

BASS LAKE AND DUCK LAKE ANGLER CREEL SURVEY

Sullivan County

2017 Fish Management Report

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EXECUTIVE SUMMARY

- An angler creel survey was conducted on Bass and Duck Lakes from April through October 2017.
- A total of 2,180 anglers fished 10,313 h on Bass Lake and a total of 367 anglers fished 847 h at Duck Lake.
- Bluegill was the number one species harvested at both Bass and Duck Lakes.
- At Bass Lake most anglers were targeting Largemouth Bass followed by Muskie and at Duck Lake most anglers were targeting Bluegill.
- Bass Lake anglers caught and released 7,474 bass, 14% were reported as legal size and greater. At Duck Lake 1,814 bass were released and 8% were legal size and greater.
- Bass Lake anglers released 617 Muskie and reported that 41% were legal (36 in) and greater. At Duck Lake there were 117 Muskie released and none were reported as legal size.

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INTRODUCTION

Bass Lake is 220 acres and Duck Lake is 59 acres, both are reclaimed coal mine pits (Figure 1 and 2). They are located within the Dugger Unit of the Greene-Sullivan State Forest. This area was acquired by the Indiana Department of Natural Resources, Division of Forestry in 2001. All lakes within the Dugger Unit are under a no-gas motor restriction. The Division of Fish and Wildlife began a Muskellunge (Muskie) stocking program at Bass Lake in 1997 (Table 1). In 2008, Duck Lake was added to the Muskie stocking program. In 2017, an angler creel survey and a general fish community survey were conducted. The creel survey methods used in 2017 were similar to the previous creel survey in 2008 (King 2009).

The objectives of the 2017 angler creel surveys at Bass and Duck Lakes were to evaluate fishing pressure, fish harvest, angler opinions and the Muskie stocking program.

METHODS

The roving-access type angler creel survey was conducted by a single clerk from April 3 through October 31, 2017 (Pollock 1994). The creel clerk worked a total of 133-d, of which 86 were at Bass Lake and 47 were at Duck Lake. Ten days out of every 14-d period were sampled including weekend days. The clerk worked either the AM shift (7:30 AM to 3:00 PM) or the afternoon shift (3:00 PM to 10:30 PM). The morning shift was scheduled at a 0.40 probability while the afternoon shift's probability was 0.60. Instantaneous count data was randomly taken four times a shift. At Bass Lake the clerk would drive to key points around the lake to view and count anglers. All counts at Duck Lake were made from the boat ramp.

Boat and shore anglers were interviewed between counts at only one lake per day at the primary boat ramps. Typical information obtained from angler interviews included fishing trip length, the number of anglers in the fishing party, species sought, number and lengths of fish harvested by species, number of Largemouth Bass caught and released, number of Muskie caught and released, and zip code. Largemouth Bass catch and release totals were categorized into less than or at least 14.0 in. The creel clerk did not differentiate between Black and White Crappie. Muskie catch and release totals were also categorized as less than or at least 36 in. All anglers were asked how many Muskie follows they observed. All anglers interviewed were also asked the follow three questions: On a scale from 1 to 5, 5 being highest, rate your overall

fishing trip satisfaction? Are you in favor of the Muskie stocking at this lake? On a scale of 1 to 5, 5 being the highest, rate your satisfaction with the Muskie fishing at this lake.

Yield was estimated by using average weights from the general surveys of Bass and Duck Lakes as well as other lakes with Gizzard Shad forage (King 2018). Harvest and effort estimates were expanded from complete trip data and angler counts.

RESULTS

Bass Lake

A total of 2,180 anglers fished approximately 10,313 h (46.9 h/ac) from April 3 through October 31, 2017. In 2008, from March through November, an estimated 1,860 anglers fished 6,732 h (30.3 h/ac) at Bass Lake. Fishing pressure was consistent throughout the survey ranging from a high of 8.4 h/ac in July to a low of 5.1 h/ac in September (Table 2). Anglers seeking bass made up 58% of the anglers followed by Muskie anglers (17%), anglers seeking “anything” (12%), Bluegill (8%), Crappie (2%), and Channel Catfish (1%).

