2001 SUMMARY REPORT
of
DOG TRAINING POND

Lake County, Illinois

Prepared by the

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TABLE OF CONTENTS

EXECUTIVE SUMMARY

Dog Training Pond is a 12.8-acre lake with a maximum depth of 19 feet located just north of Libertyville along Illinois Route 21. The lake was formed about 1903, originally as a gravel pit, and is now owned by the Lake County Forest Preserve District. No boating (i.e., canoes, etc.) or fishing is allowed on this lake. Most of the shoreline is undeveloped except for two small beach areas. Dog Training Pond is in good condition because very little of the shoreline is developed.

The water clarity in the lake is excellent, with an average Secchi disk reading of 15.1 feet during 2001. The lake has low concentrations of total suspended solids, which is a parameter directly linked to good water clarity.

Phosphorus and nitrogen, key ingredients for algae and plant growth were very low in Dog Training Pond. Seasonal total phosphorus and total Kjeldahl nitrogen concentrations near the surface averaged among the lowest of the lakes sampled between 1995 and 2001. Ammonia and nitrate nitrogen forms were not detected in any sample throughout the season.

Good concentrations of dissolved oxygen were found in Dog Training Pond. The water column had dissolved oxygen concentrations of at least 5 mg/L from the surface down to at least 12 feet deep throughout 2001 sampling season.

Staff identified seven aquatic plant species and one macroalgae (*Chara*). Over the season, the three most commonly found species were Chara, coontail and largeleaf pondweed. An important note is that the invasive, exotic Eurasian water milfoil (EWM), commonly found in nuisance populations in many lakes throughout Lake County, was not found in this lake.

Nearly 95% of the shoreline is undeveloped. The two most common types of shoreline are shrub and woodland. The remainder of the shoreline, which is developed, is classified as beach. Approximately 97% of the shoreline is eroding to some degree, with about 33% of the total shoreline classified as severely eroding. Dogs enter and leave the water at several of these severely eroding locations, which aggravates the erosion.

Staff also noted the presence of invasive, exotic plants along the entire shoreline except for the beach areas. The species noted included buckthorn (*Rhamnus* spp.), reed canary grass (*Phalaris arundinacea*), purple loosestrife (*Lythrum salicaria*) and honeysuckle (*Lonicera* spp.). Buckthorn shrubs were the most prevalent. Removal of these exotics is recommended.

Good numbers of wildlife, particularly birds, were noted on and around Dog Training Pond. Several of the species were seen during spring or fall migration and were assumed not to be nesting around the lake. This is assumed to be the case with the pied-billed grebe, an Illinois state threatened species, which was seen only once, in April. Good habitat exists around Dog Training Pond, with a mix of woods, shrubs and open prairie.

LAKE IDENTIFICATION AND LOCATION

Lake Name: Dog Training Pond

County: Lake

Nearest Municipality: Libertyville, Illinois

Location: T44N, R11E, Section 4

Watershed: Des Plaines River

Sub-basin: Upper Des Plaines River

Major Tributaries: None

Receiving Body of Water: None

Surface Area: 12.8 acres

Shoreline Length: 0.6 miles

Maximum Depth: 19 feet

Mean Depth (estimated): 9.5 feet

Volume (estimated): 121.6 acre-feet

Lake Type: Gravel Pit, constructed in 1903.

LIMNOLOGICAL DATA - WATER QUALITY

The Dog Training Pond is located just north of Libertyville along Illinois Route 21. No boating (i.e., canoes, etc.) is permitted and only bank fishing is allowed on this lake. Water samples were taken once a month, from May through September 2001, at the deepest location (See Figure 1). See Appendix B for water quality sampling and laboratory methods. Dog Training Pond had very good water quality due, in part, to its origin (gravel pit) and the surrounding land use with no development around the shoreline and minimal impact from non-point sources.

