WATER QUALITY / VARIABLE FLOW STUDY
SUMMARY OF
CRITICAL PERIOD SAMPLING # 1
COMAL RIVER, NEW BRAUNFLES, TEXAS
AUGUST 23 - 31, 2000

PBS&J

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COMAL RIVER, NEW BRAUNFELS, TEXAS

AUGUST 23 – 31, 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 **First** 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 first Critical Period Monitoring sampling from 23 August to 31 August 2000 with the flows at Comal reporting 177 cfs on 23 August 2000, 168 cfs on 28 August 2000, and 161 cfs on 31 August 2000. The sampling effort consisted of:

EVENT	DATE	LOCATION
Water Quality sampling	28 August	14 sites
Aquatic Vegetation mapping	23-28 August	4 reaches
Fountain Darter sampling		
Drop nets	28-31 August	4 reaches
Dip nets	29-31 August	5 reaches
Salamander observations	30-31 August	Spring runs 1 and 2, and Spring Island area
Macroinvertebrate sampling		
Drift nets	28-29 August	Spring runs 1, 2, and 3

Observations

At the flows present (177 – 161 cfs) during the first 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.

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 study design appears well suited to address the concerns of variable flow and water quality on the biological resources in the Comal system. **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 #1 were conducted in Dr. Groeger's laboratory at SWT.

On 28 August 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. No thermisters were deployed during this effort as they had to be ordered.

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 28-31 August 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	28 August
Landa Lake Reach	10 drop net samples	29 August
New Channel Reach	7 drop net samples	30 August
Old Channel Reach	6 drop net samples	31 August

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 $2m^2$ 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, and Landa Lake Reach were sampled on 29 August 2000; Garden Street Reach and part of the New Channel Reach on 30 August 2000; and Old Channel Reach and remaining New Channel Reach on 31 August 2000. The dip net results are presented in Table 4. Upon collection of enough species for refugia and parasite evaluation purposes, darters less than 15 mm and greater than 25 mm were reported as < 15 and >25, respectively.

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.

No minnow traps were deployed during this effort. New traps had to be ordered to conduct this component.

Visual Observations of fountain darters via SCUBA

Visual aquatic surveys are to be conducted using SCUBA in Landa Lake to identify fountain darters and salamanders at depths deeper than conventional sampling methods allow. Areas are to be surveyed to define what may be considered potential deeper water habitat. A time-constraint survey is to be conducted with observations of all fish species while focusing on fish on the bottom. Larger rocks are to be overturned at the substrate surface to expose any fountain darters or salamanders. All fountain darters and salamanders will be noted. A second focus of the visual observations is 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.

No visual observations of fountain darters were performed during this critical period sampling due to time constraints and the fact that new gill nets had to be ordered for the predation study.

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 30 August 2000, and the Spring Island area on 31 August 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).

Surveys conducted in Spring Run 1 revealed 9 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 revealed 13 salamanders. The survey lasted

approximately 1 hour. Salamanders in Spring Run 3 occurred throughout the survey area. At the time of the survey, 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, surveys conducted revealed the presence of 11 salamanders. The survey was conducted for approximately 30 minutes. Surveys of the outfall of the Spring Island Spring into the Comal River on the east side of Spring Island revealed the presence of 1 salamander. 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.

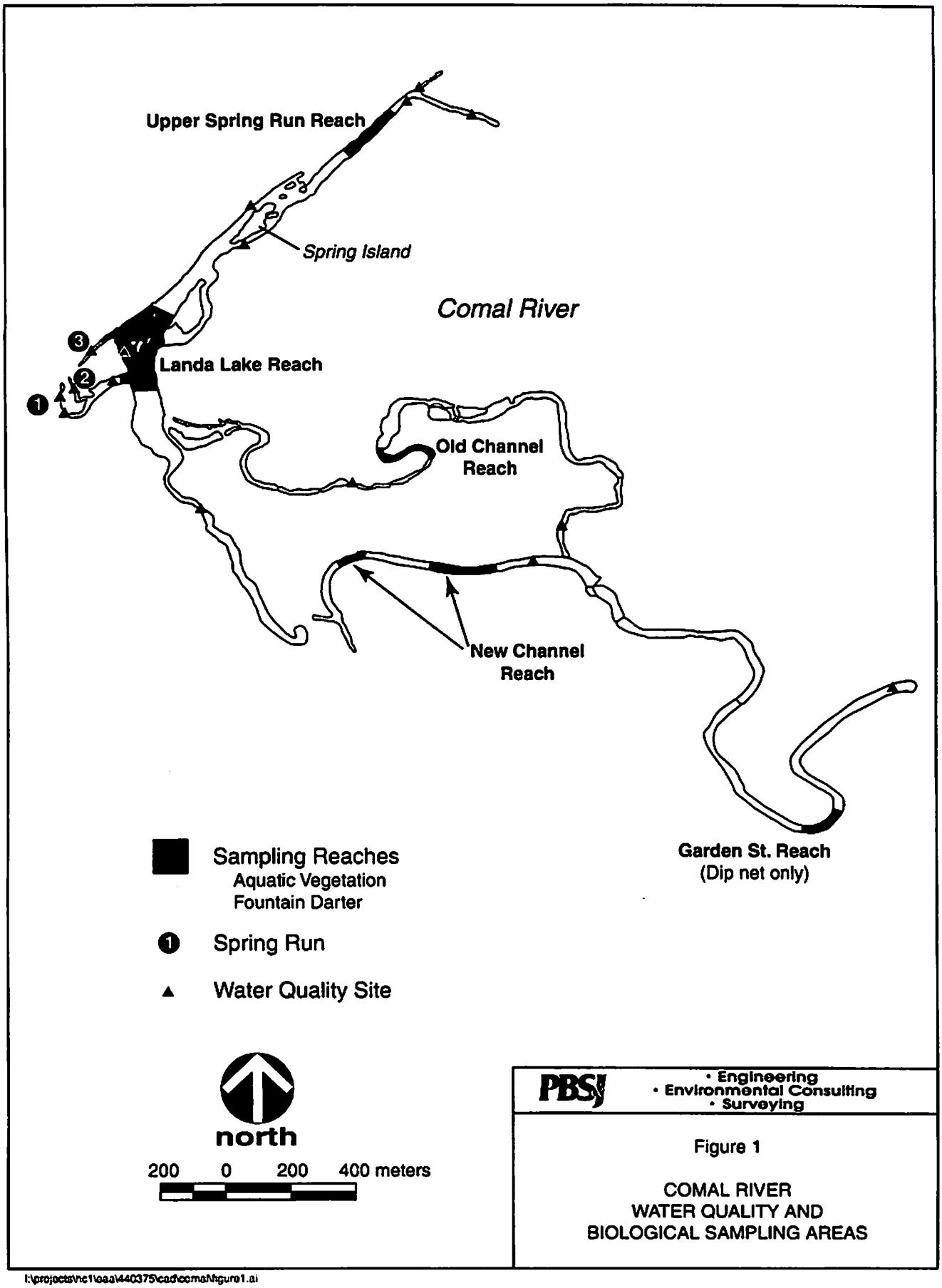
The drift net results were not available at the time of this document submittal. Drift net results will be submitted to the Edwards Aquifer Authority and U.S. Fish and Wildlife Service in a letter report upon completion of identification and compilation.

1.7 EXOTICS / PREDATION STUDY

An 150 ft experimental gill net with mesh sizes ranging from ¾ to 3 inches is to be placed in Landa Lake to collect nekton of various species and sizes. The gill net evaluation is being 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 is to be placed in the areas documented as supporting fountain darters and salamanders through previously described SCUBA activities. All fish collected in the gill net are identified, enumerated, weighed and measured. A number of representative fish are taken from different species and different size classes within species for stomach content analyses. The fish are to be stored on crushed ice until transferred to the SWT Stream Ecology Laboratory where the stomach is to be removed and contents examined. The focus is on predation of fountain darters and/or salamanders by the various species and size classes.

No gill nets were deployed during this effort. New nets had to be ordered to conduct this component.

FIGURES



PBSJ
• Engineering
• Environmental Consulting
• Surveying

Figure 1

COMAL RIVER
WATER QUALITY AND
BIOLOGICAL SAMPLING AREAS

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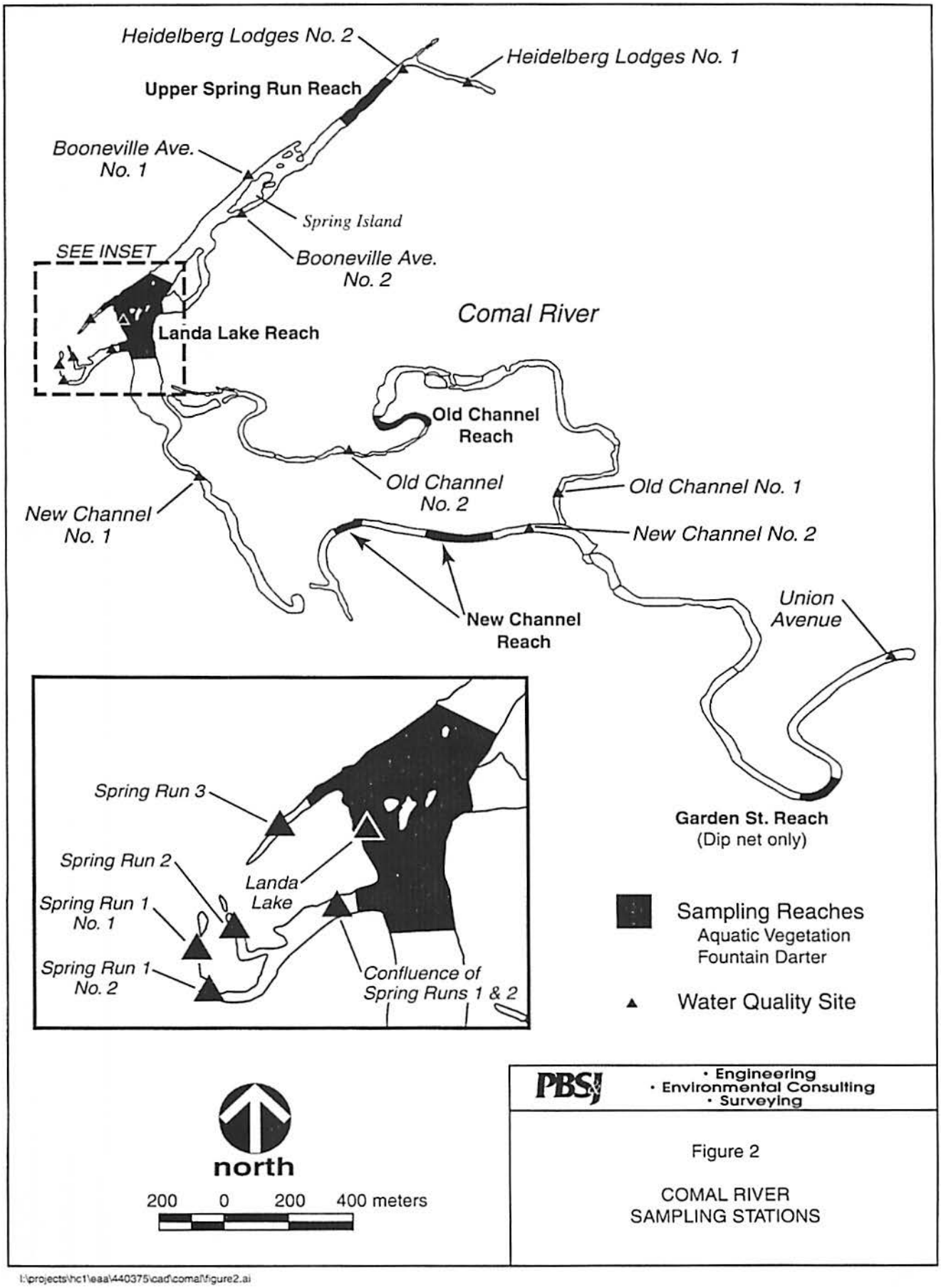