The total catch was 9,089 fish of which 998 were harvested and 8,091 were released. Harvest by weight totaled 531.83 lbs (Table 3). In 2008, the total harvest at Bass Lake was 2,719 fish, which weighed an estimated 2,107 lbs. Bluegill dominated the harvest (71%), followed by Redear Sunfish (14%), Warmouth (5%), Crappie (5%), Largemouth Bass (4%), Channel Catfish (1%) and Muskie (< 1%) (Table 3). The harvest rate was 0.10 fish/h compared to 0.40 fish/h. in 2008.

A total of 709 Bluegill was harvested that weighed 198.95 lbs. In 2008, 1,056 Bluegill were harvested. Bluegill ranged in length from 4.0 to 8.5 in and averaged 6.9 in. The Bluegill harvest rate by Bluegill anglers was 1.05 Bluegill/h compared to 0.16 Bluegill/h in 2008. Anglers targeting Bluegill accounted for 8% of the total Bluegill catch compared to 5% in 2008. Angler satisfaction was ranked on a 1 to 5 scale with 5 being the most satisfied. The average satisfaction rating for Bluegill anglers was above average at 3.4 out of 5.

Redear Sunfish ranked second in the total harvest and 86% of the harvest came from Bluegill anglers. There was an estimated 179 Redear harvested. The length range was 4.0 to 8.5 in with an average length of 7.5 in. Comparing this to the 2008 survey there were 549 Redear Sunfish harvested. The length range and average length were almost identical for both surveys

It was estimated that 42 Largemouth Bass were harvested. Harvested bass ranged in length from 14.0 to 17.5 in and averaged 15.0 in. There were 7,474 bass caught and released and 14% (1,056 bass) were reported as 14 inches and greater. The catch rate for Largemouth Bass harvested and released by bass anglers was 1.30 fish/h; in 2008 it was 0.77 fish/h. The catch rate for legal size and greater also increased from 0.05 fish/h in 2008 compared to 0.20 fish/h in 2017. The average satisfaction rating for bass anglers was 3.2 out of 5. Bass anglers response to the Muskie fishing satisfaction question scored 2.3 out of 5. Bass anglers were asked if they approved of the Muskie stocking and 47% approved, 42% did not, 9% were neutral, and 2% did not respond.

There was one 38.7 in Muskie harvested during the survey period. The expansion formula estimated that there were three Muskie harvested during the survey. It was estimated that 617 Muskie were caught and released, of which, 41% or 253 Muskie were 36 in and greater. Targeted catch rate for Muskie was 0.06 fish/h. In 2008, an estimated 83 Muskie were caught and released and 46% were reported as 36 in and greater. The targeted catch rate for Muskie in 2008 was 0.03 fish/h. All anglers were asked if they observed Muskie following their lure. Fifty-six of the 283 fishing parties observed a total of 225 Muskie follows at Bass Lake. Muskie anglers rated their fishing trip satisfaction a 4.5 out of 5. The Muskie trip satisfaction was 4.1 out of 5, and 98% approved of the Muskie stocking.

Other species targeted by 5% of the anglers were crappie and Channel Catfish. The crappie harvest declined from the previous survey, but the previous survey included the month of March which was the highest harvest month for crappie in 2008. The 45 crappie harvested ranged from 12.0 to 15.0 in. The 14 Channel Catfish harvested was almost identical to the previous survey. Channel Catfish is an underutilized species at Bass Lake. Harvested Channel Catfish ranged from 22.0 to 27.0 in. During targeted Muskie sampling it was not uncommon to collect large and plentiful Channel Catfish.

Anglers from 33 of Indiana's 92 counties fished at Bass Lake during the creel period. Sullivan County and Greene County residents accounted for 46% of the anglers. Non-residents accounted for 2% of the anglers, and they resided in Kentucky, Illinois and Maryland.