The water clarity in the Dog Training Pond during 2001 was excellent, with a seasonal average of 15.1 feet deep. The good water clarity was due to the low concentrations of total suspended solids (TSS) in the water. In May and June, the near surface TSS concentrations were 1.7 mg/L and 1.1 mg/L, respectively. The samples collected near the surface in July through September had TSS concentrations less than the detectable limit of 1 mg/L. The Lake County median for TSS is 5.7 mg/L. Total volatile solids (TVS), which include algal bodies, were also low. The near surface and deep samples collected from Dog Training Pond had TVS concentrations of 91mg/L and 98 mg/L, respectively. The Lake County TVS average is 137.3 mg/L.

The concentrations of total phosphorus (TP) throughout the water column were also much lower than Lake County median for the near surface samples. The near surface TP average concentration for the 2001 season was 0.015 mg/L[1]. Lake County TP median for near surface samples is 0.047 mg/L. The deep-water samples had low TP concentrations, averaging 0.027 mg/L. These results are low due to the fact that the deep-water samples were all within the fully oxic zone of the lake. Dog Training Pond ranked #3 out of 103 Lake County lakes based on average total phosphorus concentrations (See Table 2 in Appendix A)[2].

The trophic state index (TSI) of a lake indicates the overall level of nutrient enrichment. An oligotrophic lake has very low nutrients. A mesotrophic lake has an intermediate amount of nutrients and lower biological productivity than a lake with a eutrophic status. Most lakes in Lake County are eutrophic or nutrient rich, and are productive lakes in terms of aquatic plants and/or algae and fish. In calculating the lake's trophic status in terms of its total phosphorus content, Dog Training Pond had a mesotrophic status. The TSI calculation using the water clarity data gives the lake an oligotrophic status.

The ratio of total nitrogen to total phosphorus (TN:TP) indicates if phosphorus or nitrogen limits the algae growth in the lake. Lakes with TN:TP ratios of more than 15:1 are usually limited by phosphorus. Those with ratios less than 10:1 are usually limited by nitrogen. Dog Training Pond has a TN:TP ratio of 36:1, indicating a lake limited by phosphorus[3]. Most lakes throughout Lake County are phosphorus limited.

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[1] The July sample result was below detectable limits.
[2] Data set from 1995 to 2002.
[3] This is a conservative calculation, since two samples had less than detectable concentrations.

In 2001, Dog Training Pond exhibited polymictic tendencies, meaning it stratified and turned over several times during the year. In May the lake was weakly stratified at the 12-foot depth. By June, the lake had turned over and for the rest of the season (July, August, and September) the thermocline was present near the bottom at the 16-foot depth, although it was very weak by September.

The dissolved oxygen (DO) concentrations during 2001 were at least 5.0 mg/L from the surface down to about 14 feet in May. In June, adequate DO concentrations were found from the surface down to 16 feet deep. In July and September, DO concentrations were at least 5.0 mg/L from the surface down to 14 feet. The month of August saw the least amount of DO, with concentrations of at least 5.0 mg/L from the surface down to 12 feet. Unfortunately, without a recent accurate bathymetric map, the lake volume with adequate DO concentrations cannot be calculated.

Water level changes were noted during each sampling period. From May to September the water level dropped 13.25 inches, with the single largest drop occurring from June to July (7.35 inches). Significant water level fluctuations may have an impact on shoreline erosion. Dog Training Pond does have significant shoreline erosion problems (see **Limnological Data – Shoreline Assessment**).

The Illinois Environmental Protection Agency has assessment indices to classify Illinois lakes for their ability to support aquatic life, swimming, or recreational uses. The guidelines consider several aspects, such as water clarity, phosphorus concentrations and aquatic plant coverage. Dog Training Pond fully supports aquatic life, recreational and swimming uses according to these guidelines. The overall use support category for Dog Training Pond is that of full support.

Figure 1.

LIMNOLOGICAL DATA – AQUATIC PLANT ASSESSMENT

Staff randomly sampled locations in Dog Training Pond each month for aquatic plants, and identified 8 species (Table 3). Table 4 in Appendix A lists the plant species and the frequency that they were found.

Table 3. Aquatic Plant Species in Dog Training Pond, May – September, 2001.

