	0	0	1	30	20	23.9	4.95	341.2	348.9	0.2	1.5	0.01								23.8	6	330.8	336.6	0.2	1.4	0.48	1 RHYCAT, 2 CYPLUT, 1 PLAGRA, 1 PIMPRO	
2	5/21/2006	1245	Control	0	2	0	0	0	0	0	0	0	0	24.7	5.6	339.1	343.8	0.2	0.6	0								23.8	6	330.8	336.6	0.2	1.4	0.48	1 LEPCYA, 1 PIMPRO	
2	5/21/2006	1245	experiment	0	2	0	1	0	0	0	0	1	0	24.7	5.6	339.1	343.8	0.2	0.5	0.01								23.8	6	330.8	336.6	0.2	1.4	0.48	1 PIMPRO, 1 CYPCAR	
1	5/22/2006	1100	Control	0	0	0	0	0	0	0	0	0	0	21.7	7.57	320	340.2	0.2	1.4	0								21.3	7.48	311.4	334.7	0.2	1.5	0.64		8 tadpoles in net
1	5/22/2006	1100	experiment	0	5	0	0	0	0	0	0	0	0	21.8	7.9	320.6	340.1	0.2	1.5	0								21.3	7.48	311.4	334.7	0.2	1.5	0.64	4 PIMPRO, 1 LEPCYA	
2	5/22/2006	1108	Control	0	3	0	0	0	0	0	0	0	0	21.6	7.32	314.5	336.8	0.2	0.5	0.08								21.3	7.48	311.4	334.7	0.2	1.5	0.64	1 CYPLUT, 2 PIMPRO	
2	5/22/2006	1108	experiment	0	4	0	0	0	0	1	0	4	0	21.5	7.47	317	337.2	0.2	0.8	0.02								21.3	7.48	311.4	334.7	0.2	1.5	0.64	4 PIMPRO, 1 CYPLUT	2 of 4 PIMPRO were on front quad
1	5/23/2006	1115	Control	0	1	0	0	0	0	0	1	5	4	18.5	8.32	293.8	338.3	0.2	1.4	0.01								17.9	8.01	290.6	335.7	0.2	1.7	0.52	1 PIMPRO	
1	5/23/2006	1115	experiment	0	3	0	0	0	0	0	1	2	8	18.5	8.32	293.8	338.3	0.2	1.6	0.02								17.9	8.01	290.6	335.7	0.2	1.7	0.52	2 PIMPRO, 1 CYPLUT	
2	5/23/2006	1128	Control	1	1	0	0	0	0	0	0	0	0	18.1	7.73	292.4	336.6	0.2	0.6	0.01								17.9	8.01	290.6	335.7	0.2	1.7	0.52	1 PIMPRO	
2	5/23/2006	1128	experiment	4	5	0	0	0	0	0	0	4	2	18.1	7.73	292.4	336.6	0.2	1	0.01								17.9	8.01	290.6	335.7	0.2	1.7	0.52	4 PIMPRO, 1 CYPLUT	
1	5/24/2006	1137	Control	0	2	0	0	0	0	20	3	0	0	21	7.29	304.8	333.6	0.2	1.2	0								20.4	7.53	303.9	333	0.2	1.7	0.64	1 PIMPRO, 1 CYPLUT	
1	5/24/2006	1137	experiment	0	0	0	0	0	0	0	0	0	0	21	7.29	304.8	333.6	0.2	1.2	0								20.4	7.53	303.9	333	0.2	1.7	0.64		
2	5/24/2006	1137	Control	0	2	1	0	0	0	0	0	0	0	20.5	7.38	303.2	331.9	0.2	0.6	0.1								20.4	7.53	303.9	333	0.2	1.7	0.64	1 PIMPRO, 1 CYPLUT	
2	5/24/2006	1137	experiment	0	3	0	0	0	0	0	0	0	1	20.5	7.38	303.2	331.9	0.2	0.5	0.01								20.4	7.53	303.9	333	0.2	1.7	0.64	1 PIMPRO, 1 CYPLUT	
1	5/25/2006	1233	Control	0	0	0	0	0	0	2	0	0	3	22.9	7.53	320.7	334.5	0.2	1.6	0								22.7	7.18	320	334.6	0.2	1.7	0.76		
1	5/25/2006	1233	experiment	0	3	0	0	0	0	1	0	0	3	22.9	7.53	320.7	334.5	0.2	1.7	0.1								22.7	7.18	320	334.6	0.2	1.7	0.76	1 CYPCAR, 2 CYPLUT	
2	5/25/2006	1245	Control	0	0	0	0	0	0	0	0	0	0	22.9	7.44	320.3	333.8	0.2	0.5	0.04								22.7	7.18	320	334.6	0.2	1.7	0.76		
