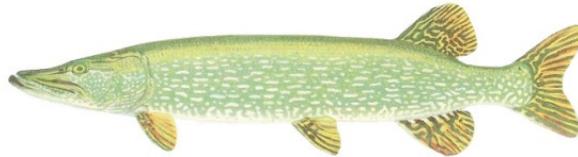


A HISTORICAL REVIEW OF NORTHERN PIKE (ESOX LUCIUS)  
IN THE RECORD FISH AND FISH-OF-THE-YEAR PROGRAMS  
AND RECOMMENDATIONS FOR FUTURE RESEARCH



FINAL REPORT

STEVEN B. DONABAUER  
ASSISTANT FISHERIES RESEARCH BIOLOGIST



FISHERIES SECTION  
INDIANA DEPARTMENT OF NATURAL RESOURCES  
INDIANA DIVISION OF FISH & WILDLIFE  
I.G.C.-SOUTH, ROOM W 273  
402 WEST WASHINGTON STREET  
INDIANAPOLIS, IN 46204

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## EXECUTIVE SUMMARY

- Northern pike (pike) are a native species in Indiana primarily found in the glacial lakes and rivers of northern Indiana, which represents the southernmost extent of their range.
- The Indiana Comprehensive Wildlife Strategy developed in 2005, classified pike as the *representative species* of the coolwater habitat guild for glacial lakes.
- Pike generate approximately \$6.6 million annually in Indiana and recent preference surveys indicated that northern Indiana anglers rank pike 7<sup>th</sup> among 26 game fish.
- The goals of this study were to better understand the trophy potential of pike in Indiana and propose recommendations for future pike research.
- The objectives of this research were to summarize Record Fish (RF) and Fish-of-the-Year (FOTY) pike by: (1) length and weight; (2) condition; (3) length-weight relationships; (4) county and waterbodies; (5) month and decade; (6) bait or lure type; (7) lunar phase; and (8) present a statistical prediction for the next state record pike in Indiana.
- Pike in the RF and FOTY programs were of quality (2%; 21 to 27.9 in), preferred (6%; 28 to 33.4 in), memorable (73%; 34 to 43.9 in), and trophy (19%; 44+ in) size classes.
- Pike submitted into the RF program were caught in the late spring (May-June) or fall (October-November); pike in the FOTY program were caught more frequently by season in May (late spring), August (summer), October (fall) and February (winter).
- Pike submitted into the RF and FOTY programs were caught on minnows (52%), spoons (13%), crankbaits (11%), spinners (10%), artificial lures (8%) and live bait (6%).
- More pike were caught during the lunar phases that coincided with the full moon (66%; N = 33) than during the lunar phases that coincided with the new moon (34%; N = 17).
- The mathematical models developed for state record pike suggest the next record pike is likely to be caught from a glacial lake by 2028 at a size of 50.0 in and 32 lbs, 10 oz.
- It is recommended that: (1) the history and scale of pike management and research in Indiana be reviewed; (2) trap nets be tested for their effectiveness to collect numbers and sizes of pike; (3) prime pike sampling locations be identified; (4) winter creel surveys for pike be considered; (5) other resource stewards interested in pike management and research be identified; and (6) the IDNR determine whether contemporary demands on pike resources warrant a full review of current harvest regulations.

## ACKNOWLEDGEMENTS

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## INTRODUCTION

Northern pike *Esox lucius* (hereafter referred to as pike) are a coolwater circumpolar species found in North America and Eurasia (Farrell et al. 2008). Pike populations are generally limited to the glacial lakes and rivers of northern Indiana, which represents the southernmost extent of their native range (Simon and Tomelleri 2011). Where pike exist in the Hoosier State (Cwalinski 2000), they are usually the top predators and sensitive to anthropogenic habitat modification (Casselman and Lewis 1996). To this end, pike have been identified as the *representative species* by technical experts, conservation partners, and concerned public stewards in the Indiana Comprehensive Wildlife Strategy (Gremillion-Smith 2005), where they were selected from the coolwater habitat guild to “*paint a reasonable mental picture of an associated habitat type...and a desire to protect, enhance, or somehow improve that habitat.*”

Current sport harvest regulations for pike in Indiana have been in effect since 1969 that include a 3 fish per day creel (6 fish possession limit) and a 20 inch minimum size limit. Pike anglers generally pursue pike due to their highly aggressive nature, trophy size potential, and excellent table fare. The percentage of anglers that specifically target pike in Indiana is quite low (1.1%) and just slightly higher (2.0%) among anglers in the northern half of the state (Broussard and Haley 2005). Nevertheless, pike sport fishing generates approximately \$6.6 million annually in Indiana (USFWS 2006; Appendix A), which ranks pike 13<sup>th</sup> among 26 species of game fish (Appendix B). Moreover, when northern Indiana anglers were asked which species of fish they most *preferred* to catch (contrary to what they *actually* pursued), pike ranked seventh only behind several species of centrarchids (bluegill, crappie, largemouth and smallmouth bass) and percids (walleye and yellow perch).

The principle goal of this study is to better understand the trophy potential of pike in Indiana, but also to set the stage for future research by proposing a set of recommendations that aim to build upon existing knowledge of pike in Indiana. The primary objectives of this research were to summarize the Record Fish (RF) and Fish-of-the-Year (FOTY) programs for pike that include: (1) length and weight frequency data; (2) condition; and (3) length-weight relationships among 3 resource types (Impoundments, Glacial Lakes, and Rivers). The secondary objectives of this research were to identify where, when, and how trophy pike have historically been harvested by: (4) county and waterbody; (5) month and decade; and (6) bait or lure type. The

final objectives originated from thought-experiments: (7) does the lunar phase influence when trophy pike are caught (Kuparinen et al. 2010); and (8) can a mathematical model based on historic state record pike data offer a reasonable statistical prediction as to when (year) and how large (lbs) the next state record pike will be in Indiana?

## METHODS

### Background

The Indiana DNR has recognized RF and FOTY for game fish since 1963 and the current rules governing the programs (Appendix C) and a standardized entry form (Appendix D) is advertised online and available as part of the annual fishing regulation guide. The official records regarding the RF and FOTY programs are archived in Indianapolis and were accessed on 14 September 2011. All pike documents in the RF program were photocopied and stored in the pike files in the library at the Northeast Regional Office (NERO; Columbia City, Indiana). A thorough search was conducted for all pike records in the FOTY program files. When a FOTY pike record was identified, standard data was tabulated (Appendix E). It should be assumed that FOTY data is a composite analysis. That is, all FOTY data submitted by anglers was pooled together, to include all entries submitted in any particular year, not only those entries that won the prize for FOTY. All RF and FOTY data was entered into a spreadsheet so the data could be sorted and manipulated to provide summary and trend information regarding pike catches from 1963 through 2010.

### Length, weight, and condition

Length and weight frequency charts were used to illustrate the distribution of pike catches for the RF and FOTY programs. Summary statistics were developed for length (in), weight (lbs), and condition (relative weight,  $W_r$ ), of pike submitted into the RF and FOTY programs that were caught from three resource types that included impoundments, rivers, and glacial lakes. Condition of pike was estimated by the relative weight  $W_r$  equation:

$$W_r = (W/W_s) \cdot 100$$

where  $W$  is the observed weight of an individual fish and  $W_s$  is the length specific standard weight developed for pike by Bister et al. (2000):

$$\log_{10}(W_s) = 3.096(\log_{10}L) + (-3.745)$$

All length, weight, and condition data were summarized using percentiles [well below average (0-5%); below average (5-25%); average (25-75%); above average (75-95%); and well above average (95-100%)]. Lastly, length-weight regression statistics were generated for pike caught from each resource type using the equation:

$$\log_{10}W = m(\log_{10}L) + b$$

where  $W$  is the weight (lbs),  $L$  is the length in inches,  $m$  is the slope and  $b$  is the intercept of the regression. Each line-of-best-fit by resource type was used to model the weights for minimum size classes of Memorable (34 in;  $M_{34}$ ) and Trophy (44 in;  $T_{44}$ ) pike. The regressions were also used to predict the weight of a theoretical 50 inch Record ( $R_{50}$ ) pike to statistically identify which resource type had the best potential to produce a new state record.

#### Where, when, and how pike have been harvested

The frequencies of pike submitted into the RF and FOTY programs were summarized in tabular format by county, resource type, and waterbody from 1963 through 2010. The frequencies of pike submitted into the RF and FOTY programs are graphically illustrated by calendar month and decade. The frequencies of pike caught on specific bait or lure types by anglers were categorized (minnow, tip-up, crank-bait, spinner, spoon, artificial lure, and live bait) and graphically illustrated.

#### The lunar influence and a statistical prediction for the next state record pike

The exact date of capture for pike submitted into the RF and FOTY programs were identified ( $N = 50$ ) and used to back-calculate the fraction of lunar illumination using online lunar tables (<http://aa.usno.navy.mil/data/docs/MoonFraction.php>). These data were summarized to calculate the *observed* number of pike caught in each of 8 common lunar phases (i.e., waning

crescent, new, waxing crescent, first quarter, waxing gibbous, full, waning gibbous, and last quarter). The length of one complete lunar cycle is 29.5 days, thus, the duration of each lunar phase was defined as 12.5% each or approximately 3.7 days per phase. The null hypothesis stated that pike would be caught at random relative to lunar phase using the following logic: by knowing (1) the number of lunar phases ( $N = 8$ ) within a full lunar cycle, and (2) that 50 pike were submitted into the RF and FOTY programs with known dates, the *expected* number of pike that should have been caught (if the null hypothesis were true) should be equal to 6.25 pike per phase (i.e., 50 pike/8 phases = 6.25 pike/phase). This *expected* catch was tested against the *observed* catch (using the back-calculated fraction of lunar illumination tables) with a Kolmogorov-Smirnov cumulative frequency statistic (Statistix 9.0, Tallahassee, Florida).

Each year a new record-breaking pike was established and the duration of that specific record was graphically represented. The year (x-axis) and weight (y-axis) of pike in the RF program were plotted on a chart from 1963 through 2010 and a logarithmic equation was fitted to these data points and time-forecasted to predict *how large* the next state record pike will be given any year from the present (2011) through 2063. A second model was generated on the same graph, but rather than fitting the model to the weight of record pike, the equation was fit to the *last-year* of a records' era to describes the *duration* of each era of a record pike and used to predict *when* the next state record pike may be caught in Indiana.

