Department of Planning, Design and Natural Resources
Division of Natural Resources
Division of Planning

Department of Park Operations
Division of Outdoor Education
Division of Parks

NATURAL RESOURCES MANAGEMENT PLAN: OXBOW LAGOON, ROCKY RIVER RESERVATION v.1.0

Cleveland Metroparks Technical Report 2012/NR-03

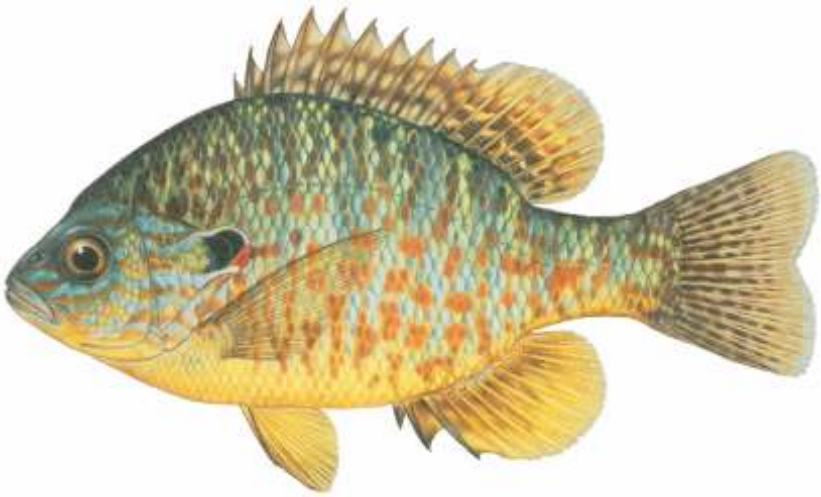

Image left: Pumpkinseed sunfish (*Lemposis gibbosus*) are the most prevalent fish species in Oxbow Lagoon.
Photo right: Cardinal flower (*Lobelia cardinalis*) and swamp milkweed (*Asclepias incarnata*) share a bankside log at Oxbow Lagoon (photo M. Durkalec).

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Executive Summary

Oxbow Lagoon is an 8.1 acre natural river oxbow which is enhanced with a raised spillbox structure on the northeast end. The oxbow and surrounding area is a popular recreation area in Cleveland Metroparks for a combination of fishing, picnicking, hiking, baseball/softball, and open field recreational activities. The overarching management goal of the waterbody is to maintain its "fishable" status per the Federal Clean Water Act (CWA) objectives, which is accomplished through active management activities focused on the fishery and habitat of the oxbow.

There are no known major water quality issues in Oxbow Lagoon. The oxbow does have nuisance levels of aquatic vegetative growth in mid to late summer, which is managed through chemical treatments around the fishing platform at the north end in the late spring/early summer. The oxbow serves a watershed role as a stormwater buffer between adjacent lands and the East Branch Rocky River.

The oxbow offers a fair recreational fishery, which would currently be considered a second tier offering in Cleveland Metroparks. There are currently at least 12 species of fish known to inhabit the oxbow, many of which would be considered of marginal interest to anglers. The fish community is currently dominated by stunted pumpkinseed sunfish (*Lepomis gibbosus*) and, to a lesser degree, by common carp (*Cyprinus carpio*) and golden shiner (*Notemigonus crysoleucas*).

Two sampling efforts in 2011 (10 August and 25 October) revealed a lack of largemouth bass (*Micropterus salmoides*), which reflects a severe predator/prey imbalance which is in large part the reason for the overpopulation of stunted sunfish. The reason for the lack of bass is under investigation, but is likely a combination of

limitations of habitat, such as low dissolved oxygen (D.O.) under the ice in winter as aquatic vegetation decomposes, and historic overharvest by anglers. Lack of appropriate spawning areas could be another limitation in the waterbody which could be addressed by installing spawning structures. Largemouth bass were stocked in the oxbow in early November 2011, and will likely continue to be stocked over the next several years, in an attempt to reestablish a predator population. Follow-up sampling in the future, likely summer 2016, will determine the success of this effort. In the meantime, D.O. will be monitored under the ice when conditions permit. If future results indicate overharvest of bass is a significant issue, changes in regulations for bass will be considered in the oxbow fishing area. Current regulations allow the harvest of 2 largemouth bass $\geq$12" per angler/day. Reestablishing a healthy predator population would have a top-down effect on the prey species in the oxbow, namely improving growth rates of stunted pumpkinseed sunfish. No other fish species in the oxbow are managed through bag or size regulations.

The oxbow does provide function as wildlife habitat. Although no rare species are known to inhabit the waterbody or immediate surrounding area, it does offer a typical regional assemblage of common waterfowl, wading birds, reptiles, amphibians, invertebrates, and aquatic macrophytes.

