WATER QUALITY / VARIABLE FLOW STUDY
SUMMARY OF
CRITICAL PERIOD SAMPLING # 2
COMAL RIVER, NEW BRAUNFLES, TEXAS
SEPTEMBER 7 - 15, 2000

PBS&J

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SUMMARY OF

CRITICAL PERIOD SAMPLING # 2

COMAL RIVER, NEW BRAUNFELS, TEXAS

SEPTEMBER 7-15, 2000

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EXECUTIVE SUMMARY

This Annual Summary Report serves only to highlight the sampling activities that were conducted with respect to the **Second** Critical Period Monitoring Effort on the Comal Springs / River ecosystem. The report presents the sampling activities, brief summary of methodologies, sample locations, and raw data. The report also serves to satisfy the requirements of the Federal Fish and Wildlife Permit # TE820022-2. The data reduction and analysis component of the project will be presented in the final report to be issued to the Edwards Aquifer Authority in February 2003.

The PBS&J project team conducted the second Critical Period Monitoring Sampling from 7 September to 15 September 2000 with the flows at Comal reporting 145 cfs on 7 September 2000, and 171 cfs on 15 September 2000. The sampling effort consisted of:

EVENT	DATE	LOCATION
Water Quality sampling	11 September	14 sites
Thermister placement	8 September	
Aquatic Vegetation mapping	7-14 September	4 reaches
Fountain Darter sampling		
Drop nets	11-14 September	4 reaches
Dip nets	8,11 September	5 reaches
Minnow traps	12-14 September	Landa Lake and Old Channel reaches
Visual observations	13 September	Landa Lake Reach
Salamander observations	13-14 September	Spring runs 1 and 2, and Spring Island area
Macroinvertebrate sampling		
Drift nets	14-15 September	Spring runs 1, 2, and 3
Exotic / Predation study	14-15 September	Landa Lake Reach

Observations

Separated by less than two weeks, the observations noted for the second Critical Period Monitoring effort were very similar to the observations of the first Critical Period Monitoring effort. At the flows present (145 – 171 cfs) during the second Critical Period Monitoring effort, all three major springs (Spring runs 1, 2, and 3) were flowing. Water quality was also measured for the system during this period with the standard parameters (including temperature) being suitable for the biological communities. Aquatic vegetation was abundant and provided suitable habitat for biological communities. Within the four reaches sampled for fountain darters via the drop net methodology, suitable habitat for the darter was observed. Drop net sampling in the lower three reaches produced fountain darters within the suitable aquatic vegetation types, sometimes in large numbers as documented in Landa Lake and the Old Channel. No fountain darters were collected in drop nets from the Upper Spring Run Reach. However, subsequent dip net sampling in the Upper Spring Run Reach for fountain darters revealed that darters still occupied the reach. In addition, dip net sampling was conducted in Landa Lake, the New Channel, the Old Channel, and below Garden Street just above the confluence with the Guadalupe River. Using dip nets,

fountain darters were collected from all reaches with large numbers being reported in the suitable habitat in Landa Lake and the Old Channel. Within the spring runs and at the springs' orifices, suitable habitat for the listed invertebrates was observed. Drift net samples were taken in Spring runs 1, 2, and 3. Suitable habitat for the Comal Springs salamander was also noted in the spring runs and Spring Island area with salamanders observed in each area.

As during the first effort, there was a considerable amount of filamentous green algae in the Upper Spring Run Reach, covering the majority of the substrate and the aquatic vegetation to varying degrees. This condition was much less evident in the lower reaches. The gill parasite that has been reported for the fountain darter over the last several years was also very evident in a number of fountain darters collected. The fountain darters collected from the Old Channel Reach exhibited the worst conditions noted with respect to parasite infections and darter condition. It should be emphasized that the parasite has been repeatedly noted for darters in the Comal System and that the Old Channel maintained some of the highest flows sampled during this effort.

The second effort again confirmed that the study design appears well suited to address the concerns of variable flow and water quality on the biological resources in the Comal system. **It also must be re-emphasized that sampling in variable flow conditions to compare back to this critical period sampling effort and future efforts remains critically important in order to best define and understand the system.**

1.0 CRITICAL PERIOD SAMPLING

1.1 WATER QUALITY

The water quality component of the study includes water sampling and laboratory analyses, standard parameter measurement, and thermister deployment and retrieval. Dr. Alan Groeger of Southwest Texas State University (SWT) supervised all aspects of the water quality component of this study. The chemical analyses for Critical Period Sampling #2 were conducted in Dr. Groeger's laboratory at SWT.

On 8 September 2000, the project team deployed thermisters at select water quality stations along the Comal River. The thermisters were set to record temperature data every five minutes. The station locations will not be described in detail as to prevent tampering with the equipment in the field.

On 11 September 2000, the project team performed a water quality evaluation on the Comal River (Figure 1). Sample sites were placed throughout the river as depicted in Figure 2 with descriptions in Table 1. At each water quality site, standard parameters, including temperature, dissolved oxygen, pH, and conductivity were measured using a Hydrolab multi-parameter probe provided by SWT. Whenever depths allowed, standard parameters were taken at the surface, mid-depth, and bottom. The depth of the site in meters was also recorded. Water samples were taken at each site that consisted of grab samples from just below the water surface. The water samples were labeled and stored in ice chests cooled with crushed ice until transport to SWT.

The standard parameter and water chemistry results are presented in Table 2.

1.2 AQUATIC VEGETATION MAPPING

The aquatic vegetation mapping effort consisted of mapping all of the vegetation within the four reaches depicted on Figure 1. These reaches included the Upper Spring Run Reach, Landa Lake Reach, New Channel Reach, and Old Channel Reach. The mapping was conducted using a Trimble Pro-XRS GPS unit with real-time differential correction that can provide sub-meter accuracy. The GPS unit was linked to a Fujitsu Stylistic 2300 lap top computer with Aspen software to display real-time differentially corrected field data. The GPS unit and computer were placed in a 10-foot Perception Swifty kayak with the GPS unit antenna mounted on the bow. The aquatic vegetation was identified and mapped by maneuvering the kayak around the perimeter of each vegetation type at the water's surface. Vegetation stands that measured between 1.0 and 0.5 meters in diameter were mapped by recording a single point. Vegetation stands less that 0.5 meter in diameter were not mapped.

The aquatic vegetation maps created for each of the four reaches are presented in sequence in the Figures section at the end of this section.

1.3 HABITAT QUALITY INDEX / PHOTO DOCUMENTATION

During the water quality collection effort, the project team provided an ecologist to conduct habitat evaluations and fixed station photography. A habitat quality index has been developed for this project and was utilized for the critical period sampling effort. A defined ranking method for the HQI categories is being finalized by the project team and thus, the HQI field sheets are not included in this report.

In addition, fixed photographs, which included an upstream, across-stream, and downstream location were taken at each HQI site. The list of fixed photographs are presented in Table 3.

1.4 FOUNTAIN DARTER SAMPLING

Drop Nets

On 11-14 September 2000, the project team performed drop net sampling on the Comal River at the four reaches depicted in Figure 1. The four reaches for aquatic vegetation mapping and fountain darter sampling by drop net are listed below with the number of drop net samples taken from each reach:

Upper Spring Run Reach (above Landa Lake)	6 drop net samples	11 September
Landa Lake Reach	10 drop net samples	12 September
New Channel Reach	6 drop net samples	14 September
Old Channel Reach	6 drop net samples	13 September

Within each reach, drop nets were placed in specific aquatic vegetation types that had been selected through stratified random methods. As previously described, the aquatic vegetation was mapped in these reaches prior to drop net sampling. The drop net sampled a 2 m^2 area using a rectangular drop net structure. Fifteen sweeps through the drop net area were completed with a specially constructed dip net. At each location, vegetation type, vegetation height and areal coverage, substrate type, mean column velocity and velocity at 15 cm above the bottom, water temperature, conductivity, pH, and dissolved oxygen were recorded. Vegetation type, height, areal coverage, and substrate were also noted for all adjacent 3 m cell areas. Darters were identified, enumerated, measured, and returned to the river at the point of collection. Other fish species were identified, measured and released, or preserved for identification at the PBS&J nekton laboratory. The total number per species and the standard length for fish were recorded for drop net samples. All live ramshorn snails were counted, measured, and destroyed. In addition, crayfish and grass shrimp were identified and enumerated. The

exotic Asian snails (*Melanoides tuberculata* and *Thiara granifera*) and Asian clam (*Corbicula* sp.) were identified and a general abundance recorded (i.e., none, slight, moderate, or heavy).

The drop net sites are depicted on the aquatic vegetation maps for the respective reaches. The data sheets for the drop net sampling are presented in the Tables section by reach and specific site, respectively.

Dip nets

In addition, dip net collections were conducted to record presence/absence information throughout the system and to provide fountain darters for refugia. The same four reaches mentioned above were sampled as well as the reach below the Garden Street bridge (Figure 1). Dip netting for fountain darters was conducted for predetermined length of time for each of the reaches: Upper Spring Run Reach (1/2 hour), Spring Island area (1/2 hour), Landa Lake Reach (1 hour), New Channel Reach (1 hour), Old Channel Reach (1 hour), and the Garden Street Reach (1 hour). Fountain darters were identified, enumerated, measured, and returned to the river at the point of collection. The areas of fountain darter collection were marked on a base map. The number of exotic snails was visually observed and abundance's estimated. Fountain darters were also collected for refugia purposes under the discretion of Dr. Thomas Brandt (U.S. Fish and Wildlife Service National Fish Hatchery and Technology Center).

The Upper Spring Run Reach, Spring Island area, Landa Lake Reach, and Old Channel Reach were sampled on 8 September 2000; and the New Channel Reach and Garden Street Reach on 11 September 2000. The dip net results are presented in Table 4.

Minnow Traps

This component of the monitoring plan consists of deploying Gee minnow traps in potential fountain darter habitat for the collection of darters. This non-destructive method will be evaluated during this project with respect to potential long-term monitoring opportunities. As with the other collection techniques, once identified, enumerated, and measured, all fountain darters will be returned to the water at the point of collection. Other fish species collected will be identified and enumerated, prior to release.

For this sampling effort, minnow traps were deployed in the Landa Lake and Old Channel reaches. Within these reaches, two traps were placed in the area immediately surrounding the drop net site. Thus, the same vegetation types were sampled and the labeling for the minnow traps corresponds with the drop net sites depicted on the aquatic vegetation maps. The Landa Lake Reach minnow traps were set on 12 September 2000 and retrieved on 13 September 2000. Minnow traps on the Old Channel Reach were set

on 13 September 2000 and retrieved on 14 September 2000. The traps at each location were placed during late afternoon and checked in the morning and mid-afternoon of the second day. The data sheets for the minnow trap sampling are presented in the Tables section by reach and specific site, respectively.

Visual Observations of fountain darters via SCUBA

Visual aquatic surveys were conducted using SCUBA in Landa Lake to identify fountain darters and salamanders at depths deeper than conventional sampling methods allow. Areas were surveyed to define what may be considered potential deeper water habitat. A time-constraint survey was conducted with observations of all fish species while focusing on fish on the bottom. Larger rocks were overturned at the substrate surface to expose any fountain darters or salamanders. All fountain darters and salamanders were noted. A second focus of the visual observations was to identify suitable habitat areas for both the darters and salamanders and subsequently set gill nets in these areas for the predation component of the study.

Surveys revealed the presence of both fountain darters and salamanders at depths greater than five feet. Fountain darters were observed throughout the reach around larger rocks associated with filamentous algae. Salamanders were observed around portions of the springs, under rocks at depths of up to 8 feet. No salamanders were observed in any areas with sediment.

Gill parasite evaluation

A small number of darters from specific size categories were collected by Dr. Brandt and returned to the National Fish Hatchery and Technology Center for gill parasite evaluation. The results of that evaluation were not present at the time of this report.

1.5 SALAMANDER VISUAL OBSERVATIONS

The project team performed presence/absence surveys for the Comal Springs salamander within the spring reaches located at the head of the Comal River. Surveys were conducted in Spring Run 1 and Spring Run 3 on 13 September 2000, and the Spring Island area on 14 September 2000 (Figure 1).

Salamander surveys were performed by two people in each spring reach starting downstream and working toward the main spring orifice. All surveys were initiated in the morning and were terminated before noon. Surveys were conducted by turning over rocks within the spring run located on the substrate surface. In depths that permitted, dive mask and snorkel were utilized. All salamanders observed were noted along with the time, location, and water depth at each. Within Spring Run 1, surveys were conducted from the first pedestrian bridge below Landa Park Drive up to 30 feet below the head spring

orifice. Spring Run 3 was surveyed from the pedestrian bridge closest to Landa Lake up to 30 feet below the head spring orifice. In the Spring Island area, surveys were conducted within the entire spring reach including approximately a 50-foot radius from each spring run outfall in the Comal River. These two areas include the spring outfall on the east side of Spring Island (closest to Edgewater Drive) and the area north of Spring Island (headed upstream).

As mentioned in the visual observation section, salamanders were observed throughout the deeper portions of Landa Lake. This observation should be noted as very little work has been done to date to document the presence of salamanders in this area.

Surveys conducted in Spring Run 1 on 13 September 2000 revealed 5 salamanders. The survey was conducted for approximately 1.5 hours. All salamanders observed occurred above the pedestrian bridge upstream of Landa Lake Drive. Surveys conducted in Spring Run 3 on 13 September 2000 revealed 14 salamanders. The survey lasted approximately 1 hour. Salamanders in Spring Run 3 occurred throughout the survey area. At the time of the surveys, the Spring Island Spring appeared to have no surface flow. Only a pool was present in the center of the spring reach. Within the Spring Island Spring pool, a survey was conducted on 14 September 2000 and revealed the presence of 6 salamanders. The survey was conducted for approximately 30 minutes. The outfall of the Spring Island Spring into the Comal River on the east side of Spring Island was surveyed on 14 September 2000 and revealed the presence of 5 salamanders. Surveys conducted at each outfall location occurred for approximately 30 minutes. No salamanders were observed in the Comal River at the spring outfall on the north side of Spring Island.

1.6 DRIFT NET SAMPLING

Drift nets were placed at the downstream end of each of the Comal Spring Runs 1, 2 and 3, near their confluence with Landa Lake or City of New Braunfels recreation pools. Single nets were used for Spring Runs 2 and 3. Two nets were used to capture drifting organisms at Spring Run 1 and were placed at the base of where the spring run bifurcates into 2 riffle-run channels. The nets consist of a 0.45 m by 0.30 m rectangular opening which connected to a 1 m, 600 μm mesh net. The tail of the net is connected to a detachable 0.15 m long cylindrical bucket. The nets were placed 1-2 cm above the substrate and capture the entire water column. Samples from the nets were collected at 3 hour intervals over a 24-hour period to account for diel the periodicity that is characteristic of many benthic organisms. The contents of the nets were stored in 95% ethanol in the field and transported to the Stream Ecology Lab at SWT for sorting net contents and taxonomic determination of drifting organisms. Water depths, current velocity, dissolved oxygen and temperature were measured at the start and end of each 24-hour collection period.

The drift net results were not available at the time of this document submittal. Drift net results will be submitted to the Edwards Aquifer Authority and U.S. Fish and Wildlife Service in a letter report upon completion of identification and compilation.

1.7 EXOTICS / PREDATION STUDY

A 150 ft experimental gill net with mesh sizes ranging from ¾ to 3 inches was placed in Landa Lake to collect nekton of various species and sizes. The gill net evaluation was conducted for a preliminary examination of exotic fish concentrations in Landa Lake and for stomach content analyses with respect to predation of endangered species. The gill net was placed in the area documented as supporting fountain darters and salamanders through previously described SCUBA activities. All fish collected in the gill net were identified, enumerated, weighed and measured. A number of representative fish were taken from different species and different size classes within species for stomach content analyses. The fish were stored on crushed ice until transferred to the PBS&J Nekton Laboratory where the stomach was removed and contents examined. The focus is on predation of fountain darters and/or salamanders by the various species and size classes.

The gill net data along with stomach contents is presented in Table 5.

FIGURES

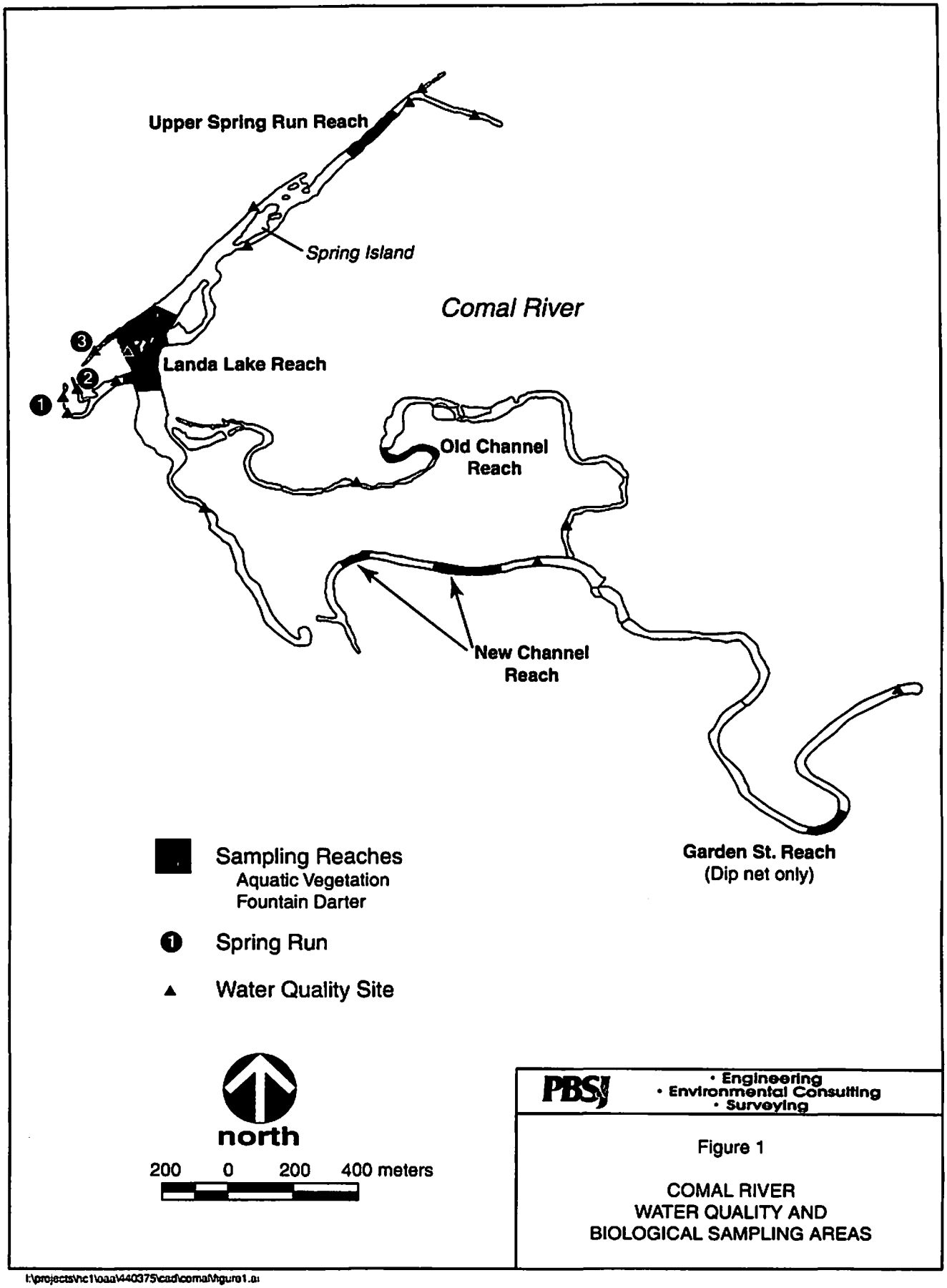

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Figure 1

COMAL RIVER
WATER QUALITY AND
BIOLOGICAL SAMPLING AREAS

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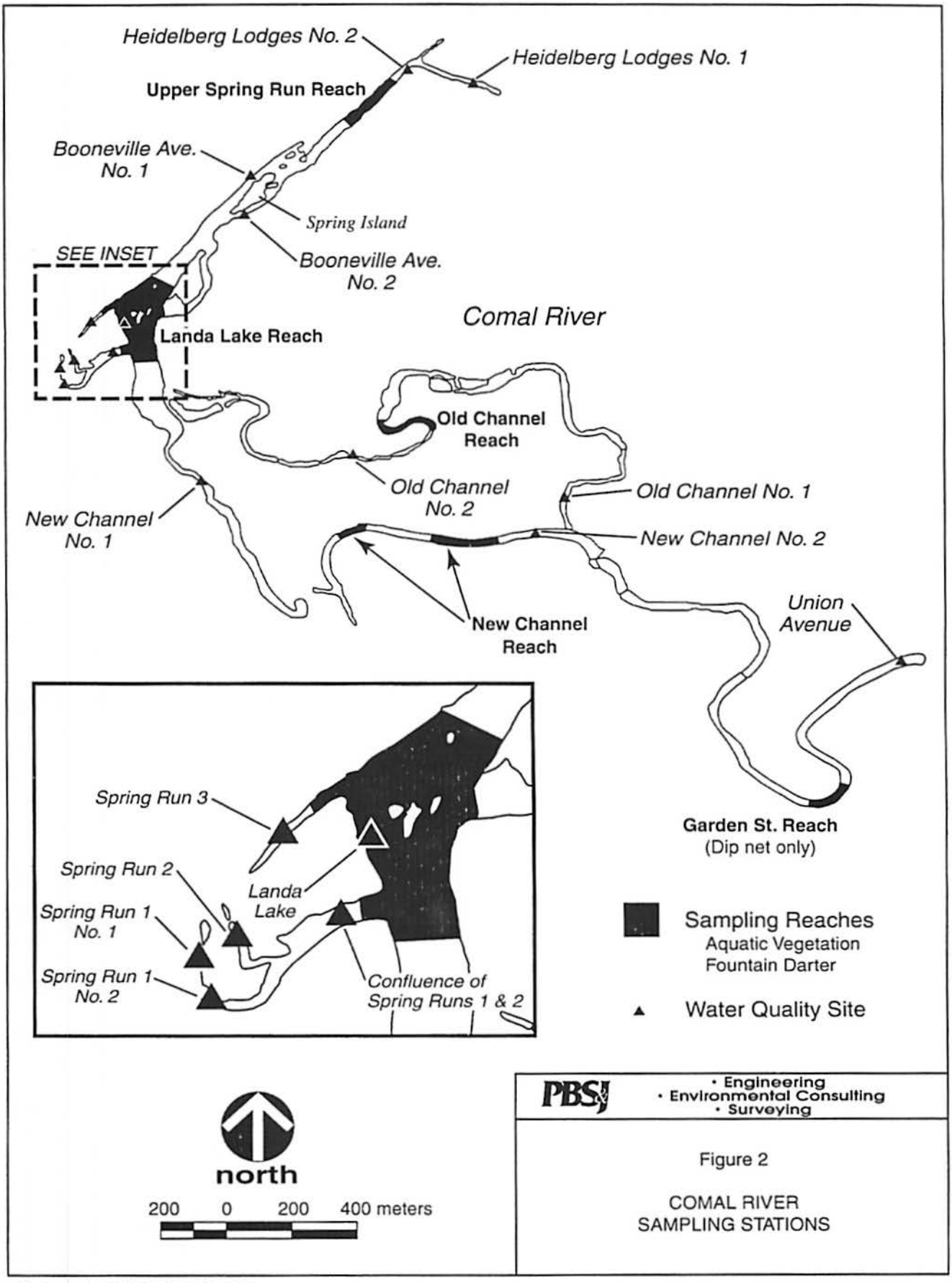