Duck Lake

There were an estimated 367 anglers that fished approximately 847 h (14.4 h/acre) from April 3 through October 31, 2017. In 2008, from March through November there was an estimated 250 anglers that fished 1,060 h (18.0 h/acre) at Duck Lake. May and June had the highest fishing pressure (Table 2).

The total estimated catch was 4,202 fish, of which, 2,271 were harvested and 1,931 were released (Table 3). Harvest by weight totaled 491.49 lbs. Harvest consisted of Bluegill, Redear Sunfish and Warmouth. In 2008, the total harvest was 899 fish that weighed an estimated 358 lbs. Bluegill was the most sought-after species making up 41% of the angler preference. Bass anglers followed at 29%, anglers seeking “anything” made up 18%, and Muskie anglers made up 10%.

The Bluegill harvest was the highest by species with 1,885 harvested. The average length was 6.3 in with the largest at 8.5 in. Targeted catch rate for Bluegill was 1.09 fish /h. The average trip satisfaction rating for Bluegill anglers was 3.9 out of 5. Bluegill angler’s response to the Muskie fishing satisfaction question scored 1.7 out of 5. Bluegill anglers were asked if they approved of the Muskie stocking and 40% approved, 30% were neutral and 30% did not respond.

Redear Sunfish was second by harvest with 269 harvested at a length range of 4.0 to 8.5 in. Average length was 7.6 in. All Redear were harvested by anglers targeting Bluegill.

There was no harvest of Largemouth Bass, but there were 1,814 caught and released with 7% of the bass 14 in and greater. The average satisfaction rating for bass anglers was 3.7 out of 5. Bass angler’s response to the Muskie fishing satisfaction question scored 2.8 out of 5. Bass anglers were asked if they approved of the Muskie stocking and 50% approved, 30% were neutral and 20% responded no.

It was also estimated that there were 117 Muskie caught and released. None were reported as greater than 36 inches. Four Muskie follows were reported by anglers.

Overall, anglers rated their fishing trip satisfaction as a 3.9 out of 5. All anglers were asked if they approved of the Muskie stocking and 50% anglers chose not to answer, 30% of the anglers approved and 9% did not approve.

Anglers from 14 of Indiana’s 92 counties fished at Duck Lake during the creel period. Sullivan County and Greene County residents accounted for 31% of the anglers.

Public Access

The unique, and primitive features of the Dugger Unit make it appealing to anglers. However, the access from shore to boat may limit access to anglers with limited mobility. The nearby ADA accessible fishing dock is now being used as a loading dock for boats as well. As the popularity of Bass Lake increases it is recommended that a loading pier for boaters be installed so the ADA fishing pier can be used for its intended use.

The limited access and parking along the drive into Duck Lake may be the reason effort was low at Duck Lake. Widening the access road and increasing the size of the parking area is recommended to accommodate at least four boat trailers for parking.

Economic Benefit

Fishing related expenditures such as bait, tackle, food, license fees, lodging and transportation represent a monetary value for both Bass and Duck Lakes. The national average cost for a fishing trip outside the Great Lakes was \$36/day in 2016 (U.S. Department of the Interior and U.S. Fish & Wildlife Service 2016). At Bass Lake 2,180 anglers fished during the survey season representing an economic value of \$78,480. At Duck Lake there were 367 estimated fishing trips for an economic value of \$13,212. There were an estimated 420 anglers that targeted Muskie at both lakes which represents an economic benefit of \$15,120.

DISCUSSION

The Dugger unit has 16 lakes ranging from 1 to 220 acres. Bass and Duck Lakes were the only lakes creeled in 2017. The angler attendance at both Bass and Duck Lakes increased 14% and 31%, respectively since the last creel survey in 2008. In 2008, the creel ran for 8 months and in 2017 the creel ran 6 months. At Bass Lake angler attendance increased but the harvest decreased. In the 2008 creel survey, much of the crappie harvest occurred in March. There was a 94% decrease in crappie harvested in 2017, most likely because the survey started in April. The Muskie program began in 1997 at Bass Lake and in 2008 at Duck Lake. The increased attendance and the increased catch for both Largemouth Bass and Muskie at Bass Lake are good signs the popularity of this lake is improving. The catch rate for anglers targeting Muskie increased almost twofold (48%).