## RESULTS

### Length, weight, and condition

Pike caught from rivers and glacial lakes had similar median lengths slightly higher (42.1 and 42.0 in, respectively) than pike from impoundments (40.1 in). The maximum lengths for pike caught from glacial lakes, rivers, and impoundments were 48.5, 44.0, and 42.8 in, respectively (Table 1). Two percent of pike submitted into the RF and FOTY programs were of quality size (21 to 27.9 in), 6% were of preferred size (28 to 33.4 in), 73% were of memorable size (34 to 43.9 in), and 19% were of trophy size (44+ in; Anderson and Neumann 1996; Figure 1). Pike caught from glacial lakes had a higher median weights (20.0 lbs) compared to pike from impoundments (19.1 lbs) or rivers (18.4 lbs). The maximum weights for a pike from glacial lakes, rivers, and impoundments were 30.1, 28.9, and 22.2 lbs, respectively (Table 1).

Fifty percent (25<sup>th</sup> to 75<sup>th</sup> percentile) of pike submitted into the RF and FOTY programs were between 17.5 and 22.1 lbs, while the smallest and largest pike weighed 11.5 and 30.1 lbs, respectively (Figure 2). Pike caught from impoundments had a higher median relative weight (110) than pike from glacial lakes (102) or rivers (97). The maximum relative weight between rivers and impoundments was higher (157) than reported for glacial lakes (126; Table 1).

Length-weight regression models for pike from glacial lakes had the best fit to the data ( $r^2 = 0.79$ ) compared to impoundments ( $r^2 = 0.36$ ) and rivers ( $r^2 = 0.17$ ; Table 2). The regression models predict that a theoretical Record pike of 50 in ( $R_{50}$ ) would weigh the most if it were to come from a glacial lake (31.6 lbs) followed by an impoundment (31.2 lbs) or river (28.3 lbs; Table 2).

#### Where, when, and how pike have been harvested

Pike submitted into the RF and FOTY programs were caught among 17 different counties in Indiana (Figure 3). However, 59% of the pike entries were caught from LaGrange, Steuben, and Kosciusko counties (Table 3). Pike were caught from glacial lakes (56%), rivers (24%), and impoundments (20%). The most pike caught from any single waterbody included Clear Lake (Steuben County) and the Pigeon River (12%; LaGrange County; Table 4).

Pike submitted into the RF program were caught in the late spring (May-June) or fall (October-November), while pike in the FOTY program were caught more frequently by season in May (spring), August (summer), October (fall) and February (winter) and less frequently during other months within each season of the calendar year (Figure 4). The number of pike submitted into the RF and FOTY programs was fairly stable from the 1960's through the 1990's (range: 4 to 7 pike/decade) and increased in the 2000's (22 pike/decade) and the first year of the current decade (5 pike/2010; Figure 5).

Fifty-two percent ( $N = 27$ ) of the pike submitted into the RF and FOTY programs were caught on minnows by rod and reel ( $N = 17$ ) or winter tip-up ( $N = 10$ ) on shiner minnows ( $N = 12$ ), chubs ( $N = 7$ ), or an unspecified minnow ( $N = 8$ ). Other lures or baits that pike were caught on included spoons (13%), crankbaits (11%), spinners (10%), other artificial lures (8%), and other live bait (6%; Figure 6).

### The lunar influence and a statistical prediction for the next state record pike

Although there were deviations between the number of pike *expected* per lunar phase and the pike actually *observed* per lunar phase (Table 5; Figure 7), the differences were not statistically significant ( $D = 0.16, p = 0.285$ ) given the current sample size ( $N = 50$ ). Nevertheless, these data seem to illustrate a pattern where nearly half of all the pike (44%;  $N = 22$ ) caught were *observed* during the full and new moons when just 25% ( $N = 12.5$ ) were *expected* to be caught during these phases. Similarly, observations during the waxing and waning gibbous phases show that slightly more pike were *observed* (32%;  $N = 16$ ) than *expected* (25%;  $N = 12.5$ ). On the contrary, just 5 (10%) pike were *observed* during the waxing and waning crescent phases when 12.5 (25%) pike were *expected*. The number of pike *expected* during the first quarter was 6.25 (12.5%), yet just 1 (2%) pike was *observed*. The *expected* number of pike during the last quarter moon was also 6.25 (12.5%) and 6 (12%) pike were *observed* during this phase. By artificially increasing the sample size (assuming that the *observed* distribution patterns described above for each lunar phase hold constant throughout the full lunar cycle), it was determined that that a statistically significant result would not be achieved until samples sizes reach 90 or 115 pike for  $\alpha$ -values of 0.10 and 0.05, respectively (Table 6).

The Indiana state record for pike has been broken four times since it was first set in 1963 (Figure 8). The original state record (Appendix F) was broken the following year in 1964 (Appendix G), and again in 1972 (Appendix H), 1983 (Appendix I), and 1992 (Appendix J). Two logarithmic models were time-forecasted through 2063 using historic *weight* data (Model 1) and the *duration* of each record (Model 2) to predict *how large* (lbs) and *when* (years) the next state record pike might be caught in Indiana. Using the models, it is likely that the current state record pike (30 lbs, 2 oz) may stand through the year 2028. If the record were to be broken in that year, the logarithmic models predict that the new state record may weigh up to 32 lbs, 10 oz. By comparison, if the record were broken this year (2011), the predicted weight would be 1.5 pounds larger (31 lbs, 10 oz) than the current state record. Any record-breaking pike scenario (lbs vs. year) can be determined using the mathematical models provided in Figure 9. Model 1 (*weight*) and Model 2 (*duration*) appear to have reasonable predictive power given the high  $r^2$  values fit to the historic record pike data (0.9986 and 0.8385, respectively).

## DISCUSSION

The principle goal of this study was to better understand the trophy potential of pike in Indiana. Trophy pike, as defined by the internationally accepted minimum standard of 44.0 in (Anderson and Neumann, 1996), exist in Indiana waters where nearly 1 in 5 (19%) pike entered into the RF and FOTY programs (pooled data) met that standard. Moreover, many more (73%) memorable (33.9 in < memorable < 44.0 in) pike were entered into the RF and FOTY programs. The history of the FOTY program indicates, that on average, one pike has been submitted into the program per year. Since the turn of the century, however, annual entries of pike into the FOTY program have more than doubled (2.5 pike/year) and 5 pike were submitted in 2010 alone. Clearly, big pike are present in Indiana and there is either growing interest from anglers in catching big pike or an increased awareness of the RF and FOTY programs.

Data from the RF and FOTY programs indicate that large pike have been caught in impoundments, rivers, and glacial lakes in Indiana. Although trophy pike (> 44 in) have been caught in rivers and glacial lakes, length-weight relationships and condition factors indicate that near record-breaking pike are primarily caught in Indiana's glacial lakes. Approximately, 25% of Indiana's glacial lakes contain pike (Cwalinski 2000; IDNR 1983). Yet, the largest pike entered into the RF and FOTY programs have been caught consistently in only a few of these waters. The current Indiana state record pike was caught from Clear Lake (Steuben County), which has also produced 6 other large pike (41.25 to 48.0 in and 19.4 to 29.0 lbs) that were entered into the FOTY program from 2002 to 2007. Two questions immediately arise: What factors have enabled Clear Lake to produce so many big pike? Do other lakes exhibit similar characteristics where we might anticipate comparably large pike to be caught in the near future?

Trophy pike require specific habitat characteristics that include vegetated spawning habitat, large expanses of clear cool-water sanctuaries during the summer months, and an abundant prey source of cylindrically-shaped fish (MDNR 1989). Clear Lake (Steuben County) meets the necessary habitat requirements to produce trophy pike: aquatic vegetation near the inlets of the south and southwest shorelines; it is large (800 ac), deep (107 ft), clear (20.0 ft Secchi depth), and has large expanses of cool water (< 61 °F) with high dissolved oxygen concentrations (> 9.4 ppm) throughout the water column; and the lake has abundant and diverse stocks of cylindrical forage fish that included yellow perch, white sucker, gizzard shad, and

golden shiner (Koza 1998). Clear Lake is also managed as a *two-story* fishery where traditional warm-water game fish are available (i.e., bluegill, largemouth bass, etc.) in addition to a supplemental cold-water fishery that includes an annual stocking of 3,500 rainbow trout by the IDNR since 1972. Anecdotal evidence suggests trophy pike have been observed preying on stocked rainbow trout in Clear Lake (L. Koza, IDNR, personal communication). Interestingly, no pike were collected in the initial fisheries survey on Clear Lake (Peterson 1972), only one pike (22.1 in) was collected in 1982 (Ledet 1982), while 13 pike (16.5 to 39.8 in) were collected in 1996 (Koza 1998). Thus, a trophy pike fishery seems to have inadvertently emerged, at least in-part, due to several decades of continued annual stocking of rainbow trout in Clear Lake.

Oliver Lake (LaGrange County), Lake Gage (Steuben County), and South Twin Lake (LaGrange County) are three other glacial lake fisheries in northern Indiana that exhibit similar quality habitat characteristics for pike as found in Clear Lake. Oliver Lake (371 ac) and Lake Gage (327 ac) are currently managed as *two-story* fisheries that have been stocked annually with several thousand rainbow trout (plus irregular stockings of brown trout) by the IDNR since the mid-1970's. Ledet (1984a) reported five pike (25.5 to 36.5 in) collected in the initial fisheries survey of Oliver Lake. Three pike (27.0 to 33.5 in) were collected in the initial survey of Lake Gage (Peterson 1977), while Ledet (1984b) re-surveyed Lake Gage in 1983 and reported that 11 pike were collected between 21.5 and 26.0 in. South Twin Lake (116 ac) was formerly managed as a *two-story* fishery and stocked annually with approximately 750 rainbow trout from 1986 to 1997 and was stocked periodically with brown trout and lake trout from 1976 to 1985. Ledet (1987) reported pike between 24 and 42 in collected in a survey of South Twin Lake and wrote: "*Although not numerous, 'trophy sized' pike are present*" and went on to write "*South Twin Lake should be managed specifically for trout*". However, in the late 1990's the IDNR's policy changed such that lakes without public access were no longer eligible to receive state-reared fish. Nevertheless, South Twin Lake has a thriving and self-sustaining population of cisco (Ledet 1987), which serves to maintain the *two-story* character of the fishery in South Twin Lake. Although no pike have been entered into the RF or FOTY programs from Oliver Lake, Lake Gage, or South Twin Lake, given their available habitat characteristics and forage base similarities compared to Clear Lake, it is likely that trophy pike (and possibly even record pike) exist in these waters.

The pike data archived in the RF (N = 5) and FOTY (N = 47) programs are limited but valuable. These data provide base-line information for a rare trophy fish: the size and frequency of trophy pike in Indiana, where trophy pike exist, and when and how trophy pike have been caught by anglers. The data mining effort conducted within this report should serve as a renewed commitment by the IDNR to conduct the research necessary to suitably manage the geographic distribution and abundance of Indiana's pike fisheries. Furthermore, IDNR should strive to sustain or enhance the trophy pike fisheries in Indiana through the support of policies that directly protect Indiana's premier pike populations and their habitats.

