WATER QUALITY / VARIABLE FLOW STUDY
SUMMARY OF
FALL QUARTERLY SAMPLING
COMAL RIVER, NEW BRAUNFLES, TEXAS
NOVEMBER 9 - 17, 2000

PBS&J

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COMAL RIVER, NEW BRAUNFELS, TEXAS
NOVEMBER 9-17, 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 Fall Quarterly Sampling (Comprehensive 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 Fall Quarterly Sampling from 9 November to 17 November 2000 with the flows at Comal reporting 314 cfs on 9 November 2000, and 344 cfs on 17 November 2000. The sampling effort consisted of:

EVENT	DATE	LOCATION
Water Quality sampling	13 November	14 sites
Thermister retrieval	2, 15 November	
Thermister placement	15 November, 6 December	
Aquatic Vegetation mapping	9-14 November	4 reaches
Fountain Darter sampling		
Drop nets	13-16 November	4 reaches
Dip nets	10 November	5 reaches
Visual observations	15 November	Landa Lake Reach, New Channel Reach
Salamander observations	15-16 November	Spring runs 1 and 2, and Spring Island area
Macroinvertebrate sampling		
Drift nets	21-22 November	Spring runs 1, 2, and 3
Exotic / Predation study	15-16 November	Landa Lake Reach

Observations

From the time of the Critical Period Monitoring efforts, a considerable amount of rainfall had accumulated and the aquifer experienced a considerable rise. The flows reported during this fall quarterly event were approximately twice those reported during the critical period events. Again, 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 all reaches produced fountain darters within the suitable aquatic vegetation types, sometimes in large numbers as documented in Landa Lake. Although a few darters were collected in the drop nets from the Upper Spring Run Reach during the Fall Quarterly sampling, follow-up dip net sampling for fountain darters in this reach was less productive than during the critical period events. In addition, dip net sampling was conducted in Landa Lake and the Old Channel.

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.

Unlike the first two events, the filamentous algea and floating mats of vegetation that had been present was thoroughly removed prior to the fall quarterly sampling. 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.

The fall quarterly effort conducted at approximately twice the Critical Period flow provided an excellent confirmation 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 must continue to be emphasized that additional sampling in variable flow conditions to compare back to this fall quarterly 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 Fall Quarterly Sampling were conducted in Dr. Groeger's laboratory at SWT.

On 2 and 15 November 2000, the project team downloaded thermisters at select water quality stations along the Comal River. In addition, three thermisters (2 in Landa Lake and 1 in the New Channel) were placed just above the substrate on 6 December 2000. These thermisters were placed using SCUBA and are in place to monitor temperature at the deeper locations in the system. 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 13 November 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. During the fall quarterly event, the upper section of the New Channel Reach was also mapped. This section will continue to be mapped during future efforts.

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 13-16 November 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	13 November
Landa Lake Reach	10 drop net samples	13-14 November
New Channel Reach	4 drop net samples	15 November
Old Channel Reach	6 drop net samples	16 November

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 to be sampled as well as the reach below the Garden Street bridge (Figure 1). Dip netting for fountain darters was to be conducted for a 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 10 November 2000; and the New Channel Reach and Garden Street Reach could not be sampled due to high water. The high water levels in the Guadalupe River resulted in the backing up of water in the lower Comal River. The dip net results are presented in Table 4. In addition to the Fall Quarterly Event results, Table 4 includes the additional dip netting efforts conducted on 01 December and 08 December 2000.

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.

As a factor of the mixed results from the second critical period monitoring, it was determined by the project team that some trap modification and subsequent laboratory investigation needed to take place before additional usage of the minnow traps. Thus, no minnow traps were deployed during the Fall Quarterly Sampling.

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.

As with the second critical period survey, the Landa Lake survey 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. During the fall quarterly sampling, a visual survey was also conducted in the New Channel Reach. This survey revealed the presence of fountain darters in suitable habitat areas. The numbers of darters observed was considerably less than in Landa Lake as the amount of suitable habitat is far less in the New Channel Reach. There were no salamanders observed in the New Channel Reach.

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 15 November 2000, and the Spring Island area on 16 November 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 documented in the second critical period event, 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.

The fall quarterly salamander surveys were conducted on 15 and 16 November 2000. Due to previous rainfall, springflows were much greater than during past surveys. Within Spring Run 1 and Spring Run 3, water levels were considerably higher with significantly higher flows. The survey in Spring Run 1 revealed a total of 8 salamanders within a 1.16-hour survey. Surveys were conducted 1 hour in Spring Run 3 and revealed 4 salamanders. Springs Island Spring was observed to be flowing for the first time within the study during the fall quarterly sampling effort. Within the spring pool a 0.5-hour survey revealed 4 salamanders. Two salamanders were observed around the spring outfall into the Comal River on the east side of Spring Island during a 0.5-hour survey. No salamanders were encountered during a 0.5-hour survey in the Comal River on the north side of Spring Island. Results of sampling efforts to date are presented in Table 5.

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 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 6.

FIGURES

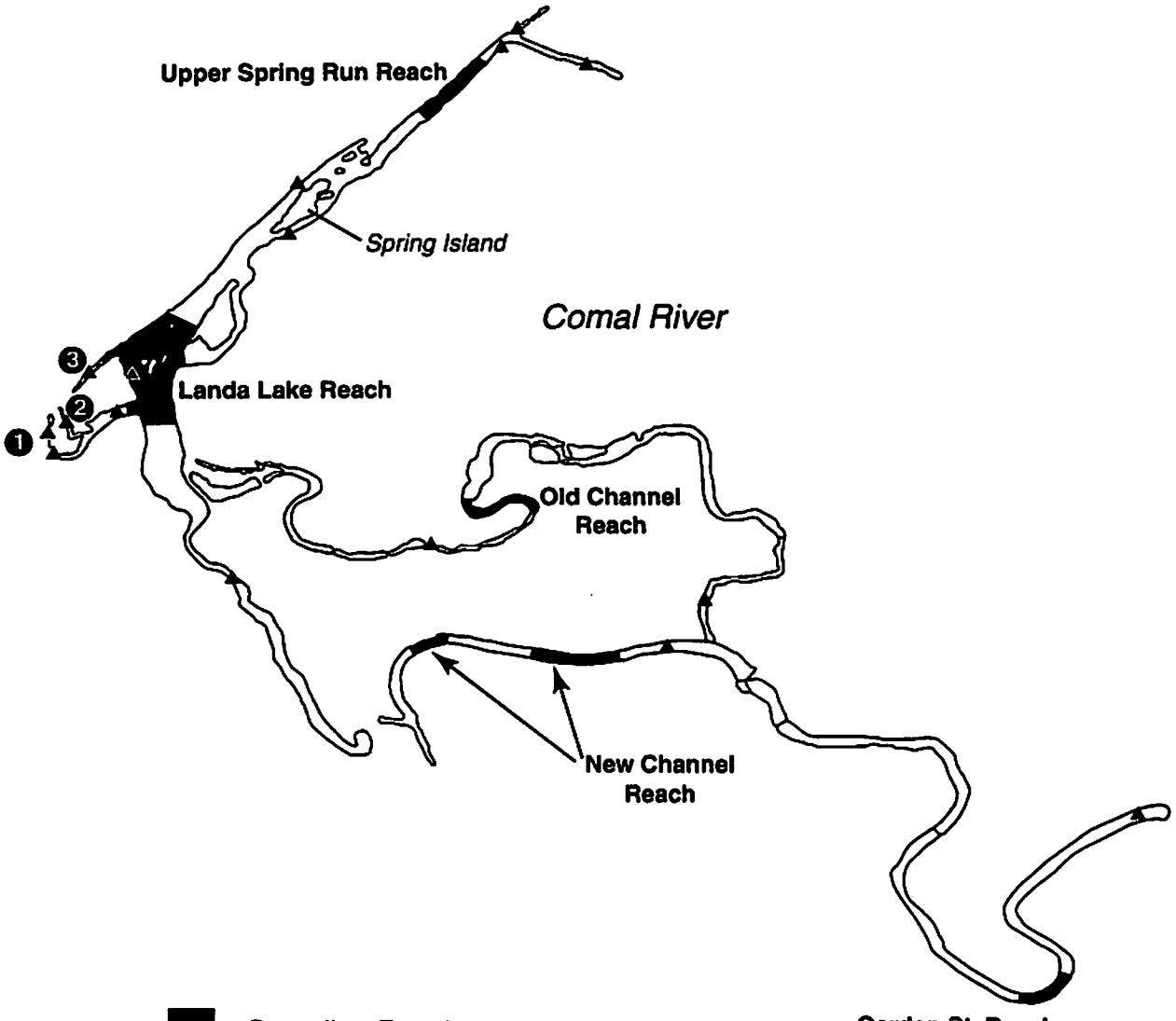

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Figure 1

COMAL RIVER
WATER QUALITY AND
BIOLOGICAL SAMPLING AREAS

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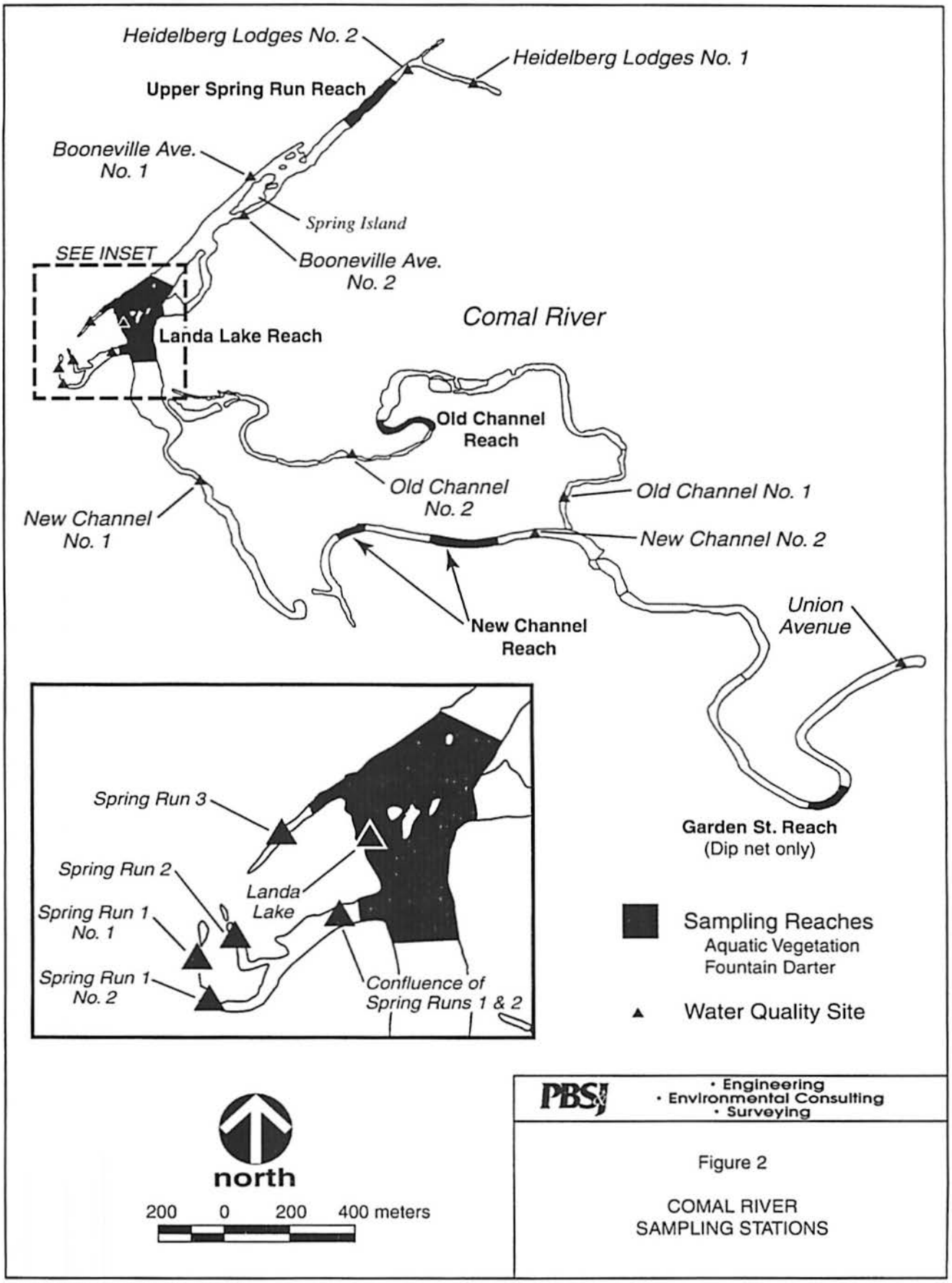

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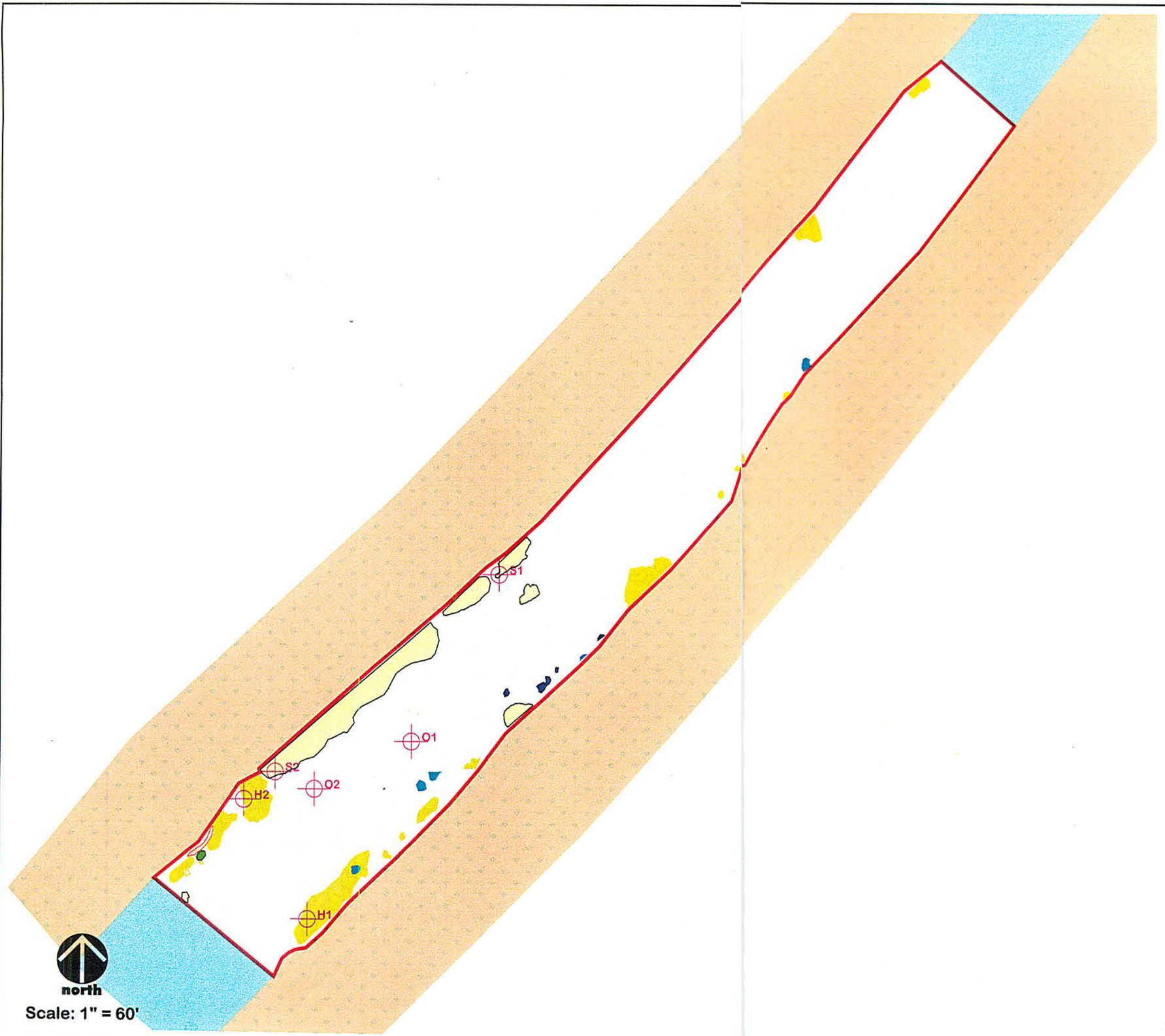

