

Watershed: Lake Travis

Segments: 1404, 1405, 1414

Water Bodies: Colorado River, Pedernales River, Lake Travis, Lake Marble Falls

Population Centers: Marble Falls, Johnson City, Fredericksburg, Lakeway, Lago Vista, Jonestown, Spicewood, Harper

Counties: Kimble, Kerr, Gillespie, Blanco, Hays, Burnett, Williamson and Travis

Ecoregion: Central Texas Plateau (Edwards Plateau)

Ecoregion Description: This ecoregion is largely a dissected plateau that is hillier in the south and east where it is easily distinguished from bordering ecological regions by a sharp fault line. The region contains a sparse network of perennial streams, but they are relatively clear and cool compared to those of surrounding areas. Originally covered by juniper-oak savanna and mesquite-oak savanna, most of the region is used for grazing beef cattle, sheep, goats and wildlife. Hunting leases are a major source of income.

Climate: Subtropical, subhumid and annual precipitation averages about 24 inches, with May and September the wetter months. Although dry periods commonly occur in July and August, the driest months are November, December and January.

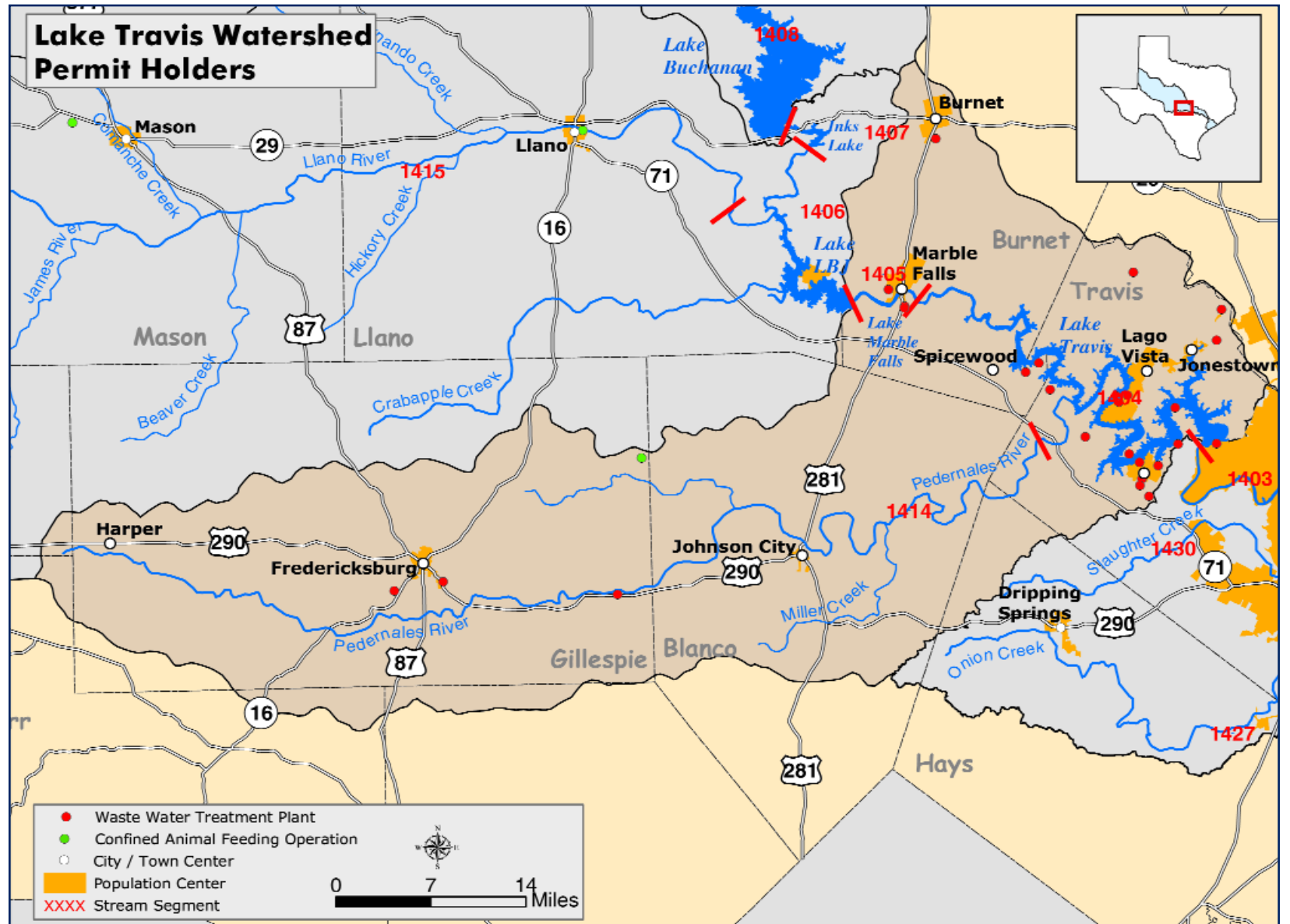
Land Use: Open woodland grazed, forest and woodland grazed, some sub-humid grassland and semi-arid grazing land

