



LAKE ECOSUMMARY

Lake Holden, Orange County

2012

DEP conducted water quality and biological sampling at Lake Holden to assess attainment of designated uses and as a continuing study of restoration efforts including the use of whole lake alum treatment to inactivate phosphorus in the sediments. Water quality results met all applicable limits. Plant community, phytoplankton and macroinvertebrate data indicated that Lake Holden 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 CaCO₂), a healthy system is expected to have ≤ 6 $\mu\text{g/L}$ of chlorophyll *a*. In colored (≥ 40 PCU) lakes or clear, high alkalinity (≥ 20 mg/L CaCO₂) lakes, healthy systems are expected to have ≤ 20 $\mu\text{g/L}$ 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. The Lake Condition Index (LCI) uses benthic macroinvertebrates to determine the biological integrity of a lake. The LCI is not used as a Statewide tool for assessing and reporting the biological condition of Florida lakes given the lack of correlation to human disturbance and the high correlation with nutrients and water clarity, which may be due to either anthropogenic or natural sources. However, the LCI can be useful for comparison of LCI assessments at a single site over time to interpret change in the benthic macroinvertebrate community. These tools are often used in conjunction with one another because it is possible to detect imbalance in one community while another appears healthy.

Methods

The DEP Central District Office conducted three site visits to Lake Holden in 2012. On January 19, water chemistry, field measurements and a LCI sample were collected. On May 24, water chemistry, field measurements and a LVI were conducted and on October 2, 2012, water chemistry, field parameters, and a repeat LVI and LCI were conducted. Samples were collected following DEP Standard Operating Procedures (SOPs; see <http://www.dep.state.fl.us/water/sas/ga/sops.htm>) and analyzed at the DEP Central Laboratory. Sampling and analyses met DEP quality assurance/quality control standards (see <http://www.dep.state.fl.us/water/sas/ga/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 macrophyte community; (38-77) Healthy; and (0-37) Impaired macrophyte community. DEP's Rule 62-302.800.(3)a.1.b., F.A.C., 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.

For the LCI, macroinvertebrates were collected from the lake bottom using a Petite ponar sampler following DEP SOP FS 7460. Samples were taken at a depth of 2–4 m to avoid the littoral zone which is typically covered with emergent vegetation. Twelve grab samples were collected from segments equally-spaced around the lake. The 12 samples were composited and a 100-organism count subsample was identified to the lowest practical taxonomic level, typically the species level. Scores range from 0 to 100.