2	5/25/2006	1245	experiment	0	2	0	0	0	0	0	0	0	0	22.9	7.44	320.3	333.8	0.2	0.8	0.03								22.7	7.18	320	334.6	0.2	1.7	0.76	2 CYPLUT	
1	5/26/2006	1017	Control	0	1	0	0	0	0	0	1	0	1	20.3	7.21	303.5	333.2	0.2	2	0.08								20.7	7.61	359.4	391.1	0.2	1.8	0.28	1 PIMPRO	
1	5/26/2006	1017	experiment	0	3	0	0	0	0	0	0	2	0	20.3	7.21	303.5	333.2	0.2	2	0.08								20.7	7.61	359.4	391.1	0.2	1.8	0.28	3 CYPLUT	
2	5/26/2006	1019	Control	0	1	1	0	0	0	0	0	0	0	20.2	7.44	237.2	241.9	0.1	0.8	0.03								20.7	7.61	359.4	391.1	0.2	1.8	0.28	1 PIMPRO	amphibian egg, quadrats overlapping
2	5/26/2006	1019	experiment	0	2	0	0	0	0	0	1	0	0	20.2	7.44	237.2	241.9	0.1	0.8	0.03								20.7	7.61	359.4	391.1	0.2	1.8	0.28	2 PIMPRO	
1	5/27/2006	1100	Control	0	4	0	0	0	0	0	2	0	0	20.2	7.3	304.1	334.5	0.2	1.5	0								19.9	7.47	300.7	333	0.2	2.05	0.76	4 PIMPRO	
1	5/27/2006	1100	experiment	0	2	0	0	0	0	0	2	0	0	20.2	7.3	304.1	334.5	0.2	1.3	0.02								19.9	7.47	300.7	333	0.2	2.05	0.76	1 CYPCAR, 1 PIMPRO	
2	5/27/2006	1123	Control	0	0	0	0	0	0	0	0	0	0	20.2	7.22	300.8	331.6	0.2	0.1	0.16								19.9	7.47	300.7	333	0.2	2.05	0.76		quadrats buried
2	5/27/2006	1123	experiment	0	1	0	0	0	0	0	0	0	0	20.2	7.22	300.8	331.6	0.2	0.6	0.04								19.9	7.47	300.7	333	0.2	2.05	0.76	1 LEPCYA	quadrats overlapped

LOS LUNAS Site Information — Silvery Minnow/Fish Data

Site 1 or 2	Date	Time arrived	Experiment or Control	Adult Fish: RGSM present	Adult Fish: other fish (check Comments)	Other eggs: front quadrat	Other eggs: back quadrat	RGSM eggs: front quadrat	RGSM eggs: back quadrat	Larval fish: front quadrat	Larval fish: back quadrat	Tadpoles: front quadrat	Tadpoles: back quadrat
				17	308	98	15	0	1	94	100	16	27
1	5/10/2006	1445	control	0	0	n/a	n/a	n/a	n/a	n/a	n/a	0	0
1	5/10/2006	1445	experiment	0	0	n/a	n/a	n/a	n/a	n/a	n/a	0	0
2	5/10/2006	1445	experiment	2	1	0	0	0	0	6	10	0	0
2	5/10/2006	1445	control	0	0	0	0	0	0	10	10	0	0
1	5/11/2006	1615	Control	0	1	0	0	0	0	0	0	0	0
1	5/11/2006	1615	Experiment	1	0	0	0	0	0	0	0	0	0
2	5/11/2006	1700	Control	4	4	0	0	0	0	1	2	0	0
2	5/11/2006	1700	Experiment	4	0	0	0	0	0	3	0	0	0
1	5/12/2006	1455	control	0	1	0	0	0	0	0	0	0	0
1	5/12/2006	1455	Experiment	0	0	0	0	0	0	0	0	0	0
2	5/12/2006	1530	control	1	7	0	0	0	0	4	15	0	0
2	5/12/2006	1520	Experiment	1	3	0	0	0	0	25	25	0	0
1	5/13/2006	558	control	0	1	0	0	0	0	0	0	0	0
1	5/13/2006	558	experiment	0	5	0	0	0	0	0	0	0	0
2	5/13/2006	646	control	1	10	0	0	0	0	0	0	0	0
2	5/13/2006	646	experiment	3	2	0	0	0	0	0	0	0	0