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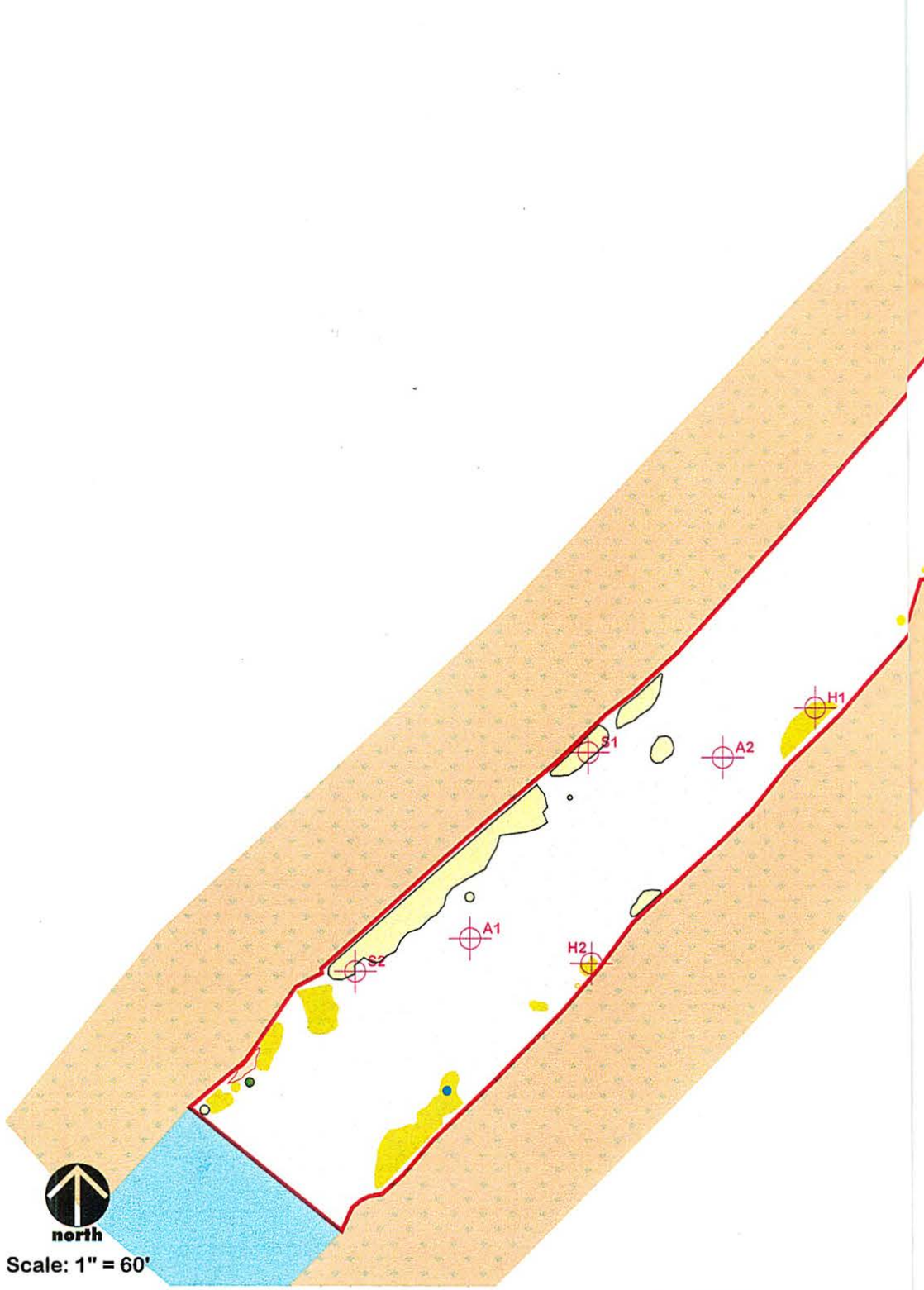

EDWARDS AQUIFER AUTHORITY

Comal River Aquatic Vegetation
Upper Spring Run Reach
September 7, 2000

Legend

	Acres
- Study Area	1.206
- Chara sp	0
- Colocasia	0.0014
- Sagittaria	0.0535
- Hygrophila	0.0456
- Cabomba	0
- Nuphar	0
- Ludwigia	0
- Bare Substrate	1.1055
- Shoreline / Island	
- Comal River	
- Drop Net Sample Sites	

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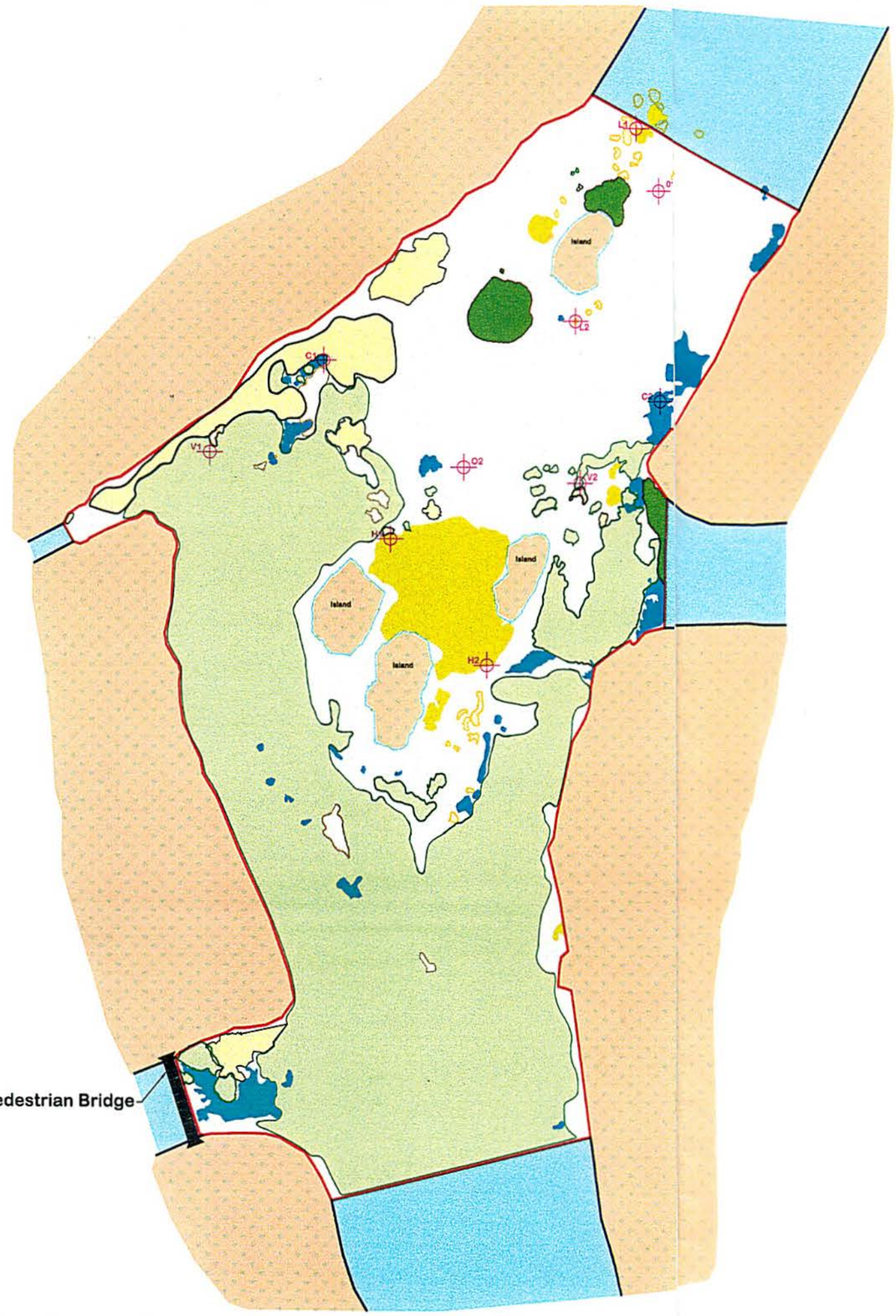

EDWARDS AQUIFER
AUTHORITY

Comal River Aquatic Vegetation
Landa Lake
September 11, 2000

Legend

	Acres
- Study Area	5.648
- Vallisneria	2.747
- Sagittaria	0.250
- Hygrophila	0.237
- Cabomba	0.154
- Nuphar	0.082
- Ludwigia	0.020
- Bare Substrate	2.158
- Shoreline / Island	
- Comal River	
- Drop Net Sample Sites	

north

Scale: 1" = 100'

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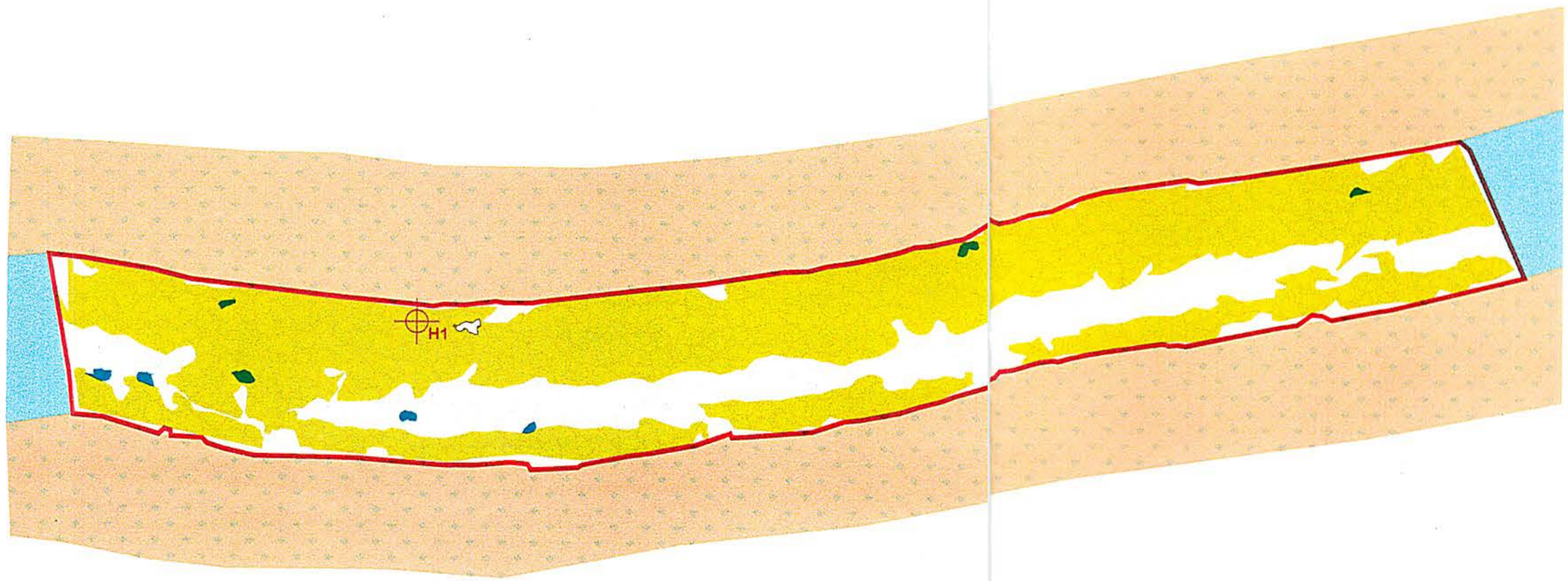
EDWARDS AQUIFER
AUTHORITY

Aquatic Vegetation Comal River
New Channel Reach
September 12, 2000



north

Scale: 1" = 60'

Legend

	Acres
- Study Area	1.045
- Cabomba	0.005
- Hygrophila	0.700
- Bare Substrate	0.340
- Shoreline / Island	
- Comal River	
- Drop Net Sample Sites	

(5 Additional Sites located at New Channel Upper Reach)

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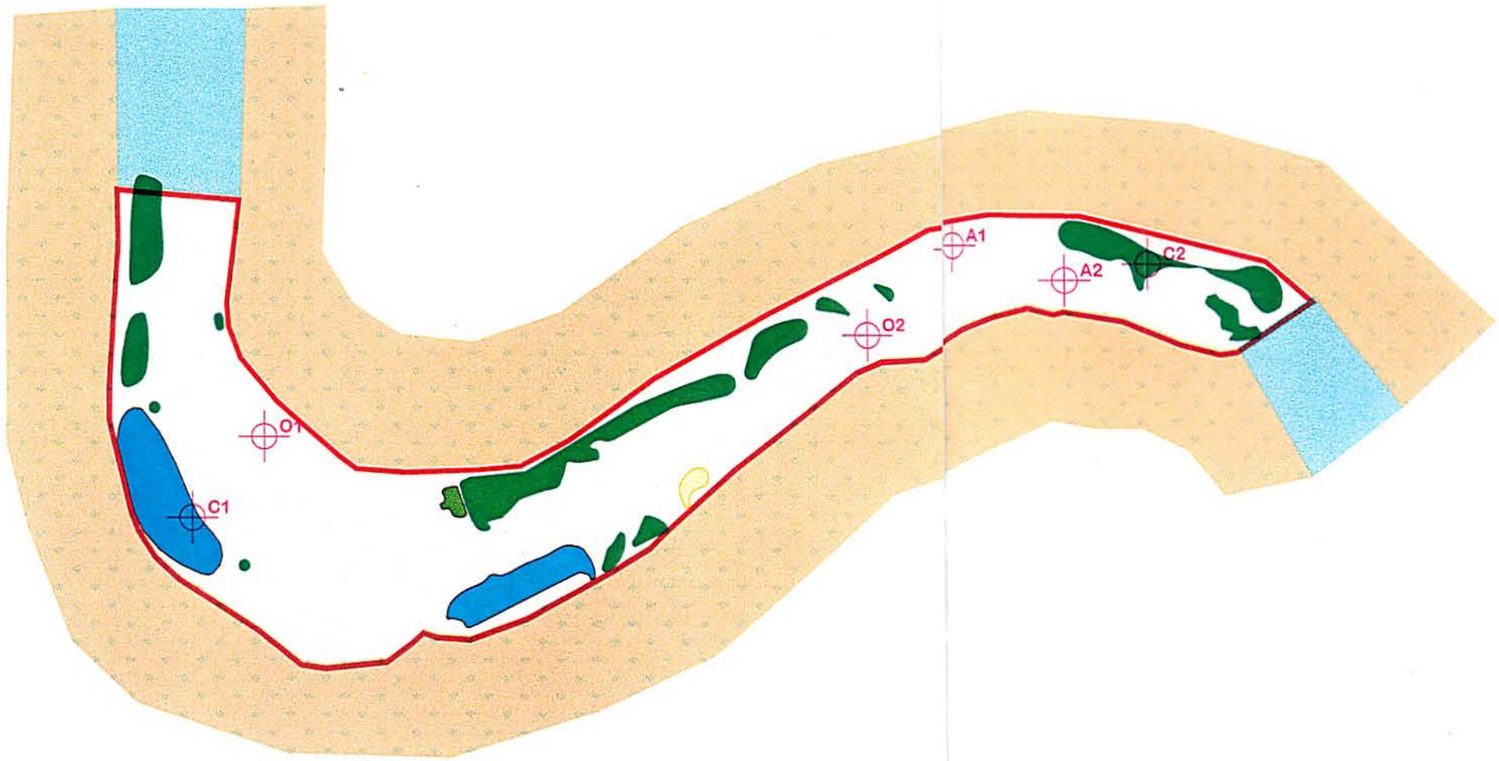
EDWARDS AQUIFER
AUTHORITY

Comal River Aquatic Vegetation
Old Channel Reach
September 12, 2000



Legend

	Acres
- Study Area	0.6880
- Ceratopteris	0.0739
- Ceratopteris/Nuphar	0.0468
- Ludwigia / Polygonum	0.0001
- Nuphar	0.0001
- Bare Substrate	0.5667
- Shoreline / Island	
- Comal River	
- Drop Net Sample Sites	

north

Scale: 1" = 60'

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TABLES

TABLE 1
WATER QUALITY SITES - STATION ABBREVIATIONS

Reach	Abbreviation
Heidelberg Lodge # 1	HL1
Heidelberg Lodge # 2	HL2
Booneville Avenue # 1	BA1
Booneville Avenue # 2	BA2
Spring Run 1 # 1	SR1-1
Spring Run 1 # 2	SR1-2 *
Spring Run 2	SR2
Spring Run 3	SR3
Confluence of Spring Run 1 & 2	SR1&2 *
Landa Lake	LL *
New Channel # 1	NC1
New Channel # 2	NC2
Old Channel # 1	OC1
Old Channel # 2	OC2
Union Avenue	UA

* No water sample taken from these sites.

TABLE 2
WATER QUALITY STANDARD PARAMETERS
COMAL RIVER - CRITICAL PERIOD SAMPLING # 2
SEPTEMBER 11, 2000

Reach	Time	Depth (m)	Standard Parameters											
			Surface				Mid				Bottom			
			Temp. (°C)	DO (mg/L)	pH	Cond. (umhos/cm)	Temp. (°C)	DO (mg/L)	pH	Cond. (umhos/cm)	Temp. (°C)	DO (mg/L)	pH	Cond. (umhos/cm)
Heidelberg Lodge Reach # 1	1045	0.62	25.38	3.19	7.19	507	--	--	--	--	--	--	--	--
Heidelberg Lodge Reach # 2	1054	0.62	26.56	6.25	*	508	--	--	--	--	--	--	--	--
Booneville Avenue # 1	1025	1.2	24.06	5.88	7.15	509	--	--	--	--	--	--	--	--
Booneville Avenue # 2	1030	--	23.96	5.08	*	508	--	--	--	--	--	--	--	--
Spring Run 3	0821	0.58	--	--	--	--	23.47	5.37	7.09	505	--	--	--	--
Spring Run 2	0829	0.45	--	--	--	--	23.53	5.02	7.13	505	--	--	--	--
Spring Run 1 - # 1	0835	0.42	--	--	--	--	23.5	5.12	7.04	504	--	--	--	--
Spring Run 1 - # 2	0843	0.17	--	--	--	--	23.67	5.62	7.23	505	--	--	--	--
Confluence of Sp. Run 1 and 2	0850	--	23.81	4.60	7.17	508	--	--	--	--	--	--	--	--
Landa Lake	0858	0.21	23.86	5.76	7.04	507	--	--	--	--	--	--	--	--
New Channel Reach # 1	1003	> 3.0	23.98	5.55	7.18	507	--	--	--	--	--	--	--	--
Old Channel Reach # 1	0935	0.65	24.40	6.12	7.48	512	--	--	--	--	--	--	--	--
New Channel Reach # 2	0948	> 1.5	24.01	7.81	7.54	507	--	--	--	--	--	--	--	--
Union Avenue	0914	variable	24.30	6.70	7.57	509	--	--	--	--	--	--	--	--
Old Channel Reach # 2	1015	0.74	24.18	6.58	7.38	508	--	--	--	--	--	--	--	--

* Hydrolab was giving an error message.