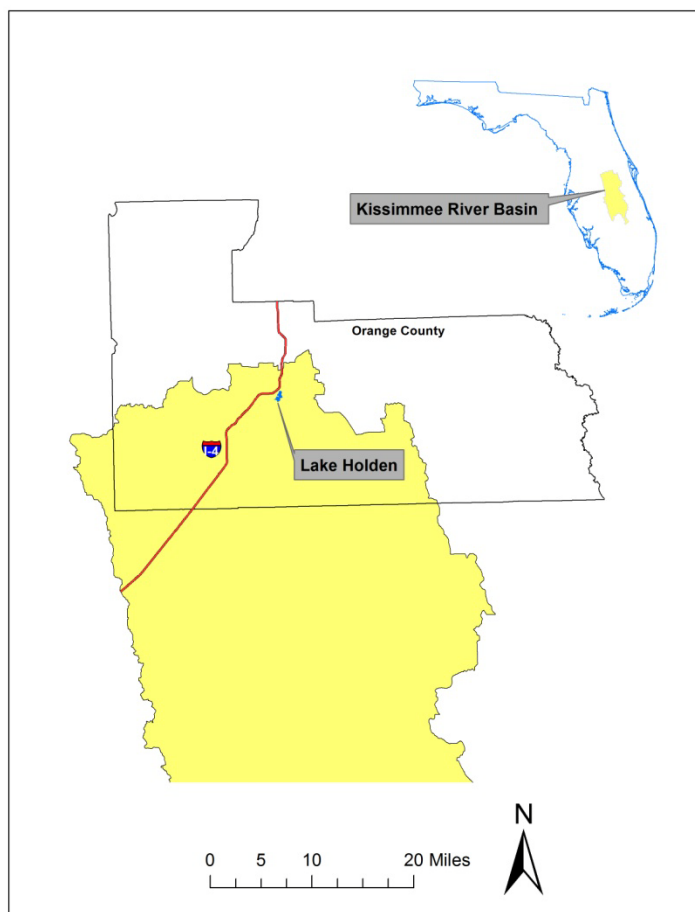


Figure 1. Location Map of Lake Holden

Site Information

Lake Holden is an urban lake located within the Kissimmee River Basin in Orange County and the City of Orlando (Figure 1). Its surface area is approximately 265 acres with an average depth of 4m (Figure 2). Lake Holden's immediate watershed land use designations are primarily medium density residential (52.8%), commercial/industrial (35.2%), forest (5.7%), wetlands (5.1%), and agriculture (1.2%). Lake Holden lies within a closed hydrological basin and drains to several drainage wells located within the lake. Using the methodology in the Identification of Impaired Surface Waters Rule (IWR, Rule 62-303, Florida Administrative Code), Lake Holden was verified as impaired for nutrients in Cycle 1 and was included on the verified list of impaired waters for the Kissimmee River Basin that was adopted by Secretarial Order on May 12, 2006. Cycle 2 confirmed this impairment as the Trophic State Index (TSI) value exceeded the threshold of 40 in 2007, as it did in 2003. TSI is a calculation based on total phosphorus, chlorophyll *a*, and Secchi depth. A draft TMDL was published for Lake Holden on July 29, 2011. The TMDL establishes the allowable loadings to the lake that would restore the waterbody so that it meets its applicable water quality narrative criteria for nutrients.

Beginning in 1983, Orange County and City of Orlando began implementing a number of storm water Best Management Practices (BMPs) in Lake Holden's watershed. Among these improvements were dry and wet retention ponds, curb grates and catch baskets, street sweeping, and inline alum injection systems. Between April 2005 and June 2010, three alum applications to the lake were conducted as part of a sediment inactivation project to reduce the transfer of phosphorus from the sediments to the water column.