1	5/14/2006	1430	control	0	5	0	0	0	0	0	0	0	0
1	5/14/2006	1430	experiment	0	0	0	0	0	0	0	0	0	0
2	5/14/2006	1527	control	0	37	0	0	0	0	0	0	0	0
2	5/14/2006	1527	experiment	0	7	0	0	0	0	0	0	0	0
1	5/15/2006	820	control	0	18	0	0	0	0	0	0	0	0
1	5/15/2006	820	experiment	0	1	0	0	0	0	0	0	0	0
2	5/15/2006	912	control	0	3	0	0	0	1	0	0	0	0
2	5/15/2006	912	experiment	0	11	4	0	0	0	3	1	0	0
1	5/16/2006	915	control	0	20	0	0	0	0	1	0	0	0
1	5/16/2006	915	experiment	0	0	0	0	0	0	0	0	0	0
2	5/16/2006	852	control	0	10	2	4	0	0	5	3	0	0
2	5/16/2006	852	experiment	0	0	0	0	0	0	0	0	0	0
1	5/17/2006	919	control	0	3	10	10	0	0	5	2	0	0
1	5/17/2006	919	experiment	0	0	0	1	0	0	3	5	0	0
2	5/17/2006	849	control	0	8	0	0	0	0	0	0	0	0
2	5/17/2006	849	experiment	0	6	0	0	0	0	0	0	0	0
1	5/18/2006	936	control	0	2	0	0	0	0	2	0	1	1
1	5/18/2006	936	experiment	0	0	0	0	0	0	0	0	0	0
2	5/18/2006	936	control	0	3	0	0	0	0	1	1	0	1
2	5/18/2006	936	experiment	0	20	0	0	0	0	0	0	0	0
1	5/19/2006	918	control	0	0	0	0	0	0	0	1	1	0
1	5/19/2006	918	experiment	0	3	0	0	0	0	1	0	0	0
2	5/19/2006	853	control	0	1	0	0	0	0	1	1	0	0
2	5/19/2006	853	experiment	0	3	0	0	0	0	0	0	0	0
1	5/20/2006	924	control	0	0	0	0	0	0	6	14	1	0
1	5/20/2006	924	experiement	0	0	2	0	0	0	1	0	0	1
2	5/20/2006	908	control	0	0	0	0	0	0	0	1	0	0
2	5/20/2006	908	experiment	0	6	0	0	0	0	3	2	0	0
1	5/21/2006	1101	control	0	0	0	0	0	0	0	0	0	5
1	5/21/2006	1101	experiment	0	4	0	0	0	0	0	0	0	0
2	5/21/2006	1038	control	0	3	0	0	0	0	0	0	0	0
2	5/21/2006	1038	experiment	0	0	0	0	0	0	0	0	0	0
1	5/22/2006	855	control	0	1	0	0	0	0	0	0	4	4
1	5/22/2006	855	experiment	0	1	0	0	0	0	2	0	0	0
2	5/22/2006	913	control	0	2	0	0	0	0	4	3	0	0
2	5/22/2006	913	experiment	0	4	0	0	0	0	2	0	0	0
1	5/23/2006	922	control	0	3	0	0	0	0	0	0	3	6
1	5/23/2006	922	experiment	0	1	0	0	0	0	0	0	3	1
2	5/23/2006	942	control	0	18	0	0	0	0	0	0	0	0
2	5/23/2006	942	experiment	0	7	0	0	0	0	0	0	1	0
1	5/24/2006	1012	control	0	0	0	0	0	0	1	0	0	3
1	5/24/2006	1012	experiment	0	12	0	0	0	0	0	1	0	0
2	5/24/2006	932	control	0	2	0	0	0	0	0	0	0	0
2	5/24/2006	932	experiment	0	6	0	0	0	0	0	0	0	1
1	5/25/2006	1418	control	0	3	0	0	0	0	2	2	1	1
1	5/25/2006	1418	experiment	0	2	80	0	0	0	0	0	0	0
2	5/25/2006	1448	control	0	1	0	0	0	0	0	0	0	0
2	5/25/2006	1448	experiment	0	20	0	0	0	0	0	0	0	0
1	5/26/2006	915	control	0	4	0	0	0	0	0	0	1	1
1	5/26/2006	915	experiment	0	6	0	0	0	0	1	0	0	0
2	5/26/2006	854	control	0	0	0	0	0	0	0	0	0	0
2	5/26/2006	854	experiment	0	1	0	0	0	0	0	0	0	0
1	5/27/2006	820	control	0	0	0	0	0	0	0	0	0	1