TABLE 2 (Concluded)
WATER QUALITY RESULTS
COMAL RIVER - CRITICAL PERIOD SAMPLING # 2
SEPTEMBER 11, 2000

Reach	Turbidity (NTU)	Alkalinity (meq/L)	SRP (ugP/l)	TP (ug/l)	NH3-N (mg/L)	N03-N (mg/L)	TN-N (mg/L)	TSS (mg/L)
Heidelberg Lodge Reach # 1	3.0	4.02	2.79	25.41	0.284	1.324	1.355	0.026
Heidelberg Lodge Reach # 2	2.1	4.04	4.01	23.35	0.200	1.654	1.283	0.021
Booneville Avenue # 1	1.4	4.14	4.53	22.31	0.189	1.622	0.924	0.011
Booneville Avenue # 2	1.1	4.12	10.10	26.10	0.288	1.455	1.697	0.018
Spring Run 3	1.0	4.04	6.10	19.55	0.159	1.985	1.210	0.021
Spring Run 2	1.2	4.04	2.61	26.45	0.071	1.991	1.377	0.022
Spring Run 1 - # 1	0.9	3.83	3.66	18.52	0.166	2.375	1.240	0.004
New Channel Reach # 1	2.0	4.09	25.08	45.41	MIA	1.856	1.949	0.020
Old Channel Reach # 1	2.8	4.23	7.49	30.24	0.132	1.823	1.376	0.022
New Channel Reach # 2	2.1	4.08	2.44	23.35	0.107	1.262	1.283	0.022
Union Avenue	2.8	4.12	3.48	23.35	0.139	1.924	1.888	0.025
Old Channel Reach # 2	2.2	4.19	2.79	24.38	0.039	1.868	1.272	0.023

TABLE 3
LIST OF FIXED PHOTOGRAPHS
COMAL RIVER - CRITICAL PERIOD SAMPLING # 2

Reach	Upstream	Across-Stream	Downstream
Heidelberg Lodge # 1	x	x	x
Heidelberg Lodge # 2	x	x	x
Booneville Ave. # 1	x	x	x
Booneville Ave. # 2	x	x	x
Spring Run 1 # 1	x	x	x
Spring Run 1 # 2	x	x	x
Spring Run 2	x	x	x
Spring Run 3	x	x	x
Confluence of Spring Run 1 & 2	x	x	x
Landa Lake	x	x	x
New Channel # 1	x	x	x
New Channel # 2	x	x	x
Old Channel # 1	x	x	x
Old Channel # 2	x	x	x
Union Avenue	x	x	x

DROP NET – FIELD DATA SHEETS

UPPER SPRING RUN REACH

DROP NET - FIELD DATA SHEETS
COMAL RIVER - CRITICAL PERIOD SAMPLING # 2

Location (Reach): Upper Spring Run		**Site:** S2 Site 1	
Date: 9/11/2000	**Time:** 0854-0919	**Observer(s):** DT, DL, DD, BL, EO	
Vegetation:	Type:	*Sagittaria* / Filamentous algae	
	Height:	43 cm / N/A	
	Areal Coverage:	70% / 30%	
	GPS location:	**GET FROM MAP**	
Substrate Type:	Silty mud with gravel and scattered cobble		
Mean Column Velocity: 0.00 m/s		Velocity at 15cm above the bottom: 0.01 m/s	

Standard Parameters: 1116	Surface	Mid	Bottom
Temperature (C°)	25.25	--	24.79
Dissolved Oxygen (mg/l)	8.63	--	8.00
pH	7.35	--	7.34
Conductivity	554.0	--	553.0
Secchi depth (cm)	Clear to bottom		

Depth (fixed) (meters): 0.56 m

Adjacent 3m cell areas:

Vegetation type:	*Sagittaria* / Bare bottom
Vegetation height:	Surface / N/A
Areal coverage:	65% / 35%
Substrate type:	Silty mud with gravel and scattered cobble

Sample Label:	**Preservative:**

Snails: *Melanoides tuberculata* - sparse / *Thiara granifera* - none

Sample Label:	**Preservative:**
Number of live Ramshorn snails	Average Size (mm)
0	

DROP NET - FIELD DATA SHEETS
COMAL RIVER - CRITICAL PERIOD SAMPLING # 2

Location (Reach):		Site:	
Upper Spring Run		S2 Site 1	
Date:	**Time:**	**Observer(s):**	
9/11/2000	0854-0919	DT, DL, DD, BL, EO	
Overall	**Species**	**Number**	**Avg. Length (mm)**
3	*Cichlasoma cyanoguttatum*	3	112.0
1	*Etheostoma lepidum*	1	38.0
3	*Gambusia* sp.	3	16.7
4	*Lepomis macrochirus*	2	18.0
5	*Lepomis punctatus*	5	55.0
sparse	*Melanoides tuberculata*		--
2	*Micropterus salmoides*	2	56.5
1	*Poecilia latipinna*	1	21.0
15	*Procambarus* sp.		--
Dip net sweep	**Species**	**Number**	**Length (mm)**
1	*Cichlasoma cyanoguttatum*	2	119,54
	Lepomis macrochirus	2	
	Lepomis punctatus	2	71,10
	Micropterus salmoides	1	80
	Poecilia latipinna	1	21
	Procambarus sp.	1	
2	*Gambusia* sp.	2	12,17
	Lepomis macrochirus	1	19
	Micropterus salmoides	1	33
3	*Cichlasoma cyanoguttatum*	1	163
	Lepomis punctatus	1	67
	Procambarus sp.	2	
4	*Procambarus* sp.	2	
5	*Procambarus* sp.	2	
6	*Lepomis macrochirus*	1	17
	Procambarus sp.	2	
7	No fish or crustaceans collected		
8	*Procambarus* sp.	1	

DROP NET - FIELD DATA SHEETS

COMAL RIVER - CRITICAL PERIOD SAMPLING # 2

Dip net sweep	Species	Number	Length (mm)
9	*Lepomis punctatus*	1	6
10	*Procambarus* sp.	1	
11	No fish or crustaceans collected		
12	*Lepomis punctatus* *Melanoides tuberculata*	1 sparse	67
13	*Etheostoma lepidum*	1	38
14	*Procambarus* sp.	2	
15	*Procambarus* sp.	2	

DROP NET - FIELD DATA SHEETS

COMAL RIVER - CRITICAL PERIOD SAMPLING # 2

Location (Reach): Upper Spring Run		**Site:** A1 Site 2	
Date: 9/11/00	**Time:** 0923-0948	**Observer(s):** EO, DT, DL, DD, BL	
Vegetation:	Type:	Filamentous algae / Bare cannel bottom	
	Height:	18 cm / N/A	
	Areal Coverage:	90% / 10%	
	GPS location:	**GET FROM MAP**	
Substrate Type:	Scattered gravel and cobble		
Mean Column Velocity: 0.00 m/s		Velocity at 15cm above the bottom: 0.00 m/s	

Standard Parameters: 1158	Surface	Mid	Bottom
Temperature (C°)	24.68	--	24.59
Dissolved Oxygen (mg/l)	6.90	--	6.79
pH	7.31	--	7.37
Conductivity	553.0	--	553.0
Secchi depth (cm)	Clear to bottom		

Depth (fixed) (meters): 0.81 m

Adjacent 3m cell areas:

Vegetation type:	Filamentous algae / Bare channel bottom
Vegetation height:	18 cm / N/A
Areal coverage:	90% / 10%
Substrate type:	Scattered gravel and cobble

Sample Label:	**Preservative:**

Snails: *Melanoides tuberculata* - none / *Thiara granifera* - none

Sample Label:	**Preservative:**
Number of live Ramshorn snails	Average Size (mm)
0	

DROP NET - FIELD DATA SHEETS

COMAL RIVER - CRITICAL PERIOD SAMPLING # 2

Location (Reach):		Site:
Upper Spring Run		A1 Site 2
Date:	**Time:**	**Observer(s):**
9/11/00	0923-0948	EO, DT, DL, DD, BL

Overall	Species	Number	Avg. Length (mm)
1	*Cichlasoma cyanoguttatum*	1	17.0
1	*Gambusia* sp.	1	11.0
2	*Lepomis punctatus*	2	12.0
1	*Procambarus* sp.		–

Dip net sweep	Species	Number	Length (mm)
1	*Lepomis punctatus*	1	12
2	*Cichlasoma cyanoguttatum*	1	17
	Lepomis punctatus	1	12
3	No fish or crustaceans collected		
4	No fish or crustaceans collected		
5	*Gambusia* sp.	1	11
6	No fish or crustaceans collected		
7	No fish or crustaceans collected		
8	*Procambarus* sp.	1	
9	No fish or crustaceans collected		
10	No fish or crustaceans collected		
11	No fish or crustaceans collected		
12	No fish or crustaceans collected		
13	No fish or crustaceans collected		
14	No fish or crustaceans collected		
15	No fish or crustaceans collected		

DROP NET - FIELD DATA SHEETS

COMAL RIVER - CRITICAL PERIOD SAMPLING # 2

Location (Reach): Upper Spring Run		**Site:** H2 Site 3	
Date: 9/11/00	**Time:** 0955-1045	**Observer(s):** EO, DT, DL, DD, BL	
Vegetation:	Type:	*Hygrophila* / Filamentous algae / Bare channel bottom	
	Height:	Surface / 10 cm / N/A	
	Areal Coverage:	70% / 5% / 25%	
	GPS location:	**GET FROM MAP**	
Substrate Type:	Silty mud with gravel and cobble		
Mean Column Velocity: 0.00 m/s		Velocity at 15cm above the bottom: 0.00 m/s	

Standard Parameters: 1047	Surface	Mid	Bottom
Temperature (C°)	25.36	--	24.52
Dissolved Oxygen (mg/l)	7.72	--	6.01
pH	7.37	--	7.31
Conductivity	554.0	--	554.0
Secchi depth (cm)	Clear to bottom		

Depth (fixed) (meters): 0.74 m

Adjacent 3m cell areas:

Vegetation type:	*Hygrophila* / Algae / Bare bottom
Vegetation height:	Surface / 10 cm / N/A
Areal coverage:	65% / 5% / 30%
Substrate type:	Silt over gravel

Sample Label:	**Preservative:**

Snails: *Melanoides tuberculata* - sparse / *Thiara granifera* - sparse

Sample Label:	**Preservative:**
Number of live Ramshorn snails	Average Size (mm)
3	40.7

DROP NET - FIELD DATA SHEETS
COMAL RIVER - CRITICAL PERIOD SAMPLING # 2

Location (Reach):		Site:
Upper Spring Run		H2 Site 3
Date:	**Time:**	**Observer(s):**
9/11/2000	0955-1045	EO, DT, DL, DD, BL

Overall	Species	Number	Avg. Length (mm)
1	*Ambloplites rupestris*	1	110.0
5	*Cichlasoma cyanoguttatum*	5	23.2
2	*Dionda episcopa*	2	25
17	*Gambusia* sp.	17	15.6
8	*Lepomis macrochirus*		35.4
23	*Lepomis megalotis*	23	34.9
11	*Lepomis punctatus*	11	44.3
3	*Marisa cornuarietis*	3	40.7
sparse	*Melanoides tuberculata*		--
8	*Micropterus salmoides*		47.5
5	*Procambarus* sp.		--
sparse	*Thiara granifera*		--

Dip net sweep	Species	Number	Length (mm)
1	*Cichlasoma cyanoguttatum*	4	19,18,27,22
	Lepomis macrochirus	7	70,32,35,32,27,24,21
	Lepomis megalotis	13	65,70,79,30,30,30,34,32, 22,22,18,22,22
	Lepomis punctatus	10	64,32,46,42,37,32,62,73, 22,30
	Marisa cornuarietis	2	45,45
	Melanoides tuberculata	sparse	
	Micropterus salmoides	2	46,57
	Procambarus sp.	2	
	Dionda eposcopa	1	30
	Thiara granifera	sparse	
2	*Ambloplites rupestris*	1	110
	Cichlasoma cyanoguttatum	1	30
	Lepomis megalotis	3	22,23,20
	Melanoides tuberculata	sparse	
	Micropterus salmoides	2	50,37
	Thiara granifera	sparse	
3	*Gambusia* sp.	1	11
	Lepomis megalotis	3	18,13,23
	Melanoides tuberculata	sparse	
	Micropterus salmoides	2	32,29

DROP NET - FIELD DATA SHEETS
COMAL RIVER - CRITICAL PERIOD SAMPLING # 2

Dip net sweep	Species	Number	Length (mm)
4	*Dionda eposcopa*	1	20
	Gambusia sp.	13	17,12,17,22,18,17,16,15, 16,18,18,15,15
	Lepomis megalotis	1	70
	Micropterus salmoides	2	79,50
	Procambarus sp.	2	
	Thiara granifera	sparse	
5	*Lepomis macrochirus*	1	42
	Lepomis megalotis	1	47
	Melanoides tuberculata	sparse	
	Procambarus sp.	1	
6	*Lepomis megalotis*	1	70
7	*Marisa cornuarietis*	1	32
8	*Gambusia* sp.	1	14
	Lepomis megalotis	1	21
	Melanoides tuberculata	sparse	
9	*Gambusia* sp.	1	12
10	*Lepomis punctatus*	1	47
11	*Gambusia* sp.	1	12
12	No fish or crustaceans collected		
13	No fish or crustaceans collected		
14	No fish or crustaceans collected		
15	No fish or crustaceans collected		

DROP NET - FIELD DATA SHEETS

COMAL RIVER - CRITICAL PERIOD SAMPLING # 2

Location (Reach): Upper Spring Run		**Site:** S1 Site 4	
Date: 9/11/2000	**Time:** 1210-1235	**Observer(s):** DT, DL, DD, BL	
Vegetation:	Type: *Sagittaria*		
	Height: 39 cm		
	Areal Coverage: 100%		
	GPS location: **GET FROM MAP**		
Substrate Type:	Silty mud with gravel		
Mean Column Velocity: 0.00 m/s		Velocity at 15cm above the bottom: 0.00 m/s	
Standard Parameters: 1153	Surface	Mid	Bottom
Temperature (C°)	24.61	--	24.26
Dissolved Oxygen (mg/l)	7.38	--	7.40
pH	7.32	--	7.30
Conductivity	553.0	--	554.0
Secchi depth (cm)	Clear to bottom		
Depth (fixed) (meters): 0.86 m			
Adjacent 3m cell areas:			
Vegetation type:	*Sagittaria* / Algae		
Vegetation height:	39 cm / 3 cm		
Areal coverage:	100%		
Substrate type:	Silty mud with gravel and cobble		
Sample Label:	**Preservative:**		
Snails: *Melanoides tuberculata* - none / *Thiara granifera* - none			
Sample Label:	**Preservative:**		
Number of live Ramshorn snails	Average Size (mm)		
1	30.0		

DROP NET - FIELD DATA SHEETS
COMAL RIVER - CRITICAL PERIOD SAMPLING # 2

Location (Reach):		Site:
Upper Spring Run		S1 Site 4
Date:	**Time:**	**Observer(s):**
9/11/2000	1210-1235	DT, DL, DD, BL

Overall	Species	Number	Avg. Length (mm)
3	*Cichlasoma cyanoguttatum*	3	39.0
14	*Dionda episcopa*	14	35.6
1	*Gambusia* sp.	1	15.0
2	*Lepomis macrochirus*	2	31.0
4	*Lepomis megalotis*	4	49.8
1	*Marisa cornuarietis*	1	30.0
2	*Micropterus salmoides*	2	112.0
6	*Procambarus* sp.		--

Dip net sweep	Species	Number	Length (mm)
1	*Cichlasoma cyanoguttatum*	1	24
	Dionda episcopa	7	40,46,31,30,31,27,28
	Lepomis macrochirus	2	37,25
	Marisa cornuarietis	1	30
	Micropterus salmoides	2	190,34
	Procambarus sp.	1	
2	*Lepomis macrochirus*	1	27
	Lepomis megalotis	1	14
	Dionda episcopa	1	40
3	*Cichlasoma cyanoguttatum*	1	26
	Dionda episcopa	2	27,45
	Lepomis megalotis	1	65
	Procambarus sp.	1	
4	*Dionda episcopa*	2	44,25
	Lepomis macrochirus	1	19
5	*Cichlasoma cyanoguttatum*	1	67
	Dionda episcopa	2	43,41
6	*Procambarus* sp.	1	
7	*Gambusia* sp.	1	15
8	No fish or crustaceans collected		
9	No fish or crustaceans collected		

DROP NET - FIELD DATA SHEETS

COMAL RIVER - CRITICAL PERIOD SAMPLING # 2

Dip net sweep	Species	Number	Length (mm)
10	*Procambarus* sp.	1	
11	*Procambarus* sp.	1	
12	*Lepomis megalotis*	2	51,69
13	No fish or crustaceans collected		
14	No fish or crustaceans collected		
15	*Procambarus* sp.	1	

DROP NET - FIELD DATA SHEETS

COMAL RIVER - CRITICAL PERIOD SAMPLING # 2

Location (Reach): Upper Spring Run		**Site:** A2 Site 5	
Date: 9/11/00	**Time:** 1237-1247	**Observer(s):** DT, DL, DD, BL	
Vegetation:	Type:	Algae / Bare channel bottom	
	Height:	3 cm / N/A	
	Areal Coverage:	85% / 15%	
	GPS location:	**GET FROM MAP**	
Substrate Type:	Silty mud, gravel, cobble over bedrock		
Mean Column Velocity: 0.02 m/s		Velocity at 15cm above the bottom: 0.01 m/s	

Standard Parameters: 1150	Surface	Mid	Bottom
Temperature (C°)	24.65	--	24.39
Dissolved Oxygen (mg/l)	6.41	--	6.18
pH	7.30	--	7.30
Conductivity	553.0	--	553.0
Secchi depth (cm)	Clear to bottom		

Depth (fixed) (meters): 1.0 m

Adjacent 3m cell areas:

Vegetation type:	Algae / Bare channel bottom
Vegetation height:	3 cm / N/A
Areal coverage:	85% / 15%
Substrate type:	Small gravel and cobble over bedrock

Sample Label:	**Preservative:**

Snails: *Melanoides tuberculata* - none / *Thiara granifera* - none

Sample Label:	**Preservative:**
Number of live Ramshorn snails	Average Size (mm)
0	

DROP NET - FIELD DATA SHEETS

COMAL RIVER - CRITICAL PERIOD SAMPLING # 2

Location (Reach):		Site:
Upper Spring Run		A2 Site 5
Date:	**Time:**	**Observer(s):**
9/11/00	1237-1247	DT, DL, DD, BL

Overall	Species	Number	Avg. Length (mm)
	No fish or crustaceans collected		

Dip net sweep	Species	Number	Length (mm)
1	No fish or crustaceans collected		
2	No fish or crustaceans collected		
3	No fish or crustaceans collected		
4	No fish or crustaceans collected		
5	No fish or crustaceans collected		
6	No fish or crustaceans collected		
7	No fish or crustaceans collected		
8	No fish or crustaceans collected		
9	No fish or crustaceans collected		
10	No fish or crustaceans collected		
11	No fish or crustaceans collected		
12	No fish or crustaceans collected		
13	No fish or crustaceans collected		
14	No fish or crustaceans collected		
15	No fish or crustaceans collected		

DROP NET - FIELD DATA SHEETS
COMAL RIVER - CRITICAL PERIOD SAMPLING # 2

Location (Reach): Upper Spring Run		**Site:** H1 Site 6	
Date: 9/11/2000	**Time:** 1253	**Observer(s):** DT, DL, DD, BL	
Vegetation:	Type:	*Hygrophila* / Algae / Bare channel bottom	
	Height:	Surface / N/A / N/A	
	Areal Coverage:	85% / 10% / 5%	
	GPS location:	**GET FROM MAP**	
Substrate Type:	Silt and gravel with cobble over bedrock		
Mean Column Velocity: 0.00m/s		Velocity at 15cm above the bottom: 0.00 m/s	

Standard Parameters: 1149	Surface	Mid	Bottom
Temperature (C°)	24.57	--	24.41
Dissolved Oxygen (mg/l)	5.91	--	5.78
pH	7.31	--	7.31
Conductivity	547.0	--	547.0
Secchi depth (cm)	Clear to bottom		

Depth (fixed) (meters): 1.07m

Adjacent 3m cell areas:

Vegetation type:	*Hygrophila* / Algae / Bare channel bottom
Vegetation height:	Surface / N/A / N/A
Areal coverage:	85% / 10% / 5%
Substrate type:	Silt and gravel with cobble over bedrock

Sample Label:	**Preservative:**

Snails: *Melanoides tuberculata* - sparse / *Thiara granifera* - sparse

Sample Label:	**Preservative:**
Number of live Ramshorn snails	Average Size (mm)
0	

DROP NET - FIELD DATA SHEETS

COMAL RIVER - CRITICAL PERIOD SAMPLING # 2

Location (Reach):		Site:
Upper Spring Run		H1 Site 6
Date:	**Time:**	**Observer(s):**
9/11/2000	1253	DT, DL, DD, BL

