Strategic Management Plan for:

BOYLE LAKE WILDLIFE AREA

Berrien County, Michigan

Michigan Department of Natural Resources
Wildlife Division
Southwest Management Unit
Crane Pond Field Office

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BOYLE LAKE WILDLIFE AREA STATEGIC PLAN
APPROVAL SIGNATURE PAGE

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INTRODUCTION

Purpose of the Plan

This master plan has been prepared for two purposes; it provides overall management direction for the Boyle Lake Wildlife Area (WA) and assures that the legal obligations for wildlife restoration and management are, or will be met, on the area. Public input was considered in developing the plan, but this is not a consensus document.

The mission of the Michigan Department of Natural Resources (DNR) Wildlife Division (WLD) is to enhance, restore, and conserve the State's wildlife resources, natural communities, and ecosystems for the benefit of Michigan's citizens, visitors, and future generations. Management at Boyle Lake WA will help fulfill this mission by maintaining habitat required by many species of wildlife. In addition, the area will remain open to the various forms of public use and enjoyment.

Project Location and Boundary

The Boyle Lake WA is 430 acres located in central Berrien County in Weesaw (T7S R19W Section 12) and Buchanan (T7S R18W, Section 7) townships (Figure 1). Communities within five miles of the area include: Baroda, Berrien Springs, Bridgman, Buchanan, and Galien. Larger communities within 20 miles include: Benton Harbor and St. Joseph to the northwest, and Elkhart and South Bend, Indiana, to the south. In addition, Chicago, Illinois, is within 75 miles of the area.

Area Description

Environmental Conditions and Biotic Inventory

Environmental Conditions

The topography of the area is slightly rolling with about 50 feet of elevation change. There are a variety of soils found throughout the WA which is characteristic of the moraine, till plain, and glacial drainages. Most soils associated with the uplands are sandy loams or loamy sands suitable for a variety of habitat ranging from oak-hickory to mesic hardwoods. Muck soils are found in many of the low lying areas associated with the small streams and wetlands.

Boyle Lake is almost entirely surrounded by public ownership except a small parcel on the southeast side of the lake. The headwaters of the east branch of the Galien River run through the entire length of the WA.

The climate of the area is heavily influenced by Lake Michigan. Average winter temperature is around 29˚F and average summer temperature around 69˚F. Annual liquid precipitation is about 35 inches with annual snowfall of 65 inches. Growing season length is between 150 – 200 days, with last frost occurring around May 2 and first frost around October 21.

Regional Ecosystem and Presettlement Condition

The project area is located in Subsection VI.3. Allegan Lake Plain and Moraine, sub-subsection VI.3.1. Berrien Springs as described by Albert (1995). This area is characterized by the moraine ridges that run parallel to the Lake Michigan shoreline. Prior to european settlement these ridges supported forested plant communities such as beech-maple forests, oak-hickory, and oak savanna. Kettle depressions supported lowland plant communities including: hardwood swamps, tamarack swamps, shrub swamps, and bog. Both natural and anthropogenic fires were probably important disturbances. Much of the sub-subsection was cleared for crops or grazed by livestock.

Landscape Characteristics and Plant Communities

The landscape within a couple miles of Boyle Lake WA changes along a northwest to southeast gradient with the WA being at the transition between the two. To the northwest, the landscape is mostly agricultural with scattered woodlots along drainages, or where several ownerships connect. Most of the agricultural product is row crop with some orchards and vineyards landscape.

Southeast of the WA is wooded with small kettle lakes, ponds, and marshes. The topography also changes from nearly flat to the northwest to more hilly terrain. Agricultural products shift to more orchards and livestock operations.

Boyle Lake WA is located very close to the transition from the lake plain to the moraine ridges. The covertype of Boyle Lake WA varies from open water to upland forests (Table 1, Figure 2). There are about 173 acres of forest comprised mainly of beech and maple on the WA. Open uplands made up of a mixture of active agriculture, upland brush, or idle field cover about 185 acres. Finally, wetlands make up 80 acres and range from the open water of Boyle Lake to emergent marsh associated with the land between Judy and Boyle lakes.

