

Current and Historical Black Bass Regulations in North America

A Survey conducted by the Centrarchid Technical Committee of the Northcentral Division of the
American Fisheries Society

Craig Paukert
U.S. Geological Survey, Kansas Cooperative Fish and Wildlife Research Unit,
Division of Biology, 205 Leasure Hall,
Kansas State University
Manhattan, Kansas 66506

Mike McInerny
Minnesota Department of Natural Resources
20596 Highway 7
Hutchinson, Minnesota 55350

Randall Schultz
Iowa Department of Natural Resources
24570 Highway 34
Chariton, IA 50049

August 2004

Executive Summary

A survey of black bass (largemouth bass *Micropterus salmoides*, smallmouth bass *M. dolomeui*, and spotted bass *M. punctulatus*) regulations was sent to state and provincial agencies in 2002 to determine the trends and rationale for these regulations. A total of 47 agencies from all four American Fisheries Society divisions returned surveys. Current statewide regulations were in place in 33 states or provinces, and these regulations were similar for all black bass species because many agencies presumably manage these species together. Bag and length limits were the most common regulations with the primary goal of providing equitable distribution of harvest and to increase the quality of bass catch or harvest. Black bass regulations changed considerably over the years, but these changes were relatively consistent among species. The first black bass regulations were in place before 1900 and were typically bag and length limits. Protecting spawning bass was a common rationale and ranked high in importance for regulations. Changing prey quality was relatively common but ranked lower than other rationale. Special regulations were commonly used to regulate black bass populations, and these usually included minimum length limits and protected slot length limits. Changing the quality of bass catch or harvest was the rationale for all regulation types except for season closure; suggesting different agencies use different regulations to achieve similar goals. Minimum length limits, bag limits, and season closures are still the primary harvest-based regulation used over the last decade.

Harvest regulations have been used in sport fisheries for years, with a closed season enacted in saltwater fisheries as early as 1652 (Redmond 1986). Historically, regulations have varied with the level of scientific knowledge about population dynamics and the effects of potential regulations. Before 1940, restrictions were typically enacted because of perceived or actual overharvest, whereas regulations implemented between 1940 and 1960 were based on more scientific knowledge and were more liberalized to potentially improve the quality of some fisheries (Redmond 1986). In the last 25 to 30 years, regulations were refined to meet specific fish population criteria, oftentimes on single water bodies. The most recent regulations were based on increased scientific knowledge relating to optimum sustained yield, ecosystem management and conservation biology, coupled with new techniques such as telemetry, refinements in tagging and sampling, genetics, and population modeling. Although several harvest regulations (e.g., season closures, bag limits) have been used in recent years, length-based regulations such as minimum length limits and slot length limits are the two most common (Wilde 1997).

Black bass fisheries in the United States and Canada are one of the most popular sport fisheries with anglers expending over 200 million days of effort for these species (U.S. Department of the Interior 1996). Black bass fisheries occur in 49 states (all except Alaska) and 7 Canadian provinces, and include both native and introduced populations (Noble 2002).

Although there are many species of black bass, the three most common species are largemouth bass (*Micropterus salmoides*), smallmouth bass (*M. dolomeui*), and spotted bass (*M. punctulatus*).

Historical trends on black bass regulations in North America have been partially documented. Quinn (2002) provided a detailed account of seasonal closures to harvest or

Deleted:

angling of black basses in North America. Fox (1975) summarized statewide season, creel and length minimum length limits among 48 states in effect during 1974. However, to our knowledge, historical trends on length and bag limits have not been compiled on a wide geographical scale. We hypothesized that regulations and rationale for regulations would differ geographically because popularity of black basses probably differ geographically. Furthermore, documentation of the history of regulations is valuable to fisheries managers, providing timelines on when regulations were first implemented, and they can be useful in ruling out potential regulations that have been used in the past and deemed unsuccessful. The objective of this report is to summarize results of a survey conducted by the Centrarchid Technical Committee of the North Central Division of the American Fisheries Society that reviewed historical and current black bass regulations as well as the rationale for these regulations.

Methods

A mail survey was sent to 49 states (excluding Alaska) and the eight southernmost Canadian provinces in summer 2002. Survey questions focused on historical regulations for largemouth, smallmouth, and spotted bass (Appendix 1). To facilitate completion of the survey and subsequent data analysis, most questions were closed-ended with space for any additional open-ended responses. Before distributing the survey to all agencies, a small group (<5) of agency biologists or administrators reviewed draft surveys and provided comments. These comments were then incorporated into the final survey instrument. For states and provinces that did not return surveys within about 4 months, an email reminder or another survey was sent. The survey was sent to either agency biologists known to be working with black bass or

administrative personnel (e.g., Chief of Fisheries). Data on current regulations were gathered via the internet.

Because we hypothesized that regulations and rationale could vary depending on geographical region, we applied several statistical procedures to determine if variables differed among AFS divisions. We chose AFS divisions as geographical region because of proximity and presumed similar angler preferences, greater likelihood of communication exchange among fisheries managers, and similar habitat, climate, and fish population dynamics. An analysis of variance (ANOVA) was used to determine if the mean ranking of black bass preference in the latest angler survey and the mean number of water bodies containing black bass differed among AFS divisions. When an ANOVA model was significant, a least-squares means test was used to located these differences. We used a two-way factorial ANOVA to determine if mean decade of initial regulation differed by regulation type (bag limit, length limit, or season closure) and AFS division. A Kruskal-Wallis test was used to determine if the median state or province-wide bag or minimum length limit differed among AFS divisions. We used a multivariate analysis of variance (MANOVA) to determine if mean rank of rationale for historical regulations differed by AFS division for each black bass species. A MANOVA was used in this analysis because more than one rationale was ranked for each regulation. Lastly, we used a Chi square test to determine if the proportion of regulation changes differed by species.

Deleted:

Results

A total of 47 agencies (43 states and 4 Canadian provinces) returned surveys that could at least be partially analyzed (Table 1). Agencies in 14 states and provinces from the Northcentral

Division (NCD), 13 from the Southern Division (SD), 11 from the Northeast Division (NE), and 9 from the Western Division (WD) returned completed or partially completed surveys.

Black basses were most or nearly the most sought by anglers in all geographic areas, but black basses were most sought by anglers in Southern Division waters. Angler preference ranks differed among divisions ($F = 3.68$, $DF=3$, 39 , $P=0.020$). Anglers in all 8 SD agency surveys that responded to this question ranked black bass as the most sought sport fish, but mean preference ranks were 2.2 (range = 1-6) among NE, 2.4 (range = 1-6) among NCD, and 2.8 (range 2–6) among WD agency surveys. All surveys were conducted between 1988 and 2002, with >50% conducted since 1998.

