



Lake Beauclair EcoSummary

November 2009

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 and 12 benthic grabs for Lake Beauclair West were taken in November 2009.



Results

Both sides of Lake Beauclair received a very poor rating on the LCI. Six different macroinvertebrate taxa were collected on the west side, and ten on the east. 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 41 % of macroinvertebrates collected on Beauclair East, while the Diptera *Chaoborus punctipennis* or phantom midges made up 20% 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 49% and 37%, respectively on Lake Beauclair West. The most abundant two taxa for each of the portions of Lake Beauclair were identical the previous 4 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 decreased in both Lake Beauclair East and Lake Beauclair West (see table below). Lake Beauclair East and West received Hulbert Index scores of 0. The HI is based on the number of pollution-intolerant lake macroinvertebrate species present. The 2009 Secchi readings or water clarity measurements were identical to 2008 at 0.25 to 0.30 meters.

LCI SCORES

	<u>2005</u>	<u>2006</u>	<u>2007</u>	<u>2008</u>	<u>2009</u>
Beauclair East	29.12	22.83	19.20	25.03	20.87
Beauclair West	25.66	21.07	13.92	17.83	16.17



Aquatic worm

Significance

The Lake County Water Authority has an off-line alum system or NuRF (Nutrient Reduction Facility) located on the Apopka-Beauclair Canal that came online in March of 2009. This will reduce the total phosphorus load in Lake Beauclair (from Lake Apopka) by as much as 81% annually. Over the coming years, 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, increasing water clarity and eventually leading to reestablishment of beneficial vegetation and a more productive sportfish population. In addition, the LCWA has plans to dredge a portion of Lake Beauclair sediment where high levels of phosphorus (the principal polluting nutrient), have accumulated over the decades from sources originating in Lake Apopka. This sediment area is shallow and can re-suspend

the phosphorus any time this area is disturbed (such as by wind or boating activity). The Lake County Water Authority will continue to monitor the macroinvertebrates in Lake Beauclair in order to assess the NuRF and sediment dredging 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.