Soils: Dry mollisols; thin reddish-brown, gravelly and stony, sandy loam prairie soils

Permitted Discharges: 26

Permitted CAFOs: 1

Fig. 19 - Lake Travis



Lake Travis Watershed Trend Analysis

Twelve sampling locations were evaluated for trends in water quality during the scope of the study. Two locations are flowing stream sites on the Pedernales River, eight are located in Lake Travis and

two are located on Lake Marble Falls. Two locations (12315, Travis at Carpenter Bend; and 12311, Travis at Anderson Bend) are field parameter only (FP only) locations.

Similar to the two upstream watersheds, Buchanan and LBJ, nutrient trends, increasing chlorophyll *a* concentrations and decreasing secchi visibility over the past 10 years are potential areas of concern for this watershed. None of the water bodies within this watershed were reported in the 1998 Clean Water Act 303d list as impaired. Table 14 presents more detailed results for this watershed.

Table 14 - Trend Analysis Results for Lake Travis Watershed and Its Tributaries.

Station	Description	Time vs. Constituent							
		DO	CI	Fecal	Nutrients		Ch a	Secchi	TSS
12323	Marble Falls Headwaters		↓		↑		↑		
12319	Marble Falls Dam		↓						
12318	Travis Headwaters		↓		↑		↑		
12316	Travis-Turkey Bend		↓		↑		↑		↓
12315	Travis-FP site		↓		↑		↑		
12313	Travis-Pace Bend		↓	NA	NA	NA	↓	NA	
12311	Travis-FP site		↓				↑	↓	
12309	Travis-Arkansas B.	↑	NA	NA	NA	NA	↓	NA	
12307	Travis-Sandy/Lime		↓		↑		↑	↓	
12302	Travis Dam		↓				↑		
12375	Ped. River-RR 1320	↑	↓		↑		↑		
12369	Ped. River-FM 962	↑	↓				NA		NA

See Appendix A: Glossary on page 76 for definition of terms.

Two major events affected water quality in the Lake Travis watershed during the past 10 years. These events listed in chronological order are “salt” spill from Natural Dam Lake (1986) and the Christmas flood (1991-1992). Two smaller events, the Memorial Day flood along Sandy Creek (1995) and the Llano River flood (1997), may also provide insight into the water trends documented in this watershed.