The number of water bodies that contained black bass fisheries was highly variable but did not differ geographically. Mean numbers of water bodies did not differ by AFS division ($F=1.35$, $DF=3,34$, $P=0.276$), although means ranged from 271 (WD) to 47,950 (NCD). This analysis accounted only for lakes, reservoirs, and ponds and did not include streams.

Current Regulations

An internet search of state and provincial black bass regulations indicated that 44 states and provinces had a state or province-wide bag limit for black bass and 27 states and provinces had a state or province-wide minimum length limit. Seven states had two bag limits, whereas 6 states indicated they had two minimum length limits. Bag limits ranged from one (Maine and Hew Hampshire) to 10 fish (Alabama, South Carolina, Georgia, Louisiana, and Mississippi)(Figure 1) and were highest in the SD (median = 6, range = 4-10) compared to the WD (median=5, range 5-6), NCD (median=5, range=2-6), and NE (median=5, range = 1-6)($X^2=8.71$, $DF=3$, $P=0.034$). Minimum length limits ranged from 10 in (Vermont) to 15 in

(Iowa, Kansas, Maryland, and Pennsylvania)(Figure 1). The NCD had the highest minimum length limits (median=14 in, range 12-15 in) followed by SD (median=12 in, range 12-15 in), WD (median=12 in, range=12-14 in), and NE (median=12, range=10-15)($X^2=8.58$, DF=3, P=0.036).

Largemouth bass.-Thirty-five states or provinces responded they had at least one statewide largemouth bass regulation currently in place. Thirty-two states and provinces had length limits, 33 had bag limits, 28 had possession limits, and 20 had season closures. The year of implementation of these regulations varied considerably, ranging from before 1900 to 2002.

Although only 35 states or provinces had statewide regulations, 44 agencies provided justification for statewide regulations (Figure 2). Thirty-three of the 44 agencies that completed surveys also included more than one justification for their current regulations. The most common justifications were to change the quality of the bass catch or harvest (68%) and to provide equitable distribution of harvest (59%). Other justifications included protecting spawning bass (27%), changing prey quality (21%), and responding to public pressure (18%).

Smallmouth bass.-Thirty-five states or provinces responded that they currently had at least one statewide smallmouth bass regulation. Length limits were in 31 states or provinces, bag limits were in 35 states and provinces, possession limits in 28, and season closures in 19 states and provinces. The year of implementation of these regulations also varied, ranging from before 1900 to 2002. The justification for these regulations was similar to largemouth bass (Figure 2), with the most common justifications were to change the quality of the bass catch or harvest

(68%) and to provide equitable distribution of harvest (57%), followed by protecting spawning bass (38%), responding to public pressure (24%), and increase prey quality (19%).

Spotted bass.-Twenty-three respondents had spotted bass in their state; we know of no spotted bass fisheries in Canada. Of these 23 responses, 12 had length limits, 17 had bag limits, 15 had possession limits, and 5 had season closures. Spotted bass regulations were more recent than those for the other black basses. The earliest regulations (bag limits) were established in the 1930s, and 50% of the states did not regulate spotted bass until after 1980. The justification for spotted bass regulations (where they existed) was slightly different than those used for regulations of largemouth bass and smallmouth bass (Figure 2). Providing equitable harvest (48% of respondents) and changing quality of catch or harvest (44%) were the most common justifications, with responding to public pressure (22%) and increasing prey quality (13%) as other major concerns. No survey respondent identified protection of spawning bass as a concern. One agency mentioned that spotted bass regulations were enacted to increase harvest of this fish, whereas two states mentioned that difficulty in identifying this species from other black basses was a justification for their regulations.

Historical Regulations

The first regulations for black bass were established before 1900, and the majority of the states and provinces (>64%) enacted their first regulations by the 1930s (Figure 3). Bag and length limits were implemented enacted more often than season closures. Initial length limits in all but one of the 33 states and provinces with length limits on largemouth and smallmouth bass

were minimums. Oregon indicated an initial reduced bag above a certain length as its first historical regulation. Current regulations for season closure for spotted bass were also the first ones enacted. In general, historical bag and length limits for spotted bass were enacted relatively recently (e.g., 1960s to 1980s).

Decade of enactment of the first regulations for largemouth and smallmouth bass differed geographically, but did not differ by regulation type (length limit, bag limit, or season closure). However, decade of enactment of spotted bass regulations was unrelated to regulation type or geographic area. Agencies in the NE division enacted the earliest largemouth bass regulations (mean decade = 1910) followed by agencies in the NCD (mean decade = 1920), SD (mean decade = 1930), and WD (mean decade = 1940) ($F=9.13$, $DF=3,83$ $P<0.001$). The earliest regulations on smallmouth bass were enacted by agencies in the NE and NCD (mean decade = 1920) followed by agencies in the SD (mean decade = 1930) and WD (mean decade = 1950) ($F=2.63$, $DF=3, 82$, $P=0.055$). The decade of first regulation enactment did not differ by regulation type for largemouth bass ($F=0.67$, $DF=2,83$, $P=0.513$), smallmouth bass ($F=0.38$, $DF=2, 82$, $P=0.685$), and spotted bass ($F=1.04$, $DF=2, 25$, $P=0.367$). There was no interaction between regulation type and AFS division for each species ($F=1.09$, $DF=6, 83$, $P=0.375$ for largemouth bass; $F=0.66$, $DF=6, 82$, $P=0.680$ for smallmouth bass; and $F=0.31$, $DF=4, 25$, $P=0.866$ for spotted bass)

Rationale for historical regulations were similar for each species. Agencies from 32 states and provinces reported rationale for historical regulations for largemouth bass, 29 agencies for smallmouth bass, and agencies from 11 states reported rationale for historical regulations for spotted bass. The most common rationale was to protect spawning bass, with 81% of respondents for largemouth bass included this as a rationale. Other common rationale were

providing equitable distribution of harvest (69%), changing quality of bass catch or harvest (66%), and changing prey quality (41%). Rationale for smallmouth bass regulations followed a similar pattern as largemouth bass, with 83% states and provinces listing protect spawning bass, 69% listing change quality of bass and equitable distribution of harvest, and 38% listing changing prey quality. Only 15 states listed rationale for spotted bass regulations. Of these, 73% listed protect spawning bass, 67% to change bass quality, 60% to provide equitable distribution of harvest, and 40% to change prey quality. In addition, the difficulty in distinguishing spotted bass from other black bass was important to one state (7%).