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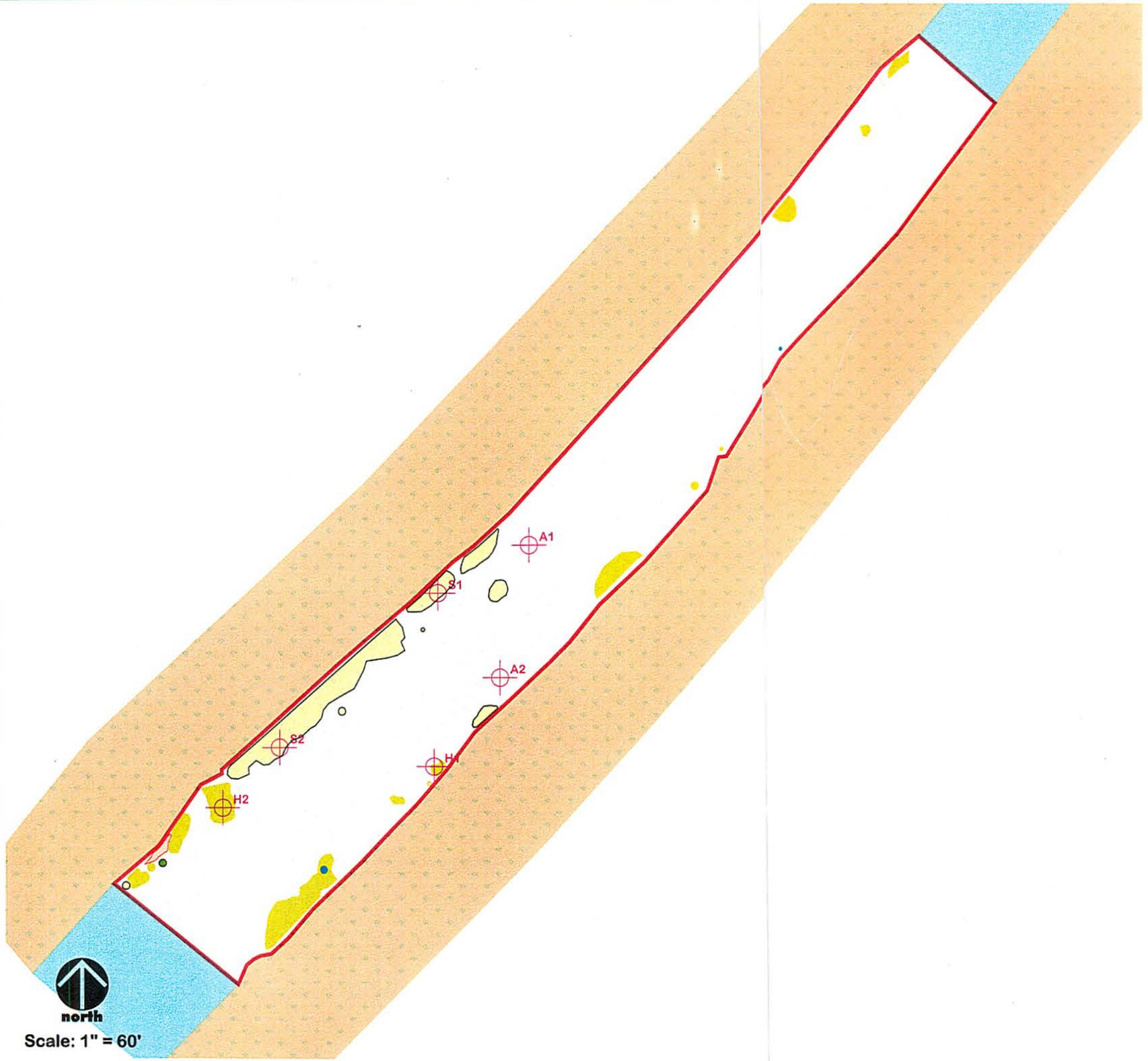

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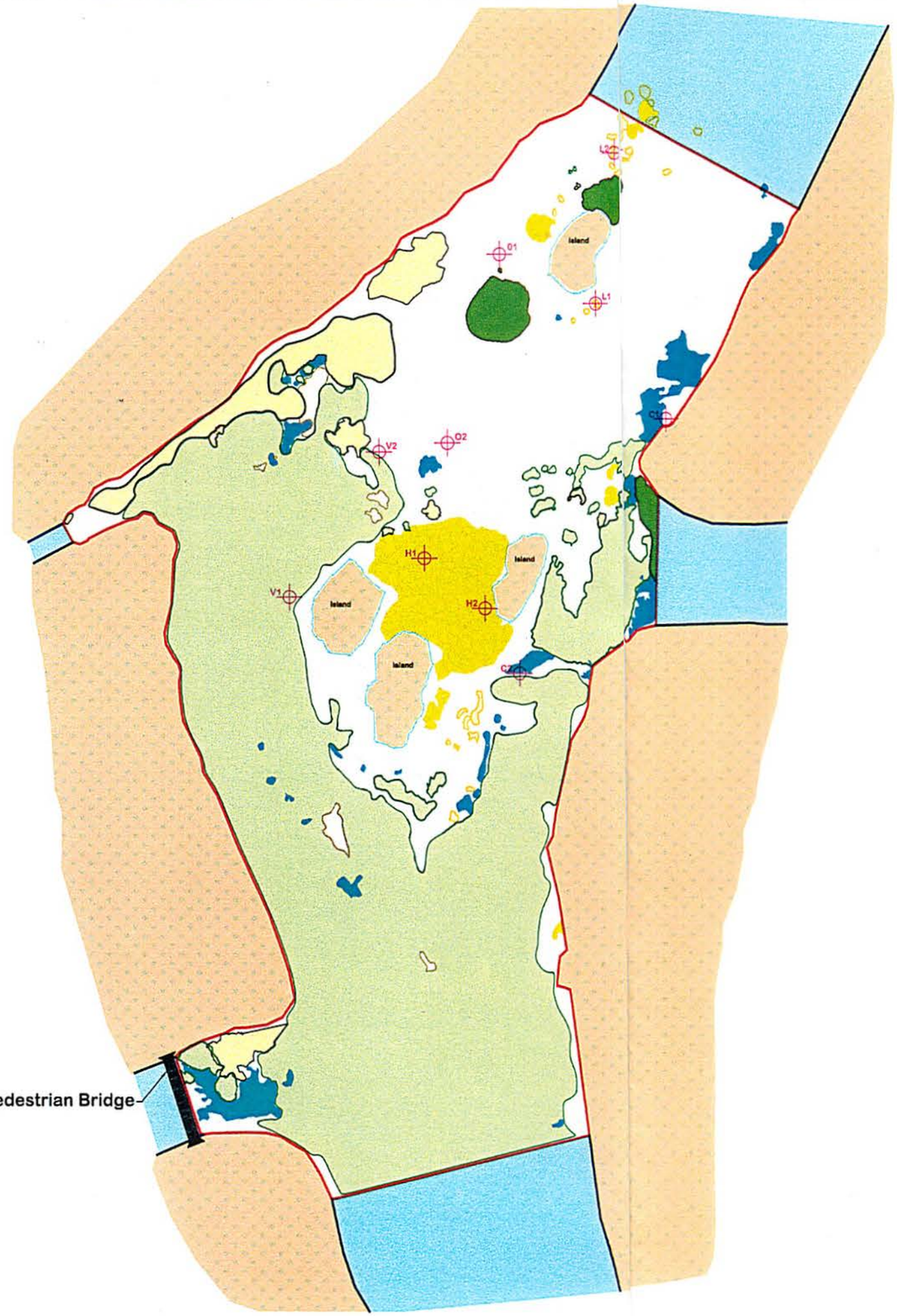
EDWARDS AQUIFER AUTHORITY

Comal River Aquatic Vegetation
Upper Spring Run Reach
August 23, 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	

PBSJ



EDWARDS AQUIFER AUTHORITY

Comal River Aquatic Vegetation
Landa Lake
August 24, 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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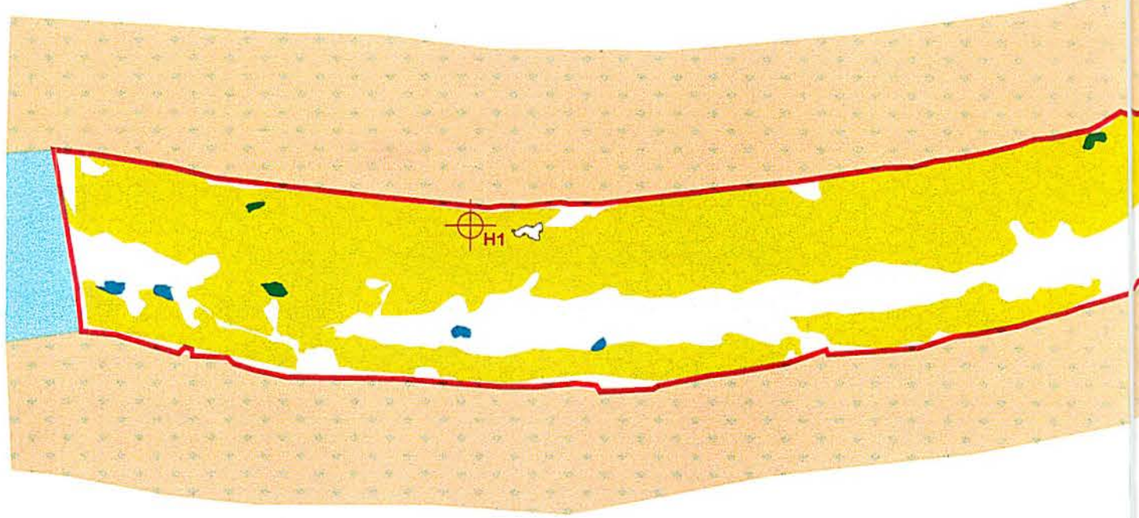
EDWARDS AQUIFER
AUTHORITY

Comal River Aquatic Vegetation
New Channel Reach
August 28, 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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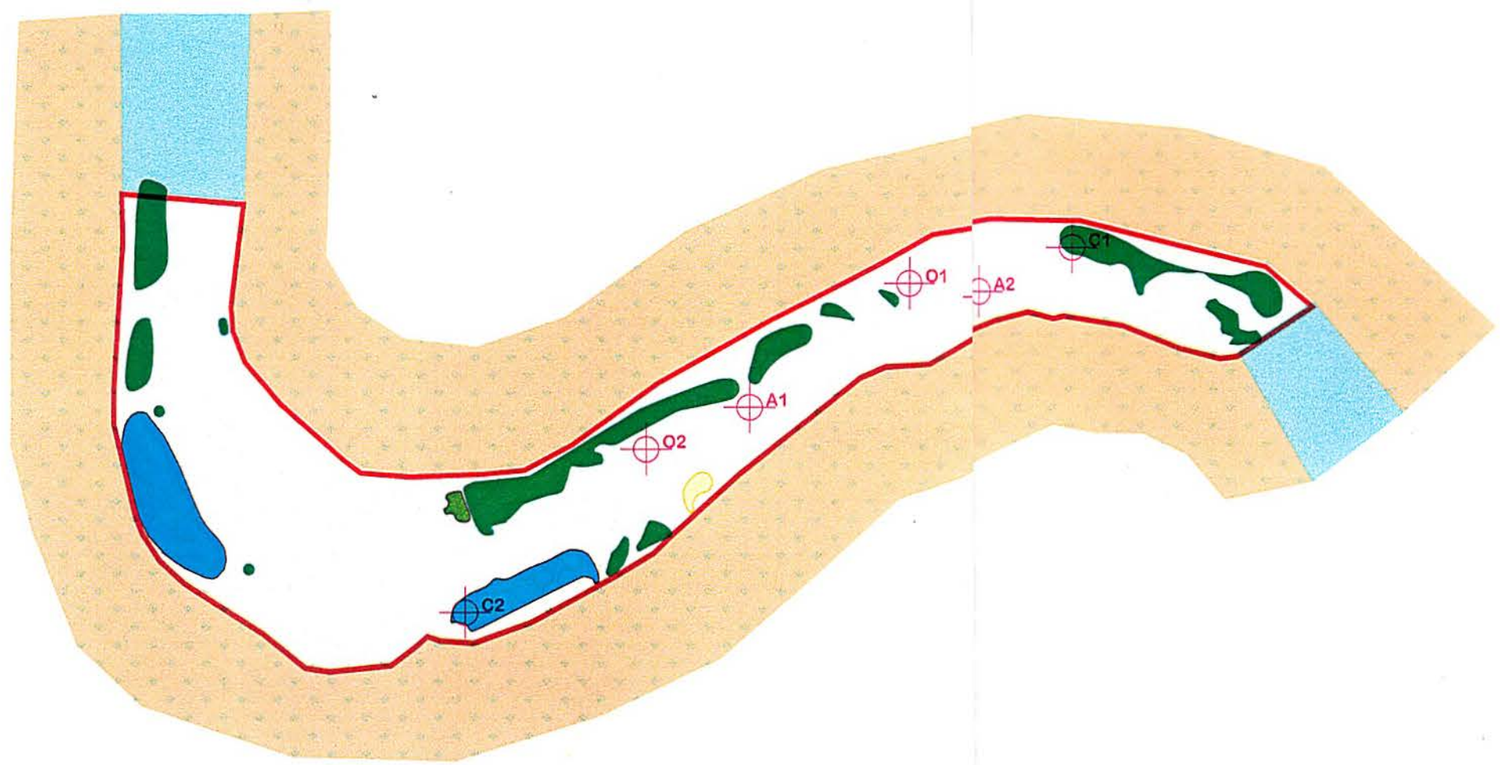
EDWARDS AQUIFER
AUTHORITY

Comal River Aquatic Vegetation
Old Channel Reach
September 8, 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 # 1
AUGUST 28, 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	0900	1.02	24.97	3.91	7.15	510	--	--	--	--	24.8	3.98	7.14	511
Heidelberg Lodge Reach # 2	0920	0.4	--	--	--	--	24.09	4.99	7.19	513	--	--	--	--
Booneville Avenue # 1	0940	1.5	--	--	--	--	23.84	5.97	7.16	509	--	--	--	--
Booneville Avenue # 2	0955	3.4	23.8	4.81	7.11	508	23.78	4.66	7.10	508	23.8	4.30	7.10	508
Spring Run 3	1045	0.6	--	--	--	--	23.55	5.23	7.17	506	--	--	--	--
Spring Run 2	1100	0.6	--	--	--	--	23.62	5.08	7.17	507	--	--	--	--
Spring Run 1 - # 1	1115	0.76	--	--	--	--	23.72	5.10	7.23	508	--	--	--	--
Spring Run 1 - # 2	1121	0.3	23.91	6.60	7.20	508	--	--	--	--	--	--	--	--
Confluence of Sp. Run 1 and 2	1140	1.00	25.00	8.12	7.40	504	--	--	--	--	24.4	7.49	7.38	505
Landa Lake	1303	2.00	--	--	--	--	--	--	--	--	24.7	6.58	7.33	505
New Channel Reach # 1	1318	2.5	25.47	8.60	7.41	503	25.38	9.20	7.31	503	25.4	9.10	7.33	503
Old Channel Reach # 1	1340	0.76	--	--	--	--	25.17	7.10	7.60	511	--	--	--	--
New Channel Reach # 2	1345	2.5	25.11	9.98	7.66	502	25.01	9.86	7.68	502	25.1	9.96	7.70	503
Union Avenue	1415	1.0 +	25.51	9.51	7.79	505	--	--	--	--	25.7	9.36	7.76	523
Old Channel Reach # 2	1455	0.61	--	--	--	--	26.05	8.38	7.60	505	--	--	--	--