Lake Travis Watershed Special Projects

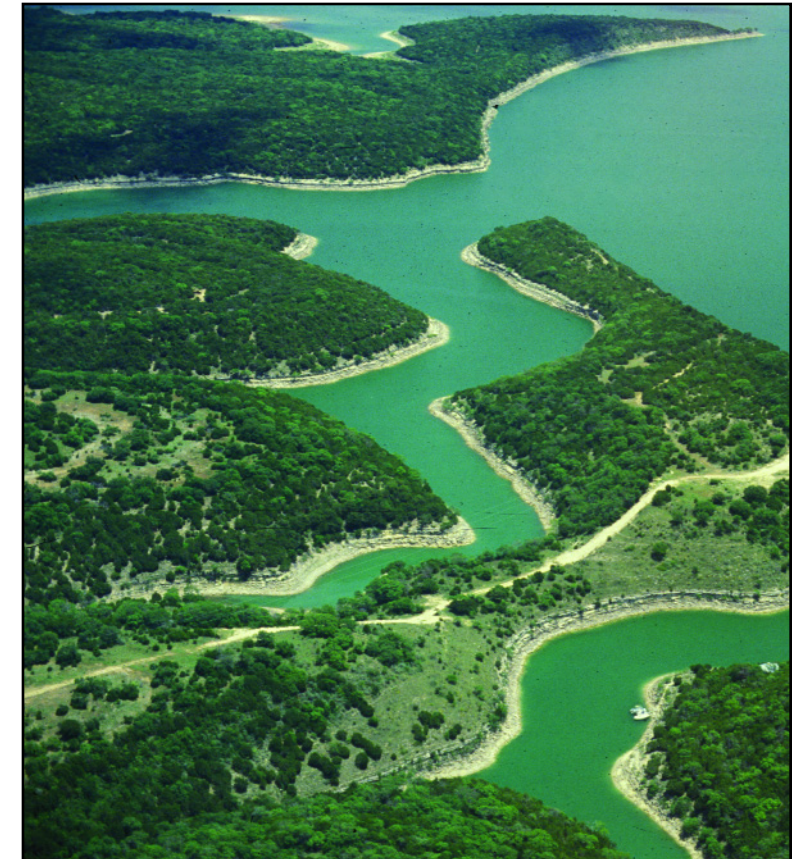
MTBE Monitoring

Methyl tertiary butyl ether (MTBE) is a gasoline additive used as an anti-knock agent and to aid engine combustion. It is found in about 3 percent of the premium grades of gasoline sold in the Austin area and frequently used by boaters and personal watercraft operators because it increases engine performance. It is highly soluble in water, difficult to biodegrade and is listed as a possible human carcinogen.

In 1999, LCRA performed a study on the Highland Lakes to determine if hazardous levels of MTBE were present in boating areas or near drinking water plant intakes. BTEX, a component of gasoline that contains benzene, toluene, ethylbenzene and xylene was also analyzed during the study.

Between September 1999 and June 2000, LCRA collected 174 MTBE and BTEX samples in the Highland Lakes. Five MTBE measurements were higher than TCEQ (formerly TNRCC)’s taste and odor threshold value of 15 µg/l. LCRA’s studies have shown that MTBE is found in the Highland Lakes in areas of high boat usage and near fueling operations on the lakes. With the exception of five MTBE measurements at boat ramps or fueling stations, the concentrations of

Lake Travis has miles of coves.



MTBE near drinking water intakes are below TCEQ (formerly TNRCC) taste and odor threshold levels. All BTEX compounds measured during these studies were below regulatory limits. Results of these studies were provided to TCEQ (formerly TNRCC) and City of Austin.

Table 15 - Lake Travis Watershed Data Summary

Segment	Year	Temperature (°C)	Dissolved Oxygen (mg/L)	pH (S.U.)	Ammonia (mg/L)	Nitrate + Nitrite (mg/L)	Total Phosphorus (mg/L)	Ortho Phosphorus (mg/L)	Chloride (mg/L)	Sulfate (mg/L)	E. coli (cfu/dL)	Chlorophyll (µg/L)
Lake LBJ Segment 1406 6 sites	1996	20.78	8.13	8.11	0.070	0.109	0.050	0.011	91.9	58.5	3	8.8
	1997	20.25	8.66	8.11	0.103	0.152	0.184	0.015	64.9	40.4	6	6.9