Overall	Species	Number	Avg. Length (mm)
6	*Astyanax mexicanus*	6	53.7
11	*Cichlasoma cyanoguttatum*	11	26.3
142	*Dionda episcopa*	63	45.9
2	*Etheostoma lepidum*	2	38.5
16	*Gambusia* sp.	16	24.6
2	*Lepomis macrochirus*	2	48.5
7	*Lepomis megalotis*	7	35.3
sparse	*Melanoides tuberculata*		--
5	*Micropterus salmoides*	5	50.2
4	*Palaemonetes* sp.		--
1	*Procambarus* sp.		--
sparse	*Thiara granifera*		--

Dip net sweep	Species	Number	Length (mm)
1	*Astyanax mexicanus*	2	65,50
	Cichlasoma cyanoguttatum	5	24,35,31,27,25
	Dionda episcopa	75	62,57,63,63,62,41,57,52, 62,47,52,55,52,54,50,45, 47,39,57,52,51,45,46,39, 37
	Gambusia sp.	1	30
	Lepomis macrochirus	2	70,27
	Lepomis megalotis	1	25
	Micropterus salmoides	4	131,14,27,30
	Palaemonetes sp.	1	
	Thiara granifera	sparse	
2	*Cichlasoma cyanoguttatum*	3	32,17,22
	Dionda episcopa	6	43,38,24,43,37,27
	Etheostoma lepidum	1	39
	Melanoides tuberculata	sparse	

DROP NET - FIELD DATA SHEETS

COMAL RIVER - CRITICAL PERIOD SAMPLING # 2

Dip net sweep	Species	Number	Length (mm)
3	*Astyanax mexicanus*	1	34
	Dionda episcopa	27	57,52,52,47,47,28,28
	Etheostoma lepidum	1	38
	Gambusia sp.	7	15,20,20,25,22,21,14
	Lepomis megalotis	3	45,30,43
	Palaemonetes sp.	1	
	Thiara granifera	sparse	
4	*Astyanax mexicanus*	1	45
	Cichlasoma cyanoguttatum	1	24
	Dionda episcopa	12	45,50,46,50,48,48,42,42, 37,46,42,34
	Gambusia sp.	1	30
	Thiara granifera	sparse	
5	*Dionda episcopa*	10	34
	Lepomis megalotis	2	38,30
	Melanoides tuberculata	sparse	
6	*Dionda episcopa*	1	42
	Melanoides tuberculata	1	
	Thiara granifera	sparse	
7	*Dionda episcopa*	4	42,47,47,42
	Gambusia sp.	3	31,37,35
	Lepomis megalotis	1	36
8	*Dionda episcopa*	1	48
	Gambusia sp.	1	15
	Palaemonetes sp.	1	
9	*Dionda episcopa*	1	35
	Palaemonetes sp.	1	
	Thiara granifera	sparse	
10	*Melanoides tuberculata*	1	
	Thiara granifera	sparse	

DROP NET - FIELD DATA SHEETS

COMAL RIVER - CRITICAL PERIOD SAMPLING # 2

Dip net sweep	Species	Number	Length (mm)
11	*Dionda episcopa*	3	45,45,46
	Gambusia sp.	3	25,24,30
	Thiara granifera	sparse	
12	No fish or crustaceans collected		
13	*Astyanax mexicanus*	2	48,80
	Cichlasoma cyanoguttatum	1	24
14	*Procambarus* sp.	1	
15	*Cichlasoma cyanoguttatum*	1	28
	Dionda episcopa	2	31,52
	Micropterus salmoides	1	49
	Thiara granifera	sparse	

LANDA LAKE REACH

DROP NET - FIELD DATA SHEETS
COMAL RIVER - CRITICAL PERIOD SAMPLING # 2

Location (Reach): Landa Lake		**Site:** H2 Site 1	
Date: 9/12/2000	**Time:** 0829-0916	**Observer(s):** EO, DT, LV, DM, BL	
Vegetation:	Type:	*Hygrophila* / Algae	
	Height:	Surface	
	Areal Coverage:	95% / 5%	
	GPS location:	29° 42' 50.6" N ; 98° 08' 06.5 W	
Substrate Type:	Silt, sand and gravel		
Mean Column Velocity: 0.12 m/s		Velocity at 15cm above the bottom: 0.04 m/s	

Standard Parameters: 0916	Surface	Mid	Bottom
Temperature (C°)	23.74	--	23.77
Dissolved Oxygen (mg/l)	5.60	--	4.80
pH	7.28	--	7.28
Conductivity	549.0	--	549.0
Secchi depth (cm)	Clear to bottom		

Depth (fixed) (meters): 0.42 m

Adjacent 3m cell areas:

Vegetation type:	*Hygrophila* / Algae / Bare channel bottom
Vegetation height:	Surface
Areal coverage:	50% / 10% / 40%
Substrate type:	Silt on top of sand/gravel

Sample Label:	**Preservative:**

Snails: *Melanoides tuberculata* - abundant / *Thiara granifera* - abundant

Sample Label:	**Preservative:**
Number of live Ramshorn snails	Average Size (mm)
0	

DROP NET - FIELD DATA SHEETS
COMAL RIVER - CRITICAL PERIOD SAMPLING # 2

Location (Reach):		Site:
Landa Lake		H2 Site 1
Date:	**Time:**	**Observer(s):**
9/12/2000	0829-0916	EO, DT, LV, DM, BL

Overall	Species	Number	Avg. Length (mm)
1	*Cichlasoma cyanoguttatum*	1	78.0
41	*Etheostoma fonticola*	29	23.2
167	*Gambusia* sp.	44	20.4
2	*Lepomis megalotis*	2	51.5
1	*Lepomis punctatus*	1	40.0
abundant	*Melanoides tuberculata*		--
1	*Micropterus punctulatus*	1	73.0
59	*Palaemonetes* sp.		--
19	*Poecilia latipinna*	19	30.9
39	*Procambarus* sp.		--
abundant	*Thiara granifera*		--

Dip net sweep	Species	Number	Length (mm)
1	*Cichlasoma cyanoguttatum*	1	78
	Etheostoma fonticola	2	28,18
	Gambusia sp.	22	20,18,20,20,25,10,15,10, 20,10,10,10,10,10,10,30, 10,25,18,20,25,22
	Lepomis megalotis	2	82,21
	Melanoides tuberculata	50	
	Palaemonetes sp.	14	
	Poecilia latipinna	2	30,25
	Procambarus sp.	31	
	Thiara granifera	100	
2	*Etheostoma fonticola*	3	20,27,23
	Gambusia sp.	21	15,14,20,22,20,18,12
	Melanoides tuberculata	1	
	Palaemonetes sp.	7	
	Poecilia latipinna	5	30,33,32,30,25
	Procambarus sp.	5	
3	*Etheostoma fonticola*	3	27,21,24
	Gambusia sp.	15	23,30,15,20,17
	Palaemonetes sp.	10	
	Poecilia latipinna	2	31,32
	Procambarus sp.	6	

DROP NET - FIELD DATA SHEETS
COMAL RIVER - CRITICAL PERIOD SAMPLING # 2

Dip net sweep	Species	Number	Length (mm)
4	*Etheostoma fonticola*	19	26,25,22,26,24,21,23
	Gambusia sp.	5	15,20,25,20,15
	Melanoides tuberculata	55	
	Micropterus punctulatus	1	73
	Palaemonetes sp.	9	
	Poecilia latipinna	6	46,35,37,42,27,22
	Procambarus sp.	9	
	Thiara granifera	195	
5	*Etheostoma fonticola*	4	25,21,26,18
	Gambusia sp.	42	15,15,25,23,21,20
	Melanoides tuberculata	8	
	Palaemonetes sp.	4	
	Poecilia latipinna	1	30
	Procambarus sp.	6	
	Thiara granifera	30	
6	*Etheostoma fonticola*	2	20,22
	Gambusia sp.	15	24,20,27,16,23
	Lepomis punctatus	1	40
	Melanoides tuberculata	20	
	Palaemonetes sp.	13	
	Poecilia latipinna	2	19,33
	Procambarus sp.	11	
	Thiara granifera	50	
7	*Etheostoma fonticola*	3	24,17,19
	Gambusia sp.	6	25
	Melanoides tuberculata	5	
	Procambarus sp.	3	
	Thiara granifera	35	
8	*Etheostoma fonticola*	1	26
	Gambusia sp.	5	
	Melanoides tuberculata	15	
	Procambarus sp.	1	
	Thiara granifera	40	
9	*Etheostoma fonticola*	2	24,27
	Gambusia sp.	5	
	Palaemonetes sp.	1	
	Procambarus sp.	1	

DROP NET - FIELD DATA SHEETS
COMAL RIVER - CRITICAL PERIOD SAMPLING # 2

Dip net sweep	Species	Number	Length (mm)
10	*Gambusia* sp.	4	
	Melanoides tuberculata	20	
	Poecilia latipinna	1	28
	Procambarus sp.	2	
	Thiara granifera	75	
11	*Etheostoma fonticola*	1	21
	Gambusia sp.	15	
12	*Etheostoma fonticola*	1	27
	Melanoides tuberculata	10	
	Palaemonetes sp.	1	
	Thiara granifera	20	
13	*Gambusia* sp.	10	
14	*Melanoides tuberculata*	20	
	Thiara granifera	20	
15	*Gambusia* sp.	2	

Yellow Crowned Night Heron was sighted

DROP NET - FIELD DATA SHEETS
COMAL RIVER - CRITICAL PERIOD SAMPLING # 2

Location (Reach): Landa Lake		**Site:** H1 Site 2	
Date: 9/12/2000	**Time:** 0926-1005	**Observer(s):** EO, LV DT, DM, BL	
Vegetation:	Type: *Hygrophila*		
	Height: 28 cm		
	Areal Coverage: 100%		
	GPS location: 29° 42' 51.5" N ; 98° 08' 07.4" W		
Substrate Type:	Silt, sand, gravel and cobble		
Mean Column Velocity: 0.05 m/s		Velocity at 15cm above the bottom: 0.04 m/s	
Standard Parameters: 1005	Surface	Mid	Bottom
Temperature (C°)	23.95	--	23.91
Dissolved Oxygen (mg/l)	5.46	--	5.49
pH	7.25	--	7.26
Conductivity	549.7	--	549.6
Secchi depth (cm)	Clear to bottom		
Depth (fixed) (meters): 0.64 m			
Adjacent 3m cell areas:			
Vegetation type:	*Hygrophila* / *Sagittaria* / *Vallisneria* / Bare channel bottom		
Vegetation height:	28 cm / 12 cm / surface / N/A		
Areal coverage:	50% / 15% / 20% / 15%		
Substrate type:	Silt, sand gravel, cobble		
Sample Label:	**Preservative:**		
Snails: *Melanoides tuberculata* - moderate / *Thiara granifera* - moderate			
Sample Label:	**Preservative:**		
Number of live Ramshorn snails	Average Size (mm)		
2	40.0		

DROP NET - FIELD DATA SHEETS
COMAL RIVER - CRITICAL PERIOD SAMPLING # 2

Location (Reach):		Site:
Landa Lake		H1 Site 2
Date:	**Time:**	**Observer(s):**
9/12/2000	0926-1005	EO, LV DT, DM, BL

Overall	Species	Number	Avg. Length (mm)
2	*Cichlasoma cyanoguttatum*	2	69.5
47	*Etheostoma fonticola*	47	24.6
196	*Gambusia* sp.	11	26.5
2	*Marisa cornuarietis*	2	40.0
moderate	*Melanoides tuberculata*		--
23	*Palaemonetes* sp.		--
2	*Poecilia latipinna*	2	39.5
85	*Procambarus* sp.		--
moderate	*Thiara granifera*		--

Dip net sweep	Species	Number	Length (mm)
1	*Gambusia* sp.	35	31,30,24,(15-25mm)
	Marisa cornuarietis	1	40
	Melanoides tuberculata	5	
	Palaemonetes sp.	5	
	Procambarus sp.	9	
	Thiara granifera	15	
2	*Etheostoma fonticola*	6	28,30,25,27,25,14
	Gambusia sp.	30	27,28,32
	Marisa cornuarietis	1	40
	Palaemonetes sp.	9	
	Procambarus sp.	7	
3	*Etheostoma fonticola*	8	20,23,27,24,28,28,23,24
	Gambusia sp.	16	23
	Poecilia latipinna	1	46
	Procambarus sp.	10	
4	*Cichlasoma cyanoguttatum*	1	52
	Etheostoma fonticola	7	32,27,30,22,25,24,21
	Gambusia sp.	21	24
	Palaemonetes sp.	3	
	Procambarus sp.	13	

DROP NET - FIELD DATA SHEETS
COMAL RIVER - CRITICAL PERIOD SAMPLING # 2

Dip net sweep	Species	Number	Length (mm)
5	*Etheostoma fonticola*	2	29,23
	Gambusia sp.	5	
	Palaemonetes sp.	2	
	Procambarus sp.	11	
6	*Etheostoma fonticola*	2	25,23
	Gambusia sp.	6	23
	Palaemonetes sp.	1	
	Procambarus sp.	1	
7	*Etheostoma fonticola*	4	26,24,22,20
	Gambusia sp.	20	
	Palaemonetes sp.	1	
	Procambarus sp.	1	
8	*Etheostoma fonticola*	6	25,28,24,20,22,22
	Gambusia sp.	17	22,27
	Procambarus sp.	2	
9	*Etheostoma fonticola*	2	25,24
	Gambusia sp.	5	
	Procambarus sp.	4	
10	*Etheostoma fonticola*	5	26,31,23,23,20
	Gambusia sp.	8	
	Melanoides tuberculata	25	
	Procambarus sp.	6	
	Thiara granifera	40	
11	*Etheostoma fonticola*	2	22,24
	Gambusia sp.	11	
	Palaemonetes sp.	2	
	Procambarus sp.	3	
12	*Cichlasoma cyanoguttatum*	1	87
	Etheostoma fonticola	1	29
	Gambusia sp.	3	
	Procambarus sp.	7	
13	*Gambusia* sp.	6	
	Poecilia latipinna	1	33
	Procambarus sp.	5	

DROP NET - FIELD DATA SHEETS

COMAL RIVER - CRITICAL PERIOD SAMPLING # 2

Dip net sweep	Species	Number	Length (mm)
14	*Etheostoma fonticola*	1	26
	Gambusia sp.	10	
	Procambarus sp.	3	
15	*Etheostoma fonticola*	1	24
	Gambusia sp.	3	
	Procambarus sp.	3	

3 Yellow Crowned Night Heron's were sighted

DROP NET - FIELD DATA SHEETS
COMAL RIVER - CRITICAL PERIOD SAMPLING # 2

Location (Reach): Landa Lake		**Site:** O2 Site 3	
Date: 9/12/2000	**Time:** 1009-1026	**Observer(s):** EO, DT, LV, DM, BL	
Vegetation:	Type:	Open water / Bare channel bottom	
	Height:	N/A	
	Areal Coverage:	N/A	
	GPS location:	29° 42' 52.1" N ; 98° 08' 06.7" W	
Substrate Type:	Gravel and cobble over clayey mud		
Mean Column Velocity: 20% - 0.07 m/s; 80% - 0.08 m/s		Velocity at 15cm above the bottom: 0.08 m/s	

Standard Parameters: 1026	Surface	Mid	Bottom
Temperature (C°)	24.02	--	23.96
Dissolved Oxygen (mg/l)	5.70	--	5.61
pH	7.22	--	7.23
Conductivity	549.0	--	549.0
Secchi depth (cm)	Clear to bottom		

Depth (fixed) (meters): 0.98 cm

Adjacent 3m cell areas:

Vegetation type:	Open water / Bare channel bottom
Vegetation height:	N/A
Areal coverage:	N/A
Substrate type:	Gravel and cobble over clayey mud

Sample Label:	**Preservative:**

Snails: *Melanoides tuberculata* - moderate / *Thiara granifera* - sparse

Sample Label:	**Preservative:**
Number of live Ramshorn snails	Average Size (mm)
0	

DROP NET - FIELD DATA SHEETS
COMAL RIVER - CRITICAL PERIOD SAMPLING # 2

Location (Reach):		Site:	
Landa Lake Reach		O2 Site 3	
Date:	**Time:**	**Observer(s):**	
9/12/2000	1009-1026	EO, DT, LV, DM, BL	
Overall	**Species**	**Number**	**Avg. Length (mm)**
1	*Etheostoma fonticola*	1	24.0
3	*Gambusia* sp.	1	15.0
moderate	*Melanoides tuberculata*		–
sparse	*Thiara granifera*		–
Dip net sweep	**Species**	**Number**	**Length (mm)**
1	*Melanoides tuberculata*	5	
2	*Etheostoma fonticola*	1	24
	Gambusia sp.	1	
	Melanoides tuberculata	3	
3	*Melanoides tuberculata*	1	
4	*Gambusia* sp.	1	15
	Melanoides tuberculata	5	
	Thiara granifera	5	
5	*Melanoides tuberculata*	2	
	Thiara granifera	1	
6	*Gambusia* sp.	1	
7	*Melanoides tuberculata*	3	
8	*Melanoides tuberculata*	4	
9	*Melanoides tuberculata*	9	
10	No fish or crustaceans collected		
11	*Melanoides tuberculata*	1	
12	*Melanoides tuberculata*	5	
13	*Melanoides tuberculata*	10	
14	No fish or crustaceans collected		
15	*Melanoides tuberculata*	10	

DROP NET - FIELD DATA SHEETS
COMAL RIVER - CRITICAL PERIOD SAMPLING # 2

Location (Reach): Landa Lake			**Site:** V2 Site 4	
Date: 9/12/2000	**Time:** 1035-1107		**Observer(s):** EO, DT, LV, DM, BL	
Vegetation:	Type:	*Vallisneria*		
	Height:	Surface		
	Areal Coverage:	100%	Covered with algae	
	GPS location:	29° 42' 51.9" N ; 98° 08' 05" W		
Substrate Type:	Silt, sand, and gravel			
Mean Column Velocity: 0.02 m/s			Velocity at 15cm above the bottom: 0.01 m/s	
Standard Parameters: 1107		Surface	Mid	Bottom
Temperature (C°)		24.02	--	24.03
Dissolved Oxygen (mg/l)		6.01	--	5.91
pH		7.21	--	7.23
Conductivity		549.3	--	549.1
Secchi depth (cm)		Clear to bottom		
Depth (fixed) (meters): 0.72 cm				
Adjacent 3m cell areas:				
Vegetation type:	*Vallisneria* / Bare channel bottom			
Vegetation height:	68 cm / N/A			
Areal coverage:	35% / 65%			
Substrate type:	Silt, sand, and gravel			
Sample Label:		**Preservative:**		
Snails: *Melanoides tuberculata* - sparse / *Thiara granifera* - sparse				
Sample Label:		**Preservative:**		
Number of live Ramshorn snails		Average Size (mm)		
2		32.5		

DROP NET - FIELD DATA SHEETS
COMAL RIVER - CRITICAL PERIOD SAMPLING # 2

Location (Reach):		Site:
Landa Lake		V2 Site 4
Date:	**Time:**	**Observer(s):**
9/12/2000	1035-1107	EO, DT, LV, DM, BL

Overall	Species	Number	Avg. Length (mm)
8	*Cichlasoma cyanoguttatum*	8	39.3
6	*Etheostoma fonticola*	6	27.3
1	*Etheostoma lepidum*	1	35.0
430	*Gambusia* sp.	25	21.1
1	*Lepomis megalotis*	1	23.0
2	*Marisa cornuarietis*	2	32.5
sparse	*Melanoides tuberculata*		--
32	*Palaemonetes* sp.		--
1	*Plecostomus*	1	15.0
43	*Procambarus* sp.		--
sparse	*Thiara granifera*		--

Dip net sweep	Species	Number	Length (mm)
1	*Cichlasoma cyanoguttatum*	1	41
	Gambusia sp.	145	15-40mm
	Marisa cornuarietis	1	27
	Palaemonetes sp.	23	
	Procambarus sp.	7	
2	*Cichlasoma cyanoguttatum*	2	27,41
	Etheostoma fonticola	1	26
	Gambusia sp.	125	
	Lepomis megalotis	1	23
	Palaemonetes sp.	6	
	Plecostomus	1	15
	Procambarus sp.	3	
3	*Gambusia* sp.	30	
	Melanoides tuberculata	5	
	Palaemonetes sp.	2	
	Procambarus sp.	6	
	Thiara granifera	10	
4	*Etheostoma fonticola*	2	27,26
	Gambusia sp.	19	
	Procambarus sp.	1	

DROP NET - FIELD DATA SHEETS
COMAL RIVER - CRITICAL PERIOD SAMPLING # 2

Dip net sweep	Species	Number	Length (mm)
5	*Cichlasoma cyanoguttatum*	2	53,27
	Gambusia sp.	40	15-35mm
	Palaemonetes sp.	2	
	Procambarus sp.	2	
6	*Cichlasoma cyanoguttatum*	1	55
	Etheostoma fonticola	1	27
	Gambusia sp.	8	23,18,17
	Palaemonetes sp.	1	
	Procambarus sp.	7	
7	*Etheostoma fonticola*	1	25
	Etheostoma lepidum	1	35
	Gambusia sp.	20	
	Procambarus sp.	2	
8	*Cichlasoma cyanoguttatum*	2	34,36
	Gambusia sp.	2	23,29
	Procambarus sp.	4	
9	*Gambusia* sp.	6	25,19
	Procambarus sp.	3	
10	*Etheostoma fonticola*	1	33
	Gambusia sp.	10	
	Procambarus sp.	2	
11	*Gambusia* sp.	13	
	Procambarus sp.	2	
12	*Gambusia* sp.	4	22,18,20,18
	Marisa cornuarietis	1	38
13	*Gambusia* sp.	5	
	Procambarus sp.	2	
14	*Gambusia* sp.	1	
	Melanoides tuberculata	2	
	Procambarus sp.	1	
15	*Gambusia* sp.	2	
	Procambarus sp.	1	

DROP NET - FIELD DATA SHEETS
COMAL RIVER - CRITICAL PERIOD SAMPLING # 2

Location (Reach): Landa Lake		**Site:** C2 Site 5	
Date: 9/12/2000	**Time:** 1115-1148	**Observer(s):** EO, DT, LV, DM, BL	
Vegetation:	Type:	*Cabomba* / Bare channel bottom	
	Height:	71 cm / N/A	
	Areal Coverage:	60% / 40%	
	GPS location:	29° 42' 52.5" N ; 98° 08' 05.0" W	
Substrate Type:	Silt and clayey mud		
Mean Column Velocity: 0.00 m/s		Velocity at 15cm above the bottom: 0.00 m/s	
Standard Parameters: 1148	Surface	Mid	Bottom
Temperature (C°)	24.31	--	24.19
Dissolved Oxygen (mg/l)	6.58	--	6.22
pH	7.24	--	7.23
Conductivity	550.2	--	549.6
Secchi depth (cm)			
Depth (fixed) (meters): 0.92 m	Algae on vegetation; oil sheen on surface		
Adjacent 3m cell areas:			
Vegetation type:	*Cabomba* / Bare channel bottom		
Vegetation height:	71 cm / N/A		
Areal coverage:	40% / 60%		
Substrate type:	Silt and clayey mud		
Sample Label:	**Preservative:**		
Snails: *Melanoides tuberculata* - abundant / *Thiara granifera* - abundant			
Sample Label:	**Preservative:**		
Number of live Ramshorn snails	Average Size (mm)		
0			

Oil sheen and smell of oil at this site.