## RECOMMENDATIONS

Northern pike are: (1) at the southernmost extent of their native range in northern Indiana; (2) classified as the *representative species* of the coolwater habitat guild; and (3) a preferred game fish among northern Indiana anglers. In August 2011, the fisheries section assigned the north region research unit to develop a statewide management plan for this species under the sections strategic guidance. It is recommended that the objectives of this management plan address:

- the history and scale of pike management and research in Indiana through a comprehensive in-state literature review that results in an exhaustive bibliography
- the utility of trap nets (traditionally used to collect muskellunge broodstock) as an effective sampling technique to catch adequate numbers and sizes of pre-spawn (i.e., March) pike
- what the highest priority sampling locations should be by taking into consideration pike populations that contain (1) trophy, (2) premier, and (3) marginal pike populations
- the need for winter creel surveys to estimate the number of anglers that target pike
- where pike management and research interests overlap between IDNR and other resource stewards (i.e., Indiana Spoonpluggers Club, <http://spoonplug.net/spoonplug/IN2011.html>) and how best to collaborate on efforts that are mutually beneficial
- whether contemporary demands on pike resources warrant a full review of current harvest regulations that have been in effect for 42 years and that were originally imposed to distribute the catch and protect adults until they could spawn at least once

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#### APPROVAL

Submitted by: Steven B. Donabauer  
Assistant Research Biologist  
Submitted: September 30, 2011

Approved by: Jeremy Price  
North Region Supervisor  
Approved: March 19, 2012

Table 1.— Summary statistics for length (in), weight (lbs), and condition (relative weight,  $W_r$ ), of northern pike from impoundments, rivers, and glacial lakes that were submitted into the Record Fish and Fish-of-the-Year programs from 1963 through 2010.

Length (in)	N	Percentiles						
		Min	5%	25%	Med	75%	95%	Max
Impoundment	9	36.0	36.5	38.0	40.5	41.5	42.5	42.8
River	10	38.5	39.6	41.6	42.1	43.2	44.0	44.0
Glacial Lake	23	35.0	39.1	40.4	42.0	45.1	48.1	48.5
<b>Weight (lbs)<sup>1</sup></b>								
Impoundment	9	11.5	12.1	17.4	19.1	22.0	22.1	22.2
River	10	14.0	15.6	17.9	18.4	22.6	26.5	28.9
Glacial Lake	23	11.5	13.7	17.7	20.0	22.6	29.0	30.1
<b>Relative Weight (<math>W_r</math>)</b>								
Impoundment	9	87	91	99	110	116	152	157
River	10	79	84	94	97	106	140	157
Glacial Lake	23	79	86	95	102	107	121	126

<sup>1</sup> Weights for the Fish-of-the-Year program are reported as voluntary information by the angler who submitted the entry form.

Table 2.— Length-weight regression statistics [where:  $\log_{10}W = m(\log_{10}L)+b$ ] of northern pike caught from impoundments, rivers, and glacial lakes that were submitted into the Record Fish and Fish-of-the-Year programs from 1963 through 2010. The regressions were applied to predict the weights for minimum size classes of Memorable (34 in;  $M_{34}$ ), Trophy (44 in;  $T_{44}$ ), and theoretical Record northern pike (50 in;  $R_{50}$ ).

Resource Type	Length-Weight Regression Statistics			Weight (lbs) at Minimum Size Class		
	Slope (m)	Intercept (b)	$r^2$	$M_{34}$	$T_{44}$	$R_{50}$
Impoundment	2.4069	-2.5954	0.36	12.3	22.9	31.2
River	2.1093	-2.1320	0.17	12.5	21.6	28.3
Glacial Lake <sup>1</sup>	2.7891	-3.2387	0.79	10.8	22.1	31.6

<sup>1</sup> The current length-weight regression used by IDNR to estimate pike weight based on standard survey data for glacial lakes is  $\log_{10}W = 3.14083(\log_{10}L) - 3.84897$  (J. Pearson, IDNR, personal communication), which, when applied to large pike equates to:  $M_{34} = 9.1$ ,  $T_{44} = 20.6$ , and  $R_{50} = 30.7$ .

Table 3.— Frequency of northern pike submitted into the Record Fish and Fish-of-the-Year programs by county in Indiana from 1963 through 2010.

County	Fish-of-the-Year Frequency (N)	Record Fish Frequency (N)	Total Frequency (%)
LaGrange	10	1	21
Steuben	10	1	21
Kosciusko	8	1	17
Lake	4	0	8
Elkhart	2	0	4
Marshall	1	1	4
Noble	2	0	4
Starke	1	1	4
Crawford	1	0	2
Dubois	1	0	2
Fulton	1	0	2
Jefferson	1	0	2
LaPorte	1	0	2
Monroe	1	0	2
Porter	1	0	2
Scott	1	0	2
Union	1	0	2
Total	47	5	100

Table 4.— Frequency of northern pike by resource type and waterbody in Indiana submitted into the Record Fish and Fish-of-the-Year programs from 1963 through 2010.

<u>Resource Type</u>	County	Fish-of-the-Year Frequency (N)	Record Fish Frequency (N)	Total Frequency (%)
<u>Waterbody</u>				
<u>Impoundment</u>				
Hardy	Jefferson/Scott	2	0	4
Mongo Mill Pond	LaGrange	2	0	4
Patoka	Crawford/Dubois	2	0	4
St. Joseph	Elkhart	2	0	4
Brookville	Union	1	0	2
Monroe	Monroe	1	0	2
<u>Glacial Lake</u>				
Clear	Steuben	6	1	13
Snow	Steuben	3	0	6
Bass	Starke	0	1	2
Big Long	LaGrange	1	0	2
Bruce	Fulton	1	0	2
Chapman	Kosciusko	1	0	2
Diamond	Noble	1	0	2
Dollar	Noble	1	0	2
Emma	LaGrange	0	1	2
James	Steuben	1	0	2
Koontz	Starke	1	0	2
Sechrist	Kosciusko	1	0	2
Stone	LaPorte	1	0	2
Syracuse	Kosciusko	1	0	2
Tippecanoe	Kosciusko	0	1	2
Unspecified Lake	Kosciusko	1	0	2
Unspecified Lake	LaGrange	1	0	2
Unspecified Lake	Lake	1	0	2
Unspecified Lake	Porter	1	0	2
Wawasee	Kosciusko	1	0	2
Winona	Kosciusko	1	0	2
Wolf	Lake	1	0	2
<u>River</u>				
Pigeon	LaGrange	6	0	12
Tippecanoe	Kosciusko/Marshall	3	0	6
Kankakee	Lake	2	0	4
Yellow	Marshall	0	1	2
<u>Total</u>		<u>47</u>	<u>5</u>	<u>100</u>

Table 5.—The *expected* catch of pike (N = 50) compared to the *observed* catch of pike (N = 50) per lunar phase. The null hypothesis stated that the *expected* percent (Pct.) of pike caught during each lunar phase is equal to the percent (Pct.) composition of each phase within the Total Cycle; that is, lunar phase does not influence when pike are caught. Yet, more pike (66%; N = 33) were caught during the 4 lunar phases that coincided with the full moon (i.e., Waxing Gibbous → Full Moon → Waning Gibbous → Last Quarter) than during the 4 lunar phases that coincided with the new moon (34%; N = 17; Waning Crescent → New Moon → Waxing Crescent → First Quarter). Nevertheless, the results of this study support the null hypothesis, which indicated there was not a statistical difference between the *observed* and *expected* distributions ( $D = 0.16, p = 0.285; N = 50$ ). See Figure 7 for a graphical representation of these data.

Lunar Phase	Total Cycle		Expected		Observed	
	Days	Pct.	N	Pct.	N	Pct.
Waning Crescent	3.6875	12.5	6.25	12.5	2	4.0
New	3.6875	12.5	6.25	12.5	11	22.0
Waxing Crescent	3.6875	12.5	6.25	12.5	3	6.0
First Quarter	3.6875	12.5	6.25	12.5	1	2.0
Waxing Gibbous	3.6875	12.5	6.25	12.5	9	18.0
Full	3.6875	12.5	6.25	12.5	11	22.0
Waning Gibbous	3.6875	12.5	6.25	12.5	7	14.0
Last Quarter	3.6875	12.5	6.25	12.5	6	12.0
Total	29.5	100.0	50	100.0	50	100.0

Table 6.— Assuming that the *observed* lunar distribution patterns described in Table 5 and Figure 6 hold constant throughout the full lunar cycle and by artificially increasing the size (N), it was determined that that a statistically significant result would not be achieved until samples sizes reach 90 or 125 pike for  $\alpha$ -values of 0.10 and 0.05, respectively.

N	P-value ( $\alpha$ )
50	0.2850
65	0.1571
75	0.1353
85	0.1069
90	0.0807
95	0.0601
110	0.0595
125	0.0387

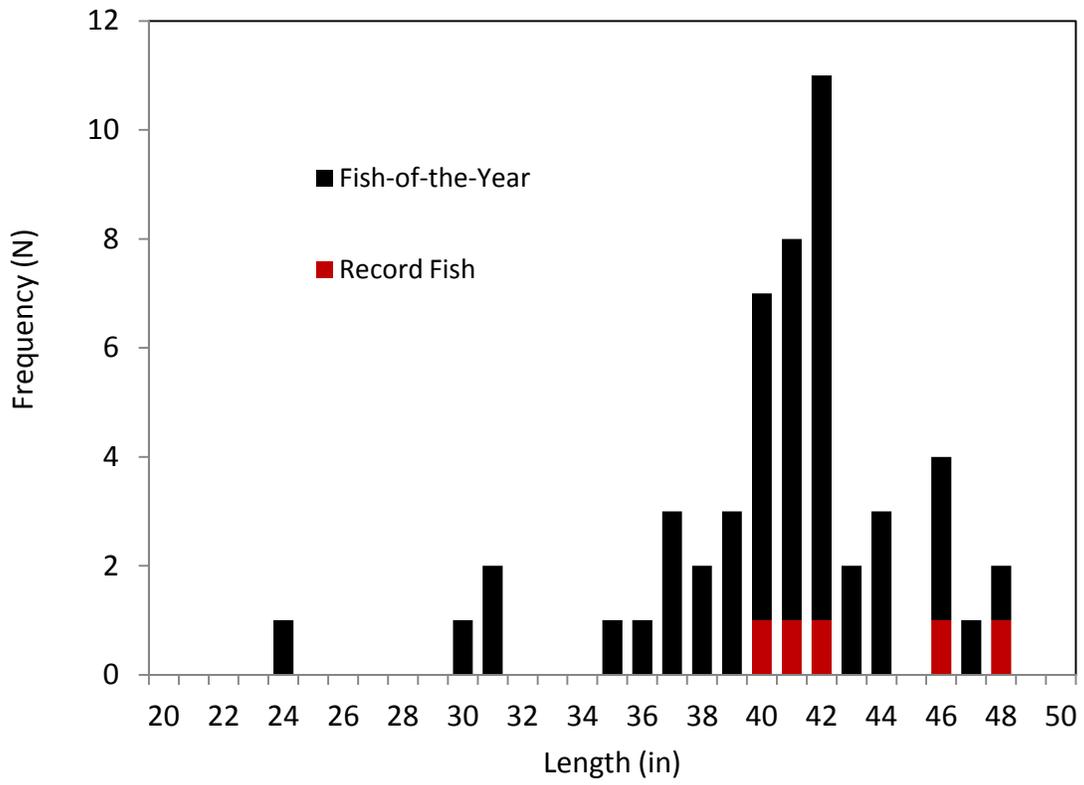


Figure 1.— Length frequency of northern pike submitted into the Record Fish (N = 5) program (red) and Fish-of-the-Year (N = 47) program (black) from 1963 through 2010.

