SWCA
ENVIRONMENTAL CONSULTANTS

SILVERY MINNOW EGG AND LARVAL FISH MONITORING IN NURSERY HABITATS: SUMMARY OF FINDINGS REPORT

Prepared for

U.S. BUREAU OF RECLAMATION

Prepared by

SWCA ENVIRONMENTAL CONSULTANTS

August 2006

SILVERY MINNOW EGG AND LARVAL FISH MONITORING IN NURSERY HABITATS: SUMMARY OF FINDINGS REPORT

Prepared for

U.S. BUREAU OF RECLAMATION
555 Broadway NE, Suite 100
Albuquerque, New Mexico 87102-2352
Telephone: (505) 462-3596

Prepared by

Sarah E. Beck
Joseph J. Fluder III

SWCA® ENVIRONMENTAL CONSULTANTS
5647 Jefferson Street NE
Albuquerque, New Mexico 87109
Telephone: (505) 254-1115; Fax: (505) 254-1116
www.swca.com

SWCA Project No. 11214-196

August 11, 2006

TABLE OF CONTENTS

LIST OF FIGURES

LIST OF TABLES

INTRODUCTION

As part of the effort to investigate ideal nursery habitat criteria for Rio Grande silvery minnow (*Hybognathus amarus*; silvery minnow) the U.S. Bureau of Reclamation, Albuquerque Area Office (Reclamation) contracted with SWCA Environmental Consultants (SWCA) to conduct nursery habitat monitoring during 2006. The objective of this study was to determine whether inundated, low-velocity mesohabitats with emergent vegetation (terrestrial or hydrophytic) attract spawning Rio Grande silvery minnows, gravid females, or larvae. Because of low spring flows during 2006, such areas did not exist within the study area, and this type of habitat was simulated using either naturally occurring or temporarily constructed shallow, low-velocity areas and substituting hay for naturally occurring terrestrial vegetation.

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 two to three days, and the larvae may continue to drift or become retained in backwaters or embayments. The species normally lives about two to three years in the wild. Natural flow regimes, movement within their limited remaining range, and habitat diversity are important to the completion of the life cycle.

In 1994, the silvery minnow was classified as endangered by the U.S. Fish and Wildlife Service (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/sec) and shallow water (<0.4 m) 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, 2004b). 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). 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, it often slows flows and provides food for larvae and adults and cover from predators (Massong et al. 2004).

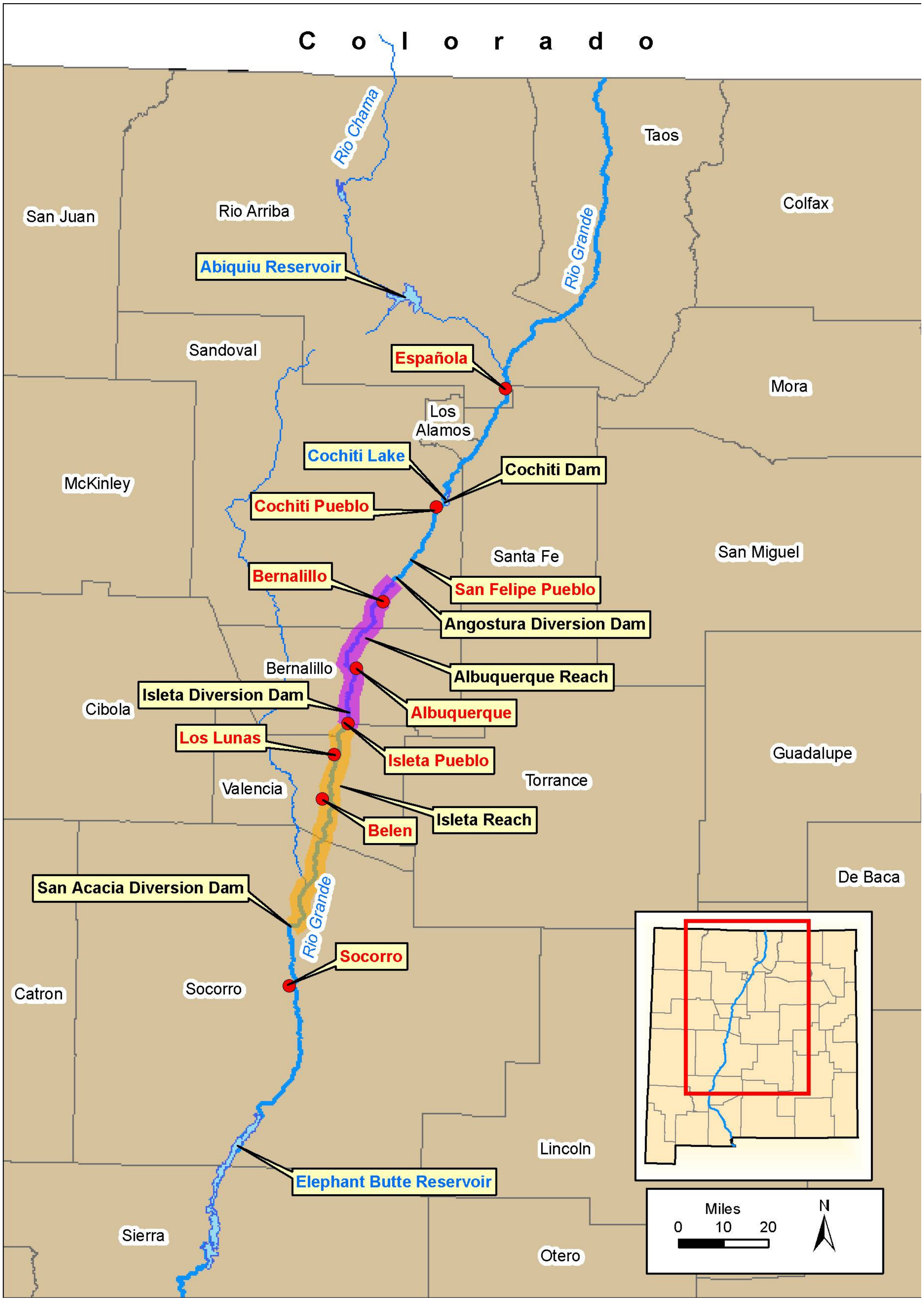

Figure 1. Overview of Middle Rio Grande. The Albuquerque Reach is highlighted in purple, the Isleta Reach in yellow.

