



**A Report by the Ecosystem
Management Water Quality
Assessment Section
#98-008**

**Bear Branch, Desoto County
March 3, 1998
Charlotte Harbor EMA**

Purpose *Biorecon: A rapid, cost-effective screening method for identification of biological impairment.*

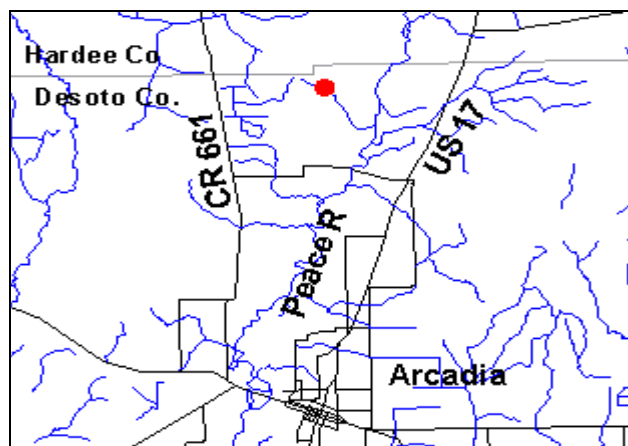
A Biorecon was performed on Bear Branch in order to gain further information on the biological health of the watershed for use in the administration of Florida's Ecosystem Management and Total Maximum Daily Loads programs. Macroinvertebrate samples were also collected for the calculation of the Stream Condition Index¹. Surface water samples were also collected for analysis of parameters of concern.

Methods

Biorecons are based on three measurements of the aquatic invertebrates present in the stream: the total number of different species (Total Taxa), the number of 'good water quality' indicator species (Florida Index) and the total number of Ephemeroptera (mayflies), Plecoptera (stoneflies) and Trichoptera (caddisflies) species present. A stream scoring above the threshold value for all three of these measurements is considered healthy. If two of the values are reached, the stream's health may be considered ecologically suspect. If one or none of the thresholds are reached, an impaired condition is concluded.

Basin Characteristics

Bear Branch is located in north-central Desoto County, on Williams Road near the town of Brownville. It is a small stream that flows into the Peace River. The sampling site is shown in Figure 1. Bear Branch is a wetland stream with no true banks. There is not much littoral zone on the west side, which runs along a road through open pasture. Water velocity is sluggish and the substrate is a combination of mud and fine sand. There is adequate instream habitat for macroinvertebrate colonization, particularly aquatic vegetation and tree roots, but the majority is covered with silt. Agriculture is the dominant land use in the basin, particularly cattle and citrus. The wetland is utilized by cattle, at least periodically, as evidenced by hoof prints and trampled areas. No permitted domestic or industrial waste discharges occur in the watershed.



Results

The stream was slightly turbid and its velocity was 0.15 m/s. Dissolved oxygen was 7.18 mg/l. Conductivity was 334 umho/cm. pH was 6.12 SU and temperature was 16.65 ° C. The habitat assessment score, 81, was in the low suboptimal category (Fig. 2). Water chemistry results are shown in Fig. 3. Total nitrogen was moderately elevated, particularly nitrate-nitrite, as compared to typical values statewide². This may be evidence of runoff from cattle pasture. Orthophosphate was also elevated, but may be typical of the predominance of phosphate bearing rock in the area. Sulfate concentration was also high. Turbidity and total suspended solids were quite low, but both total and fecal coliforms exceeded the State standards for a single day level.

This site on Bear Branch exceeded the thresholds for all three measurements of the Biorecon (Fig 3). The Stream Condition Index rating was 31, in the 'excellent' range. This indicates that the stream supported a healthy macroinvertebrate community and met its designated use at the time of sampling.

Suggestions

The chemical parameters analyzed indicated that modest levels of nutrients and high levels of coliforms were being introduced into the stream at the time of sampling, most likely due to agricultural activities, particularly local cattle pastures. These levels did not result in a degraded macroinvertebrate community at the time of sampling. Bear Branch flows into the Peace River, which flows into Charlotte Harbor, where accumulated nutrients may result in degraded water quality, including algal blooms and associated oxygen depletion. The development of best management practices for cattle ranges, citrus groves and other agricultural activities, in all the tributaries of the Peace River, is important when managing the ecological integrity of the Charlotte Harbor ecosystem.