Wildlife Resources

The transitional nature of the Boyle Lake WA and the varying habitat types from open water to upland hardwoods provides resources for a variety of wildlife (Appendix A). Upland small game and furbearing species can be found on the WA and include ring-necked pheasant, American woodcock, cottontail rabbits, raccoons, mink, beaver, and muskrat. Larger wildlife species like white-tailed deer and wild turkeys are able to find

adequate resources on the WA and surrounding private land to maintain permanent residence.

Migratory songbirds are able to find a variety of habitat for nesting and migration stopovers. Many of the southern michigan raptors can be found in the area and there is an active osprey nest on Judy Lake within one-half mile of the WA.

Boyle Lake and the waters of the Galien River provide valuable resources for amphibians and reptiles.

Threatened and Endangered

A database maintained by Michigan Natural Features Inventory (MNFI) indicated that the American lotus (*Nelumbo lutea*) which is a state threatened plant was found at Boyle Lake in 1981. Several state threatened or concerned species were identified within several miles of the site, making it possible that these species could be located on site in the future.

Nonnative / Nuisance

Autumn olive (*Elaeagnus umbellata*) has encroached in one old field to the point that removal would be expensive. Multi-flora rose (*Rosa multiflora*) is abundant in a young stand of mixed hardwoods adjacent to the old field. Garlic mustard (*Alliaria petiolata*) is also found throughout the WA.

Establishment of Area and Land Acquisition History

The land for Boyle Lake WA was purchased in 1997 from the estate of Anita and Gerald Tichenor using money from the Michigan Natural Resources Trust Fund (MNRTF). The land was dedicated as a WA that same year. The land had been in the family since Mrs. Tichenor's great-grandparents settled it. Prior to the purchase, of the property it had been enrolled in the Hunter Access Program. In 1999, an additional 40 acres were purchased from Mr. Merle Phillippi, using MNRTF and Pittman Robertson money. No other property has been purchased since then.

Legislation, Policies and Legal Agreements Specific to this Area

At the time the Phillippi tract was purchased there was an active apple orchard on the property. Just after purchase Michigan Department of Agriculture informed local Wildlife Division staff that according to state law abandoned orchards within ¼ mile of active orchards had to be destroyed. The adjacent landowner to the west has an active apple orchard. The orchard was removed in 2001 and maintenance such as mowing or herbicide treatment is aimed at eliminating any apple trees that are suckering from the old root systems.

There are three power line easements that cross the WA. According to the easements these companies are allowed to access the property to mechanically remove vegetation without a permit. If herbicide is applied the company or representative must obtain a permit before application.

Public Use of the Area

The WA is open to the public throughout the year and receives some use during all hunting seasons. Small game hunters use the area in pursuit of rabbits and pheasants. Waterfowl hunters use the area for duck hunting. Other uses throughout the year include fishing, hiking, and bird watching.

Commercial use of the area

Sharecropping of the fields is the only commercial use on the WA and is the major habitat management on the area.

Facilities

Currently there are four parking lots on the WA. These are maintained when necessary, with gravel or grading. In addition, there is one carry-on boat launch located on Boyle Lake Road at the parking lot. This was constructed as part of an Eagle Scout project during the summer of 2000. Several gates and barriers are located in parking lots and fields to minimize illegal vehicular access.

MANAGEMENT GOALS AND OBJECTIVES

Management Goal

From a landscape perspective, Boyle Lake WA appears to be a transition between two different land cover types. To the south and east, the landscape is dominated by relatively large wooded tracts with scattered kettle lakes and ponds. To the north and west, the landscape shifts to mostly agricultural with fairly level topography. The WA represents features of both landscapes making it an important link between the two.

Boyle Lake WA is somewhat isolated from other Wildlife Division administered lands. The Crane Pond Field Office is over 35 miles away making it difficult to intensively manage the property. This fact weighs heavily on the overall goal for the area.

In addition, the WA offers some excellent hunting and fishing opportunities for residents of nearby towns. The WA central location between larger population centers, such as

Benton Harbor and South Bend Indiana, accounts for heavy recreational use throughout the year.

The goal for Boyle Lake WA will be to protect and enhance the existing forested habitats and agricultural land uses on the area for wildlife resources that utilize these habitat types. This will be beneficial in maintaining the linkage on a landscape level. In addition, public use and enjoyment will remain an important aspect of the WA.