1	5/27/2006	820	experiment	0	5	0	0	0	0	1	1	0	0
2	5/27/2006	920	control	0	0	0	0	0	0	0	0	0	0
2	5/27/2006	920	experiment	0	0	0	0	0	0	0	0	0	0

Water Quality Data — Mouth of Enclosure / Inside Enclosure (if applicable)

Site 1 or 2	Date	Experiment or Control	Mouth: water temp (oC)	Mouth: DO (mg/L)	Mouth: conduct (uS)	Mouth: spec cond (uS)	Mouth: salinity (ppt)	Mouth: water depth (10th of foot)	Mouth: current velocity (m/s)	Inside: water temp (oC)	Inside: DO (mg/L)	Inside: conduct (uS)	Inside: spec cond (uS)	Inside: salinity (ppt)	Inside: water depth (10th of foot)	Inside: current velocity (m/s)
1	5/10/2006	control						0.7	0.20	25.6	5.09	136.5	431.5	0.2		
1	5/10/2006	experiment						0.7	0.20	25.6	5.09	136.5	431.5	0.2		
2	5/10/2006	experiment	26	5.90	436.6	428.5	0.2	0.8	0.00	26.5	7.67	428.6	417.1	0.2	0.75	0.00
2	5/10/2006	control	26	5.90	436.6	428.5	0.2	0.8	0.00	26.5	7.67	428.6	417.1	0.2	0.75	0.00
1	5/11/2006	Control	25.4	6.38	446.9	441.6	0.2	0.9	0.03							
1	5/11/2006	Experiment	25.4	6.53	446.3	441.5	0.2	0.6	0.02							
2	5/11/2006	Control	26.3	6.83	449.4	438.2	0.2	0.7	0.00							
2	5/11/2006	Experiment	26.3	6.83	449.4	438.2	0.2	0.7	0.00							
1	5/12/2006	control	28.6	7.28	464.1	433.2	0.2	0.9	0.08							
1	5/12/2006	Experiment	28.8	7.57	462.8	428.1	0.2	0.5	0.02	28.4	7.56	464.6	432.0	0.2	0.50	0.02
2	5/12/2006	control	29.3	8.93	466.2	430.8	0.2	0.7	0.00							
2	5/12/2006	Experiment	29.3	8.93	466.2	430.8	0.2	0.8	0.02							
1	5/13/2006	control	17.6	7.70	406.0	353.5	0.2	1.5	0.05							
1	5/13/2006	experiment	17.6	7.00	330.4	388.8	0.1	0.0								
2	5/13/2006	control	16.9	8.24	353.0	417.7	0.2	1.3	0.03							
2	5/13/2006	experiment	16.9	8.24	350.1	416.1	0.2	1.3	0.09							
1	5/14/2006	control	28.3	6.72	458.1	435.5	0.2	1.0	0.03							
1	5/14/2006	experiment	28	6.35	458.6	434.5	0.2	0.9	0.02							
2	5/14/2006	control	29.6	6.97	475.2	436.2	0.2	1.1	0.08							
2	5/14/2006	experiment	29.6	6.97	475.2	436.2	0.2	1.2	0.13							
1	5/15/2006	control	16.6	7.13	332.6	396.1	0.2	1.0	0.02							
1	5/15/2006	experiment	16.6	6.77	332.5	395.6	0.2	0.6	0.18	16.6	6.93	332.1	395.8	0.2	0.80	0.02
2	5/15/2006	control	17.1	8.71	337.7	398.0	0.2	1.1	0.23							
2	5/15/2006	experiment	17.1	8.12	337.4	397.9	0.2	1.2	0.09							
1	5/16/2006	control	19.2	8.63	359.4	404.7	0.2	0.7	0.01							
1	5/16/2006	experiment	18.8	7.70	365.2	404.2	0.2	0.5	0.00	18.8	7.96	357.9	406.5	0.2	0.70	0.00
2	5/16/2006	control	17.1	8.72	339.3	399.8	0.2	0.8	0.00							