If the fishery at Oxbow Lagoon continues to be limited despite adaptive management efforts, then other higher quality fisheries in the area will fulfill this role and the management focus should shift primarily towards improving the waterbody as a wetland offering quality wildlife habitat and hydrologic function.

Historic Overview and Background

Oxbow Lagoon is an 8.1 acre natural Rocky River oxbow with water level increased by a raised culvert outlet. The current oxbow is the former main channel of the East Branch Rocky River and was cut-off to facilitate the building the parkway. The Engineering Department Report from the 1938-1939 Cleveland Metropolitan Park District Report of the Board of Park Commissioners states *"The new Lagoon, a former river bed, is slightly more than one-half mile in length. This former river bed was drained and cleaned, pit holes leveled, and carefully graded to establish a water depth ranging from two to nine feet. A dam was built in the main river channel below the intake to insure a proper lagoon level and constant water circulation"*. The oxbow has a relatively small watershed of 0.16 miles^2 per USGS StreamStats program, with drainage mostly from the west and south (Figure 1). Historically, the deepest area is at the northern end of the oxbow at just over 6 feet, with depths in the middle section averaging 5-6 feet, and the south end of the waterbody comparatively shallow at around 3 feet maximum depth. Most of the fishing opportunities exist in the northern half of the oxbow, and a wooden fishing platform was installed in this area. The oxbow is situated such that the east shore is mostly surrounded by medium width forested buffer and the west shore has a wide forest buffer, with the extreme north and south ends coming in near proximity to the parkway and paved all purpose trail (APT). The east shore of the middle of the oxbow comes in close contact with a parking lot and picnic area, and a natural surface path runs along the east shoreline. Despite intensive park development, the oxbow retains a mostly scenic quality and is largely surrounded by tree canopy and adjacent wetlands. (Figure 2). The oxbow has been part of a fairly intensively used

recreation area which features fishing, picnicking, hiking, wildlife viewing, biking, baseball/softball, and open field recreational activities. Activities are overall most intense during the late spring through summer months.

The overarching goal for management of Oxbow Lagoon is to maintain, and improve where possible, the chemical, physical, and biological integrity of the waterbody as reflected in the national water quality objective as contained in the Federal Clean Water Act (CWA). The CWA objective is often referred to as the "fishable/swimmable goal", and the foremost goal for the oxbow is its continued management as a fishing area. This is currently conducted through management activities focused on the fishery. Swimming is prohibited at this location.

Water Quality and Habitat Overview

All indications are that overall water quality is good for this lentic system, given its location in an otherwise urbanized region. The oxbow would be best characterized as eutrophic, which is a typical scenario for an old river oxbow. The oxbow receives nutrients from adjacent watershed runoff, as well as from the waters of the East Branch Rocky River, which periodically backflows into the lagoon during high water periods. Eutrophication is most reflected in the form of heavy rooted aquatic macrophyte growth during the mid to late summer months. Consequently, it is suspected that decomposing aquatic vegetation under the ice in winter may cause low dissolved oxygen levels. Water transparency varies, being clearer during the colder seasons, due to seasonal variation in phytoplankton and zooplankton communities in the oxbow (Wetzel 1983).

There is no significant industry in the Oxbow Lagoon subwatershed to contribute associated pollutants. During periods of high water, the lagoon occasionally has direct hydrologic connection to the East Branch of the Rocky River via backflow through the spillbox outlet structure. According to the Ohio Environmental Protection Agency, the primary physical/chemical water quality concerns in the East Branch Rocky River are nutrients and fecal coliform bacteria levels (Ohio EPA 1999). There are no other exceedances of warm water habitat (WWH) physical/chemical criteria for the East Branch of the Rocky River (Ohio EPA 1999). No further documentation of physical or chemical water quality issues at the oxbow were found in Cleveland Metroparks historic files.

Fisheries Resource Overview

In an effort to obtain current data on the fish community in Oxbow Lagoon, electrofishing was performed on 10 August 2011 in two sampling runs totaling 59 minutes. Electrofishing is a well established method utilized by fisheries managers to accurately assess fish population dynamics, abundance, and structure (Neilsen and Johnson 1983, Reynolds 1993, Smith-Root 2007). Sample run 1 was conducted for 45 minutes in the northern third of the waterbody and sample run 2 was conducted for 14 minutes in the approximate middle section of the oxbow (Figure 2) Approximately the southern quarter of the waterbody was inaccessible on this date due to shallow water and heavy submerged aquatic weeds and woody debris. A Smith Root GPP 5.0 electrofishing unit and customized Alweld commercial johnboat, including booms constructed by Ashcraft Machine and Supply, Inc., of Newark, Ohio, were used. One person

maneuvered the boat and operated the electrofishing unit control box while two assistants collected stunned fish, which were retained in an aerated 90 gallon onboard livewell for later processing. Fish lengths (mm) were obtained using a custom measuring board and weights (g) were obtained using a digital scale. Data was recorded onsite and all fish were released afterwards. Datasheets from the sampling activity are available in Appendix A.