DROP NET - FIELD DATA SHEETS

COMAL RIVER - CRITICAL PERIOD SAMPLING # 2

Location (Reach):		Site:
Landa Lake		C2 Site 5
Date:	**Time:**	**Observer(s):**
9/12/2000	1115-1148	EO, DT, LV, DM, BL

Overall	Species	Number	Avg. Length (mm)
1	*Etheostoma fonticola*	1	23.0
360	*Gambusia* sp.		–
abundant	*Melanoides tuberculata*		–
1	*Micropterus salmoides*	1	92.0
17	*Procambarus* sp.		–
abundant	*Thiara granifera*		–

Dip net sweep	Species	Number	Length (mm)
1	*Procambarus* sp.	2	
	Micropterus salmoides	1	92
	Gambusia sp.	50	
	Melanoides tuberculata	abundant	
	Thiara granifera	abundant	
2	*Procambarus* sp.	1	
	Etheostoma fonticola	1	23
	Gambusia sp.	20	
3	*Procambarus* sp.	3	
	Gambusia sp.	30	
	Melanoides tuberculata	abundant	
4	*Procambarus* sp.	3	
	Gambusia sp.	15	
5	*Procambarus* sp.	1	
	Gambusia sp.	100	
6	*Procambarus* sp.	1	
	Gambusia sp.	50	
7	*Gambusia* sp.	25	
8	*Gambusia* sp.	20	

DROP NET - FIELD DATA SHEETS
COMAL RIVER - CRITICAL PERIOD SAMPLING # 2

Dip net sweep	Species	Number	Length (mm)
9	*Procambarus* sp.	1	
10	*Procambarus* sp.	2	
	Gambusia sp.	5	
11	*Procambarus* sp.	3	
	Gambusia sp.	5	
12	*Gambusia* sp.	10	
13	*Gambusia* sp.	10	
14	*Gambusia* sp.	10	
15	*Gambusia* sp.	10	

Oil sheen and smell of oil at this site.

DROP NET - FIELD DATA SHEETS
COMAL RIVER - CRITICAL PERIOD SAMPLING # 2

Location (Reach): Landa Lake		**Site:** L2 Site 6	
Date: 9/12/2000	**Time:** 1058-1224	**Observer(s):** EO, DT, LV, DM, BL	
Vegetation:	Type:	*Ludwigia* / Bare channel bottom	
	Height:	24 cm / N/A	
	Areal Coverage:	30% / 70%	
	GPS location:	29° 42' 53.2" N ; 98° 08' 05.8" W	
Substrate Type:	Gravel and cobble		
Mean Column Velocity: 0.03 m/s		Velocity at 15cm above the bottom: 0.02 m/s	

Standard Parameters: 1224	Surface	Mid	Bottom
Temperature (C°)	24.47	--	24.34
Dissolved Oxygen (mg/l)	6.09	--	6.37
pH	7.21	--	7.21
Conductivity	549.5	--	548.7
Secchi depth (cm)	Clear to bottom		

Depth (fixed) (meters): 0.83 cm

Adjacent 3m cell areas:

Vegetation type:	*Ludwigia* / Bare channel bottom
Vegetation height:	24 cm / N/A
Areal coverage:	10% / 90%
Substrate type:	Gravel and cobble

Sample Label:	**Preservative:**

Snails: *Melanoides tuberculata* - sparse / *Thiara granifera* - sparse

Sample Label:	**Preservative:**
Number of live Ramshorn snails	Average Size (mm)
2	29.5

DROP NET - FIELD DATA SHEETS
COMAL RIVER - CRITICAL PERIOD SAMPLING # 2

Location (Reach):		Site:
Landa Lake		L2 Site 6
Date:	**Time:**	**Observer(s):**
9/12/2000	1058-1224	EO, DT, LV, DM, BL

Overall	Species	Number	Avg. Length (mm)
6	*Etheostoma fonticola*	6	21.5
401	*Gambusia* sp.	176	19.5
2	*Marisa cornuarietis*	2	29.5
sparse	*Melanoides tuberculata*		--
1	*Palaemonetes* sp.		--
1	*Plecostomus*	1	14.0
19	*Procambarus* sp.		--
sparse	*Thiara granifera*		--

Dip net sweep	Species	Number	Length (mm)
1	*Etheostoma fonticola*	5	24,21,26,14,19
	Gambusia sp.	125	10-25mm
	Marisa cornuarietis	1	39
	Palaemonetes sp.	1	
2	*Gambusia* sp.	36	26
3	*Etheostoma fonticola*	1	25
	Gambusia sp.	50	15-30mm
	Melanoides tuberculata	5	
	Plecostomus	1	14
	Procambarus sp.	2	
4	*Gambusia* sp.	25	
	Procambarus sp.	2	
	Thiara granifera	sparse	
5	*Procambarus* sp.	8	8
	Gambusia sp.	10	10
6	*Gambusia* sp.	30	
7	*Gambusia* sp.	20	
	Procambarus sp.	2	

DROP NET - FIELD DATA SHEETS
COMAL RIVER - CRITICAL PERIOD SAMPLING # 2

Dip net sweep	Species	Number	Length (mm)
8	*Gambusia* sp.	10	
	Procambarus sp.	1	
9	*Gambusia* sp.	25	
	Procambarus sp.	1	
10	*Gambusia* sp.	10	
	Marisa cornuarietis	1	20
	Procambarus sp.	1	
11	*Gambusia* sp.	15	
	Procambarus sp.	1	
12	*Gambusia* sp.	20	
13	*Gambusia* sp.	10	
	Procambarus sp.	1	
14	*Gambusia* sp.	5	
15	*Gambusia* sp.	10	

DROP NET - FIELD DATA SHEETS
COMAL RIVER - CRITICAL PERIOD SAMPLING # 2

Location (Reach): Landa Lake		**Site:** O1 Site 7	
Date: 9/12/2000	**Time:** 1228-1245	**Observer(s):** EO, DT, LV, DM, BL	
Vegetation:	Type:	Bare bottom w/ *Riccia*	
	Height:	3 cm	
	Areal Coverage:	<5% *Riccia*	
	GPS location:	29° 42' 54.2" N ; 98° 08' 05.0" W	
Substrate Type:	Cobble and rock		
Mean Column Velocity: 0.04 m/s		Velocity at 15cm above the bottom: 0.03 m/s	

Standard Parameters: 1245	Surface	Mid	Bottom
Temperature (C°)	24.55	--	24.35
Dissolved Oxygen (mg/l)	6.14	--	6.15
pH	7.22	--	7.21
Conductivity	549.9	--	549.5
Secchi depth (cm)	Clear to bottom		

Depth (fixed) (meters): 0.57 m

Adjacent 3m cell areas:

Vegetation type:	Open water / Bare channel bottom w/ *Riccia*
Vegetation height:	N/A / 3 cm
Areal coverage:	<5% *Riccia*
Substrate type:	Cobble and rock

Sample Label:	**Preservative:**

Snails: *Melanoides tuberculata* - none / *Thiara granifera* - sparse

Sample Label:	**Preservative:**
Number of live Ramshorn snails	Average Size (mm)
0	

DROP NET - FIELD DATA SHEETS
COMAL RIVER - CRITICAL PERIOD SAMPLING # 2

Location (Reach):		Site:
Landa Lake		O1 Site 7
Date:	**Time:**	**Observer(s):**
9/12/2000	1228-1245	EO, DT, LV, DM, BL

Overall	Species	Number	Avg. Length (mm)
1	*Etheostoma fonticola*	1	21.0
305	*Gambusia* sp.	1	24.0
sparse	*Thiara granifera*		–

Dip net sweep	Species	Number	Length (mm)
1	*Gambusia* sp.	59	
2	*Gambusia* sp.	40	
3	*Gambusia* sp.	50	
4	*Etheostoma fonticola*	1	21
	Gambusia sp.	30	
5	*Gambusia* sp.	30	
6	*Etheostoma fonticola*	10	
	Gambusia sp.	1	24
7	*Gambusia* sp.	10	
8	*Gambusia* sp.	10	
9	*Gambusia* sp.	10	
10	*Gambusia* sp.	10	
	Thiara granifera	sparse	
11	*Gambusia* sp.	5	
12	*Gambusia* sp.	15	
13	*Gambusia* sp.	10	
14	*Gambusia* sp.	5	
15	*Gambusia* sp.	20	

DROP NET - FIELD DATA SHEETS
COMAL RIVER - CRITICAL PERIOD SAMPLING # 2

Location (Reach): Landa Lake		**Site:** L1 Site 8	
Date: 9/12/2000	**Time:** 1250-1325	**Observer(s):** EO, DT, LV, DM, BL	
Vegetation:	Type:	*Ludwigia* / Bare channel bottom	
	Height:	40 cm / N/A	
	Areal Coverage:	95% / 5%	
	GPS location:	29° 42' 57.7" N ; 98° 08' 05.2" W	
Substrate Type:	Silt, gravel and cobble		
Mean Column Velocity: 0.00 m/s		Velocity at 15cm above the bottom: 0.00 m/s	

Standard Parameters: 1325	Surface	Mid	Bottom
Temperature (C°)	25.05	--	24.87
Dissolved Oxygen (mg/l)	7.26	--	6.94
pH	7.20	--	7.20
Conductivity	547.5	--	548.3
Secchi depth (cm)	Clear to bottom		

Depth (fixed) (meters): 0.43 m

Adjacent 3m cell areas:

Vegetation type:	*Ludwigia* / Bare channel bottom with *Riccia* and algae
Vegetation height:	41.5 cm / N/A
Areal coverage:	40% / 60%
Substrate type:	Silt, gravel and cobble

Sample Label:	**Preservative:**

Snails: *Melanoides tuberculata* - none / *Thiara granifera* - none

Sample Label:	**Preservative:**
Number of live Ramshorn snails	Average Size (mm)
1	29.0

DROP NET - FIELD DATA SHEETS
COMAL RIVER - CRITICAL PERIOD SAMPLING # 2

Location (Reach):		Site:
Landa Lake		L1 Site 8
Date:	**Time:**	**Observer(s):**
9/12/2000	1250-1325	EO, DT, LV, DM, BL

Overall	Species	Number	Avg. Length (mm)
1	*Dionda episcopa*	1	39.0
9	*Etheostoma fonticola*	9	25.1
218	*Gambusia* sp.		--
1	*Marisa cornuarietis*	1	29.0
65	*Palaemonetes* sp.		--
1	*Poecilia latipinna*	1	37.0
14	*Procambarus* sp.		--

Dip net sweep	Species	Number	Length (mm)
1	*Dionda episcopa*	1	39
	Gambusia sp.	50	
	Palaemonetes sp.	25	
2	*Gambusia* sp.	20	
	Palaemonetes sp.	10	
	Poecilia latipinna	1	37
	Procambarus sp.	3	
3	*Gambusia* sp.	15	
	Palaemonetes sp.	4	
	Procambarus sp.	3	
4	*Etheostoma fonticola*	2	27,21
	Gambusia sp.	5	
	Palaemonetes sp.	10	
	Procambarus sp.	1	
5	*Etheostoma fonticola*	1	19
	Gambusia sp.	10	
	Palaemonetes sp.	5	
6	*Etheostoma fonticola*	3	25,27,27
	Gambusia sp.	5	
	Marisa cornuarietis	1	29
	Palaemonetes sp.	5	
	Procambarus sp.	3	

DROP NET - FIELD DATA SHEETS
COMAL RIVER - CRITICAL PERIOD SAMPLING # 2

Dip net sweep	Species	Number	Length (mm)
7	*Etheostoma fonticola*	1	26
	Gambusia sp.	10	
	Palaemonetes sp.	3	
	Procambarus sp.	1	
8	*Gambusia* sp.	5	
9	*Gambusia* sp.	15	
	Palaemonetes sp.	3	
	Procambarus sp.	1	
10	*Gambusia* sp.	15	
11	*Gambusia* sp.	25	
12	*Procambarus* sp.	1	
	Gambusia sp.	10	
13	*Etheostoma fonticola*	1	26
	Gambusia sp.	10	
14	*Etheostoma fonticola*	1	28
	Gambusia sp.	20	
15	*Gambusia* sp.	3	
	Procambarus sp.	1	

DROP NET - FIELD DATA SHEETS
COMAL RIVER - CRITICAL PERIOD SAMPLING # 2

Location (Reach): Landa Lake		**Site:** C1 Site 9	
Date: 9/12/2000	**Time:** 1416-1506	**Observer(s):** EO, DT, LV, DM, BL	
Vegetation:	Type:	*Cabomba* / Bare channel bottom	
	Height:	53 cm / N/A	
	Areal Coverage:	90% / 10%	
	GPS location:	29° 42' 52.9" N ; 98° 08' 08.0" W	
Substrate Type:	Silt		
Mean Column Velocity: 20% - 0.00 m/s ; 80% - 0.02 m/s		Velocity at 15cm above the bottom: 0.00 m/s	

Standard Parameters: 1506	Surface	Mid	Bottom
Temperature (C°)	25.77	24.39	24.43
Dissolved Oxygen (mg/l)	6.93	5.95	6.05
pH	7.19	7.14	7.14
Conductivity	548.7	548.9	548
Secchi depth (cm)	Clear to bottom		

Depth (fixed) (meters): 1.4 m

Adjacent 3m cell areas:

Vegetation type:	*Cabomba* / *Sagitaria* / *Vallisneria* / Bare channel bottom
Vegetation height:	53 cm / 64 cm / surface / N/A
Areal coverage:	15% / 30% / 10% / 45%
Substrate type:	Silt

Sample Label:	**Preservative:**

Snails: *Melanoides tuberculata* - moderate / *Thiara granifera* - moderate

Sample Label:	**Preservative:**
Number of live Ramshorn snails	Average Size (mm)
10	34.5

DROP NET - FIELD DATA SHEETS
COMAL RIVER - CRITICAL PERIOD SAMPLING # 2

Location (Reach):		Site:
Landa Lake		C1 Site 9
Date:	**Time:**	**Observer(s):**
9/12/2000	1416-1506	EO, DT, LV, DM, BL

Overall	Species	Number	Avg. Length (mm)
16	*Dionda episcopa*	3	25.3
9	*Etheostoma fonticola*	9	23.8
607	*Gambusia* sp.	17	22.9
2	*Lepomis megalotis*	2	65.0
10	*Marisa cornuarietis*	10	34.5
moderate	*Melanoides tuberculata*		--
15	*Palaemonetes* sp.		--
1	*Plecostomus*	1	14.0
10	*Procambarus* sp.		--
moderate	*Thiara granifera*		--

Dip net sweep	Species	Number	Length (mm)
1	*Dionda episcopa*	1	23
	Etheostoma fonticola	3	24,23,20
	Gambusia sp.	80	20,20
	Marisa cornuarietis	4	44,37,32,34
	Melanoides tuberculata	1	
	Palaemonetes sp.	5	
	Procambarus sp.	2	
2	*Dionda episcopa*	15	30,23
	Etheostoma fonticola	4	23,27,25,24
	Gambusia sp.	91	15
	Palaemonetes sp.	7	
	Procambarus sp.	3	
3	*Etheostoma fonticola*	2	25,23
	Gambusia sp.	90	50,25,15
	Marisa cornuarietis	2	50,28
	Melanoides tuberculata	moderate	
	Plecostomus	1	14
	Thiara granifera	moderate	
4	*Gambusia* sp.	30	15,15
	Marisa cornuarietis	1	32

DROP NET - FIELD DATA SHEETS
COMAL RIVER - CRITICAL PERIOD SAMPLING # 2

Dip net sweep	Species	Number	Length (mm)
5	*Gambusia* sp.	80	10,20,25,10,15
	Melanoides tuberculata	moderate	
	Procambarus sp.	2	
	Thiara granifera	moderate	
6	*Gambusia* sp.	120	20,20,80
	Palaemonetes sp.	1	
7	*Gambusia* sp.	25	
	Lepomis megalotis	1	63
	Melanoides tuberculata	mod-abund	
	Thiara sp.	mod-abund	
8	*Gambusia* sp.	10	
	Procambarus sp.	1	
9	*Gambusia* sp.	10	
	Marisa cornuarietis	2	35,20
10	*Gambusia* sp.	10	
	Palaemonetes sp.	2	
11	*Gambusia* sp.	20	
	Melanoides tuberculata	moderate	
	Thiara granifera	moderate	
12	*Gambusia* sp.	10	
	Lepomis megalotis	1	67
13	*Gambusia* sp.	5	
	Marisa cornuarietis	1	33
	Procambarus sp.	1	
14	*Gambusia* sp.	1	15
	Procambarus sp.	1	
15	*Gambusia* sp.	25	

DROP NET - FIELD DATA SHEETS
COMAL RIVER - CRITICAL PERIOD SAMPLING # 2

Location (Reach): Landa Lake		**Site:** V1 Site 10	
Date: 9/12/2000	**Time:** 1513-1550	**Observer(s):** EO, DT, LV, DM, BL	
Vegetation:	Type: *Vallisneria*		
	Height: 125 cm		
	Areal Coverage: 100%		
	GPS location: 29° 42' 52.1" N ; 98° 08' 09.0" W		
Substrate Type:	Soft silty and clayey mud		
Mean Column Velocity: 20% - 0.00 m/s ; 80% - 0.00 m/s		Velocity at 15cm above the bottom: 0.00 m/s	
Standard Parameters: 1550	Surface	Mid	Bottom
Temperature (C°)	24.94	24.50	24.40
Dissolved Oxygen (mg/l)	6.36	6.08	4.40
pH	7.17	7.15	7.11
Conductivity	547.4	546.9	546.5
Secchi depth (cm)	Clear to bottom		
Depth (fixed) (meters): 1.34 m			
Adjacent 3m cell areas:			
Vegetation type:	*Vallisneria* / Bare channel bottom		
Vegetation height:	125 cm / N/A		
Areal coverage:	95% / 5%		
Substrate type:	Soft silty and clayey mud		
Sample Label:	**Preservative:**		
Snails: *Melanoides tuberculata* - sparse / *Thiara granifera* - sparse			
Sample Label:	**Preservative:**		
Number of live Ramshorn snails	Average Size (mm)		
4	32.8		

DROP NET - FIELD DATA SHEETS
COMAL RIVER - CRITICAL PERIOD SAMPLING # 2

Location (Reach):		Site:
Landa Lake		V1 Site 10
Date:	**Time:**	**Observer(s):**
9/12/2000	1513-1550	EO, DT, LV, DM, BL

Overall	Species	Number	Avg. Length (mm)
1	*Cichlasoma cyanoguttatum*	1	72.0
865	*Gambusia* sp.		--
5	*Lepomis megalotis*	5	71.8
4	*Marisa cornuarietis*	4	32.8
sparse	*Melanoides tuberculata*		--
1	*Palaemonetes* sp.		--
1	*Poecilia latipinna*	1	25.0
3	*Procambarus* sp.		--
sparse	*Thiara granifera*		--

Dip net sweep	Species	Number	Length (mm)
1	*Gambusia* sp.	220	
	Lepomis megalotis	1	64
	Poecilia latipinna	1	25
2	*Gambusia* sp.	95	
	Lepomis megalotis	1	67
3	*Gambusia* sp.	105	
4	*Gambusia* sp.	60	
	Lepomis megalotis	1	80
5	*Cichlasoma cyanoguttatum*	1	72
	Gambusia sp.	100	
	Lepomis megalotis	1	81
6	*Gambusia* sp.	45	
	Procambarus sp.	2	
7	*Gambusia* sp.	50	
	Melanoides tuberculata	5	
8	*Gambusia* sp.	60	
9	*Gambusia* sp.	30	