Management Objectives

Desired Wildlife

Wildlife associated with farmland, forests, and aquatic habitats are desired on this WA. Game species such as white-tailed deer, wild turkey, squirrels, and rabbits are expected to benefit from the management on the WA. Forest species, such as songbirds and small mammals will benefit from maintaining the continuity of the wooded landscape. The non-development of the shoreline of Boyle Lake will be beneficial for many amphibians and reptiles that depend on shallow water and adjacent forested lowlands.

Objectives for Public Use

The WA will remain open to various forms of recreational use such as fishing, hunting, and wildlife viewing. There are no plans to develop additional access points for the WA.

MANAGEMENT ACTIVITIES

Habitat Management Techniques

Due to the remoteness of the Boyle Lake WA the farming by Wildlife Division employees will be limited. Therefore, sharecropping will be the avenue in which farming is completed. The WA has been sharecropped since acquisition by a local farmer. In 2003, that individual was no longer able to farm and the Crane Pond Field Office had several inquiries. In fact, interviews were held to select the current sharecropper. The level of competition among farmers in that part of the county indicates that sharecropping may be a sustainable management practice for many years.

Currently 127 acres of the WA are under annual sharecrop agreements; 10 acres are mowed annually with the remainder being planted to row crops. Corn is typically left standing through the winter and harvested in the spring with the farmer keeping all that is harvested for their share. This arrangement works well to ensure plenty of food and cover through the winter for wildlife on the area.

There are 173 acres of mixed forest cover on the WA, 73 acres being between 60 and 80 years old. Much of the older timber is located around the lake providing a scenic setting uncommon in southern michigan, while the younger stands are associated more with the rivers. Although some of the timber around the lake may be valuable for wood fiber production, it also holds a certain aesthetic value to users of the area. In addition, access to several stands is somewhat limited due to the lake and river system. Therefore, timber management will be aimed at allowing natural disturbances to take place and the forest to maintain itself in a mature state.

The remainder of the WA is in early seral stages of plant succession, ranging from emergent wetlands to upland brush. At this point there are no plans to manage these covertypes. The power line right-of-way is mowed periodically by the power company and will continue to be maintained by them.

Facilities Management and Maintenance

Annual maintenance of the road and parking only one lot will be continued to allow users access to the WA. Gates and barriers will be constructed or maintained, as necessary, to limit illegal vehicular access to the area. Volunteers through local civics groups have been helpful in the past to develop public access to the river and remove refuse. It is expected that these efforts will continue to be a valuable asset in the future.

Monitoring and Adaptive Management

Wildlife species use will be monitored using existing division surveys and periodic site visits. Although Wildlife Division staff time on the area is somewhat limited, reports from the local conservation officer and sharecropper provide valuable information on species presence or absence. Reports from neighbors, hunters, and anglers also provide valuable insight into the public use of the area.

Sharecrop agreements are set up on an annual basis and provide a process for evaluation. As part of an adaptive management process, sharecropping will be evaluated through this process to ensure management activities are contributing to the welfare of intended wildlife species.

Adaptive management involves integrating management activities and assessment of the effectiveness of those activities through monitoring, and then modifying plans to enhance the desired impacts of management on the area. Results of assessments of management actions will be reviewed by agency personnel and interested stakeholders annually, and appropriate modifications to management actions will be included in annual workplans so that continual improvement can be made toward meeting goals and objectives for this area.

PUBLIC INPUT

The public was invited to comment on the plan in September 2007, following the completion of initial drafts. The plan was available at the Crane Pond Field Office and Plainwell Operations Service Center. In addition, the public as invited to comment at the Southwest Management Unit public meeting held September 26, 2998, in Plainwell. There were no comments received at the public meeting or though written comments.

Tables

Table 1. Summary of cover type for the entire area classified using IFMAP standards collected in 2007.