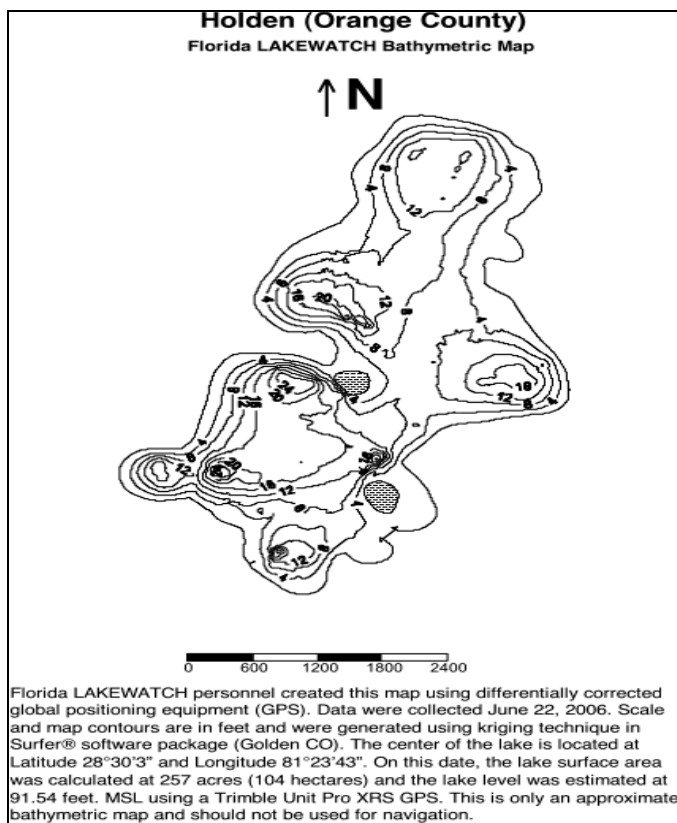


Figure 2. Bathymetric Map of Lake Holden

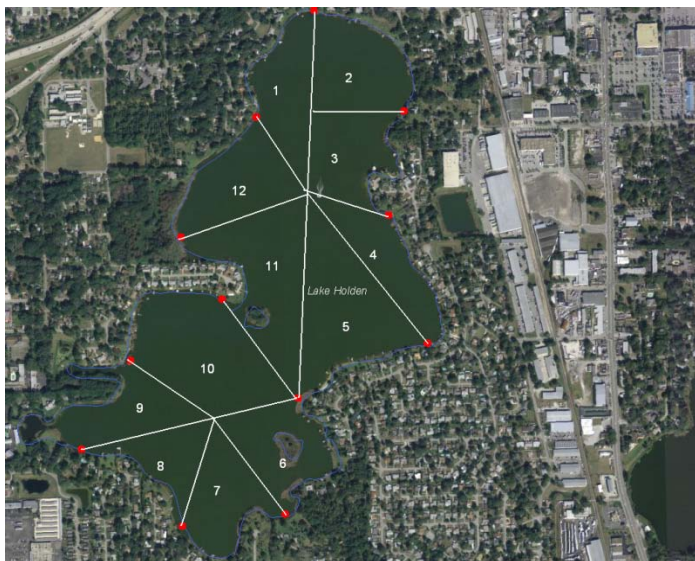


Figure 3. Sampling map of Lake Holden. Sections 12,9,6 and 3 were sampled for the Lake Vegetation Index on May 24, 2012 and 1,10,7 and 4 were sampled on October 24, 2012. The water quality samples were collected from the middle of the lake.

Results

Water Quality

Water chemistry and field measurements were collected in Lake Holden on January 19, May 24, and October 2, 2012 in conjunction with biology samples.

Based on these three sampling events, Lake Holden's average chlorophyll *a* concentration (4.0 µg/L) complied with the adopted criterion of 20 µg/L for alkaline lakes. The average total nitrogen (TN) concentration (0.52 mg/L) from the samples collected in 2012 also complied with the newly adopted water quality criterion of 1.91 mg/L. Similarly, the average total phosphorus (TP) concentration (0.01 mg/L), met the newly adopted water quality criterion of 0.09 mg/L. All other water quality parameters also met their applicable limits. Note that compliance with nutrient criteria must be based on a minimum of four water quality samples per year, and that the numeric criteria are based on annual geometric means not to be surpassed more than once in a three year period. See Table 1 for other results.

Lake Vegetation Index

The LVI score for Lake Holden on May, 24 2012 was 59 out of a possible 100 points, corresponding with a Category II "Healthy" designation. A follow up LVI was performed on October 2, 2012 and scored a 47 out of a possible 100 points, also corresponding with a Category II "Healthy" designation. Table 2 and Table 3 contain the species list and occurrence information for these sampling events.

A total of 7 invasive exotic plants were observed in the sampled sections on May 24, 2012, but they were not dominant. *Vallisneria americana* (eel grass), a beneficial submersed plant, dominated three sections and was co-dominant with *Najas guadalupensis*, another native, beneficial submersed plant, in the fourth segment sampled.

A total of 9 invasive exotic plants were observed in the sampled sections on October 2, 2012, but again, they did not dominate the plant community. *Vallisneria americana* (eel grass), dominated two of the sampled sections and was co-dominant with *Nitella*, a vascular plant-like macro algae, in two others.

On October 2, 2003, a Floristic Quality Index (FQI, a precursor to the LVI) assessment was performed on Lake Holden by FDEP staff. During this sampling event, all twelve sections of the lake were sampled. Eleven invasive species were present and six of the twelve

sections were dominated by the exotic taxon, *Panicum repens* (torpedo grass), and six others dominated by *Typha* (cattails) instead of beneficial, submersed aquatic plants that are currently observed in the lake. These historic results, in conjunction with the present LVI results, indicate a significant improvement in the plant community over time, likely associated with the in-lake and watershed management activities.