TABLE 2 (Concluded)
WATER QUALITY RESULTS
COMAL RIVER - CRITICAL PERIOD SAMPLING # 1
AUGUST 28, 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	2.6	4.10	10.10	33.00	0.261	1.794	1.961	0.026
Heidelberg Lodge Reach # 2	1.4	3.97	2.26	17.14	0.021	1.700	1.799	0.028
Booneville Avenue # 1	1.6	4.27	4.88	22.31	0.016	1.557	1.683	0.049
Booneville Avenue # 2	1.1	4.29	3.48	19.21	0.030	5.969	0.617	0.018
Spring Run 3	1.1	4.14	3.31	17.83	0.025	2.337	2.496	0.017
Spring Run 2	0.9	4.12	4.70	20.93	0.021	2.117	1.060	0.0003
Spring Run 1 - # 1	1.1	4.08	2.79	19.90	0.025	2.075	2.125	0.018
New Channel Reach # 1	1.7	4.16	2.26	27.14	MIA	1.732	1.714	0.030
Old Channel Reach # 1	2.2	4.40	5.75	25.41	0.012	1.769	1.697	0.023
New Channel Reach # 2	1.5	4.21	2.09	18.52	0.032	1.787	2.114	0.044
Union Avenue	1.9	4.29	2.79	17.14	0.025	5.826	1.001	0.019
Old Channel Reach # 2	2.0	4.27	2.44	21.28	0.025	1.645	0.633	0.021

TABLE 3
LIST OF FIXED PHOTOGRAPHS
COMAL RIVER - CRITICAL PERIOD SAMPLING #1

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 # 1

Location (Reach): Upper Spring Run		**Site:** A1 Site 1	
Date: 8/28/2000	**Time:** 1330-1353	**Observer(s):** EO, DT, TA, TB	
Vegetation:	Type:	Algae - drop net set under branches and shade of pecan trees	
	Height:	N/A	
	Areal Coverage:	90%	
	GPS location:	**GET FROM MAP**	
Substrate Type:	Small gravel, cobble, boulder		
Mean Column Velocity: 0.02 m/s		Velocity at 15cm above the bottom: 0.00 m/s	

Standard Parameters:	Surface	Mid	Bottom
Temperature (C°)	25.18	--	25.34
Dissolved Oxygen (mg/l)	7.99	--	7.38
pH	7.35	--	7.25
Conductivity	510.0	--	509.0
Secchi depth (cm)			

Depth (fixed) (meters): 0.9 m

Adjacent 3m cell areas:

Vegetation type:	Algae
Vegetation height:	N/A
Areal coverage:	75%
Substrate type:	Cobble to small boulders

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 # 1

Location (Reach):		Site:
Upper Spring Run		A1 Site 1
Date:	**Time:**	**Observer(s):**
8/28/2000	1330-1353	EO, DT, TA, TB

Overall	Species	Number	Avg. Length (mm)
1	*Cichlasoma cyanoguttatum*	1	18.0
1	*Gambusia* sp.	1	15.0
1	*Lepomis macrochirus*	1	20.0
1	*Micropterus* sp.	1	15.0

Dip net sweep	Species	Number	Length (mm)
1	No fish or crustaceans collected		
2	*Micropterus* sp.	1	15
3	*Lepomis macrochirus*	1	20
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	*Cichlasoma cyanoguttatum*	1	18
9	No fish or crustaceans collected		
10	*Gambusia* sp.	1	15
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 # 1

Location (Reach): Upper Spring Run		**Site:** A2 Site 2	
Date: 8/28/2000	**Time:** 1401-1419	**Observer(s):** EO, DT, TA, TB	
Vegetation:	Type: Algae		
	Height: N/A		
	Areal Coverage: 80%		
	GPS location: **GET FROM MAP**		
Substrate Type:	Gravel to cobble, prediminately gravel		
Mean Column Velocity: 0.0 - 20% 0.01 - 80%		Velocity at 15cm above the bottom: 0.0 m/s	
Standard Parameters:	Surface	Mid	Bottom
Temperature (C°)	26.19	--	24.95
Dissolved Oxygen (mg/l)	8.62	--	8.12
pH	7.33	--	7.23
Conductivity	503.0	--	509.0
Secchi depth (cm)			
Depth (fixed) (meters): 1.1 m			
Adjacent 3m cell areas:			
Vegetation type:	Algae		
Vegetation height:	N/A		
Areal coverage:	80%		
Substrate type:	Predominately gravel		
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 # 1

Location (Reach):	Site:
Upper Spring Run	A2 Site 2
Date: 8/28/2000	**Time:** 1401-1419
Observer(s): EO, DT, TA, TB	

Overall	Species	Number	Avg. Length (mm)
1	*Lepomis macrochirus*	1	17.0
3	*Lepomis megalotis*		--
1	*Micropterus* sp.		--
2	*Notropis amabilis*		--
sparse	*Thiara granifera*		--

Dip net sweep	Species	Number	Length (mm)
1	*Micropterus* sp.	1	
2	*Lepomis megalotis*	1	
	Notropis amabilis	2	
	Thiara granifera	1	
3	No fish or crustaceans collected		
4	No fish or crustaceans collected		
5	*Notropis amabilis*	1	
6	No fish or crustaceans collected		
7	*Thiara granifera*	sparse	
8	No fish or crustaceans collected		
9	*Lepomis macrochirus*	1	17
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	*Lepomis megalotis*	1	
15	*Lepomis megalotis*	1	

DROP NET - FIELD DATA SHEETS
COMAL RIVER - CRITICAL PERIOD SAMPLING # 1

Location (Reach): Upper Spring Run		**Site:** S1 Site 3	
Date: 8/28/2000	**Time:** 1425-1449	**Observer(s):** EO, DT, TA, TB	
Vegetation:	Type: *Sagittaria*		
	Height: 30.5 cm		
	Areal Coverage: 100%		
	GPS location: **GET FROM MAP**		
Substrate Type: Silt over gravel			
Mean Column Velocity: 0.0 m/s		Velocity at 15cm above the bottom: 0.0 m/s	

Standard Parameters:	Surface	Mid	Bottom
Temperature (C°)	26.04	--	25.28
Dissolved Oxygen (mg/l)	7.86	--	8.16
pH	7.35	--	7.20
Conductivity	508.0	--	509.0
Secchi depth (cm)			

Depth (fixed) (meters): 0.7 m

Adjacent 3m cell areas:

Vegetation type:	*Sagittaria*
Vegetation height:	30.5 cm
Areal coverage:	100%
Substrate type:	Silt over gravel

Sample Label:	**Preservative:**

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

Sample Label:	**Preservative:**
Number of live Ramshorn snails	Average Size (mm)
1	36.0

DROP NET - FIELD DATA SHEETS
COMAL RIVER - CRITICAL PERIOD SAMPLING # 1

Location (Reach):	Site:
Upper Spring Run	S1 Site 3
Date: 8/28/2000	**Time:** 1425-1449
Observer(s):	EO, DT, TA, TB

Overall	Species	Number	Avg. Length (mm)
1	*Ameriurus natalis*	1	73.0
1	*Cichlasoma cyanoguttatum*	1	31.0
13	*Lepomis macrochirus*	13	39.0
5	*Lepomis megalotis*	1	41.0
1	*Lepomis microlophus*	1	43.0
sparse	*Melanoides tuberculata*		--
1	*Micropterus salmoides*	1	41.0
1	*Notropis amabilis*	1	25.0
1	*Procambarus* sp.		--
			--
			--

Dip net sweep	Species	Number	Length (mm)
1	*Lepomis megalotis*	4	
2	*Cichlasoma cyanoguttatum*	1	31
	Lepomis macrochirus	4	40-62
	Lepomis megalotis	1	41
	Lepomis microlophus	1	43
3	*Procambarus* sp.	1	
4	*Lepomis macrochirus*	8	23-41
5	No fish or crustaceans collected		
6	*Micropterus salmoides*	1	41
7	*Ameriurus natalis*	1	73
	Notropis amabilis	1	25
10	*Lepomis macrochirus*	1	41
11	No fish or crustaceans collected		

DROP NET - FIELD DATA SHEETS
COMAL RIVER - CRITICAL PERIOD SAMPLING # 1

Dip net sweep	Species	Number	Length (mm)
12	No fish or crustaceans collected		
13	*Melanoides tuberculata*	1	
14	No fish or crustaceans collected		
15	No fish or crustaceans collected		

DROP NET - FIELD DATA SHEETS
COMAL RIVER - CRITICAL PERIOD SAMPLING # 1

Location (Reach): Upper Spring Run		**Site:** S2 Site 4	
Date: 8/28/2000	**Time:** 1451-1507	**Observer(s):** EO, DT, CN, TB	
Vegetation:	Type: *Sagittaria* with algae		
	Height: 30.5 cm		
	Areal Coverage: 100%		
	GPS location: **GET FROM MAP**		
Substrate Type:	Silt over gravel with small cobble		
Mean Column Velocity: 0.01 m/s		Velocity at 15cm above the bottom: 0.0 m/s	

Standard Parameters:	Surface	Mid	Bottom
Temperature (C°)	26.75	--	26.46
Dissolved Oxygen (mg/l)	9.21	--	9.66
pH	7.39	--	7.32
Conductivity	509.0	--	509.0
Secchi depth (cm)	Clear to bottom		

Depth (fixed) (meters): 0.62 m

Adjacent 3m cell areas:

Vegetation type:	*Sagittaria*
Vegetation height:	30.5 cm
Areal coverage:	100%
Substrate type:	Silt over gravel

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 # 1

Location (Reach):		Site:
Upper Spring Run		S2 Site 4
Date:	**Time:**	**Observer(s):**
8/28/2000	1451-1507	EO, DT, CN, TB

Overall	Species	Number	Avg. Length (mm)
2	*Cichlasoma cyanoguttatum*	2	59.0
6	*Lepomis macrochirus*	6	46.3
1	*Lepomis megalotis*	1	112.0
1	*Micropterus salmoides*	1	56.0
2	*Palaemonetes* sp.	2	30.5
4	*Procambarus* sp.		--

Dip net sweep	Species	Number	Length (mm)
1	*Lepomis macrochirus*	1	20
	Micropterus salmoides	1	56
	Palaemonetes sp.	2	27-34
	Procambarus sp.	4	
2	*Lepomis macrochirus*	2	62-64
3	*Cichlasoma cyanoguttatum*	1	53
	Lepomis macrochirus	1	50
	Lepomis megalotis	1	112
4	*Lepomis macrochirus*	1	57
5	*Lepomis macrochirus*	1	25
6	*Cichlasoma cyanoguttatum*	1	65
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 # 1

Location (Reach): Upper Spring Run		**Site:** H1 Site 5	
Date: 8/28/2000	**Time:** 1509-1538	**Observer(s):** EO, DT, CN, TB	
Vegetation:	Type: *Hygrophila*		
	Height: 22.9 cm		
	Areal Coverage: 100%		
	GPS location: **GET FROM MAP**		
Substrate Type: Silt over gravel			
Mean Column Velocity: 0.01 m/s		Velocity at 15cm above the bottom: 0.01 m/s	

Standard Parameters:	Surface	Mid	Bottom
Temperature (C°)	27.01	--	26.80
Dissolved Oxygen (mg/l)	9.64	--	9.59
pH	7.48	--	7.30
Conductivity	509.0	--	509.0
Secchi depth (cm)			

Depth (fixed) (meters): 0.8 m

Adjacent 3m cell areas:

Vegetation type:	*Hygrophila*
Vegetation height:	22.9 cm
Areal coverage:	100%
Substrate type:	Silt and sand over gravel

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 # 1

Location (Reach):		Site:
Upper Spring Run		H1 Site 5
Date:	**Time:**	**Observer(s):**
8/28/2000	1509-1538	EO, DT, CN, TB, MH

Overall	Species	Number	Avg. Length (mm)
3	*Cichlasoma cyanoguttatum*	3	27.0
1	*Dionda episcopa*	1	17.0
19	*Lepomis macrochirus*	19	32.2
1	*Lepomis megalotis*	1	111.0
3	*Micropterus salmoides*	3	32.3
4	*Notropis amabilis*	4	28.6
2	*Palaemonetes* sp.	2	24.0
1	*Pimephales vigilax*	1	43.0
4	*Procambarus* sp.		--
sparse	*Thiara granifera*		--