Land cover	Acres	% Cover
Non-forested cover types		
Cropland	127	29%
Emergent Wetland	11	3%
Herbaceous Openland	34	8%
Low-Density Trees	15	3%
Mixed non-forested wetland	32	7%
Upland Shrub	17	4%
Water	25	6%
Non-forested acres	***261***	***60%***
Forested cover types		
Lowland Deciduous Forest	32	7%
Mixed Upland Deciduous	40	9%
Northern Hardwood	93	21%
Other Upland Deciduous	9	2%
Forested acres	***173***	***40%***
Total acres	**434**	**100%**

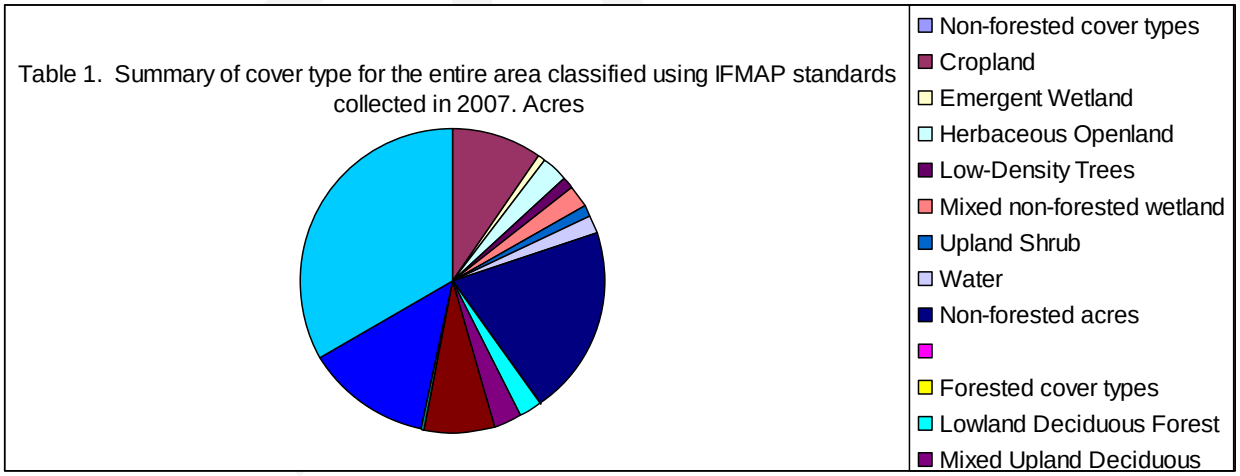
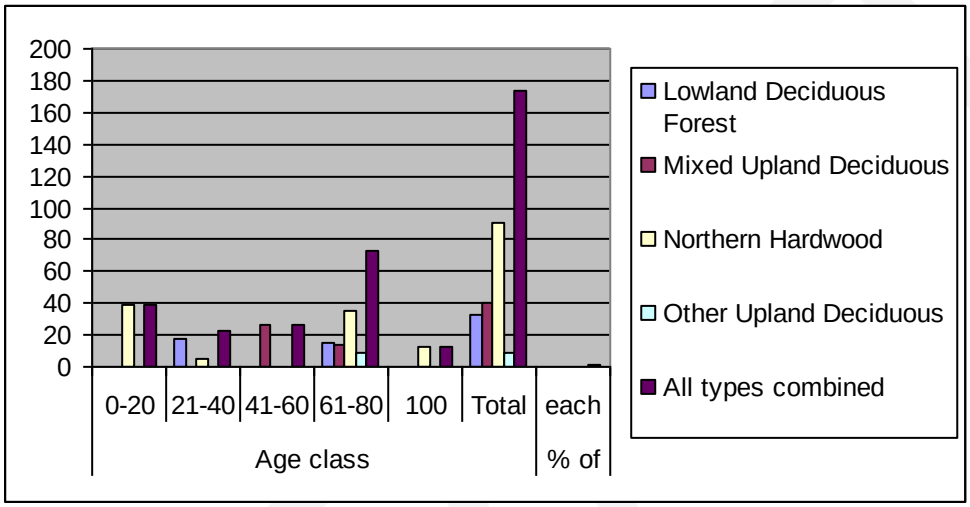


Table 2. Summary of forested stand age class by acres using IFMAP standards collected in 2007.