DROP NET - FIELD DATA SHEETS
COMAL RIVER - CRITICAL PERIOD SAMPLING # 2

Dip net sweep	Species	Number	Length (mm)
10	*Gambusia* sp.	15	
	Lepomis megalotis	1	67
	Marisa cornuarietis	1	23
11	*Gambusia* sp.	20	
	Marisa cornuarietis	2	37,35
	Thiara granifera	15	
12	*Procambarus* sp.	1	
	Marisa cornuarietis	1	36
	Gambusia sp.	15	
13	*Gambusia* sp.	20	
	Palaemonetes sp.	1	
14	*Gambusia* sp.	5	
15	*Gambusia* sp.	25	

NEW CHANNEL REACH

DROP NET - FIELD DATA SHEETS
COMAL RIVER - CRITICAL PERIOD SAMPLING # 2

Location (Reach):		**Site:**
New Channel		H1 Site 1
Date:	**Time:**	**Observer(s):**
9/14/00	0800-0855	DT, MH, DM, LV, BL

Vegetation:	Type:	*Hygrophila*
	Height:	52 cm
	Areal Coverage:	100% *Hygrophila* with filamentous algae on it
	GPS location:	29° 42' 28.2" N ; 98° 07' 33.3" W
Substrate Type:	Gravel and silty clay	

Mean Column Velocity:	Velocity at 15cm above the bottom:
*	*

Standard Parameters: 0854	Surface	Mid	Bottom
Temperature (C°)	24.50	--	24.45
Dissolved Oxygen (mg/l)	8.79	--	9.01
pH	7.74	--	7.77
Conductivity	546.0	--	546.0
Secchi depth (cm)	Clear to bottom		

Depth (fixed) (meters):

0.84 m

Adjacent 3m cell areas:

Vegetation type:	*Hygrophila*
Vegetation height:	10-80 cm
Areal coverage:	60% *Hygrophila* with filamentous algae on it
Substrate type:	Gravel and siltey clay

Sample Label:	**Preservative:**

Snails: *Melanoides tuberculata* - none / *Thiara granifera* - abundant

Sample Label:	**Preservative:**
Number of live Ramshorn snails	Average Size (mm)
0	

* No flow measurement taken due to the upstream release of water
Yellow-Crowned Night Heron spotted in vicinity

DROP NET - FIELD DATA SHEETS

COMAL RIVER - CRITICAL PERIOD SAMPLING # 2

Location (Reach):		Site:	
New Channel		H1 Site 1	
Date:	**Time:**	**Observer(s):**	DT, MH, DM, LV, BL
9/14/00	0800-0855		

Overall	Species	Number	Avg. Length (mm)
1	*Cichlasoma cyanoguttatum*	1	54.0
1	*Corbicula* sp.		--
5	*Etheostoma fonticola*	5	18.0
1	*Lepomis macrochirus*	1	44.0
7	*Lepomis megalotis*	7	25.9
1	*Micropterus punctulatus*	1	67.0
31	*Palaemonetes* sp.		--
4	*Procambarus* sp.		
abundant	*Thiara granifera*		--

Dip net sweep	Species	Number	Length (mm)
1	*Lepomis megalotis*	3	37,27,27
	Micropterus punctulatus	1	67
	Palaemonetes sp.	6	
	Procambarus sp.	2	
	Thiara granifera	abundant	
2	*Cichlasoma cyanoguttatum*	1	54
	Etheostoma fonticola	1	21
	Lepomis megalotis	1	43
	Palaemonetes sp.	5	
	Thiara granifera	abundant	
3	*Etheostoma fonticola*	2	20,11
	Palaemonetes sp.	8	
	Procambarus sp.	1	
4	*Palaemonetes* sp.	5	
5	*Etheostoma fonticola*	1	24
	Palaemonetes sp.	1	
	Thiara granifera	sparse	
6	*Palaemonetes* sp.	1	

DROP NET - FIELD DATA SHEETS

COMAL RIVER - CRITICAL PERIOD SAMPLING # 2

Dip net sweep	Species	Number	Length (mm)
7	*Palaemonetes* sp.	1	
8	*Lepomis macrochirus*	1	44
	Palaemonetes sp.	2	
9	*Palaemonetes* sp.	2	
	Procambarus sp.	1	
10	No fish or crustaceans collected		
11	No fish or crustaceans collected		
12	*Etheostoma fonticola*	1	14
	Lepomis megalotis	2	13,10
13	*Lepomis megalotis*	1	24
14	No fish or crustaceans collected		
15	*Corbicula* sp.	1	

DROP NET - FIELD DATA SHEETS

COMAL RIVER - CRITICAL PERIOD SAMPLING # 2

Location (Reach): New Channel		**Site:** L1 Site 2	
Date: 9/14/00	**Time:** 0905-0942	**Observer(s):** DT, MH, DM, BL	
Vegetation:	Type:	submergent *Ludwigia*	
	Height:	24.4 cm	
	Areal Coverage	100%	
	GPS location:	29° 42' 29.1" N ; 98° 07 46.4" W	
Substrate Type:	Silt over clay with gravel, cobble, and boulders		
Mean Column Velocity: *		Velocity at 15cm above the bottom: *	

Standard Parameters: 1307	Surface	Mid	Bottom
Temperature (C°)	24.43	--	24.44
Dissolved Oxygen (mg/l)	7.82	--	7.85
pH	7.68	--	7.70
Conductivity	545.3	--	545.4
Secchi depth (cm)	clear to bottom		

Depth (fixed) (meters): 1.18 m

Adjacent 3m cell areas:

Vegetation type:	submergent *Ludwigia / Hygrophila*
Vegetation height:	24.4 cm
Areal coverage:	30% / 40%
Substrate type:	Silt over clay with gravel, cobble, and boulders

Sample Label:	**Preservative:**

Snails: *Melanoides tuberculata* - none / *Thiara granifera* - moderate

Sample Label:	**Preservative:**
Number of live Ramshorn snails	Average Size (mm)
0	

* No flow measurement taken due to the upstream release of water

DROP NET - FIELD DATA SHEETS

COMAL RIVER - CRITICAL PERIOD SAMPLING # 2

Location (Reach):		Site:	
New Channel		L1 Site 2	
Date:	**Time:**	**Observer(s):**	
9/14/00	0905-0942	DT, MH, DM, BL	
Overall	**Species**	**Number**	**Avg. Length (mm)**
1	*Ambloplites rupestris*	1	73.0
1	*Cichlasoma cyanoguttatum*	1	47.0
15	*Corbicula* sp.		--
3	*Lepomis megalotis*	3	15.0
1	*Micropterus salmoides*	1	67.0
17	*Palaemonetes* sp.		--
16	*Procambarus* sp.		--
moderate	*Thiara granifera*		--
Dip net sweep	**Species**	**Number**	**Length (mm)**
1	*Corbicula* sp.	1	
	Lepomis megalotis	3	17,15,13
	Palaemonetes sp.	4	
2	*Micropterus salmoides*	1	67
	Palaemonetes sp.	1	
	Procambarus sp.	2	
	Thiara granifera	sparse	
3	*Palaemonetes* sp.	1	
	Procambarus sp.	1	
4	*Procambarus* sp.	3	
5	*Corbicula* sp.	7	
	Palaemonetes sp.	2	
6	No fish or crustaceans collected		
7	*Ambloplites rupestris*	1	73
	Palaemonetes sp.	5	
	Procambarus sp.	2	
8	*Palaemonetes* sp.	4	
	Procambarus sp.	2	

DROP NET - FIELD DATA SHEETS

COMAL RIVER - CRITICAL PERIOD SAMPLING # 2

Dip net sweep	Species	Number	Length (mm)
9	*Corbicula* sp.	1	
	Procambarus sp.	2	
10	*Procambarus* sp.	1	
11	*Procambarus* sp.	2	
12	*Procambarus* sp.	1	
13	No fish or crustaceans collected		
14	*Cichlasoma cyanoguttatum*	1	47
	Corbicula sp.	5	
	Thiara granifera	moderate	
15	*Corbicula* sp.	1	

DROP NET - FIELD DATA SHEETS

COMAL RIVER - CRITICAL PERIOD SAMPLING # 2

Location (Reach): New Channel		**Site:** O2 Site 3	
Date: 9/14/00	**Time:** 0945-1019	**Observer(s):** EO, DT, MH, DM, BL	
Vegetation:	Type:	Bare channel bottom / *Hygrophila*	
	Height:	N/A / 25 cm	
	Areal Coverage	75% / 25%	
	GPS location:	29° 42' 28.8" N ; 98° 07' 46.6" W	
Substrate Type:	Silty clay mud with lots of detritus		
Mean Column Velocity: *		Velocity at 15cm above the bottom: *	

Standard Parameters: 1304	Surface	Mid	Bottom
Temperature (C°)	24.37	24.40	24.35
Dissolved Oxygen (mg/l)	7.89	7.66	5.71
pH	7.68	7.68	7.60
Conductivity	545.0	545.0	546.0
Secchi depth (cm)	Clear to bottom		

Depth (fixed) (meters): 0.61 m

Adjacent 3m cell areas:

Vegetation type:	*Hygrophila / Ludwigia*
Vegetation height:	25 cm to surface / 20 cm
Areal coverage:	25% / 10%
Substrate type:	Silty clay mud with lots of detritus and cobble and boulders

Sample Label:	**Preservative:**

Snails: *Melanoides tuberculata* - none / *Thiara granifera* - moderate

Sample Label:	**Preservative:**
Number of live Ramshorn snails	Average Size (mm)
0	

* No flow measurement taken due to the upstream release of water

DROP NET - FIELD DATA SHEETS
COMAL RIVER - CRITICAL PERIOD SAMPLING # 2

Location (Reach):		Site:
New Channel		O2 Site 3
Date:	**Time:**	**Observer(s):**
9/14/2000	0945-1019	EO, DT, DM, MH, BL

Overall	Species	Number	Avg. Length (mm)
45	*Corbicula* sp.		--
16	*Gambusia* sp.	16	17.4
1	*Lepomis megalotis*	1	55.0
3	*Lepomis punctatus*	3	29.3
1	*Palaemonetes* sp.		--
1	*Procambarus* sp.		--
moderate	*Thiara granifera*		--

Dip net sweep	Species	Number	Length (mm)
1	*Corbicula* sp.	25	
	Gambusia sp.	1	
	Thiara granifera	moderate	
2	*Corbicula* sp.	moderate (20)	
	Gambusia sp.	2	20,20
	Lepomis punctatus	2	16,12
	Thiara granifera	moderate	
3	*Lepomis punctatus*	1	60
4	*Procambarus* sp.	1	
5	*Gambusia* sp.	2	20,7
	Lepomis megalotis	1	55
6	No fish or crustaceans collected		
7	*Gambusia* sp.	1	20
8	No fish or crustaceans collected		
9	No fish or crustaceans collected		
10	*Palaemonetes* sp.	1	
11	*Gambusia* sp.	1	

DROP NET - FIELD DATA SHEETS

COMAL RIVER - CRITICAL PERIOD SAMPLING # 2

Dip net sweep	Species	Number	Length (mm)
12	*Gambusia* sp.	8	
13	*Gambusia* sp.	1	
14	No fish or crustaceans collected		
15	No fish or crustaceans collected		

DROP NET - FIELD DATA SHEETS

COMAL RIVER - CRITICAL PERIOD SAMPLING # 2

Location (Reach): New Channel		**Site:** H2 Site 4
Date: 9/14/00	**Time:** 1026-1050	**Observer(s):** EO, DT, DM, BL

Vegetation:	Type:	Submergent *Hygrophila* / Bare channel bottom
	Height:	14 cm / N/A
	Areal Coverage	85% / 15%
	GPS location:	29° 42' 28.2" N ; 98° 07' 48.3" W
Substrate Type:	Clay with small boulders and large cobble	

Mean Column Velocity: *	Velocity at 15cm above the bottom: *

Standard Parameters: 1052	Surface	Mid	Bottom
Temperature (C°)	24.47	--	24.44
Dissolved Oxygen (mg/l)	7.78	--	7.93
pH	7.66	--	7.69
Conductivity	544.0	--	546.0
Secchi depth (cm)	Clear to bottom		

Depth (fixed) (meters): 1.03 m

Adjacent 3m cell areas:

Vegetation type:	*Hygrophila* / Bare channel bottom
Vegetation height:	14 cm / N/A
Areal coverage:	60% / 40%
Substrate type:	Clay with small boulders and large cobble

Sample Label:	**Preservative:**

Snails: *Melanoides tuberculata* - none / *Thiara granifera* - sparse

Sample Label:	**Preservative:**
Number of live Ramshorn snails	Average Size (mm)
0	

* No flow measurement taken due to the upstream release of water

Yellow-Crowned Night Heron spotted in vicinity

DROP NET - FIELD DATA SHEETS
COMAL RIVER - CRITICAL PERIOD SAMPLING # 2

Location (Reach):		Site:
New Channel		H2 Site 4
Date:	**Time:**	**Observer(s):**
9/14/2000	1026-1050	EO, DT, DM, BL

Overall	Species	Number	Avg. Length (mm)
1	*Cichlasoma cyanoguttatum*	1	15.0
1	*Corbicula* sp.		--
3	*Gambusia* sp.	3	16.5
3	*Lepomis megalotis*	3	32.5
107	*Palaemonetes* sp.		--
7	*Procambarus* sp.		--
sparse	*Thiara granifera*		--

Dip net sweep	Species	Number	Length (mm)
1	*Cichlasoma cyanoguttatum*	1	15
	Gambusia sp.	1	25
	Lepomis megalotis	2	30
	Palaemonetes sp.	44	
	Procambarus sp.	1	
2	*Gambusia* sp.	1	8
	Palaemonetes sp.	20	
	Thiara granifera	sparse	
3	*Gambusia* sp.	1	
	Palaemonetes sp.	8	
4	*Procambarus* sp.	1	
	Palaemonetes sp.	9	
5	*Palaemonetes* sp.	4	
6	*Palaemonetes* sp.	1	
7	*Procambarus* sp.	1	
	Palaemonetes sp.	2	

DROP NET - FIELD DATA SHEETS

COMAL RIVER - CRITICAL PERIOD SAMPLING # 2

Dip net sweep	Species	Number	Length (mm)
8	*Corbicula* sp.	1	
	Palaemonetes sp.	3	
	Procambarus sp.	2	
	Thiara granifera	sparse	
9	*Palaemonetes* sp.	5	
10	No fish or crustaceans collected		
11	*Procambarus* sp.	2	
	Palaemonetes sp.	3	
12	*Lepomis megalotis*	1	35
	Palaemonetes sp.	4	
13	*Palaemonetes* sp.	2	
14	*Palaemonetes* sp.	2	
15	No fish or crustaceans collected	1	

DROP NET - FIELD DATA SHEETS

COMAL RIVER - CRITICAL PERIOD SAMPLING # 2

Location (Reach): New Channel			**Site:** O1 Site 5
Date: 9/14/00	**Time:** 1137-1152		**Observer(s):** EO, DT, DM, BL
Vegetation:	Type:	Open water over bare channel with attached filamentous algae	
	Height:	N/A	
	Areal Coverage	Patches of filamentous algae	
	GPS location:	29° 42' 28.0" N ; 98° 07' 48.2" W	
Substrate Type:	Gravel and cobble		
Mean Column Velocity: *		Velocity at 15cm above the bottom: *	

Standard Parameters: 1154	Surface	Mid	Bottom
Temperature (C°)	24.53	--	24.43
Dissolved Oxygen (mg/l)	7.80	--	7.82
pH	7.68	--	7.69
Conductivity	544.0	--	545.0
Secchi depth (cm)	Clear to bottom		

Depth (fixed) (meters): 0.89 m

Adjacent 3m cell areas:

Vegetation type:	Open water over bare channel with attached filamentous algae
Vegetation height:	N/A
Areal coverage:	Patches of filamentous algae
Substrate type:	Gravel and cobble

Sample Label:	**Preservative:**

Snails: *Melanoides tuberculata* - none / *Thiara granifera* - sparse

Sample Label:	**Preservative:**
Number of live Ramshorn snails	Average Size (mm)
0	

DROP NET - FIELD DATA SHEETS

COMAL RIVER - CRITICAL PERIOD SAMPLING # 2

Location (Reach):		Site:
New Channel		O1 Site 5
Date:	**Time:**	**Observer(s):**
9/14/00	1137-1152	EO, DT, DM, BL, BK

Overall	Species	Number	Avg. Length (mm)
sparse	*Corbicula* sp.		--
1	*Etheostoma fonticola*	1	28.0
sparse	*Thiara granifera*		--

Dip net sweep	Species	Number	Length (mm)
1	*Etheostoma fonticola*	1	28
2	No fish or crustaceans collected		
3	*Thiara granifera*	sparse	
4	No fish or crustaceans collected		
5	No fish or crustaceans collected		
6	No fish or crustaceans collected		
7	No fish or crustaceans collected		
8	No fish or crustaceans collected		
9	No fish or crustaceans collected		
10	*Thiara granifera*	sparse	
11	No fish or crustaceans collected		
12	No fish or crustaceans collected		
13	*Corbicula* sp.	sparse	
14	No fish or crustaceans collected		
15	No fish or crustaceans collected		

DROP NET - FIELD DATA SHEETS

COMAL RIVER - CRITICAL PERIOD SAMPLING # 2

Location (Reach): New Channel		**Site:** L2 Site 6
Date: 9/14/00	**Time:** 1214-1249	**Observer(s):** EO, DT, DM, BK, BL
Vegetation:	Type: *Ludwigia / Hygrophila*	
	Height: 28 cm / 20 cm	
	Areal Coverage 40% / 10%	
	GPS location: 29° 42' 27.6" N ; 98° 07' 48.4" W	
Substrate Type:	Silt on top of gravel and gravel with a large amount of detritus	
Mean Column Velocity: *		Velocity at 15cm above the bottom: *

Standard Parameters: 1252	Surface	Mid	Bottom
Temperature (C°)	24.41	24.38	24.37
Dissolved Oxygen (mg/l)	7.97	7.97	7.93
pH	7.66	7.67	7.68
Conductivity	543	544	544
Secchi depth (cm)	Clear to bottom		

Depth (fixed) (meters):
1.21 m

Adjacent 3m cell areas:

Vegetation type:	*Hygrophila / Cabomba / Ludwigia / Riccia*
Vegetation height:	20 cm average
Areal coverage:	50% / 5% / 30% / 3% / 15 %
Substrate type:	Silt on top of gravel and cobble with a large amount of detritus

Sample Label:	**Preservative:**

Snails: *Melanoides tuberculata* - sparse / *Thiara granifera* - moderate

Sample Label:	**Preservative:**
Number of live Ramshorn snails	Average Size (mm)
3	18.0

* No flow measurement taken due to the upstream release of water

Yellow-Crowned Night Heron spotted in vicinity

DROP NET - FIELD DATA SHEETS

COMAL RIVER - CRITICAL PERIOD SAMPLING # 2

Location (Reach):		Site:
New Channel		L2 Site 6
Date:	**Time:**	**Observer(s):**
9/14/00	1214-1249	EO, DT, DM, BK, BL

Overall	Species	Number	Avg. Length (mm)
sparse	*Corbicula* sp.		--
1	*Etheostoma fonticola*	1	24.0
2	*Lepomis megalotis*	2	20.5
3	*Marisa cornuarietis*	3	18.0
sparse	*Melanoides tuberculata*		--
4	*Palaemonetes* sp.		--
7	*Procambarus* sp.		--
moderate	*Thiara granifera*		--

Dip net sweep	Species	Number	Length (mm)
1	*Palaemonetes* sp.	1	
2	*Corbicula* sp.	1	
	Etheostoma fonticola	1	24
	Marisa cornuarietis	2	22,12
	Procambarus sp.	1	
	Thiara granifera	sparse	
3	No fish or crustaceans collected		
4	*Corbicula* sp.	2	
	Lepomis megalotis	1	16
	Procambarus sp.	2	
5	*Lepomis megalotis*	1	25
	Marisa cornuarietis	1	20
	Palaemonetes sp.	2	
6	*Procambarus* sp.	2	
7	*Corbicula* sp.	sparse	
	Palaemonetes sp.	1	
	Thiara granifera	moderate	

DROP NET - FIELD DATA SHEETS

COMAL RIVER - CRITICAL PERIOD SAMPLING # 2

Dip net sweep	Species	Number	Length (mm)
8	*Corbicula* sp. *Procambarus* sp.	sparse 1	
9	*Melanoides tuberculata*	sparse	
10	No fish or crustaceans collected		
11	*Procambarus* sp.	1	
12	No fish or crustaceans collected		
13	No fish or crustaceans collected		
14	No fish or crustaceans collected		
15	No fish or crustaceans collected		