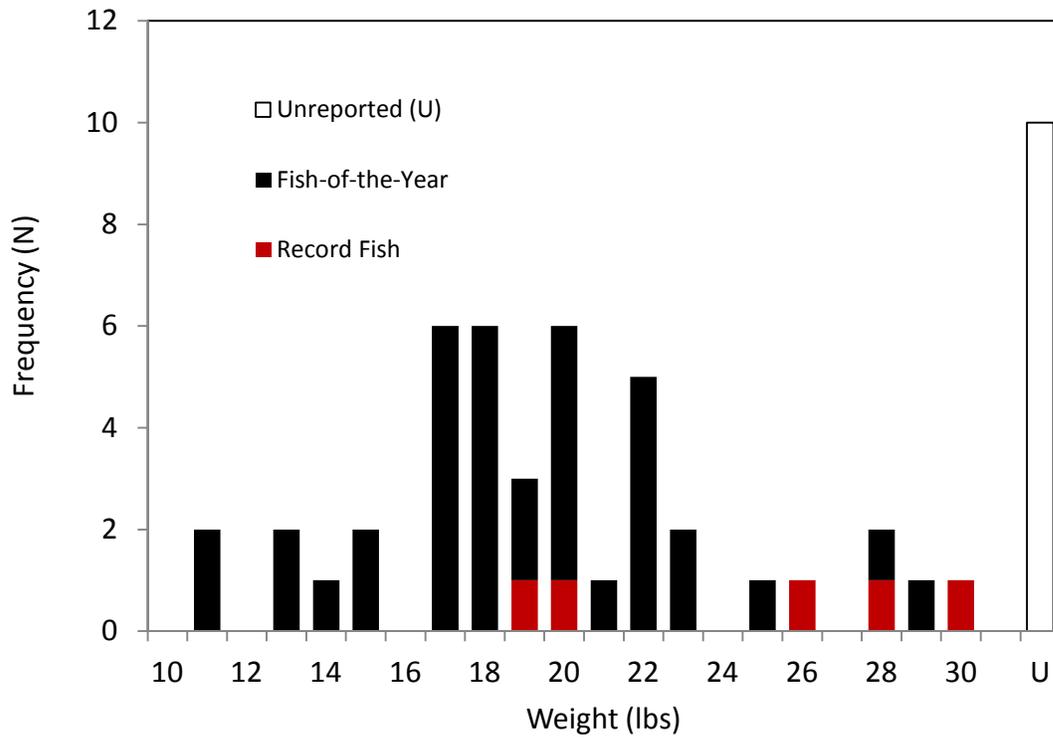


Figure 2.— Weight frequency of northern pike submitted into the Record Fish (N = 5) program (red) and Fish-of-the-Year (N = 37) program (black) and from 1963 through 2010. Ten pike were submitted into the FOTY program with weight data unreported (clear).

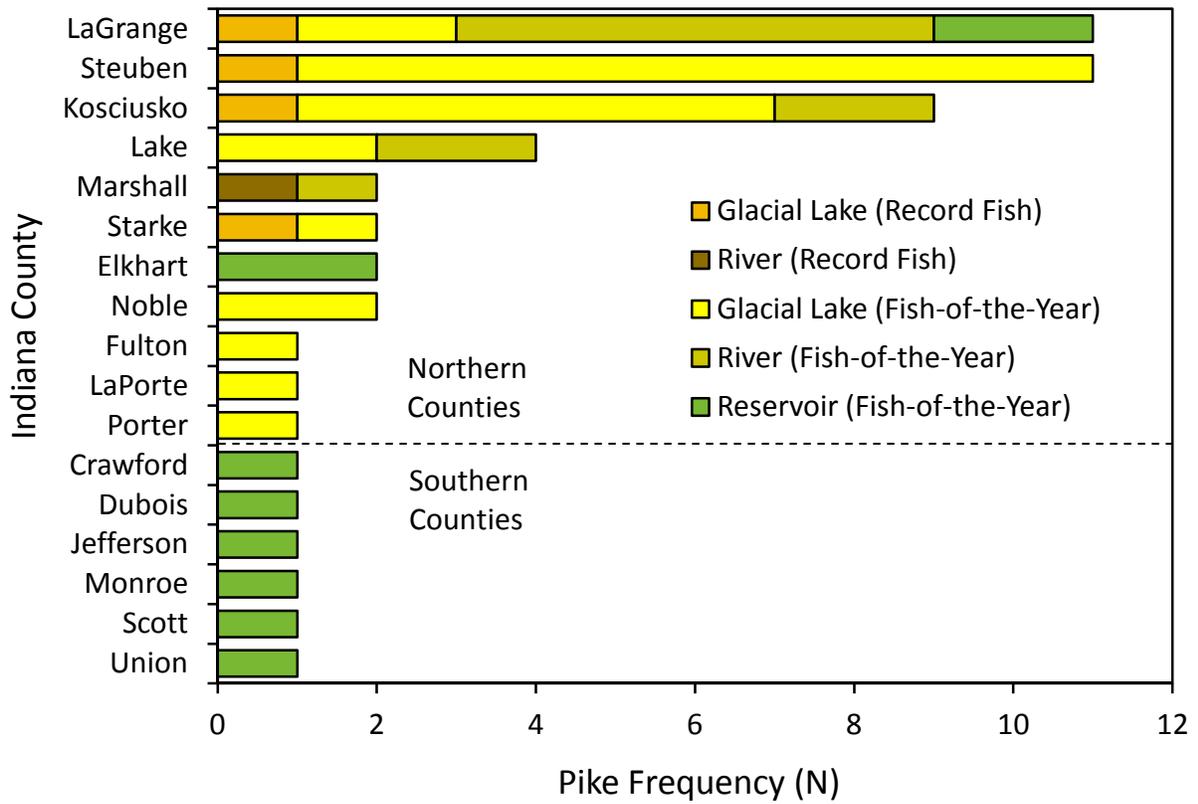


Figure 3.— Frequency of northern pike submitted into the Record Fish and Fish-of-the-Year programs by county and resource type from 1963 through 2010.

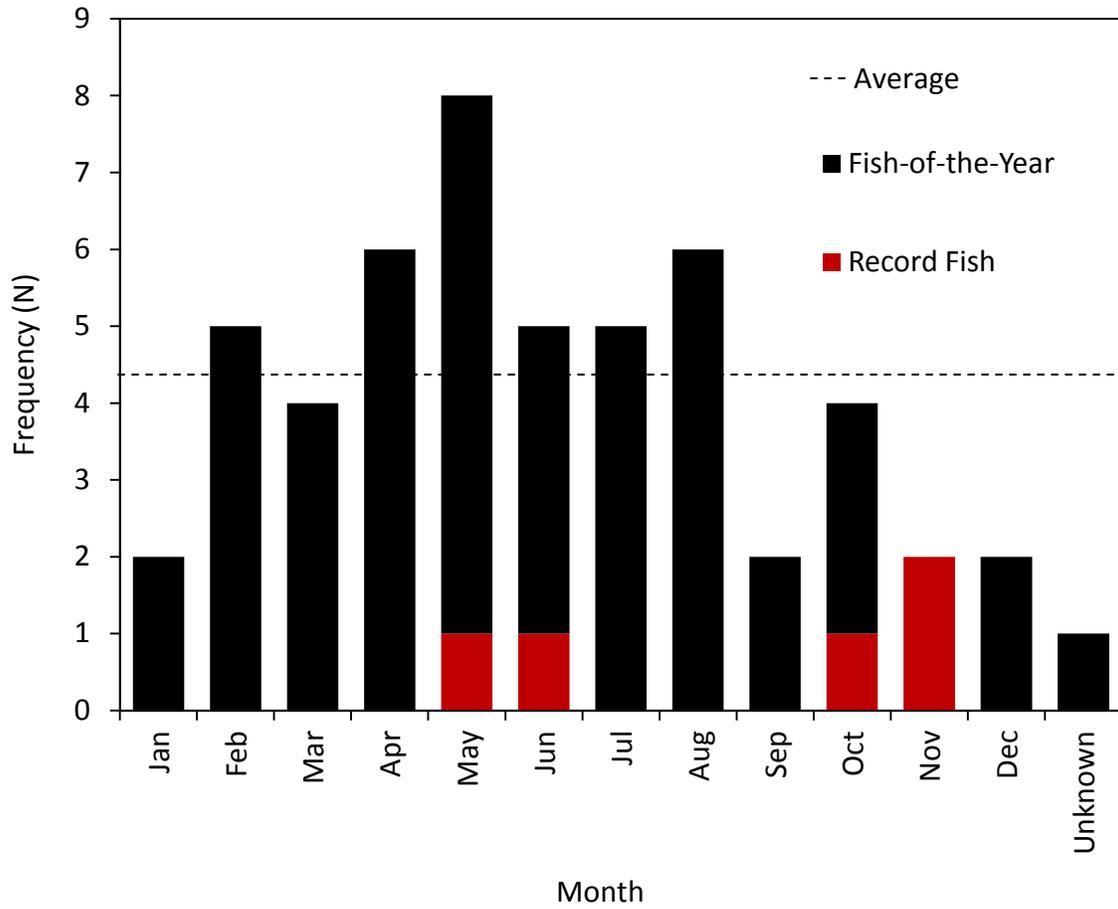


Figure 4.— Frequency (N) of northern pike submitted into the Fish-of-the-Year program (black) and Record Fish program (red) by calendar month from 1963 through 2010.