	Age class						% of
	0-20	21-40	41-60	61-80	100	Total	each
Lowland Deciduous Forest	0	18	0	15	0	33	19%
Mixed Upland Deciduous	0	0	26	14	0	40	23%
Northern Hardwood	39	5	0	35	12	91	53%
Other Upland Deciduous	0	0	0	9	0	9	5%
All types combined	39	23	26	73	12	173	100%



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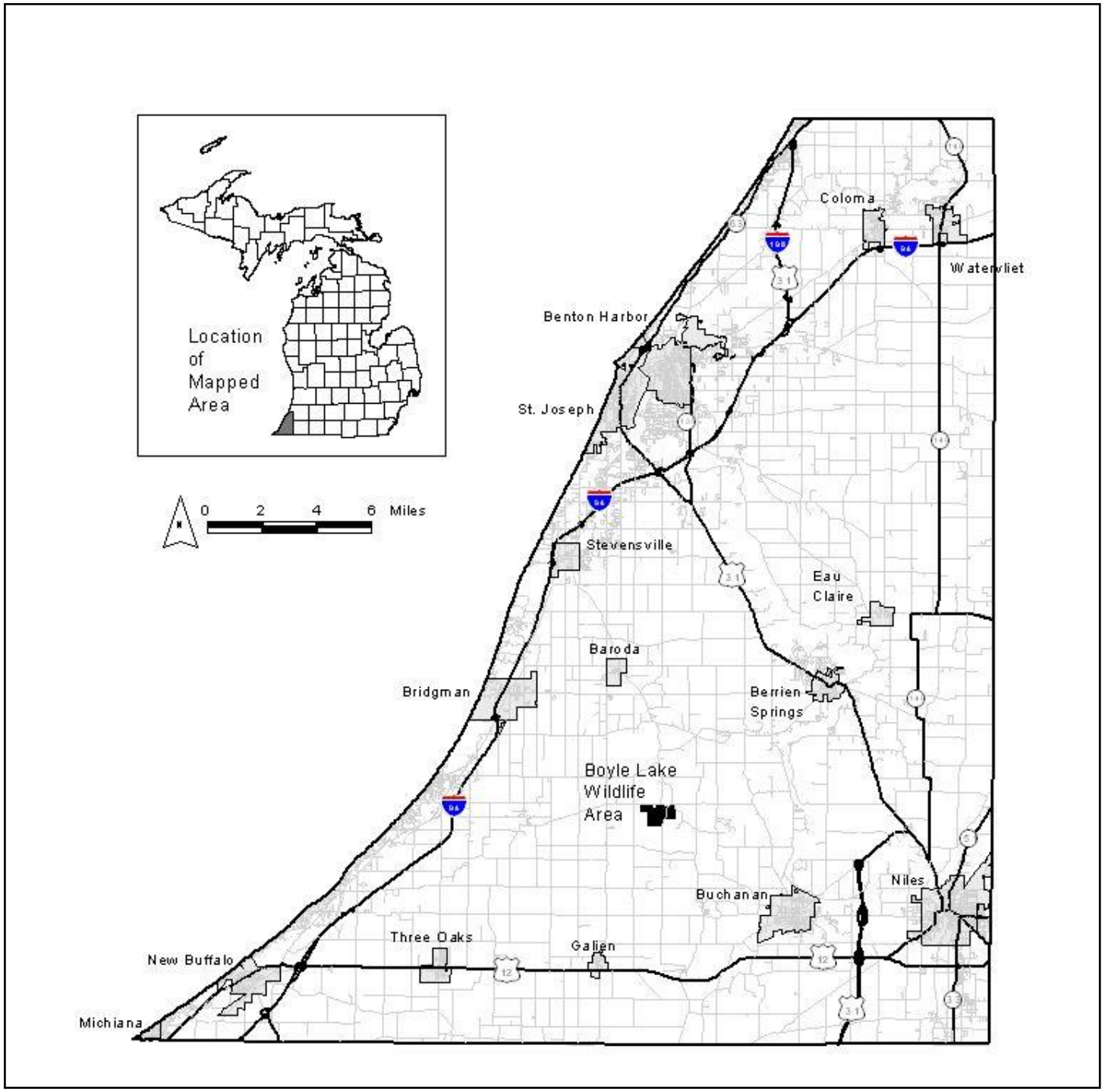

Figure 1. Location of Boyle Lake Wildlife Area.