2	5/16/2006	experiment	17	8.85	339.6	400.3	0.2	0.8	0.02							
1	5/17/2006	control	18.6	7.48	354.1	403.2	0.2	0.8	0.02							
1	5/17/2006	experiment	18.5	8.87	351.4	402.6	0.2	0.4	0.00	18.5	7.86	352.8	403.2	0.2	0.30	0.02
2	5/17/2006	control	18.1	9.20	345.9	404.4	0.2	0.9	0.02							
2	5/17/2006	experiment	18	8.35	349.8	403.5	0.2	0.9	0.01							
1	5/18/2006	control	20.7	9.06	373.5	406.1	0.2	0.6	0.02							
1	5/18/2006	experiment	20	7.94	364.9	404.0	0.2	0.4	0.01	19.8	8.27	366.6	407.1	0.2	0.50	0.00
2	5/18/2006	control	18.9	8.49	354.5	401.3	0.2	0.7	0.02							
2	5/18/2006	experiment	18.9	8.43	354.5	401.4	0.2	0.7	0.02							
1	5/19/2006	control	19.6	9.07	367.0	408.0	0.2	0.7	0.00							
1	5/19/2006	experiment	20.7	7.57	367.2	400.2	0.2	0.7	0.10	20.5	8.26	364.4	397.8	0.1	0.40	0.01
2	5/19/2006	control	20	7.16	306.0	374.2	0.2	0.8	0.01							
2	5/19/2006	experiment	20.1	7.04	347.0	394.4	0.2	0.8	0.01							
1	5/20/2006	control	20.5	9.18	375.5	413.3	0.2	0.7	0.01							
1	5/20/2006	experiement	20.8	8.66	371.7	404.7	0.2	0.6	0.01	20.7	8.84	370.2	403.6	0.2	0.50	0.00
2	5/20/2006	control	20.2	8.07	365.0	402.4	0.2	0.8	0.00							
2	5/20/2006	experiment	20.2	8.07	365.0	402.4	0.2	0.8	0.00							
1	5/21/2006	control	24.5	8.84	400.8	404.6	0.1	0.6	0.01							
1	5/21/2006	experiment	24.4	6.58	404.4	408.6	0.2	0.6	0.02	24.4	7.13	404.2	407.5	0.2	0.50	0.01
2	5/21/2006	control	23.9	6.97	398.7	406.5	0.2	0.8	0.02							
2	5/21/2006	experiment	23.9	6.97	398.7	406.5	0.2	0.8	0.02							
1	5/22/2006	control	20.6	7.58	393.1	427.9	0.2	0.6	0.00							
1	5/22/2006	experiment	21.2	7.74	372.1	401.3	0.2	0.6	0.00	21.1	8.21	372.5	403.8	0.2	0.50	0.00
2	5/22/2006	control	21.8	8.12	376.1	400.4	0.2	0.8	0.00							
2	5/22/2006	experiment	21.8	8.12	376.1	400.4	0.2	0.9	0.00							
1	5/23/2006	control	16.6	9.06	340.6	404.9	0.2	0.8	0.00							
1	5/23/2006	experiment	17	8.69	337.1	396.9	0.2	0.5	0.02	16.6	8.64	339.0	404.1	0.2	0.80	0.01
2	5/23/2006	control	16.8	8.64	345.3	406.0	0.2	0.9	0.00							
2	5/23/2006	experiment	16.7	7.57	341.5	403.5	0.2	0.5	0.00							
1	5/24/2006	control	20.2	7.48	381.7	421.5	0.2	1.0	0.00							
1	5/24/2006	experiment	19.8	7.32	379.3	420.7	0.2	1.0	0.00	19.9	7.70	379.0	419.8	0.2	0.50	0.00
2	5/24/2006	control	19	8.31	367.6	415.3	0.2	1.1	0.00							
2	5/24/2006	experiment	19	7.95	368.2	415.5	0.2	1.1	0.01							
1	5/25/2006	control	27.8	7.49	442.9	420.2	0.2	1.0	0.00							