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 attracting 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 the retention of silvery minnow eggs (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 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 effective February 19, 2003, and includes the Albuquerque Reach of the Rio Grande (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, many components of the olfactory system in fish are not completely understood. These components appear to vary widely in different species. It is known that *Brycon cephalus* (a South American ray-finned fish) exhibits 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 fish 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 that suggests that Cyprinidae or related fishes respond to scent cues in seeking spawning habitat. Field observations of a gravid and ready-to-spawn female 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 minnows 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 those fish 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 Moñtano, I-40, and Los Lunas. Methods used were those set forth by Michael Porter of Reclamation (personal communication 2006). Ideal sites had low or no current velocity and depths between 20 and 30 cm. Where such sites were not available, artificial embayments were created using silt fences. Silt fences were placed mid channel and arranged in an elongated horseshoe shape with the curve pointed upstream, creating a reduced-velocity area inside. Two rectangular hoop nets (0.5 × 0.5 m, 6.4-mm mesh size) were placed next to each other and within the silt fence embayment. A nylon mesh bag of timothy hay was placed in the cod end of one of the two hoop nets ("experimental"); the other net did not contain any hay ("control"). Both were securely attached to the substrate. Two square quadrats (0.5 × 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 six experimental and six control units.

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. If fish were present, they were identified (noting gravid silvery minnow females), counted, and released. Hoop nets were reset and quadrats were replaced underneath. Finally, water depth and current velocity were recorded for each hoop net. Unknown fish species, major changes in water level, and anything else of note were logged and photographed, if appropriate. Appendix A contains photographs of each site.

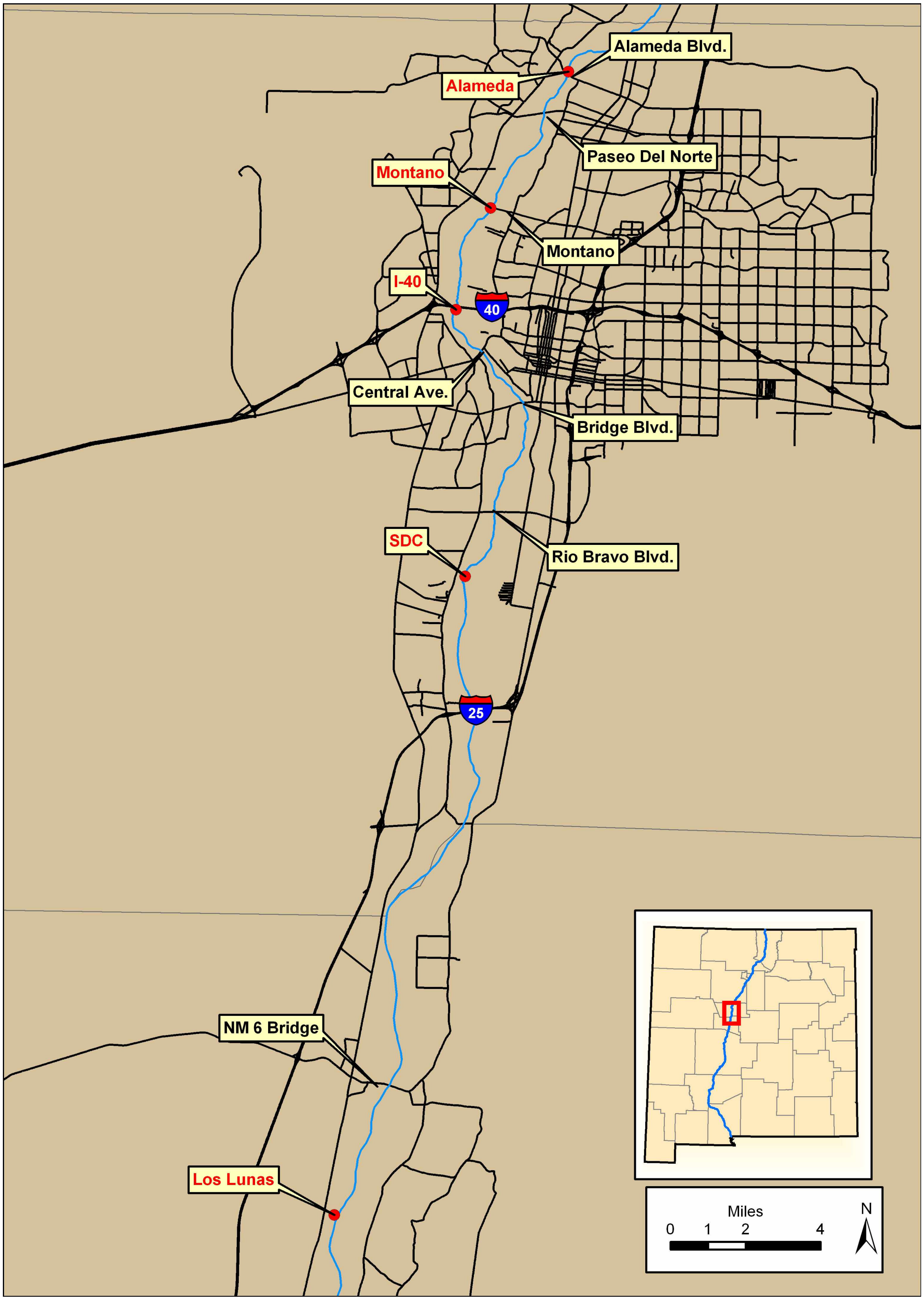

Figure 2. 2006 Middle Rio Grande nursery habitat monitoring sites, indicated by red font. Reclamation-funded sites are Montaño, I-40, and Los Lunas.