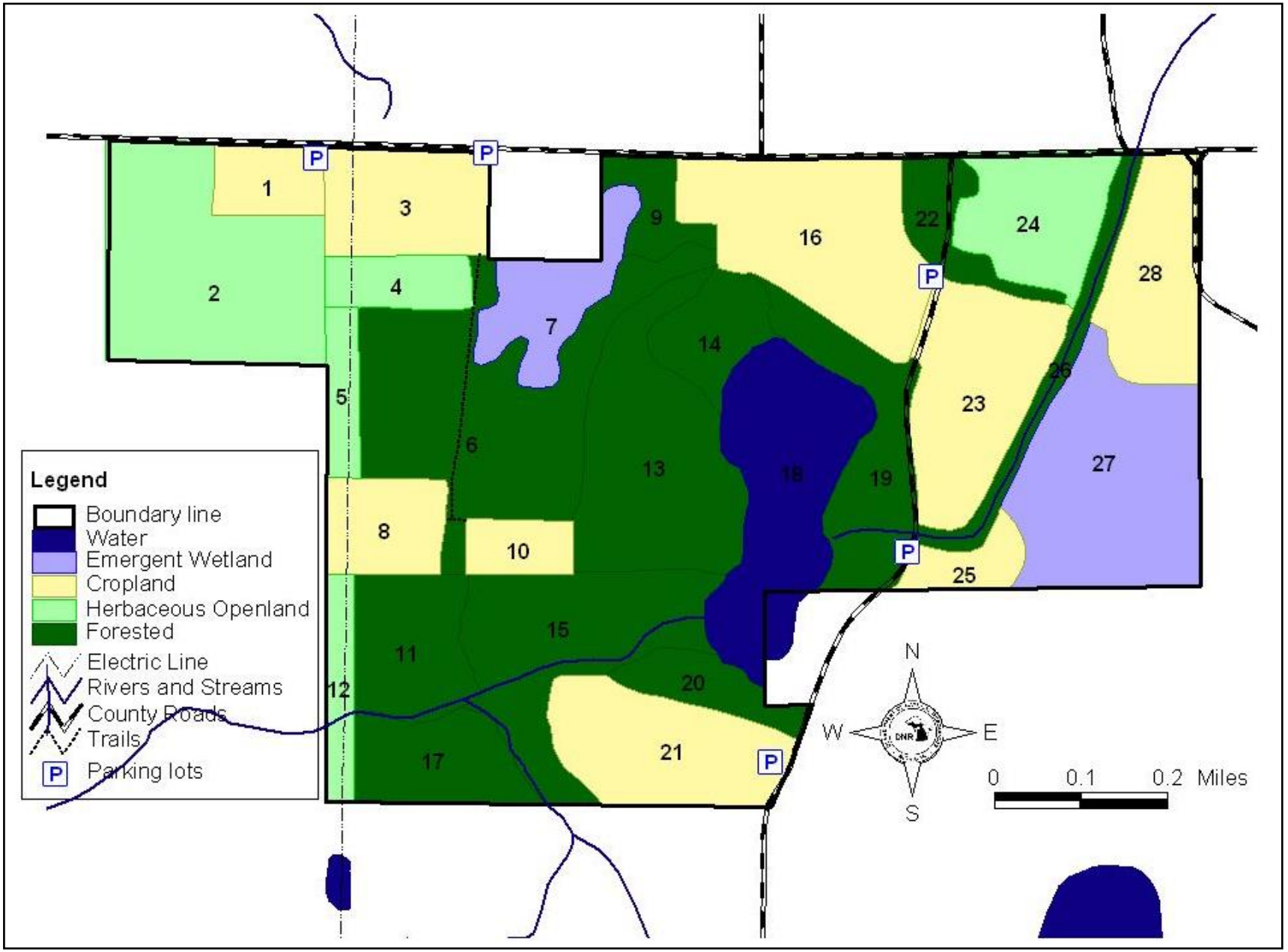

Figure 2. Covertype, facilities, and roads at Boyle Lake Wildlife Area.

Appendix A. List of possible vertebrate species on Boyle Lake Wildlife Area.