Oxbow Lagoon offers an assemblage of common species for a small lake in Ohio (Austin 1996). The most abundant fish species in the oxbow are pumpkinseed sunfish (*Lepomis gibbosus*) and common carp (*Cyprinus carpio*). Other species present in moderate abundance and also of potential interest to anglers include white crappie (*Pomoxis annularis*), bluegill (*L. macrochirus*), white sucker (*Catostomus commersoni*) and yellow and brown bullhead catfishes (*Ameriurus* spp.). Warmouth sunfish (*L. gulosis*) and green sunfish (*L. cyanellus*) are also present in the oxbow in small numbers. Largemouth bass (*Micropterus salmoides*) were formerly present in the oxbow but were not found during sampling in 2011. Forage species found in the oxbow include, in descending order of abundance, golden shiner (*Notemigonus crysoleucas*), emerald shiner (*Notropis atherinoides*), and gizzard shad (*Dorosoma cepedianum*). In total, at least 12 species of warmwater fish are currently or historically known from the oxbow. Introduction of some of these species are likely a combination of intrusion from inflow via the East Branch Rocky River, as well as potential incidental introductions from angler's bait buckets.

The fish community, overall, is notable in lacking a healthy predator population. Largemouth bass should be the dominant year-round predator in Oxbow Lagoon given the habitat available and, as such, have a marked influence over the fish community (Anderson 1976, Carlander 1977, Austin 1996). The reason for this lack of largemouth bass in the recent sampling may be due to low dissolved oxygen in harsh winters, lack of suitable spawning areas, overharvest by anglers, or a combination of these factors. Lack of prey species is not a limiting factor in this waterbody. Due to this scenario predator proportional stock densities and predator/prey ratio could not be calculated and analyzed. Efforts are currently underway to reintroduce largemouth bass to the oxbow and also to determine limiting factors influencing sustainability of their populations in the waterbody (see below).

Pumpkinseed sunfish are the most dominant forage fish in Oxbow Lagoon. Sampling yielded 209 total sunfish, mostly pumpkinseed, weighing a total of 2.97 kg (6.5 lbs) (Table 1). Based on plotting length against frequency, there appears to be as many as six year classes of sunfish in the sample (Figure 3). Note that the smallest size classes of sunfish are less susceptible to electrofishing than larger specimens due to less surface area exposed to the electric field, hence their lower frequency in the sample. Given a complete lack of "quality" size sunfish of 15 cm or greater in the sample, proportional stock density (PSD) of sunfish was 0.0%, reflecting a severely stunted sunfish population (Anderson 1980, Gabelhouse 1984). This would be the expected outcome of a system lacking significant predators, as is the case in Oxbow Lagoon. Given the lack of predators in the system, a Total Quality (TQ) plot could not be calculated for Oxbow Lagoon in its current state.

Due to the heavy submerged weed growth in the southern half of the oxbow during the 10 August 2011 sampling, a follow-up sampling was conducted on 25 October 2011 when the vegetation was greatly reduced at the end of the growing season, to verify the earlier sampling results were representative. Overall, the numbers and species of fish sampled were similar, so the earlier survey was considered a representative sample of the fish community despite the heavy vegetative cover. Two additional species (gizzard shad and warmouth sunfish), both present in very small numbers, were collected during the October sampling.

The fishery, overall, would be characterized as "fair" in its current state, and the venue is considered a second tier fishing destination within the Park District most suited to families, children, and less experienced anglers who want to catch fish regardless of size or sporting quality. Other than sunfish, other species present would be characterized as incidental catches by the majority of anglers who utilize the oxbow.

Other Recreational Uses

Other than fishing, wildlife watching is the only other significant recreational activity suited to Oxbow Lagoon. The waterbody is too small and filled with woody debris and submerged aquatic vegetation to make paddling sports (such as kayaking and canoeing) popular, and swimming is prohibited in this area. Hiking around parts of the lagoon is also popular, as is open field recreation, softball/baseball, and picnicking in the areas adjacent to the middle of the lagoon (Figure 2).

Ecosystem Function Overview

Oxbow Lagoon is a natural oxbow wetland, although its hydrology is now controlled with a water control structure, and therefore does serve some general ecosystem functions in the watershed. The basin, which has a watershed size of 0.16 mi^2, drains adjacent lands which are in a mostly natural state (Figures 1, 2). A significant forested wetland borders the northeast shoreline of the predominantly deepwater marsh oxbow, located at approximately the northern fifth of the waterbody.