EDWARDS AQUIFER
AUTHORITY

Comal river Aquatic Vegetation
Upper Spring Run Reach
November 8, 2000

Legend

	Acres
- Study Area	1.206
- Chara sp	0.001
- Colocasia	0.001
- Sagittaria	0.056
- Hygrophila	0.0483
- Cabomba	0.003
- Nuphar	0.001
- Ludwigia	0.0002
- Bare Substrate	1.0955
- Shoreline / Island	
- Comal River	
- Drop Net Sample Sites	

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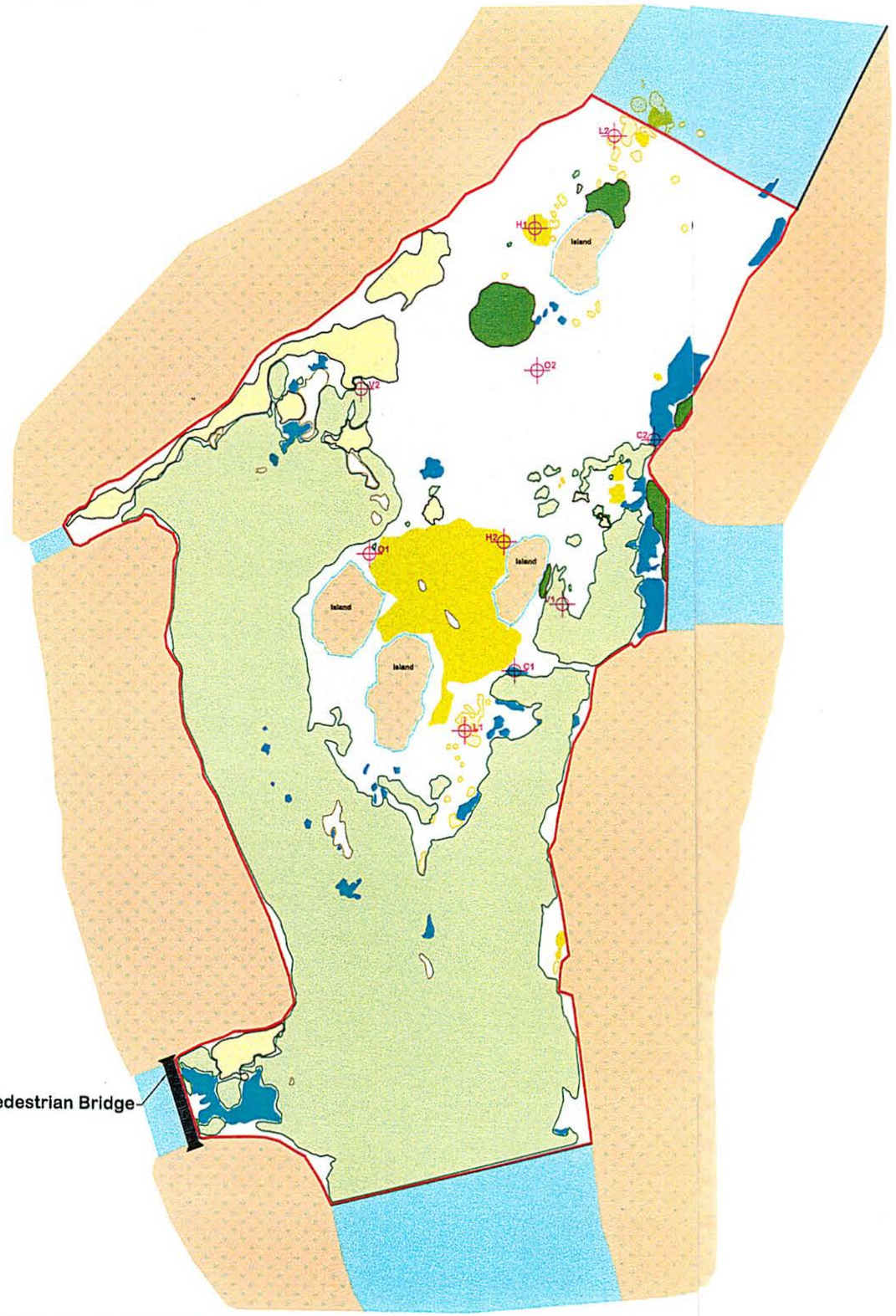

EDWARDS AQUIFER
AUTHORITY

Comal River Aquatic Vegetation
Landa Lake
November 14, 2000

Legend

	Acres
- Study Area	5.648
- Vallisneria	2.583
- Sagittaria	0.209
- Hygrophila	0.251
- Cabomba	0.158
- Nuphar	0.084
- Ludwigia	0.037
- Bare Substrate	2.326
- 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
November 14, 2000

north

Scale: 1" = 60'

Legend

	Acres
- Study Area	1.045
- Hygrophila	0.747
- Cabomba	0.0046
- Bare Substrate	0.2908
- Shoreline / Island	
- Comal River	
- Drop Net Sample Sites	

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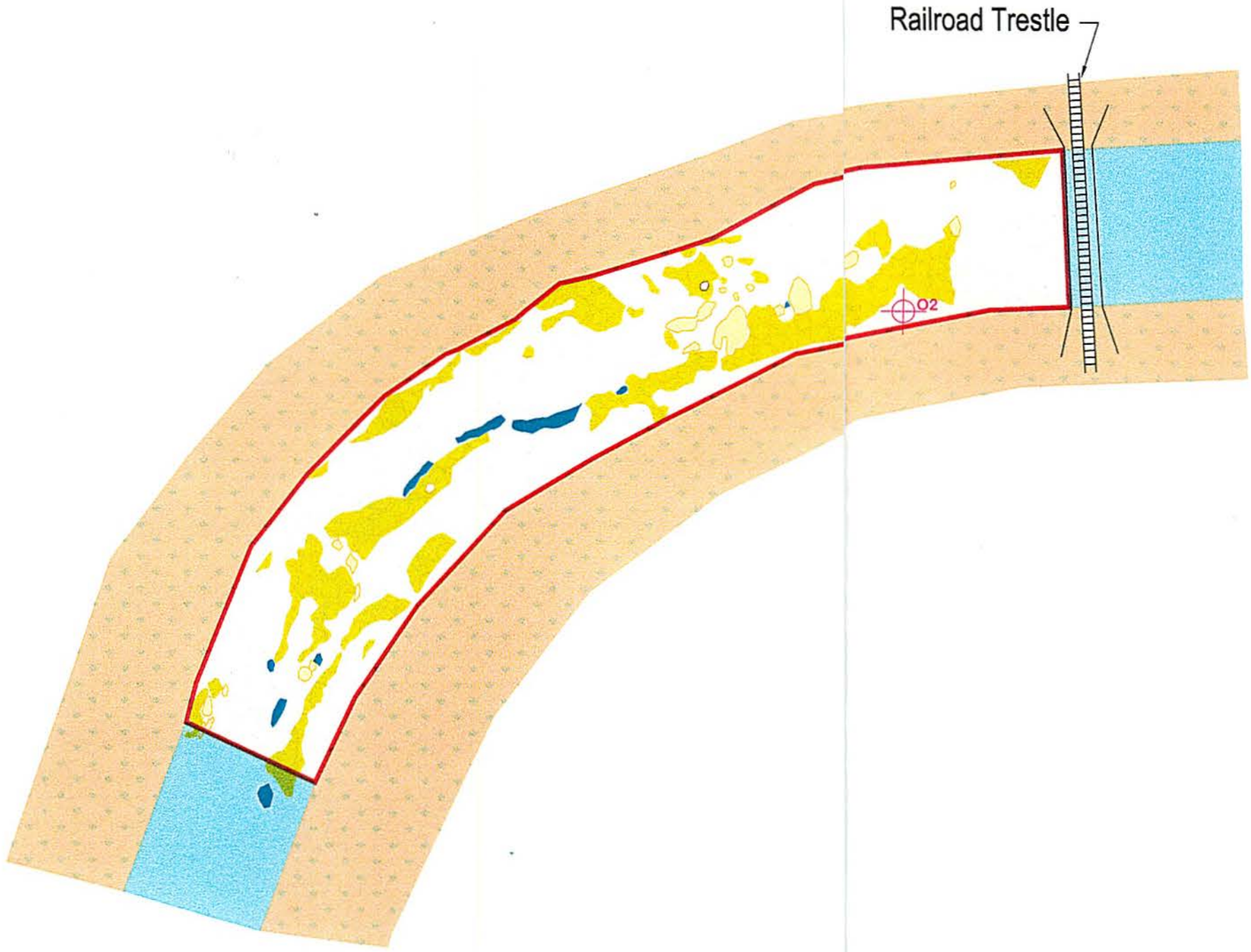

north

Scale: 1" = 60'

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EDWARDS AQUIFER AUTHORITY

Comal River Aquatic Vegetation
New Channel - Upper Reach
November 14, 2000

Legend

	Acres
- Study Area	0.747
- Hygrophila	0.158
- Cabomba	0.008
- Ludwigia	0.0095
- Bare Substrate	0.5715
- Shoreline / Island	
- Comal River	
- Drop Net Sample Sites	

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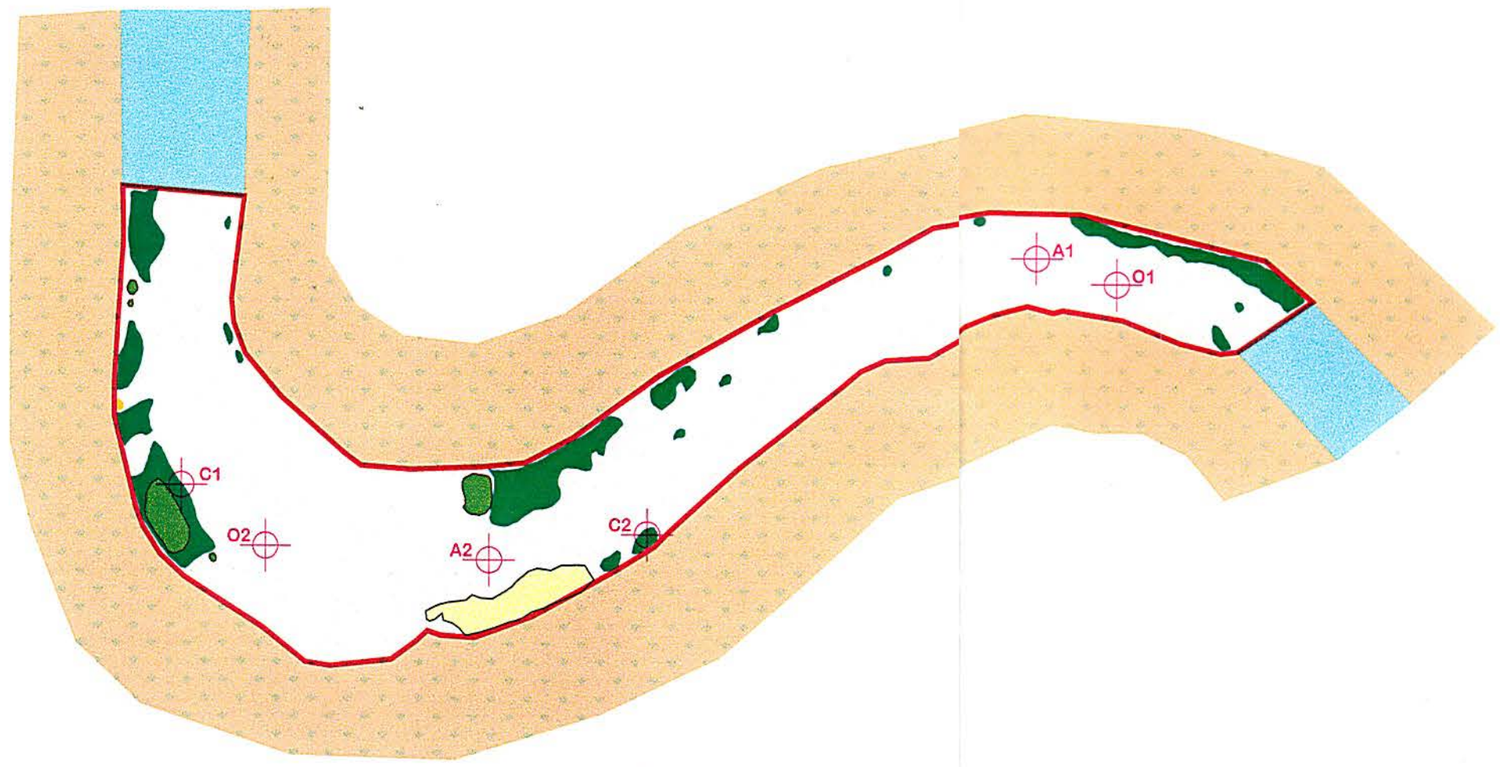
EDWARDS AQUIFER
AUTHORITY

Comal River Aquatic Vegetation
Old Channel Reach
November 14, 2000



Legend

	Acres
- Study Area	0.688
- Ceratopteris	0.058
- Justicia	0.0001
- Azolla/Nuphar	0.018
- Nuphar	0.010
- Bare Substrate	0.6019
- Shoreline / Island	
- Comal River	
- Drop Net Sample Sites	

north

Scale: 1" = 60'

PBS&J

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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 - FALL QUARTERLY SAMPLING
NOVEMBER 13, 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	1205	0.8	20.87	8.40	7.51	529	--	--	--	--	--	--	--	--
Heidelberg Lodge Reach # 2	1210	0.7	22.91	7.02	7.35	533	--	--	--	--	--	--	--	--
Booneville Avenue # 1	1145	1.1	22.57	7.88	7.36	522	--	--	--	--	22.63	6.77	7.38	523
Booneville Avenue # 2	1156	2.4	22.85	6.90	7.28	524	--	--	--	--	23.05	6.81	7.30	527
Spring Run 3	0945	0.5	--	--	--	--	23.17	6.84	7.37	525	--	--	--	--
Spring Run 2	0948	0.3	--	--	--	--	23.14	6.24	7.34	532	--	--	--	--
Spring Run 1 - # 1	0956	0.4	--	--	--	--	23.18	6.32	7.32	531	--	--	--	--
Spring Run 1 - # 2	1000	0.3	--	--	--	--	23.26	7.03	7.33	531	--	--	--	--
Confluence of Sp. Run 1 and 2	1010	1.30	23.01	6.92	7.40	529	--	--	--	--	22.99	5.81	7.38	528
Landa Lake	1016	0.50	23.19	7.34	7.37	526	--	--	--	--	--	--	--	--
New Channel Reach # 1	1113	3.0	22.61	9.04	7.47	529	--	--	--	--	22.63	8.86	7.44	530
Old Channel Reach # 1	1055	0.7	20.39	8.99	7.87	533	--	--	--	--	--	--	--	--
New Channel Reach # 2	1105	1.6	22.02	10.05	7.72	523	--	--	--	--	22.04	9.90	7.71	529
Union Avenue	1045	variable	21.22	9.18	7.85	525	--	--	--	--	--	--	--	--
Old Channel Reach # 2	1134	0.5	21.63	9.90	7.62	530	--	--	--	--	--	--	--	--

TABLE 2 (Concluded)
WATER QUALITY RESULTS
COMAL RIVER - FALL QUARTERLY SAMPLING
NOVEMBER 13, 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	1.2	4.05	5.57	41.97	0.093	1.770	1.799	0.022
Heidelberg Lodge Reach # 2	1.0	4.29	5.40	54.38	0.071	2.152	2.166	0.022
Booneville Avenue # 1	1.7	4.26	5.75	47.83	0.025	1.925	1.992	0.010
	1.6	4.27	5.40	48.86	0.021	2.116	2.170	0.012
Booneville Avenue # 2	1.1	4.37	6.79	34.03	0.014	1.823	1.914	0.010
Spring Run 3	0.6	4.23	3.66	21.97	0.134	1.739	1.869	0.0001
Spring Run 2	0.8	4.25	7.31	21.97	0.139	1.904	2.125	0.004
Spring Run 1 - # 1	0.6	4.31	6.10	22.66	0.132	1.977	2.110	0.004
New Channel Reach # 1	1.1	4.32	6.79	22.31	0.030	2.089	2.101	0.018
Old Channel Reach # 1	1.6	4.44	9.93	35.07	0.034	1.654	1.696	0.052
New Channel Reach # 2	1.1	4.56	7.14	23.34	0.032	1.832	1.840	0.012
	1.7	4.60	6.97	22.66	0.034	2.135	2.151	0.012
Union Avenue	3.2	4.40	10.45	29.55	0.021	1.781	1.812	0.028
Old Channel Reach # 2	1.7	4.31	5.40	38.52	0.134	2.202	2.342	0.030