At Bass Lake the Muskie population has been developing for 19 years at the standard stocking rate (5 fish/ac) for Indiana. The last Muskie survey in 2016 evaluated the number caught, age and average weight of the fish (King 2017). The stocking rate for Muskie of 5 fish/ac is no longer necessary to develop this population. Muskie are often considered a trophy species. They are long-living fish and past and present surveys have shown that there is very low harvest. Maintaining the population and increasing the size of Muskie takes habitat and enough food to allow these fish to reach their potential before dying of old age. Largemouth Bass are the most popular species that anglers target at the Duggar Unit. Maintaining adequate forage for bass is also a management priority. It is recommended to reduce the stocking rate to 3 fall Muskie fingerlings per acre annually to maintain recruitment while maintaining enough forage to support a healthy population of mature Muskie and Largemouth Bass. The Duck Lake stocking rate will remain at 5 fish/ac. Bass Lake remains the best opportunity to see and catch Muskie of the two lakes.

RECOMMENDATIONS

- Reduce the Muskie stocking rate at Bass Lake to 3 fish/acre.
- Continue stocking Muskie at Duck Lake at 5 fish/acre.
- Pursue expanding boat trailer parking at Duck Lake to four vehicles and widening the access road.
- Pursue a dock at Bass Lake to allow anglers to moor boats while parking vehicles.

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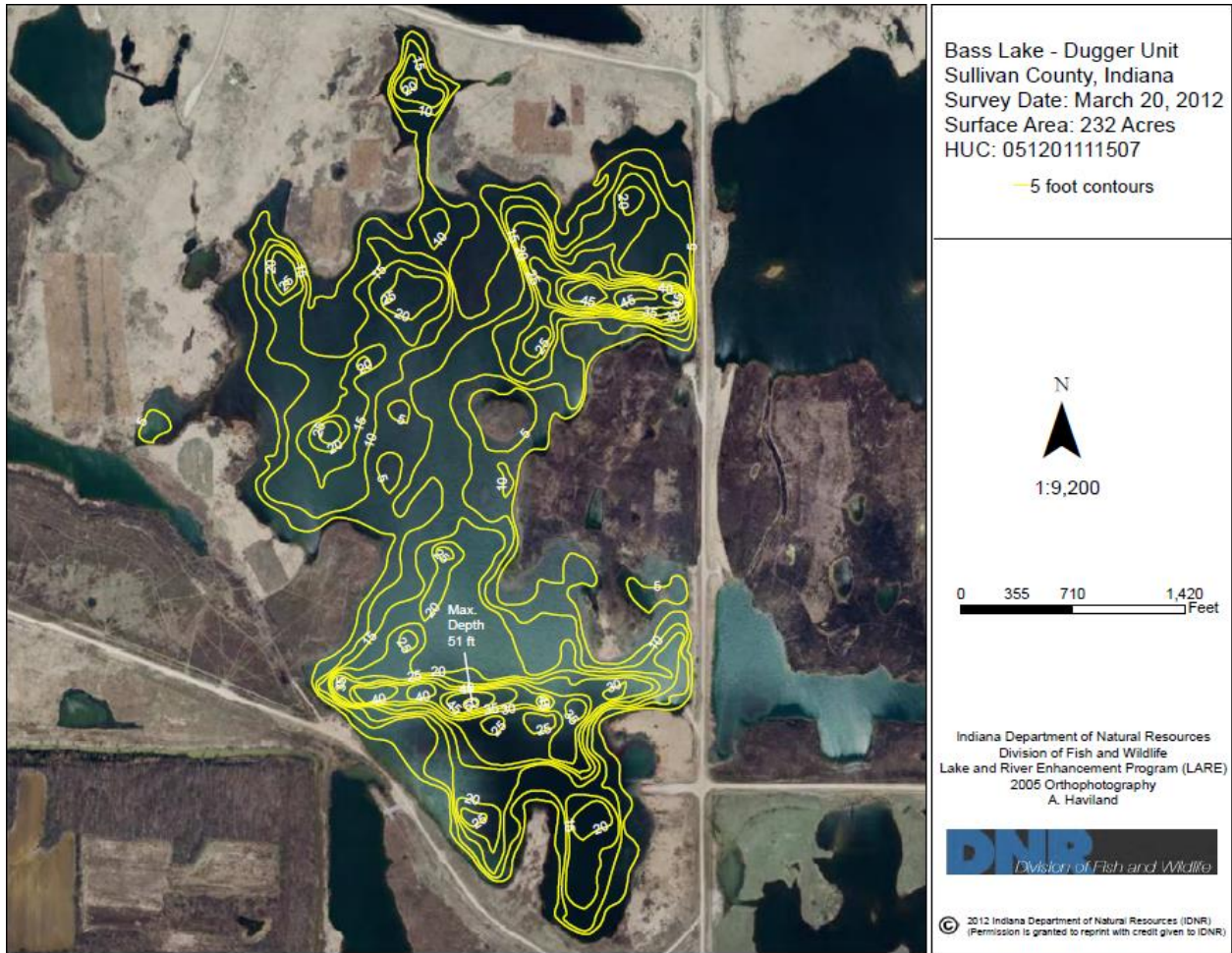