1	5/25/2006	experiment	27.7	7.07	441.8	420.6	0.2	1.0	0.02	27.6	6.89	441.1	420.2	0.2	0.60	0.06
2	5/25/2006	control	28.7	7.51	450.1	420.5	0.2	1.2	0.07							
2	5/25/2006	experiment	28.6	7.30	450.1	421.2	0.2	0.9	0.07							
1	5/26/2006	control	19.3	7.08	378.2	425.0	0.2	1.3	0.05							
1	5/26/2006	experiment	19.3	6.56	378.4	424.6	0.2	1.3	0.14	19.3	5.67	378.5	424.6	0.2	1.00	0.02
2	5/26/2006	control	18.9	6.92	370.9	420.3	0.2	1.4	0.02							
2	5/26/2006	experiment	18.9	7.38	371.1	420.3	0.2	1.4	0.02							
1	5/27/2006	control	17.1	7.88	334.7	391.7	0.2	1.0	0.00							
1	5/27/2006	experiment	17.3	7.54	335.1	392.6	0.2	0.9	0.01	17.1	7.91	334.2	393.3	0.2	0.85	0.00
2	5/27/2006	control	19	8.33	351.3	397.5	0.2	1.3	0.01							
2	5/27/2006	experiment	19	8.33	351.3	397.5	0.2	1.4	0.07							

Water Quality Data — Main Channel, Fish, Comments

Site 1 or 2	Date	Experiment or Control	Main Channel: water temp (oC)	Main Channel: DO (mg/L)	Main Channel: conduct (uS)	Main Channel: spec cond (uS)	Main Channel: salinity (ppt)	Main Channel: water depth (10th of foot)	Main Channel: current velocity (m/s)	Fish	Comments
1	5/10/2006	control	25.4	5.46	437.8	432.7	0.2	0.5	0.47		because no fish were present, we did not check quadrats for eggs
1	5/10/2006	experiment	25.4	5.46	437.8	432.7	0.2	0.5	0.47		because no fish were present, we did not check quadrats for eggs
2	5/10/2006	experiment	25.8	5.89	440.2	432.8	0.2	1.8	0.46	GAMAFF	
2	5/10/2006	control	25.8	5.89	440.2	432.8	0.2	1.8	0.46		
1	5/11/2006	Control	25.6	6.91	447.8	441.7	0.2	0.8	0.44	Baby ICTPUN	
1	5/11/2006	Experiment	25.6	6.91	447.8	441.7	0.2	0.8	0.44		
2	5/11/2006	Control	26.3	6.66	452.3	441.5	0.2	1.25	0.35	2 PIMPRO, 2 GAMAFF	
2	5/11/2006	Experiment	26.3	6.66	452.3	441.5	0.2	1.25	0.35		1 ADULT RGSM WAS DEAD
1	5/12/2006	control	28.6	7.18	463.2	427.9	0.2	0.7	0.46	1 baby ICTPUN	
1	5/12/2006	Experiment	28.6	7.18	463.2	427.9	0.2	0.7	0.46		
2	5/12/2006	control	28.9	7.23	467.1	433.3	0.2	1.3	0.34	6 PIMPRO, 1 10 mm PLAGRA on quadrat	1 dead fish in hoop net, not sure what kind
2	5/12/2006	Experiment	28.9	7.23	467.1	433.3	0.2	1.3	0.34	3 PLAGRA on quadrat	
1	5/13/2006	control	17.7	7	355.1	413	0.2	1.5	0.56	1 PIMPRO	southern quad was buried in sand
1	5/13/2006	experiment	17.7	7	355.1	413	0.2	1.5	0.56	1 ICTPUN, 1 CYPLUT, 3 PIMPRO	quads and nets buried in 6-8" of sand
2	5/13/2006	control	17	6.9	355.5	419.8	0.2	1.7	0.24	7 PIMPRO, 2 PLAGRA, 1 CYPPLUT	quads filled with silt and algae
2	5/13/2006	experiment	17	6.9	355.5	419.8	0.2	1.7	0.24	2 AMENIT	southern quad stuck to net and pulled up