Yellow-Crowned Night Heron spotted

OLD CHANNEL REACH

DROP NET - FIELD DATA SHEETS

COMAL RIVER - CRITICAL PERIOD SAMPLING # 2

Location (Reach): Old Channel		**Site:** A2 Site 1	
Date: 9/13/00	**Time:** 0822-1007	**Observer(s):** DT, DM, BL, BK	
Vegetation:	Type: Algae		
	Height: 4 - 16 cm		
	Areal Coverage: 100%		
	GPS location: **GET FROM MAP**		
Substrate Type:	Soft silt clayey mud with heavy detrital accumulation		
Mean Column Velocity: 20% - 0.00 m/s ; 80% - 0.00 m/s		Velocity at 15cm above the bottom: 0.00 m/s	

Standard Parameters: 1338	Surface	Mid	Bottom
Temperature (C°)	24.72	--	24.70
Dissolved Oxygen (mg/l)	7.74	--	6.56
pH	7.51	--	7.45
Conductivity	546.0	--	547.0
Secchi depth (cm)	Clear to bottom		

Depth (fixed) (meters): 1.37 m

Adjacent 3m cell areas:

Vegetation type:	Algae
Vegetation height:	4 - 16 cm
Areal coverage:	100%
Substrate type:	Soft silt clayey mud with heavy detrital accumulation

Sample Label:	**Preservative:**

Snails: *Melanoides tuberculata* - none / *Thiara granifera* - none

Sample Label:	**Preservative:**
Number of live Ramshorn snails	Average Size (mm)
0	

DROP NET - FIELD DATA SHEETS
COMAL RIVER - CRITICAL PERIOD SAMPLING # 2

Location (Reach):		Site:
Old Channel		A2 Site 1
Date:	**Time:**	**Observer(s):**
9/13/00	0822-1007	EO, DT, CN, TB

Overall	Species	Number	Avg. Length (mm)
4	*Astyanax mexicanus*	4	27.8
1	*Cichlasoma cyanoguttatum*	1	16.0
1	*Corbicula* sp.		--
90	*Etheostoma fonticola*	90	21.5
45	*Lepomis megalotis*	45	19.1
95	*Palaemonetes* sp.		--
10	*Procambarus* sp.		--
3	*Rana* sp.		--

Dip net sweep	Species	Number	Length (mm)
1	*Cichlasoma cyanoguttatum*	1	16
	Corbicula sp.	1	
	Etheostoma fonticola	53	27,25,23,25,23,22,27,26, 26,26,25,27,20,25,27,17, 17,25,21,24,17,30,23,18, 25,25,25,21,19,19,20,18, 17,19,21,15,13,13,26,24, 23,29,23,24,17,22,16,14
	Lepomis megalotis	10	25,32,15,17,15,21,30,23, 17,25
	Palaemonetes sp.	47	
	Procambarus sp.	6	
	Rana sp.	2	
2	*Astyanax mexicanus*	1	15
	Etheostoma fonticola	8	27,14,27,27,22,15,14,18
	Lepomis megalotis	17	27,12,15,27,18,27,22,23 23,22,17,22,17,20,20,17, 27
	Palaemonetes sp.	9	
	Procambarus sp.	1	
	Rana sp.	1	
3	*Astyanax mexicanus*	1	32
	Etheostoma fonticola	5	23,16,28,30,22
	Lepomis megalotis	5	25,18,17,22,18
4	*Astyanax mexicanus*	1	32
	Lepomis megalotis	4	22,17,27,14

DROP NET - FIELD DATA SHEETS

COMAL RIVER - CRITICAL PERIOD SAMPLING # 2

Dip net sweep	Species	Number	Length (mm)
5	*Etheostoma fonticola*	5	24,24,15,21,15
	Lepomis megalotis	4	22,20,17,10
	Palaemonetes sp.	7	
6	*Etheostoma fonticola*	1	29
	Procambarus sp.	1	
7	*Astyanax mexicanus*	1	32
	Etheostoma fonticola	2	20,17
	Lepomis megalotis	1	11
	Palaemonetes sp.	1	
8	*Etheostoma fonticola*	6	21,23,23,24,22,15
	Lepomis megalotis	2	10,12
	Palaemonetes sp.	15	
	Procambarus sp.	2	
9	*Etheostoma fonticola*	4	25,23,23,16
	Palaemonetes sp.	1	1
10	*Etheostoma fonticola*	1	15
	Palaemonetes sp.	7	
11	*Palaemonetes* sp.	2	
12	*Etheostoma fonticola*	3	23,22,16
	Lepomis megalotis	1	15
	Palaemonetes sp.	3	
13	*Etheostoma fonticola*	1	21
14	*Palaemonetes* sp.	4	
15	*Etheostoma fonticola*	1	12

DROP NET - FIELD DATA SHEETS

COMAL RIVER - CRITICAL PERIOD SAMPLING # 2

Location (Reach): Old Channel		**Site:** C2 Site 2
Date: 9/13/00	**Time:** 1029-1112	**Observer(s):** DT, DM, BL, BK, EO
Vegetation:	Type:	*Nuphar* / *Ceratopteris* / Algae
	Height:	Surface / Surface / N/A
	Areal Coverage:	60% / 30% / 10%
	GPS location:	**GET FROM MAP**
Substrate Type:	Silty clay w/dense accumulation of detrital material	
Mean Column Velocity: 20% - 0.00 m/s ; 80% - 0.00 m/s		Velocity at 15cm above the bottom: 0.00 m/s

Standard Parameters: 1345	Surface	Mid	Bottom
Temperature (C°)	25.25	--	24.63
Dissolved Oxygen (mg/l)	7.57	--	7.14
pH	7.55	--	7.54
Conductivity	547.0	--	550.0
Secchi depth (cm)	0.61 m		

Depth (fixed) (meters): 0.95 m

Adjacent 3m cell areas:

Vegetation type:	*Nuphar* / *Ceratopteris* / Algae
Vegetation height:	Surface / Surface / N/A
Areal coverage:	50% / 25% / 25%
Substrate type:	Silty clay with dense accumulation of detrital material

Sample Label: OCR	**Preservative:** 10% Formalin

Snails: *Melanoides tuberculata* - none / *Thiara granifera* - none

Sample Label:	**Preservative:**
Number of live Ramshorn snails	Average Size (mm)
0	

DROP NET - FIELD DATA SHEETS
COMAL RIVER - CRITICAL PERIOD SAMPLING # 2

Location (Reach):		Site:
Old Channel		C2 Site 2
Date:	**Time:** 1029-1112	**Observer(s):**
9/13/00	1029-1112	DT, DM, BL, BK, EO

Overall	Species	Number	Avg. Length (mm)
18	*Astyanax mexicanus*	18	20.3
12	*Cichlasoma cyanoguttatum*	12	18.7
13	*Gambusia* sp.	13	20.4
2	*Ictalurus natalis*	2	28.5
3	*Lepomis macrochirus*	3	39.0
18	*Lepomis megalotis*	18	26.2
72	*Palaemonetes* sp.		--
1	*Poecilia latipinna*	1	23.0
32	*Procambarus* sp.		--
1	*Rana* sp.		--

Dip net sweep	Species	Number	Length (mm)
1	*Astyanax mexicanus*	16	21,18,21,15,17,18,20,15 25,22,17,26,19,15,20,15
	Cichlasoma cyanoguttatum	6	27,15,17,20,20,13
	Gambusia sp.	4	
	Ictalurus natalis	1	30
	Lepomis macrochirus	1	42
	Lepomis megalotis	2	20,15
	Palaemonetes sp.	15	
2	*Cichlasoma cyanoguttatum*	1	14
	Gambusia sp.	7	27,23,22,20,21,20,15
	Lepomis macrochirus	1	28
	Lepomis megalotis	2	60,30
	Palaemonetes sp.	28	
3	*Astyanax mexicanus*	2	29,33
	Cichlasoma cyanoguttatum	3	18,24,17
	Lepomis megalotis	2	80,24
	Palaemonetes sp.	5	
	Procambarus sp.	3	
	Rana sp.	1	
4	*Lepomis megalotis*	3	22,16,14
	Palaemonetes sp.	8	

DROP NET - FIELD DATA SHEETS

COMAL RIVER - CRITICAL PERIOD SAMPLING # 2

Dip net sweep	Species	Number	Length (mm)
5	*Cichlasoma cyanoguttatum*	1	17
	Lepomis megalotis	3	27,25,20
	Procambarus sp.	1	
6	*Gambusia* sp.	1	11
	Lepomis megalotis	1	25
	Palaemonetes sp.	1	
	Procambarus sp.	1	
7	*Lepomis megalotis*	2	21,13
	Palaemonetes sp.	3	
8	*Gambusia* sp.	1	25
	Palaemonetes sp.	2	
9	*Lepomis macrochirus*	1	47
	Palaemonetes sp.	1	
10	*Cichlasoma cyanoguttatum*	1	22
	Palaemonetes sp.	4	
11	*Ictalurus natalis*	1	27
	Lepomis megalotis	1	23
	Poecilia latipinna	1	23
	Procambarus sp.	27	
12	*Lepomis megalotis*	2	24,12
	Palaemonetes sp.	4	
13	*Palaemonetes* sp.	1	
14	No fish or crustaceans collected		
15	No fish or crustaceans collected		

DROP NET - FIELD DATA SHEETS

COMAL RIVER - CRITICAL PERIOD SAMPLING # 2

Location (Reach):		**Site:**
Old Channel		A1 Site 3
Date:	**Time:**	**Observer(s):**
9/13/00	1119-1204	EO, DT, BK, DM, BL

Vegetation:	Type:	Algae / Bare channel bottom
	Height:	8 - 20 cm / N/A
	Areal Coverage:	90% / 10%
	GPS location:	**GET FROM MAP**
Substrate Type:	Soft silty clay	

Mean Column Velocity:	Velocity at 15cm above the bottom:
0.00 m/s	0.00 m/s

Standard Parameters: 1350	Surface	Mid	Bottom
Temperature (C°)	25.03	--	24.96
Dissolved Oxygen (mg/l)	6.50	--	6.50
pH	7.63	--	7.58
Conductivity	549.0	--	549.0
Secchi depth (cm)	Clear to bottom		

Depth (fixed) (meters):
0.64 m

Adjacent 3m cell areas:

Vegetation type:	Algae / Bare bottom
Vegetation height:	8 - 20 cm / N/A
Areal coverage:	80% / 20%
Substrate type:	Soft silty clay

Sample Label:	**Preservative:**

Snails: *Melanoides tuberculata* - none / *Thiara granifera* - sparse

Sample Label:	**Preservative:**
Number of live Ramshorn snails	Average Size (mm)
0	

DROP NET - FIELD DATA SHEETS

COMAL RIVER - CRITICAL PERIOD SAMPLING # 2

Location (Reach):		Site:
Old channel		A1 Site 3
Date:	**Time:**	**Observer(s):**
9/13/00	1119-1204	EO, DT, BK, DM, BL

Overall	Species	Number	Avg. Length (mm)
53	*Etheostoma fonticola*	53	21.6
15	*Notropis amabilis*	15	34.8
27	*Palaemonetes* sp.		--
10	*Procambarus sp.*		--
1	*Rana* sp.		--
sparse	*Thiara granifera*		--

Dip net sweep	Species	Number	Length (mm)
1	*Etheostoma fonticola*	25	24,24,23,20,21,23,26,27, 27,25,23,26,22,28,16,24 26,17,12,15,14,13,18,16, 14
	Notropis amabilis	6	37,45,43,37,29,26
	Palaemonetes sp.	13	
	Procambarus sp.	2	
2	*Etheostoma fonticola*	3	25,23,22
	Notropis amabilis	4	34,27,24,24
	Palaemonetes sp.	5	
	Procambarus sp.	1	
3	*Etheostoma fonticola*	1	21
	Palaemonetes sp.	1	
4	*Etheostoma fonticola*	3	23,27,15
	Notropis amabilis	4	37,42,47,38
	Palaemonetes sp.	3	
	Procambarus sp.	2	
5	*Procambarus sp.*	1	
6	*Etheostoma fonticola*	3	25,29,32
	Notropis amabilis	1	32
	Palaemonetes sp.	1	
	Procambarus sp.	1	

DROP NET - FIELD DATA SHEETS

COMAL RIVER - CRITICAL PERIOD SAMPLING # 2

Dip net sweep	Species	Number	Length (mm)
7	*Etheostoma fonticola*	7	26,28,17,17,15,18,19
	Palaemonetes sp.	1	
	Procambarus sp.	2	
8	*Etheostoma fonticola*	1	26
	Palaemonetes sp.	2	
	Procambarus sp.	1	
9	*Etheostoma fonticola*	4	23,15,24,17
	Palaemonetes sp.	1	
	Rana sp.	1	
10	No fish or crustaceans collected	0	
11	*Etheostoma fonticola*	3	27,15,21
12	No fish or crustaceans collected	0	
13	*Etheostoma fonticola*	3	22,19,19
14	No fish or crustaceans collected	0	
15	*Thiara granifera*	sparse	

DROP NET - FIELD DATA SHEETS
COMAL RIVER - CRITICAL PERIOD SAMPLING # 2

Location (Reach): Old Channel		**Site:** O2 Site 4	
Date: 9/13/00	**Time:** 1214-1235	**Observer(s):** EO, DT, DM, BL	
Vegetation:	Type:	Bare channel bottom / Algae	
	Height:	N/A / 13.5 cm	
	Areal Coverage:	75% / 25%	
	GPS location:	**GET FROM MAP**	
Substrate Type:	Small amount of silt over gravel and cobble		
Mean Column Velocity: 0.16 m/s		Velocity at 15cm above the bottom: 0.13 m/s	

Standard Parameters: 1217	Surface	Mid	Bottom
Temperature (C°)	24.76	--	24.75
Dissolved Oxygen (mg/l)	7.68	--	7.60
pH	7.58	--	7.59
Conductivity	548.0	--	548.0
Secchi depth (cm)	Clear to bottom		

Depth (fixed) (meters): 0.71 m

Adjacent 3m cell areas:

Vegetation type:	Bare channel bottom / Algae
Vegetation height:	N/A / 13.5 cm
Areal coverage:	75% / 25%
Substrate type:	Small amount of silt over gravel and cobble

Sample Label:	**Preservative:**

Snails: *Melanoides tuberculata* - none / *Thiara granifera* - none

Sample Label:	**Preservative:**
Number of live Ramshorn snails	Average Size (mm)
0	

DROP NET - FIELD DATA SHEETS

COMAL RIVER - CRITICAL PERIOD SAMPLING # 2

Location (Reach):		Site:
Old Channel		O2 Site 4
Date:	**Time:**	**Observer(s):**
9/13/00	1214-1235	EO, DT, DM, BL

Overall	Species	Number	Avg. Length (mm)
11	*Etheostoma fonticola*	11	18.8
1	*Lepomis megalotis*	1	12.0
2	*Palaemonetes* sp.		–

Dip net sweep	Species	Number	Length (mm)
1	*Etheostoma fonticola*	4	14,13,17,26
	Palaemonetes sp.	1	
2	*Palaemonetes* sp.	1	
3	*Etheostoma fonticola*	1	19
4	*Etheostoma fonticola*	3	26,14,14
5	*Etheostoma fonticola*	1	16
6	No fish or crustaceans collected		
7	*Etheostoma fonticola*	1	24
8	No fish or crustaceans collected		
9	*Etheostoma fonticola*	1	24
10	No fish or crustaceans collected		
11	No fish or crustaceans collected		
12	*Lepomis megalotis*	1	12
13	No fish or crustaceans collected		
14	No fish or crustaceans collected		
15	No fish or crustaceans collected		

DROP NET - FIELD DATA SHEETS

COMAL RIVER - CRITICAL PERIOD SAMPLING # 2

Location (Reach):		**Site:**
Old Channel		O1 Site 5
Date:	**Time:**	**Observer(s):**
9/13/00	1240-1250	EO, DT, BK, DM, BL

Vegetation:	Type:	Bare channel bottom / Algae
	Height:	N/A / 14 cm
	Areal Coverage:	90% / 10%
	GPS location:	**GET FROM MAP**
Substrate Type:	Gravel and cobble over bedrock	

Mean Column Velocity:	Velocity at 15cm above the bottom:
0.15 m/s	0.14 m/s

Standard Parameters: 1400	Surface	Mid	Bottom
Temperature (C°)	24.82	--	24.82
Dissolved Oxygen (mg/l)	7.79	--	7.76
pH	7.59	--	7.60
Conductivity	548.0	--	549.0
Secchi depth (cm)	Clear to bottom		

Depth (fixed) (meters):

0.85 m

Adjacent 3m cell areas:

Vegetation type:	Bare channel bottom / Algae / *Ceratopteris*
Vegetation height:	N/A / 14 cm / 28 cm
Areal coverage:	85% / 10% / 5%
Substrate type:	Gravel and cobble over bedrock

Sample Label:	**Preservative:**

Snails: *Melanoides tuberculata* - none / *Thiara granifera* - sparse

Sample Label:	**Preservative:**
Number of live Ramshorn snails	Average Size (mm)
0	

DROP NET - FIELD DATA SHEETS

COMAL RIVER - CRITICAL PERIOD SAMPLING # 2

Location (Reach):		Site:
Old Channel		O1 Site 5
Date:	**Time:**	**Observer(s):**
9/13/00	1240-1250	EO, DT, BK, DM, BL

Overall	Species	Number	Avg. Length (mm)
3	*Etheostoma fonticola*	3	19.6
1	*Lepomis megalotis*	1	14.0
1	*Palaemonetes* sp.		--
sparse	*Thiara granifera*		--

Dip net sweep	Species	Number	Length (mm)
1	No fish or crustaceans collected		
2	*Etheostoma fonticola*	1	27
3	No fish or crustaceans collected		
4	No fish or crustaceans collected		
5	No fish or crustaceans collected		
6	*Lepomis megalotis*	1	14
7	*Palaemonetes* sp.	1	
8	No fish or crustaceans collected		
9	*Etheostoma fonticola*	1	16
10	No fish or crustaceans collected		
11	*Etheostoma fonticola*	1	16
	Thiara granifera	1	
12	No fish or crustaceans collected		
13	No fish or crustaceans collected		
14	No fish or crustaceans collected		
15	No fish or crustaceans collected		

DROP NET - FIELD DATA SHEETS
COMAL RIVER - CRITICAL PERIOD SAMPLING # 2

Location (Reach): Old Channel		**Site:** C1 Site 6	
Date: 9/13/2000	**Time:** 1341-1437	**Observer(s):** EO, BH, DT, DM, BK, BL	
Vegetation:	Type:	*Ceratopteris* / Bare channel bottom	
	Height:	39 cm / N/A	
	Areal Coverage:	90% / 10%	
	GPS location:	**GET FROM MAP**	
Substrate Type:	Small amount of silt over gravel and cobble		
Mean Column Velocity: 0.13 m/s		Velocity at 15cm above the bottom: 0.13 m/s	

Standard Parameters: 1401	Surface	Mid	Bottom
Temperature (C°)	24.82	--	24.81
Dissolved Oxygen (mg/l)	7.69	--	7.67
pH	7.58	--	7.59
Conductivity	549.0	--	549.0
Secchi depth (cm)	Clear to bottom		

Depth (fixed) (meters): 0.92 m

Adjacent 3m cell areas:

Vegetation type:	*Ceratopteris* / Bare channel bottom
Vegetation height:	39 cm / N/A
Areal coverage:	90% / 10%
Substrate type:	Small amount of silt over gravel and cobble

Sample Label:	**Preservative:**

Snails: *Melanoides tuberculata* - none / *Thiara granifera* - none

Sample Label:	**Preservative:**
Number of live Ramshorn snails	Average Size (mm)
0	

DROP NET - FIELD DATA SHEETS
COMAL RIVER - CRITICAL PERIOD SAMPLING # 2

Location (Reach):		Site:
Old Channel		C1 Site 6
Date:	**Time:**	**Observer(s):**
9/13/2000	1253-1315	EO, BH, DT, DM, BK, BL

Overall	Species	Number	Avg. Length (mm)
3	*Etheostoma fonticola*	3	23.3
5	*Lepomis megalotis*	5	22.4
14	*Palaemonetes* sp.		--
1	*Procambarus sp.*		--

Dip net sweep	Species	Number	Length (mm)
1	*Etheostoma fonticola*	1	22
	Lepomis megalotis	2	18,15
	Palaemonetes sp.	2	
	Procambarus sp.	1	
2	*Etheostoma fonticola*	1	24
	Lepomis megalotis	1	39
	Palaemonetes sp.	3	
3	*Lepomis megalotis*	1	24
	Palaemonetes sp.	1	
4	No fish or crustaceans collected		
5	*Palaemonetes* sp.	4	
6	No fish or crustaceans collected		
7	*Etheostoma fonticola*	1	21
8	No fish or crustaceans collected		
9	No fish or crustaceans collected		
10	*Lepomis megalotis*	1	16
	Palaemonetes sp.	2	
11	No fish or crustaceans collected		
12	No fish or crustaceans collected		
13	No fish or crustaceans collected		
14	*Palaemonetes* sp.	1	
15	*Palaemonetes* sp.	1	