Figure 1. Bass Lake bathymetric map.

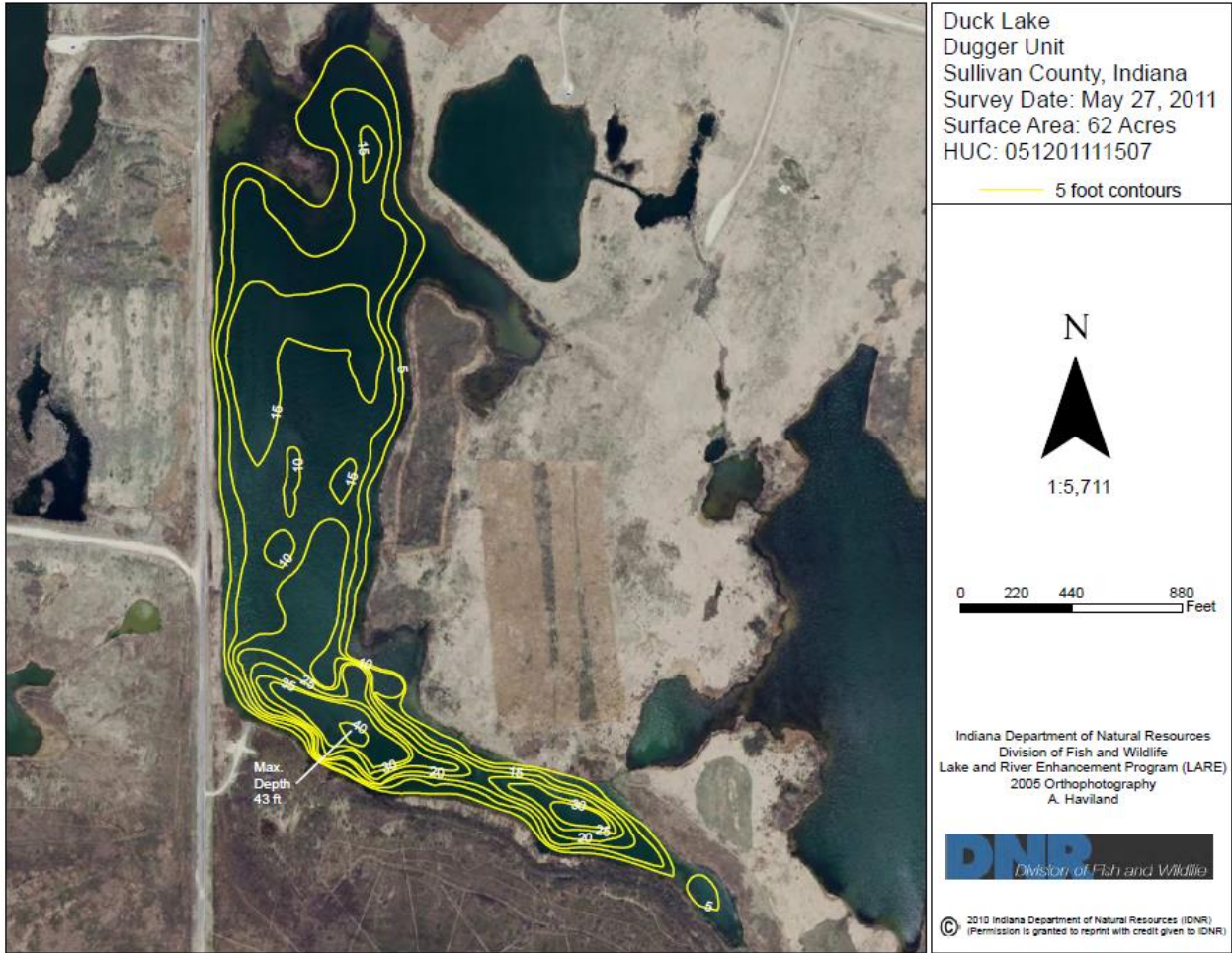


Figure 2. Duck Lake bathymetric map.

Table 1. Muskie stocking history of Bass and Duck Lakes.

Bass Lake			Duck Lake		
Year	Total Number	Stocking Rate	Year	Total Number	Stocking Rate
1997	2,200	10/ac	2008	295	5/ac
1998	1,760	8/ac	2009	295	5/ac
1999	1,760	8/ac	2010	295	5/ac
2000	1,760	8/ac	2011	295	5/ac
2001	3,520	16/ac	2012	295	5/ac
2002	1,760	8/ac	2013	295	5/ac
2003	1,759	8/ac	2014	295	5/ac
2004	1,100	5/ac	2015	295	5/ac
2005	1,100	5/ac	2016	295	5/ac
2006	1,110	5/ac	2017	118	2/ac
2007	446	2/ac			
2008	1,100	5/ac			
2009	1,100	5/ac			
2010	1,110	5/ac			
2011	1,100	5/ac			
2012	1,100	5/ac			
2013	1,111	5/ac			
2014	1100	5/ac			
2015	1110	5/ac			
2016	1111	5/ac			
2017	445	2/ac			

Table 2. Estimated fishing pressure in hours, anglers, and hours per acre by month for Bass and Duck Lakes 2017.

	Bass Lake			Duck Lake		