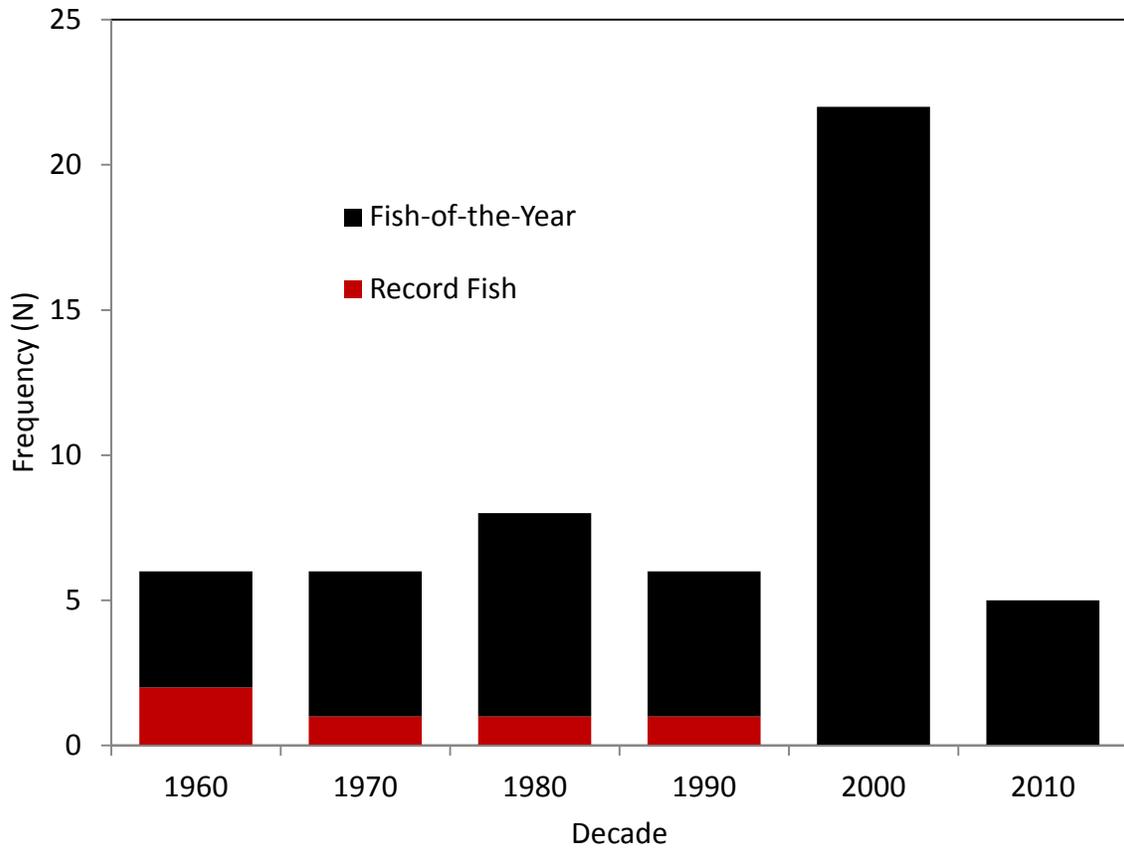


Figure 5.— The frequency of northern pike submitted into the Record Fish and Fish-of-the-Year programs by decade from 1963 through 2010.

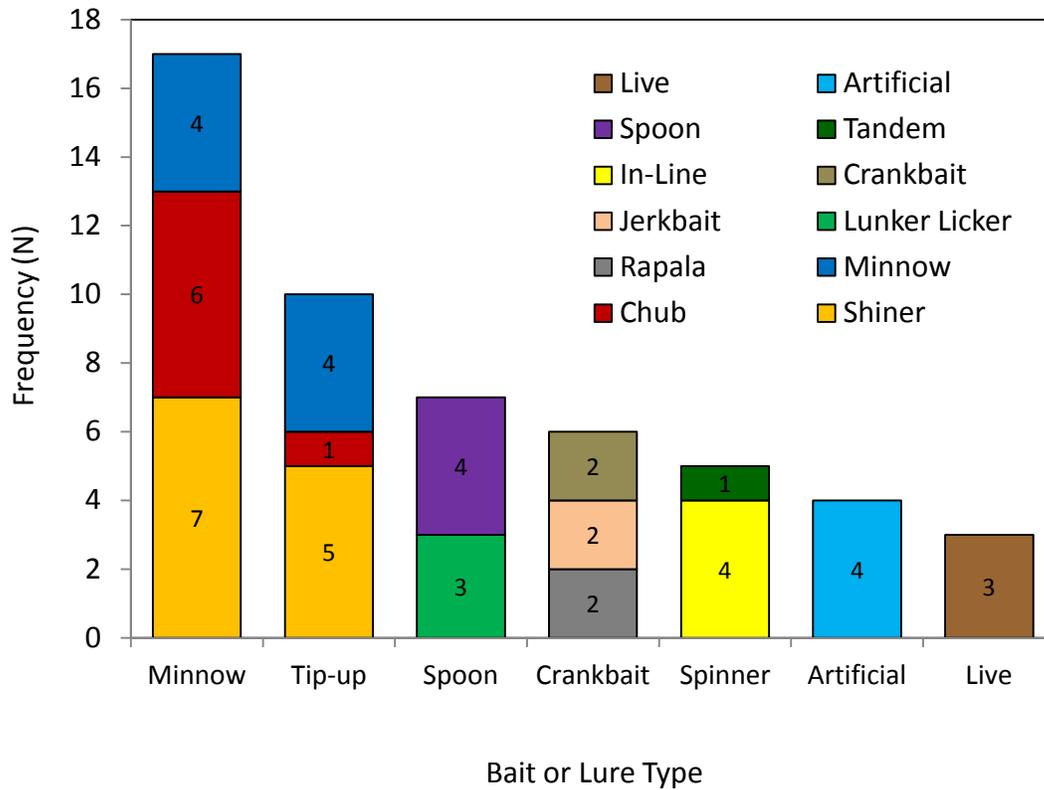


Figure 6.— The frequency of northern pike caught on specific (legend) and generic (*x*-axis) bait or lure types that were submitted by anglers into the Record Fish and Fish-of-the-Year programs from 1963 through 2010.

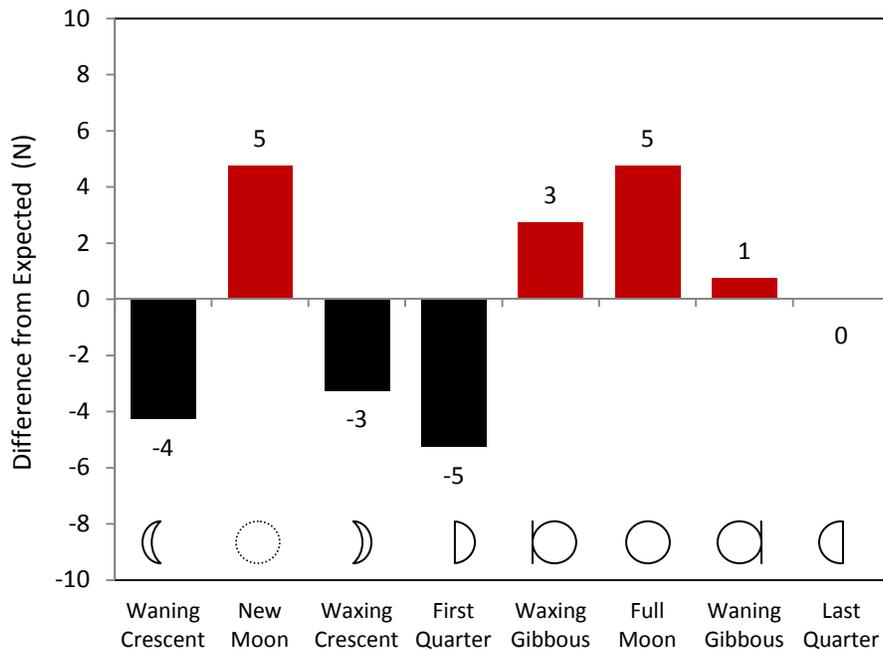


Figure 7.— The *expected* number of pike at  $y = 0$  is the value if pike were caught at random relative to each lunar phase. Thus, if the null hypothesis were true, the *expected* value should be 6.25 pike per lunar phase from a sample of 50 pike (the total number caught in the Record Fish and Fish-of-the-Year programs). Any deviation from the *expected* values are illustrated as positive (red) or negative (black) bars. For example, 6 (rounded) pike were *expected* to be caught during the waning crescent phase, but the *observed* data shows that 4 fewer pike ( $N = 2$ ) were caught during this lunar phase. Similarly, 11 pike were *observed* during the new moon phase (5 more than the 6 that were *expected*). Although fewer pike were *observed* than *expected* for the crescent phases and first quarter moon, and, more pike were *observed* during the new, full, and gibbous phases than *expected* (the number *observed* pike was equal to the number *expected* pike for the last quarter phase where  $N = 6$ ), these observations were not significantly different from random ( $D = 0.16$ ,  $P = 0.285$ ) given the sample size ( $N = 50$ ).