RESULTS

Over the 18-day sample period, 26 Rio Grande silvery minnows were collected from the nursery habitat sites at the Montaño, I-40, and Los Lunas project sites. None of the silvery minnows was gravid, and only one egg was collected; 222 larvae (species undetermined) were collected at all sites. Table 1 summarizes the results, and the full dataset is available in the attached Excel spreadsheet (Appendix B).

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

Project Site	Unit	Minnow Adults	Gravid Minnow	Other Fish	Minnow Eggs	Minnow Larvae
Montaño	Experimental	7	0	8	0	2
	Control	1	0	15	0	2
I-40	Experimental	1	0	55	0	4
	Control	0	0	47	0	20
Los Lunas	Experimental	11	0	137	0	96
	Control	6	0	171	1	98

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 that for some water-quality parameters, large diel fluctuations existed. For example, during this study, the main channel at Montaño had an all-time low temperature of 15.1°C at 9:15 A.M. on May 12 and an all-time high of 26.9°C at 3:00 P.M. on 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 3). Within the main channel at Moñtano, water quality ranges were: temperature, 15.1–26.9°C, dissolved oxygen, 5.58–8.9 mg/L; conductivity, 205.1–327.9 µS/cm; specific conductance, 226.5–321.3 µS/cm; salinity, 0.1–0.2 ppt; water depth, 0.15–0.45 m; and current velocity, 0.19–0.63 m/sec. At the hoop nets, temperature range was 15.0–27.5°C; dissolved oxygen, 5.15–8.26 mg/L; conductivity, 228.9–334.5 µS/cm; specific conductance, 252.9–322.4 µS/cm; salinity, 0.1–0.2 ppt; water depth, 0.12–0.32 m; and current velocity, 0–0.5 m/sec.

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

Project Site	Unit	Temp (°C)	Dissolv-ed O_2 (mg/L)	Conduc-tivity (µS/cm)	Specific Conductance (µS/cm)	Salinity (ppt)	Water Depth (m)	Water Velocity (m/s)
Montaño	Experimental	21.8	7.03	296.6	316.0	0.2	0.83	0.06
	Control	21.8	7.10	295.6	314.4	0.2	0.65	0.04
	Main Channel	21.5	7.23	291.7	314.3	0.2	0.91	0.47
I-40	Experimental	21.0	7.26	299.6	318.5	0.2	0.60	0.03
	Control	21.7	7.13	304.6	320.8	0.2	0.61	0.02
	Main Channel	20.8	7.49	297.5	323.1	0.2	0.77	0.42
Los Lunas	Experimental	21.4	7.59	383.6	411.0	0.2	0.8	0.04
	Control	21.4	7.89	385.7	411.1	0.2	0.9	0.03
	Main Channel	21.2	7.52	382.8	409.7	0.2	0.79	0.45

At the I-40 site, water quality ranges in the main channel were: temperature, 16.6–26.4°C, dissolved oxygen, 6.28–8.54 mg/L; conductivity, 256.5–332.0 µS/cm; specific conductance, 283.4–331.6 µS/cm; salinity, 0.1–0.2 ppt; water depth, 0.14–0.88 m; and current velocity, 0.22–0.67 m/sec. At the hoop nets, ranges were temperature, 17.0–27.5°C; dissolved oxygen, 5.38–9.34 mg/L; conductivity, 270.0–339.8 µS/cm; specific conductance, 311.9–350.0 µS/cm; salinity, 0.1–0.2 ppt; water depth, 0.11–0.27 m; and current velocity, 0–0.27 m/sec.

At the Los Lunas site, water quality ranges in the main channel were: temperature, 16.0–29.6°C, dissolved oxygen, 5.46–9.00 mg/L; conductivity, 331.9–468.4 µS/cm; specific conductance, 370.2–441.7 µS/cm; water depth, 0.03–0.55 m; and current velocity, 0.24–0.68 m/sec; salinity was constant at 0.2 ppt throughout the study. At the hoop nets, ranges were temperature, 16.6–29.6°C; dissolved oxygen, 5.90–9.20 mg/L; conductivity, 306.0–475.2 µS/cm; specific conductance, 353.5–441.6 µS/cm; salinity, 0.1–0.2 ppt; water depth, 0.12–0.45 m; and current velocity, 0–0.23 m/sec.