Of the states that ranked the rationale, equitable distribution of harvest ranked high in importance for all black bass species (Table 2). In addition, protect spawning bass also ranked relatively high in all black bass species. Although changing prey quality was a relatively common rationale for regulations, it was only ranked moderately high in importance (mean ranking of 3.5 to 3.8, depending on species). Mean rank of the four most common rationale (equitable distribution of harvest, protect spawning bass, change bass quality, and change prey quality) rationale did not differ among AFS divisions for largemouth bass (MANOVA, Wilk's $\lambda=0.19$, $F=1.60$, $DF=9, 15$, $P=0.203$) or smallmouth bass (MANOVA, Wilk's $\lambda=0.218$, $F=0.95$, $DF=9, 10$, $P=0.524$). We did not attempt a MANOVA for spotted bass because of too few respondents (15 across all AFS divisions and rationales).

Statewide regulations frequently changed over the years, with changes being relatively consistent for largemouth and smallmouth bass (Figure 4). For both species, the number of regulation changes was similar, with high numbers of changes from the 1920s to the 1990s (Figure 4). Spotted bass, however, had more recent changes in their statewide regulations, with the majority of changes occurring from the 1970s and 1980s (Figure 4). Regulation changes for

each species were primarily changes in length and bag limits. The proportion of each type of regulation change (bag limit, length limit, or season closure) did not differ by species ($X^2=0.57$, $DF=4$, $P=0.973$). Length limits account for 45%, bag limits accounted for 38%, and season closures accounted for 17% of the regulation changes. In addition, gear restrictions and closure of nighttime fishing were listed by one state each as a historic regulation change.

Special Regulations

Thirty five state and two provincial agencies reported a total of 92 special regulations which consisted of various length limits, bag limits, and season closures. The most common special regulation was minimum length limits (38%) followed by protected slot length limits (24%)(Figure 5). A combination of bag and length limits were used in 10% of the special regulations. Respondents listed 111 rationale for the 92 special regulations. Area closures, extended seasons, gear restrictions, and elimination of minimum length limits were all special regulations reported by only one state or province. The most popular rationale was to change the quality of bass catch or harvest; and was at least one rationale for nearly 74% (68 of 92) of all the special regulations reported in the survey (Table 3). Changing bass prey structure or abundance was also a rationale for about 24% of the special regulations. Catch and release, a combination of bag and length limits, minimum length limits, and slot length limits were all regulations used to change the quality of bass prey. In contrast, season closures were only used to protect spawning bass.

States and provinces usually evaluated regulations, with only 9 of 44 respondents indicating they had not. Six states and provinces published in peer-reviewed journals their

regulation evaluations; however, most evaluations (25) were published in agency reports. In addition, 7 states used unpublished data to determine the effectiveness of the regulations.

Discussion

Current and historical regulations for both largemouth and smallmouth bass were similar, likely because these two species were commonly included in the same regulations. However, we did not ask in our survey if regulations were separated by species. Therefore, it was unclear if the historical regulations and/or justification were for just one species of black bass or a combination of species. Based on current regulations, 88% of the 56 states and provinces surveyed and with black bass fisheries combine statewide regulations for smallmouth and largemouth bass, although special regulations are oftentimes separated by species. Therefore, results for largemouth bass and smallmouth bass from this survey should be interpreted generally as both species combined. Spotted bass regulations differed slightly compared to the other black bass, likely because their biology and angler acceptances differ. Spotted bass and largemouth bass may compete for the same resources and efforts are underway in some waters to reduce spotted bass numbers (Buynak et al. 1991; Long 2000).

Black bass regulations have varied over the last 100 years. The early 1900s were the age of restrictive regulations (Redmond 1986) with bag limits and season closures the most prominent regulations. Our results mirrored Redmond's as states and provinces implemented statewide regulations most commonly in the 1930s and 1940s with substantially fewer statewide regulations implemented since the 1940s. During the liberalization to restriction period (1940-1960; Redmond 1986), our survey results indicated fewer statewide regulations were

implemented. Length limits have been the most common length-based regulations (Wilde 1997), although slot and maximum length limits have also become more popular (Noble and Jones 1999; Noble 2002). Minimum length limits were likely the primary regulation because overharvest was considered a key problem with fish populations in the 1940s to 1960s (Redmond 1986). Other length-based regulations (e.g. slot limits) have been developed more recently (Anderson 1974) and therefore were not used when many of these regulations were enacted. Our results suggested that changes in regulations became more common from the 1970s to present, and likely coincided with more restrictive (Redmond 1986) and special regulations. Since 1974, 35 of 48 states (Alaska and Hawaii excluded) reduced their creel limits, and the number of states with statewide minimum lengths doubled (Fox 1975; current study). Also, minimum lengths in 11 of 14 states with statewide minimum length limits in 1974 increased (Fox 1975; current study). Fox did not provide any regulation data for Canadian provinces.

Harvest regulations have also been used not only to alter black bass populations, but to alter their prey populations as well. Using harvest regulations on bass populations to change prey population structure was a common rationale for regulations, although it was relatively low importance. Regulations have been used to manage prey populations, and largemouth bass can have substantial influences on their prey population structure and dynamics (Anderson 1976; Noble and Jones 1999). This might be because LMB are highly sought by anglers rather than their prey species (i.e. bluegills or shad species).

Recent regulations have become more species and site specific. Changes in statewide regulations have been common since about the 1970s, and likely coincide with more specialized regulations. Noble (2002) indicated that the trend of liberalized regulations from the 1970s has now shifted to an increase use of harvest restrictions, which mirrors our results of increased

changes in regulations since the 1970s. Increased research and scientific knowledge about population dynamics occurred during this period and therefore these regulations changes were likely a result of this effect. Special regulations are now regularly implemented by state and provincial resource agencies. Noble (2002) found an increase use of slot length limit studies (as well as bag and minimum length limits) over the last 25 years of black bass regulations as regulations became more complex. In contrast, there were very few special regulations that included season closures or liberalized regulation changes. The survey results suggest that special regulations were used with different rationale, presumably because of different population and community structure across the U.S. and Canada. For example, four types of regulations were used to change black bass prey quality and five different regulations were used to protect spawning bass. Special regulations should always be evaluated (Noble and Jones 1999) and most states and provinces had some evaluation criteria for their regulations. Although few evaluations were in peer-reviewed literature, state agency reports were the most common regulation evaluation.