1	5/14/2006	control	27.8	6.7	454.9	431.8	0.2	0.8	0.63	1 CYPLUT, 4 PIMPRO	river level much higher than before, quadrats buried in sand
1	5/14/2006	experiment	27.8	6.7	454.9	431.8	0.2	0.8	0.63		river level much higher than before, silt fence down, hoop net collapsed, quadrats buried
2	5/14/2006	control	28.9	6.42	468.4	432.9	0.2	0.5	0.3	32 CYPLUT, 5 PIMPRO	river level much higher than before
2	5/14/2006	experiment	28.9	6.42	468.4	432.9	0.2	0.5	0.3	1 CYPLUT, 6 PIMPRO	river level much higher than before
1	5/15/2006	control	16.5	7.16	331.9	396	0.2	0.55	0.51	11 CYPLUT, 4 PIMPRO, 3 PLAGRA	calibrated DO prior to this site
1	5/15/2006	experiment	16.5	7.16	331.9	396	0.2	0.55	0.51	1 PLAGRA	PLAGRA was dead
2	5/15/2006	control	16.9	7.46	338	399.7	0.2	1	0.53	2 PIMPRO, 1 CYPLUT	
2	5/15/2006	experiment	16.9	7.46	338	399.7	0.2	1	0.53	1 PLAGRA, 6 PIMPRO, 3 CYPLUT, AMELMEL	
1	5/16/2006	control	18.1	7.7	349	401.8	0.2	0.8	0.45	12 CYPLUT, 8 PIMPRO	
1	5/16/2006	experiment	18.1	7.7	349	401.8	0.2	0.8	0.45		mouth is not completely submerged
2	5/16/2006	control	16.8	8.42	335.8	396.2	0.2	0.5	0.42	9 CYPLUT, 1 PIMPRO	
2	5/16/2006	experiment	16.8	8.42	335.8	396.2	0.2	0.5	0.42	1 AMENAT, 2 CARCAR, 7 PIMPRO, 6 CYPLUT, 1 GAMAFF	
1	5/17/2006	control	18.3	7.5	351.8	403.3	0.2	1	0.43	2 PIMPRO, 1 CYPLUT	
1	5/17/2006	experiment	18.3	7.5	351.8	403.3	0.2	1	0.43		
2	5/17/2006	control	17.8	7.56	345.1	401.1	0.2	0.6	0.39	4 GAMAFF, 3 PIMPRO, 1 CYPLUT	Pharnophis sp. On bank just behind traps
2	5/17/2006	experiment	17.8	7.56	345.1	401.1	0.2	0.6	0.39	1 GAMAFF, 5 PIMPRO	
1	5/18/2006	control	19.6	8.18	362.7	403.6	0.2	0.8	0.43	1 CYPLUT, 1 PIMPRO	mouth of hoopnet blown over
1	5/18/2006	experiment	19.6	8.18	362.7	403.6	0.2	0.8	0.43		mouth of hoopnet blown over
2	5/18/2006	control	18.5	8.58	334.7	385.8	0.2	0.6	0.52	1 CYPLUT, 1 GAMAFF, 1 PIMPRO	
2	5/18/2006	experiment	18.5	8.58	334.7	385.8	0.2	0.6	0.52	13 PIMPRO, 1 ICTPUN, 6 CYPLUT	
1	5/19/2006	control	20.4	8.59	364.9	401.3	0.2	0.7	0.41		
1	5/19/2006	experiment	20.4	8.59	364.9	401.3	0.2	0.7	0.41	1 GAMAFF, 2 PIMPRO	
2	5/19/2006	control	19.6	7.9	356.6	398.3	0.2	0.7	0.4	1 GAMAFF	
2	5/19/2006	experiment	19.6	7.9	356.6	398.3	0.2	0.7	0.4	1 PIMPRO, 1 PLAGRA, 1 CYPLUT	
1	5/20/2006	control	20.6	8.39	369.2	402.2	0.2	0.8	0.47		
1	5/20/2006	experiement	20.6	8.39	369.2	402.2	0.2	0.8	0.47		
2	5/20/2006	control	19.7	8.47	360.1	400.1	0.2	0.5	0.56		