A number of associated wildlife, notably birds, utilize the oxbow. Great blue heron (*Ardea herodias*), belted kingfisher (*Ceryle alcyon*), mallard duck (*Anas platyrhynchos*), wood duck (*Aix sponsa*), and Canada goose (*Branta canadensis*) are observed at the oxbow regularly by wildlife watchers. Nesting of red-headed woodpecker (*Melanerpes erythrocephalus*) is a regular occurrence in the standing dead wood in and around the water (Wendy Weirich, Rocky River Nature Center Manager, personal communication). Barred owl (*Strix varia*) have also nested in this area in recent years (Annette Piechowski, Medina Raptor Center volunteer, personal communication). Although not documented at the site, there is also potential prothonetary warbler (*Protonotaria citrea*) nesting habitat onsite, which is an uncommon warbler species in northern Ohio. North American beaver (*Castor canadensis*) have used the oxbow for years, and currently have a lodge on the east bank of the middle segment of the oxbow. The oxbow is host to an assemblage of common reptiles and amphibians either year-round or during the mating season, including eastern painted turtle (*Chrysemys picta picta*), snapping turtle (*Chelydra serpentina*), American toad (*Anaxyrus americanus*), green frog (*Lithobates clamitans*), and bullfrog (*L. catesbeianus*). No threatened or

endangered species of flora or fauna are known residents of the oxbow. Although common dragonfly (suborder Anisoptera) and damselfly (suborder Zygoptera) species can be observed utilizing the oxbow margin a regular basis, there is little information collected on specific macroinvertebrate or microbial communities within the waterbody.

The vegetative community of the oxbow is comprised mainly of Eurasian watermilfoil (*Myriophyllum spicatum*), which becomes progressively more dense moving toward the south end of the oxbow. Overall, submerged aquatic vegetation in the oxbow would be considered heavy in mid to late summer. Duckweed (*Lemna* spp.) is also found in the southern basin. Emergent vegetation in the water is sparse, although in wet areas adjacent to the oxbow patches of swamp milkweed (*Asclepias incarnata*) and cardinal flower (*Lobelia carinalis*). Algal populations are not problematic in the oxbow. A full inventory of aquatic vegetation at Oxbow Lagoon has not been undertaken so a number of other species are likely present.

Current Fisheries Management

Oxbow Lagoon has not been an intensively managed fishery in recent years, mainly because other high quality fisheries resources, including the Rocky River and Wallace Lake, are within close proximity. A bag limit of 2 largemouth bass of 12" or greater per angler per day is in affect although, as previously noted, there are currently few bass in the oxbow. There are no bag or size limit regulations on any other fish species in the oxbow. As is the case with all Cleveland Metroparks waters, a valid Ohio fishing license is required to fish Oxbow Lagoon. A wheelchair accessible fishing platform is available at the northeastern end of the waterbody (Figure 2).

The Oxbow Lagoon fish community could be supplemented with fish stocking activities, as needed. Stocking of various fish species, such as largemouth bass, is a very common fisheries management activity which has been shown to have many benefits to the public, especially in urban areas (DesJardine 1983, Gordon 1983, Halko1983, Heidinger 1993, Manfredo et al. 1983, Norville 1961, Weithman 1993). The only stocking activity conducted in the past six years was reintroduction of largemouth bass following the August 2011 fish community assessment. On November 4 and 7, 2011, approximately 375 largemouth bass and 650 bluegill were transferred to Oxbow Lagoon from an irrigation lake at Medina Country Club. In the short term, it is hoped that the predatory bass will begin reducing the stunted pumpkinseed sunfish population to a more desirable level. In the longer term, more largemouth bass will be stocked in the oxbow over the next few years with the hope that a significant bass population will establish by the time the next fish community survey is conducted, likely in 2016.

It has been noted by various fish managers that proper communication with the public and the media is a powerful, and often underutilized, fisheries management tool (Decker and Krueger 1993, Patterson 1983, Cohen et al. 2008). With this in mind, information regarding fishing at Oxbow Lagoon is disseminated through multiple outlets, including Cleveland Metroparks fishing booklet and trifold, on the Cleveland Metroparks website, and through direct communication with anglers. The fishery, unlike Wallace Lake or the Rocky River, is not considered a highlight offering so it is not promoted heavily through the media or other outlets to a wider audience.

Current Wildlife Habitat Management

Overall, Oxbow Lagoon requires a low level of management effort given its mostly natural character. Nusiance aquatic vegetation around the fishing platform is sprayed annually with aquatic herbicide in early summer, as well as in follow-up applications, when needed. Natural Resource division staff have installed, and routinely monitor, three wood duck nesting boxes on the south end of the oxbow, as well.