	1998	22.48	7.70	7.93	0.138	0.072	0.097	0.010	57.6	37.3	5	14.9
	1999	21.61	8.22	8.04	0.027	0.061	0.044	0.010	67.4	40.1	3	9.8
	2000	21.39	8.24	8.15	0.021	0.206	0.046	0.010	65.9	40.1	7	5.3
	Mean	21.27	8.19	8.06	0.074	0.122	0.076	0.011	69.3	43.2	5	9.2
	Benchmark	34.44	5.00	6.5 - 9.0	0.106	0.320	0.180	0.050	125.0	75.0	126	21.4
Sandy Creek Unclassified Stream 1 site	1996	19.76	9.39	8.30	0.082	0.138	0.048	0.006	28.1	23.0	21	3.8
	1997	21.78	9.27	8.36	0.080	0.104	0.090	0.035	22.3	16.4	503	16.0
	1998	22.11	9.33	7.57	0.064	0.020	0.075	0.011	31.3	25.0	26	1.5
	1999	24.41	8.66	8.23	0.020	0.020	0.040	0.010	28.8	20.0	56	1.4
	2000	24.22	9.20	8.41	0.020	0.180	0.042	0.010	26.4	21.6	28	0.7
	Mean	22.18	9.22	7.99	0.057	0.097	0.061	0.017	26.9	20.9	63	5.9
	Benchmark	34.44	5.00	6.5 - 9.0	0.170	2.760	0.800	0.500	125.0	75.0	126	11.6
Llano River Segment 1415 4 sites	1996	21.51	9.28	8.41	0.046	0.169	0.039	0.003	21.2	12.7	17	2.8
	1997	21.46	9.49	8.39	0.078	0.229	0.032	0.030	35.6	22.5	10	3.1
	1998	22.65	8.43	7.65	0.088	0.088	0.070	0.014	28.0	16.4	16	2.5
	1999	24.67	8.51	8.32	0.038	0.113	0.040	0.010	21.5	12.0	13	0.9
	2000	21.46	9.17	8.21	0.020	0.722	0.066	0.010	19.5	12.2	22	0.9
	Mean	22.04	9.04	8.07	0.047	0.323	0.052	0.014	24.4	14.8	16	1.9
	Benchmark	32.78	5.00	6.5 - 9.0	0.170	2.760	0.800	0.500	50.0	50.0	126	11.6
Violation Rate	0.00	1.70	0.00	3.400	0.000	0.000	0.000	0.0	0.0	8	1.7	
Inks Lake Segment 1407 2 sites	1996	19.05	7.70	7.99	0.110	0.065	0.044	0.175	130.6	85.8	2	6.7
	1997	18.35	7.96	8.04	0.110	0.146	0.050	0.016	82.5	53.6	3	12.3
	1998	21.09	8.56	8.01	0.105	0.051	0.086	0.011	80.0	52.2	4	35.4
	1999	20.73	7.54	7.88	0.069	0.029	0.040	0.010	84.4	53.8	5	10.2
	2000	20.62	6.68	7.89	0.044	0.078	0.074	0.011	82.6	51.9	5	7.2
	Mean	19.93	7.71	7.96	0.088	0.077	0.061	0.049	93.2	60.3	4	14.8
	Benchmark	32.22	5.00	6.5 - 9.0	0.106	0.320	0.180	0.050	150.0	100.0	126	21.4
Violation Rate	0.00	15.80	0.00	27.700	5.700	0.000	3.800	7.5	7.5	0	5.9	