Dip net sweep	Species	Number	Length (mm)
1	*Cichlasoma cyanoguttatum*	2	25-26
	Lepomis macrochirus	7	21-39
	Notropis amabilis	2	31-43
	Palaemonetes sp.	1	28
	Pimephales vigilax	1	43
	Procambarus sp.	1	
2	*Lepomis macrochirus*	3	27-31
	Micropterus salmoides	2	20-21
	Notropis amabilis	2	20-21
	Thiara granifera	sparse	
3	*Lepomis macrochirus*	2	29-34
	Micropterus salmoides	1	44
	Thiara granifera	sparse	
4	*Palaemonetes* sp.	1	20

DROP NET - FIELD DATA SHEETS

COMAL RIVER - CRITICAL PERIOD SAMPLING # 1

Dip net sweep	Species	Number	Length (mm)
5	*Cichlasoma cyanoguttatum*	1	30
	Lepomis macrochirus	1	15
	Procambarus sp.	1	
6	*Lepomis macrochirus*	1	56
7	*Lepomis macrochirus*	2	15-51
8	*Lepomis macrochirus*	2	18
	Procambarus sp.	2	
	Thiara granifera	sparse	
9	*Dionda episcopa*	1	17
	Lepomis megalotis	1	111
10	*Lepomis macrochirus*	1	37
	Thiara granifera	sparse	
11	*Thiara granifera*	sparse	
12	*Thiara granifera*	sparse	
13	No fish or crustaceans collected		
14	*Thiara granifera*	sparse	
15	No fish or crustaceans collected		

DROP NET - FIELD DATA SHEETS
COMAL RIVER - CRITICAL PERIOD SAMPLING # 1

Location (Reach): Upper Spring Run		**Site:** H2 Site 6	
Date: 8/28/2000	**Time:** 1542-1619	**Observer(s):** EO, DT, CN, TB	
Vegetation:	Type: *Hygrophila*		
	Height: 22.9 cm		
	Areal Coverage: 100%		
	GPS location: **GET FROM MAP**		
Substrate Type:	Silt over gravel with cobble over bedrock		
Mean Column Velocity: 0.0 m/s		Velocity at 15cm above the bottom: 0.0 m/s	

Standard Parameters:	Surface	Mid	Bottom
Temperature (C°)	26.82	--	26.25
Dissolved Oxygen (mg/l)	9.79	--	9.86
pH	7.38	--	7.30
Conductivity	506.0	--	506.0
Secchi depth (cm)	clear to bottom		

Depth (fixed) (meters): 0.8 m

Adjacent 3m cell areas:

Vegetation type:	*Hygrophila*
Vegetation height:	22.9 cm
Areal coverage:	100%
Substrate type:	Silt-sand over gravel on bedrock

Sample Label:	**Preservative:**

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

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

DROP NET - FIELD DATA SHEETS
COMAL RIVER - CRITICAL PERIOD SAMPLING # 1

Location (Reach):		Site:
Upper Spring Run		H2 Site 6
Date:	**Time:**	**Observer(s):**
8/28/2000	1542-1619	EO, DT, CN, TB, MH

Overall	Species	Number	Avg. Length (mm)
25	*Astyanax mexicanus*	25	33.0
1	*Cichlasoma cyanoguttatum*	1	20.0
11	*Dionda episcopa*	11	32.2
8	*Gambusia* sp.	8	28.4
1	*Lepomis gulosus*	1	63.0
21	*Lepomis macrochirus*	21	32.4
15	*Notropis amabilis*	15	39.1
3	*Pimephales vigilax*	3	41.3
11	*Procambarus* sp.	11	--
sparse	*Thiara granifera*		--
2	*Tilapia aurea*	2	345.0

Dip net sweep	Species	Number	Length (mm)
1	*Astyanax mexicanus*	13	17-47
	Lepomis gulosus	1	63
	Lepomis macrochirus	9	22-75
	Notropis amabilis	4	37-41
	Pimephales vigilax	3	41-42
	Thiara granifera	sparse	27-37
2	*Gambusia* sp.	3	19-23
	Lepomis macrochirus	3	30-37
	Notropis amabilis	11	35-43
	Procambarus sp.	2	
	Thiara granifera	sparse	
3	No fish or crustaceans collected		
4	*Tilapia aurea*	2	340-350
5	*Astyanax mexicanus*	12	27-43
	Gambusia sp.	5	24-37

DROP NET - FIELD DATA SHEETS
COMAL RIVER - CRITICAL PERIOD SAMPLING # 1

Dip net sweep	Species	Number	Length (mm)
6	*Dionda episcopa*	11	25-37
	Lepomis macrochirus	8	20-29
	Procambarus sp.	6	
7	No fish or crustaceans collected		
8	*Procambarus* sp.	1	
9	No fish or crustaceans collected		
10	*Procambarus* sp.	1	
11	*Cichlasoma cyanoguttatum*	1	20
12	*Lepomis macrochirus*	1	33
	Procambarus sp.	1	
	Thiara granifera	sparse	
13	No fish or crustaceans collected		
14	No fish or crustaceans collected		
15	No fish or crustaceans collected		

LANDA LAKE REACH

DROP NET - FIELD DATA SHEETS
COMAL RIVER - CRITICAL PERIOD SAMPLING # 1

Location (Reach): Landa Lake		**Site:** L2 Site 1	
Date: 8/29/2000	**Time:** 0830	**Observer(s):** EO, LV, DT, MH	
Vegetation:	Type: *Ludwigia / Riccia*		
	Height: 46 cm		
	Areal Coverage: 60% / 40%		
	GPS location: **GET FROM MAP**		
Substrate Type:	Small gravel, cobble, boulder		
Mean Column Velocity: N/A		Velocity at 15cm above the bottom: 0.01 m/s	
Standard Parameters:	Surface	Mid	Bottom
Temperature (C°)	25.42	25.26	25.30
Dissolved Oxygen (mg/l)	6.65	6.62	6.31
pH	7.20	7.20	7.24
Conductivity	506.0	506.0	504.0
Secchi depth (cm)			
Depth (fixed) (meters): 0.79 m			
Adjacent 3m cell areas:			
Vegetation type:	Bare channel bottom / *Ludwigia* / *Hygrophila*		
Vegetation height:	N/A / 52 cm / N/A		
Areal coverage:	20% / 40% / 20%		
Substrate type:	Silt on top of sand/gravel		
Sample Label:	**Preservative:**		
Snails: *Melanoides tuberculata* - none / *Thiara granifera* - abundant			
Sample Label:	**Preservative:**		
Number of live Ramshorn snails	Average Size (mm)		
5	N/A		

DROP NET - FIELD DATA SHEETS
COMAL RIVER - CRITICAL PERIOD SAMPLING # 1

Location (Reach):		Site:
Landa Lake		L2 Site 1
Date:	**Time:**	**Observer(s):**
8/29/2000	0830	EO, LV, DT, MH

Overall	Species	Number	Avg. Length (mm)
61	*Etheostoma fonticola*	61	26.3
832	*Gambusia* sp.		--
83	*Palaemonetes* sp.		--
86	*Procambarus* sp.		--
abundant	*Thiara granifera*		--

Dip net sweep	Species	Number	Length (mm)
1	*Etheostoma fonticola*	8	15-38
2	*Etheostoma fonticola*	8	26-29
3	*Etheostoma fonticola*	5	23-32
4	*Etheostoma fonticola*	5	22-34
5	*Etheostoma fonticola*	6	23-32
6	*Etheostoma fonticola*	5	15-32
7	*Etheostoma fonticola*	2	24-25
8	*Etheostoma fonticola*	3	22-24
9	*Etheostoma fonticola*	3	26-28
10	*Etheostoma fonticola*	2	26-32
11	*Etheostoma fonticola*	1	25
12	*Etheostoma fonticola*	2	24-28
15	*Etheostoma fonticola*	3	23-29

DROP NET - FIELD DATA SHEETS
COMAL RIVER - CRITICAL PERIOD SAMPLING # 1

Location (Reach): Landa Lake		**Site:** L1 Site 2	
Date: 8/29/2000	**Time:** 1022-1112	**Observer(s):** EO, LV, DT, MH	
Vegetation:	Type:	*Ludwigia* / Bare channel bottom	
	Height:	81 cm / N/A	
	Areal Coverage:	85% / 15%	
	GPS location:	**GET FROM MAP**	
Substrate Type:	Cobble with some smaller rocks		
Mean Column Velocity: 20% - 0.05 m/s / 80% - 0.01 m/s		Velocity at 15cm above the bottom: 0.00 m/s	

Standard Parameters:	Surface	Mid	Bottom
Temperature (C°)	25.12	24.98	24.95
Dissolved Oxygen (mg/l)	6.84	6.68	6.66
pH	7.17	7.17	7.17
Conductivity	507.0	507.0	507.0
Secchi depth (cm)			

Depth (fixed) (meters): 1.0 m

Adjacent 3m cell areas:

Vegetation type:	*Ludwigia* / Bare channel bottom
Vegetation height:	75 cm / N/A
Areal coverage:	5%
Substrate type:	Cobble with some smaller rocks

Sample Label:	**Preservative:**

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

Sample Label:	**Preservative:**
Number of live Ramshorn snails	Average Size (mm)
4	N/A

DROP NET - FIELD DATA SHEETS
COMAL RIVER - CRITICAL PERIOD SAMPLING # 1

Location (Reach):		Site:
Landa Lake		L1 Site 2
Date:	**Time:**	**Observer(s):**
8/29/2000	1022-1112	EO, LV, DT, MH

Overall	Species	Number	Avg. Length (mm)
2	*Cichlasoma cyanoguttatum*	2	21.0
27	*Etheostoma fonticola*	27	22.6
1911	*Gambusia* sp.	1911	20.0
46	*Palaemonetes* sp.		--
31	*Procambarus* sp.		--
moderate	*Thiara granifera*		--

Dip net sweep	Species	Number	Length (mm)
1	*Etheostoma fonticola*	9	23-26
2	*Etheostoma fonticola*	2	15-24
4	*Etheostoma fonticola*	6	21-27
6	*Etheostoma fonticola*	2	18-26
9	*Etheostoma fonticola*	2	18-23
11	*Etheostoma fonticola*	3	18-22
13	*Etheostoma fonticola*	2	22-25
14	*Etheostoma fonticola*	1	20

DROP NET - FIELD DATA SHEETS
COMAL RIVER - CRITICAL PERIOD SAMPLING # 1

Location (Reach): Landa Lake		**Site:** C1 Site 3	
Date: 8/29/2000	**Time:** 1122-1202	**Observer(s):** EO, DT, MH, LV, AG	
Vegetation:	Type: *Cabomba*		
	Height: surface		
	Areal Coverage: 100%		
	GPS location: **GET FROM MAP**		
Substrate Type:	Small gravel, cobble, boulder		
Mean Column Velocity: N/A		Velocity at 15cm above the bottom: 0.0 m/s	
Standard Parameters:	Surface	Mid	Bottom
Temperature (C°)	25.30	25.32	25.34
Dissolved Oxygen (mg/l)	7.51	7.28	7.44
pH	7.20	7.20	7.24
Conductivity	508.0	506.0	508.0
Secchi depth (cm)			
Depth (fixed) (meters): 0.64 m			
Adjacent 3m cell areas:			
Vegetation type:	*Cabomba* / silt		
Vegetation height:	surface / N/A		
Areal coverage:	70% / 30%		
Substrate type:	Silt/mud		
Sample Label:		**Preservative:**	
Snails: *Melanoides tuberculata* - none / *Thiara granifera* - abundant			
Sample Label:		**Preservative:**	
Number of live Ramshorn snails		Average Size (mm)	
2		N/A	

DROP NET - FIELD DATA SHEETS
COMAL RIVER - CRITICAL PERIOD SAMPLING # 1

Location (Reach):		Site:
Landa Lake		C1 Site 3
Date:	**Time:**	**Observer(s):**
8/29/2000	1122-1202	EO, LV, DT, MH, AG

Overall	Species	Number	Avg. Length (mm)
1	*Cichlasoma cyanoguttatum*		--
2	*Etheostoma fonticola*	2	29.5
382	*Gambusia* sp.	382	21.3
2	*Palaemonetes* sp.		--
6	*Poecilia latipinna*	6	22.7
32	*Procambarus clarki*		--
abundant	*Thiara granifera*		--

Dip net sweep	Species	Number	Length (mm)
1	*Etheostoma fonticola*	2	29-30

DROP NET - FIELD DATA SHEETS
COMAL RIVER - CRITICAL PERIOD SAMPLING # 1

Location (Reach): Landa Lake		**Site:** O1 Site 4	
Date: 8/29/2000	**Time:** 1208-1230	**Observer(s):** EO, DT, MH, LV, AG	
Vegetation:	Type:	*Riccia* / Bare channel bottom	
	Height:	5 cm / N/A	
	Areal Coverage:	50% / 50%	
	GPS location:	**GET FROM MAP**	
Substrate Type:	Cobble		
Mean Column Velocity: 20% - 0.01 m/s / 80% - 0.0 m/s		Velocity at 15cm above the bottom: 0.00 m/s	

Standard Parameters:	Surface	Mid	Bottom
Temperature (C°)	25.26	25.22	24.78
Dissolved Oxygen (mg/l)	6.77	6.26	5.22
pH	7.19	7.20	7.22
Conductivity	510.0	508.0	511.0
Secchi depth (cm)			

Depth (fixed) (meters): 1.1 m

Adjacent 3m cell areas:

Vegetation type:	*Riccia* / Bare channel bottom
Vegetation height:	5 cm / N/A
Areal coverage:	40% / 60%
Substrate type:	Cobble