TABLE 3
LIST OF FIXED PHOTOGRAPHS
COMAL RIVER - FALL QUARTERLY SAMPLING

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 - FALL QUARTERLY SAMPLING

Location (Reach): Upper Spring Run		**Site:** H1 Site 1	
Date: 11/13/00	**Time:** 0910-1000	**Observer(s):** EO, TA, LP, PT, DT	
Vegetation:	Type: *Hygrophila*		
	Height: Surface		
	Areal Coverage	100%	
	GPS location:	29° 43' 09.9"N - 98° 07' 46.3"W	
Substrate Type:	Firm silty clay with assorted size gravel and cobble		
Mean Column Velocity: N/A		Velocity at 15cm above the bottom: 0.0 m/s	

Standard Parameters: 1003	Surface	Mid	Bottom
Temperature (C°)	22.50	--	22.52
Dissolved Oxygen (mg/l)	6.89	--	6.87
pH	7.49	--	7.51
Conductivity	535.0	--	533.0
Secchi depth (cm)	Clear to bottom		

Depth (fixed) (meters): 0.82 m

Adjacent 3m cell areas:

Vegetation type:	*Hygrophila* / Bare channel bottom
Vegetation height:	surface / N/A
Areal coverage:	60% / 40%
Substrate type:	Firm silty clay

Sample Label:	**Preservative:**

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

Sample Label:	**Preservative:**
Number of live Ramshorn snails	Average Size (mm)
2	28.5

DROP NET - FIELD DATA SHEETS
COMAL RIVER - FALL QUARTERLY SAMPLING

Location (Reach):		Site:
Upper Spring Run		H1 Site 1
Date:	**Time:**	**Observer(s):**
11/13/00	0910-1000	EO, TA, LP, PT, DT

Overall	Species	Number	Avg. Length (mm)
5	*Astyanax mexicanus*	5	42.3
3	*Cichlasoma cyanoguttatum*	3	34.7
sparse	*Corbicula* sp.		--
8	*Etheostoma fonticola*	8	30.9
19	*Gambusia sp.*	19	20.3
11	*Lepomis megalotis*	11	28.0
2	*Marisa cornuarietis*	2	28.5
sparse	*Melanoides tuberculata*		--
1	*Notropis amabilis*	1	30.0
7	*Palaemonetes* sp.		--
12	*Procambarus* sp.		--
sparse	*Thiara granifera*		--

Dip net sweep	Species	Number	Length (mm)
1	*Astyanax mexicanus*	2	39,40
	Etheostoma fonticola	1	26
	Lepomis megalotis	7	28,25,17,22,21,25,24
	Melanoides tuberculata	sparse	
	Palaemonetes sp.	4	
	Procambarus sp.	3	
	Thiara granifera	sparse	
2	*Etheostoma fonticola*	1	23
	Gambusia sp.	4	8,10,11,12
	Lepomis megalotis	2	21,18
	Astyanax mexicanus	1	46
	Procambarus sp.	2	
3	*Corbicula* sp.	sparse	
	Lepomis megalotis	1	26
	Melanoides tuberculata	sparse	
	Procambarus sp.	3	
	Thiara granifera	sparse	

DROP NET - FIELD DATA SHEETS
COMAL RIVER - FALL QUARTERLY SAMPLING

Dip net sweep	Species	Number	Length (mm)
4	*Astyanax mexicanus*	1	29
	Etheostoma fonticola	3	47,31,27
	Gambusia sp.	2	25,9
	Marisa cornuarietis	1	23
	Procambarus sp.	1	
5	*Cichlasoma cyanoguttatum*	2	35,32
	Lepomis megalotis	1	26
	Melanoides tuberculata	sparse	
	Palaemonetes sp.	2	
	Procambarus sp.	1	
	Thiara granifera	sparse	
6	*Etheostoma fonticola*	1	22
	Gambusia sp.	3	28,12,24
	Marisa cornuarietis	1	34
	Notropis amabilis	1	30
	Thiara granifera	sparse	
7	*Etheostoma fonticola*	1	40
	Melanoides tuberculata	sparse	
	Procambarus sp.	1	
8	*Astyanax mexicanus*	1	46
	Etheostoma fonticola	1	27
	Gambusia sp.	2	25,15
	Thiara granifera	sparse	
9	*Melanoides tuberculata*	sparse	
	Thiara granifera	sparse	
10	*Etheostoma fonticola*	1	31
	Gambusia sp.	1	26
	Melanoides tuberculata	sparse	
	Thiara granifera	sparse	
11	*Gambusia sp.*	1	32
	Melanoides tuberculata	sparse	
	Palaemonetes sp.	1	
	Thiara granifera	sparse	

DROP NET - FIELD DATA SHEETS
COMAL RIVER - FALL QUARTERLY SAMPLING

Dip net sweep	Species	Number	Length (mm)
12	*Melanoides tuberculata*	sparse	
	Thiara granifera	sparse	
13	*Gambusia sp.*	1	22
	Melanoides tuberculata	sparse	
	Procambarus sp.	1	
	Thiara granifera	sparse	
14	*Cichlasoma cyanoguttatum*	1	37
	Gambusia sp.	5	32,26,22,26,21
	Thiara granifera	sparse	
15	*Thiara granifera*	sparse	

DROP NET - FIELD DATA SHEETS
COMAL RIVER - FALL QUARTERLY SAMPLING

Location (Reach): Upper Spring Run		**Site:** H2 Site 2	
Date: 11/13/00	**Time:** 1010-1047	**Observer(s):** EO, TA, LP, PT, DT	
Vegetation:	Type: *Hygrophila*		
	Height: 0.85 m		
	Areal Coverage: 100%		
	GPS location: 29° 43' 10.6"N - 98° 07' 46.7"W		
Substrate Type:	Soft silty clay mud with occasional gravel		
Mean Column Velocity: 20% - 0.0 m/s 80% - 0.0 m/s		Velocity at 15cm above the bottom: 0.0 m/s	
Standard Parameters: 1047	Surface	Mid	Bottom
Temperature (C°)	22.54	--	22.7
Dissolved Oxygen (mg/l)	7.11	--	6.33
pH	7.38	--	7.36
Conductivity	535.0	--	535.0
Secchi depth (cm)	Clear to bottom		
Depth (fixed) (meters): 0.94 m			
Adjacent 3m cell areas:			
Vegetation type:	*Hygrophila* / Bare channel bottom		
Vegetation height:	0.85 m / N/A		
Areal coverage:	75% / 25%		
Substrate type:	Firm gravel and cobble with thin layer of silt		
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 - FALL QUARTERLY SAMPLING

Location (Reach):		Site:
Upper Spring Run		H2 Site 2
Date:	**Time:**	**Observer(s):**
11/13/2000	1010-1047	EO, TA, LP, PT, DT

Overall	Species	Number	Avg. Length (mm)
1	*Cichlasoma cyanoguttatum*	1	54.0
1	*Etheostoma fonticola*	1	23.0
1	*Lepomis macrochirus*	1	25.0
17	*Lepomis megalotis*	17	27.8
sparse	*Melanoides tuberculata*		--
20	*Notropis amabilis*	20	21.0
1	*Palaemonetes* sp.		--
5	*Procambarus* sp.		--
1	*Tilapia aurea*	1	56.0
sparse	*Thiara granifera*		--

Dip net sweep	Species	Number	Length (mm)
1	*Etheostoma fonticola*	1	23
	Lepomis megalotis	8	39,35,27,23,23,25,12,13
	Notropis amabilis	15	21,22,30,25,25,29,32,35, 31,34,29,31,27,44,29
	Palaemonetes sp.	1	
	Procambarus sp.	1	
	Thiara granifera	sparse	
2	*Cichlasoma cyanoguttatum*	1	54
	Lepomis megalotis	1	21
	Notropis amabilis	1	21
	Procambarus sp.	1	
	Tilapia aurea	1	56
3	*Lepomis macrochirus*	1	25
	Lepomis megalotis	4	40,21,18,32
	Notropis amabilis	1	34
4	*Notropis amabilis*	1	35
5	*Melanoides tuberculata*	sparse	
	Notropis amabilis	1	33
6	No fish or crustaceans collected		

DROP NET - FIELD DATA SHEETS
COMAL RIVER - FALL QUARTERLY SAMPLING

Dip net sweep	Species	Number	Length (mm)
7	*Melanoides tuberculata*	sparse	
	Procambarus sp.	1	
8	*Thiara granifera*	sparse	
9	*Lepomis megalotis*	1	13
10	*Lepomis megalotis*	1	24
	Melanoides tuberculata	sparse	
	Notropis amabilis	1	45
11	*Lepomis megalotis*	1	40
	Melanoides tuberculata	sparse	
	Procambarus sp.	1	
12	No fish or crustaceans collected		
13	No fish or crustaceans collected		
14	*Lepomis megalotis*	1	67
	Melanoides tuberculata	sparse	
	Procambarus sp.	1	
	Thiara granifera	sparse	
15	*Melanoides tuberculata*	sparse	
	Notropis amabilis	1	32
	Thiara granifera	sparse	

DROP NET - FIELD DATA SHEETS
COMAL RIVER - FALL QUARTERLY SAMPLING

Location (Reach): Upper Spring Run		**Site:** S2 Site 3	
Date: 11/13/00	**Time:** 1054-1120	**Observer(s):** EO, LP, DT	
Vegetation:	Type: *Sagittaria*		
	Height: 32 cm		
	Areal Coverage: 100%		
	GPS location: 29° 43' 10.9"N - 98° 07' 46.3"W		
Substrate Type:	Soft silty clayey mud		
Mean Column Velocity: 60% - 0.0 m/s		Velocity at 15cm above the bottom: 0.0 m/s	
Standard Parameters: 1117	Surface	Mid	Bottom
Temperature (C°)	22.76	--	22.77
Dissolved Oxygen (mg/l)	6.47	--	6.24
pH	7.27	--	7.31
Conductivity	537.0	--	536.0
Secchi depth (cm)	Clear to bottom		
Depth (fixed) (meters): 0.72 m			
Adjacent 3m cell areas:			
Vegetation type:	*Sagittaria* / *Colocasia* / Bare channel bottom		
Vegetation height:	35 cm / emergent / N/A		
Areal coverage:	85% / 5% / 10%		
Substrate type:	Soft firm clayey mud, gravel and 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 - FALL QUARTERLY SAMPLING

Location (Reach):		Site:
Upper Spring Run		S2 Site 3
Date:	**Time:**	**Observer(s):**
11/13/00	1054-1120	EO, LP, DT

Overall	Species	Number	Avg. Length (mm)
1	*Cichlasoma cyanoguttatum*	1	41.0
1	*Lepomis gulosus*	1	35.0
4	*Lepomis macrochirus*	4	26.8
10	*Lepomis megalotis*	10	35.0
sparse	*Melanoides tuberculata*		--
1	*Notropis amabilis*	1	36.0
3	*Procambarus* sp.		--

Dip net sweep	Species	Number	Length (mm)
1	*Cichlasoma cyanoguttatum*	1	41
	Lepomis gulosus	1	35
	Lepomis megalotis	5	22,21,35,38,21
	Notropis amabilis	1	36
2	*Lepomis macrochirus*	3	42,25,20
	Lepomis megalotis	3	55,19,26
3	*Lepomis megalotis*	1	22
4	*Lepomis megalotis*	1	13
5	*Lepomis macrochirus*	1	20
6	No fish or crustaceans collected		
7	*Procambarus* sp.	1	
8	No fish or crustaceans collected		
9	*Melanoides tuberculata*	sparse	
10	*Procambarus* sp.	1	
11	No fish or crustaceans collected		
12	No fish or crustaceans collected		

DROP NET - FIELD DATA SHEETS
COMAL RIVER - FALL QUARTERLY SAMPLING

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

DROP NET - FIELD DATA SHEETS
COMAL RIVER - FALL QUARTERLY SAMPLING

Location (Reach): Upper Spring Run		**Site:** O2 Site 4	
Date: 11/13/00	**Time:** 1125-1140	**Observer(s):** EO, LP, DT	
Vegetation:	Type:	Open water / Bare channel bottom	
	Height:	N/A	
	Areal Coverage:	100%	
	GPS location:	29° 43' 10.8"N - 98° 07' 46.2"W	
Substrate Type:	Coarse sand and assorted-sized gravel		
Mean Column Velocity: 60% - 0.01 m/s		Velocity at 15cm above the bottom: 0.01 m/s	

Standard Parameters: 1139	Surface	Mid	Bottom
Temperature (C°)	22.79	--	22.91
Dissolved Oxygen (mg/l)	6.89	--	6.56
pH	7.34	--	7.35
Conductivity	533.0	--	534.0
Secchi depth (cm)	Clear to bottom		

Depth (fixed) (meters): 0.79 m

Adjacent 3m cell areas:

Vegetation type:	Bare channel bottom / *Sagittaria*
Vegetation height:	N/A / 35 cm
Areal coverage:	90% / 10%
Substrate type:	Coarse sand with assorted-sized gravel and 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 - FALL QUARTERLY SAMPLING

Location (Reach):		Site:	
Upper Spring Run		O2 Site 4	
Date:	**Time:**	**Observer(s):**	
11/13/00	1125-1140	EO, LP, DT	
Overall	**Species**	**Number**	**Avg. Length (mm)**
sparse	*Melanoides tuberculata*		
1	*Procambarus* sp.		
Dip net sweep	**Species**	**Number**	**Length (mm)**
1	*Melanoides tuberculata*	sparse	
2	*Procambarus* sp.	1	
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	*Melanoides tuberculata*	sparse	
11	*Melanoides tuberculata*	sparse	
12	No fish or crustaceans collected		

DROP NET - FIELD DATA SHEETS
COMAL RIVER - FALL QUARTERLY SAMPLING

Location (Reach): Upper Spring Run		**Site:** O1 Site 5	
Date: 11/13/00	**Time:** 1150-1201	**Observer(s):** EO, LP, DT	
Vegetation:	Type:	Open water / Bare channel bottom	
	Height:	N/A	
	Areal Coverage:	100%	
	GPS location:	29° 43' 11.6"N - 98° 07' 45.3"W	
Substrate Type:	Assorted-sized gravel and cobble		
Mean Column Velocity: 60% - 0.01 m/s		Velocity at 15cm above the bottom: 0.0 m/s	

Standard Parameters: 1201	Surface	Mid	Bottom
Temperature (C°)	22.97	--	22.05
Dissolved Oxygen (mg/l)	6.49	--	6.60
pH	7.34	--	7.34
Conductivity	536.0	--	534.0
Secchi depth (cm)	Clear to bottom		

Depth (fixed) (meters): 1.0 m

Adjacent 3m cell areas:

Vegetation type:	Open water / Bare channel bottom
Vegetation height:	N/A
Areal coverage:	100%
Substrate type:	Assorted-sized 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 - FALL QUARTERLY SAMPLING

Location (Reach):		Site:	
Upper Spring Run		O1 Site 5	
Date:	**Time:**	**Observer(s):**	
11/13/00	1150-1201	EO, LP, DT	
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		

DROP NET - FIELD DATA SHEETS
COMAL RIVER - FALL QUARTERLY SAMPLING

Location (Reach): Upper Spring Run		**Site:** S1 Site 6	
Date: 11/13/00	**Time:** 1207-1230	**Observer(s):** EO, LP, DT	
Vegetation:	Type: *Sagittaria*		
	Height: 0.52 m		
	Areal Coverage: 100%		
	GPS location: 29° 43' 11"N - 98° 07' 45.2"W		
Substrate Type:	Soft silt-clay mud		
Mean Column Velocity: 0.0 m/s		Velocity at 15cm above the bottom: 0.0 m/s	

Standard Parameters: 1230	Surface	Mid	Bottom
Temperature (C°)	23.16	–	23.22
Dissolved Oxygen (mg/l)	6.88	–	6.42
pH	7.28	–	7.27
Conductivity	534.0	--	533.0
Secchi depth (cm)			

Depth (fixed) (meters): 0.88 m

Adjacent 3m cell areas:

Vegetation type:	*Sagittaria* / Bare channel bottom
Vegetation height:	0.55 m / N/A
Areal coverage:	85% / 15%
Substrate type:	Soft silty clay mud, gravel and cobble

Sample Label:	**Preservative:**

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

Sample Label:	**Preservative:**
Number of live Ramshorn snails	Average Size (mm)
3	33.3

DROP NET - FIELD DATA SHEETS
COMAL RIVER - FALL QUARTERLY SAMPLING

Location (Reach):		Site:
Upper Spring Run		S1 Site 6
Date:	**Time:**	**Observer(s):**
11/13/00	1207-1230	EO, LP, DT

Overall	Species	Number	Avg. Length (mm)
4	*Lepomis macrochirus*	4	42.5
6	*Lepomis megalotis*	6	42.7
1	*Lepomis punctatus*	1	36.0
3	*Marisa cornuarietis*	3	33.3
sparse	*Melanoides tuberculata*		--
14	*Notropis amabilis*	14	45.1
5	*Procambarus* sp.		--

Dip net sweep	Species	Number	Length (mm)
1	*Lepomis macrochirus*	4	35,30,41,29
	Lepomis megalotis	1	18
	Marisa cornuarietis	3	32,30,38
	Melanoides tuberculata	sparse	
	Notropis amabilis	4	46,44,34
2	*Lepomis megalotis*	3	40,15,19
	Melanoides tuberculata	sparse	
	Notropis amabilis	1	40,41
3	*Lepomis punctatus*	1	96
	Notropis amabilis	3	45,44,45
4	*Procambarus* sp.	2	
5	*Lepomis megalotis*	1	74
	Procambarus sp.	1	
6	*Notropis amabilis*	2	62,35
7	No fish or crustaceans collected		
8	*Notropis amabilis*	1	39
9	*Notropis amabilis*	1	44
10	No fish or crustaceans collected		

DROP NET - FIELD DATA SHEETS
COMAL RIVER - FALL QUARTERLY SAMPLING

Dip net sweep	Species	Number	Length (mm)
11	*Procambarus* sp.	1	
12	No fish or crustaceans collected		
13	No fish or crustaceans collected		
14	*Lepomis megalotis*	1	90
15	*Notropis amabilis*	2	54,58
	Procambarus sp.	1	

LANDA LAKE REACH

DROP NET - FIELD DATA SHEETS
COMAL RIVER - FALL QUARTERLY SAMPLING

Location (Reach): Landa Lake		**Site:** O2 Site 1	
Date: 11/13/00	**Time:** 1426-1450	**Observer(s):** EO, LP, LV, DT	
Vegetation:	Type:	Open water / Bare channel bottom	
	Height:	N/A	
	Areal Coverage:	100%	
	GPS location:	29° 42' 54.2"N ; 98° 08' 05.0"W	
Substrate Type:	Gravel and cobble		
Mean Column Velocity: 60% - 0.05 m/s		Velocity at 15cm above the bottom: 0.03 m/s	

Standard Parameters: 1450	Surface	Mid	Bottom
Temperature (C°)	23.29	--	23.36
Dissolved Oxygen (mg/l)	6.64	--	6.42
pH	7.36	--	7.36
Conductivity	531	--	530
Secchi depth (cm)			

Depth (fixed) (meters): 0.97 m

Adjacent 3m cell areas:

Vegetation type:	Open water / *Vallisneria* / *Nuphar*
Vegetation height:	N/A / 0.46 m / 0.85 m
Areal coverage:	N/A / 4% / 1%
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)
0	

DROP NET - FIELD DATA SHEETS
COMAL RIVER - FALL QUARTERLY SAMPLING

Location (Reach):		Site:	
Landa Lake		O2 Site 1	
Date:	**Time:**	**Observer(s):**	
11/13/00	1426-1450	EO, LP, LV, DT	
Overall	**Species**	**Number**	**Avg. Length (mm)**
1	*Etheostoma fonticola*	1	26.0
45	*Gambusia* sp.	45	15.7
sparse	*Melanoides tuberculata*	sparse	--
sparse	*Thiara granifera*	sparse	--
Dip net sweep	**Species**	**Number**	**Length (mm)**
1	*Melanoides tuberculata*	sparse	
	Thiara granifera	sparse	
2	*Melanoides tuberculata*	sparse	
	Thiara granifera	sparse	
3	*Melanoides tuberculata*	sparse	
	Thiara granifera	sparse	
4	*Melanoides tuberculata*	sparse	
5	*Gambusia* sp.	3	12,17,14
	Melanoides tuberculata	sparse	
6	*Gambusia* sp.	2	16,21
	Melanoides tuberculata	sparse	
7	*Gambusia* sp.	4	21,20,12,12
8	*Gambusia* sp.	21	12-22
9	*Gambusia* sp.	2	12,12
10	No fish or crustaceans collected		

DROP NET - FIELD DATA SHEETS

COMAL RIVER - FALL QUARTERLY SAMPLING

Dip net sweep	Species	Number	Length (mm)
11	*Gambusia* sp.	1	22
	Melanoides tuberculata	sparse	
12	*Gambusia* sp.	1	15
	Melanoides tuberculata	sparse	
13	*Gambusia* sp.	6	12,15,12,14,13,12
	Melanoides tuberculata	sparse	
14	*Etheostoma fonticola*	1	26
	Gambusia sp.	4	15,20,18,16
	Melanoides tuberculata	sparse	
15	*Gambusia* sp.	1	13,17
	Melanoides tuberculata	sparse	

DROP NET - FIELD DATA SHEETS
COMAL RIVER - FALL QUARTERLY SAMPLING

Location (Reach):		**Site:**
Landa Lake		H1 Site 2
Date: 11/13/00	**Time:** 1454-1545	**Observer(s):** EO, LP, LV, DT

Vegetation:	Type:	*Hygrophila* / *Riccia*
	Height:	52 cm / 10 cm
	Areal Coverage	90% / 10%
	GPS location:	29° 42' 5.15"N ; 98° 08' 07.4"W
Substrate Type:	Thin silt layer over gravel and cobble	

Mean Column Velocity:	Velocity at 15cm above the bottom:
60% - 0.01 m/s	0.0 m/s

Standard Parameters: 1545	Surface	Mid	Bottom
Temperature (C°)	22.82	--	23.30
Dissolved Oxygen (mg/l)	7.48	--	6.83
pH	7.32	--	7.35
Conductivity	530	--	531
Secchi depth (cm)	Clear to bottom		

Depth (fixed) (meters):

0.73 m

Adjacent 3m cell areas:

Vegetation type:	*Hygrophila* / *Riccia* / Bare channel bottom
Vegetation height:	52 cm / 13 cm / N/A
Areal coverage:	80% / 10% / 10%
Substrate type:	Thin silt layer over gravel and cobble

Sample Label:	**Preservative:**

Snails: *Melanoides tuberculata* - sparse / *Thiara granifera* - sparse / *Elimia* sp. - sparse

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

DROP NET - FIELD DATA SHEETS
COMAL RIVER - FALL QUARTERLY SAMPLING

Location (Reach):		Site:	
Landa Lake		H1 Site 2	
Date:	**Time:**	**Observer(s):**	
11/13/00	1454-1545	EO, LP, LV, DT	
Overall	**Species**	**Number**	**Avg. Length (mm)**
sparse	*Elimia comalensis*		--
11	*Etheostoma fonticola*	11	29.0
516	*Gambusia* sp.	27	21.3
sparse	*Melanoides tuberculata*		--
15	*Palaemonetes* sp.		--
19	*Poecilia latipinna*	18	29.7
27	*Procambarus* sp.		--
sparse	*Thiara granifera*		--
Dip net sweep	**Species**	**Number**	**Length (mm)**
1	*Etheostoma fonticola*	3	30,31,28
	Gambusia sp.	134	15,15,23,25,29,25,18,25, 21,16,29,21,18,22,20,22, 20,22,20,8,15,35,15,12, 27,29,28
	Melanoides tuberculata	moderate	
	Palaemonetes sp.	5	
	Poecilia latipinna	10	32,39,32,18,32,36,22,32, 21,21
	Procambarus sp.	7	
	Thiara granifera	moderate	
2	*Gambusia* sp.	47	
	Melanoides tuberculata	sparse	
	Palaemonetes sp.	3	
	Procambarus sp.	3	
	Thiara granifera	sparse	
3	*Etheostoma fonticola*	2	25,29
	Gambusia sp.	39	
	Melanoides tuberculata	sparse	
	Palaemonetes sp.	3	
	Poecilia latipinna	2	39,26
	Procambarus sp.	5	
	Thiara granifera	sparse	

DROP NET - FIELD DATA SHEETS
COMAL RIVER - FALL QUARTERLY SAMPLING

Dip net sweep	Species	Number	Length (mm)
4	*Gambusia* sp.	55	
	Melanoides tuberculata	sparse	
	Palaemonetes sp.	1	
	Poecilia latipinna	1	27
	Procambarus sp.	4	
	Thiara granifera	sparse	
5	*Elimia comalensis*	sparse	
	Gambusia sp.	24	
	Melanoides tuberculata	sparse	
	Palaemonetes sp.	2	
	Procambarus sp.	2	
	Thiara granifera	sparse	
6	*Gambusia* sp.	44	
	Melanoides tuberculata	sparse	
	Thiara granifera	sparse	
7	*Etheostoma fonticola*	3	33,28,23
	Gambusia sp.	55	
	Palaemonetes sp.	1	
	Poecilia latipinna	2	30,25
	Procambarus sp.	2	
	Thiara granifera	sparse	
8	*Etheostoma fonticola*	2	34,26
	Gambusia sp.	2	
	Thiara granifera	sparse	
9	*Gambusia* sp.	13	
	Poecilia latipinna	2	22,36
	Procambarus sp.	2	
10	*Etheostoma fonticola*	1	32
	Gambusia sp.	40	
	Poecilia latipinna	1	35
	Thiara granifera	moderate	
11	*Gambusia* sp.	4	
	Thiara granifera	sparse	

DROP NET - FIELD DATA SHEETS
COMAL RIVER - FALL QUARTERLY SAMPLING

Dip net sweep	Species	Number	Length (mm)
12	*Gambusia* sp.	18	
	Poecilia latipinna	1	
13	*Gambusia* sp.	8	
	Procambarus sp.	2	
	Thiara granifera	sparse	
14	*Gambusia* sp.	30	
	Thiara granifera	sparse	
15	*Gambusia* sp.	3	
	Thiara granifera	sparse	

DROP NET - FIELD DATA SHEETS
COMAL RIVER - FALL QUARTERLY SAMPLING

Location (Reach): Landa Lake		**Site:** L2 Site 3	
Date: 11/13/00	**Time:** 1550-1624	**Observer(s):** EO, LP, LV, DT	
Vegetation:	Type:	*Ludwigia / Riccia*	
	Height:	33 cm / 15 cm	
	Areal Coverage:	35% / 5%	
	GPS location:	29° 42' 53.2"N ; 98° 08' 05.8"W	
Substrate Type:	Assorted size gravel and cobble		
Mean Column Velocity: 60% - 0.03 m/s		Velocity at 15cm above the bottom: 0.01 m/s	

Standard Parameters: 1624	Surface	Mid	Bottom
Temperature (C°)	23.09	--	23.22
Dissolved Oxygen (mg/l)	6.71	--	6.51
pH	7.27	--	7.28
Conductivity	529	--	528
Secchi depth (cm)			

Depth (fixed) (meters): 0.69 m

Adjacent 3m cell areas:

Vegetation type:	*Ludwigia / Riccia* / Bare channel bottom
Vegetation height:	38 cm / 16 cm / N/A
Areal coverage:	65% / 20% / 15%
Substrate type:	Assorted sized gravel and cobble

Sample Label:	**Preservative:**

Snails: *Elimia* sp. - moderate / *Thiara granifera* - sparse

Sample Label:	**Preservative:**
Number of live Ramshorn snails	Average Size (mm)
2	24.0

DROP NET - FIELD DATA SHEETS
COMAL RIVER - FALL QUARTERLY SAMPLING

Location (Reach):		Site:
Landa Lake		L2 Site 3
Date:	**Time:**	**Observer(s):**
11/13/00	1550-1624	EO, LP, LV, DT

Overall	Species	Number	Avg. Length (mm)
moderate	*Elimia comalensis*		–
10	*Etheostoma fonticola*	10	29.1
153	*Gambusia* sp.	25	18.1
2	*Marisa cornuarietis*	2	24.0
62	*Palaemonetes* sp.		–
40	*Procambarus* sp.		–
sparse	*Thiara granifera*		–

Dip net sweep	Species	Number	Length (mm)
1	*Elimia comalensis*	moderate	
	Etheostoma fonticola	4	32,28,31,25
	Gambusia sp.	30	12,12,13,21,15,28,22,30, 22,21,16,22,26,21,24,13, 9,17,10
	Palaemonetes sp.	43	
	Thiara granifera	sparse	
2	*Etheostoma fonticola*	1	33
	Gambusia sp.	9	17,19,21,12,14,16
	Palaemonetes sp.	7	
	Procambarus sp.	3	
3	*Etheostoma fonticola*	1	34
	Gambusia sp.	24	
	Marisa cornuarietis	1	36
	Palaemonetes sp.	8	
	Procambarus sp.	6	
4	*Gambusia* sp.	17	
	Palaemonetes sp.	1	
	Procambarus sp.	3	
5	*Gambusia* sp.	15	
	Procambarus sp.	11	

DROP NET - FIELD DATA SHEETS
COMAL RIVER - FALL QUARTERLY SAMPLING

Dip net sweep	Species	Number	Length (mm)
6	*Etheostoma fonticola*	1	23
	Gambusia sp.	2	
	Procambarus sp.	4	
7	*Etheostoma fonticola*	1	32
	Gambusia sp.	18	
	Palaemonetes sp.	2	
	Procambarus sp.	1	
8	*Etheostoma fonticola*	1	26
	Procambarus sp.	3	
9	*Etheostoma fonticola*	1	27
	Gambusia sp.	4	
	Procambarus sp.	2	
10	*Gambusia* sp.	11	
	Gambusia sp.	1	
	Procambarus sp.	2	
11	*Gambusia* sp.	5	
	Marisa cornuarietis	1	12
12	*Gambusia* sp.	6	
	Procambarus sp.	4	
13	*Gambusia* sp.	7	
	Procambarus sp.	1	
14	*Gambusia* sp.	4	
15	*Gambusia* sp.	1	

DROP NET - FIELD DATA SHEETS
COMAL RIVER - FALL QUARTERLY SAMPLING

Location (Reach): Landa Lake		**Site:** L1 Site 4	
Date: 11/14/00	**Time:** 0836-0913	**Observer(s):** EO, CN, LV, DT	
Vegetation:	Type:	*Ludwigia / Riccia*	
	Height:	31 cm / 11 cm	
	Areal Coverage:	95% / 5%	
	GPS location:	29° 42' 54.7"N ; 98° 08' 05.2"W	
Substrate Type:	Soft clayey mud under grass bed surrounded by assorted sized gravel and cobble		
Mean Column Velocity: 60% - 0.15 m/s		Velocity at 15cm above the bottom: 0.0 m/s	

Standard Parameters: '0913	Surface	Mid	Bottom
Temperature (C°)	22.59	--	22.68
Dissolved Oxygen (mg/l)	6.67	--	6.58
pH	7.43	--	7.45
Conductivity	529.0	--	528.0
Secchi depth (cm)	Clear to bottom		

Depth (fixed) (meters): 0.75 m

Adjacent 3m cell areas:

Vegetation type:	*Ludwigia / Riccia* / Bare channel bottom
Vegetation height:	37 cm / 11 cm / N/A
Areal coverage:	55% / 2.5% / 42.5%
Substrate type:	Soft clayey mud under grass bed surrounded by assorted sized gravel & cobble

Sample Label:	**Preservative:**

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

Sample Label:	**Preservative:**
Number of live Ramshorn snails	Average Size (mm)
4	18.3

DROP NET - FIELD DATA SHEETS
COMAL RIVER - FALL QUARTERLY SAMPLING

Location (Reach):		Site:
Landa Lake		L1 Site 4
Date:	**Time:**	**Observer(s):**
11/14/00	0836-0913	EO, CN, LV, DT