Later enactments of regulations in SD and WD waters were likely associated with black bass being native and available suitable habitat, but we do not know why lengths of harvest minimums differed regionally. Black basses are native to waters in NE, NCD, and SD waters, but are not native to WD waters (Gilbert and Williams 2002); however, all three species of black basses have been introduced to water bodies outside their native range including nearly all WD states and provinces (Fuller et al. 1999). Furthermore, new impoundments and reservoirs > 500 ha were built between 1900 and 1970 providing up to 11,000,000 acres of additional black bass habitat (Miranda 1996), much of which is located in SD and WD states. Associated angling pressure also increased with increasing numbers of reservoirs (Miranda 1996). Although

numerous impoundments and reservoirs were also built in NCD and NE states, their influence was substantially less because of greater abundance of naturally formed waters with native populations.

Geographical differences in minimum lengths appear more social than biological. Larger minimum lengths found in NCD and NE waters protect mature largemouth bass much longer than the shorter minimum lengths do in SD and WD waters. Few individuals of all three species reach sexual maturity before reaching 8 to 10 in TL (Coble 1975; Heidinger 1975; Vogeles 1975), and each species grows faster in more southerly habitats (Carlander 1977; McCauley and Kilgour 1990). Therefore, 12-in minimums probably protect mature bass for only one growing season after reaching sexual maturity in SD waters whereas 14-in minimums protect mature black bass for several years after reaching sexual maturity in NE and NCD waters. More restrictive or higher minimums were probably more easily sold to anglers in states and provinces where black basses were less popular among anglers, which could explain lower minimum lengths in SD waters where black basses are most sought by anglers.

In summary, black bass regulations have varied considerably over the years, but remained relatively consistent among species. Although the biology and ecology of largemouth, smallmouth, and spotted bass may be different, regulating these species are similar, possibly because anglers have difficulty distinguishing between the species and/or ease of regulation interpretations. Although there have been changes in regulations over the years, the rationale for these regulations have remained relatively constant. There has been more recent emphasis on lake-specific regulations and population dynamics of the black bass may be different from lake to lake and may be a reason why it was common to have several rationale for a specific special regulation. In addition, angler attitudes may affect the regulation type enacted by a state or

province (Quinn 2002). Nonetheless, minimum length limits, bag limits, and season closures are still the primary harvest-based regulation used over the last decade.

Acknowledgements

We thank all the agency biologists and administrators who responded to this survey. Kevin Pope and David Willis reviewed drafts of the survey and preliminary discussions about the study.

References

- Anderson, R. O. 1974. Influence of mortality rates on production and potential sustained harvest of largemouth bass populations. Pages 18-28 *in* J. L. Fink, editor. Symposium on overharvest and management of largemouth bass in small impoundments. North Central Division, American Fisheries Society, Special Publication 3, Bethesda, Maryland.
- Anderson, R. O. 1976. Management of small warmwater impoundments. *Fisheries* 1(6): 26-28.
- Buynak, G. L., L. E. Kornman, A. Surmont, and B. Mitchell. 1991. Evaluation of a differential harvest regulation for black bass in Cave Run Lake, Kentucky. *North American Journal of Fisheries Management* 11:277-284.
- Carlander, K. D. 1977. Handbook of freshwater fishery biology, volume 2. Iowa State University Press, Ames.
- Coble, D. W. 1975. Smallmouth bass. Pages 21-33 *in* R.H. Stroud and H. Clepper, editors. Black bass biology and management, Sport Fishing Institute, Washington, D.C.
- Fox, A. C. 1975. Effects of traditional harvest regulations on bass populations and fishing. Pages 392-398 *in* R.H. Stroud and H. Clepper, editors. Black bass biology and management, Sport Fishing Institute, Washington, D.C.
- Fuller, P.L., L.G. Nico, and J.D. Williams. 1999. Nonindigenous fishes introduced into inland waters of the United States. American Fisheries Society, Special Publication 27, Bethesda.
- Gilbert, C.R., and J.D. Williams. 2002. National Audubon Society Field Guide to the Fishes. Alfred A. Knopf, Incorporated, New York.
- Heidinger, R. C. 1975. Largemouth bass. Pages 11-20 *in* R.H. Stroud and H. Clepper, editors. Black bass biology and management, Sport Fishing Institute, Washington, D.C.

- Kubacki, M. F., F. J. S. Phelan, J. E. Claussen, and D. P. Philipp. 2002. How well does a closed season protect spawning bass in Ontario? Pages 379-386 *in* D. P. Philipp and M. S. Ridgeway, editors. Black bass: ecology, conservation, and management. American Fisheries Society, Symposium 31, Bethesda, Maryland.
- Long, J. M. 2000. Population dynamics and interactions of three black bass species in an Oklahoma reservoir as influenced by environmental variability and differential harvest regulations. Doctoral dissertation, Oklahoma State University, Stillwater.
- McCauley, R. W., and D. M. Kilgour. 1990. Effect of air temperature on growth of largemouth bass in North America. *Transactions of the American Fisheries Society* 119:276-281.
- Miranda, L.E. 1996. Development of reservoir fisheries management paradigms in the twentieth century. Pages 3-11 *in* L.E. Miranda and D.R. DeVries, editors. Multidimensional approaches to reservoir fisheries management. American Fisheries Society Symposium 16.
- Noble, R. L. 2002. Reflections on 25 years of progress in black bass management. Pages 419-432 *in* D. P. Philipp and M. S. Ridgeway, editors. Black bass: ecology, conservation, and management. American Fisheries Society, Symposium 31, Bethesda, Maryland.
- Noble, R. L., and T. W. Jones. 1999. Managing fisheries with regulations. Pages 455-480 *in* C. C. Kohler and W. A. Hubert, editors. Inland fisheries management in North American, second edition. American Fisheries Society, Bethesda, Maryland.
- Novinger, G. D. 1984. Observation on the use of size limits for black basses in reservoirs. *Fisheries* 9(4): 2-6.
- Quinn, S. P. 1996. Trends in regulatory and voluntary catch-and-release fishing. American Fisheries Society Symposium 16: 152-162.