Sample Label:	**Preservative:**

Snails: *Melanoides tuberculata* - none / *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 # 1

Location (Reach):		Site:	
Landa Lake		O1 Site 4	
Date:	**Time:**	**Observer(s):**	
8/29/2000	1208-1230	EO, LV, DT, MH, AG	
Overall	**Species**	**Number**	**Avg. Length (mm)**
4	*Etheostoma fonticola*	4	19.3
21	*Gambusia* sp.	21	8.0
5	*Procambarus* sp.		--
abundant	*Thiara granifera*		--
Dip net sweep	**Species**	**Number**	**Length (mm)**
1	*Etheostoma fonticola*	2	19-23
6	*Etheostoma fonticola*	1	17
7	*Etheostoma fonticola*	1	18

DROP NET - FIELD DATA SHEETS
COMAL RIVER - CRITICAL PERIOD SAMPLING # 1

Location (Reach): Landa Lake		**Site:** O2 Site 5	
Date: 8/29/2000	**Time:** 1235	**Observer(s):** EO, DT, MH, LV, AG	
Vegetation:	Type:	Bare channel bottom	
	Height:	N/A	
	Areal Coverage:	100%	
	GPS location:	**GET FROM MAP**	
Substrate Type:	Rocks, silt, sand		
Mean Column Velocity: 20% - 0.01 m/s 80% - 0.0 m/s		Velocity at 15cm above the bottom: 80% - 0.01 m/s / 20% - 0.0 m/s	

Standard Parameters:	Surface	Mid	Bottom
Temperature (C°)	25.00	25.16	24.98
Dissolved Oxygen (mg/l)	6.83	6.91	6.65
pH	7.20	7.18	7.29
Conductivity	508.0	508.0	505.0
Secchi depth (cm)			

Depth (fixed) (meters): 0.94 m

Adjacent 3m cell areas:

Vegetation type:	Bare channel bottom / Algae
Vegetation height:	N/A
Areal coverage:	95% / 5%
Substrate type:	Rocks, silt sand

Sample Label:	**Preservative:**

Snails: *Melanoides tuberculata* - none / *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 # 1

Location (Reach):		Site:	
Landa Lake		O2 Site 5	
Date:	**Time:**	**Observer(s):**	
8/29/2000	1235	EO, LV, DT, MH, AG	
Overall	**Species**	**Number**	**Avg. Length (mm)**
1 abundant	*Etheostoma fonticola* *Thiara granifera*	1	12.0 --
Dip net sweep	**Species**	**Number**	**Length (mm)**
2	*Etheostoma fonticola*	1	12

DROP NET - FIELD DATA SHEETS
COMAL RIVER - CRITICAL PERIOD SAMPLING # 1

Location (Reach): Landa Lake		**Site:** V2 Site 6	
Date: 8/29/2000	**Time:** 1309	**Observer(s):** EO, DT, MH, LV, AG	
Vegetation:	Type: *Vallisneria*		
	Height: Surface		
	Areal Coverage: 100%		
	GPS location: **GET FROM MAP**		
Substrate Type: Silt, clay			
Mean Column Velocity: 20% - 0.03 m/s / 80% - 0.0 m/s (in veg.)		Velocity at 15cm above the bottom: 0.00 m/s	
Standard Parameters:	Surface	Mid	Bottom
Temperature (C°)	25.19	24.81	25.29
Dissolved Oxygen (mg/l)	6.70	6.13	6.47
pH	7.19	7.16	7.25
Conductivity	507.0	508.0	514.0
Secchi depth (cm)			
Depth (fixed) (meters): 1.23 m			
Adjacent 3m cell areas:			
Vegetation type:	*Sagittaria* / *Vallisneria* / Bare channel bottom		
Vegetation height:	61 cm / surface / N/A		
Areal coverage:	30% / 30% / 30%		
Substrate type:	Silt, clay		
Sample Label:		**Preservative:**	
Snails: *Melanoides tuberculata* - none / *Thiara granifera* - abundant			
Sample Label:		**Preservative:**	
Number of live Ramshorn snails		Average Size (mm)	
1		N/A	

DROP NET - FIELD DATA SHEETS

COMAL RIVER - CRITICAL PERIOD SAMPLING # 1

Location (Reach):		Site:	
Landa Lake		V2 Site 6	
Date:	**Time:**	**Observer(s):**	
8/29/2000	1309	EO, LV, DT, MH, AG	
Overall	**Species**	**Number**	**Avg. Length (mm)**
1	*Cichlasoma cyanoguttatum*	1	82.0
1	*Hypostomus plecostomus*		--
1	*Lepomis macrochirus*	1	66.0
5	*Lepomis punctatus*	5	89.3
51	*Palaemonetes* sp.		--
18	*Procambarus* sp.		--
abundant	*Thiara granifera*		
Dip net sweep	**Species**	**Number**	**Length (mm)**
	no fountain darters		

DROP NET - FIELD DATA SHEETS
COMAL RIVER - CRITICAL PERIOD SAMPLING # 1

Location (Reach): Landa Lake		**Site:** H2 Site 7	
Date: 8/29/2000	**Time:** 1250	**Observer(s):** EO, LV, DT, MH, AG	
Vegetation:	Type: *Hygrophila*		
	Height: 33 cm		
	Areal Coverage: 100%		
	GPS location: **GET FROM MAP**		
Substrate Type:	Rocks, silt, and sand		
Mean Column Velocity: 60% - 0.02 m/s		Velocity at 15cm above the bottom: 0.00m/s	
Standard Parameters:	Surface	Mid	Bottom
Temperature (C°)	24.90	--	24.94
Dissolved Oxygen (mg/l)	6.55	--	6.35
pH	7.15	--	7.20
Conductivity	509.0	--	509.0
Secchi depth (cm)			
Depth (fixed) (meters): 0.35 - 0.49 m			
Adjacent 3m cell areas:			
Vegetation type:	*Hygrophila* / Bare channel bottom		
Vegetation height:	33 cm / N/A		
Areal coverage:	85% 15%		
Substrate type:	Rocks, silt, and sand		
Sample Label:		**Preservative:**	
Snails: *Melanoides tuberculata* - none / *Thiara granifera* - abundant			
Sample Label:		**Preservative:**	
Number of live Ramshorn snails		Average Size (mm)	
2		N/A	

DROP NET - FIELD DATA SHEETS
COMAL RIVER - CRITICAL PERIOD SAMPLING # 1

Location (Reach):		Site:
Landa Lake		H2 Site 7
Date:	**Time:**	**Observer(s):**
8/29/2000	1250	LV, EO, DT, MH, AG

Overall	Species	Number	Avg. Length (mm)
1	*Cichlasoma cyanoguttatum*	1	63.0
9	*Etheostoma fonticola*	9	22.7
232	*Gambusia* sp.	232	15-30
1	*Lepomis macrochirus*	1	37.0
47	*Palaemonetes* sp.		–
14	*Poecilia latipinna*	14	40.6
14	*Procambarus* sp.		–
abundant	*Thiara granifera*		–

Dip net sweep	Species	Number	Length (mm)
1	*Etheostoma fonticola*	5	22-32
2	*Etheostoma fonticola*	2	25-27
3	*Etheostoma fonticola*	1	22
7	*Etheostoma fonticola*	1	6

DROP NET - FIELD DATA SHEETS
COMAL RIVER - CRITICAL PERIOD SAMPLING # 1

Location (Reach): Landa Lake		**Site:** H1 Site 8	
Date: 8/29/2000	**Time:** 1435	**Observer(s):** LV, DT, EO, MH	
Vegetation:	Type: *Hygrophila*		
	Height: Surface		
	Areal Coverage: 100%		
	GPS location: **GET FROM MAP**		
Substrate Type: Silt/clay			
Mean Column Velocity: 60% - 0.02 m/s		Velocity at 15cm above the bottom: 0.00 m/s	

Standard Parameters:	Surface	Mid	Bottom
Temperature (C°)	25.23	--	25.20
Dissolved Oxygen (mg/l)	7.10	--	6.70
pH	7.20	--	7.28
Conductivity	505.0	--	506.0
Secchi depth (cm)			

Depth (fixed) (meters): 0.67 m

Adjacent 3m cell areas:

Vegetation type:	*Hygrophila* / surface algae
Vegetation height:	surface / surface
Areal coverage:	85% / 15%
Substrate type:	Silt/clay

Sample Label:	**Preservative:**

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

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

DROP NET - FIELD DATA SHEETS
COMAL RIVER - CRITICAL PERIOD SAMPLING # 1

Location (Reach):		Site:
Landa Lake		H1 Site 8
Date:	**Time:**	**Observer(s):**
8/29/2000	1435	LV, DT, EO, MH

Overall	Species	Number	Avg. Length (mm)
2	*Ameiurus natalis*	2	36.0
3	*Cichlasoma cyanoguttatum*	3	22.0
29	*Etheostoma fonticola*	29	23.9
199	*Gambusia* sp.		--
1	*Lepomis macrochirus*	1	78.0
1	*Lepomis punctatus*	1	95.0
11	*Palaemonetes* sp.		--
1	*Poecilia latipinna*	1	30.0
59	*Procambarus* sp.		--
abundant	*Thiara granifera*		--

Dip net sweep	Species	Number	Length (mm)
1	*Etheostoma fonticola*	4	14-29
2	*Etheostoma fonticola*	6	23-30
3	*Etheostoma fonticola*	7	21-26
4	*Etheostoma fonticola*	3	20-23
5	*Etheostoma fonticola*	1	22
6	*Etheostoma fonticola*	1	21
8	*Etheostoma fonticola*	2	25-26
9	*Etheostoma fonticola*	1	17
11	*Etheostoma fonticola*	1	28
15	*Etheostoma fonticola*	3	25-33

DROP NET - FIELD DATA SHEETS
COMAL RIVER - CRITICAL PERIOD SAMPLING # 1

Location (Reach): Landa Lake		**Site:** C2 Site 9	
Date: 8/29/2000	**Time:** 1530-1615	**Observer(s):** LV, EO, DT, MH	
Vegetation:	Type: *Cabomba*		
	Height: 25 cm		
	Areal Coverage: 100%		
	GPS location: **GET FROM MAP**		
Substrate Type:	Rocks, silt, some clay		
Mean Column Velocity: 20% - 0.06 m/s / 80% - 0.035 m/s		Velocity at 15cm above the bottom: 0.00m/s	

Standard Parameters:	Surface	Mid	Bottom
Temperature (C°)	24.76	24.81	24.79
Dissolved Oxygen (mg/l)	6.71	6.92	6.87
pH	7.08	7.17	7.23
Conductivity	509.0	508.0	506.0
Secchi depth (cm)			

Depth (fixed) (meters): 0.97 m

Adjacent 3m cell areas:

Vegetation type:	*Cabomba* / *Vallisnaria* / Bare channel bottom
Vegetation height:	25 cm / surface / N/A
Areal coverage:	20% / 30% / 50%
Substrate type:	Rocky/ silt with wome clay

Sample Label:	**Preservative:**

Snails: *Melanoides tuberculata* - none / *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 # 1

Location (Reach):		Site:
Landa Lake		C2 Site 9
Date:	**Time:**	**Observer(s):**
8/29/2000	1530-1615	LV, DT, EO, MH

Overall	Species	Number	Avg. Length (mm)
5	*Cichlasoma cyanoguttatum*	5	17.6
54	*Etheostoma fonticola*	54	23.4
252	*Gambusia* sp.		--
5	*Palaemonetes* sp.		--
1	*Poecilia latipinna*	1	40.0
46	*Procambarus* sp.		--
abundant	*Thiara granifera*		--

Dip net sweep	Species	Number	Length (mm)
1	*Etheostoma fonticola*	19	20-34
2	*Etheostoma fonticola*	10	16-27
3	*Etheostoma fonticola*	5	17-25
5	*Etheostoma fonticola*	3	17-24
6	*Etheostoma fonticola*	4	19-25
7	*Etheostoma fonticola*	1	22
9	*Etheostoma fonticola*	4	16-24
10	*Etheostoma fonticola*	1	24
11	*Etheostoma fonticola*	2	24-29
14	*Etheostoma fonticola*	1	27
15	*Etheostoma fonticola*	4	17-24

DROP NET - FIELD DATA SHEETS
COMAL RIVER - CRITICAL PERIOD SAMPLING # 1

Location (Reach): Landa Lake		**Site:** V1 Site 10	
Date: 8/29/2000	**Time:** 1625	**Observer(s):** EO, LV, DT	
Vegetation:	Type: *Vallisneria*		
	Height: surface		
	Areal Coverage: 100%		
	GPS location: **GET FROM MAP**		
Substrate Type: Silt/clay			
Mean Column Velocity: 20% - 0.03 m/s 80% - 0.01 m/s		Velocity at 15cm above the bottom: 0.00 m/s	
Standard Parameters:	Surface	Mid	Bottom
Temperature (C°)	25.16	25.16	25.17
Dissolved Oxygen (mg/l)	7.40	7.30	7.37
pH	7.20	7.19	7.27
Conductivity	506.0	507.0	509.0
Secchi depth (cm)			
Depth (fixed) (meters): 0.98 m			
Adjacent 3m cell areas:			
Vegetation type: *Vallisneria*			
Vegetation height: surface			
Areal coverage: 100%			
Substrate type: Silt/clay			
Sample Label:	**Preservative:**		
Snails: *Melanoides tuberculata* - none / *Thiara granifera* - abundant			
Sample Label:	**Preservative:**		
Number of live Ramshorn snails	Average Size (mm)		
10	N/A		

