



Lake Beauclair EcoSummary October-November 2008

Lake Condition Index (LCI): A biological assessment tool developed by the Florida Department of Environmental Protection to indicate ecosystem health and identify impairment in Florida lakes

Watershed Characteristics

Located in central Lake County with a portion of the lake located in Orange County, 1119-acre Lake Beauclair is surrounded largely by a mix of residential, natural and recreational lands. Lake Beauclair has nutrient loadings more than four times that of any other lake in the Upper Ocklawaha River basin largely due to incoming flow from the Apopka-Beauclair Canal. Lake Beauclair has a turnover rate of approximately 56 days (or 6.5 turns/year) under average conditions. Because Lake Beauclair is larger than 1000 acres in size, two separate LCIs were performed, one on the east side and one on the west. The 12 benthic grabs for Lake Beauclair East were taken in October 2008 and the 12 benthic grabs for Lake Beauclair West were taken in November 2008.



Results

Both sides of Lake Beauclair received a very poor rating on the LCI. Eight different macroinvertebrate taxa were collected on the west side, and thirteen on the east. The last three years of drought have lowered lake levels and greatly reduced the flow from Lake Apopka into Lake Beauclair. However, this summer there was slightly more rainfall than the previous two years. Summer is generally the season of highest rainfall in Florida. Macroinvertebrates are an integral part of the food chain which support other invertebrates, fish, birds etc. On Lake Beauclair East, the most abundant macroinvertebrate collected was the oligocheate, tubificid worm *Limnodrilus hoffmeisteri*. Oligocheates made up 51.4% of macroinvertebrates collected on Beauclair East, while the Diptera *Chaoborus punctipennis* or phantom midges made up 35.2% of the total population of macroinvertebrates. The Chironomid *Cladotanytarsus sp.B* and oligocheate worms *Limnodrilus hoffmeisteri* and *Ilyodrilus templetoni* comprised the majority of macroinvertebrates at 50% and 43.3%, respectively on Lake Beauclair West. The most abundant two taxa for each of the portions of Lake Beauclair were identical the previous 3 years. Tubificids frequently form dense populations in organically enriched habitats with a mucky substrate tending

toward anoxic conditions. The sediment in 11 of the 12 benthic grabs in Beauclair East was predominately muck and coarse particulate organic matter. Beauclair West was predominately sand in 6 of the 12 benthic/sediment grabs. The dipteran (fly) larvae present consisted of pollution tolerant species such as *Cladotanytarsus sp.B*, *Chaoborus punctipennis* and *Chironomus sp.* The mean LCI scores slightly increased in both Lake Beauclair East and Lake Beauclair West (see table below). Lake Beauclair East received a Hulbert Index score of 2 and Lake Beauclair West was given Hulbert Index scores of 0. The HI is based on the number of pollution-intolerant lake macroinvertebrate species present.

LCI SCORES

	<u>2005</u>	<u>2006</u>	<u>2007</u>	<u>2008</u>
Beauclair East	29.12	22.83	19.20	25.03
Beauclair West	25.66	21.07	13.92	17.83



Photo courtesy of Dana Denson DEP

Aquatic worm

Significance

The Lake County Water Authority has an off-line alum system or NuRF (Nutrient Reduction Facility) project under construction that would reduce the total phosphorus load in Lake Beauclair by as much as 81% annually. When the project is completed, Lake Beauclair should improve from a nutrient-rich hypereutrophic lake to a considerably 'healthier' mesotrophic lake. This could increase recreation on the lake by eliminating persistent algal blooms, eventually leading to reestablishment of beneficial vegetation and a more productive sportfish population. The Lake County Water Authority will continue to monitor

the macroinvertebrates in Lake Beauclair in order to assess the NuRF project impacts on the ecosystem health.

Suggestions

Lakeside property owners can help keep the lake healthy by minimizing, or eliminating, the use of pesticides, herbicides and inorganic fertilizers, by preserving native shorezone vegetation, by minimizing impervious surfaces on their properties, by being careful with the use and storage of petroleum products, and by properly maintaining septic or sewer systems.



References

Fulton, R.S., III. 1995. *External nutrient budget and trophic state modeling for lakes in the Upper Ocklawaha River Basin*. Technical Publication SJ95-6. Palatka, Fla.: St. Johns River Water Management District.

Fulton, R.S.,III, C. Schluter, T.A. Keller, S. Nagid, W. Godwin, D. Smith, D. Clapp, A. Karama, and J. Richmond. 2004. *Pollutant Load Reduction Goals for seven major lakes in the Upper Ocklawaha River Basin*. Technical Publication SJ2004-5, Palatka, Fla.: St Johns River Water Management District.