- Quinn, S. P. 2002. Status of seasonal restrictions on black bass fisheries in Canada and the United States. *American Fisheries Society Symposium* 31:455-465.
- Redmond, L. C. 1986. The history and development of warmwater fish harvest regulations. Pages 186-195 *in* G. E. Hall and M. J. Van Den Avyle, editors. *Reservoir fisheries management: strategies for the 80's*. Reservoir Committee, Southern Division, American Fisheries Society, Bethesda, Maryland.
- U.S. Department of the Interior (USDI). 1996. 1996 Survey of hunting, fishing, and wildlife associated recreation. Washington, DC.
- Wilde, G. R. 1997. Largemouth bass fishery responses to length limits. *Fisheries* 22(8): 14-22.
- Vogele, L. E. 1975. Spotted bass. Pages 34-45 *in* R.H. Stroud and H. Clepper, editors. *Black bass biology and management*, Sport Fishing Institute, Washington, D.C.

Table 1. List of states and provinces that participated in a mail survey of historical black bass regulations.

	States	Canadian Provinces
Alabama	Mississippi	Alberta
Arizona	Missouri	New Brunswick
Arkansas	Nebraska	Nova Scotia
California	Nevada	Ontario
Colorado	New Jersey	
Connecticut	New Hampshire	
Delaware	New Mexico	
Florida	New York	
Georgia	North Carolina	
Idaho	North Dakota	
Illinois	Ohio	
Indiana	Oklahoma	
Iowa	Oregon	
Kansas	Pennsylvania	
Kentucky	South Carolina	
Louisiana	South Dakota	
Maine	Tennessee	
Maryland	Texas	
Massachusetts	Utah	
Michigan	Vermont	
Minnesota	Washington	
	Wisconsin	

Table 2. Mean ranking (1 being the highest) of rationale for historical black bass regulations listed in a 2001 survey of states and provinces.

Rationale	Largemouth bass		Smallmouth bass		Spotted bass	
	Mean	N	Mean	N	Mean	N
	(SE)		(SE)		(SE)	
Equitable harvest distribution	1.7(0.2)	22	1.7(0.2)	20	1.7(0.3)	9
Protect spawning bass	1.8(0.2)	26	1.7(0.2)	24	2.0(0.3)	11
Change quality of bass catch	2.1(0.2)	21	2.2(0.2)	20	1.8(0.2)	10
Change quality of bass prey	3.5(0.3)	13	3.8(0.1)	11	3.8(0.2)	6
Limit bass harvest	1.5(0.5)	4	2.3(0.5)	4		
Increase quantity of bass	2.0(-)	1	2.0(-)	1	2.0(-)	1
Lack of suitable bass habitat	5.0(-)	1	5.0(-)	1	5.0(-)	1
Difficulty in identification of bass species					1.0(-)	1

Table 3. Rationale for special regulations listed in a 2001 survey of states and provinces on their historical black bass regulations. The numbers indicate the number of that regulation type for which the rationale was listed.

Regulation	Rationale for regulation					
	Equitable distribution of harvest	Protect spawning bass	Change quality of bass catch	Change quality of bass prey	Increase bass harvest	Decrease bass harvest
Bag limit	3		5		1	
Bag and length limit		1	8	3	1	
Catch and release		1	5	2		
Eliminate of regulations			1		1	
Maximum length			3			
Minimum length	2	4	27	10		3
Season closure		2				
Slot length limit	1	2	19	7		
Total	6	9	68	22	3	3

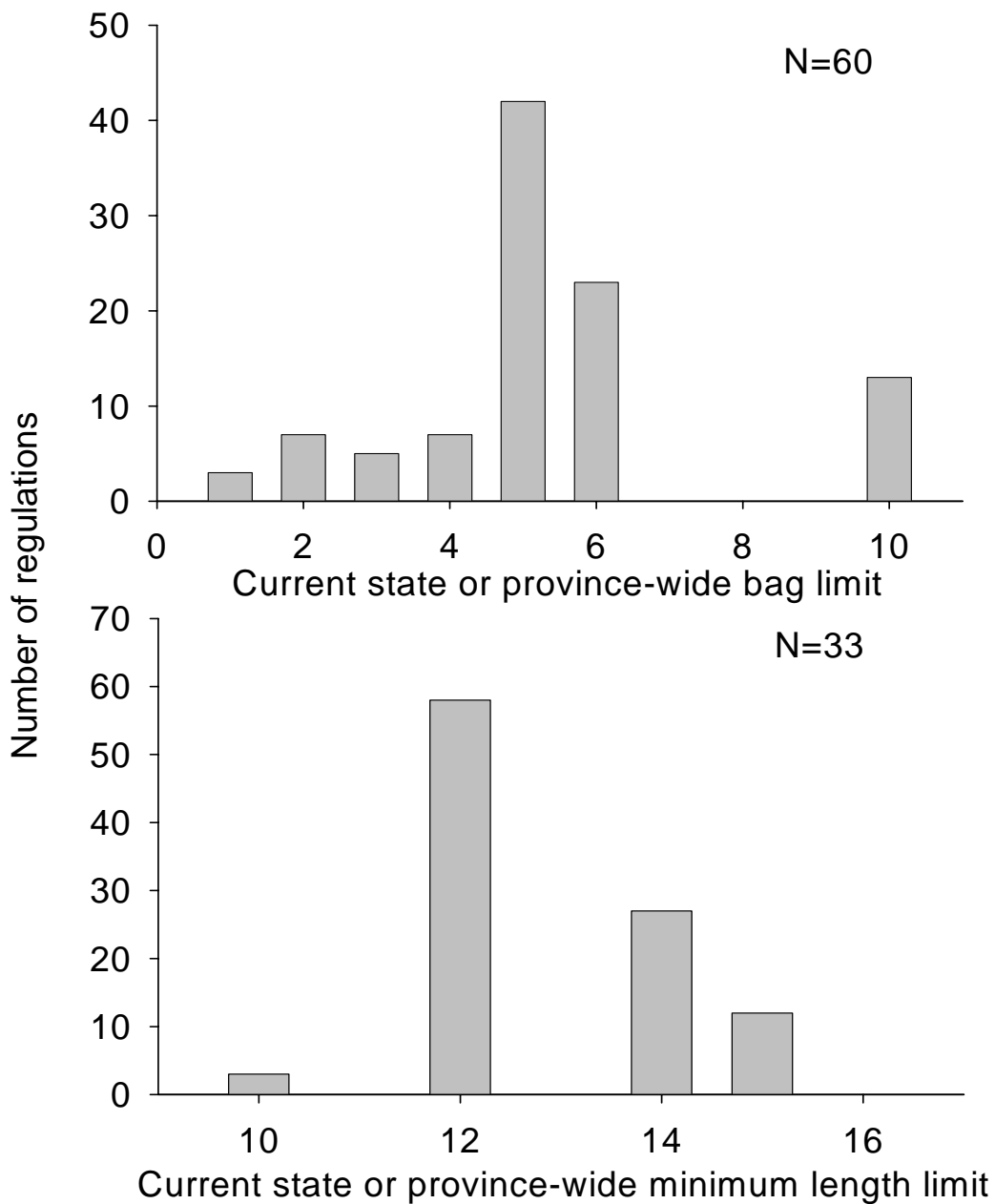


Figure 1. Frequency of bag and minimum length limits for black bass among US states and Canadian provinces in a 2002 survey (some states and provinces have more than one general regulation so totals exceed the number of state and provincial agencies surveyed).