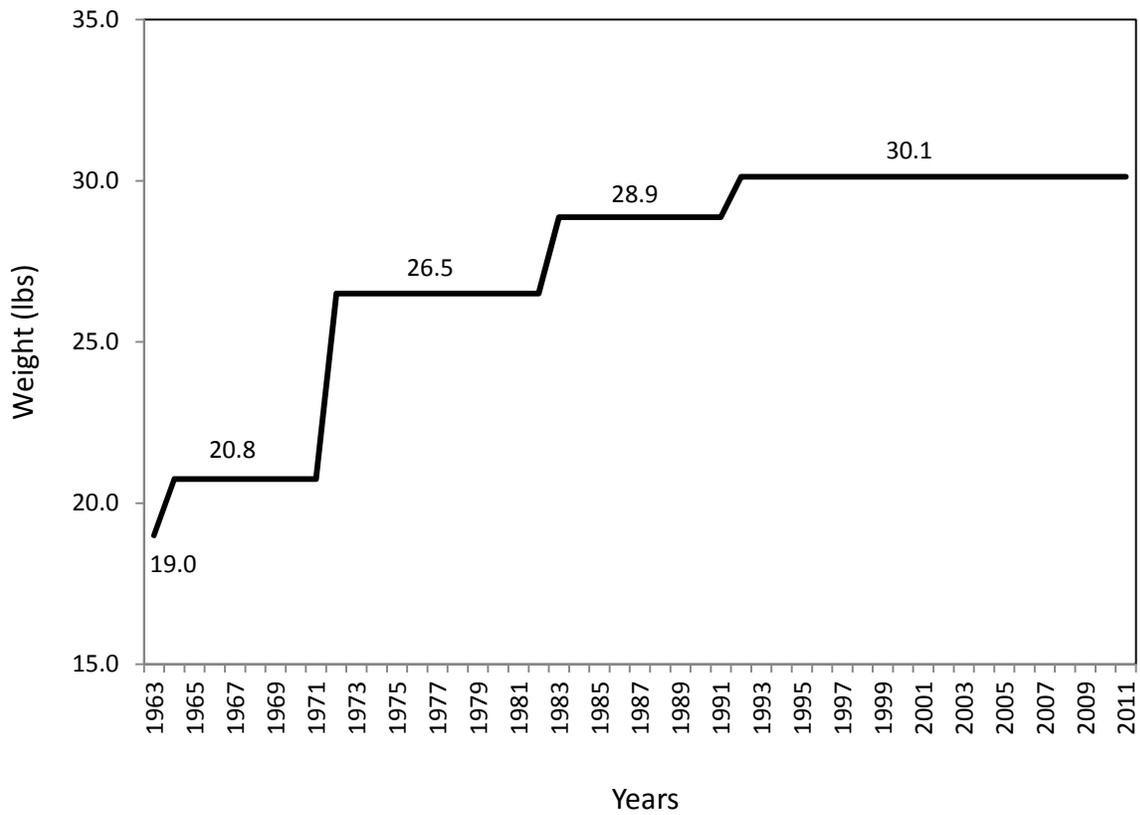


Figure 8.— The Indiana state record for northern pike has been broken four times since it was first set in 1963. The current state record was established in 1992 at 30 lbs, 2 oz.

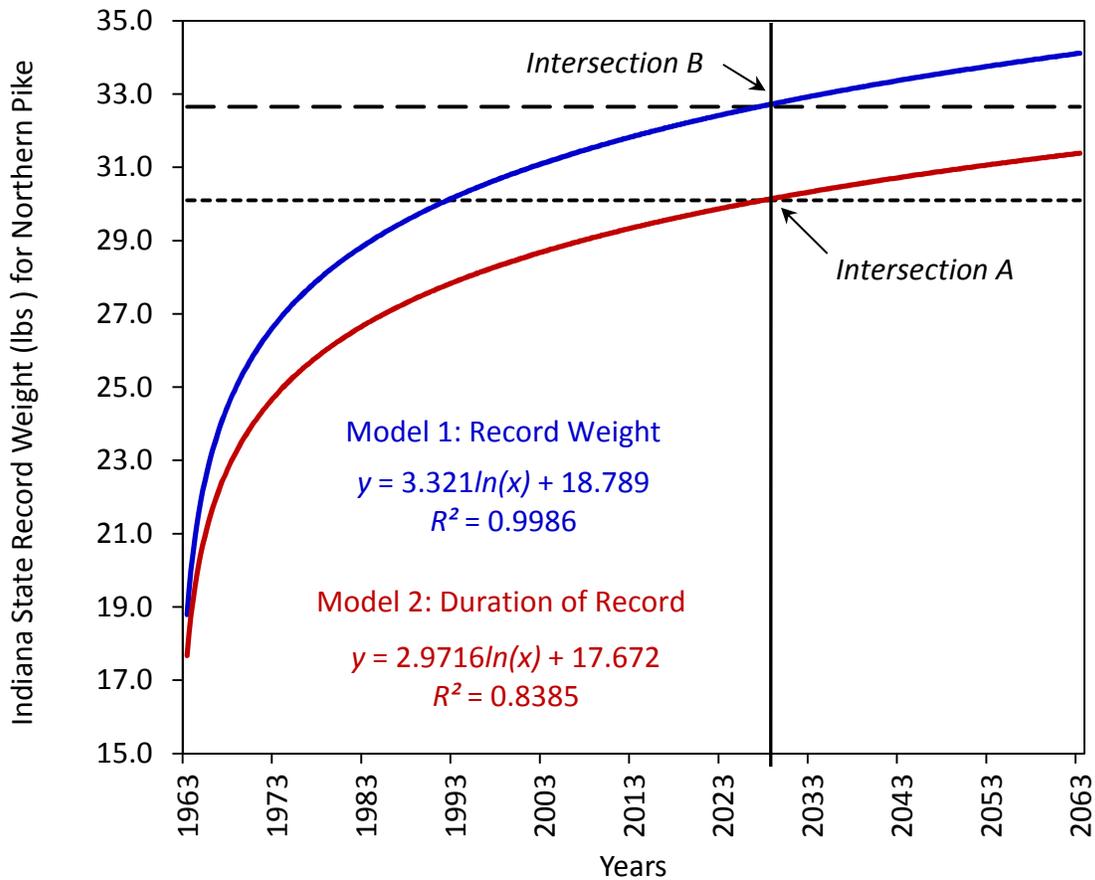


Figure 9.— Logarithmic functions time-forecasted through 2063 that predicts when (years) and how large (lbs) the next state record northern pike will be in Indiana. Model 1 (solid blue line) illustrates a mathematical scenario fitted to the *weight* of northern pike for each year that a particular record was established. Note the high  $R^2$  value (0.9986) for Model 1. Model 2 (solid red line) describes the *duration* of each era held by a particular record by fitting a function to the *last-year* of each records' era. Again, the data fit Model 2 well ( $R^2 = 0.8385$ ). *Intersection A* predicts that the current state record (30 lbs, 2 oz; fine dashed line) for northern pike may stand through 2028 (solid vertical line). *Intersection B* predicts that if the record were to be broken in 2028, the expected size of the next Indiana state record northern pike would be 2.5 pounds larger (32 lbs, 10 oz; course dashed line) than the current record. By comparison, if the record were broken this year (2011), the predicted weight would be 1.5 pounds larger (31 lbs, 10 oz) than the current state record. Any record-breaking (lbs) northern pike scenario ( $y$ ) can be estimated using the mathematical models provided above by substituting a given year ( $x = 0$  for 1963;  $x = 48$  for 2011;  $x = 65$  for 2028; etc.) for  $\ln(x)$ .

Appendix A.— The mathematical logic used to estimate the \$6.6 million dollar economic value of northern pike in Indiana derived from survey data compiled by the USFWS (2006) in conjunction with survey data provided by Broussard and Haley (2005).

**From USFWS (2006)**

Number of Indiana resident and non-resident anglers = **768,000**  
 Total number of angler-days = 9,805,000  
 Average angler-days per angler = **12.8**  
 Total fishing expenditures by Indiana resident and non-resident anglers = \$627,167,000  
 Average expenditure per Indiana resident and non-resident angler-day = **\$63.97**

**From Broussard and Haley (2005)**

Number of state-wide Indiana anglers that pursue northern pike:  
 Most often = 12/1605 [*Weighted (\*3) = 36/4815*]  
 Second most often = 16/1604 [*Weighted (\*2) = 32/3208*]  
Third most often = 33/1574 [*Weighted (\*1) = 33/1574*]  
*Weighted total = 101/9597 = 1.1%*

Number of North Region (Districts 1-4) Indiana anglers that pursue northern pike:  
*Weighted total = 91/4502 = 2.0%*

**Economic value of northern pike in Indiana**

Annual Number of Anglers	768,000 (USFWS 2006)
Percentage of Northern Pike Anglers	1.1% (Broussard and Haley 2005)
Total Northern Pike Anglers	8079 ( <i>Calculated estimate</i> )
Average Fishing Days/Angler	12.8 (USFWS 2006)
Total Northern Pike Fishing Days	103,149 ( <i>Calculated estimate</i> )
<u>Average Expenditure/Fishing Day</u>	<u>\$63.97 (USFWS 2006)</u>
<b>Total Economic Value of Northern Pike</b>	<b>\$6,598,416 (6.6 million annually)</b>

Appendix B.— The economic value of northern pike (**bold**) in Indiana relative to other game species. Data was provided by the USFWS (2006) national survey in conjunction with survey data provided by Broussard and Haley (2005).

Species	Percent Anglers (%)	Economic Value (\$ millions)
Bluegill	25.49	159.9
Largemouth Bass	21.74	136.3
Crappie (Black & White)	16.39	102.8
Channel Catfish	7.40	46.4
Smallmouth Bass	7.19	45.1
Blue Catfish	3.29	20.7
Walleye	3.09	19.4
Yellow Perch	2.65	16.6
Flathead Catfish	1.90	11.9
Sunfish	1.63	10.2
Steelhead Trout	1.10	6.9
Striped Bass	1.08	6.8
<b>Northern Pike</b>	<b>1.05</b>	<b>6.6</b>
Coho Salmon	0.94	5.9
Rock Bass	0.85	5.4
Chinook Salmon	0.78	4.9
Muskellunge	0.66	4.1
Brown Trout	0.59	3.7
White Bass	0.48	3.0
Inland Rainbow Trout	0.36	2.3
White Perch	0.35	2.2
Freshwater Drum	0.27	1.7
Spotted Bass	0.21	1.3
Sauger	0.20	1.2
Lake Trout	0.17	1.1
Rough Fish	0.14	0.9
Statewide Total	100.00	627.2

## RECORD FISH PROGRAMS AND STATE FISH RECORDS

State form 54257 (3-10)

The Division of Fish and Wildlife sponsors two award programs recognizing outstanding catches by sport anglers. The Indiana Record Fish Program recognizes new State Record catches. The Fish of the Year program recognizes anglers who catch the largest fish of each species that is smaller than the current state record. Weight is the measurement used for state record fish. Total length is used for Fish of the Year fish. Both programs have the same fish divisions and use the same entry form for submitting information. Winners receive a certificate and a colorful jacket patch. Entry forms and pictures will not be returned to the angler.

### General Rules for Submitting an Entry:

- Fish must be taken legally by hook and line from Indiana waters. Fish taken from the main stem of the Ohio River between Kentucky and Indiana, or from the Wabash River between Illinois and Indiana will be considered for Indiana's Record Fish Program, provided the angler possessed an Indiana fishing license at the time of the catch.
- A photocopy of the angler's license must accompany an entry if a license was required to catch fish from that body of water.

