LAKE ECOSUMMARY

Wildcat Lake

August 1, 2012

DEP conducted water quality and biological sampling on August 1, 2012 at Wildcat Lake to assess attainment of designated uses. Water quality results met all applicable limits and plant community data met expectations for a healthy, well-balanced lake.

Background

Although a healthy, well -balanced lake may be maintained with some level of human disturbance, human activities may result in lake degradation. Human stressors include increased inputs of nutrients, sediments and/or pesticides from watershed runoff, undesirable removal of native shoreline and/or upland buffer vegetation, and introduction of nuisance (generally exotic) plants and animals. DEP has methods to evaluate if human activities have resulted in the condition where a particular waterbody has exceeded water quality criteria (Chapter 62-302, Florida Administrative Code), including whether adverse impacts to biological communities have occurred. DEP water quality standards are designed to protect designated uses of the waters of the state (*e.g.,* recreation, aquatic life support), and exceedances of these standards are associated with interference with the designated use. Chlorophyll *a* is a measure of algal biomass in the water column. In clear, low alkalinity lakes (lakes where color is < 40 PCU and alkalinity is < 20 mg/L $CaCO_2$), a healthy system is expected to have $\leq$ 6 µg/L of chlorophyll *a*. In colored ($\geq$ 40 PCU) lakes or clear, high alkalinity ($\geq$20 mg/L $CaCO_2$) lakes, healthy systems are expected to have $\leq$ 20 µg/L of chlorophyll *a*. Chlorophyll *a* values greater than those shown above may result in unwanted shading of aquatic plants and/or greater potential for harmful algal blooms. The Lake Vegetation Index (LVI) assesses how closely the plant community of a lake resembles a native undisturbed community. These assessments are often used in conjunction with one another because it is possible to detect imbalances in the plant community while the algal community appears healthy (and vice versa).

Methods

The DEP Central District Office conducted a LVI and collected field parameter data and water samples on August 1, 2012 on Wildcat Lake. Samples were collected following DEP Standard Operating Procedures (SOPs; see http://www.dep.state.fl.us/water/sas/qa/sops.htm). Sampling and analyses met DEP quality assurance/quality control standards (see http://www.dep.state.fl.us/water /sas/qa/index.htm). For the LVI, species lists were developed for four of twelve sections of the lake (Figure 1), and the following information was derived from those lists: percent native species, percent invasive exotic species, percent sensitive species, and the coefficient of conservatism (C of C; a measure of how tolerant a species is to disturbance) of the dominant species. According to DEP SOP LT 7000, the LVI score ranges and categories are: (78-100) Exceptional; (38-77) Healthy; and (0-37) Impaired. DEP's new draft F.A.C. Chapter 62.302 requires at least two temporally independent LVIs with an average score of 43 or above in order to meet the expectation of a healthy, well balanced community. The LVI was sampled per DEP SOP FS7310 and calculated per DEP SOP LT7000.

Site Information

Wildcat Lake, located in the northwest corner of Lake County in the "Big Scrub" of the Ocala National Forest, is part of the middle St. Johns River Basin. Wildcat lake has a surface area of approximately 335 acres.

Surface water enters Wildcat Lake from sheet flow over natural vegetation. Less than 10% of Wildcat Lake's buffer zone is affected by structures, roads and other disturbances and expected native vegetation is present.

Results

Water Quality

Newly proposed water quality criteria from 62-302 Florida Administrative Code require that low alkalinity, low color lakes have a maximum chlorophyll *a* concentration of 6 µg/L. On August 1, 2012, Wildcat's chlorophyll *a* concentration was 2.7 µg/L, which is well below the criterion. The concentration of total nitrogen (TN) in the sample collected on August 1, 2012 (0.29 mg/L) was well below the newly proposed water quality criterion of .93 mg/L as was the total phosphorus (TP) concentration (0.007 mg/L) well below the newly proposed water quality criterion (0.03 mg/L). All other parameters met their applicable limits. (Note that compliance cannot be determined with a single sample; all concentrations are based on annual geometric means not to be surpassed more than once in a three year period) Please see Table 1 for other results.

Figure 1. Sampling map of Wildcat Lake. Sections 3,6,9 and 12 were sampled for the Lake Vegetation Index. The water quality sample was collected from the lake center.

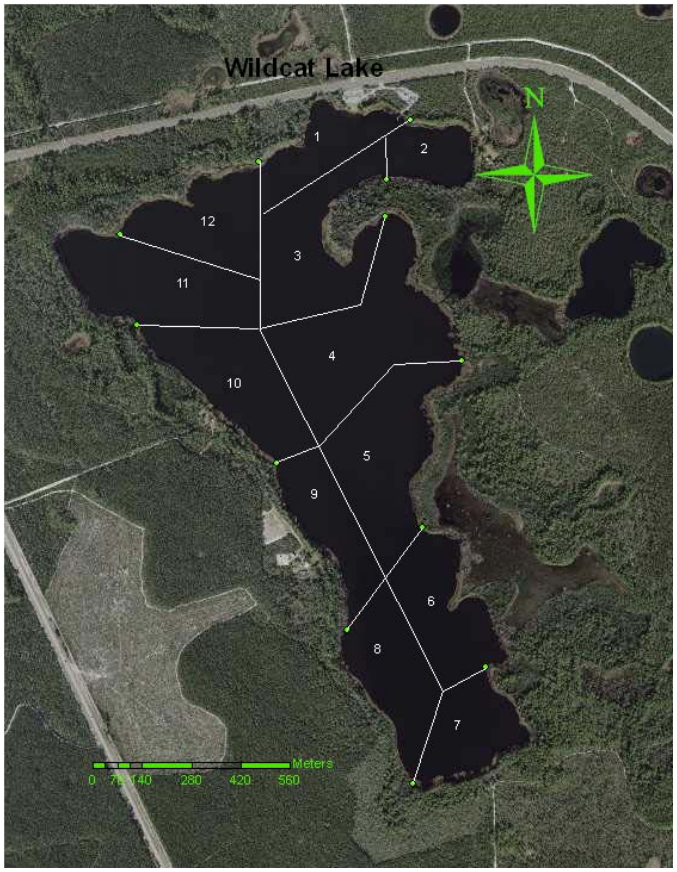


Table 1. Water quality results from surface water samples collected on August 1, 2012 at Wildcat Lake by FDEP. Water quality criteria from 62-302, F.A.C.