Phytoplankton

The algal community in the water column on January 19 consisted of 33% green algae, 21.7% cyanobacteria (blue-green algae), 20% cryptomonads, 12% Chrysophyta, 10.7% diatoms, 2.3% dinoflagellates and 0.3% euglenoids. On October 2, 2012, the algal community consisted of 34.46% cyanobacteria (blue-green algae), 32.46% green algae, 6.31% diatoms, 12.31% cryptomonads and 14.46% dinoflagellates. . On October 2, 2003, Lake Holden's algal community consisted of 91.4% cyanobacteria, 7%, green algae, as well as small numbers of cryptomonads, euglenoids, and diatoms

These results suggest that there have been reductions in the proportion of cyanobacteria inhabiting the lake, and that the current algal community is more balanced than historically.

Lake Condition Index

The LCI score on January 19, 2012 for Lake Holden was 59, corresponding with a "very good" designation. On October 2, 2012 a confirmation LCI was performed and scored a 66, also corresponding to a "very good" designation. The LCI score can range from 0 to 100.

Eight of the 23 species sampled in the January 19, 2012 LCI are considered very tolerant of poor water quality, but they were not overly abundant (Table 4). One long-lived species, *Palaemonetes* (grass shrimp), generally an indicator of good water quality, was also encountered, but also not in abundance. The mayfly *Caenis* was present, as were two caddisflies, the case building *Oecetis* and the retreat-building *Cernotina*. Mayflies and caddisflies are generally considered pollution-sensitive macroinvertebrates, and are regarded as good water quality indicators. Eleven midge species were

represented, including three filter feeding taxa, *Dicrotendipes modestus*, *Tanytarsus limneticus* and *Cladotanytarsus*.

Six of the 21 invertebrate species sampled in the October 2, 2012 LCI are considered very tolerant, but again, they were not overly abundant (Table 5). The very tolerant oligochaete (worm) *Limnodrilus hoffmeisteri*, had significantly more individuals than the January 19, 2012 LCI sample, but the difference may be explained by seasonal and sampling variation, or the patchy distribution of freshwater oligochaetes. Oligochaetes often occur in dense concentrations, so a given Ponar may collect many in one spot but not another. No long-lived species were identified in this sample. Mayflies were again represented by *Caenis*, and the caddisflies, *Oxyethira* and *Cernotina*, were also present. These taxa are usually associated with healthy lake conditions. Ten midge species were represented, including three filter feeding taxa, *Tanytarsus sp.*, *Cladotanytarsus* and *Paratanytarsus*.

Overall, the benthic community appears to be balanced and stable and has shown considerable improvement from past conditions. In a LCI sample collected on October 2, 2003, Lake Holden received a score of 30, corresponding to a "poor" designation. Five of the 11 species sampled are considered very tolerant to poor water quality (Table 6). Mayflies were represented by *Caenis*, but otherwise the sample was dominated by midges and worms associated with poor water quality. No caddisflies were represented.

Table 1. Water quality results from surface water samples collected on January 19, 2012, May 24, 2012 and October 2, 2012 at Lake Holden by the Florida Department of Environmental Protection. Additional results available.

Analyte	01/19/12 Result	05/24/12 Result	10/02/12 Result	Applicable Class III Water Quality Criteria
Field Temperature (°C)	16.9	28.2	28.7	
Field pH (SU)	7.9	8.4	8.2	
Field Dissolved Oxygen (mg/L)	9.45	8.11	7.94	≥ 5
Field Specific Conductance (µmhos/cm)	257	292	258	Not to exceed 50% of background or 1275 µmhos/cm
Secchi disk depth (m)	5.0 J	3.5	3.1	
Alkalinity (mg CaCO ₃ /L)	50	43 A	43	
Color (PCU)	2.9 I	4.9 I	3.3 I	
Hardness (mg/L)	33.4	37.5	32.4	
Turbidity (NTU)	1.4 A	2.0	0.70	
Chlorophyll a (µg/L)	2.2 J	4.2 A	5.6	<20*
Total Phosphorus (mg/L)	0.010	0.011	0.010	<0.09*
Nitrate+Nitrite (mg/L)	0.029	0.004 U	0.006 I	
Total Kjeldahl Nitrogen (mg/L)	0.51	0.54	0.47	
Total Nitrogen (mg/L)	0.54	0.54	0.47	<1.91*
Cadmium (ug/L)	0.05 U	0.05 U	0.05 U	<0.4636 - 0.5196**
Chromium (ug/L)	0.30 U	0.30 U	0.37	<33.8940 - 38.1735**
Copper (ug/L)	0.72 I	0.63 I	0.60 I	<3.5236 - 3.9890**
Lead (ug/L)	0.20 U	0.20 U	0.33 I	<0.7459**
Nickel (ug/L)	0.25 U	0.25 U	0.44 I	<19.8939 - 22.4937**
Zinc (ug/L)	5.0 U	5.0 U	5.0 U	<45.6278 - 51.6005**