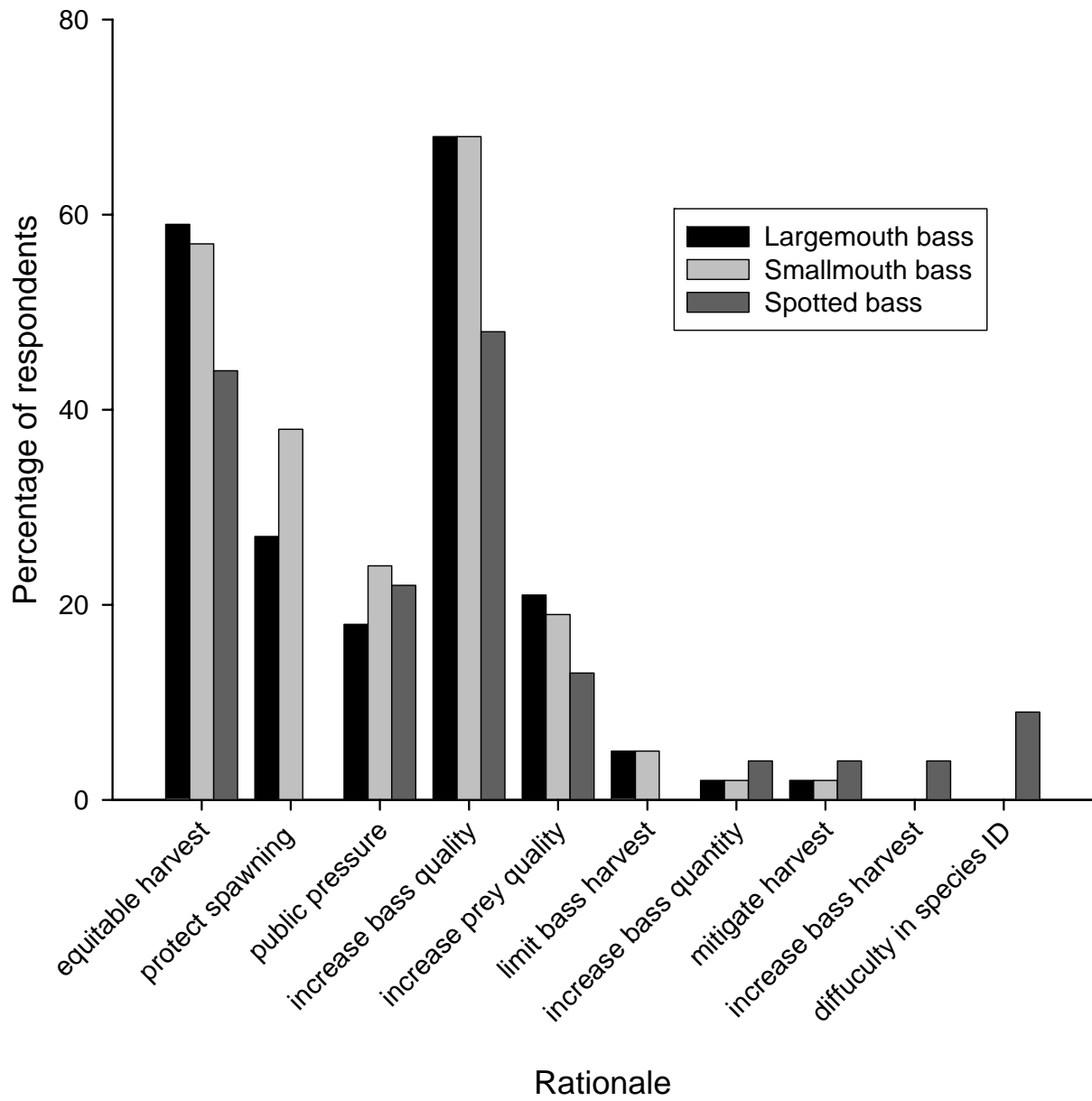


Figure 2. Rationale for current (2002) statewide black bass regulations.