Analyte	6/4/12 Result	Comment	Applicable Class III Water Quality Criteria
Field Temperature (°C)	32		
Field pH (SU)	6.2		
Field Dissolved Oxygen (mg/L)	6.74		≥ 5
Field Specific Conductance (µmhos/cm)	48		"Not to exceed 50% of background or 1275 µmhos/cm"
Alkalinity (mg $CaCO_3$/L)	0.65	U	
Color (PCU)	8.0		
Turbidity (NTU)	2.2		
Chlorophyll *a* (µg/L)	2.7		<6.0**
Total Phosphorus (mg/L)	0.007		< 0.03**
Total Nitrogen (mg/L)	0.29		<.93
Nitrate+Nitrite (mg/L)	0.004	U	
Ammonia (mg/L)	0.011	I	
Total Kjeldahl Nitrogen (mg/L)	0.29		
Secchi disk depth (m)	3.3		

**proposed 62-302 thresholds for Annual Geometric Mean Total
U - Material was analyzed for but not detected. The reported value is the method detection limit for the sample analyzed.
I - The reported value is between the laboratory method detection limit and the laboratory practical quantitation limit.

Lake Vegetation Index

The LVI score for this lake was 94 out of a possible 100 points, corresponding with a Category I "Exceptional" designation. Table 2 contains the species list and occurrence information for this sampling event. No invasive exotic plants were observed in the sections sampled.

Table 2. Species list for the August 1, 2012 LVI at Wildcat Lake. An asterisk (*) indicates an invasive exotic plant species. P = present, D = dominant, C = codominant.

Species	Common Name	Sections:	3	6	9	12
Baccharis	SALT BUSH			P		
Bidens mitis	SMALL FRUIT BEGGAR TICKS			P	P	
Blechnum serrulatum	SWAMP FERN		P	P	P	
Cephalanthus occidentalis	BOTTON BUSH		P	P	P	P
Cladium jamaicense	SAW GRASS		P	C	P	P
Erechtites hieraciifolia	FIRE WEED				P	P
Eriocaulon decangulare	HAT PIN			P		
Eupatorium capillifolium	DOG FENNEL			P	P	P
Fuirena scirpoidea	RUSH FUIRENA		P		P	
Gordonia lasianthus	LOBLOLLY BAY		P	P	P	P
Hydrocotyle	PENNY WORT				P	
Hypericum fasciculatum	ST. JOHN'S WORT					P
Ilex cassine	DAHOON HOLLY		P	P		
Lachnanthes caroliniana	RED ROOT			P		P
Leersia hexandra	SOUTHERN CUTGRASS		P	P		P
Ludwigia suffruticosa	SHRUBBY PRIMROSE WILLOW			P		
Lyonia lucida	FETTER BUSH				P	P
Magnolia virginiana	SWEET BAY			P		
Myrica cerifera	WAX MYRTLE		P	P	P	
Najas guadalupensis	SOUTHERN NIAD					P
Nitella	NIAD					P
Nuphar	COW LILLY		P	P	P	
Nymphaea odorata	FRAGRENT WATER LILLY				P	P
Nymphoides aquatica	BANNANA LILLY		P	P	P	
Nyssa sylvatica biflora	SWAMP BAY		P	P		
Panicum hemitomon	MAIDENCANE		D	C	D	D
Pontederia cordata	PICKEREL		P	P	P	P
Rhynchospora inundata	HORNED BEAKSEDGE			P		
Rhynchospora microcepha	BUNCHED BEAKSEDGE			P		
Taxodium	CYPRESS				P	
Triadenum virginicum	VIRGINIA MARSH ST. JOHN'S WORT			P		
Utricularia gibba	TANGLED BLADDER WORT			P	P	
Utricularia purpurea	PURPLE BLADDER WORT			P	P	
Vitis			P	P	P	

Summary

Wildcat Lake has benefited from its remote location in the Ocala national Forest. A management plan to prevent potential nutrient loading from its watershed and to keep submersed and emergent exotic vegetation from invading and establishing will ensure stability in Wildcat's water chemistry and plant community.

Water quality results were well within acceptable limits for chlorophyll *a,* total nitrogen and total phosphorus on August 1, 2012. The Lake Vegetation Index score, 94 at of a possible 100, corresponded with an "Exceptional" designation.

Thank you for your interest in maintaining the water quality of Florida's lakes. Please feel free to contact us if you have any questions.

Contact and resources for more information

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DEP publications on Best Management Practices and Environmental Stewardship and Education: http://www.dep.state.fl.us/water/nonpoint/pubs.htm DEP biological assessment resources: http://www.dep.state.fl.us/water/bioassess/index.htm FWCC Aquatic Plant Management: http://myfwc.com/wildlifehabitats/habitat/invasive-plants/aquatic-plant/

Freshwater Algal Bloom information: http://www.dep.state.fl.us/labs/biology/hab/index.htm