Overall	Species	Number	Avg. Length (mm)
sparse	*Elimia comalensis*		--
19	*Etheostoma fonticola*	19	28.8
116	*Gambusia* sp.	25	18.7
1	*Lepomis macrochirus*	1	79.0
4	*Marisa comuarietis*	4	18.3
sparse	*Melanoides tuberculata*		--
47	*Palaemonetes* sp.		--
1	*Plecostomus*	1	20.0
1	*Poecilia latipinna*	1	20.0
45	*Procambarus* sp.		--
sparse	*Thiara granifera*		--

Dip net sweep	Species	Number	Length (mm)
1	*Elimia comalensis*	sparse	
	Etheostoma fonticola	2	30,29
	Gambusia sp.	43	24,26,16,20,15,30,28,18, 21,23,16,8,14,20,22,22, 17,17,28,24,9,10,13,15, 12
	Melanoides tuberculata	sparse	
	Palaemonetes sp.	16	
	Procambarus sp.	3	
2	*Elimia comalensis*	sparse	
	Etheostoma fonticola	2	31,22
	Gambusia sp.	22	
	Marisa comuarietis	1	15
	Palaemonetes sp.	19	
	Plecostomus	1	20
	Procambarus sp.	2	
	Thiara granifera	sparse	
3	*Etheostoma fonticola*	3	33,28,27
	Lepomis macrochirus	1	79
	Melanoides tuberculata	sparse	
	Palaemonetes sp.	5	
	Procambarus sp.	3	
	Thiara granifera	sparse	

DROP NET - FIELD DATA SHEETS
COMAL RIVER - FALL QUARTERLY SAMPLING

Dip net sweep	Species	Number	Length (mm)
4	*Etheostoma fonticola*	2	32,30
	Gambusia sp.	4	
	Melanoides tuberculata	sparse	
	Palaemonetes sp.	3	
	Procambarus sp.	4	
	Thiara granifera	sparse	
5	*Gambusia* sp.	3	
	Procambarus sp.	4	
6	*Etheostoma fonticola*	4	24,34,30,25
	Procambarus sp.	2	
7	*Etheostoma fonticola*	2	29,38
	Gambusia sp.	3	
	Procambarus sp.	1	
	Thiara granifera	sparse	
8	*Etheostoma fonticola*	1	26
	Gambusia sp.	5	
	Marisa comuarietis	1	24
9	*Etheostoma fonticola*	1	26
	Gambusia sp.	3	
	Marisa comuarietis	1	26
	Melanoides tuberculata	sparse	
	Palaemonetes sp.	3	
	Procambarus sp.	5	
10	*Gambusia* sp.	3	
	Palaemonetes sp.	2	
	Procambarus sp.	1	
11	*Etheostoma fonticola*	2	30,24
	Gambusia sp.	15	
	Marisa comuarietis	1	8
	Palaemonetes sp.	1	
	Poecilia latipinna	1	20
	Procambarus sp.	7	
	Thiara granifera	sparse	
12	*Gambusia* sp.	3	
	Procambarus sp.	8	
13	*Gambusia affinis*	5	
	Procambarus sp.	3	
	Thiara granifera	sparse	

DROP NET - FIELD DATA SHEETS
COMAL RIVER - FALL QUARTERLY SAMPLING

Dip net sweep	Species	Number	Length (mm)
14	*Gambusia* sp.	3	
	Thiara granifera	sparse	
15	*Gambusia* sp.	4	
	Procambarus sp.	2	
	Thiara granifera	sparse	

DROP NET - FIELD DATA SHEETS
COMAL RIVER - FALL QUARTERLY SAMPLING

Location (Reach): Landa Lake		**Site:** O1 Site 5	
Date: 11/14/00	**Time:** 0920-0940	**Observer(s):** EO, LV, CN, DT	
Vegetation:	Type:	Open water / Bare channel bottom	
	Height:	N/A	
	Areal Coverage:	100%	
	GPS location:	29° 42' 52.1"N ; 98° 08' 06.7"W	
Substrate Type:	Silt clayey mud, gravel and cobble		
Mean Column Velocity: 60% - 0.08 m/s		Velocity at 15cm above the bottom: 0.04 m/s	

Standard Parameters: '0940	Surface	Mid	Bottom
Temperature (C°)	22.93	--	22.94
Dissolved Oxygen (mg/l)	7.01	--	6.88
pH	7.35	--	7.38
Conductivity	531.0	--	531.0
Secchi depth (cm)			

Depth (fixed) (meters): N/A

Adjacent 3m cell areas:

Vegetation type:	Bare channel bottom / *Vallisneria* / *Hygrophila*
Vegetation height:	N/A / 35 cm / 37 cm
Areal coverage:	65% / 15% / 20%
Substrate type:	Silt clayey mud, 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 - FALL QUARTERLY SAMPLING

Location (Reach):		Site:	
Landa Lake		O1 Site 5	
Date:	**Time:**	**Observer(s):**	
11/14/00	0920-0940	EO, LV, CN, DT	
Overall	**Species**	**Number**	**Avg. Length (mm)**
1	*Etheostoma fonticola*	1	23.0
288	*Gambusia* sp.	25	21.4
Dip net sweep	**Species**	**Number**	**Length (mm)**
1	No fish or crustaceans collected		
2	*Gambusia* sp.	2	19,13
3	*Gambusia* sp.	3	16,10,10
4	*Gambusia* sp.	10	30,26,28,24,29,23,22,19, 13,14
5	*Etheostoma fonticola*	1	23
	Gambusia sp.	31	22,20,15,35,33,20,17,26, 25,25
6	*Gambusia* sp.	34	
7	*Gambusia* sp.	37	
8	*Gambusia* sp.	35	
9	*Gambusia* sp.	28	
10	*Gambusia* sp.	22	
11	*Gambusia* sp.	31	
12	*Gambusia* sp.	9	
13	*Gambusia* sp.	5	
14	*Gambusia* sp.	18	
15	*Gambusia* sp.	23	

DROP NET - FIELD DATA SHEETS
COMAL RIVER - FALL QUARTERLY SAMPLING

Location (Reach): Landa Lake		**Site:** H2 Site 6	
Date: 11/14/00	**Time:** 0949	**Observer(s):** EO, CN, LV, DT	
Vegetation:	Type:	*Hygrophila* / Bare channel bottom / *Riccia*	
	Height:	29 cm / N/A / N/A	
	Areal Coverage:	80% / N/A / N/A	
	GPS location:	29° 42' 50.6"N ; 98° 08' 06.5"W	
Substrate Type:	Firm, silty clay over hard substrate, gravel and cobble		
Mean Column Velocity: 60% - 0.01 m/s		Velocity at 15cm above the bottom: 0.0 m/s	

Standard Parameters:	Surface	Mid	Bottom
Temperature (C°)	22.72	--	22.86
Dissolved Oxygen (mg/l)	6.56	--	6.37
pH	7.34	--	7.35
Conductivity	529.0	--	530.0
Secchi depth (cm)			

Depth (fixed) (meters): 0.51 m

Adjacent 3m cell areas:

Vegetation type:	*Hygrophila / Riccia* / Bare channel bottom / *Colocasia*
Vegetation height:	36 cm / 10 cm / N/A / Emergent
Areal coverage:	80% / 7.5% / 15% / 2.5%
Substrate type:	Firm, silty clay over hard substrate, 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	34.0

DROP NET - FIELD DATA SHEETS
COMAL RIVER - FALL QUARTERLY SAMPLING

Location (Reach):		Site:	
Landa Lake		H2 Site 6	
Date:	**Time:**	**Observer(s):**	
11/14/00	0949	EO, LV, CN, DT	

Overall	Species	Number	Avg. Length (mm)
1	*Etheostoma fonticola*	1	31.0
273	*Gambusia* sp.	27	21.7
2	*Marisa cornuarietis*	2	34.0
sparse	*Melanoides tuberculata*		--
4	*Palaemonetes* sp.		--
29	*Procambarus* sp.		--
1	*Dionda* sp.	1	52.0
sparse	*Thiara granifera*		--

Dip net sweep	Species	Number	Length (mm)
1	*Dionda* sp.	1	52
	Gambusia sp.	40	27,35,26,12,24,10,24,10 24,33,20,22,20,20,10,10 21,25,26,24,19,32,21,27, 20,20,23
	Melanoides tuberculata	sparse	
	Palaemonetes sp.	1	
	Procambarus sp.	11	
	Thiara granifera	sparse	
2	*Gambusia* sp.	21	
	Procambarus sp.	4	
3	*Etheostoma fonticola*	1	31
	Gambusia sp.	48	
	Thiara granifera	sparse	
4	*Gambusia* sp.	23	
	Palaemonetes sp.	2	
	Procambarus sp.	4	
5	*Gambusia* sp.	30	
	Procambarus sp.	1	
6	*Gambusia* sp.	19	
	Marisa cornuarietis	1	36
	Procambarus sp.	2	

DROP NET - FIELD DATA SHEETS

COMAL RIVER - FALL QUARTERLY SAMPLING

Dip net sweep	Species	Number	Length (mm)
7	*Gambusia* sp.	17	
	Melanoides tuberculata	sparse	
	Procambarus sp.	1	
8	*Gambusia* sp.	11	
	Melanoides tuberculata	sparse	
	Procambarus sp.	1	
9	*Gambusia* sp.	6	
	Melanoides tuberculata	sparse	
	Procambarus sp.	1	
	Thiara granifera	sparse	
10	*Gambusia* sp.	9	
	Marisa cornuarietis	1	32
	Procambarus sp.	3	
11	*Gambusia* sp.	11	
	Thiara granifera	sparse	
12	*Gambusia* sp.	4	
	Thiara granifera	sparse	
13	*Gambusia* sp.	26	
	Thiara granifera	sparse	
14	*Gambusia* sp.	7	
	Procambarus sp.	1	
	Thiara granifera	sparse	
15	*Gambusia* sp.	1	
	Palaemonetes sp.	1	

DROP NET - FIELD DATA SHEETS
COMAL RIVER - FALL QUARTERLY SAMPLING

Location (Reach): Landa Lake		**Site:** V2 Site 7	
Date: 11/14/2000	**Time:** 1029-1112	**Observer(s):** EO, CN, LV, DT	
Vegetation:	Type: *Vallisneria*		
	Height: 0.7 m		
	Areal Coverage: 100%		
	GPS location: 29° 42' 51.9"N ; 98° 08' 05.7"W		
Substrate Type:	Soft, silty and clayey mud		
Mean Column Velocity: V8 - 0.03 m/s V2 - 0.04 m/s		Velocity at 15cm above the bottom: 0.0 m/s	
Standard Parameters: 1112	Surface	Mid	Bottom
Temperature (C°)	23.30	--	23.28
Dissolved Oxygen (mg/l)	7.03	--	6.56
pH	7.29	--	7.34
Conductivity	531.0	--	530.0
Secchi depth (cm)			
Depth (fixed) (meters): 1.1 m			
Adjacent 3m cell areas:			
Vegetation type:	*Vallisneria* / Bare channel bottom		
Vegetation height:	0.82 , / N/A		
Areal coverage:	85% / 15%		
Substrate type:	Soft, silty and claey mud		
Sample Label:	**Preservative:**		
Snails: *Melanoides tuberculata* - sparse / *Thiara granifera* - none			
Sample Label:	**Preservative:**		
Number of live Ramshorn snails	Average Size (mm)		
4	26.5		

DROP NET - FIELD DATA SHEETS
COMAL RIVER - FALL QUARTERLY SAMPLING

Location (Reach):		Site:
Landa Lake		V2 Site 7
Date:	**Time:**	**Observer(s):**
11/14/00	1029-1112	EO, CN, LV, DT

Overall	Species	Number	Avg. Length (mm)
3	*Cichlasoma cyanoguttatum*	3	46.7
713	*Gambusia* sp.	24	23.2
4	*Lepomis megalotis*	4	84.8
4	*Marisa comuarietis*	4	26.5
sparse	*Melanoides tuberculata*		--
47	*Palaemonetes* sp.		--
32	*Poecilia latipinna*	21	38.7
7	*Procambarus* sp.		--

Dip net sweep	Species	Number	Length (mm)
1	*Cichlasoma cyanoguttatum*	1	35
	Gambusia sp.	302	20,28,20,24,16,20,20,20, 25,32,18,35,28,25,25,18 23,30,23,20,16,23,26,22
	Marisa comuarietis	4	35,35,27,9
	Palaemonetes sp.	11	
	Poecilia latipinna	21	34,31,39,28,33,21,40,31, 39,43,40,44,42,46,50,55, 42,45,35,42,32
	Procambarus sp.	2	
2	*Gambusia* sp.	150	
	Palaemonetes sp.	6	
	Procambarus sp.	1	
3	*Cichlasoma cyanoguttatum*	1	80
	Gambusia sp.	250	
	Palaemonetes sp.	9	
	Poecilia latipinna	5	
4	*Gambusia* sp.	37	
	Lepomis megalotis	2	85,98
	Palaemonetes sp.	12	
	Procambarus sp.	1	
5	*Cichlasoma cyanoguttatum*	1	25
	Gambusia sp.	53	
	Palaemonetes sp.	2	
	Poecilia latipinna	4	

DROP NET - FIELD DATA SHEETS

COMAL RIVER - FALL QUARTERLY SAMPLING

Dip net sweep	Species	Number	Length (mm)
6	*Gambusia* sp.	8	
	Poecilia latipinna	1	
7	*Gambusia* sp.	8	
	Palaemonetes sp.	1	
	Procambarus sp.	1	
8	*Gambusia* sp.	1	
9	*Gambusia* sp.	6	
	Procambarus sp.	1	
10	*Gambusia* sp.	7	
	Melanoides tuberculata	sparse	
	Procambarus sp.	1	
11	*Gambusia* sp.	3	
12	*Gambusia* sp.	1	
13	*Gambusia* sp.	7	
	Lepomis megalotis	1	66
	Palaemonetes sp.	2	
14	*Gambusia* sp.	27	
	Lepomis megalotis	1	90
	Palaemonetes sp.	3	
	Poecilia latipinna	1	
15	*Gambusia* sp.	3	
	Palaemonetes sp.	1	

DROP NET - FIELD DATA SHEETS
COMAL RIVER - FALL QUARTERLY SAMPLING

Location (Reach): Landa Lake			**Site:** C1 Site 8
Date: 11/14/00	**Time:** 1124-1210		**Observer(s):** EO, CN, LV, DT
Vegetation:	Type:	*Cabomba* / Bare channel bottom	
	Height:	0.33 m / N/A	
	Areal Coverage:	85% / 15%	
	GPS location:	29° 42' 52.9"N ; 98° 08' 08.0"W	
Substrate Type:	Soft sand-silt mud with gravel and cobble		
Mean Column Velocity: 20% - 0.11 m/s 80% - 0.17 m/s			Velocity at 15cm above the bottom: 0.04 m/s

Standard Parameters: 1208	Surface	Mid	Bottom
Temperature (C°)	23.04	--	23.25
Dissolved Oxygen (mg/l)	6.84	--	6.8
pH	7.29	--	7.28
Conductivity	527.0	--	526.0
Secchi depth (cm)			

Depth (fixed) (meters): 1.2 m

Adjacent 3m cell areas:

Vegetation type:	*Cabomba / Hygrophila* / Bare channel bottom / *Vallisneria*
Vegetation height:	0.33 m / 0.49 m / N/A / 0.64 m
Areal coverage:	25% / 25% / 25% / 25%
Substrate type:	Soft sand-silt mud with gravel and cobble

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 - FALL QUARTERLY SAMPLING

Location (Reach):		Site:
Landa Lake		C1 Site 8
Date:	**Time:**	**Observer(s):**
11/14/00	1124-1210	EO, CN, LV, DT

Overall	Species	Number	Avg. Length (mm)
2	*Cichlasoma cyanoguttatum*	2	24.5
7	*Etheostoma fonticola*	7	25.4
171	*Gambusia* sp.	25	15.8
1	*Lepomis macrochirus*	1	25.0
2	*Lepomis megalotis*	2	32.5
sparse	*Melanoides tuberculata*		--
34	*Palaemonetes* sp.		--
9	*Procambarus* sp.		--
sparse	*Thiara granifera*		--