	Estimated Hours	Estimated Anglers	Fishing Pressure h/ac	Estimated Hours	Estimated Anglers	Fishing Pressure h/ac
April	1,332	315	6.1	34	121	0.6
May	1,702	344	7.7	346	114	5.9
June	1,355	347	6.2	173	40	2.9
July	1,851	373	8.4	65	52	1.1
August	1,519	272	6.9	72	17	1.2
September	1,122	265	5.1	31	4	0.5
October	1,432	264	6.5	125	19	2.1
Total	10,313	2,180	46.9	847	367	3.8

Table 3. Fish species harvested by number, percent, weight, and caught and released for Bass and Duck Lakes 2017.

Bass Lake					
Species	Harvested	%	Weight	Catch and Released < legal	>legal
Bluegill	709	71.0	198.95		
Redear Sunfish	138	13.8	42.36		
Warmouth	47	4.7	15.58		
Crappie	45	4.5	67.77		
Largemouth Bass	42	4.2	80.97	6,418	1,056
Channel Catfish	14	1.4	90.20		
Muskie	3	0.3	36.00	364	253
	998		531.83		

Duck Lake					
Species	Harvested	%	Weight	Catch and Released < legal	>legal
Bluegill	1,885	83.0	386.09		
Redear Sunfish	269	11.8	82.00		
Largemouth Bass				1,677	137
Warmouth	117	5.2	23.40		
Muskie				117	
	2,271		491.49		