For more information, contact Peggy Morgan, FDEP Southwest District, 3804 Coconut Palm Dr., Tampa, FL 33619; (813) 744 - 6100

Fig. 1. Site location

Figure 2. Habitat Score

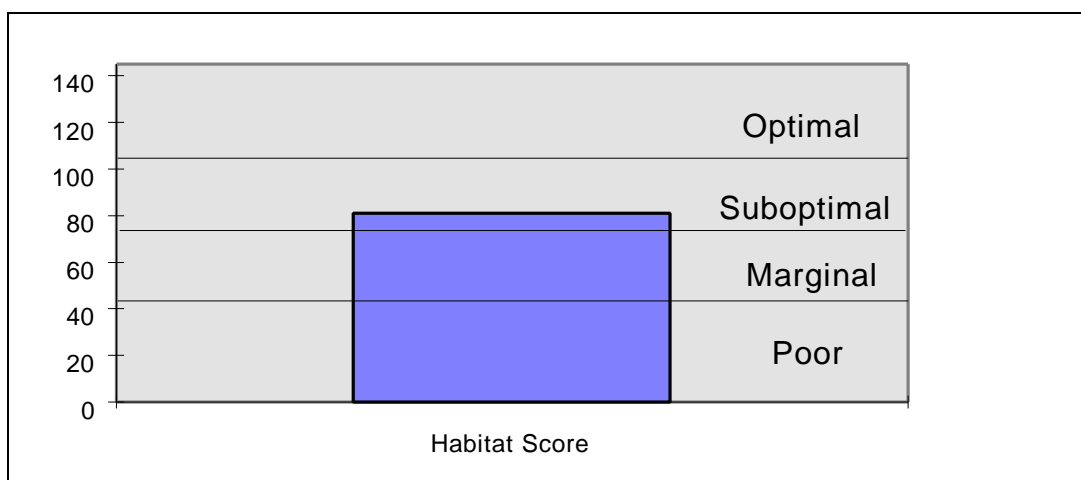
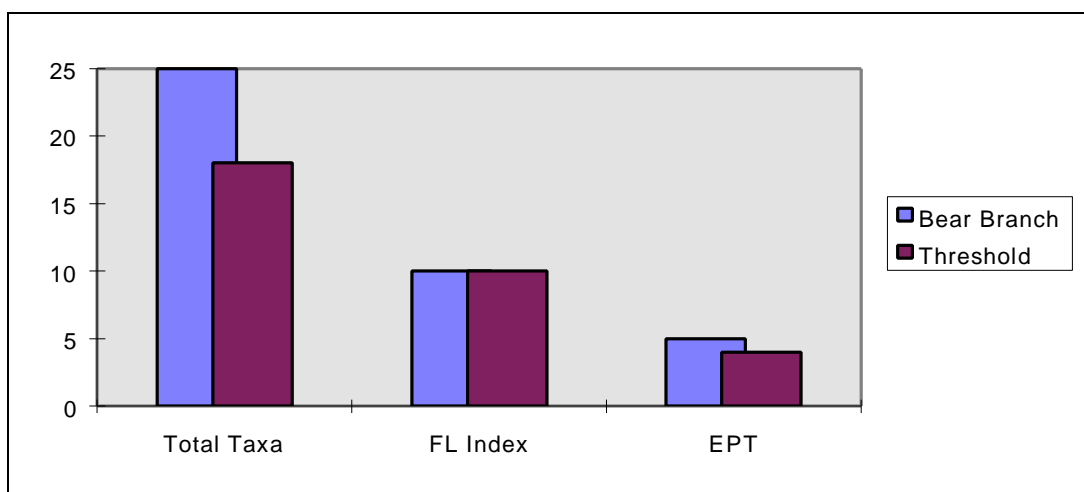


Figure 3. Water Chemistry results

Chloro- phyll-a	Chloride	Sulfate	Ammonia- N	Nitrate- Nitrite	Kjeldahl Nitrogen	Total Phos- phorus	Ortho- phosphate	Total Organic Carbon
Tg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l
1.12	29	95	0.06	0.4	0.6	0.23	0.17	12

Turbidity	Total Suspended Solids	Total Coliforms	Fecal Coliforms
NTU	mg/l	#colonies/100 ml	#colonies/100 ml
2.2	2	3300	1080

Figure 3. Biorecon results



¹ State of Florida Department of Environmental Protection. 1993. Standard Operating Procedures Manual (Draft). Benthic Macroinvertebrate Sampling and Habitat Assessment Methods: 1. Freshwater Streams and Rivers. FDEP Contract No. WM385. EA Engineering, Science and Technology, Inc., Carrollton, Texas.

² State of Florida Department of Environmental Protection. 1989. Friedemann, M. and J. Hand. Typical water quality values for Florida's lakes, streams and Estuaries. Standards and Monitoring Section. Bureau of Surface Water Management.