Dip net sweep	Species	Number	Length (mm)
1	*Cichlasoma cyanoguttatum*	1	22
	Etheostoma fonticola	2	24,28
	Gambusia sp.	28	25,12,4,10,11,15,20,20, 19,19
	Melanoides tuberculata	sparse	
	Palaemonetes sp.	1	
	Procambarus sp.	2	
	Thiara granifera	sparse	
2	*Etheostoma fonticola*	1	21
	Gambusia sp.	50	10,15,33,28,15,15,23,15, 12,15,10,10,11,15,12
	Palaemonetes sp.	27	
	Procambarus sp.	1	
3	*Cichlasoma cyanoguttatum*	1	27
	Gambusia sp.	8	
	Melanoides tuberculata	sparse	
	Palaemonetes sp.	1	
	Procambarus sp.	1	
4	*Gambusia* sp.	5	
	Procambarus sp.	1	

DROP NET - FIELD DATA SHEETS
COMAL RIVER - FALL QUARTERLY SAMPLING

Dip net sweep	Species	Number	Length (mm)
5	*Etheostoma fonticola*	1	25
	Gambusia sp.	31	
	Palaemonetes sp.	1	
	Procambarus sp.	1	
6	*Gambusia* sp.	10	
	Palaemonetes sp.	1	
	Thiara granifera	sparse	
7	*Palaemonetes* sp.	1	
8	*Gambusia* sp.	13	
	Lepomis megalotis	1	37
9	*Etheostoma fonticola*	1	30
	Gambusia sp.	10	
	Procambarus sp.	2	
10	*Etheostoma fonticola*	1	25
	Gambusia sp.	2	
11	*Gambusia* sp.	3	
	Palaemonetes sp.	1	
12	*Etheostoma fonticola*	3	24,24,27
	Gambusia sp.	1	
	Thiara granifera	sparse	
13	No fish or crustaceans collected		
14	*Gambusia* sp.	5	
	Lepomis macrochirus	1	25
	Lepomis megalotis	1	28
	Palaemonetes sp.	1	
	Procambarus sp.	1	
15	*Etheostoma fonticola*	1	25
	Gambusia sp.	5	

DROP NET - FIELD DATA SHEETS
COMAL RIVER - FALL QUARTERLY SAMPLING

Location (Reach): Landa Lake		**Site:** V1 Site 9	
Date: 11/14/00	**Time:** 1216-1251	**Observer(s):** EO, CN, LV, DT	
Vegetation:	Type: *Vallisneria*		
	Height: 0.3 m		
	Areal Coverage: 100%		
	GPS location: 29° 42' 52.1"N ; 98° 08' 09.0"W		
Substrate Type:	Soft coarse sand over clayey mud		
Mean Column Velocity: 60% - 0.09 m/s		Velocity at 15cm above the bottom: 0.0 m/s	

Standard Parameters: 1249	Surface	Mid	Bottom
Temperature (C°)	23.29	--	23.27
Dissolved Oxygen (mg/l)	7.00	--	6.95
pH	7.12	--	7.09
Conductivity	530.0	--	529.0
Secchi depth (cm)	Clear to bottom		

Depth (fixed) (meters): 0.93 m

Adjacent 3m cell areas:

Vegetation type:	*Vallisneria* / Bare channel bottom
Vegetation height:	0.34 m / N/A
Areal coverage:	55% / 45%
Substrate type:	Soft coarse sand over claey mud

Sample Label:	**Preservative:**

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

Sample Label:	**Preservative:**
Number of live Ramshorn snails	Average Size (mm)
2	38.0

DROP NET - FIELD DATA SHEETS
COMAL RIVER - FALL QUARTERLY SAMPLING

Location (Reach):		Site:
Landa Lake		V1 Site 9
Date:	**Time:**	**Observer(s):**
11/14/00	1216-1251	EO, CN, LV, DT

Overall	Species	Number	Avg. Length (mm)
1	*Ameiurus natalis*	1	52.0
6	*Cichlasoma cyanoguttatum*	6	39.7
1	*Etheostoma fonticola*	1	30.0
115	*Gambusia* sp.	25	15.4
3	*Lepomis gulosus*	3	63.0
1	*Lepomis macrochirus*	1	55.0
2	*Marisa comuarietis*	2	38.0
sparse	*Melanoides tuberculata*		--
1	*Micropterus salmoides*	1	56.0
155	*Palaemonetes* sp.		--
8	*Poecilia latipinna*	8	24.9
26	*Procambarus* sp.		--
sparse	*Thiara granifera*		--

Dip net sweep	Species	Number	Length (mm)
1	*Cichlasoma cyanoguttatum*	1	36
	Gambusia sp.	45	12,12,18,13,18,15,23,20, 12,12,20,12,20,12,10,18, 13,15,13,25,24,11,16,10, 12
	Marisa comuarietis	2	41,35
	Melanoides tuberculata	sparse	
	Palaemonetes sp.	67	
	Poecilia latipinna	2	30,26
	Procambarus sp.	3	
	Thiara granifera	sparse	
2	*Cichlasoma cyanoguttatum*	3	42,60,34
	Etheostoma fonticola	1	30
	Gambusia sp.	15	
	Micropterus salmoides	1	56
	Palaemonetes sp.	32	
	Poecilia latipinna	2	25,23
	Procambarus sp.	1	
3	*Gambusia* sp.	15	
	Lepomis gulosus	1	58
	Lepomis macrochirus	1	55
	Palaemonetes sp.	24	
	Procambarus sp.	2	

DROP NET - FIELD DATA SHEETS
COMAL RIVER - FALL QUARTERLY SAMPLING

Dip net sweep	Species	Number	Length (mm)
4	*Gambusia* sp.	10	
	Lepomis gulosus	1	95
	Palaemonetes sp.	11	
	Poecilia latipinna	2	25,17
	Procambarus sp.	2	
5	*Gambusia* sp.	1	
	Palaemonetes sp.	3	
	Poecilia latipinna	1	23
	Procambarus sp.	3	
6	*Gambusia* sp.	4	
	Palaemonetes sp.	6	
	Procambarus sp.	2	
7	*Gambusia* sp.	2	
	Palaemonetes sp.	1	
	Procambarus sp.	2	
8	*Cichlasoma cyanoguttatum*	1	34
	Gambusia sp.	14	
	Palaemonetes sp.	6	
	Procambarus sp.	2	
9	*Gambusia* sp.	1	
	Palaemonetes sp.	1	
	Procambarus sp.	2	
10	*Lepomis gulosus*	1	36
	Palaemonetes sp.	1	
	Procambarus sp.	1	
11	*Procambarus* sp.	2	
12	No fish or crustaceans collected		
13	*Gambusia* sp.	3	
	Palaemonetes sp.	1	
	Procambarus sp.	2	
14	*Gambusia* sp.	2	
	Procambarus sp.	2	
15	*Ameiurus natalis*	1	52
	Cichlasoma cyanoguttatum	1	32
	Gambusia sp.	3	
	Palaemonetes sp.	2	
	Poecilia latipinna	1	30

DROP NET - FIELD DATA SHEETS
COMAL RIVER - FALL QUARTERLY SAMPLING

Location (Reach): Landa Lake		**Site:** C2 Site 10	
Date: 11/14/00	**Time:** 1254	**Observer(s):** EO, CN, LV, DT	
Vegetation:	Type: *Cabomba*		
	Height: 0.24 m		
	Areal Coverage: 100%		
	GPS location: 29° 42' 52.5"N ; 98° 08' 05.0"W		
Substrate Type:	Soft, silty, clayey mud		
Mean Column Velocity: 60% - 0.0 m/s		Velocity at 15cm above the bottom: 0.0 m/s	
Standard Parameters:	Surface	Mid	Bottom
Temperature (C°)	23.13	--	23.18
Dissolved Oxygen (mg/l)	7.40	--	7.87
pH	7.33	--	7.37
Conductivity	528.0	--	528.0
Secchi depth (cm)			
Depth (fixed) (meters): 0.9 m			
Adjacent 3m cell areas:			
Vegetation type:	*Cabomba / Vallisneria* / Bare channel bottom		
Vegetation height:	0.32 m / 0.52 m / N/A		
Areal coverage:	55% / 40% / 5%		
Substrate type:	Soft, silty, clayey mud		
Sample Label:	**Preservative:**		
Snails: *Melanoides tuberculata* - sparse / *Thiara granifera* - sparse			
Sample Label:	**Preservative:**		
Number of live Ramshorn snails	Average Size (mm)		
3	30.3		

DROP NET - FIELD DATA SHEETS
COMAL RIVER - FALL QUARTERLY SAMPLING

Location (Reach):		Site:
Landa Lake		C2 Site 10
Date:	**Time:**	**Observer(s):**
11/14/00	1254	EO, CN, LV, DT

Overall	Species	Number	Avg. Length (mm)
2	*Etheostoma fonticola*	2	28.0
285	*Gambusia* sp.	25	19.5
3	*Marisa cornuarietis*	3	30.3
sparse	*Melanoides tuberculata*		--
8	*Palaemonetes* sp.		--
1	*Poecilia latipinna*	1	21.0
52	*Procambarus* sp.		--
sparse	*Thiara granifera*		--

Dip net sweep	Species	Number	Length (mm)
1	*Etheostoma fonticola*	2	29,27
	Gambusia sp.	130	25,23,28,27,25,10,18,18, 17,20,15,22,10,12,25,27, 21,25,21,12,21,10,13,25, 17
	Marisa cornuarietis	1	31
	Melanoides tuberculata	sparse	
	Palaemonetes sp.	6	
	Poecilia latipinna	1	21
	Procambarus sp.	31	
	Thiara granifera	sparse	
2	*Gambusia* sp.	75	
	Marisa cornuarietis	1	35
	Melanoides tuberculata	sparse	
	Palaemonetes sp.	2	
	Procambarus sp.	10	
3	*Gambusia* sp.	15	
	Marisa cornuarietis	1	25
	Procambarus sp.	8	
4	*Gambusia* sp.	10	
5	*Gambusia* sp.	1	
	Procambarus sp.	1	

DROP NET - FIELD DATA SHEETS
COMAL RIVER - FALL QUARTERLY SAMPLING

Dip net sweep	Species	Number	Length (mm)
6	*Gambusia* sp. *Thiara granifera*	25 sparse	
7	*Gambusia* sp. *Thiara granifera*	1 sparse	
8	*Gambusia* sp. *Procambarus* sp. *Thiara granifera*	15 1 sparse	
9	*Gambusia* sp.	1	
10	*Gambusia* sp. *Thiara granifera*	3 sparse	
11	*Gambusia* sp. *Thiara granifera*	2 sparse	
12	*Melanoides tuberculata* *Procambarus* sp.	sparse 1	
13	*Gambusia* sp.	7	
14	No fish or crustaceans collected		
15	*Melanoides tuberculata*	sparse	

NEW CHANNEL REACH

DROP NET - FIELD DATA SHEETS
COMAL RIVER - FALL QUARTERLY SAMPLING

Location (Reach): New Channel		**Site:** H2 Site 1	
Date: 11/15/00	**Time:** 0817-0902	**Observer(s):** EO, PT, CN, DT	
Vegetation:	Type: *Hygrophila*		
	Height: 0.64 m		
	Areal Coverage: 100%		
	GPS location: 29° 42' 28.2"N ; 98° 07' 33.6"W		
Substrate Type:	Silty clayey mud		
Mean Column Velocity: 60% - 0.02 m/s		Velocity at 15cm above the bottom: 0.01 m/s	

Standard Parameters: 0901	Surface	Mid	Bottom
Temperature (C°)	22.31	--	22.37
Dissolved Oxygen (mg/l)	8.78	--	8.46
pH	7.76	--	7.75
Conductivity	525.0	--	527.0
Secchi depth (cm)			

Depth (fixed) (meters): 1.1 m

Adjacent 3m cell areas:

Vegetation type:	*Hygrophila*
Vegetation height:	0.61 m
Areal coverage:	100%
Substrate type:	Silty clayey mud

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 - FALL QUARTERLY SAMPLING

Location (Reach):		Site:
New Channel		H2 Site 1
Date:	**Time:**	**Observer(s):**
11/15/00	0817-0902	EO, PT, CN, DT

Overall	Species	Number	Avg. Length (mm)
1	*Ambloplites rupestris*	1	31.0
2	*Cichlasoma cyanoguttatum*	2	37.0
1	*Dionda episcopa*	1	51.0
2	*Etheostoma fonticola*	2	18.0
4	*Gambusia* sp.	4	23.5
1	*Lepomis macrochirus*	1	57.0
4	*Lepomis megalotis*	4	79.5
1	*Micropterus salmoides*	1	115.0
82	*Palaemonetes* sp.		--
12	*Procambarus* sp.		--
abundant	*Thiara granifera*		--

Dip net sweep	Species	Number	Length (mm)
1	*Cichlasoma cyanoguttatum*	1	40
	Etheostoma fonticola	2	18,18
	Lepomis megalotis	1	81
	Palaemonetes sp.	2	
	Procambarus sp.	2	
	Thiara granifera	abundant	
2	*Cichlasoma cyanoguttatum*	1	34
	Dionda episcopa	1	51
	Lepomis megalotis	1	24
	Palaemonetes sp.	14	
	Procambarus sp.	1	
	Thiara granifera	abundant	
3	*Gambusia* sp.	2	34,20
	Lepomis megalotis	1	140
	Micropterus salmoides	1	115
	Palaemonetes sp.	5	
4	*Lepomis macrochirus*	1	57
	Palaemonetes sp.	15	
	Procambarus sp.	3	

DROP NET - FIELD DATA SHEETS
COMAL RIVER - FALL QUARTERLY SAMPLING

Dip net sweep	Species	Number	Length (mm)
5	*Ambloplites rupestris*	1	31
	Palaemonetes sp.	9	
6	*Palaemonetes* sp.	4	
	Procambarus sp.	2	
	Thiara granifera	moderate	
7	*Palaemonetes* sp.	13	
	Procambarus sp.	2	
	Thiara granifera	abundant	
8	*Palaemonetes* sp.	9	
	Thiara granifera	sparse	
9	*Lepomis megalotis*	1	73
	Palaemonetes sp.	3	
	Procambarus sp.	2	
	Thiara granifera	moderate	
10	*Palaemonetes* sp.	10	
	Thiara granifera	moderate	
11	*Gambusia* sp.	2	16,24
	Palaemonetes sp.	1	
	Thiara granifera	moderate	
12	*Thiara granifera*	abundant	
13	No fish or crustaceans collected		
14	*Palaemonetes* sp.	2	
15	No fish or crustaceans collected		

DROP NET - FIELD DATA SHEETS
COMAL RIVER - FALL QUARTERLY SAMPLING

Location (Reach): New Channel		**Site:** O2 Site 2	
Date: 11/15/00	**Time:** 0926-0941	**Observer(s):** EO, PT, CN, DT	
Vegetation:	Type:	Open water / Bare channel bottom	
	Height:	N/A	
	Areal Coverage:	100%	
	GPS location:	29° 42' 28.1"N ; 98° 08' 48.1"W	
Substrate Type:	Firm substrate, small to large gravel and cobble		
Mean Column Velocity: 60% - 0.22 m/s		Velocity at 15cm above the bottom: 0.15 m/s	

Standard Parameters: 0940	Surface	Mid	Bottom
Temperature (C°)	22.43	--	22.51
Dissolved Oxygen (mg/l)	8.62	--	8.46
pH	7.73	--	7.74
Conductivity	529.0	--	528.0
Secchi depth (cm)	Clear to bottom		

Depth (fixed) (meters): 1.1 m

Adjacent 3m cell areas:

Vegetation type:	Open water / Bare channel bottom / *Hygrophila*
Vegetation height:	N/A / 0.27 m
Areal coverage:	90% / 10%
Substrate type:	Firm substrate, small to large gravel, cobble and boulders

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 - FALL QUARTERLY SAMPLING

Location (Reach):		Site:	
New Channel		O2 Site 2	
Date:	**Time:**	**Observer(s):**	
11/15/00	0926-0941	EO, PT, CN, DT	
Overall	**Species**	**Number**	**Avg. Length (mm)**
sparse	No fish or crustaceans collected *Thiara granifera*		
Dip net sweep	**Species**	**Number**	**Length (mm)**
1	No fish or crustaceans collected *Thiara granifera*	sparse	
2	No fish or crustaceans collected *Thiara granifera*	sparse	
3	No fish or crustaceans collected *Thiara granifera*	sparse	
4	No fish or crustaceans collected *Thiara granifera*	sparse	
5	No fish or crustaceans collected *Thiara granifera*	sparse	
6	No fish or crustaceans collected *Thiara granifera*	sparse	
7	No fish or crustaceans collected *Thiara granifera*	sparse	
8	No fish or crustaceans collected *Thiara granifera*	sparse	
9	No fish or crustaceans collected *Thiara granifera*	sparse	
10	No fish or crustaceans collected *Thiara granifera*	sparse	