DROP NET - FIELD DATA SHEETS
COMAL RIVER - CRITICAL PERIOD SAMPLING # 1

Location (Reach):		Site:
Landa Lake		V1 Site 10
Date:	**Time:**	**Observer(s):**
8/29/2000	1625	EO, LV, DT

Overall	Species	Number	Avg. Length (mm)
2	*Ameiurus natalis*	2	29.0
404	*Gambusia* sp.		--
2	*Lepomis macrochirus*	2	79.0
1	*Lepomis megalotis*	1	125.0
34	*Palaemonetes* sp.		--
6	*Poecilia latipinna*	6	33.2
16	*Procambarus* sp.		--
abundant	*Thiara granifera*		--

Dip net sweep	Species	Number	Length (mm)
	no fountain darters		

NEW CHANNEL REACH

DROP NET - FIELD DATA SHEETS
COMAL RIVER - CRITICAL PERIOD SAMPLING # 1

Location (Reach): New Channel		**Site:** H3 Site 1	
Date: 8/30/2000	**Time:** 0930-1013	**Observer(s):** EO, DT, CB, CN, TB	
Vegetation:	Type: *Hygrophila*		
	Height: Surface		
	Areal Coverage: 100%		
	GPS location: **GET FROM MAP**		
Substrate Type:	Silty clay over bedrock		
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: 1240	Surface	Mid	Bottom
Temperature (C°)	25.21	25.06	25.06
Dissolved Oxygen (mg/l)	9.52	9.28	7.58
pH	7.70	7.61	7.63
Conductivity	507.0	505.0	507.0
Secchi depth (cm)	Clear to bottom		
Depth (fixed) (meters): 1.14 m			
Adjacent 3m cell areas:			
Vegetation type:	*Hygrophila*		
Vegetation height:	Surface		
Areal coverage:	100%		
Substrate type:	Silt and gravel over bedrock		
Sample Label:	**Preservative:**		
Snails: *Melanoides tuberculata* - sparse / *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 # 1

Location (Reach):		Site:
New Channel		H3 Site 1
Date:	**Time:**	**Observer(s):**
8/30/00	0940-1013	EO, DT, CB, CN, TB

Overall	Species	Number	Avg. Length (mm)
5	*Astyanax mexicanus*	5	44.0
3	*Cichlasoma cyanoguttatum*	3	40.0
20	*Lepomis macrochirus*	20	31.3
1	*Lepomis megalotis*	1	66.0
sparse	*Melanoides tuberculata*		--
12	*Procambarus* sp.		--
abundant	*Thiara granifera*		--

Dip net sweep	Species	Number	Length (mm)
1	*Astyanax mexicanus*	3	41, 45, 47
	Cichlasoma cyanoguttatum	2	30, 40
	Lepomis macrochirus	9	56,32,30,44,21,21,16,19, 17
	Lepomis megalotis	1	66
	Procambarus sp.	5	
	Thiara granifera	abundant	
2	*Astyanax mexicanus*	1	50
	Cichlasoma cyanoguttatum	1	20
	Lepomis macrochirus	6	39, 33 ,17, 46, 23, 21
	Procambarus sp.	5	
	Thiara granifera	abundant	
3	*Thiara granifera*	moderate	
4	*Thiara granifera*	abundant	
5	*Procambarus* sp.	1	
	Thiara granifera	abundant	
6	*Lepomis macrochirus*	2	22, 38
	Thiara granifera	abundant	
7	*Astyanax mexicanus*	1	37
	Lepomis macrochirus	1	43

DROP NET - FIELD DATA SHEETS

COMAL RIVER - CRITICAL PERIOD SAMPLING # 1

Dip net sweep	Species	Number	Length (mm)
8	*Melanoides* sp.	1	
	Thiara granifera	abundant	
9	*Melanoides* sp.	2	
	Procambarus sp.	1	
	Thiara granifera	abundant	
10	*Thiara granifera*	abundant	
11	*Lepomis macrochirus*	1	44
	Thiara granifera	abundant	
12	*Lepomis macrochirus*	1	45
	Thiara granifera	abundant	
13	*Melanoides* sp.	1	
	Thiara granifera	sparse	
14	*Thiara granifera*	moderate	
15	*Thiara granifera*	moderate	

DROP NET - FIELD DATA SHEETS

COMAL RIVER - CRITICAL PERIOD SAMPLING # 1

Location (Reach): New Channel			**Site:** H1 Site 2
Date: 8/30/00	**Time:** 1018-1121		**Observer(s):** EO, DT, CB, CN, TB
Vegetation:	Type:	*Hygrophila* / Bare channel bottom	
	Height:	0.12 m / N/A	
	Areal Coverage:	90% / 10%	
	GPS location:	**GET FROM MAP**	
Substrate Type:	Silty clay over bedrock		
Mean Column Velocity: 0.08 m/s			Velocity at 15cm above the bottom: 0.01 m/s

Standard Parameters: 1253	Surface	Mid	Bottom
Temperature (C°)	24.95	--	24.87
Dissolved Oxygen (mg/l)	9.30	--	9.23
pH	7.64	--	7.62
Conductivity	507.0	--	507.0
Secchi depth (cm)	Clear To Bottom		

Depth (fixed) (meters): 0.95 m

Adjacent 3m cell areas:

Vegetation type:	*Hygrophila* / Bare channel bottom
Vegetation height:	10 cm / N/A
Areal coverage:	90% / 10%
Substrate type:	Silt over patches of gravel over bedrock

Sample Label:	**Preservative:**

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

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

DROP NET - FIELD DATA SHEETS

COMAL RIVER - CRITICAL PERIOD SAMPLING # 1

Location (Reach):		Site:
New Channel		H1 Site 2
Date:	**Time:**	**Observer(s):**
8/30/2000	1018-1112	EO, DT, CB, CN, TB

Overall	Species	Number	Avg. Length (mm)
2	*Cichlasoma cyanoguttatum*		--
12	*Etheostoma fonticola*	12	24.3
1	*Gambusia* sp.		--
2	Lepomis auritus		--
1	*Lepomis macrochirus*	1	15.0
2	*Lepomis megalotis*		--
sparse	*Melanoides tuberculata*		--
43	*Procambarus* sp.		--
abundant	*Thiara granifera*		--

Dip net sweep	Species	Number	Length (mm)
1	*Lepomis macrochirus*	1	15
	Lepomis megalotis	2	
	Procambarus sp.	20	
	Thiara granifera	abundant	
2	*Cichlasoma cyanoguttatum*	1	25
	Etheostoma fonticola	5	21, 25, 25, 22, 17
	Gambusia sp.	1	
	Lepomis auritus	2	
	Melanoides tuberculata	1	
	Procambarus sp.	10	
	Thiara granifera	abundant	
3	*Etheostoma fonticola*	1	25
	Melanoides tuberculata	1	
	Palaemonetes sp.	2	
	Procambarus sp.	6	
	Thiara granifera	abundant	

DROP NET - FIELD DATA SHEETS
COMAL RIVER - CRITICAL PERIOD SAMPLING # 1

Dip net sweep	Species	Number	Length (mm)
4	*Etheostoma fonticola*	3	26,31,18
	Melanoides tuberculata	1	
	Palaemonetes sp.	1	
	Procambarus sp.	2	
	Thiara granifera	abundant	
5	*Cichlasoma cyanoguttatum*	1	34
	Etheostoma fonticola	1	26
	Melanoides tuberculata	1	
	Procambarus sp.	1	
	Thiara granifera	abundant	
6	*Etheostoma fonticola*	2	28,28
	Procambarus sp.	2	
	Thiara granifera	sparse	
7	*Procambarus* sp.	1	
	Thiara granifera	sparse	
8	*Thiara granifera*	moderate	
9	*Thiara granifera*	moderate	
10	*Thiara granifera*	abundant	
11	*Thiara granifera*	moderate	
12	*Thiara granifera*	sparse	
13	*Thiara granifera*	sparse	
14	*Thiara granifera*	sparse	
15	*Procambarus* sp.	1	
	Thiara granifera	moderate	

DROP NET - FIELD DATA SHEETS

COMAL RIVER - CRITICAL PERIOD SAMPLING # 1

Location (Reach): New Channel		**Site:** H2 Site 3	
Date: 8/30/00	**Time:** 1135-1209	**Observer(s):** EO, DT, CN, BK	
Vegetation:	Type:	*Hygrophila* with algae	
	Height:	0.49 m	
	Areal Coverage:	100%	
	GPS location:	**GET FROM MAP**	
Substrate Type:	Soft silty clay and patches of small gravel over bedrock		
Mean Column Velocity: 20% - 0.08 m/s ; 80% - 0.00 m/s		Velocity at 15cm above the bottom: 0.00 m/s	

Standard Parameters: 1301	Surface	Mid	Bottom
Temperature (C°)	24.95	24.83	24.84
Dissolved Oxygen (mg/l)	9.40	8.83	7.59
pH	7.62	7.59	8.88
Conductivity	507.0	508.0	508.0
Secchi depth (cm)	Clear To Bottom		

Depth (fixed) (meters): 1.3 m

Adjacent 3m cell areas:

Vegetation type:	*Hygrophila* with algae
Vegetation height:	0.37 to 0.49 m
Areal coverage:	75%
Substrate type:	Silty clay over bedrock

Sample Label:	**Preservative:**

Snails: *Melanoides tuberculata* - none / *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 # 1

Location (Reach):		Site:
New Channel		H2 Site 3
Date:	**Time:**	**Observer(s):**
8/30/2000	1135-1209	EO, DT, BK, CN

Overall	Species	Number	Avg. Length (mm)
2	*Ambloplites rupestris*	2	39.5
2	*Cichlasoma cyanoguttatum*	2	31.5
2	*Etheostoma fonticola*	2	22.0
1	*Gambusia* sp.	1	13.0
1	*Lepomis gulosus*	1	21.0
7	*Lepomis macrochirus*	7	28.8
3	*Lepomis megalotis*	3	40.1
1	*Micropterus salmoides*	1	87.0
195	*Palaemonetes* sp.		--
33	*Procambarus* sp.		--
abundant	*Thiara granifera*		--

Dip net sweep	Species	Number	Length (mm)
1	*Lepomis gulosus*	1	21
	Lepomis macrochirus	2	26, 27
	Palaemonetes sp.	70	
	Procambarus sp.	1	
	Lepomis megalotis	2	40
2	*Palaemonetes* sp.	39	
	Lepomis megalotis	1	12
3	*Cichlasoma cyanoguttatum*	1	36
	Etheostoma fonticola	1	23
	Lepomis macrochirus	1	42
	Procambarus sp.	20	
4	*Palaemonetes* sp.	26	
	Procambarus sp.	3	
	Thiara granifera	Moderate	
5	*Ambloplites rupestris*	1	42
	Palaemonetes sp.	18	

DROP NET - FIELD DATA SHEETS
COMAL RIVER - CRITICAL PERIOD SAMPLING # 1

Dip net sweep	Species	Number	Length (mm)
6	*Ambloplites rupestris*	1	37
	Etheostoma fonticola	1	21
	Gambusia sp.	1	13
	Lepomis macrochirus	1	14
	Palaemonetes sp.	8	
7	*Lepomis macrochirus*	2	33,37
	Palaemonetes sp.	5	
	Procambarus sp.	3	
8	*Palaemonetes* sp.	2	
	Procambarus sp.	2	
9	*Palaemonetes* sp.	4	
10	*Palaemonetes* sp.	9	
	Procambarus sp.	2	
11	*Palaemonetes* sp.	1	
12	*Cichlasoma cyanoguttatum*	1	27
	Palaemonetes sp.	6	
13	*Micropterus salmoides*	1	87
	Palaemonetes sp.	7	
14	*Lepomis macrochirus*	1	23
15	*Palaemonetes* sp.	2	
	Procambarus sp.	2	

DROP NET - FIELD DATA SHEETS

COMAL RIVER - CRITICAL PERIOD SAMPLING # 1

Location (Reach): New Channel			**Site:** L1 Site 4
Date: 8/30/00	**Time:** 1400-1430		**Observer(s):** EO, DT, CN, LV, BK
Vegetation:	Type: *Ludwigia*		
	Height: 25 cm		
	Areal Coverage: 100%		
	GPS location: **GET FROM MAP**		
Substrate Type:	Pebbles/sand/some clay		
Mean Column Velocity: 0.21 m/s			Velocity at 15cm above the bottom: 0.03 m/s

Standard Parameters: 1626	Surface	Mid	Bottom
Temperature (C°)	26.78	–	26.72
Dissolved Oxygen (mg/l)	8.56	–	8.17
pH	7.73	–	7.69
Conductivity	494.0	–	492.0
Secchi depth (cm)	Clear To Bottom		

Depth (fixed) (meters): 1.2 m

Adjacent 3m cell areas:

Vegetation type:	*Hygrophila* / *Ludwigia* / Bare channel bottom
Vegetation height:	25 cm / 25 cm / N/A
Areal coverage:	35% / 35% / 30%
Substrate type:	Pebbles/sand/some clay

Sample Label:	**Preservative:**

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

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

DROP NET - FIELD DATA SHEETS

COMAL RIVER - CRITICAL PERIOD SAMPLING # 1

Location (Reach):		Site:
New Channel		L1 Site 4
Date:	**Time:**	**Observer(s):**
8/30/00	1400-1430	EO, DT, LV, CN