- Fish taken from water on artificial feeding programs are not eligible.
- Entry must be postmarked by Dec. 31 of the calendar year the fish was caught.
- A good-quality side-view photograph of the fish must accompany each entry. Blue catfish must be photographed from the side against a light background. For State Record Fish entries, applicants may wish to consider hiring a photographer.
- Anyone can enter, and multiple entries are accepted. Fish must be caught in public or private fishing waters where there is no fee for the fish taken.
- Complete and mail the entry form below along with the following:
  1. copy of fishing license
  2. Scale Inspection Report for all State Record Fish entries only
  3. photo(s) (side view is best)

### Rules for Fish of the Year Entries

- Size is determined by a total length measurement or fork length for shovelnose sturgeon. No weight measurement is required for Fish of the Year.
- One witness, who is not a relative, who observed the length and/or weight measurement must sign the entry form.
- It is not necessary to report the location where the length measurement was taken for Fish of the Year entries.
- Provide photograph(s) of the fish (side-view) and copy of fishing license, if required.

### Rules for State Record Fish Entries

- Size is determined by weight measurement first, then length, for state record fish. Both weight and length measurements are required. The weight measurement must be taken before the fish is frozen and on a scale that has been certified by the State of Indiana to be accurate to 1 ounce. If you can't find a certified scale at a grocery, hardware, grain store, or propane distributor, call the Indiana Division of Weights and Measures at (317) 356-7078 for the nearest location.
- Obtain a copy of the Scale Inspection Report from the store owner where the fish is weighed and submit the report with the entry form.
- Submit a printed meat packaging label showing the weight of the fish, if available.
- After weighing, the fish may be gutted and iced, but not filleted or otherwise cut up. The fish must be available for inspection and identification.
- State record fish entries may require verification by a Division of Fish and Wildlife fisheries biologist. It is the responsibility of the angler to schedule a time to have the fish examined by a State fisheries biologist.
- Two witnesses, who are not relatives, who observed the length and/or weight measurement must sign the entry form.
- Provide the location information on where the fish was weighed.
- Provide side-view photograph(s) of the fish and copy of fishing license, if required.

Appendix C.— The 2011 Indiana DNR rules that govern submission of an entry into the Record Fish or Fish-of-the-Year program.

# Record Fish Entry

Part of State Form 54257 (3-10)

Please print clearly. Photocopies of entry form are accepted. A good quality photo must be submitted with entry.

- FISH OF THE YEAR**  
(no weight required)
- STATE RECORD FISH**  
(weight required)

## INFORMATION ON THE FISH

### FISH OF THE YEAR

Species of fish \_\_\_\_\_

Length \_\_\_\_\_ Girth \_\_\_\_\_

### STATE RECORD FISH

Species of fish \_\_\_\_\_

Weight (lbs., oz.) \_\_\_\_\_

Length \_\_\_\_\_ Girth \_\_\_\_\_

## MEASUREMENT LOCATION

Where measurement was taken \_\_\_\_\_

Address \_\_\_\_\_

City \_\_\_\_\_

State \_\_\_\_\_ ZIP \_\_\_\_\_

Phone \_\_\_\_\_

## INFORMATION ON ANGLER

Name of angler \_\_\_\_\_

Address \_\_\_\_\_

City \_\_\_\_\_

State \_\_\_\_\_ ZIP \_\_\_\_\_

Phone \_\_\_\_\_

E-mail \_\_\_\_\_

## WITNESS 1

First witness name \_\_\_\_\_

Address \_\_\_\_\_

City \_\_\_\_\_

State \_\_\_\_\_ ZIP \_\_\_\_\_

Phone \_\_\_\_\_

## WHERE, WHEN, HOW

Date caught \_\_\_\_\_

Name of lake, pond or stream \_\_\_\_\_

County where caught \_\_\_\_\_

Type of tackle used \_\_\_\_\_

Lure or bait used \_\_\_\_\_

## WITNESS 2

Second witness name \_\_\_\_\_

Address \_\_\_\_\_

City \_\_\_\_\_

State \_\_\_\_\_ ZIP \_\_\_\_\_

Phone \_\_\_\_\_

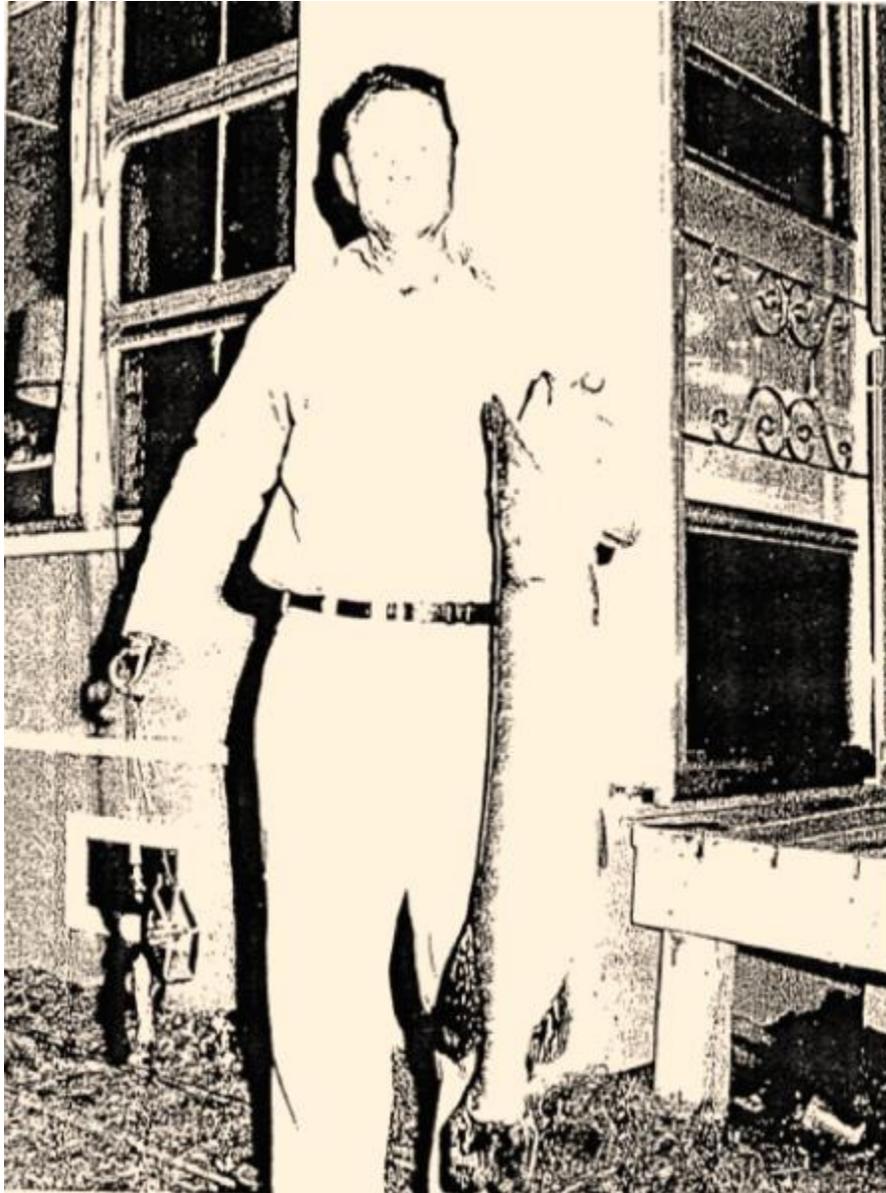
Appendix D.— The 2011 official Indiana State Form for submission of an entry into the Record Fish or Fish-of-the-Year program.