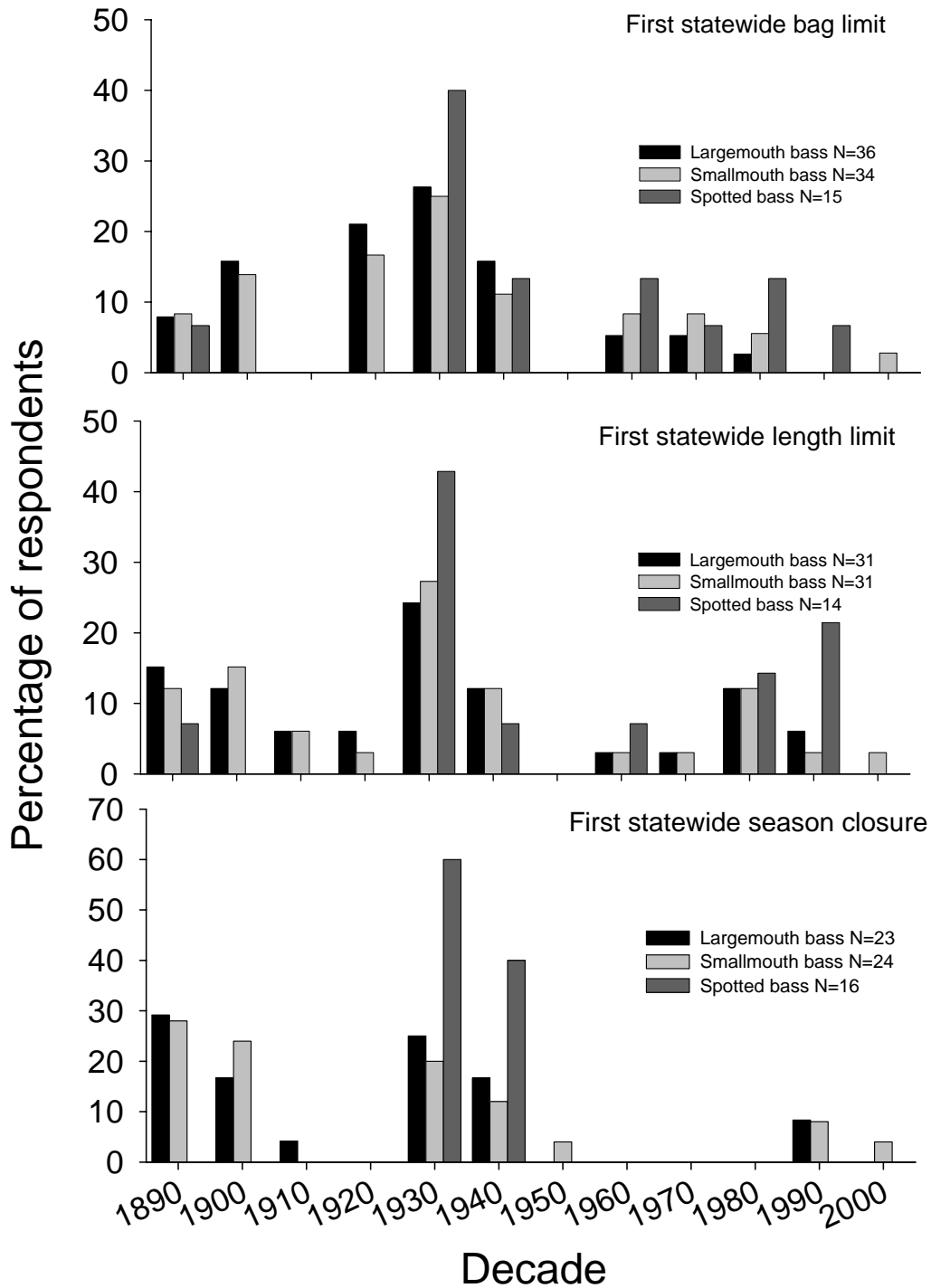


Figure 3. Decade of first statewide bag limit, length limit, and season closure for largemouth, smallmouth, and spotted bass. Values before 1900 are represented under decade 1890.

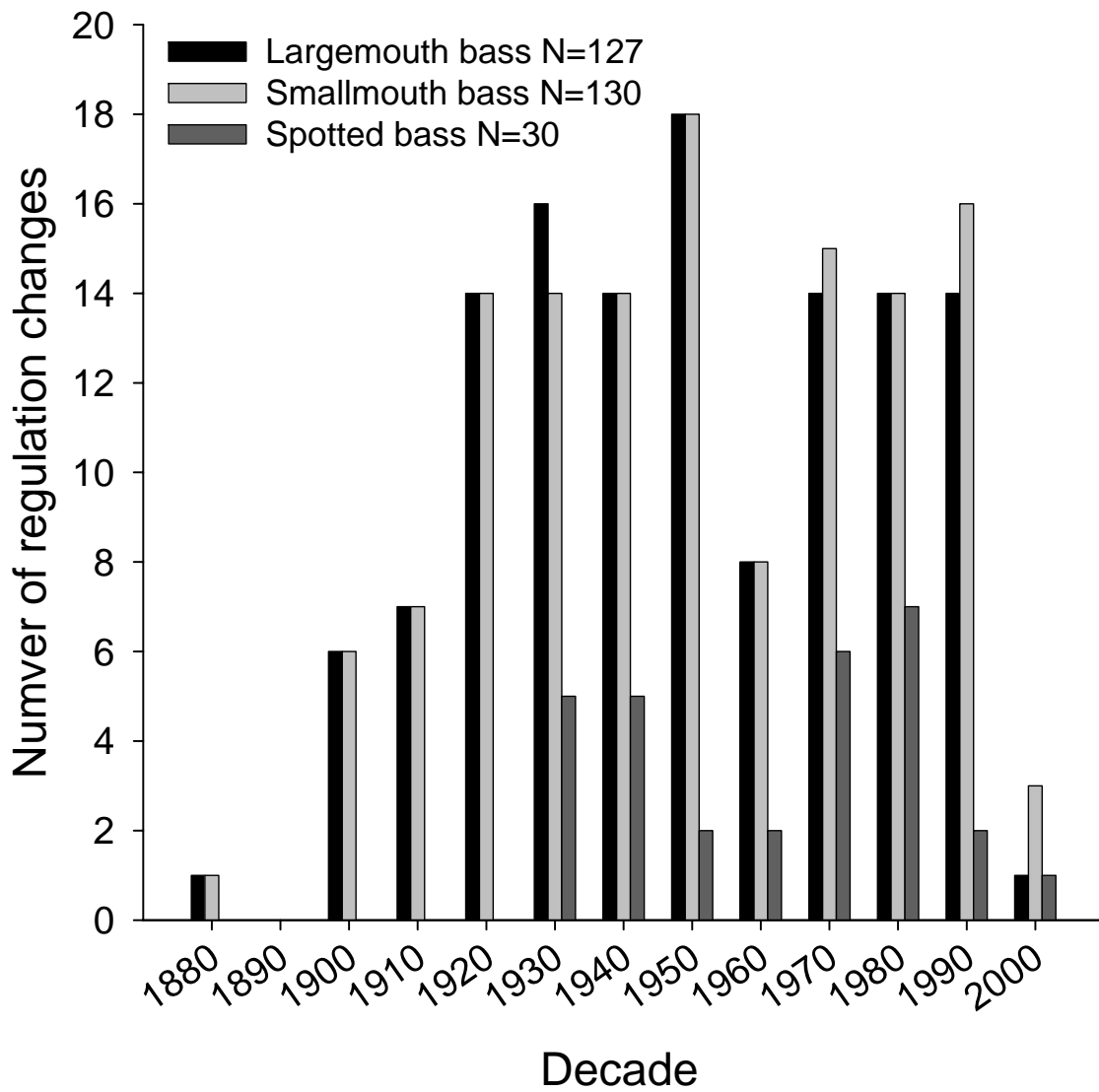


Figure 4. Number of statewide regulation changes by decade for black bass.