*newly adopted 62-302 FAC thresholds for Annual Geometric Mean Total

**Criteria dependent on Hardness

A - Value reported is the mean of two or more determinations

I - The reported value is between the laboratory method detection limit and the laboratory practical quantitation limit.

J - Estimated result.

U - Material was analyzed for but not detected. The reported value is the method detection limit for the sample analyzed.

Summary

Lake Holden's water quality, plant community data, phytoplankton data, and macroinvertebrate data, as sampled on January 19, May 24, and October 2, 2012 indicated that the lake met expectations for a healthy, well-balanced lake. Total nitrogen, total phosphorus and chlorophyll *a* concentrations complied with the applicable state water quality criteria. Note that compliance with nutrient criteria 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.

Plant community data indicates that Lake Holden has a stable, healthy plant community, dominated by beneficial, submersed aquatic plants.

Phytoplankton data indicate stability and balance in the algal community with low potential for harmful algal blooms.

Macroinvertebrate data indicate stability and balance in the benthic community, which was composed of macroinvertebrates usually associated with good water quality.

These results indicate that management activities designed to improve the health of Lake Holden, which included control of nutrient loading from the watershed, maintenance of upland buffer zones with native plants, alum treatment, and control of exotic vegetation, have been successful.

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.

Special thanks to Dana Denson, macroinvertebrate specialist with Reedy Creek Improvement District, and Marianne Pluchino, Senior Lakes Biologist with Seminole County Stormwater for LCI macroinvertebrate data interpretation.

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>

Table 2. Species list for the May 24, 2012 LVI at Lake Holden.
 An asterisk (*) indicates an invasive exotic plant species.
 P = present D = dominant, C = codominant.