Management Recommendations

Oxbow Lagoon falls short of offering a high quality fishery, due to its stunted sunfish population and lack of predatory fish species. With this limitation noted, Natural Resource staff will continue the stocking of predatory largemouth bass with a goal of establishing a predator fish population in the oxbow. Dissolved oxygen levels will be monitored under the ice in winter over the next several years to determine if this could be a potential habitat limitation. If it turns out that a largemouth bass population has not been established based on follow-up sampling, scheduled for approximately 2016, then alternative management strategies for the oxbow should be considered. These would include accepting the limited fishery of the oxbow as it is and shifting management to improving wetlands habitat by introducing native vegetation, control of milfoil, and/or lowering the water levels to promote emergent wetland and submerged aquatic/floating plants.

The fishery could also potentially benefit from more restrictive largemouth bass regulations, such as a increased minimum size (currently 12”), reduced bag limit, or slot limit requiring the immediate release of all bass in a size range, thereby protecting both

smaller fish being recruited into the population and larger fish that are capable of producing the most offspring. Anderson (1976) notes that a 15-18" minimum length on largemouth bass should improve or sustain the quality of fishing under conditions where catchability is high, annual recruitment is low, and/or the there is overpopulation of stunted sunfish prey species. This idea will be revisited following the findings of the 2016 follow-up fish community survey, dependant upon whether or not a bass population can be established in the oxbow based on re-introduction effort.

If future surveys reveal largemouth bass are surviving, but recruitment of younger fish through spawning is low or absent, this would indicate a lack of appropriate spawning habitat in the oxbow. Largemouth bass are flexible in spawning preference, but prefer firmer substrates. Since enhancement of spawning habitat by addition of gravel beds in shallow water is not a realistic option in this natural wetland, this could be a potential limitation of a self-sustaining bass population in the lagoon and their presence could be maintained through periodic stocking, or could be abandoned in favor of managing the oxbow as a natural wetland habitat.

The oxbow could also potentially benefit from stocking of other warmwater fish species. One potential candidate species would be channel catfish (*Ictalurus punctatus*). The main goal, as already outlined, would be to re-establish largemouth bass in the oxbow, but large channel catfish can also serve a role as predators on sunfish in a system. This alternative can be evaluated if a bass population cannot be established.

Increasing public education regarding introduction of aquatic invasive species should be a focus at Oxbow Lagoon, as well as all other park waters. This issue needs to be addressed as part of a wide-reaching campaign to be effective. The presence of red-

eared slider turtles (*Trachemys scripta elegans*) in the lagoon and round gobies (*Neogobius melanostomus*) in other nearby waters are testaments to the fact that human-introduced species have occurred in the past in Cleveland Metroparks. Cleveland Metroparks signs advising visitors not to release pets in our wetlands can be installed at the lagoon. Continued offering of printed and online information focusing on this concern, a well as communication with the media and word of mouth with anglers and other park users, would be an effective multi-pronged approach to combat this problem.

No known current or historic stormwater related water quality impacts have been noted in this waterbody, and in its current state Oxbow Lagoon and fringing wetland will continue to serve as a buffer between the surrounding landscape and the East Branch Rocky River.

The current overall assessment is that Oxbow Lagoon could use improvement in fulfilling its primary role in the Park District as wetland with the water level increased to provide fishing opportunities, and is currently a "work in progress". Adaptive management practices currently being employed at the oxbow will be assessed periodically in an attempt to improve the quality of the fishery at this venue as much as can reasonably be accomplished. If the fishery continues to be limited despite these measures, then other higher quality fisheries in the area will fulfill this role and the management focus of Oxbow Lagoon should shift primarily towards improving the waterbody as a wetland offering quality wildlife habitat and hydrologic function.