Amphibians	
Mudpuppy	*Necturus maculosus maculosus*
Spotted salamander	*Ambystoma maculatum*
Blue spotted salamander	*Ambystoma laterale*
Eastern tiger salamander	*Ambystoma tigrinum tigrinum*
Red-backed salamader	*Plethodon cinereus*
Western chorus frog	*Pseudacris triseriata*
Northern spring peeper	*Pseudacris crucifer crucifer*
Gray treefrog	*Hyla versicolor*
Bullfrog	*Rana catesbeiana*
Green frog	*Rana clamitans melanota*
Wood frog	*Rana sylvatica*
Reptiles	
Common snapping turtle	*Chelydra serpentina serpentina*
Common musk turtle	*Sternotherus odoratus*
Eastern box turtle	*Terrapene carolina carolina*
Blanding's turtle	*Emydoidea blandingii*
Common map turtle	*Graptemys geographica*
Painted turtle	*Chrysemys picta*
Eastern spiny softshell turtle	*Apalone spinifera spinifera*
Five-lined skink	*Eumeces fasciatus*
Northern water snake	*Nerodia sipedon*
Common garter snake	*Thamnophis sirtalis sirtalis*
Brown snake	*Storeria dekayi*
Smooth green snake	*Opheodrys vernalis*
Blue racer	*Coluber constrictor foxi*
Black rat snake	*Elaphe obsoleta obsoleta*
Eastern milk snake	*Lampropeltis triangulum triangulum*
Northern ring-necked snake	*Diadophis punctatus edwardsii*
Eastern massassauga	*Sistrurus catenatus catenatus*
Birds	
Least bittern	*Ixobrychus exilis*
Great blue heron	*Ardea herodias*
Green-backed heron	*Butorides virescens*
Mute swan	*Cygnus olor*
Canada goose	*Branta candadensis*
Mallard	*Anas platyrhyncos*
American black duck	*Anas rubripes*
Northern pintail	*Anas acuta*
Gadwall	*Anas strepera*
American wigeon	*Anas americana*
Northern shoveller	*Anas clypeata*

Blue-winged teal	*Anas discors*
Green-winged teal	*Anas crecca*
Wood duck	*Aix sponsa*
Redhead	*Aythya americana*
Canvasback	*Aythya valisineria*
Ring-necked duck	*Aythya collaris*
Greater scaup	*Aythya marila*
Lesser scaup	*Aythya affinis*
Common goldeneye	*Bucephala clangula*
Bufflehead	*Bucephala albeola*
Hooded merganser	*Lophodytes cucullatus*
Common merganser	*Mergus merganser*
Red-breasted merganser	*Mergus serrator*
Ruddy duck	*Oxyura jamaicensis*
Turkey vulture	*Cathartes aura*
Coopers hawk	*Accipter cooperii*
Red-tailed hawk	*Buteo jamaicensis*
Broad-winged hawk	*Buteo platypterus*
Red-shouldered hawk	*Buteo lineatus*
Osprey	*Pandion haliaetus*
American kestrel	*Falco sparverius*
Ring-necked pheasant	*Phasianus colchicus*
Ruffed grouse	*Bonasa umbellus*
Wild turkey	*Meleagris gallopavo*
Northern bobwhite	*Colinus virginaianus*
Sandhill crane	*Grus canadensis*
Killdeer	*Charadrius vociferus*
Spotted sandpiper	*Acitits macularia*
Common snipe	*Gallinago gallinago*
American woodcock	*Scolopax minor*
Mourning dove	*Zenaida macroura*
Black-billed cuckoo	*Cocyzus erythropthalmus*
Yellow-billed cuckoo	*Cocyzus americanus*
Eastern screech owl	*Ottus asio*
Great horned owl	*Bubo virginianus*
Barred owl	*Strix varia*
Common nighthawk	*Chordeiles minor*
Whip-poor-will	*Caprimulgus vociferus*
Chimney swift	*Chaetura palagica*
Ruby-throated hummingbird	*Archilochus colubris*
Belted kingfisher	*Ceryle alcyon*
Red-bellied woodpecker	*Melanerpes carolinus*
Downy woodpecker	*Picoides pubescens*
Hairy woodpecker	*Picoides villosus*
Nothern flicker	*Colaptes auratus*
Pileated woodpecker	*Dryocopus pileatus*