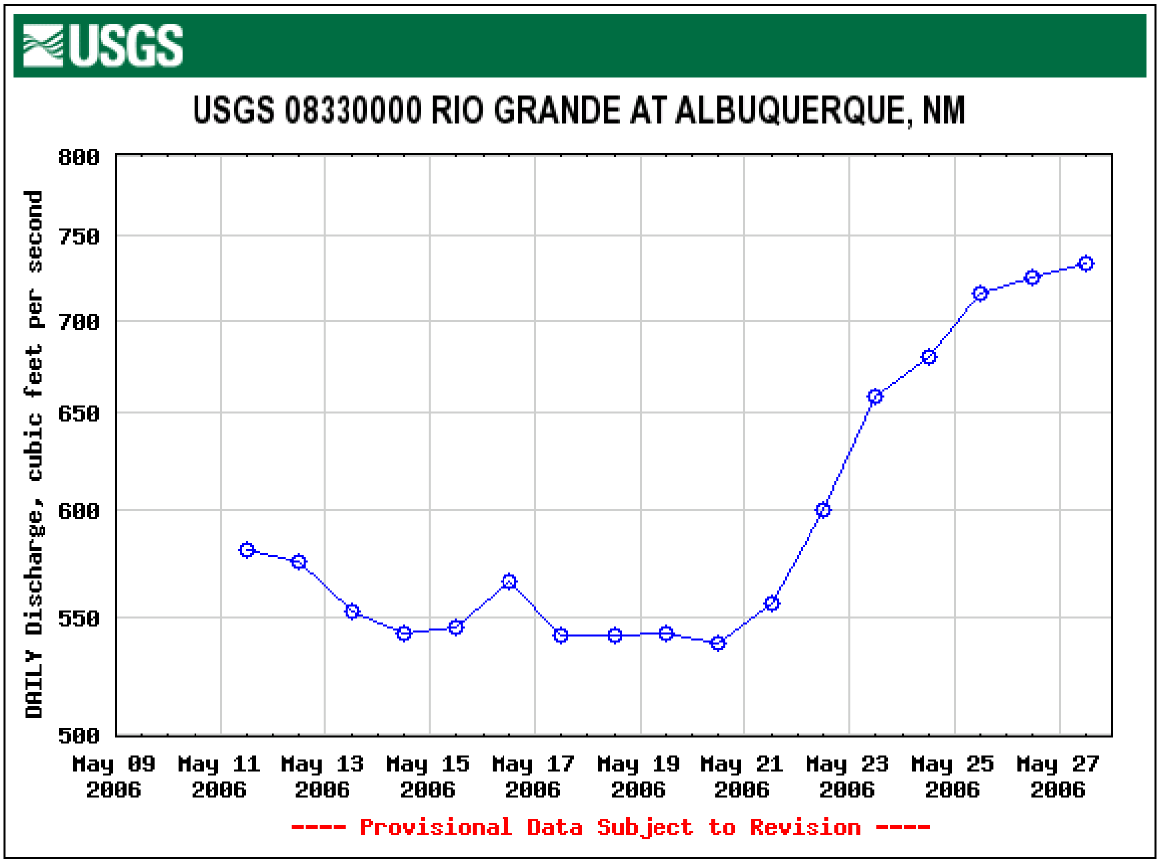

Figure 3. USGS hydrograph for the gage at Central Avenue for the study period.

CONCLUSION

Future monitoring of Rio Grande silvery minnow nursery habitat should build upon the work completed in this study. Little is known about how Cyprinidae respond to non-alarm scent cues, and even less is known about such cues and the silvery minnow. It is possible that silvery minnows did not appear to respond to the dried vegetation because it was a non-native grass. Future studies might incorporate dried native vegetation, either naturally occurring if spring runoff allows or gathered from the floodplain instead. A more methodical experimental design should allow us to ascertain whether or not silvery minnow are responding to vegetation.

ACKNOWLEDGEMENTS

This work was conducted with funding from the U.S. Bureau of Reclamation, Albuquerque Area Office. Dr. Michael D. Porter of Reclamation assisted in creating field and data collection protocols. For SWCA, Sarah Beck led the fish identification and field data collection process, assisted by Burt McAlpine, Jeanne Welch, Matt McMillan, Heather Timmons, Andy Hawk, Josh Sammons, Patrick McKnight, Carly Welch, Eric Barker, Steve Shoup, and Matthew Martin. Burt McAlpine prepared the maps, and Deborah Risberg was the technical editor.

REFERENCES CITED

Bestgen, K. R., and S. P. Platania. 1991. Status and conservation of the Rio Grande silvery minnow *Hybognathus amarus*. *Southwestern Naturalist* 36: 225-232.

Dudley, R. K., and S. P. Platania. 1997. Habitat use of the Rio Grande silvery minnow. Report to U.S. Bureau of Reclamation, Albuquerque, New Mexico. 88 pp.

Dudley, R. K., S. J. Gottlieb, and S. P. Platania. 2003. 2002 population monitoring of Rio Grande silvery minnow, *Hybognathus amarus*. Final Report for the U.S. Bureau of Reclamation. American Ichthyological Research Foundation, Albuquerque, NM, 179 pp.

Federal Register (FR). 1994. Endangered and threatened wildlife and plants: Final rule to list the Rio Grande silvery minnow as an endangered species. 59(138)/Wednesday, July 20, 1994/Final Rule. Pp 36988-36995.

FR. 2003. Notice of intent to prepare a programmatic environmental impact statement for the Middle Rio Grande Endangered Species Act Collaborative Program. U.S. Army Corps of Engineers. 68:(119)/Friday, June 20, 2003/Notice of Intent. Pp. 36975-36976.

Fluder, J. J., M. D. Porter, T. M Massong, and B. McAlpine. 2006. In review. Analyzing floodplain and aquatic nursery habitat of the Rio Grande silvery minnow at different hydrologic flows using GIS. In *Proceedings of the Third International Symposium on GIS/Spatial Analyses in Fishery and Aquatic Sciences*. T. Nishida (ed.). Fisheries GIS Research Group, Saitama, Japan.

Ide, L. M., E. C. Urbinati, and A. Hoffmann. 2003. The role of olfaction in the behavioural and physiological responses to conspecific skin extract in *Bryon cephalus*. *Journal of Fish Biology* 63:332-343.

Massong, T. M., M. D. Porter, and T. Bauer. 2004. Design improvements for constructed Rio Grande silvery minnow nursery habitat. U.S. Department of the Interior, Bureau of Reclamation, 25 pp.

Platania, S. P. 1995. Reproductive biology and early life-history of the Rio Grande silvery minnow, *Hybognathus amarus*. Albuquerque District, U.S. Army Corps of Engineers, Albuquerque, New Mexico.

