

Normandale Fisheries Assessment

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During the summer of 2018, the Riley-Purgatory-Bluff Creek Watershed District (RPBCWD) assisted Nine Mile Creek Watershed District in conducting a fish assessment of Normandale Lake and Lake Cornelia and ponds connected to Cornelia. The fish surveys were based on research and methodology established by the University of Minnesota (UMN) in the Riley Chain of Lakes Carp Management Plan drafted in 2014 (Bajer, 2014), and the Purgatory Creek Carp Management Plan drafted in 2015 (Sorensen, 2015). Common carp populations within both lakes were of specific concern due to the negative impacts large populations can cause within lakes in Minnesota. Adult carp populations are monitored by conducting three, 20-minute electrofishing transects per lake, three times between late July and October. If the total biomass estimate of carp is above 100kg/h in lakes, significant water quality degradation can occur. Young of the year (YOY) carp are monitored by conducting five, 24-hour small mesh fyke net sets between July and September. If YOY carp were captured during this event, it meant successful recruitment occurred which can lead to a larger future carp population. Bluegill abundance was also important to assess because they can keep a carp population under control by consuming carp eggs during the spawn. In the case of both sampling techniques all other fish species were enumerated and summarized. The following document is an overall summary of the fish assessment results on Normandale Lake.

Fyke Netting

District staff completed a fyke net survey on Normandale Lake on August 2nd, 2018. The results from this survey can be seen in Table 1. As is true with many lakes during summer located within the Twin Cities Metro Area, the inshore fish community was dominated by bluegill sunfish. Comparing bluegill abundance in Normandale Lake (57/net) to RPBCWD lakes indicates it had lower overall total numbers, however the overall size structure was good with fish from multiple year classes present. Many other Centrarchid species, including pumpkinseed sunfish and black crappie (Figure 2), were also common across Normandale. Larger predator fish including northern pike and largemouth bass were captured at very low numbers within the fyke nets (1 northern pike, 1 largemouth). Overall, 19 painted turtles and 5 snapping turtles were captured in the fyke nets. During the survey no YOY carp were captured in Normandale Lake which indicates that little/no recruitment occurred in Normandale in 2018.



Figure 1: Setting a fyke net in RPBCWD.



Figure 2: Measuring a black crappie from fyke nets on Normandale Lake.



Figure 3: Snapping turtle captured in a fyke net.

Table 1: Normandale Lake Fyke Net Results

Species	Number of fish caught in each category (inches)									Total	Fish/Net
	0-5	6-8	9-11	12-14	15-19	20-24	25-29	30+			
<i>black bullhead</i>		14	4							18	3.6
<i>black crappie</i>	15	10	3							28	5.6
<i>bluegill</i>	214	71								285	57
<i>common carp</i>					1	1				2	0.4
<i>green sunfish</i>	33	2								35	7
<i>hybrid sunfish</i>	11	3								14	2.8
<i>largemouth</i>		1								1	0.2
<i>northern pike</i>				1						1	0.2
<i>pumpkinseed</i>	102	9								112	22.4
<i>yellow bullhead</i>		22	42	2						66	13.2
<i>painted turtle</i>										19	3.8
<i>snapping turtle</i>										5	1

Electrofishing

Boat electrofishing was conducted across three dates on Normandale Lake. Two surveys included netting all fish captured and one was targeting and netting carp only. Due to the thick vegetation, including thick mats of filamentous algae and duckweed, fish estimates are most likely underestimating the number of fish captured per hour (including carp). Fish captured via electrofishing mirrored that which was captured within the fyke nets (Table 2). Additional fish captured via electrofishing included 1 large adult black buffalo and 37 golden shiners which were not captured in the fyke nets. Bluegill sunfish were the most abundant fish captured (54 fish) followed by pumpkinseed sunfish (43 fish). Low numbers of small predatory fish including largemouth bass and northern pike were captured. A total of 17 common carp were captured which placed the total carp biomass estimate over the carp threshold (100 kg/ha) with an estimate of 163.78 kg/ha (Table 3). All carp captured in Normandale were of large size large (>500 mm).



Figure 2: Adult carp captured via electrofishing on Normandale Lake.

Table 3: 2018 Common Carp Biomass Estimates for Normandale Lake

Lake	Fish per Hour	Density per Hectare	Average Weight (kg)	Carp Biomass (kg/h)	Threshold (kg/h)
Normandale Lake	9.16	46.16	3.55	163.78	100

Table 2: Normandale Lake Boat Electrofishing Results

Species	Number of fish caught in each category (inches)									
	0-5	6-8	9-11	12-14	15-19	20-24	25-29	30+	Total	Fish/Hour
<i>black bullhead</i>		26	3						29	9.482392
<i>black buffalo</i>						1			1	0.326979
<i>black crappie</i>	2	1	1						4	1.307916
<i>bluegill sunfish</i>	47	7							54	17.65687
<i>common carp</i>					3	8	14	3	17	5.558644
<i>golden shiner</i>	34	3							37	12.09822
<i>green sunfish</i>	7								7	2.288853
<i>hybrid sunfish</i>	9								9	2.942811
<i>largemouth</i>	8	3	1						12	3.923748
<i>northern pike</i>				2					2	0.653958
<i>pumpkinseed</i>	42	1							43	14.0601
<i>yellow bullhead</i>		6	8						14	4.577707

Summary

Overall the fish sampled in Normandale Lake are similar to what can be found across the Twin Cities Metro Area with bluegill being the most abundant. The number of bluegill and the overall size structure indicates that the past winters have not resulted in a winterkill. From one fyke net sampling event it appears that the bluegill may be keeping common carp recruitment under control in Normandale. However, the large number of adult common carp captured indicate successful carp spawning within the Nine Mile Creek system occurred at some time. The large population of carp could be from a past winterkill that occurred in Normandale, which allowed carp to spawn successfully by killing all native predators while keeping some carp alive to spawn due their high tolerance of low oxygen conditions. Another possible explanation is that a carp nursery may exist either upstream or downstream of Normandale and adult carp may be moving into them to spawn before returning to Normandale. If the nurseries winterkill more frequently then carp could be successfully reproducing and contributing to the large population in Normandale.

References:

- Sorensen, P., P. Bajer, and M. Headrick. 2015. Development and implementation of a sustainable strategy to control common carp in the Purgatory Chain of Lakes. Prepared for Riley Purgatory Bluff Creek Watershed District. University of Minnesota, Saint Paul, MN. Accessed online from: http://rpbcwd.org/files/6414/9382/4422/SorensenBajerandHeadrick2015_Development_of_carp_control_in_the_Purgatory_Creek_Chain_of_Lakes.pdf
- Bajer, P.G., M. Headrick, B.D. Miller, and P.W. Sorensen. 2014. Development and implementation of a sustainable strategy to control common carp in Riley Creek Chain of Lakes. Prepared for Riley Purgatory Bluff Creek Watershed District. University of Minnesota, Saint Paul, MN. Accessed online from: http://rpbcwd.org/files/3414/3561/7194/Carp_management_report_2014.pdf