Eastern wood-pewee	*Contopus virens*
Acadian flycatcher	*Empidonax virescens*
Alder flycatcher	*Empidonax alnorum*
Willow flycatcher	*Empidonax trailii*
Least flycatcher	*Empidonax minimus*
Eastern phoebe	*Sayornis phoebe*
Great crested flycatcher	*Myiarchus crinitus*
Eastern kingbird	*Tyrannus tyrannus*
Purple martin	*Progne subis*
Tree swallow	*Tachycineta bicolor*
Northern rough-winged swallow	*Stelgidopteryx serripennis*
Barn swallow	*Hirundo rustica*
Blue jay	*Cyanocitta cristata*
American crow	*Corvus brachyrhynchos*
Black-capped chickadee	*Parus atricapillus*
Tufted titmouse	*Parus bicolor*
White-breasted nuthatch	*Sitta carolinensis*
Brown creeper	*Certhia americana*
Carolina wren	*Thryothorus ludovicianus*
House wren	*Troglodytes aedon*
Sedge wren	*Cistothorus platensis*
Marsh wren	*Cistotherus palustris*
Blue-gray gnatcatcher	*Polioptila caerulea*
Eastern bluebird	*Sialia sialis*
Veery	*Catharus fuscescens*
Wood thrush	*Hylocichla mustelina*
American robin	*Turdus migratorius*
Gray catbird	*Dumetella carolinensis*
Northern mockingbird	*Mimus polyglottos*
Brown thrasher	*Toxostoma rufum*
Cedar waxwing	*Bombycilla cedrorum*
European starling	*Sturnus vulgaris*
White-eyed vireo	*Vireo griseus*
Red-eyed vireo	*Vireo olivaceus*
Blue-winged warbler	*Vermivora pinus*
Yellow warbler	*Dendroica petechia*
Chestnut-sided warbler	*Dendroica pennsylvanica*
Black-throated green warbler	*Dendroica virens*
Blackburnian warbler	*Dendroica fusca*
Yellow-throated warbler	*Dendroica dominica*
Black-and-white warbler	*Mniotilta varia*
Ovenbird	*Seiurus aurocapillus*
Louisiana waterthrush	*Seiurus motacilla*
Common yellowthroat	*Geothlypis trichas*
Hooded warbler	*Wilsonia citrina*
Canada warbler	*Wilsonia canadensis*

Yellow-breasted chat	*Icteria virens*
Scarlet tanager	*Piranga olivacea*
Northern cardinal	*Cardinalis cardinalis*
Rose-breasted grosbeak	*Pheucticus ludovicianus*
Indigo bunting	*Passernia cyanea*
Field sparrow	*Spizella pusilla*
Song sparrow	*Melospiza melodia*
Swamp sparrow	*Melospiza georgiana*
Dark-eyed junco	*Junco hyemalis*
Red-winged blackbird	*Agelaius phoeniceus*
Common grackle	*Quiscalus quiscula*
Orchard oriole	*Icterus spurius*
Northern oriole	*Icterus galbula*
Purple finch	*Carpodacus purpureus*

Mammals

Virginia opossum	*Didelphis virginiana*
Masked shrew	*Sorex cinereus*
Northern short-tailed shrew	*Blarina brevicauda*
Eastern mole	*Scalopus aquaticus*
Star-nosed mole	*Condylura cristata*
Keen's bat	*Myotis keenii*
Little brown bat	*Myotis lucifugus*
Silver-haired bat	*Lasionycteris noctivagans*
Big brown bat	*Eptesicus fuscus*
Eastern red bat	*Lasiurus borealis*
Hoary bat	*Lasiurus cinereus*
Eastern cottontail	*Sylvilagus floridansis*
Eastern chipmunk	*Tamias striatus*
Woodchuck	*Marmota monax*
Thirteen-lined ground squirrel	*Spermophilus tridecemlineatus*
Gray squirrel	*Sciurus carolinensis*
Fox squirrel	*Sciurus niger*
Red squirrel	*Tamiascirus hundsonicus*
Southern flying squirrel	*Glaucomys volans*
American beaver	*Castor canadensis*
White-footed mouse	*Peromyscus leucopus*
Meadow vole	*Microtus pennsylvanicus*
Muskrat	*Ondatra zibethicus*
Coyote	*Canis latrans*
Red fox	*Vulpes vulpes*
Gray fox	*Urocyon cinereoargenteus*
Raccoon	*Procyon lotor*
Long-tailed weasel	*Mustela frenata*
Least weasel	*Mustela nivalis*
Mink	*Mustela vison*

Badger	*Taxidea taxus*
Striped skunk	*Mephitis mephitis*
White-tailed deer	*Odocoileus virginianus*