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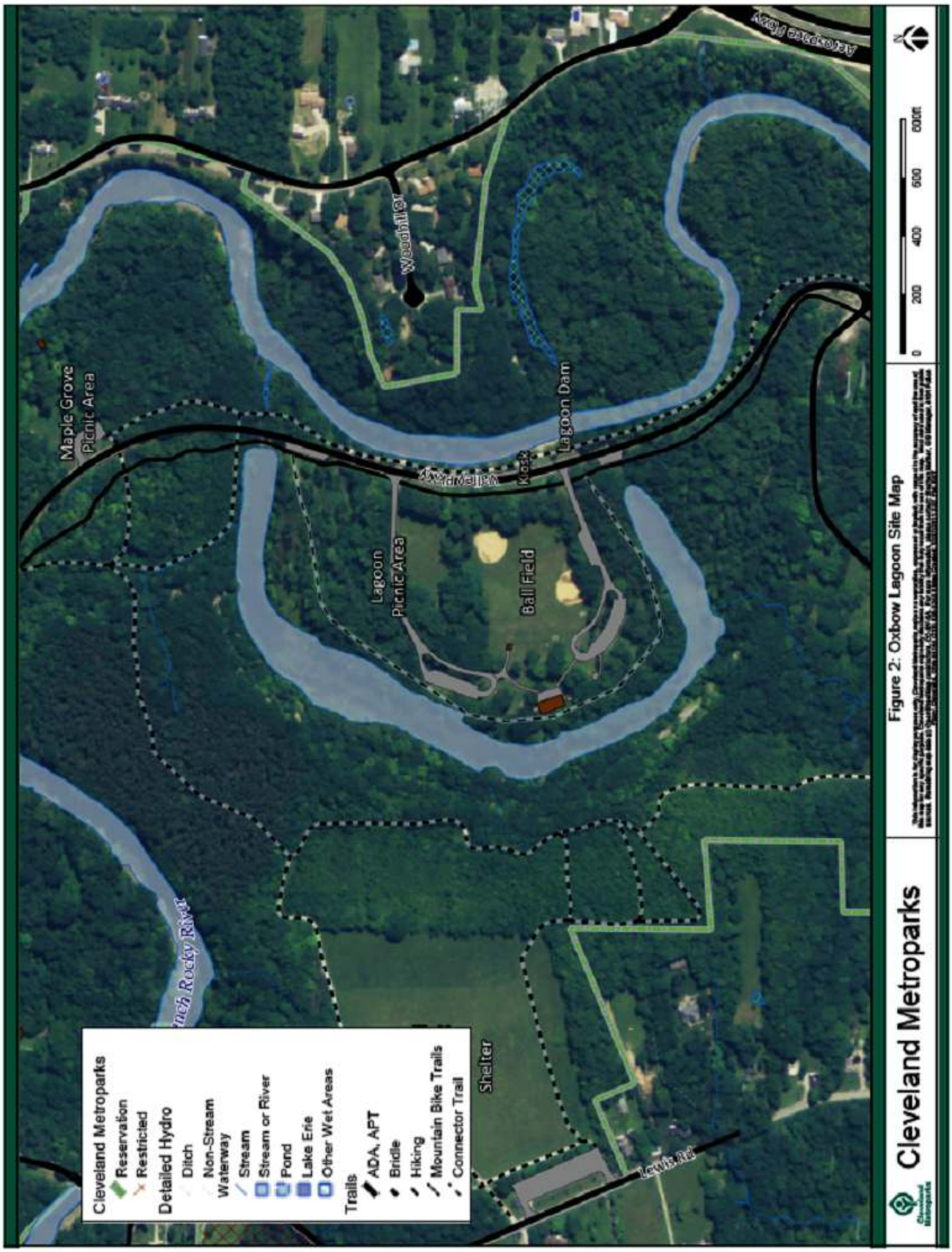
Table 1. Basic characteristics of the sunfish population based on 10 August 2011 assessment (sampling time = 59 minutes)

Species	Total Number	Total Weight (kg)	Average Size (mm)	Average Relative Weight (W_r)[1]
Bluegill, Green and Pumpkinseed sunfish	209	2.97	87.6	115.5

[1] As outlined in Wege and Anderson 1978, Anderson and Gutreuter 1983.

Figure 1. Oxbow Lagoon Subwatershed Map


Maple Grove Picnic Area
Lagoon Picnic Area
Ball Field
Lagoon Dam
Kiosk
Shelter
Cleveland Metroparks
Reservation
Restricted
Detailed Hydro
Ditch
Non-Stream
Waterway
Stream
Stream or River
Pond
Lake Erie
Other Wet Areas
Trails
ADA, APT
Bridle
Hiking
Mountain Bike Trails
Connector Trail
Cleveland Metroparks
Figure 2: Oxbow Lagoon Site Map
0
200
400
600
800