Poling, K. R. and P. C. Brunjes. 2000. Sensory deafferentation and olfactory bulb morphology in zebrafish and related species. *Brain Research* 856: 135-141.

Pollock, M. S., R. G. Friesen, R. J. Pollock, R. C. Kusch, and D.P. Chivers. 2005. The avoidance response of fathead minnows to chemical alarm cues: Understanding the effects of donor gender and breeding condition. *Chemoecology* 15: 205-209.

Porter, M. D., and T. M. Massong. 2004a. Contributions to delisting Rio Grande silvery minnow: Egg habitat identification. U.S. Department of the Interior, Bureau of Reclamation. 19 pp.

Porter, M. D., and T. M. Massong. 2004b. Habitat fragmentation and modifications affecting distribution of the Rio Grande silvery minnow. In *Proceedings of the Second International Symposium on GIS/Spatial Analyses in Fishery and Aquatic Sciences.* T. Nishida, P. J. Kailola, and C. E. Hollingworth, eds. *Fishery GIS Research Group*: 421-432.

Propst, D. L. 1999. Threatened and endangered fishes of New Mexico. Technical Report No. 1, New Mexico Department of Game and Fish. Santa Fe. 84 pp.

Sublette, J. E., M. D. Hatch, and M. Sublette. 1990. *The fishes of New Mexico*. University of New Mexico Press, Albuquerque. 393 pp.

APPENDIX A
SITE PHOTOS

Picture A.1: Constructed low-velocity mid-channel habitat at Montaño. The hoop net on the left is baited with hay, while the hoop net on the right is a control.

Picture A.2: Los Lunas site. Hoop nets are located in a naturally-occurring shallow, low-velocity inlet.

Picture A.3: Hoop nets at Montaño. This is a shallow, low-velocity flat located immediately upstream of a mid-channel island.

Picture A.4: Los Lunas site 2.

Picture A.5: I-40 site 2.

APPENDIX B
SPREADSHEET DATA

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		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)		
				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	326.7	0.2										16.9	6.38	240.2	293.6	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	330.2	0.1										16.9	6.38	240.2	293.6	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	330.2	0.1										16.9	6.38	240.2	293.6	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	326.7	0.2										16.9	6.38	240.2	293.6	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	333.5	0.2	0.8	0								15.9	8.05	256.7	310.8	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	333.2	0.2	1.3	0								15.9	8.05	256.7	310.8	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	333.5	0.2	1.3	0								15.9	8.05	256.7	310.8	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	333.2	0.2	1.3	0								15.9	8.05	256.7	310.8	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	331.5	0.2	0.9	0								14.6	8.17	251.4	313.3	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	313.3	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	331.5	0.2	1.4	0								14.6	8.17	251.4	313.3	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	313.3	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	324.4	0.2	1.2	0								21.2	7.29	288.6	311.6	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	327.5	0.2	1	0								21.2	7.29	288.6	311.6	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	324.4	0.2	1.3	0								21.2	7.29	288.6	311.6	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	327.5	0.2	1	0								21.2	7.29	288.6	311.6	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	312.7	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	312.7	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	312.7	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	312.7	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	327.5	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	327.4	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	327.5	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	327.4	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	334.9	0.2	0.9	0.1								23	7.24	315.8	328.2	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	327.7	0.2	1.3	0.02								23	7.24	315.8	328.2	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	325.9	0.2	1.4	0.02								23	7.24	315.8	328.2	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	327.7	0.2	1	0.02								23	7.24	315.8	328.2	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	327.8	0.2	0.9	0								23.7	7.6	318.3	326.2	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	326.2	0.2	1.2	0								23.7	7.6	318.3	326.2	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	327.8	0.2	1.3	0								23.7	7.6	318.3	326.2	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	326.2	0.2	1	0.01								23.7	7.6	318.3	326.2	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	331.8	0.2	0.9	0								23.7	7.55	320.6	327.7	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	329.7	0.2	1.3	0.01								23.7	7.55	320.6	327.7	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	331.8	0.2	1.4	0.03								23.7	7.55	320.6	327.7	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	329.7	0.2	1	0.02								23.7	7.55	320.6	327.7	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	335.7	0.2	0.9	0.01								23	7.11	313.7	325.1	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	331.5	0.2	1.4	0								23	7.11	313.7	325.1	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	335.7	0.2	1.3	0.01								23	7.11	313.7	325.1	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	331.5	0.2	1	0								23	7.11	313.7	325.1	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	340.4	0.2	0.7	0								23.4	7.45	309.7	318.8	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	337.5	0.2	1.3	0.01								23.4	7.45	309.7	318.8	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	340.4	0.2	1.3	0.02								23.4	7.45	309.7	318.8	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	337.5	0.2	1	0.01								23.4	7.45	309.7	318.8	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	335.9	0.2	0.9	0.01								25.5	7.51	333.9	311.2	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	331.1	0.2	1.4	0								25.5	7.51	333.9	311.2	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	335.9	0.2	1.4	0.02								25.5	7.51	333.9	311.2	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	331.1	0.2	0.9	0.01								25.5	7.51	333.9	311.2	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	325.2	0.2	0.9	0								22.6	7.2	309.7	324.8	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	325.9	0.2	1.4	0								22.6	7.2	309.7	324.8	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	325.2	0.2	1.4	0								22.6	7.2	309.7	324.8	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	325.9	0.2	1	0								22.6	7.2	309.7	324.8	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	326.1	0.2	1	0								21.3	7.58	305	327.5	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	325.4	0.2	1.4	0.01								21.3	7.58	305	327.5	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	326.1	0.2	1.5	0.01								21.3	7.58	305	327.5	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	325.4	0.2	1	0.02								21.3	7.58	305	327.5	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	330.5	0.2	1	0.02								23.9	8.38	318.5	325.5	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	330.1	0.2	1.4	0								23.9	8.38	318.5	325.5	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	330.5	0.2	1.4	0								23.9	8.38	318.5	325.5	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	330.1	0.2	1	0								23.9	8.38	318.5	325.5	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	325.4	0.2	0.9	0								18.1	7.78	271.5	312.5	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	317.5	0.2	1.3	0								18.1	7.78	271.5	312.5	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	325.4	0.2	1.5	0								18.1	7.78	271.5	312.5	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	317.5	0.2	1	0								18.1	7.78	271.5	312.5	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	323.6	0.2	1	0.01								23.4	7.07	315.7	325.3	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	320.5	0.2	1.4	0.01								23.4	7.07	315.7	325.3	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	323.6	0.2	1.5	0								23.4	7.07	315.7	325.3	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	320.5	0.2	1.1	0.02								23.4	7.07	315.7	325.3	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	331.7	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	331.7	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	331.7	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	331.7	0.2	1.9	0.57	1 LEPCYA, 3 PIMPRO, 1 CYPLUT	