Species	Common Name	Sections:	12	9	6	3
Acer rubrum	RED MAPLE					P
Canna	HYBRID CANNA					P
Canna flaccida	BANDANA-OF-THE-EVERGLADES		P			P
Cladium jamaicense	SAWGRASS		P			
Colocasia esculenta*	TARO; WILD TARO		P	P	P	
Cyperus alternifolius*	UMBRELLA SEDGE		P			
Cyperus odoratus	FRAGRANT FLATSEDEGE		P	P		
Eclipta prostrata	FALSE DAISY		P			
Eleocharis baldwinii	BALDWIN'S SPIKERUSH; ROADGRASS		P	P	P	
Eleocharis interstincta	KNOTTED SPIKERUSH			P		
Eupatorium capillifolium	DOGFENNEL				P	P
Fuirena scirpoides	RUSH FIURENA		P			P
Galium uniflorum	ONEFLOWER BEDSTRAW		P			
Hydrilla verticillata*	HYDRILLA		P	P		
Hydrocotyle	MARSHPENNYWORT		P	P	P	P
Juncus effusus	SOFT RUSH		P			
Ludwigia leptocarpa	ANGLESTEM PRIMROSEWILLOW		P			
Ludwigia octovalvis	MEXICAN PRIMROSEWILLOW			P	P	
Ludwigia peruviana*	PERUVIAN PRIMROSEWILLOW		P	P	P	
Micranthemum glomeratum	MANATEE MUDDFLOWER		P	P	P	P
Mikania scandens	CLIMBING HEMPVINE		P	P		
Myrica cerifera	WAX MYRTLE			P		
Najas guadalupensis	SOUTHERN NIAD		C	P	P	P
Nelumbo lutea	AMERICAN LOTUS			P		
Nitella	NITELLA			P	P	P
Nuphar	COW LILY		P	P	P	
Nymphaea odorata	AMERICAN WHITE WATERLILY		P	P	P	
Panicum hemitomon	MAIDENCANE		P	P	P	
Panicum repens*	TORPEDO GRASS		P	P	P	P
Pontederia cordata	PICKERELWEED		P	P	P	P
Potamogeton illinoensis	ILLINOIS PONDWEED		P		P	
Ptilimnium capillaceum	MOCK BISHOPSWEED		P			
Sagittaria graminea	GRASSY ARROWHEAD					P
Sagittaria lancifolia	BULLTONGUE ARROWHEAD		P	P	P	P
Sagittaria latifolia	BROADLEAF ARROWHEAD; DUCK POTATO		P			
Salix caroliniana	CAROLINA WILLOW		P	P	P	P
Sambucus canadensis	ELDERBERRY		P	P		
Schinus terebinthifolius*	BRAZILIAN PEPPER		P			
Schoenoplectus	BULL RUSH				P	P
Schoenoplectus californicus	GIANT BULL RUSH			P		
Schoenoplectus pungens	THREE SQUARE					P
Schoenoplectus tabernaemontani	SOFTSTEM BULL RUSH		P	P		
Taxodium	CYPRESS		P	P	P	
Typha	CAT TAIL		P	P	P	P
Utricularia gibba	HUMPED/TANGLED BLADDERWORT		P			
Vallisneria americana	TAPEGRASS; AMERICAN EELGRASS		C	D	D	D
Vigna luteola	HAIRYPOD COWPEA					P
Vitis	GRAPE VINE		P	P		
Wedelia trilobata*	CREeping OX EYE		P	P	P	P

Table 3. Species list for the October 2, 2012 LVI at Lake Holden. An asterisk (*) indicates an invasive exotic plant species. P = present D = dominant, C = codominant.

Species	Common Name	Sections:	1	10	7	4
Acer rubrum	RED MAPLE		P			
Alternanthera philoxeroides*	ALLIGATOR WEED					P
Bidens alba	WHITE BEGGAR-TICKS					P
Colocasia esculenta	TARO; WILD TARO		P		P	P
Cyperus alternifolius*	UMBRELLA SEDGE					P
Eleocharis interstincta	KNOTTED SPIKERUSH			P	P	
Fuirena scirpoides	SOUTHERN UMBRELLASEDEGE					P
Hydrilla verticillata*	HYDRILLA			P	P	
Hydrocotyle	MARSHPENNYWORT			P	P	P
Juncus	RUSH		P			
Ludwigia leptocarpa	ANGLESTEM PRIMROSEWILLOW		P	P	P	P
Ludwigia octovalvis	MEXICAN PRIMROSEWILLOW		P			P
Ludwigia peruviana*	PERUVIAN PRIMROSEWILLOW		P	P	P	P
Micranthemum glomeratum	MANATEE MUDDFLOWER			P		
Mikania scandens	CLIMBING HEMPVINE		P	P	P	
Myrica cerifera	SOUTHERN BAYBERRY; WAX MYRTLE					P
Najas guadalupensis	SOUTHERN WATERNYMPH		P	P	P	P
Nelumbo lutea	AMERICAN LOTUS		P	P		
Nitella	NITELLA			C	P	C
Nuphar	COW LILY			P	P	P
Nymphaea odorata	AMERICAN WHITE WATERLILY		P	P	P	P
Panicum repens*	TORPEDO GRASS		P	P	P	P
Pontederia cordata	PICKERELWEED		P	P	P	P
Potamogeton illinoensis	ILLINOIS PONDWEED		P	P	P	P
Sagittaria lancifolia	BULLTONGUE ARROWHEAD		P	P	P	P
Salix caroliniana	CAROLINA WILLOW		P	P	P	P
Sapium sebiferum*	CHINESE TALLOW					P
Schinus terebinthifolius*	BRAZILIAN PEPPER			P	P	P
Schoenoplectus californicus	GIANT BULL RUSH		P	P	P	
Schoenoplectus tabernaemontani	SOFTSTEM BULL RUSH					P
Taxodium	CYPRESS		P	P	P	P
Typha	CAT TAIL		P	P	P	P
Urochloa mutica*	PARA GRASS		P		P	P
Vallisneria americana	TAPEGRASS; AMERICAN EELGRASS		D	C	D	C
Vigna luteola	HAIRYPOD COWPEA					P
Vitis	GRAPE VINE					P
Wedelia trilobata*	CREeping OX EYE		P		P	P