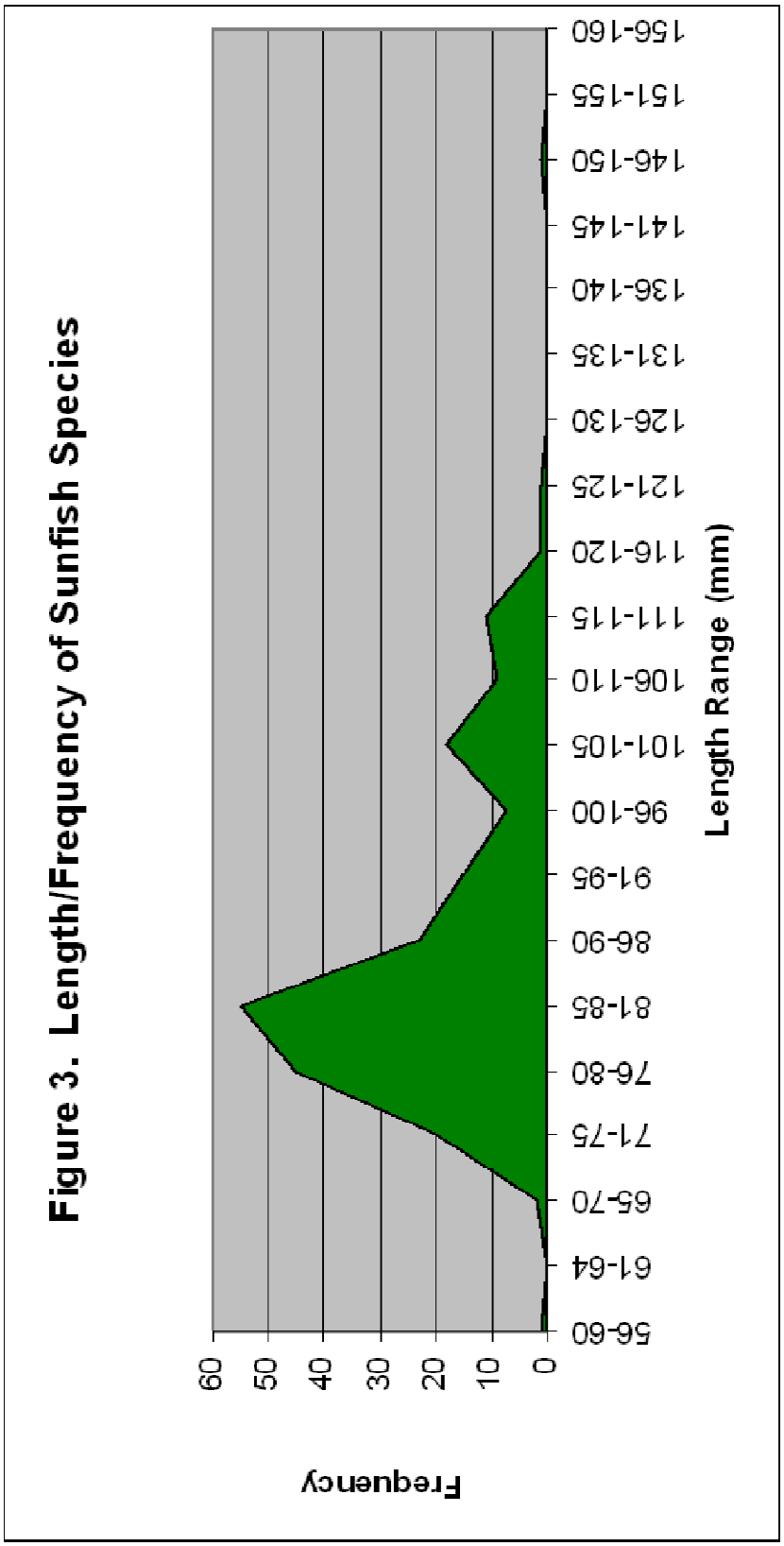


Figure 3. Length/Frequency of Sunfish Species
Length Range (mm)
156-160
151-155
146-150
141-145
136-140
131-135
126-130
121-125
116-120
111-115
106-110
101-105
96-100
91-95
86-90
81-85
76-80
71-75
65-70
61-64
56-60
0
10
20
30
40
50
60
Frequency

APPENDIX A:
Fish Population Assessment Data Sheets
10 August 2011 (three pages)

Cleveland Metroparks Fish Population Assessment Data Sheet

Date: 8/10/11 **Location:** Oxbow Lagoon (Rocky River) - Run 1

Species: SUNFISH **Time Sampled:** start - 1803 end - 1848 (45min)

	Pumpkinseed Length (mm)	Weight (g)		Pumpkinseed Length (mm)	Weight (g)		Length (mm)	Weight (g)	
1	113	23	41	106	24	81	126	26	Golden Shiner
2	111	25	42	86	13	82	266	173	White Sucker
3	82	9	43	77	10	83	166	52	Yellow Bullhead
4	91	15	44	113	33	84	51	2	Yellow Bullhead
5	76	8	45	76	11	85	146	71	Bluegill
6	92	13	46	88	19	86	91	19	Green Sunfish
7	84	10	47	82	12	87	202	80	White Sucker
8	95	14	48	73	9	88	76	4	Emerald Shiner
9	95	16	49	86	11	89	81	5	Emerald Shiner
10	106	19	50	81	14	90	141	26	Golden Shiner
11	84	10	51	81	12	91	174	79	Golden Shiner
12	82	10	52	82	13	92	91	13	Common Carp
13	106	19	53	72	8	93	99	21	Green Sunfish
14	81	11	54	86	13	94	70	4	Golden Shiner
15	82	10	55	96	22	95	102	23	Green Sunfish
16	78	10	56	105	25	96	124	24	Yellow Bullhead
17	75	7	57	83	10	97	105	28	Bluegill
18	85	13	58	82	11	98	124	24	Golden Shiner
19	102	22	59	112	31	99	124	23	Golden Shiner
20	92	18	60	79	13	100	123	21	Golden Shiner
21	81	13	61	103	22	101	46	1	Bluegill
22	106	21	62	81	10	102	84	10	Common Carp
23	84	11	63	96	22	103	120	24	Common Carp
24	90	16	64	78	13	104	115	19	Golden Shiner
25	111	28	65	74	9	105	76	8	Common Carp
26	81	12	66	71	8	106	\	\	mirror Carp
27	76	10	67	76	9	107	93	12	Common Carp
28	69	8	68	105	24	108	220	97	White Sucker
29	76	9	69	77	10	109	65	4	Black Crappie
30	76	10	70	88	15	110	110	15	Golden Shiner
31	82	12	71	86	17	111	113	16	Golden Shiner
32	91	19	72	76	10	112	100	15	Green Sunfish
33	101	20	73	113	27	113	100	16	Common Carp
34	84	12	74	103	24	114	173	79	Black Crappie
35	76	10	75	105	26	115	115	22	Common Carp
36	92	15	76	95	17	116	107	21	Common Carp
37	83	9	77	78	9	117	115	23	Common Carp
38	93	14	78	90	13	118	95	15	Common Carp
39	87	13	79	86	13	119			
40	77	9	80	86	14	120			