DROP NET - FIELD DATA SHEETS
COMAL RIVER - FALL QUARTERLY SAMPLING

Location (Reach): New Channel			**Site:** H1 Site 3
Date: 11/15/00	**Time:** 0953-1037		**Observer(s):** EO, PT, CN, DT
Vegetation:	Type:	*Hygrophila*	
	Height:	31 cm	
	Areal Coverage:	100%	
	GPS location:	29° 42' 27.9"N ; 98° 08' 48.4"W	
Substrate Type:	Silt and clay, mostly hard gravel, cobble, and boulder		
Mean Column Velocity: 20% - 0.26 m/s 80% - 0.08 m/s			Velocity at 15cm above the bottom: 0.09 m/s

Standard Parameters: 1035	Surface	Mid	Bottom
Temperature (C°)	22.59	--	22.59
Dissolved Oxygen (mg/l)	8.61	--	8.13
pH	7.70	--	7.66
Conductivity	529.0	--	531.0
Secchi depth (cm)			

Depth (fixed) (meters): 1.1 m

Adjacent 3m cell areas:

Vegetation type:	*Hygrophila* / *Ludwigia* / Bare channel bottom
Vegetation height:	32 cm / 30 cm / N/A
Areal coverage:	60% / 10% / 30%
Substrate type:	Silt and clay, mostly hard gravel, cobble, and boulder

Sample Label:	**Preservative:**

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

Sample Label:	**Preservative:**
Number of live Ramshorn snails	Average Size (mm)
1	18.0

DROP NET - FIELD DATA SHEETS
COMAL RIVER - FALL QUARTERLY SAMPLING

Location (Reach):		Site:
New Channel		H1 Site 3
Date:	**Time:**	**Observer(s):**
11/15/00	0953-1037	EO, PT, CN, DT

Overall	Species	Number	Avg. Length (mm)
2	*Cichlasoma cyanoguttatum*	2	44.0
sparse	*Corbicula* sp.		--
3	*Etheostoma fonticola*	3	29.7
2	*Gambusia* sp.	2	20.5
3	*Lepomis macrochirus*	3	26.7
1	*Marisa cornuarietis*	1	18.0
sparse	*Melanoides tuberculata*		--
55	*Palaemonetes* sp.		--
61	*Procambarus* sp.		--
sparse	*Thiara granifera*		--

Dip net sweep	Species	Number	Length (mm)
1	*Etheostoma fonticola*	1	27
	Lepomis macrochirus	1	50
	Palaemonetes sp.	21	
	Procambarus sp.	1	
2	*Etheostoma fonticola*	1	30
	Palaemonetes sp.	10	
	Procambarus sp.	5	
3	*Etheostoma fonticola*	1	32
	Palaemonetes sp.	3	
	Procambarus sp.	8	
4	*Lepomis macrochirus*	1	31
	Palaemonetes sp.	1	
	Procambarus sp.	6	
5	*Palaemonetes* sp.	4	
	Procambarus sp.	1	
6	*Cichlasoma cyanoguttatum*	1	32
	Palaemonetes sp.	14	
	Procambarus sp.	10	
	Thiara granifera	sparse	

DROP NET - FIELD DATA SHEETS
COMAL RIVER - FALL QUARTERLY SAMPLING

Dip net sweep	Species	Number	Length (mm)
7	*Gambusia* sp.	1	29
	Procambarus sp.	6	
8	*Melanoides tuberculata*	sparse	
	Procambarus sp.	5	
	Thiara granifera	sparse	
9	*Palaemonetes* sp.	1	
	Procambarus sp.	2	
10	*Cichlasoma cyanoguttatum*	1	56
	Corbicula sp.	sparse	
	Gambusia sp.	1	12
	Procambarus sp.	11	
	Thiara granifera	sparse	
11	*Lepomis macrochirus*	1	44
	Procambarus sp.	3	
12	No fish or crustaceans collected		
13	*Palaemonetes* sp.	1	
	Procambarus sp.	1	
14	No fish or crustaceans collected		
15	*Corbicula* sp.	sparse	
	Marisa cornuarietis	1	18
	Procambarus sp.	2	

DROP NET - FIELD DATA SHEETS
COMAL RIVER - FALL QUARTERLY SAMPLING

Location (Reach): New Channel		**Site:** H3 Site 4	
Date: 11/15/00	**Time:** 1123-1224	**Observer(s):** EO, PT, CN, DT	
Vegetation:	Type: *Hygrophila*		
	Height: 0.49 m		
	Areal Coverage: 100%		
	GPS location: 29° 42' 28.3"N ; 98° 08' 33.1"W		
Substrate Type:	Silt and clayey mud		
Mean Column Velocity: 60% - 0.07 m/s		Velocity at 15cm above the bottom: 0.0 m/s	
Standard Parameters: 1224	Surface	Mid	Bottom
Temperature (C°)	22.52	--	22.58
Dissolved Oxygen (mg/l)	8.96	--	8.76
pH	7.73	--	7.74
Conductivity	530.0	--	529.0
Secchi depth (cm)	Clear to bottom		
Depth (fixed) (meters): 1.2 m			
Adjacent 3m cell areas:			
Vegetation type:	*Hygrophila*		
Vegetation height:	0.58 m		
Areal coverage:	100%		
Substrate type:	Silt and clayey mud		
Sample Label:		**Preservative:**	
Snails: *Melanoides tuberculata* - none / *Thiara granifera* - sparse to moderate			
Sample Label:		**Preservative:**	
Number of live Ramshorn snails		Average Size (mm)	
0			

DROP NET - FIELD DATA SHEETS
COMAL RIVER - FALL QUARTERLY SAMPLING

Location (Reach):		Site:
New Channel		H3 Site 4
Date:	**Time:**	**Observer(s):**
11/15/00	1123-1224	EO, PT, CN, DT

Overall	Species	Number	Avg. Length (mm)
4	*Cichlasoma cyanoguttatum*	4	27.5
4	*Etheostoma fonticola*	4	24.3
2	*Gambusia* sp.	2	32.5
1	*Lepomis megalotis*	1	23.0
172	*Palaemonetes* sp.		--
21	*Procambarus* sp.		--
sparse to moderate	*Thiara granifera*		--

Dip net sweep	Species	Number	Length (mm)
1	*Cichlasoma cyanoguttatum*	3	21,26,30
	Gambusia sp.	2	44,21
	Lepomis megalotis	1	23
	Palaemonetes sp.	54	
	Procambarus sp.	8	
2	*Etheostoma fonticola*	1	19
	Palaemonetes sp.	21	
	Procambarus sp.	2	
3	*Palaemonetes* sp.	25	
4	*Cichlasoma cyanoguttatum*	1	33
	Palaemonetes sp.	42	
	Procambarus sp.	2	
5	*Etheostoma fonticola*	1	25
	Palaemonetes sp.	10	
	Procambarus sp.	3	
6	*Palaemonetes* sp.	11	
	Procambarus sp.	1	
	Thiara granifera	moderate	

DROP NET - FIELD DATA SHEETS
COMAL RIVER - FALL QUARTERLY SAMPLING

Dip net sweep	Species	Number	Length (mm)
7	*Etheostoma fonticola*	1	25
	Palaemonetes sp.	2	
	Procambarus sp.	1	
8	*Palaemonetes* sp.	2	
9	*Procambarus* sp.	1	
	Thiara granifera	sparse	
10	*Etheostoma fonticola*	1	28
	Palaemonetes sp.	5	
	Procambarus sp.	1	
11	*Thiara granifera*	sparse	
12	No fish or crustaceans collected		
13	No fish or crustaceans collected		
14	*Procambarus* sp.	1	
15	*Procambarus* sp.	1	

OLD CHANNEL REACH

DROP NET - FIELD DATA SHEETS

COMAL RIVER - FALL QUARTERLY SAMPLING

Location (Reach):		**Site:**
Old Channel		O1 Site 1
Date:	**Time:**	**Observer(s):**
11/16/00	0938-1014	EO, PT, CN, DC, DT

Vegetation:	Type:	Bare channel bottom / Algae
	Height:	N/A / 10 cm
	Areal Coverage:	90% / 10%
	GPS location:	29° 42' 39.3"N ; 98° 08' 42.0"W
Substrate Type:	Firm bottom comprised of assorted-sized gravel and cobble	

Mean Column Velocity:	Velocity at 15cm above the bottom:
60% - 0.11 m/s	0.03 m/s

Standard Parameters: 1013	Surface	Mid	Bottom
Temperature (C°)	22.72	--	22.73
Dissolved Oxygen (mg/l)	7.15	--	7.07
pH	7.60	--	7.61
Conductivity	530.0	--	530.0
Secchi depth (cm)	Clear to bottom		

Depth (fixed) (meters):
1.05 m

Adjacent 3m cell areas:

Vegetation type:	Bare channel bottom / Algae / *Nuphar*
Vegetation height:	N/A / 15 cm / Surface
Areal coverage:	88% / 10% / 2%
Substrate type:	Assorted-sized gravel/cobble and soft silty clayey mud

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 - FALL QUARTERLY SAMPLING

Location (Reach):		Site:
Old Channel		O1 Site 1
Date:	**Time:**	**Observer(s):**
11/16/00	0938-1014	EO, PT, CN, DC, DT

Overall	Species	Number	Avg. Length (mm)
11	*Etheostoma fonticola*	11	23.2
1	*Lepomis megalotis*	1	20.0
15	*Palaemonetes* sp.		--
2	*Procambarus sp.*		--
1	*Rana* sp.		--

Dip net sweep	Species	Number	Length (mm)
1	*Etheostoma fonticola*	5	31, 21, 16, 28, 21
	Palaemonetes sp.	2	
	Procambarus sp.	1	
2	*Palaemonetes* sp.	2	
3	*Etheostoma fonticola*	1	22
	Palaemonetes sp.	1	
	Procambarus sp.	1	
4	*Etheostoma fonticola*	1	27
	Palaemonetes sp.	4	
5	*Etheostoma fonticola*	2	13,14
	Lepomis megalotis	1	20
	Palaemonetes sp.	1	
6	*Palaemonetes* sp.	4	
7	*Etheostoma fonticola*	1	22
	Palaemonetes sp.	1	
	Rana sp.	1	
8	No fish or crustaceans collected		
9	No fish or crustaceans collected		
10	No fish or crustaceans collected		
11	No fish or crustaceans collected		

DROP NET - FIELD DATA SHEETS

COMAL RIVER - FALL QUARTERLY SAMPLING

Dip net sweep	Species	Number	Length (mm)
12	No fish or crustaceans collected		
13	No fish or crustaceans collected		
14	*Etheostoma fonticola*	1	40
15	No fish or crustaceans collected		

DROP NET - FIELD DATA SHEETS
COMAL RIVER - FALL QUARTERLY SAMPLING

Location (Reach): Old Channel		**Site:** A1 Site 2	
Date: 11/16/00	**Time:** 1020-1044	**Observer(s):** EO, PT, CN, DC, DT	
Vegetation:	Type:	Bare channel bottom / Algae	
	Height:	N/A / 12 cm	
	Areal Coverage:	60% / 40%	
	GPS location:	29° 42' 39.4"N ; 98° 08' 41.8"W	
Substrate Type:	Gravel and cobble with occassional rock		
Mean Column Velocity: 60% - 0.12 m/s		Velocity at 15cm above the bottom: 0.11 m/s	

Standard Parameters: 1043	Surface	Mid	Bottom
Temperature (C°)	22.78	--	22.79
Dissolved Oxygen (mg/l)	7.41	--	7.18
pH	7.61	--	7.61
Conductivity	531.0	--	531.0
Secchi depth (cm)	Clear to bottom		

Depth (fixed) (meters): 0.83 m

Adjacent 3m cell areas:

Vegetation type:	Bare channel bottom / Algae / *Ceratopteris*
Vegetation height:	N/A / 10 cm / 73 cm
Areal coverage:	70% / 28% / 2%
Substrate type:	Gravel and cobble with occassional rock

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 - FALL QUARTERLY SAMPLING

Location (Reach):		Site:
Old Channel		A1 Site 2
Date:	**Time:**	**Observer(s):**
11/16/00	1020-1044	EO, PT, CN, DC, DT

Overall	Species	Number	Avg. Length (mm)
6	*Etheostoma fonticola*	6	21
5	*Palaemonetes* sp.		--
3	*Procambarus* sp.		--

Dip net sweep	Species	Number	Length (mm)
1	*Palaemonetes* sp.	1	
	Procambarus sp.	2	
2	*Palaemonetes* sp.	1	
3	*Etheostoma fonticola*	1	21
4	*Palaemonetes* sp.	1	
5	*Etheostoma fonticola*	1	16
6	*Etheostoma fonticola*	1	32
7	No fish or crustaceans collected		
8	*Etheostoma fonticola*	1	19
9	No fish or crustaceans collected		
10	*Etheostoma fonticola*	1	29
	Palaemonetes sp.	1	
11	*Etheostoma fonticola*	1	22
	Procambarus sp.	1	
12	No fish or crustaceans collected		
13	No fish or crustaceans collected		
14	No fish or crustaceans collected		
15	*Palaemonetes* sp.	1	

DROP NET - FIELD DATA SHEETS
COMAL RIVER - FALL QUARTERLY SAMPLING

Location (Reach): Old Channel		**Site:** C2 Site 3	
Date: 11/16/00	**Time:** 1047-1140	**Observer(s):** EO, PT, CN, DC, LV, DT	
Vegetation:	Type: *Ceratopteris*		
	Height: 34 cm		
	Areal Coverage: 100%		
	GPS location: 29° 42' 39.8"N ; 98° 08' 41.5"W		
Substrate Type:	Soft clayey mud with leaf litter, gravel and small cobble		
Mean Column Velocity: 60% - 0.08 m/s		Velocity at 15cm above the bottom: 0.02 m/s	
Standard Parameters: 1138	Surface	Mid	Bottom
Temperature (C°)	22.81	--	22.89
Dissolved Oxygen (mg/l)	7.57	--	7.36
pH	7.62	--	7.62
Conductivity	530.0	--	531.0
Secchi depth (cm)	Clear to bottom		
Depth (fixed) (meters): 0.64 m			
Adjacent 3m cell areas:			
Vegetation type:	*Ceratopteris* / Algae / Bare channel bottom		
Vegetation height:	30 cm / 10 cm / N/A		
Areal coverage:	60% / 10% / 20%		
Substrate type:	Soft silty clay		
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 - FALL QUARTERLY SAMPLING

Location (Reach):		Site:
Old Channel		C2 Site 3
Date:	**Time:**	**Observer(s):**
11/16/00	1047-1140	EO, PT, CN, DC, LV, DT

Overall	Species	Number	Avg. Length (mm)
2	*Etheostoma fonticola*	2	24.0
15	*Lepomis megalotis*	15	30.3
4	*Lepomis punctatus*	4	32.3
20	*Palaemonetes* sp.		--
3	*Procambarus* sp.		--
1	*Rana* sp.		--

Dip net sweep	Species	Number	Length (mm)
1	*Etheostoma fonticola*	2	23,25
	Lepomis megalotis	3	84,25,35
	Lepomis punctatus	4	25,35,44,25
	Palaemonetes sp.	3	
	Procambarus sp.	1	
2	*Lepomis megalotis*	2	22,15
	Palaemonetes sp.	2	
	Rana sp.	1	
3	*Lepomis megalotis*	3	72,34,26
	Palaemonetes sp.	6	
4	*Lepomis megalotis*	1	25
	Palaemonetes sp.	5	
	Procambarus sp.	2	
5	*Palaemonetes* sp.	3	
6	*Lepomis megalotis*	2	37,29
7	No fish or crustaceans collected		
8	*Lepomis megalotis*	1	34
9	No fish or crustaceans collected		
10	*Lepomis megalotis*	3	32,27,24
11	No fish or crustaceans collected		

DROP NET - FIELD DATA SHEETS

COMAL RIVER - FALL QUARTERLY SAMPLING

Dip net sweep	Species	Number	Length (mm)
12	*Palaemonetes* sp.	1	
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 - FALL QUARTERLY SAMPLING