Table 4. Species list for the January 19, 2012 LCI at Lake Holden

Taxonomic Level	Sample Date	Scientific Name	Number Counted
Genus	1/19/2012	Oecetis	2
Species	1/19/2012	Ablabesmyia (karelia) grp.	4
Genus	1/19/2012	Cryptochironomus	1
Species	1/19/2012	Dicrotendipes modestus	1
Genus	1/19/2012	Cladopelma	5
Genus	1/19/2012	Pseudochironomus	1
Species	1/19/2012	Tanytarsus limneticus	3
Genus	1/19/2012	Cladotanytarsus	10
Species	1/19/2012	Polypedilum halterale grp.	28
Genus	1/19/2012	Arrenurus	1
Genus	1/19/2012	Hygrobatas	1
Genus	1/19/2012	Oxus	1
Species	1/19/2012	Bratislavia unidentata	1
Species	1/19/2012	Limnodrilus hoffmeisteri	4
Species	1/19/2012	Lumbriculus variegatus	5
Genus	1/19/2012	Palaemonetes	1
Species	1/19/2012	Hyalella azteca	6
Family	1/19/2012	Planorbidae	2
Species	1/19/2012	Labrundinia maculata	1
Species	1/19/2012	Tanytarsus sp. i epler	1
Genus	1/19/2012	Cernotina	10
Genus	1/19/2012	Chironomus	13
Genus	1/19/2012	Caenis	3

Table 5. Species List for the October 2, 2012 LCI at Lake Holden

Taxonomic Level	Sample Date	Scientific Name	Number Counted
Genus	10/2/2012	Oxyethira	1
Species	10/2/2012	Tanytarsus sp. c epler	1
Genus	10/2/2012	Cladotanytarsus	1
Species	10/2/2012	Tanytarsus sp. i epler	1
Genus	10/2/2012	Larsia	1
Genus	10/2/2012	Cryptochironomus	1
Genus	10/2/2012	Labrundinia	1
Species	10/2/2012	Polypedilum halterale grp.	2
Genus	10/2/2012	Paratanytarsus	6
Species	10/2/2012	Ablabesmyia (karelia) grp.	2
Genus	10/2/2012	Neumania	2
Species	10/2/2012	Lumbriculus variegatus	6
Species	10/2/2012	Limnodrilus hoffmeisteri	50
Species	10/2/2012	Hyalella azteca	8
Family	10/2/2012	Ancyliidae	3
Genus	10/2/2012	Physa	1
Genus	10/2/2012	Planorbella	5
Family	10/2/2012	Libellulidae	1
Genus	10/2/2012	Cernotina	10
Species	10/2/2012	Ablabesmyia rhamphe grp.	2
Genus	10/2/2012	Caenis	2

Table 6. Species List for the October 2, 2003 LCI at Lake Holden

Taxonomic Level	Sample Date	Scientific Name	Number Counted
Genus	10/2/2003	Caenis	1
Species	10/2/2003	Chaoborus punctipennis	26
Genus	10/2/2003	Cladotanytarsus	4
Genus	10/2/2003	Coelotanypus	16
Genus	10/2/2003	Cryptochironomus	4
Genus	10/2/2003	Dero	1
Species	10/2/2003	Glyptotendipes paripes	3
Species	10/2/2003	Limnodrilus hoffmeisteri	38
Species	10/2/2003	Polypedilum halterale grp.	1
Genus	10/2/2003	Procladius	2
Species	10/2/2003	Tanytus carinatus	9
Genus	10/2/2003	Tanytarsus	1