Fish Population Assessment Data Sheet

Date: 8/10/2011 **Location:** Oxbow Lagoon (Rocky River) - Run 1

Species: Sunfish (cont...) Pumpkinseed **Time Sampled:** start – 1803 (45 min) end – 1848

	Length (mm)	Weight (g)
1	75	10
2	85	14
3	75	10
4	80	10
5	81	10
6	74	8
7	87	14
8	76	9
9	107	24
10	80	10
11	81	11
12	89	13
13	80	10
14	86	12
15	85	11
16	75	9
17	75	9
18	79	7
19	104	19
20	85	7
21	112	27
22	105	18
23	115	28
24	95	19
25	118	27
26	86	12
27	74	8
28	69	5
29	75	7
30	84	14
31	80	12
32	83	11
33	80	11
34	74	7
35	74	10
36	91	14
37	85	11
38	110	28
39	84	11
40	85	11

Pumpkinseed

	Length (mm)	Weight (g)
41	114	23
42	103	19
43	85	11
44	86	14
45	82	10
46	78	9
47	102	19
48	76	8
49	80	9
50	80	9
51	103	21
52	105	21
53	80	10
54	93	17
55	125	35
56	99	21
57	80	12
58	76	9
59	72	16
60	80	12
61	109	26
62	82	12
63	113	30
64	87	14
65	89	16
66	75	10
67	79	10
68	90	16
69	81	11
70	101	18
71	102	21
72	72	7
73	91	15
74	83	12
75	86	14
76	83	9
77	84	11
78	77	8
79	82	10
80	83	12

Pumpkinseed

	Length (mm)	Weight (g)
81	72	7
82	84	13
83	85	13
84	105	16
85	80	10
86	81	12
87	85	13
88	82	10
89	92	16
90	109	25
91	85	13
92	83	10
93		
94		
95		
96		
97		
98		
99		
100		
101		
102		
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120		

Fish Population Assessment Data Sheet

* boat motor broke

Date: 8/10/11 **Location:** Oxbow Lagoon (Rocky River) - Run 2

Species: Sunfish (Pumpkinseed) **Time Sampled:** start - 19:46 end - 20:00 (14min) *

	Length (mm)	Weight (g)		Length (mm)	Weight (g)		Length (mm)	Weight (g)	
1	90	15	41			81	64	3	Emerald Shiner
2	80	9	42			82	180	63	Golden Shiner
3	79	9	43			83	245	148	White Sucker
4	100	19	44			84	200	79	White Sucker
5	110	26	45			85	125	32	Common Carp
6	79	10	46			86	135	28	Golden Shiner
7	83	10	47			87	125	22	Golden Shiner
8	78	10	48			88	184	70	Golden Shiner
9	75	8	49			89	110	20	Common Carp
10	82	10	50			90	125	30	Common Carp
11	84	11	51			91	115	26	Common Carp
12	85	8	52			92	165	13	Golden Shiner
13	80	10	53			93	125	21	Golden Shiner
14	97	16	54			94	111	21	Common Carp
15	80	10	55			95	123	18	Golden Shiner
16	115	26	56			96	95	13	Common Carp
17	80	10	57			97	110	20	Common Carp
18	84	11	58			98	105	15	Common Carp
19	80	9	59			99			
20	75	8	60			100			
21	76	9	61			101			
22	84	11	62			102			
23	80	9	63			103			
24	82	10	64			104			
25	82	10	65			105			
26	84	11	66			106			
27	80	9	67			107			
28	79	8	68			108			
29	86	13	69			109			
30	90	14	70			110			
31			71			111			
32			72			112			
33			73			113			
34			74			114			
35			75			115			
36			76			116			
37			77			117			
38			78			118			
39			79			119			
40			80			120			