Silvery Minnow/Fish Data — Water Quality 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	Mouth of Enclosure: 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 Enclosure (if applicable): 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)	Main Channel: water temp (oC)	Main: DO (mg/L)	Main: conduct (uS)	Main: spec cond (uS)	Main: salinity (ppt)	Main: water depth (10th of foot)	Main: current velocity (m/s)	Fish	Comments
Montano Site Information				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		

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	Mouth of Enclosure: 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 Enclosure (if applicable): 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)	Main Channel: water temp (oC)	Main: DO (mg/L)	Main: conduct (uS)	Main: spec cond (uS)	Main: salinity (ppt)	Main: water depth (10th of foot)	Main: current velocity (m/s)	Fish	Comments
				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	

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	Mouth of Enclosure: 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 Enclosure (if applicable): 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)	Main Channel: water temp (oC)	Main: DO (mg/L)	Main: conduct (uS)	Main: spec cond (uS)	Main: salinity (ppt)	Main: water depth (10th of foot)	Main: current velocity (m/s)	Fish	Comments
				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	1	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

Silvery Minnow/Fish Data

Water Quality Data

Los Lunas 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)		
				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						0.7	0.20	25.6	5.09	136.5	431.5	0.2			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	1445	experiment	0	0	n/a	n/a	n/a	n/a	n/a	n/a	0	0						0.7	0.20	25.6	5.09	136.5	431.5	0.2			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	1445	experiment	2	1	0	0	0	0	6	10	0	0	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	25.8	5.89	440.2	432.8	0.2	1.8	0.46	GAMAFF	
2	5/10/2006	1445	control	0	0	0	0	0	0	10	10	0	0	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	25.8	5.89	440.2	432.8	0.2	1.8	0.46		
1	5/11/2006	1615	Control	0	1	0	0	0	0	0	0	0	0	25.4	6.38	446.9	441.6	0.2	0.9	0.03								25.6	6.91	447.8	441.7	0.2	0.8	0.44	Baby ICTPUN	
1	5/11/2006	1615	Experiment	1	0	0	0	0	0	0	0	0	0	25.4	6.53	446.3	441.5	0.2	0.6	0.02								25.6	6.91	447.8	441.7	0.2	0.8	0.44		
2	5/11/2006	1700	Control	4	4	0	0	0	0	1	2	0	0	26.3	6.83	449.4	438.2	0.2	0.7	0.00								26.3	6.66	452.3	441.5	0.2	1.25	0.35	2 PIMPRO, 2 GAMAFF	
2	5/11/2006	1700	Experiment	4	0	0	0	0	0	3	0	0	0	26.3	6.83	449.4	438.2	0.2	0.7	0.00								26.3	6.66	452.3	441.5	0.2	1.25	0.35		1 ADULT RGSM WAS DEAD
1	5/12/2006	1455	control	0	1	0	0	0	0	0	0	0	0	28.6	7.28	464.1	433.2	0.2	0.9	0.08								28.6	7.18	463.2	427.9	0.2	0.7	0.46	1 baby ICTPUN	
1	5/12/2006	1455	Experiment	0	0	0	0	0	0	0	0	0	0	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	28.6	7.18	463.2	427.9	0.2	0.7	0.46		
2	5/12/2006	1530	control	1	7	0	0	0	0	4	15	0	0	29.3	8.93	466.2	430.8	0.2	0.7	0.00								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	1520	Experiment	1	3	0	0	0	0	25	25	0	0	29.3	8.93	466.2	430.8	0.2	0.8	0.02								28.9	7.23	467.1	433.3	0.2	1.3	0.34	3 PLAGRA on quadrat	
1	5/13/2006	558	control	0	1	0	0	0	0	0	0	0	0	17.6	7.70	406.0	353.5	0.2	1.5	0.05								17.7	7	355.1	413	0.2	1.5	0.56	1 PIMPRO	southern quad was buried in sand