Aquatic Plants

Coontail	*Ceratophyllum demersum*
Chara	*Chara*
Slender Naiad	*Najas flexilis*
Largeleaf Pondweed	*Potamogeton amplifolius*
Curlyleaf Pondweed	*Potamogeton crispus*
Leafy Pondweed	*Potamogeton foliosus*
Small Pondweed	*Potamogeton pusillus*
Sago Pondweed	*Stuckenia pectinatus*

Shoreline Plants

Honeysuckle	*Lonicera* spp.
Purple Loosestrife	*Lythrum salicaria*
Reed Canary Grass	*Phalaris arundinacea*
Buckthorn	*Rhamnus* spp.

Plants that reached the water's surface covered about 25% of the lake, and were not in nuisance proportions. However, plant coverage across the bottom was approximately 95%. Aquatic plants will not photosynthesize in water depths with less than 1% of the available sunlight. Water clarity and depth are the major limiting factors in determining the maximum depth at which aquatic plants will grow in a specific lake. During 2001, the 1 % light level reached the bottom from May through September in Dog Training Pond. The maximum depth to which plants were found was 17 feet. To maintain a healthy fishery, the Illinois Department of Natural Resources suggests plant coverage of 20% to 40%. The three most commonly found plants over the season were Chara (which is actually a macroalgae), coontail and largeleaf pondweed. Chara was found at 61.5% of all sample locations for 2001. Largeleaf pondweed and coontail were both found at 57.7% of all sample locations. Seven of the species are beneficial, native plants. Curlyleaf pondweed, however, is not native, but was found in small percentages.

Floristic quality index is a measurement designed to evaluate the closeness of the flora (plants species) of an area to that with undisturbed conditions. It can be used to: 1) identify natural areas, 2) compare the quality of different sites or different locations within a single site, 3) monitor long term floristic trends, and 4) monitor habitat restoration efforts. Each floating and submersed aquatic plant in a lake is assigned a number between 1 and 10 (10 indicating the plant species most sensitive to disturbance).

These numbers are then used to calculate the floristic quality index (FQI). A high FQI number indicates that there are a large number of sensitive, high quality plant species present in the lake, and better plant diversity. Nonnative species are included in the FQI calculations for Lake County lakes. The FQI of 64 lakes measured in 2000 and 2001 ranges from 0 to 37.2, with an average of 14. Dog Training Pond has a FQI of 15.1, indicative of slightly above average aquatic plant diversity based on the 64 lakes measured.

LIMNOLOGICAL DATA – SHORELINE ASSESSMENT

In July, 2001, LCHD staff assessed the shoreline of Dog Training Pond. See Appendix B for a discussion of the methods used, and Figure 2 for a shoreline erosion map. Nearly 95% of the shoreline is undeveloped. The two most common types of shoreline are shrub (53% of the total shoreline) and woodland (42% of the total shoreline). The remainder of the shoreline is classified as beach (5.5 % of the total shoreline).

Approximately 97% or 3,329 feet of the shoreline is eroding to some degree. Approximately 33% or 1,135 feet of the total shoreline is severely eroding, especially in areas with steep embankments along the southern shore. Dogs enter and leave the water at several of these severely eroding locations, which aggravates the erosion. Plans for mitigating these shorelines would need to accommodate the use of the access by dogs and owners. About 23% or 794 feet of the total shoreline is moderately eroding, and 41% or 1,401 feet of the shoreline is slightly eroding.

Staff also noted the presence of invasive, exotic plants along the entire shoreline except for the beach areas. The species noted included buckthorn (*Rhamnus* spp.), reed canary grass (*Phalaris arundinacea*), purple loosestrife (*Lythrum salicaria*) and honeysuckle (*Lonicera* spp.). Buckthorn shrubs were the most prevalent. Removal of these exotics is recommended.

Figure 2.

Figure 3.

LIMNOLOGICAL DATA – WILDLIFE ASSESSMENT

Good numbers of wildlife, particularly birds, were noted on and around Dog Training Pond. See Appendix B for methods. Several of the species listed in Table 5 were seen during spring or fall migration and were assumed not to be nesting around the lake. This is assumed to be the case with the pied-billed grebe that was observed on Dog Training Pond. The grebe, a state of Illinois threatened species, was seen only once in April.