Fish	Year	Month	Day	Lbs	Oz	Lbs	Length	Waterbody	Resource Type	County	Bait-Specific	Bait-Type	Lunar Illumination	Moon Phase	Program
1	1963	11	16	19	0	19.0	42.000	Lake Tippecanoe	Lake	Kosciusko	Bucktail Spinner	Spinner	0.00	New	Record Fish
2	1964	11	15	20	12	20.8	40.500	Bass Lake	Lake	Starke	Line Chub	Minnnow	0.76	Waxing Gibbous	Record Fish
3	1972	5	12	26	8	26.5	46.500	Emma Lake	Lake	LaGrange	Live Bait	Live	0.02	New	Record Fish
4	1963	6	4	28	14	28.9	41.500	Yellow River	River	Marshall	Minnnow	Minnnow	0.47	Last Quarter	Record Fish
5	1992	10	25	30	2	30.1	48.250	Clear Lake	Lake	Steuben	Jig 1/8oz Yamamoto Grub	Artificial	0.01	New	Record Fish
6	1965	10	13	18	0	18.0	40.250	Koontz Lake	Lake	Starke	Mepps #8	Spinner	0.92	Full	Fish-of-the-Year
7	1966	4	2	18	8	18.5	43.000	Kankakee River	River	Lake	Golden Roach	Minnnow	0.85	Waxing Gibbous	Fish-of-the-Year
8	1967	2	22	20	0	20.0	44.000	Unspecified Lake	Lake	Kosciusko	Minnnow Tip-up	Minnnow on Tip-up	0.91	Full	Fish-of-the-Year
9	1969	4	26	17	5	17.3	42.500	Syracuse Lake	Lake	Kosciusko	Spoon plug	Spoon	0.64	Waxing Gibbous	Fish-of-the-Year
10	1970	4	11	15	2	15.1	40.000	Unspecified Lake	Lake	Lake	Chub Minnow	Minnnow	0.28	Waxing Crescent	Fish-of-the-Year
11	1971	6	5	14	0	14.0	41.000	Tippecanoe River	River	Kosciusko	Purple Worm	Artificial	0.86	Waxing Gibbous	Fish-of-the-Year
12	1977	-	-	18	11	18.7	41.500	Unspecified Lake	Lake	Porter	Rapala	Crankbait	-	-	Fish-of-the-Year
13	1978	5	8	13	0	13.0	37.250	Brookville Reservoir	Impoundment	Union	Rooster Tail	Spinner	0.01	New	Fish-of-the-Year
14	1979	9	3	15	0	15.0	39.000	Dollar Pond	Lake	Noble	Tandem Spinner	Spinner	0.85	Waxing Gibbous	Fish-of-the-Year
15	1981	2	26	20	12	20.8	42.500	James Lake	Lake	Steuben	Minnnow Tip-up	Minnnow on Tip-up	0.58	Last Quarter	Fish-of-the-Year
16	1982	5	11	22	0	22.0	39.000	Patoka Reservoir	Impoundment	Crawford	Minnnow Tip-up	Minnnow on Tip-up	0.91	Full	Fish-of-the-Year
17	1983	3	28	19	2	19.1	40.500	Hardy Lake	Impoundment	Jefferson	Chub Minnow	Minnnow	0.99	Full	Fish-of-the-Year
18	1984	4	26	17	0	17.0	42.000	Winona Lake	Lake	Kosciusko	Live Minnow	Minnnow	0.21	Waning Crescent	Fish-of-the-Year
19	1986	3	26	20	4	20.3	41.500	Monroe Reservoir	Impoundment	Monroe	Bayou Boogie	Crankbait	1.00	Full	Fish-of-the-Year
20	1987	6	19	22	0	22.0	38.000	Hardy Lake	Impoundment	Scott	Little George	Spoon	0.42	Last Quarter	Fish-of-the-Year
21	1989	10	30	23	8	23.5	44.000	Kankakee River	River	Lake	Lure	Artificial	0.01	New	Fish-of-the-Year
22	1991	5	23	25	15	25.9	46.250	Unspecified Lake	Lake	LaGrange	Shiner Minnow	Minnnow	0.75	Waxing Gibbous	Fish-of-the-Year
23	1992	8	24	11	8	11.5	35.000	Lake Bruce	Lake	Fulton	Red Sparkle Tail	Crankbait	0.41	Last Quarter	Fish-of-the-Year
24	1993	7	18	11	8	11.5	36.000	Patoka Reservoir	Impoundment	Dubois	Spoon plug	Spoon	0.02	New	Fish-of-the-Year
25	1999	6	21	18	4	18.3	42.000	Pigeon River	River	LaGrange	Live Shiner Minnow	Minnnow	0.55	First Quarter	Fish-of-the-Year
26	2000	1	25	22	3	22.2	42.000	St. Joseph River	Impoundment	Elkhart	Shiner Minnow Tip-up	Minnnow on Tip-up	0.80	Waning Gibbous	Fish-of-the-Year
27	2000	7	22	17	8	17.5	38.500	Pigeon River	River	LaGrange	Shiner #2 Hook	Minnnow	0.72	Waning Gibbous	Fish-of-the-Year
28	2001	2	6	18	8	18.5	40.000	Stone Lake	Lake	LaPorte	Golden Roach	Minnnow	1.00	Full	Fish-of-the-Year
29	2002	1	6	22	8	22.5	42.250	Snow Lake	Lake	Steuben	Shiner Minnow Tip-up	Minnnow on Tip-up	0.49	Last Quarter	Fish-of-the-Year
30	2002	4	16	17	8	17.5	41.000	Mongo Mill Pond	Impoundment	LaGrange	Live Shiner Minnow	Minnnow	0.11	New	Fish-of-the-Year
31	2002	5	24	-	-	-	24.000	Lake Wawasee	Lake	Kosciusko	Rooster Tail Spinner	Spinner	0.93	Full	Fish-of-the-Year
32	2002	8	5	21	8	21.5	41.500	Clear Lake	Lake	Steuben	Lunker Licker Spoon	Spoon	0.15	Waning Crescent	Fish-of-the-Year
33	2002	8	11	22	11	22.7	41.250	Clear Lake	Lake	Steuben	Lunker Licker Spoon	Spoon	0.09	New	Fish-of-the-Year
34	2003	2	21	29	+	29.0	48.500	Clear Lake	Lake	Steuben	Minnnow Tip-up	Minnnow on Tip-up	0.77	Waning Gibbous	Fish-of-the-Year
35	2003	4	18	20	12	20.8	46.500	Clear Lake	Lake	Steuben	Live Minnow	Minnnow	0.97	Full	Fish-of-the-Year
36	2003	8	3	13	8	13.5	39.500	Diamond Lake	Lake	Noble	Live Crayfish	Live	0.27	Waxing Crescent	Fish-of-the-Year
37	2004	8	3	20	11	20.7	43.250	Pigeon River	River	LaGrange	Shiner Minnow #2 Hook	Minnnow	0.91	Full	Fish-of-the-Year
38	2005	3	19	-	-	-	46.000	Tippecanoe River	River	Marshall	Bait	Live	0.64	Waxing Gibbous	Fish-of-the-Year
39	2005	9	7	23	3	23.2	44.000	Pigeon River	River	LaGrange	Creek Chub	Minnnow	0.11	New	Fish-of-the-Year
40	2005	10	-	-	-	-	42.000	Sechrist Lake	Lake	Kosciusko	Glide Bait	Crankbait	-	-	Fish-of-the-Year
41	2006	7	26	19	7	19.4	41.500	Clear Lake	Lake	Steuben	Lunker Licker Spoon	Spoon	0.09	New	Fish-of-the-Year
42	2006	7	31	17	13	17.6	42.000	Pigeon River	River	LaGrange	Live Chub #2 Hook	Minnnow	0.30	Waxing Crescent	Fish-of-the-Year
43	2007	3	2	28	15	28.9	47.000	Clear Lake	Lake	Steuben	Shiner Minnow Tip-up	Minnnow on Tip-up	0.97	Full	Fish-of-the-Year
44	2007	5	4	17	7	17.4	42.750	Mongo Mill Pond	Impoundment	LaGrange	Minnnow	Minnnow	0.97	Full	Fish-of-the-Year
45	2007	6	3	16	4	16.3	42.125	Pigeon River	River	LaGrange	8 inch Chub	Minnnow	0.79	Waning Gibbous	Fish-of-the-Year
46	2007	12	29	-	-	-	40.500	Snow Lake	Lake	Steuben	Shiner Minnow Tip-up	Minnnow on Tip-up	0.70	Waning Gibbous	Fish-of-the-Year
47	2009	8	31	-	-	-	30.000	Tippecanoe River	River	Kosciusko	12 inch Black Rubber Eel	Artificial	0.83	Waxing Gibbous	Fish-of-the-Year
48	2010	2	6	-	-	-	32.000	Snow Lake	Lake	Steuben	Chub Tip-up	Minnnow on Tip-up	0.47	Last Quarter	Fish-of-the-Year
49	2010	5	2	-	-	-	37.500	St. Joseph River	Impoundment	Elkhart	Jerkbait	Crankbait	0.85	Waning Gibbous	Fish-of-the-Year
50	2010	5	4	-	-	-	32.500	Wolf Lake	Lake	Lake	Spoon	Spoon	0.68	Waning Gibbous	Fish-of-the-Year
51	2010	7	9	-	-	-	40.000	Big Long Lake	Lake	LaGrange	6 in Perch Rapala	Crankbait	0.09	New	Fish-of-the-Year
52	2010	12	17	-	-	-	37.500	Chapman Lake	Lake	Kosciusko	Shiner Minnow Tip-up	Minnnow on Tip-up	0.83	Waxing Gibbous	Fish-of-the-Year

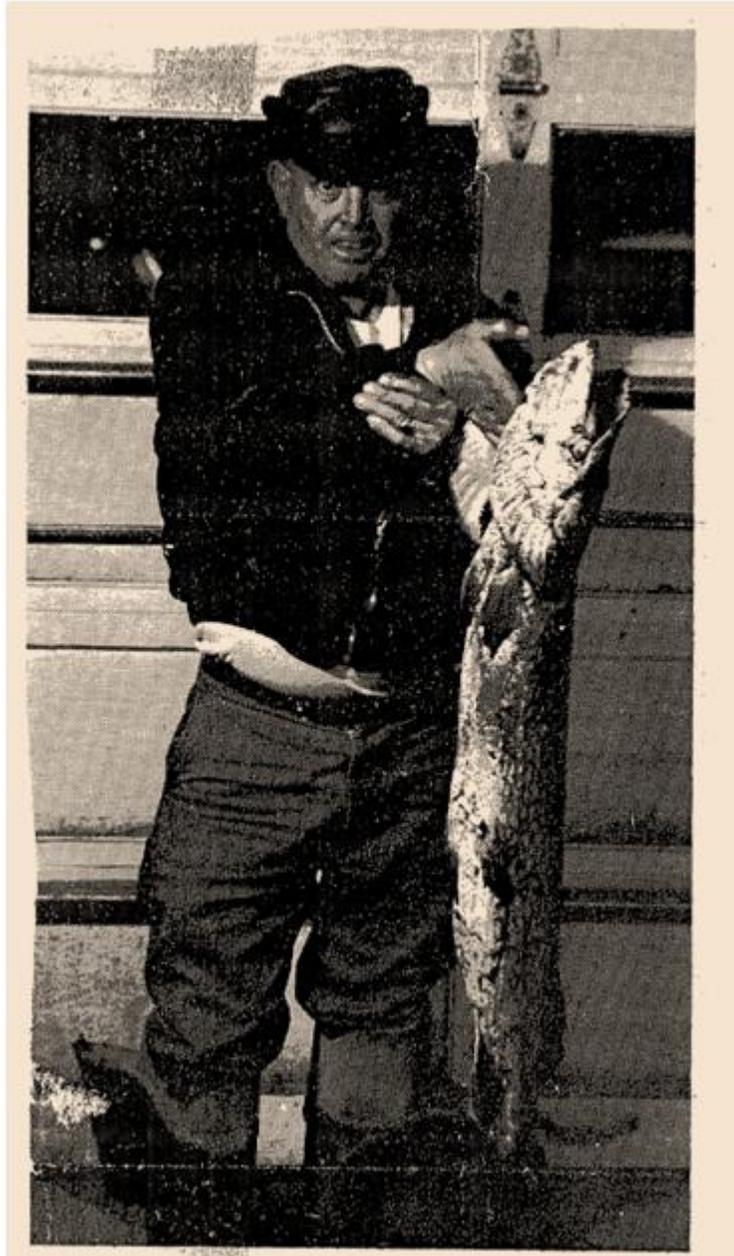
Appendix E.— Raw data for northern pike submitted into the Record Fish (Fish 1-5) and Fish-of-the-Year (Fish 6-52) programs from 1963-2010.



Appendix F. — The first official state record northern pike (19 lbs, 0 oz; 42.0 inches; 18.0 inch girth) caught on a bucktail spinner by Samuel Dungan on November 16, 1963 at Lake Tippecanoe (Kosciusko County).



Appendix G. — The second official state record northern pike (20 lbs, 12 oz; 40.5 inches; 16.75 inch girth) caught on a line chub by George Byer on November 15, 1964 at Bass Lake (Starke County).



Appendix H. — The third official state record northern pike (26 lbs, 8 oz; 46.5 inches; 19.0 inch girth) caught on a live bait by Wayne Lewis on May 12, 1972 at Emma Lake (LaGrange County).



Appendix I. — The fourth official state record northern pike (28 lbs, 14 oz; 41.5 inches; 16.875 inch girth) caught on a minnow by Terry Barner on June 4, 1983 at the Yellow River (Marshall County).



Appendix J. — The fifth (and most recent) official state record northern pike (30 lbs, 2 oz; 48.25 inches; 20.0 inch girth) caught on an 1/8 oz jig and grub combination by Jack Barnes on October 25, 1992 at Clear Lake (Steuben County).