1	5/13/2006	558	experiment	0	5	0	0	0	0	0	0	0	0	17.6	7.00	330.4	388.8	0.1	0.0									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	646	control	1	10	0	0	0	0	0	0	0	0	16.9	8.24	353.0	417.7	0.2	1.3	0.03								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	646	experiment	3	2	0	0	0	0	0	0	0	0	16.9	8.24	350.1	416.1	0.2	1.3	0.09								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	1430	control	0	5	0	0	0	0	0	0	0	0	28.3	6.72	458.1	435.5	0.2	1.0	0.03								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	1430	experiment	0	0	0	0	0	0	0	0	0	0	28	6.35	458.6	434.5	0.2	0.9	0.02								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	1527	control	0	37	0	0	0	0	0	0	0	0	29.6	6.97	475.2	436.2	0.2	1.1	0.08								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	1527	experiment	0	7	0	0	0	0	0	0	0	0	29.6	6.97	475.2	436.2	0.2	1.2	0.13								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	820	control	0	18	0	0	0	0	0	0	0	0	16.6	7.13	332.6	396.1	0.2	1.0	0.02								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	820	experiment	0	1	0	0	0	0	0	0	0	0	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	16.5	7.16	331.9	396	0.2	0.55	0.51	1 PLAGRA	PLAGRA was dead
2	5/15/2006	912	control	0	3	0	0	0	1	0	0	0	0	17.1	8.71	337.7	398.0	0.2	1.1	0.23								16.9	7.46	338	399.7	0.2	1	0.53	2 PIMPRO, 1 CYPLUT	
2	5/15/2006	912	experiment	0	11	4	0	0	0	3	1	0	0	17.1	8.12	337.4	397.9	0.2	1.2	0.09								16.9	7.46	338	399.7	0.2	1	0.53	1 PLAGRA, 6 PIMPRO, 3 CYPLUT, AMELMEL	
1	5/16/2006	915	control	0	20	0	0	0	0	1	0	0	0	19.2	8.63	359.4	404.7	0.2	0.7	0.01								18.1	7.7	349	401.8	0.2	0.8	0.45	12 CYPLUT, 8 PIMPRO	
1	5/16/2006	915	experiment	0	0	0	0	0	0	0	0	0	0	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	18.1	7.7	349	401.8	0.2	0.8	0.45		mouth is not completely submerged
2	5/16/2006	852	control	0	10	2	4	0	0	5	3	0	0	17.1	8.72	339.3	399.8	0.2	0.8	0.00								16.8	8.42	335.8	396.2	0.2	0.5	0.42	9 CYPLUT, 1 PIMPRO	
2	5/16/2006	852	experiment	0	0	0	0	0	0	0	0	0	0	17	8.85	339.6	400.3	0.2	0.8	0.02								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	919	control	0	3	10	10	0	0	5	2	0	0	18.6	7.48	354.1	403.2	0.2	0.8	0.02								18.3	7.5	351.8	403.3	0.2	1	0.43	2 PIMPRO, 1 CYPLUT	
1	5/17/2006	919	experiment	0	0	0	1	0	0	3	5	0	0	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	18.3	7.5	351.8	403.3	0.2	1	0.43		
2	5/17/2006	849	control	0	8	0	0	0	0	0	0	0	0	18.1	9.20	345.9	404.4	0.2	0.9	0.02								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	849	experiment	0	6	0	0	0	0	0	0	0	0	18	8.35	349.8	403.5	0.2	0.9	0.01								17.8	7.56	345.1	401.1	0.2	0.6	0.39	1 GAMAFF, 5 PIMPRO	
1	5/18/2006	936	control	0	2	0	0	0	0	2	0	1	1	20.7	9.06	373.5	406.1	0.2	0.6	0.02								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	936	experiment	0	0	0	0	0	0	0	0	0	0	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	19.6	8.18	362.7	403.6	0.2	0.8	0.43		mouth of hoopnet blown over
2	5/18/2006	936	control	0	3	0	0	0	0	1	1	0	1	18.9	8.49	354.5	401.3	0.2	0.7	0.02								18.5	8.58	334.7	385.8	0.2	0.6	0.52	1 CYPLUT, 1 GAMAFF, 1 PIMPRO	
2	5/18/2006	936	experiment	0	20	0	0	0	0	0	0	0	0	18.9	8.43	354.5	401.4	0.2	0.7	0.02								18.5	8.58	334.7	385.8	0.2	0.6	0.52	13 PIMPRO, 1 ICTPUN, 6 CYPLUT	
1	5/19/2006	918	control	0	0	0	0	0	0	0	1	1	0	19.6	9.07	367.0	408.0	0.2	0.7	0.00								20.4	8.59	364.9	401.3	0.2	0.7	0.41		
1	5/19/2006	918	experiment	0	3	0	0	0	0	1	0	0	0	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	20.4	8.59	364.9	401.3	0.2	0.7	0.41	1 GAMAFF, 2 PIMPRO	
2	5/19/2006	853	control	0	1	0	0	0	0	1	1	0	0	20	7.16	306.0	374.2	0.2	0.8	0.01								19.6	7.9	356.6	398.3	0.2	0.7	0.4	1 GAMAFF	
2	5/19/2006	853	experiment	0	3	0	0	0	0	0	0	0	0	20.1	7.04	347.0	394.4	0.2	0.8	0.01								19.6	7.9	356.6	398.3	0.2	0.7	0.4	1 PIMPRO, 1 PLAGRA, 1 CYPLUT	
1	5/20/2006	924	control	0	0	0	0	0	0	6	14	1	0	20.5	9.18	375.5	413.3	0.2	0.7	0.01								20.6	8.39	369.2	402.2	0.2	0.8	0.47		
1	5/20/2006	924	experiement	0	0	2	0	0	0	1	0	0	1	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	20.6	8.39	369.2	402.2	0.2	0.8	0.47		
2	5/20/2006	908	control	0	0	0	0	0	0	0	1	0	0	20.2	8.07	365.0	402.4	0.2	0.8	0.00								19.7	8.47	360.1	400.1	0.2	0.5	0.56		
2	5/20/2006	908	experiment	0	6	0	0	0	0	3	2	0	0	20.2	8.07	365.0	402.4	0.2	0.8	0.00								19.7	8.47	360.1	400.1	0.2	0.5	0.56	4 CYPLUT, 2 PIMPRO	
1	5/21/2006	1101	control	0	0	0	0	0	0	0	0	0	5	24.5	8.84	400.8	404.6	0.1	0.6	0.01								23.7	7.38	380.7	383.2	0.2	0.7	0.44		quadrats slightly overlapped