Good habitat exists around Dog Training Pond, with a mix of woods, shrubs and open prairie. The presence of dogs (and owners) likely reduces the use of the area by some wildlife.

No fish surveys were completed by LCHD in 2001, although many small bluegill were noted throughout the season.

Table 5. Wildlife species observed on Dog Training Pond, May – September 2001.

Birds

Pied-billed Grebe+	*Podilymbus podiceps*
Ring-necked Duck	*Aythya collaris*
Red-breasted Merganser	*Mergus serrator*
Green Heron	*Butorides striatus*
Spotted Sandpiper	*Actitis macularia*
Belted Kingfisher	*Megaceryle alcyon*
Common Flicker	*Colaptes auratus*
Red-bellied Woodpecker	*Melanerpes carolinus*
Downy Woodpecker	*Picoides pubescens*
Eastern Kingbird	*Tyrannus tyrannus*
Great Crested Flycatcher	*Myiarchus crinitus*
Purple Martin	*Progne subis*
Tree Swallow	*Iridoprocne bicolor*
American Crow	*Corvus brachyrhynchos*
Blue Jay	*Cyanocitta cristata*
Black-capped Chickadee	*Poecile atricapillus*
House Wren	*Troglodytes aedon*
Catbird	*Dumetella carolinensis*
American Robin	*Turdus migratorius*
Wood Thrush	*Hylocichla mustelina*
Cedar Waxwing	*Bombycilla cedrorum*
Red-eyed Vireo	*Vireo olivaceus*
Warbling Vireo	*Vireo gilvus*
Yellow Warbler	*Dendroica petechia*
Red-winged Blackbird	*Agelaius phoeniceus*

Table 5. Wildlife species observed on Dog Training Pond, May – September 2001 (cont'd).

Common Grackle	*Quiscalus quiscula*
Starling	*Sturnus vulgaris*
Northern Oriole	*Icterus galbula*
House Sparrow	*Passer domesticus*
Northern Cardinal	*Cardinalis cardinalis*
American Goldfinch	*Carduelis tristis*
Indigo Bunting	*Passerina cyanea*
Song Sparrow	*Melospiza melodia*

Mammals and Reptiles
None noted.

Amphibians

Bull Frog	*Rana catesbeiana*

Insects
Cicadas
Dragonfly
Damselfly
Sulphur Butterfly
Monarch Butterfly
Red Admiral Butterfly

+Threatened in Illinois

EXISTING LAKE QUALITY PROBLEMS
AND MANAGEMENT SUGGESTIONS

Dog Training Pond had good water quality, with low concentrations of most of the parameters measured. It also provides good habitat for wildlife as well as an aesthetic setting for Forest Preserve visitors.

- *Shoreline Erosion*

  Approximately 97% or 3,329 feet of the shoreline is eroding in some degree. Approximately 33% or 1,135 feet of the total shoreline is severely eroding, especially in areas with steep embankments along the southern shore. Dogs enter and leave the water at several of these severely eroding locations, which aggravates the erosion. Plans for mitigating these shorelines would need to accommodate the use of the access by dogs and owners.

- *Invasive Shoreline Plant Species*

  LCHD staff noted the presence of aggressive exotic plant species along most of the shoreline. The species noted included buckthorn (*Rhamnus* spp.), reed canary grass (*Phalaris arundinacea*), purple loosestrife (*Lythrum salicaria*) and honeysuckle (*Lonicera* spp.). Buckthorn shrubs were the most prevalent. Some of the locations where buckthorn shrubs were growing were on steep, eroding slopes. A plan for erosion control on these shores needs to be in place as the buckthorn is being removed.

- *Lack of a Quality Bathymetric Map*

  A bathymetric (depth contour) map is an essential tool in effective lake management since it provides information on the morphometric features of the lake, such as depth, surface area, volume, etc. The knowledge of this morphometric information would be necessary if lake management practices such as aquatic herbicide use, fish stocking, dredging, or an alum treatment were part of the overall lake management plan. Dog Training Pond does not have a recent bathymetric map. Maps can be created by the Lake County Health Department – Lakes Management Unit or other agencies for costs that vary from $3,000-$10,000, depending on lake size.