2	5/20/2006	experiment	19.7	8.47	360.1	400.1	0.2	0.5	0.56	4 CYPLUT, 2 PIMPRO	
1	5/21/2006	control	23.7	7.38	380.7	383.2	0.2	0.7	0.44		quadrats slightly overlapped
1	5/21/2006	experiment	23.7	7.38	380.7	383.2	0.2	0.7	0.44	2 PIMPRO, 1 CYPLUT, 1 PLAGRA	
2	5/21/2006	control	23.4	7.83	396.7	409.4	0.2	1.1	0.33	3 PIMPRO	
2	5/21/2006	experiment	23.4	7.83	396.7	409.4	0.2	1.1	0.33		
1	5/22/2006	control	21.6	7.19	372.9	399	0.2	0.4	0.37	1 GAMAFF	6 tadpoles in net, recalibrated DO at this site, quadrats askew at both control and experimental
1	5/22/2006	experiment	21.6	7.19	372.9	399	0.2	0.4	0.37	1 PIMPRO	
2	5/22/2006	control	21.6	7.53	373.6	399.8	0.2	0.4	0.37	1 GAMAFF, 1 ICTPUN	ICTPUN dead, approx 12 inches SL
2	5/22/2006	experiment	21.6	7.53	373.6	399.8	0.2	0.4	0.37	2 PIMPRO, 2 GAMAFF	
1	5/23/2006	control	16	9	334.3	403.8	0.2	0.6	0.27	3 GAMAFF	5 tadpoles in hoop net
1	5/23/2006	experiment	16	9	334.3	403.8	0.2	0.6	0.27	2 PIMPRO	2 of 2 PIMPRO in front quadrat
2	5/23/2006	control	16.4	8.67	338.1	404.3	0.2	0.9	0.51	14 CYPLUT, 2 PIMPRO, 2 PLAGRA	
2	5/23/2006	experiment	16.4	8.67	338.1	404.3	0.2	0.9	0.51	5 PIMPRO, 1 GAMAFF, 1 CYPLUT	1 crayfish in hoop net
1	5/24/2006	control	19.5	7.64	370.5	411.9	0.2	0.6	0.48		2 tadpoles in the net
1	5/24/2006	experiment	19.5	7.64	370.5	411.9	0.2	0.6	0.48	11 PIMPRO	
2	5/24/2006	control	18.4	7.7	361.5	370.2	0.2	0.9	0.59	1 ICTPUN, 1 AMENAT	
2	5/24/2006	experiment	18.4	7.7	361.5	370.2	0.2	0.9	0.59	6 PIMPRO	1 tadpole in net
1	5/25/2006	control	27.5	6.92	439.3	419.8	0.2	0.6	0.43	2 PIMPRO, 1 GAMAFF	
1	5/25/2006	experiment	27.5	6.92	439.3	419.8	0.2	0.6	0.43	2 PIMPRO	
2	5/25/2006	control	27.9	6.76	440.2	416.8	0.2	0.5	0.41	1 CYPLUT	
2	5/25/2006	experiment	27.9	6.76	440.2	416.8	0.2	0.5	0.41	14 CYPLUT, 1 ICTPUN, 2 GAMAFF, 3 AMENAT	
1	5/26/2006	control	19.3	7.79	377.4	423.8	0.2	0.9	0.68	4 PIMPRO	1 tadpole in net, water level noticably higher
1	5/26/2006	experiment	19.3	7.79	377.4	423.8	0.2	0.9	0.68	6 PIMPRO	1 tadpole in net
2	5/26/2006	control	18.8	8.4	370.2	419.7	0.2	0.9	0.41		east facing wing blown down, water level higher
2	5/26/2006	experiment	18.8	8.4	370.2	419.7	0.2	0.9	0.41	1 AMEMEL	water level higher
1	5/27/2006	control	17.1	7.91	334.3	393.5	0.2	0.09	0.6		1 tadpole in hoop net
1	5/27/2006	experiment	17.1	7.91	334.3	393.5	0.2	0.09	0.6	2 CYPLUT, 3 PIMPRO	
2	5/27/2006	control	18.3	7.86	348	398.9	0.2	0.6	0.35		calibrated DO prior to this site
2	5/27/2006	experiment	18.3	7.86	348	398.9	0.2	0.6	0.35		1 tadpole in net