Mean - annual average value

Benchmark - state standard or threshold

Violation Rate - percent of sample exceeded benchmark

Fig. 20 - Lake Travis Watershed Monitoring Locations

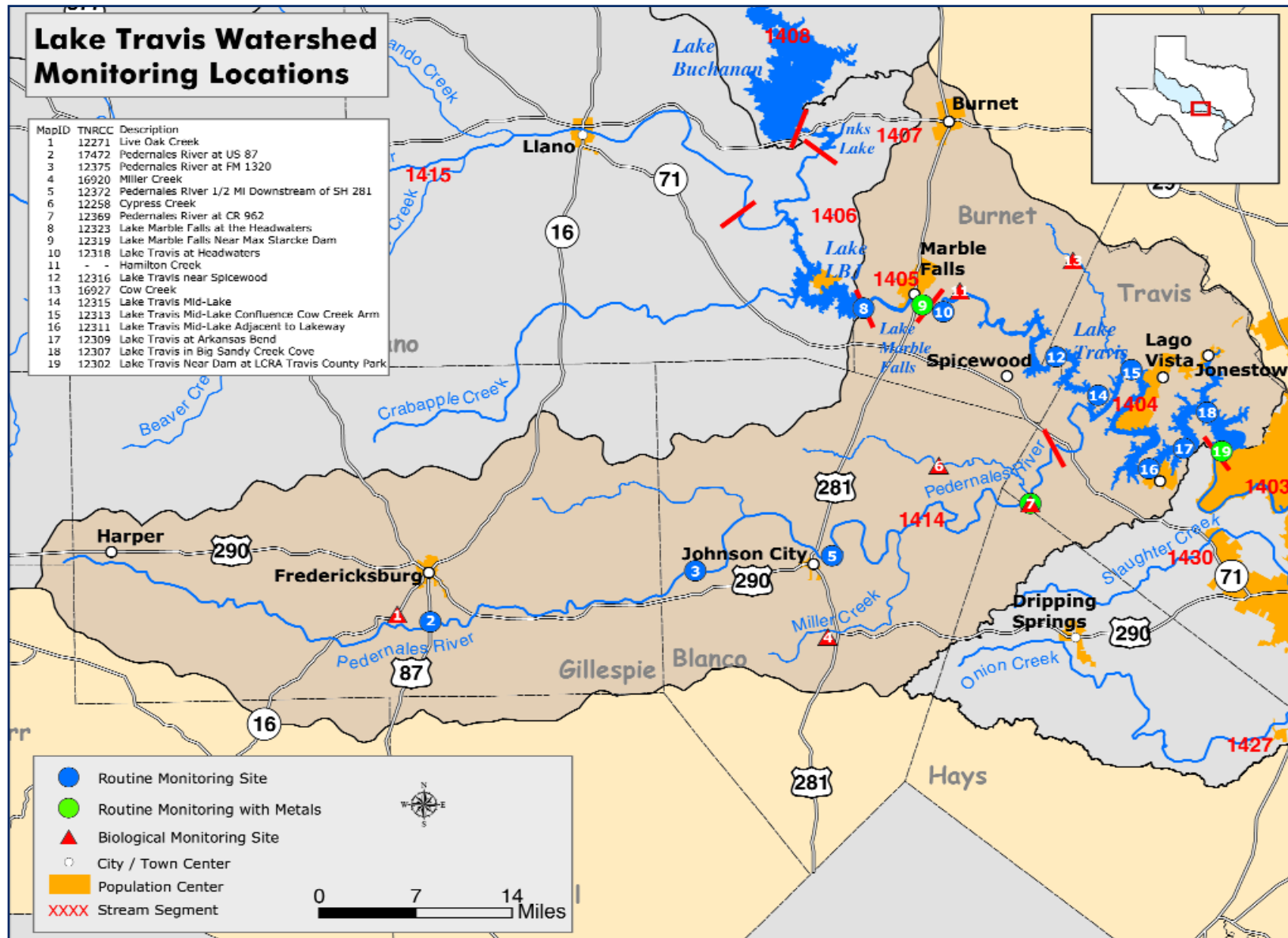


Table 16 - Results of Biological Surveys in the Lake Travis Watershed

Site	Date	Aquatic Life Use Fish	Aquatic Life Use Macroinvertebrates	Aquatic Life Use Dissolved Oxygen
Cow Creek	May-98	Limited	High	Exceptional
Cow Creek	Jul-98	Intermediate	High	Exceptional
Cow Creek	Nov-98	Intermediate	High	Exceptional
Cow Creek	Mar-99	Limited	High	Exceptional
Hamilton Creek	May-98	High	High	Exceptional
Hamilton Creek	Jul-98	-	High	Exceptional
Hamilton Creek	Nov-98	High	High	Exceptional
Hamilton Creek	Mar-99	High	High	Exceptional
Cypress Creek	May-98	Intermediate	High	Exceptional
Cypress Creek	Jul-98	-	High	Exceptional
Cypress Creek	Nov-98	Intermediate	Exceptional	Exceptional
Cypress Creek	Mar-99	Intermediate	High	Exceptional
Miller Creek	May-98	Intermediate	High	Exceptional
Miller Creek	Jul-98	Intermediate	High	Exceptional
Miller Creek	Nov-98	Intermediate	High	Exceptional
Miller Creek	Mar-99	Intermediate	High	Exceptional
Live Oak Creek	May-98	Intermediate	High	Exceptional
Live Oak Creek	Jul-98	High	High	Exceptional
Live Oak Creek	Nov-98	High	High	Exceptional
Live Oak Creek	Mar-99	High	High	Exceptional
Pedernales at Hammetts Crossing	Mar-00	High/Exceptional	Exceptional	-
Pedernales at Hammetts Crossing	Aug-00	High/Exceptional	High	-
Pedernales at Hammetts Crossing	Jun-01	High/Exceptional	High	Exceptional
Pedernales at Hammetts Crossing	Sep-01	High/Exceptional	High	Exceptional

Lake Travis Basin Biological Monitoring

Six sites were sampled for fish, bugs and dissolved oxygen in the Lake Travis Basin. Five were on small streams in the basin and one site was on the Pedernales River.

Fish communities typically scored intermediate to high in the smaller streams. The intermediate ratings are typical for small creeks throughout the Hill Country because of drought. Harsh conditions during drought limit the diversity of the fish community, which lowers the score for the stream. The lower fish scores are not a result of pollution, but rather natural conditions. Benthic macroinvertebrate scores were higher than fish, indicating good water quality. The Pedernales River showed a diverse, healthy fish and bug community and exceptional dissolved oxygen. Table 11 shows the aquatic life uses for streams sampled in the Lake Travis watershed during the reporting period.

Metals

Results for the Lake Travis Watershed dissolved metals in water sampling in August of 1998 is located in Appendix E on page 84.