DIP NET RESULTS

TABLE 4
DIP NET DATA
COMAL RIVER - CRITICAL PERIOD SAMPLING # 2
SEPTEMBER 8 & 11, 2000

River Section	Date	Number of Darters	Length (mm)
Upper Reach of the Comal River (Section 3)	9/8/2000	1	13
		2	23
		1	24
		1	26
		1	27
	Total Number:	**6**	
Spring Island Run (Section 4)	9/8/2000	1	10
		2	13
		3	15
		1	17
		3	18
		1	19
		1	20
		3	21
		1	23
		3	25
		1	28
		1	30
		1	31
		2	32
		1	33
		1	35
	Total Number:	**26**	
Landa Lake Pecan Island (Section 4)	9/8/2000	2	15
		1	17
		1	18
		1	19
		2	21
		1	22
		1	23
		2	24
		3	25
		4	26
		1	27
		2	28
		1	29
		3	30
		3	31
		5	32
		4	33
		1	34
		1	35
		1	36
	Total Number:	**40**	

TABLE 4
DIP NET DATA
COMAL RIVER - CRITICAL PERIOD SAMPLING # 2
SEPTEMBER 8 & 11, 2000

River Section	Date	Number of Darters	Length (mm)
Old Channel Reach (Section 16)	9/8/2000	1	12
		3	13
		4	14
		2	15
		2	16
		6	17
		3	18
		3	19
		4	20
		3	21
		3	22
		2	23
		3	24
		4	25
		2	26
		2	27
		5	28
		5	30
		2	31
		2	32
		1	33
		1	38
	Total Number:	**63**	
New Channel Reach (Section 10)	9/11/2000	2	13
		1	14
		3	15
		2	16
		4	17
		3	18
		2	19
		2	21
		2	24
		4	25
		1	26
		4	27
		2	28
		2	29
		4	30
		1	31
		3	32
	Total Number:	**42**	

TABLE 4
DIP NET DATA
COMAL RIVER - CRITICAL PERIOD SAMPLING # 2
SEPTEMBER 8 & 11, 2000

River Section	Date	Number of Darters	Length (mm)
Comal River Below Clems Dam (Sections 14)	9/11/2000	1	17
		1	18
		1	20
		2	23
		1	25
		11	27
		4	28
		3	29
		6	30
		3	31
		3	32
		4	33
		1	34
		1	38
	Total Number:	**42**	

MINNOW TRAP – FIELD DATA SHEETS

MINNOW TRAPS - FIELD DATA SHEETS

COMAL RIVER - CRITICAL PERIOD SAMPLING # 2

Location (Reach):				Site:
Landa Lake Reach				Site 1-H2
Date Set:	**Time Set:**	**Date Collected:**	**Time Collected:**	**Observer(s):**
9/12/2000	1603-1638	9/13/2000	0852	Ed Oborny

Species	Number	Length (mm)
Trap 1:		
Cichlasoma cyanoguttatus	1	20
Etheostoma fonitcola	1	18
Gambusia sp.	200	
Palaemonetes sp.	8	
Procambarus sp.	1	
Trap 2:		
Palaemonetes sp.	15	
Procambarus sp.	6	

Location (Reach):				Site:
Landa Lake Reach				Site 2-H1
Date Set:	**Time Set:**	**Date Collected:**	**Time Collected:**	**Observer(s):**
9/12/2000	1603-1638	9/13/2000	0837	Ed Oborny

Species	Number	Length (mm)
Trap 1:		
Cichlasoma cyanoguttatus	1	
Etheostoma fonitcola	1	25
Gambusia sp.	150	
Palaemonetes sp.	10	
Trap 2:		
Gambusia sp.	150	
Palaemonetes sp.	3	
Procambarus sp.	4	

Location (Reach):				Site:
Landa Lake Reach				Site 3-02
Date Set:	**Time Set:**	**Date Collected:**	**Time Collected:**	**Observer(s):**
9/12/2000	1603-1638	9/13/2000	0847	Ed Oborny

Species	Number	Length (mm)
Trap 1:		
Gambusia sp.	1	
Palaemonetes sp.	2	
Trap 2:		
Gambusia sp.	1	
Dionda episcopa	1	

MINNOW TRAPS - FIELD DATA SHEETS

COMAL RIVER - CRITICAL PERIOD SAMPLING # 2

Location (Reach):				Site:
Landa Lake Reach				Site 4 - V2
Date Set:	**Time Set:**	**Date Collected:**	**Time Collected:**	**Observer(s):**
9/12/2000	1603-1638	9/13/2000	0857	Ed Oborny

Species	Number	Length (mm)
Trap 1:		
Cichlasoma cyanoguttatus	1	
Gambusia sp.	45	
Palaemonetes sp.	4	
Trap 2:		
Cichlasoma cyanoguttatus	2	35
Gambusia sp.	50	
Procambarus sp.	1	
Dionda episcopa	1	

Location (Reach):				Site:
Landa Lake Reach				Site 5 - C2
Date Set:	**Time Set:**	**Date Collected:**	**Time Collected:**	**Observer(s):**
9/12/2000	1603-1638	9/13/2000	0908	Ed Oborny

Species	Number	Length (mm)
Trap 1:		
Gambusia sp.	60	
Palaemonetes sp.	8	
Procambarus sp.	4	
Trap 2:		
Gambusia sp.	125	
Palaemonetes sp.	7	

Location (Reach):				Site:
Landa Lake Reach				Site 6 - L2
Date Set:	**Time Set:**	**Date Collected:**	**Time Collected:**	**Observer(s):**
9/12/2000	1603-1638	9/13/2000	0923	Ed Oborny

Species	Number	Length (mm)
Trap 1:		
Etheostoma fonticola	1	32
Gambusia sp.	17	
Lepomis sp.	2	
Palaemonetes sp.	2	
Procambarus sp.	1	
Trap 2:		
Cichlasoma cyanoguttatus	1	
Etheostoma fonticola	2	30,18
Gambusia sp.	28	
Palaemonetes sp.	3	
Procambarus sp.	2	

MINNOW TRAPS - FIELD DATA SHEETS

COMAL RIVER - CRITICAL PERIOD SAMPLING # 2

Location (Reach):				Site:
Landa Lake Reach				Site 7 - O1
Date Set:	**Time Set:**	**Date Collected:**	**Time Collected:**	**Observer(s):**
9/12/2000	1603-1638	9/13/2000	0939	Ed Oborny

Species	Number	Length (mm)
Trap 1:		
Gambusia sp.	35	
Lepomis sp.	1	
Palaemonetes sp.	1	
Trap 2:		
Gambusia sp.	5	
Lepomis sp.	1	
Palaemonetes sp.	1	

Location (Reach):				Site:
Landa Lake Reach				Site 8-L1
Date Set:	**Time Set:**	**Date Collected:**	**Time Collected:**	**Observer(s):**
9/12/2000	1603-1638	9/13/2000	0945	Ed Oborny

Species	Number	Length (mm)
Trap 1:		
Gambusia sp.	17	
Lepomis sp.	2	
Palaemonetes sp.	5	
Procambarus sp.	2	
Trap 2:		
Gambusia sp.	55	
Marisa cornuarietis	1	
Palaemonetes sp.	11	
Procambarus sp.	1	

Location (Reach):				Site:
Landa Lake Reach				Site 9 - C1
Date Set:	**Time Set:**	**Date Collected:**	**Time Collected:**	**Observer(s):**
9/12/2000	1603-1638	9/13/2000	0953	Ed Oborny

Species	Number	Length (mm)
Trap 1:		
Gambusia sp.	35	
Palaemonetes sp.	3	
Dionda episcopa	3	
Trap 2:		
Gambusia sp.	55	
Palaemonetes sp.	9	

MINNOW TRAPS - FIELD DATA SHEETS

COMAL RIVER - CRITICAL PERIOD SAMPLING # 2

Location (Reach):				Site:
Landa Lake Reach				Site 10-V1
Date Set:	**Time Set:**	**Date Collected:**	**Time Collected:**	**Observer(s):**
9/12/2000	1603-1638	9/13/2000	1001	Ed Oborny

Species	Number	Length (mm)
Trap 1:		
Gambusia sp.	85	
Palaemonetes sp.	1	
Procambarus sp.	1	
Trap 2:		
Gambusia sp.	90	
Palaemonetes sp.	3	

Location (Reach):				Site:
Landa Lake Reach				Site 1 - H2
Date Set:	**Time Set:**	**Date Collected:**	**Time Collected:**	**Observer(s):**
9/12/2000	1603-1638	9/13/2000	1518	Ed Oborny

Species	Number	Length (mm)
Trap 1:		
Etheostoma fonticola	2	26, 20
Gambusia sp.	111	15-35
Trap 2:		
Etheostoma fonticola	1	32
Gambusia sp.	1	
Palaemonetes sp.	1	

Location (Reach):				Site:
Landa Lake Reach				Site 2 - H1
Date Set:	**Time Set:**	**Date Collected:**	**Time Collected:**	**Observer(s):**
9/12/2000	1603-1638	9/13/2000	1557	Ed Oborny

Species	Number	Length (mm)
Trap 1:		
Cichlasoma cyanoguttatus	1	
Etheostoma fonticola	1	27
Gambusia sp.	29	
Trap 2:		
Gambusia sp.	29	
Poecilia latipinna	1	

MINNOW TRAPS - FIELD DATA SHEETS

COMAL RIVER - CRITICAL PERIOD SAMPLING # 2

Location (Reach):				Site:
Landa Lake Reach				Site 3 - O2
Date Set:	**Time Set:**	**Date Collected:**	**Time Collected:**	**Observer(s):**
9/12/2000	1603-1638	9/13/2000	1603	Ed Oborny

Species	Number	Length (mm)
Trap 1:		
No fish collected		
Trap 2:		
No fish collected		

Location (Reach):				Site:
Landa Lake Reach				Site 4-V2
Date Set:	**Time Set:**	**Date Collected:**	**Time Collected:**	**Observer(s):**
9/12/2000	1603-1638	9/13/2000	1607	Ed Oborny

Species	Number	Length (mm)
Trap 1:		
Cichlasoma cyanoguttatus	1	
Gambusia sp.	18	
Trap 2:		
Cichlasoma cyanoguttatus	1	
Gambusia sp.	45	

Location (Reach):				Site:
Landa Lake Reach				Site 5-C2
Date Set:	**Time Set:**	**Date Collected:**	**Time Collected:**	**Observer(s):**
9/12/2000	1603-1638	9/13/2000	1610	Ed Oborny

Species	Number	Length (mm)
Trap 1:		
Gambusia sp.	14	
Trap 2:		
Gambusia sp.	90	

MINNOW TRAPS - FIELD DATA SHEETS

COMAL RIVER - CRITICAL PERIOD SAMPLING # 2

Location (Reach):				Site:
Landa Lake Reach				Site 6-L2
Date Set:	**Time Set:**	**Date Collected:**	**Time Collected:**	**Observer(s):**
9/12/2000	1603-1638	9/13/2000	1618	Ed Oborny

Species	Number	Length (mm)
Trap 1:		
Gambusia sp.	13	
Trap 2:		
Gambusia sp.	22	

Location (Reach):				Site:
Landa Lake Reach				Site 7-O1
Date Set:	**Time Set:**	**Date Collected:**	**Time Collected:**	**Observer(s):**
9/12/2000	1603-1638	9/13/2000	1624	Ed Oborny

Species	Number	Length (mm)
Trap 1:		
Gambusia sp.	22	
Trap 2:		
Gambusia sp.	1	

Location (Reach):				Site:
Landa Lake Reach				Site 8-L1
Date Set:	**Time Set:**	**Date Collected:**	**Time Collected:**	**Observer(s):**
9/12/2000	1603-1638	9/13/2000	1629	Ed Oborny

Species	Number	Length (mm)
Trap 1:		
Gambusia sp.	80	
Micropterus salmoides	1	
Trap 2:		
Gambusia sp.	77	
Lepomis sp.	1	

MINNOW TRAPS - FIELD DATA SHEETS

COMAL RIVER - CRITICAL PERIOD SAMPLING # 2

Location (Reach): Landa Lake Reach				Site: Site 9-C1
Date Set: 9/12/2000	Time Set: 1603-1638	Date Collected: 9/13/2000	Time Collected: 1634	Observer(s): Ed Oborny

Species	Number	Length (mm)
Trap 1:		
Gambusia sp.	18	
Palaemonetes sp.	2	
Dionda episcopa	1	
Trap 2:		
Gambusia sp.	26	

Location (Reach): Landa Lake Reach				Site: Site 10-V1
Date Set: 9/12/2000	Time Set: 1603-1638	Date Collected: 9/13/2000	Time Collected: 1644	Observer(s): Ed Oborny

Species	Number	Length (mm)
Trap 1:		
Gambusia sp.	30	
Trap 2:		
Gambusia sp.	90	

MINNOW TRAPS - FIELD DATA SHEETS

COMAL RIVER - CRITICAL PERIOD SAMPLING # 2

Location (Reach):				Site:
Old Channel Reach				Site1-C2
Date Set:	Time Set:	Date Collected:	Time Collected:	Observer(s):
9/13/2000	1710-1721	9/14/2000	0850	Ed Oborny, Lisa Vitale

Species	Number	Length (mm)
Trap 1:		
Etheostoma fonticola	1	23
Lepomis sp.	33	
Palaemonetes sp.	12	
Trap 2:		
Etheostoma fonticola	2	24,19
Lepomis sp.	31	
Palaemonetes sp.	19	

Location (Reach):				Site:
Old Channel Reach				Site1-C2
Date Set:	Time Set:	Date Collected:	Time Collected:	Observer(s):
9/13/2000	1710-1721	9/14/2000	1501	Ed Oborny, David Thomas

Species	Number	Length (mm)
Trap 1:		
Cichlasoma cyanoguttatum	1	
Lepomis sp.	28	
Trap 2:		
Cichlasoma cyanoguttatum	1	
Lepomis sp.	24	
Palaemonetes sp.	1	

Location (Reach):				Site:
Old Channel Reach				Site 2-02
Date Set:	Time Set:	Date Collected:	Time Collected:	Observer(s):
9/13/2000	1710-1721	9/14/2000	0853	Ed Oborny, Lisa Vitale

Species	Number	Length (mm)
Trap 1:		
Astyanax mexicanus	1	
Lepomis sp.	6	
Palaemonetes sp.	15	
Trap 2:		
Lepomis sp.	5	
Palaemonetes sp.	8	

MINNOW TRAPS - FIELD DATA SHEETS

COMAL RIVER - CRITICAL PERIOD SAMPLING # 2

Location (Reach):				Site:
Old Channel Reach				Site 2-02
Date Set:	**Time Set:**	**Date Collected:**	**Time Collected:**	**Observer(s):**
9/13/2000	1710-1721	9/14/2000	1501	Ed Oborny, David Thomas

Species	Number	Length (mm)
Trap 1:		
Cichlasoma cyanoguttatum	1	
Palaemonetes sp.	15	
Trap 2:		
Lepomis macrochirus	1	
Palaemonetes sp.	1	

Location (Reach):				Site:
Old Channel Reach				Site 3-A1
Date Set:	**Time Set:**	**Date Collected:**	**Time Collected:**	**Observer(s):**
9/13/2000	1710-1721	9/14/2000	0853	Ed Oborny, Lisa Vitale

Species	Number	Length (mm)
Trap 1:		
Lepomis sp.	6	
Palaemonetes sp.	16	
Trap 2:		
Cichlasoma cyanoguttatum	1	
Etheostoma fonticola	1	26
Lepomis macrochirus	2	
Lepomis sp.	6	
Palaemonetes sp.	7	

Location (Reach):				Site:
Old Channel Reach				Site 3-A1
Date Set:	**Time Set:**	**Date Collected:**	**Time Collected:**	**Observer(s):**
9/13/2000	1710-1721	9/14/2000	1512	Ed Oborny, David Thomas

Species	Number	Length (mm)
Trap 1:		
Cichlasoma cyanoguttatum	1	
Trap 2:		
Lepomis sp.	1	
Palaemonetes sp.	1	

MINNOW TRAPS - FIELD DATA SHEETS

COMAL RIVER - CRITICAL PERIOD SAMPLING # 2

Location (Reach): Old Channel Reach				Site: Site Added algae site - 1	
Date Set:	Time Set:	Date Collected:	Time Collected:	Observer(s):	
9/13/2000	1710-1721	9/14/2000	0906	Ed Oborny, Lisa Vitale	
Species				**Number**	**Length (mm)**
Trap 1:					
Etheostoma fonticola				1	18
Lepomis sp.				9	
Palaemonetes sp.				8	
Trap 2:					
Lepomis sp.				6	
Palaemonetes sp.				6	

Location (Reach): Old Channel Reach				Site: Site Added algae site - 1	
Date Set:	Time Set:	Date Collected:	Time Collected:	Observer(s):	
9/13/2000	1710-1721	9/14/2000	1515	Ed Oborny, David Thomas	
Species				**Number**	**Length (mm)**
Trap 1:					
Lepomis sp.				10	
Trap 2:					
Lepomis sp.				3	

Location (Reach): Old Channel Reach				Site: Site 4-01	
Date Set:	Time Set:	Date Collected:	Time Collected:	Observer(s):	
9/13/2000	1710-1721	9/14/2000	0910	Ed Oborny, Lisa Vitale	
Species				**Number**	**Length (mm)**
Trap 1:					
No fish in sample					
Trap 2:					
Palaemonetes sp.				6	

MINNOW TRAPS - FIELD DATA SHEETS

COMAL RIVER - CRITICAL PERIOD SAMPLING # 2

Location (Reach):				Site:
Old Channel Reach				Site 4-01
Date Set:	**Time Set:**	**Date Collected:**	**Time Collected:**	**Observer(s):**
9/13/2000	1710-1721	9/14/2000	1518	Ed Oborny, David Thomas

Species	Number	Length (mm)
Trap 1:		
Lepomis sp.	3	
Trap 2:		
Lepomis sp.	1	

Location (Reach):				Site:
Old Channel Reach				Site 5-A2
Date Set:	**Time Set:**	**Date Collected:**	**Time Collected:**	**Observer(s):**
9/13/2000	1710-1721	9/14/2000	0919	Ed Oborny, Lisa Vitale

Species	Number	Length (mm)
Trap 1:		
Palaemonetes sp.	1	
tadpole	1	
Trap 2:		
Lepomis sp.	2	
Palaemonetes sp.	1	

Location (Reach):				Site:
Old Channel Reach				Site 5-A2
Date Set:	**Time Set:**	**Date Collected:**	**Time Collected:**	**Observer(s):**
9/13/2000	1710-1721	9/14/2000	1525	Ed Oborny, David Thomas

Species	Number	Length (mm)
Trap 1:		
No fish in sample		
Trap 2:		
Lepomis sp.	1	

MINNOW TRAPS - FIELD DATA SHEETS

COMAL RIVER - CRITICAL PERIOD SAMPLING # 2

Location (Reach):				Site:
Old Channel Reach				Site Added algae site - 2
Date Set:	**Time Set:**	**Date Collected:**	**Time Collected:**	**Observer(s):**
9/13/2000	1710-1721	9/14/2000	0915	Ed Oborny, Lisa Vitale

Species	Number	Length (mm)
Trap 1:		
Palaemonetes sp.	4	
Lepomis sp.	1	
Trap 2:		
Palaemonetes sp.	7	
Lepomis sp.	1	

Location (Reach):				Site:
Old Channel Reach				Site Added algae site - 2
Date Set:	**Time Set:**	**Date Collected:**	**Time Collected:**	**Observer(s):**
9/13/2000	1710-1721	9/14/2000	1521	Ed Oborny, David Thomas

Species	Number	Length (mm)
Trap 1:		
No fish in sample		
Trap 2:		
No fish in sample		

Location (Reach):				Site:
Old Channel Reach				Site 6-C1
Date Set:	**Time Set:**	**Date Collected:**	**Time Collected:**	**Observer(s):**
9/13/2000	1710-1721	9/14/2000	0922	Ed Oborny, Lisa Vitale

Species	Number	Length (mm)
Trap 1:		
Lepomis macrochirus	3	
Lepomis sp.	4	
Palaemonetes sp.	3	
Procambarus sp.	1	
Trap 2:		
Lepomis sp.	2	

MINNOW TRAPS - FIELD DATA SHEETS

COMAL RIVER - CRITICAL PERIOD SAMPLING # 2

Location (Reach):				Site:
Old Channel Reach				Site 6-C1
Date Set:	**Time Set:**	**Date Collected:**	**Time Collected:**	**Observer(s):**
9/13/2000	1710-1721	9/14/2000	1530	Ed Oborny, David Thomas

Species	Number	Length (mm)
Trap 1:		
Ambloplites rupestris	1	
Cichlasoma cyanoguttatum	5	
Lepomis sp.	3	
Trap 2:		
Lepomis sp.	1	

GILL NET RESULTS

TABLE 5
LANDA LAKE GILL NET DATA
COMAL RIVER - CRITICAL PERIOD SAMPLING #2
SEPTEMBER 14-15, 2000

Species	Total Length (mm)	Total Weight (gr)	Stomach Contents
Micropterus salmoides	209	135.8	Crayfish; *Elimia comalensis*
	152	45.3	Empty
	159	67.9	Crayfish; *Elimia comalensis*
	247	90.6	Crayfish
	296	362.2	Crayfish
	320	498.1	Crayfish
	156	45.3	Unidentifiable digested material
Total Number **7**			
Tilapia aurea	372	1086.7	Empty
	337	860.3	Algae
	275	407.5	Empty
	296	543.4	Empty
	376	1177.3	Empty
	375	1132.0	Algae
	420	1403.7	Empty
	387	1403.7	Empty
	390	1086.7	Empty
	410	1675.3	Empty
	383	1313.1	Algae
Total Number **11**			