1	5/21/2006	1101	experiment	0	4	0	0	0	0	0	0	0	0	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	23.7	7.38	380.7	383.2	0.2	0.7	0.44	2 PIMPRO, 1 CYPLUT, 1 PLAGRA	
2	5/21/2006	1038	control	0	3	0	0	0	0	0	0	0	0	23.9	6.97	398.7	406.5	0.2	0.8	0.02								23.4	7.83	396.7	409.4	0.2	1.1	0.33	3 PIMPRO	
2	5/21/2006	1038	experiment	0	0	0	0	0	0	0	0	0	0	23.9	6.97	398.7	406.5	0.2	0.8	0.02								23.4	7.83	396.7	409.4	0.2	1.1	0.33		
1	5/22/2006	855	control	0	1	0	0	0	0	0	0	4	4	20.6	7.58	393.1	427.9	0.2	0.6	0.00								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	855	experiment	0	1	0	0	0	0	2	0	0	0	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	21.6	7.19	372.9	399	0.2	0.4	0.37	1 PIMPRO	
2	5/22/2006	913	control	0	2	0	0	0	0	4	3	0	0	21.8	8.12	376.1	400.4	0.2	0.8	0.00								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	913	experiment	0	4	0	0	0	0	2	0	0	0	21.8	8.12	376.1	400.4	0.2	0.9	0.00								21.6	7.53	373.6	399.8	0.2	0.4	0.37	2 PIMPRO, 2 GAMAFF	
1	5/23/2006	922	control	0	3	0	0	0	0	0	0	3	6	16.6	9.06	340.6	404.9	0.2	0.8	0.00								16	9	334.3	403.8	0.2	0.6	0.27	3 GAMAFF	5 tadpoles in hoop net
1	5/23/2006	922	experiment	0	1	0	0	0	0	0	0	3	1	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	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	942	control	0	18	0	0	0	0	0	0	0	0	16.8	8.64	345.3	406.0	0.2	0.9	0.00								16.4	8.67	338.1	404.3	0.2	0.9	0.51	14 CYPLUT, 2 PIMPRO, 2 PLAGRA	
2	5/23/2006	942	experiment	0	7	0	0	0	0	0	0	1	0	16.7	7.57	341.5	403.5	0.2	0.5	0.00								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	1012	control	0	0	0	0	0	0	1	0	0	3	20.2	7.48	381.7	421.5	0.2	1.0	0.00								19.5	7.64	370.5	411.9	0.2	0.6	0.48		2 tadpoles in the net
1	5/24/2006	1012	experiment	0	12	0	0	0	0	0	1	0	0	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	19.5	7.64	370.5	411.9	0.2	0.6	0.48	11 PIMPRO	
2	5/24/2006	932	control	0	2	0	0	0	0	0	0	0	0	19	8.31	367.6	415.3	0.2	1.1	0.00								18.4	7.7	361.5	370.2	0.2	0.9	0.59	1 ICTPUN, 1 AMENAT	
2	5/24/2006	932	experiment	0	6	0	0	0	0	0	0	0	1	19	7.95	368.2	415.5	0.2	1.1	0.01								18.4	7.7	361.5	370.2	0.2	0.9	0.59	6 PIMPRO	1 tadpole in net
1	5/25/2006	1418	control	0	3	0	0	0	0	2	2	1	1	27.8	7.49	442.9	420.2	0.2	1.0	0.00								27.5	6.92	439.3	419.8	0.2	0.6	0.43	2 PIMPRO, 1 GAMAFF	
1	5/25/2006	1418	experiment	0	2	80	0	0	0	0	0	0	0	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	27.5	6.92	439.3	419.8	0.2	0.6	0.43	2 PIMPRO	
2	5/25/2006	1448	control	0	1	0	0	0	0	0	0	0	1	28.7	7.51	450.1	420.5	0.2	1.2	0.07								27.9	6.76	440.2	416.8	0.2	0.5	0.41	1 CYPLUT	
2	5/25/2006	1448	experiment	0	20	0	0	0	0	0	0	0	0	28.6	7.30	450.1	421.2	0.2	0.9	0.07								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	915	control	0	4	0	0	0	0	0	0	1	1	19.3	7.08	378.2	425.0	0.2	1.3	0.05								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	915	experiment	0	6	0	0	0	0	1	0	0	0	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	19.3	7.79	377.4	423.8	0.2	0.9	0.68	6 PIMPRO	1 tadpole in net
2	5/26/2006	854	control	0	0	0	0	0	0	0	0	0	0	18.9	6.92	370.9	420.3	0.2	1.4	0.02								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	854	experiment	0	1	0	0	0	0	0	0	0	0	18.9	7.38	371.1	420.3	0.2	1.4	0.02								18.8	8.4	370.2	419.7	0.2	0.9	0.41	1 AMEMEL	water level higher
1	5/27/2006	820	control	0	0	0	0	0	0	0	0	0	1	17.1	7.88	334.7	391.7	0.2	1.0	0.00								17.1	7.91	334.3	393.5	0.2	0.09	0.6		1 tadpole in hoop net
1	5/27/2006	820	experiment	0	5	0	0	0	0	1	1	0	0	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	17.1	7.91	334.3	393.5	0.2	0.09	0.6	2 CYPLUT, 3 PIMPRO	
2	5/27/2006	920	control	0	0	0	0	0	0	0	0	0	0	19	8.33	351.3	397.5	0.2	1.3	0.01								18.3	7.86	348	398.9	0.2	0.6	0.35		calibrated DO prior to this site
2	5/27/2006	920	experiment	0	0	0	0	0	0	0	0	0	0	19	8.33	351.3	397.5	0.2	1.4	0.07								18.3	7.86	348	398.9	0.2	0.6	0.35		1 tadpole in net