Location (Reach): Old Channel		**Site:** A2 Site 4	
Date: 11/16/00	**Time:** 1144-1208	**Observer(s):** EO, PT, CN, DC, DT	
Vegetation:	Type:	Bare channel bottom / Algae	
	Height:	12 cm / N/A	
	Areal Coverage:	70% / 30%	
	GPS location:	29° 42' 39.8"N ; 98° 08' 40.9"W	
Substrate Type:	Hard bottom composed of gravel and cobble with occassional rock		
Mean Column Velocity: 60% - 0.09 m/s		Velocity at 15cm above the bottom: 0.07 m/s	

Standard Parameters: 1206	Surface	Mid	Bottom
Temperature (C°)	22.97	--	22.97
Dissolved Oxygen (mg/l)	8.45	--	7.44
pH	7.61	--	7.61
Conductivity	529.0	--	529.0
Secchi depth (cm)	Clear to bottom		

Depth (fixed) (meters): 0.61 m

Adjacent 3m cell areas:

Vegetation type:	Bare channel bottom / Algae
Vegetation height:	N/A / 15 cm
Areal coverage:	65% / 35%
Substrate type:	Hard bottom composed of gravel and cobble w/ occassional rock

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 - FALL QUARTERLY SAMPLING

Location (Reach):		Site:	
Old Channel		A2 Site 4	
Date:	**Time:**	**Observer(s):**	
11/16/00	1144-1208	EO, PT, CN, DC, DT	
Overall	**Species**	**Number**	**Avg. Length (mm)**
3	*Etheostoma fonticola*	3	19.7
6	*Palaemonetes* sp.		--
5	*Procambarus* sp.		--
Dip net sweep	**Species**	**Number**	**Length (mm)**
1	*Etheostoma fonticola*	2	25,16
	Palaemonetes sp.	3	
	Procambarus sp.	2	
2	*Etheostoma fonticola*	1	18
	Palaemonetes sp.	2	
	Procambarus sp.	3	
3	No fish or crustaceans collected		
4	No fish or crustaceans collected		
5	*Palaemonetes* sp.	1	
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 - FALL QUARTERLY SAMPLING

Location (Reach): Old Channel		**Site:** O2 Site 5	
Date: 11/16/00	**Time:** 1232-1250	**Observer(s):** EO, PT, CN, DT	
Vegetation:	Type: Bare channel bottom		
	Height: N/A		
	Areal Coverage: 100%		
	GPS location: 29° 42' 40.2"N ; 98° 08' 38.9"W		
Substrate Type:	Large gravel, cobble, and rock		
Mean Column Velocity: 60% - 0.13 m/s		Velocity at 15cm above the bottom: 0.11 m/s	
Standard Parameters: 1249	Surface	Mid	Bottom
Temperature (C°)	23.05	--	23.08
Dissolved Oxygen (mg	7.98	--	7.76
pH	7.64	--	7.64
Conductivity	530.0	--	530.0
Secchi depth (cm)	Clear to bottom		
Depth (fixed) (meters): 0.85 m			
Adjacent 3m cell areas:			
Vegetation type:	Bare channel bottom / *Ceratopteris*		
Vegetation height:	N/A / 33.5 cm		
Areal coverage:	85% / 15%		
Substrate type:	Large gravel, cobble, and rock		
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 - FALL QUARTERLY SAMPLING

Location (Reach):		Site:	
Old Channel		O2 Site 5	
Date:	**Time:**	**Observer(s):**	
11/16/00	1232-1250	EO, PT, CN, DT	
Overall	**Species**	**Number**	**Avg. Length (mm)**
9	*Palaemonetes* sp.		–
1	*Procambarus* sp.		–
Dip net sweep	**Species**	**Number**	**Length (mm)**
1	*Palaemonetes* sp.	4	
2	No fish or crustaceans collected		
3	No fish or crustaceans collected		
4	*Palaemonetes* sp.	2	
5	No fish or crustaceans collected		
6	*Palaemonetes* sp.	1	
7	No fish or crustaceans collected		
8	No fish or crustaceans collected		
9	No fish or crustaceans collected		
10	*Palaemonetes* sp.	1	
11	No fish or crustaceans collected		
12	*Palaemonetes* sp.	1	
13	No fish or crustaceans collected		
14	No fish or crustaceans collected		
15	*Procambarus* sp.	1	

DROP NET - FIELD DATA SHEETS
COMAL RIVER - FALL QUARTERLY SAMPLING

Location (Reach): Old Channel		**Site:** C1 Site 6	
Date: 11/16/00	**Time:** 1252-1323	**Observer(s):** EO, PT, CN, DT	
Vegetation:	Type: *Ceratopteris*		
	Height: 14 cm		
	Areal Coverage: 100%		
	GPS location: 29° 42' 40.0"N ; 98° 08' 38.9"W		
Substrate Type:	Assorted-sized gravel and cobble		
Mean Column Velocity: 60% - 0.10 m/s		Velocity at 15cm above the bottom: 0.03 m/s	

Standard Parameters: 1322	Surface	Mid	Bottom
Temperature (C°)	23.11	--	23.14
Dissolved Oxygen (mg	7.89	--	7.83
pH	7.65	--	7.64
Conductivity	530.0	--	530.0
Secchi depth (cm)	Clear to bottom		

Depth (fixed) (meters): 1.01 m

Adjacent 3m cell areas:

Vegetation type:	*Ceratopteris* / Bare channel bottom
Vegetation height:	14 cm / N/A
Areal coverage:	30% / 70%
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 - FALL QUARTERLY SAMPLING

Location (Reach):		Site:	
Old Channel		C1 Site 6	
Date:	**Time:**	**Observer(s):**	
11/16/00	1252-1323	EO, PT, CN, DT	
Overall	**Species**	**Number**	**Avg. Length (mm)**
6	*Etheostoma fonticola*	6	17.7
4	*Lepomis megalotis*	4	36
50	*Palaemonetes* sp.		--
4	*Procambarus* sp.		--
Dip net sweep	**Species**	**Number**	**Length (mm)**
1	*Etheostoma fonticola*	3	19,20,11
	Lepomis megalotis	3	36,26,23
	Palaemonetes sp.	22	
	Procambarus sp.	3	
2	*Etheostoma fonticola*	1	18
	Palaemonetes sp.	6	
3	*Palaemonetes* sp.	1	
4	*Etheostoma fonticola*	1	19
	Palaemonetes sp.	3	
	Procambarus sp.	1	
5	*Palaemonetes* sp.	2	
6	*Palaemonetes* sp.	4	
7	*Palaemonetes* sp.	4	
8	*Palaemonetes* sp.	2	
9	*Lepomis megalotis*	1	34
	Palaemonetes sp.	1	
10	*Palaemonetes* sp.	2	
11	*Palaemonetes* sp.	2	
12	No fish or crustaceans collected		

DROP NET - FIELD DATA SHEETS

COMAL RIVER - FALL QUARTERLY SAMPLING

Dip net sweep	Species	Number	Length (mm)
13	No fish or crustaceans collected		
14	*Etheostoma fonticola*	1	19
	Palaemonetes sp.	1	
15	No fish or crustaceans collected		

DIP NET RESULTS

TABLE 4
DIP NET DATA
COMAL RIVER - FALL QUARTERLY SAMPLING
NOVEMBER 10, 2000

River Section	Date	Number of Darters	Length (mm)
Upper Reach of the Comal River (Section 3)	11/10/2000	1	22
		1	23
	Total Number:	**2**	
Spring Island Run (Section 4)	11/10/2000	1	16
		1	17
		3	18
		1	19
		3	20
		4	21
		4	22
		3	23
		7	24
		4	25
		3	26
		4	27
		4	28
		1	29
		6	30
		1	31
		1	32
		1	33
		1	34
		1	37
	Total Number:	**54**	
Landa Lake Pecan Island (Section 4)	11/10/2000	1	12
		1	16
		1	17
		1	18
		1	20
		1	21
		4	22
		3	23
		4	24
		2	25
		2	26
		2	27
		2	28
		2	29
		5	30
		2	31
		5	32
		2	33
		1	34
	Total Number:	**42**	

TABLE 4
DIP NET DATA
COMAL RIVER - FALL QUARTERLY SAMPLING
NOVEMBER 10, 2000

River Section	Date	Number of Darters	Length (mm)
Landa Lake (Section 5)	11/10/2000	1	19
		1	22
		1	23
		3	24
		1	26
		1	30
		2	31
	Total Number:	**10**	
New Channel Reach (Section 10)	11/10/2000	Collection halted due to turbidity and high water levels	
Comal River Below Clems Dam (Section 14)	11/10/2000	No collection taken due to turbidity and high water levels	
Old Channel Reach (Section 16)	11/10/2000	2	12
		2	14
		2	15
		3	17
		2	18
		4	19
		5	20
		3	21
		8	22
		8	23
		4	24
		5	25
		4	26
		5	27
		5	28
		4	29
		6	30
		4	31
		2	32
		1	33
		1	34
	Total Number:	**80**	

TABLE 4 (Continued)
DIP NET DATA
COMAL RIVER - ADDITIONAL SAMPLING
DECEMBER 1, 2000

River Section	Date	Number of Darters	Length (mm)
Upper Reach of the Comal River (Section 3)	12/1/2000	1	26
	Total Number:	**1**	
Spring Island Run (Section 4)	12/1/2000	1	13
		1	14
		2	17
		4	18
		1	19
		1	20
		6	21
		2	22
		5	23
		3	24
		3	25
		2	26
		4	27
		3	28
		1	29
		1	30
		2	32
	Total Number:	**42**	
Landa Lake Pecan Island (Section 4)	12/1/2000	1	15
		1	21
		2	24
		2	25
		1	26
		1	27
		2	28
		2	30
		2	33
	Total Number:	**14**	
Landa Lake (Section 5)	12/1/2000	1	20
		1	21
		1	22
		1	25
		1	27
		2	29
	Total Number:	**7**	

TABLE 4 (Continued)
DIP NET DATA
COMAL RIVER - ADDITIONAL SAMPLING
DECEMBER 1, 2000

River Section	Date	Number of Darters	Length (mm)
New Channel Reach (Section 10)	12/1/2000	No collection due to high water levels	
Comal River Below Clems Dam (Section 14)	12/1/2000	No collection due to high water levels	
Old Channel Reach (Section 16)	12/1/2000	1	12
		1	18
		1	30
		2	14
		2	17
		2	19
		2	20
		2	24
		2	28
		2	29
		2	33
		3	31
		4	21
		4	26
		5	23
		5	25
		6	22
		6	27
	Total Number:	**52**	

TABLE 4 (Concluded)
DIP NET DATA
COMAL RIVER - ADDITIONAL SAMPLING
DECEMBER 8, 2000

River Section	Date	Number of Darters	Length (mm)
Upper Reach of the Comal River (Section 3)	12/8/2000	0	--
	Total Number:	**0**	
Spring Island Run (Section 4)	12/8/2000	1	12
		2	13
		1	14
		4	15
		6	16
		3	17
		2	18
		2	19
		1	20
		1	21
		1	22
		1	23
		4	24
		2	25
		2	26
		1	27
		4	28
		1	30
		1	31
		1	39
	Total Number:	**41**	
Landa Lake Pecan Island (Section 4)	12/8/2000	1	11
		1	16
		1	22
		1	23
		1	24
		3	25
		2	26
		1	27
		1	28
		1	30
		2	31
		2	32
		1	33
	Total Number:	**18**	

TABLE 4 (Concluded)
DIP NET DATA
COMAL RIVER - ADDITIONAL SAMPLING
DECEMBER 8, 2000

River Section	Date	Number of Darters	Length (mm)
Landa Lake (Section 5)	12/8/2000	1	18
		1	22
		1	24
		1	27
	Total Number:	**4**	
New Channel Reach (Section 10)	12/8/2000	No collections due to high water levels	
Comal River Below Clems Dam (Section 14)	12/8/2000	No collections due to high water levels	
Old Channel Reach (Section 16)	12/8/2000	1	13
		2	14
		1	15
		1	16
		3	17
		5	18
		2	19
		1	20
		4	21
		9	22
		6	23
		2	24
		4	25
		5	26
		4	27
		3	28
		1	29
		1	30
		1	31
		1	32
		1	33
	Total Number:	**58**	

COMAL SPRINGS SALAMANDER RESULTS

TABLE 5
Salamander Survey
Comal River

Sample Location	Date	Sample Period (hours)	No Salamanders	Time of Observation	Substrate	Water Depth (inches)
Spring Reach 1	30 August 2000	1.58	1	0935	Cobble	9
			7	0955-1000	Rock w/ Algae & *Bacopa*	3.5
			1	1005	Rock over Cobble	3
	TOTAL		**9**			
	13 September 2000	1.66	2	1000	Rock/cobble w/algae	2
			2	1005	Rock/cobble w/algae	3
			1	1007	Rock/cobble w/algae	2
	TOTAL		**5**			
	15 November 2000	1.16	1	0915	Large cobble	10
			1	0920	Cobble	6
			6	0930-0945	Rock/Cobble	2-4
	TOTAL		**8**			

Sample Location	Date	Sample Period (hours)	No Salamanders	Time of Observation	Substrate	Water Depth (inches)
Spring Reach 3	30 August 2000	1.16	2	1045	In Potamegeton w/ Cobble/Rock	12
			7	1115-1122	Rock/cobble	1-4
			3	1130	Rock/cobble	2-0.5
			1	1140	Rock/cobble	4
	TOTAL		**13**			
	13 September 2000	1.50	1	1105	In *Potamegeton* w/ Cobble/Rock	13
			2	1110	Rock	2
			9	1115-1125	Rock	15
			1	1138	Rock	12
			1	1140	Rock	12
	TOTAL		**14**			
	15 November 2000	1.00	1	1005	Rock/Cobble	18
			3	1040-1050	Lg. Limestone w/ Rock	13
	TOTAL		**4**			

TABLE 5
Salamander Survey
Comal River

Sample Location	Date	Sample Period (hours)	No Salamanders	Time of Observation	Substrate	Water Depth (inches)
Spring Island Spring	31 August 2000	0.50	10	0820-0835	Cobble	5-7
			1	0840	Cobble	6
	TOTAL		11			
	14 September 2000	0.50	6	1032-1040	Rock	3-5
	TOTAL		6			
	16 November 2000	0.50	1	0847	Rock w/ Leaf Litter	6
			3	0850-0900	Rock	5
	TOTAL		4			

Sample Location	Date	Sample Period (hours)	No Salamanders	Time of Observation	Substrate	Water Depth (inches)
Comal River East of Spring Island	31 August 2000	0.50	1	0855	Rock/Cobble	7
	TOTAL		1			
	14 September 2000	0.50	1	1102	Rock	3
			3	1110	Rock	3-5
			1	1121	Rock	3
	TOTAL		5			
	16 November 2000	0.50	1	0925	Rock	12
			1	0930	Rock Adjacent to Wall	8
	TOTAL		2			

Sample Location	Date	Sample Period (hours)	No Salamanders	Time of Observation	Substrate	Water Depth (inches)
Comal River North of Spring Island	31 August 2000	0.5	0	--	--	--
	TOTAL		0			
	14 September 2000	0.33	0	--	--	--
	TOTAL		0			
	16 November 2000	0.33	0	--	--	--
	TOTAL		0			

GILL NET RESULTS

TABLE 6
LANDA LAKE GILL NET DATA
COMAL RIVER - FALL QUARTERLY SAMPLING
NOVEMBER 15-16, 2000

Species	Total Length (mm)	Total Weight (gr)	Stomach Contents
Cichlasoma cyanoguttatum	193	157.6	Empty
	186	152.2	Empty
	135	53.0	Empty
	96	22.7	Empty
	113	33.9	Empty
Total Number 5			
Lepomis auritus	147	49.5	Assorted insect parts
	133	38.8	Empty
	133	49.4	Insect parts & Vegetation
Total Number 3			
Lepomis gulosus	92	16.1	Unidentifiable material
	91	16.3	Insect parts, scale, vegetation
	137	51.9	Empty
	90	17.0	Assorted insect parts
Total Number 4			
Lepomis punctatus	108	25.6	Empty
Total Number 1			
Lepomis megalotis	123	49.8	Unidentifiable digested material
	103	25.7	snail;scale;insects;pebble
	118	34.3	Empty
	102	21.0	Empty
	89	16.4	Insects, snails, vegetation
Total Number 5			
Micropterus salmoides	360	633.2	Digested notropid (minnow)
	202	120.4	Unidentifiable digested material
Total Number 2			
Tilapia aurea	395	1177.3	Empty
	411	1494.2	Empty
	283	362.2	Empty
Total Number 3			