Overall	Species	Number	Avg. Length (mm)
2	*Cichlasoma cyanoguttatum*	2	43.5
2	*Etheostoma fonticola*	2	24.0
6	*Lepomis macrochirus*	6	27.5
1	*Lepomis megalotis*	1	10.0
1	*Micropterus salmoides*	1	78.0
13	*Palaemonetes* sp.		--
29	*Procambarus* sp.		--
moderate	*Thiara granifera*		--

Dip net sweep	Species	Number	Length (mm)
1	*Etheostoma fonticola*	1	27
8	*Etheostoma fonticola*	1	21
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 # 1

Location (Reach): New Channel		**Site:** O1 Site 5	
Date: 8/30/00	**Time:** 1435	**Observer(s):** EO, DT, CN, MH, LV	
Vegetation:	Type:	Bare channel bottom	
	Height:	N/A	
	Areal Coverage:	100%	
	GPS location:	**GET FROM MAP**	
Substrate Type:	Gravel - cobble - boulder - bedrock		
Mean Column Velocity: 0.02 m/s		Velocity at 15cm above the bottom: 0.01 m/s	

Standard Parameters: 1631	Surface	Mid	Bottom
Temperature (C°)	26.75	--	26.71
Dissolved Oxygen (mg/l)	7.77	--	7.66
pH	7.65	--	7.01
Conductivity	482.0	--	468.0
Secchi depth (cm)	Clear to bottom		

Depth (fixed) (meters): 1.01 m

Adjacent 3m cell areas:

Vegetation type:	Bare channel bottom
Vegetation height:	N/A
Areal coverage:	100%
Substrate type:	Gravel - cobble - boulder - 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 # 1

Location (Reach):		Site:	
New Channel		O1 Site 5	
Date:	**Time:**	**Observer(s):**	
8/30/00	1435	EO, DT, CN, MH, LV	
Overall	**Species**	**Number**	**Avg. Length (mm)**
	No fish or crustaceans collected Heavy accumulation of detrital material		
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 # 1

Location (Reach): New Channel		**Site:** O2 Site 6	
Date: 8/30/00	**Time:** 1505-1515	**Observer(s):** EO, DT, CN, MH	
Vegetation:	Type:	Bare channel bottom w/ intermittent patches of *Riccia*	
	Height:	N/A	
	Areal Coverage:	100%	
	GPS location:	**GET FROM MAP**	
Substrate Type:	Gravel - cobble - boulder - bedrock		
Mean Column Velocity: 0.16 m/s		Velocity at 15cm above the bottom: 0.11 m/s	

Standard Parameters: 1638	Surface	Mid	Bottom
Temperature (C°)	26.54	--	26.45
Dissolved Oxygen (mg/l)	8.24	--	8.21
pH	7.67	--	7.64
Conductivity	442.0	--	443.0
Secchi depth (cm)	Clear to bottom		

Depth (fixed) (meters): 0.93 m

Adjacent 3m cell areas:

Vegetation type:	*Ludwigia* / Bare channel bottom
Vegetation height:	47 cm / N/A
Areal coverage:	20% / 80%
Substrate type:	Gravel - cobble - boulder- 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 # 1

Location (Reach):		Site:
New Channel		O2 Site 6
Date:	**Time:**	**Observer(s):**
8/30/00	0940-1013	EO, DT, CB, CN, TB

Overall	Species	Number	Avg. Length (mm)
sparse	*Thiara granifera*	6	--

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	*Thiara granifera*	6	
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 # 1

Location (Reach): New Channel		**Site:** L2 Site 7	
Date: 8/30/00	**Time:** 1521-1603	**Observer(s):** EO, DT, MH, BK	
Vegetation:	Type:	*Ludwigia* / *Riccia*	
	Height:	61 cm / N/A	
	Areal Coverage:	95% / 5%	
	GPS location:	**GET FROM MAP**	
Substrate Type:	Silty clay over bedrock		
Mean Column Velocity: 20% - 0.13 m/s ; 80% - 0.11 m/s		Velocity at 15cm above the bottom: 0.03 m/s	

Standard Parameters: 1643	Surface	Mid	Bottom
Temperature (C°)	26.48	26.38	26.39
Dissolved Oxygen (mg/l)	7.66	7.62	7.62
pH	8.32	8.17	7.89
Conductivity	444.0	445.0	444.0
Secchi depth (cm)	Clear To Bottom		

Depth (fixed) (meters): 1.3 m

Adjacent 3m cell areas:

Vegetation type:	*Ludwigia* / *Hygrophila* / *Riccia* / Bare channel bottom
Vegetation height:	61 cm / 33 cm / N/A / N/A
Areal coverage:	45% / 45% / 5% / 5%
Substrate type:	Silty clay over bedrock

Sample Label:	**Preservative:**

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

Sample Label:	**Preservative:**
Number of live Ramshorn snails	Average Size (mm)
4	N/A

DROP NET - FIELD DATA SHEETS

COMAL RIVER - CRITICAL PERIOD SAMPLING # 1

Location (Reach):		Site:
New Channel		L2 Site 7
Date:	**Time:**	**Observer(s):**
8/30/00	0940-1013	EO, DT, CB, CN, TB

Overall	Species	Number	Avg. Length (mm)
2	*Cichlasoma cyanoguttatum*	2	25.5
2	*Etheostoma fonticola*	2	26.5
3	*Lepomis macrochirus*	3	48.7
1	*Micropterus salmoides*	1	95.0
50	*Palaemonetes* sp.		--
96	*Procambarus* sp.		--
sparse	*Thiara granifera*		--

Dip net sweep	Species	Number	Length (mm)
1	*Cichlasoma cyanoguttatum*	1	27
	Palaemonetes sp.	15	
	Procambarus sp.	2	
2	*Lepomis macrochirus*	1	51
	Procambarus sp.	3	
3	*Cichlasoma cyanoguttatum*	1	24
	Micropterus salmoides	1	95
	Palaemonetes sp.	10	
	Procambarus sp.	5	
4	*Palaemonetes* sp.	5	
	Procambarus sp.	5	
5	*Lepomis macrochirus*	1	63
	Thiara granifera	sparse	
6	*Palaemonetes* sp.	3	
	Procambarus sp.	10	
7	*Palaemonetes* sp.	4	
	Procambarus sp.	6	
8	*Palaemonetes* sp.	5	
	Procambarus sp.	8	

DROP NET - FIELD DATA SHEETS

COMAL RIVER - CRITICAL PERIOD SAMPLING # 1

Dip net sweep	Species	Number	Length (mm)
9	*Etheostoma fonticola*	1	25
	Palaemonetes sp.	5	
	Procambarus sp.	6	
10	*Etheostoma fonticola*	1	28
	Lepomis macrochirus	1	32
11	*Procambarus* sp.	2	
12	*Procambarus* sp.	1	
13	No fish or crustaceans collected		
14	*Palaemonetes* sp.	3	
15	No fish or crustaceans collected		

OLD CHANNEL REACH

DROP NET - FIELD DATA SHEETS

COMAL RIVER - CRITICAL PERIOD SAMPLING # 1

Location (Reach): Old Channel		**Site:** C1 Site 1	
Date: 8/31/00	**Time:** 0835-0940	**Observer(s):** EO, DT, CN, TB	
Vegetation:	Type: *Nuphar / Ceratopteris /* algae		
	Height: Surface/ Surface / Bottom		
	Areal Coverage: 40% / 55% / 5%		
	GPS location: **GET FROM MAP**		
Substrate Type:	Soft clayey mud With heavy detritus in dense aquatic vegetation		
Mean Column Velocity: 0.01 m/s		Velocity at 15cm above the bottom: 0.0 m/s	

Standard Parameters: 1302	Surface	Mid	Bottom
Temperature (C°)	25.11	--	24.64
Dissolved Oxygen (mg/l)	7.20	--	7.05
pH	7.33	--	7.33
Conductivity	513	--	511.0
Secchi depth (cm)	Clear To Bottom		

Depth (fixed) (meters): 0.79 m

Adjacent 3m cell areas:

Vegetation type:	*Ceratopteris / Nuphar /* algae
Vegetation height:	Surface / Surface / 10 cm off channel bottom
Areal coverage:	50% / 45% / 5%
Substrate type:	Soft clayey mud intermixed with dense detrital accumulation

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 # 1

Location (Reach):		Site:
Old Channel		C1 Site 1
Date:	**Time:**	**Observer(s):**
8/31/2000	0835-0940	EO, DT, CN, TB

Overall	Species	Number	Avg. Length (mm)
16	*Astyanax mexicanus*	16	24.5
5	*Cichlasoma cyanoguttatum*	5	19.2
5	*Gambusia* sp.	5	14 + 4 kept
17	*Lepomis macrochirus*	17	31.7
4	*Lepomis megalotis*	4	12 + 3 kept
13	*Palaemonetes* sp.		--
2	*Procambarus sp.*		--
2	*Rana* sp.		--

Dip net sweep	Species	Number	Length (mm)
1	*Astyanax mexicanus*	10	11, 21,14,18,22,18,14,24, 21,22
	Cichlasoma cyanoguttatum	4	25, 28, 14, 15
	Lepomis macrochirus	7	24,34,23,51,21,14,19
	Palaemonetes sp.	5	
	Procambarus sp.	2	
2	*Astyanax mexicanus*	3	17, 22, 17
	Gambusia sp.	4	kept for ID purposes
	Lepomis macrochirus	2	16, 17
	Palaemonetes sp.	3	
	Rana sp.	2	
3	*Astyanax mexicanus*	1	18
	Lepomis macrochirus	3	16, 22, 24
	Lepomis megalotis	2	kept for ID purposes
	Lepomis megalotis	1	kept for ID purposes
	Palaemonetes sp.	4	
4	*Astyanax mexicanus*	2	12, 12
	Lepomis macrochirus	2	42, 65
5	*Cichlasoma cyanoguttatum*	1	14
	Gambusia sp.	1	14
	Palaemonetes sp.	2	

DROP NET - FIELD DATA SHEETS

COMAL RIVER - CRITICAL PERIOD SAMPLING # 1

Dip net sweep	Species	Number	Length (mm)
6	*Lepomis macrochirus*	1	43
7	*Lepomis macrochirus*	1	57
	Lepomis megalotis	1	12
8	*Palaemonetes* sp.	2	
	Lepomis macrochirus	1	51
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 # 1

Location (Reach): Old Channel		**Site:** A2 Site 2	
Date: 8/31/2000	**Time:** 0945	**Observer(s):** EO, DT, CN, TB	
Vegetation:	Type: Algae		
	Height: 10 cm from the channel bottom		
	Areal Coverage: 50%		
	GPS location: **GET FROM MAP**		
Substrate Type:	2 - 4 inch silt layer over bedrock		
Mean Column Velocity: 0.13 m/s		Velocity at 15cm above the bottom: 0.07 m/s	

Standard Parameters: 1207	Surface	Mid	Bottom
Temperature (C°)	24.44	–	24.43
Dissolved Oxygen (mg/l)	7.65	–	7.44
pH	7.36	--	7.35
Conductivity	511.0	--	511.0
Secchi depth (cm)	Clear To Bottom		

Depth (fixed) (meters): 0.79 m

Adjacent 3m cell areas:

Vegetation type:	Algae
Vegetation height:	10 cm from the channel bottom
Areal coverage:	50%
Substrate type:	Silt layer over bedrock

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 # 1

Location (Reach):		Site:
Old Channel		A2 Site 2
Date:	**Time:**	**Observer(s):**
8/31/2000	0945	EO, DT, CN, TB

Overall	Species	Number	Avg. Length (mm)
3	*Cichlasoma cyanoguttatum*	3	18.3
64	*Etheostoma fonticola*	64	23.3
2	*Lepomis auritus*		–
6	*Lepomis macrochirus*	6	14.2
3	*Palaemonetes* sp.		–
6	*Procambarus* sp.		–

Dip net sweep	Species	Number	Length (mm)
1	*Cichlasoma cyanoguttatum*	2	17,17
	Etheostoma fonticola	26	29,21,30,24,29,22 29,22,27,20 29,33,30,22, 30,24,23,21,19,20,17,20, 21,23,16,17
	Lepomis auritus	2	kept for ID purposes
	Lepomis macrochirus	5	15,15,15,15,10
	Procambarus sp.	2	
2	*Etheostoma fonticola*	23	15,31,31,16 32,29,22,26,14,21,32,22, 27,27,25,22,23,17,18,17, 17,22,18
	Procambarus sp.	2	
3	*Etheostoma fonticola*	6	29,32,25,31,16,24
	Procambarus sp.	2	
4	*Cichlasoma cyanoguttatum*	1	21
	Etheostoma fonticola	2	21,25
	Palaemonetes sp.	2	
5	*Lepomis macrochirus*	1	15

DROP NET - FIELD DATA SHEETS
COMAL RIVER - CRITICAL PERIOD SAMPLING # 1

Dip net sweep	Species	Number	Length (mm)
6	No fish or crustaceans collected	0	
7	*Etheostoma fonticola*	2	29,21
8	*Palaemonetes* sp.	1	
9	*Etheostoma fonticola*	1	19
10	*Etheostoma fonticola*	1	14
11	*Etheostoma fonticola*	1	24
12	*Etheostoma fonticola*	1	14
13	*Etheostoma fonticola*	1	22
14	No fish or crustaceans collected	0	
15	No fish or crustaceans collected	0	

DROP NET - FIELD DATA SHEETS
COMAL RIVER - CRITICAL PERIOD SAMPLING # 1

Location (Reach): Old Channel		**Site:** O1 Site 3	
Date: 8/31/2000	**Time:** 1038	**Observer(s):** EO, DT, CN, TB	
Vegetation:	Type:	Algae / *Riccia* / Bare channel bottom	
	Height:	Algae growth up to 7 cm above channel bottom	
	Areal Coverage:	50% / 50%	
	GPS location:	**GET FROM MAP**	
Substrate Type:	Silt layer over scattered small gravel and cobble over bedrock		
Mean Column Velocity: 0.13 m/s		Velocity at 15cm above the bottom: 0.12 m/s	

Standard Parameters: 1202	Surface	Mid	Bottom
Temperature (C°)	24.51	--	24.51
Dissolved Oxygen (mg/l)	7.71	--	7.55
pH	7.45	--	7.39
Conductivity	510.0	--	511.0
Secchi depth (cm)	Clear to bottom		

Depth (fixed) (meters): 0.49 m

Adjacent 3m cell areas:

Vegetation type:	Algae (*Riccia*) / *Polygonum hydropiperoides* / *Ludwigia* / Bare
Vegetation height:	10 cm above bottom / 87cm above water / 15 cm above water
Areal coverage:	48% / 2.5% / 2.5% / 48%
Substrate type:	Silt layer over cobble and bedrock

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 # 1

Location (Reach):		Site:
Old Channel		O1 Site 3
Date:	**Time:**	**Observer(s):**
8/31/2000	1038	EO, DT, CN, TB

Overall	Species	Number	Avg. Length (mm)
1	*Cichlasoma cyanoguttatum*	1	12.0
12	*Etheostoma fonticola*	12	19.8
26	*Notropis amabilis*	26	28.9
2	*Palaemonetes* sp.		–
3	*Procambarus sp.*		–

Dip net sweep	Species	Number	Length (mm)
1	*Etheostoma fonticola*	4	14,18,21,27,
	Notropis amabilis	8	31,30,21,25,24,23,17,28
	Palaemonetes sp.	1	
2	*Cichlasoma cyanoguttatum*	1	12
	Etheostoma fonticola	3	23,20,15
	Notropis amabilis	17	40,28,28,31,28,31,39,36, 30,28,29,28,29,30,31,28, 28
	Procambarus sp.	2	
3	*Notropis amabilis*	1	32
	Palaemonetes sp.	1	
4	*Etheostoma fonticola*	2	18,14
5	*Etheostoma fonticola*	1	25
6	*Etheostoma fonticola*	1	25
	Procambarus sp.	1	
7	*Etheostoma fonticola*	1	18
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 # 1

Location (Reach): Old Channel			**Site:** A1 Site 4	
Date: 8/31/2000	**Time:** 1111		**Observer(s):** EO, DT, CN, MH	
Vegetation:	Type:	Algae with *Riccia* / *Ceratopteris* / Bare bottom		
	Height:	Algae and Water cress growth up to 10 cm above channel bottom		
	Areal Coverage:	20% / 10% / 70%		
	GPS location:	**GET FROM MAP**		
Substrate Type:	Large gravel/cobble/occasional boulder/bedrock			
Mean Column Velocity: 20% - 0.14 m/s ; 80% - 0.12 m/s			Velocity at 15cm above the bottom: 0.10 m/s	
Standard Parameters: 1217		Surface	Mid	Bottom
Temperature (C°)		24.46	--	24.45
Dissolved Oxygen (mg/l)		7.59	--	7.44
pH		7.38	--	7.36
Conductivity		511.0	--	510.0
Secchi depth (cm)		Clear To Bottom		
Depth (fixed) (meters): 1.04 m				
Adjacent 3m cell areas:				
	Vegetation type:	Bare channel bottom / Algae with *Riccia* / *Ceratopteris*		
	Vegetation height:	N/A / 7 to12 cm / surface		
	Areal coverage:	75% / 20% / 5%		
	Substrate type:	Small to large gravel/cobble/occasional boulder/bedrock		
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 # 1

Location (Reach):		Site:
Old Channel		A1 Site 4
Date:	**Time:**	**Observer(s):**
8/31/2000	1111	EO, DT, CN, MH

Overall	Species	Number	Avg. Length (mm)
1	*Cichlasoma cyanoguttatum*	1	15.0
11	*Etheostoma fonticola*	11	21.4
2	*Lepomis macrochirus*	2	12.0
32	*Palaemonetes* sp.		--
3	*Procambarus sp.*		--

Dip net sweep	Species	Number	Length (mm)
1	*Cichlasoma cyanoguttatum*	1	15
	Etheostoma fonticola	4	18,17,14,21
	Palaemonetes sp.	12	
2	*Etheostoma fonticola*	7	21,25,26,24, 22,23,24
	Lepomis macrochirus	1	12
	Palaemonetes sp.	12	
3	*Palaemonetes* sp.	1	
4	*Palaemonetes* sp.	2	
	Procambarus sp.	1	
5	No fish or crustaceans collected		
6	*Lepomis macrochirus*	1	12
	Palaemonetes sp.	1	
	Procambarus sp.	1	
7	*Palaemonetes* sp.	1	
8	*Palaemonetes* sp.	1	
9	*Palaemonetes* sp.	2	
10	*Procambarus* sp.	1	

DROP NET - FIELD DATA SHEETS
COMAL RIVER - CRITICAL PERIOD SAMPLING # 1

Dip net sweep	Species	Number	Length (mm)
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 # 1

Location (Reach): Old Channel		**Site:** O2 Site 5	
Date: 8/31/2000	**Time:** 1308-1320	**Observer(s):** EO, DT, CN, LV	
Vegetation:	Type: Bare channel bottom		
	Height: N/A		
	Areal Coverage: 100%		
	GPS location: **GET FROM MAP**		
Substrate Type: Rock/silt			
Mean Column Velocity: 0.21 m/s		Velocity at 15cm above the bottom: 0.17 m/s	
Standard Parameters: 1221	Surface	Mid	Bottom
Temperature (C°)	24.55	--	24.52
Dissolved Oxygen (mg/l)	7.74	--	7.59
pH	7.45	--	7.38
Conductivity	508.0	--	509.0
Secchi depth (cm)	Clear to bottom		
Depth (fixed) (meters): 0.78 m			
Adjacent 3m cell areas:			
Vegetation type:	Bare channel bottom		
Vegetation height:	N/A		
Areal coverage:	100%		
Substrate type:	Rock/silt		
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 # 1

Location (Reach):		Site:
Old Channel		O2 Site 5
Date:	**Time:**	**Observer(s):**
8/31/2000	1111	EO, DT, CN, MH

Overall	Species	Number	Avg. Length (mm)
3	*Lepomis macrochirus*	3	20.3

Dip net sweep	Species	Number	Length (mm)
1	*Lepomis macrochirus*	3	16, 18, 27
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 # 1

Location (Reach): Old Channel		**Site:** C2 Site 6	
Date: 8/31/00	**Time:** 1341-1437	**Observer(s):** EO, BH, DT, CN, MH	
Vegetation:	Type: *Ceratopteris*		
	Height: Surface		
	Areal Coverage: 100%		
	GPS location: **GET FROM MAP**		
Substrate Type:	Silty mud over bedrock		
Mean Column Velocity: 0.03 m/s		Velocity at 15cm above the bottom: 0.02 m/s	

Standard Parameters: 1228	Surface	Mid	Bottom
Temperature (C°)	24.50	--	24.48
Dissolved Oxygen (mg/l)	7.50	--	7.24
pH	7.29	--	7.33
Conductivity	507.0	--	510.0
Secchi depth (cm)	Clear to bottom		

Depth (fixed) (meters): 0.76 m

Adjacent 3m cell areas:

Vegetation type:	*Ceratopteris* / Elephant ears / Bare channel bottom
Vegetation height:	Surface / 88 cm / N/A
Areal coverage:	55% / 2% / 43%
Substrate type:	Silty mud over large gravel/cobble/bedrock

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 # 1

Location (Reach):		Site:
Old Channel		C2 Site 6
Date:	**Time:**	**Observer(s):**
8/31/00	1341-1437	EO, BH, DT, CN, MH

Overall	Species	Number	Avg. Length (mm)
1	*Ambloplites rupestris*		--
9	*Astyanax mexicanus*	9	38.0
3	*Cichlasoma cyanoguttatum*	3	30.6
22	*Gambusia* sp.	22	18.6
1	*Lepomis auritus*	1	72.0
17	*Lepomis macrochirus*	17	32.0
55	*Palaemonetes* sp.		--
1	*Plecostomus*	1	14.0
2	*Rana* sp.		--

Dip net sweep	Species	Number	Length (mm)
1	*Ambloplites rupestris*	1	
	Astyanax mexicanus	7	38,37,28,26,36,27,26
	Cichlasoma cyanoguttatum	2	33,26
	Gambusia sp.	1	
	Lepomis auritus	1	72
	Lepomis macrochirus	12	53,48,32,27,56,33,27,33, 31,34,27,26
	Palaemonetes sp.	15	
	Rana sp.	2	
2	*Astyanax mexicanus*	1	27
	Gambusia sp.	2	32,27
	Lepomis macrochirus	2	37,17
3	*Cichlasoma cyanoguttatum*	1	33
	Gambusia sp.	2	12,15
	Palaemonetes sp.	1	
4	*Astyanax mexicanus*	1	47
	Gambusia sp.	2	12,27
	Palaemonetes sp.	3	
5	*Lepomis macrochirus*	1	47
	Palaemonetes sp.	2	

DROP NET - FIELD DATA SHEETS

COMAL RIVER - CRITICAL PERIOD SAMPLING # 1

Dip net sweep	Species	Number	Length (mm)
6	No fish or crustaceans collected		
7	*Gambusia* sp.	4	15,14,14,14
8	No fish or crustaceans collected		
9	*Palaemonetes* sp.	4	
10	*Gambusia* sp.	1	20
	Palaemonetes sp.	5	
	Plecostomus	1	14
11	*Gambusia* sp.	6	15,10,11
	Palaemonetes sp.	23	
12	*Gambusia* sp.	4	25,14,15,13
13	*Palaemonetes* sp.	2	
14	*Lepomis macrochirus*	2	55,20
15	No fish or crustaceans collected		

DIP NET RESULTS

TABLE 4
DIP NET DATA
COMAL RIVER - CRITICAL PERIOD SAMPLING # 1
AUGUST 29 - 31, 2000

River Section	Date	Number of Darters	Length (mm)
Upper Reach of the Comal River (Section 3)	8/29/2000	1	25
		1	28
		1	31
		1	34
		1	38
	Total Number:	**5**	
Spring Island Run # 1 (Section 4)	8/29/2000	1	8
		1	15
		2	18
		1	20
		1	21
		2	22
		4	23
		1	25
		1	26
		1	27
		3	28
		3	30
		1	31
		2	32
	Total Number:	**24**	
Spring Island Run # 2 (Section 4)	8/29/2000	20	< 15
		4	19
		3	20
		2	21
		3	22
		1	23
		3	24
		2	25
		1	26
		1	27
		19	> 25
	Total Number:	**59**	
Landa Lake Pecan Island (Section 4)	8/29/2000	4	< 15
		1	20
		1	21
		0	22
		1	23
		3	24
		4	25
		35	> 25
	Total Number:	49	

TABLE 4
DIP NET DATA
COMAL RIVER - CRITICAL PERIOD SAMPLING # 1
AUGUST 29 - 31, 2000

River Section	Date	Number of Darters	Length (mm)
Landa Lake (Section 5)	8/29/2000	1	< 15
		2	20
		2	21
		1	22
		3	23
		2	24
		14	> 25
	Total Number:	**25**	
New Channel Reach (Section 10)	8/30/2000	1	19
		1	24
		3	25
		2	26
		3	27
		1	28
		5	29
		6	30
		3	31
		13	> 25
	Total Number:	**38**	
New Channel Reach (Section 10)	8/31/2000	11	< 15
		1	12
		1	15
		1	16
		3	17
		2	18
		3	19
		1	21
		1	22
		1	23
		4	25
		2	26
		4	27
		2	28
		1	29
		1	30
		1	31
	Total Number:	**40**	
Comal River Below Clems Dam (Sections 11, 13, 14)	8/30/2000	1	13
		1	26
		2	27
		3	28
		2	29
		3	30
		1	31
		1	32
		1	33
		3	34
		3	35
		2	36
	Total Number:	**23**	

TABLE 4
DIP NET DATA
COMAL RIVER - CRITICAL PERIOD SAMPLING # 1
AUGUST 29 - 31, 2000

River Section	Date	Number of Darters	Length (mm)
Old Channel Reach (Sections 15 and 16)	8/31/2000	17	< 15
		2	11
		6	12
		4	13
		6	14
		6	15
		4	16
		4	17
		4	18
		6	19
		3	20
		2	22
		5	23
		3	24
		7	25
		3	26
		3	27
		2	28
		5	29
		4	30
		3	31
		4	32
		1	33
		8	> 25
	Total Number:	**112**	
Old Channel Reach (Section 17)	8/31/2000	1	22
		4	23
		2	24
		2	25
		1	26
		1	28
		2	30
		1	> 25
	Total Number:	**14**	