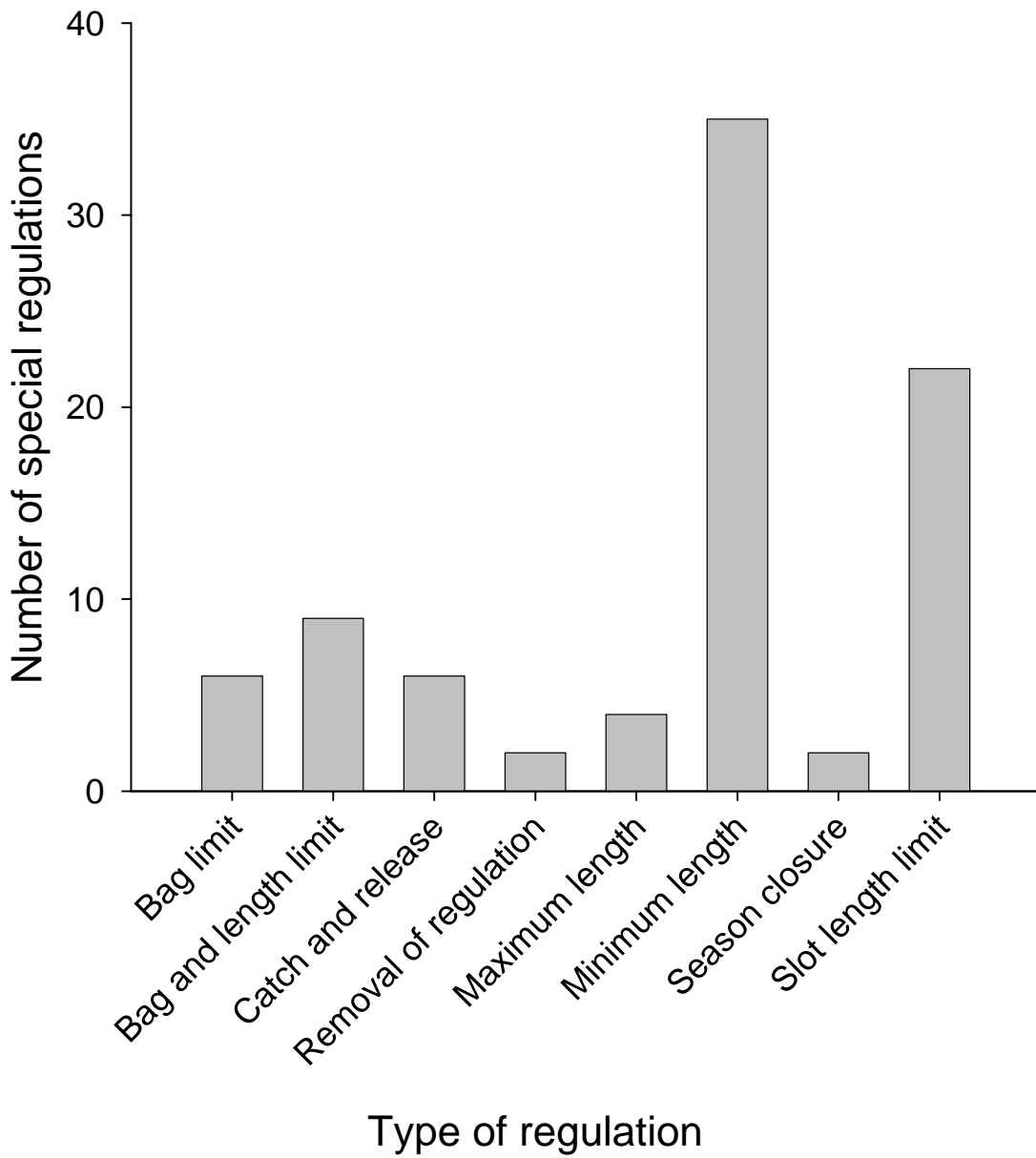


Figure 5. Number of special regulations for black bass.

Appendix 1. Survey instrument on black bass regulations sent to state and provincial agency biologists in summer 2002.

Current and Historical Black Bass Regulations In North America

The Centrarchid Technical Committee of the North Central Division of the American Fisheries Society is conducting a survey to determine the history and rationale for black bass regulations in North America. We also wanted to compare black bass regulations throughout North America. Our goal is to publish these findings in *Fisheries*.

State: _____ Agency: _____
 Name of person completing survey: _____
 Address: _____
 Phone: _____ Email: _____

Based on the most recent state or province-wide angler or creel surveys on public inland waters, what is the rank of preference of black basses compared to other freshwater fish taxa? (check appropriate box)

1 2 3 4 5 6 >6 Year of
 survey: _____

Approximately how many water bodies provide black bass fisheries in your state or province?

Current regulations:

We have already obtained your state or province's current seasons, bag, possession, and length limit regulations.

What year were these current regulations implemented?

LMB: season limit: _____ bag limit: _____ possession limit: _____ length
 limit: _____
 SMB: season limit: _____ bag limit: _____ possession limit: _____ length
 limit: _____
 SPB: season limit: _____ bag limit: _____ possession limit: _____ length
 limit: _____

What was the rationale for these regulations? (Please check all that apply):

LMB: Provide equitable distribution of harvest Change quality of bass harvest
 Protect spawning bass Change prey quality (bluegill, crappie)
 Public pressure (no biological reason)
 other _____

SMB: Provide equitable distribution of harvest Change quality of bass harvest
 Protect spawning bass Change prey quality (bluegill, crappie)
 Public pressure (no biological reason)
 other _____

SPB: Provide equitable distribution of harvest Change quality of bass harvest
 Protect spawning bass Change prey quality (bluegill, crappie)
 Public pressure (no biological reason)
 other _____

Historical regulations

When was the first statewide bag limit regulation implemented in your state or province (please check appropriate decade)? Please provide the number of fish allowed in the bag limit.

LMB: <1900 1900 1910 1920 1930 1940 1950 1960 1970 1980 1990

Limit: _____

SMB: <1900 1900 1910 1920 1930 1940 1950 1960 1970 1980 1990

Limit: _____

SPB: <1900 1900 1910 1920 1930 1940 1950 1960 1970 1980 1990

Limit: _____

When was the first statewide length limit regulation implemented in your state or province (please check appropriate decade)?

LMB: <1900 1900 1910 1920 1930 1940 1950 1960 1970 1980 1990

SMB: <1900 1900 1910 1920 1930 1940 1950 1960 1970 1980 1990

SPB: <1900 1900 1910 1920 1930 1940 1950 1960 1970 1980 1990

Please provide the type of statewide length limit regulation first implemented:

LMB: minimum maximum protected slot harvest slot lower bag above a certain length

SMB: minimum maximum protected slot harvest slot lower bag above a certain length

SPB: minimum maximum protected slot harvest slot lower bag above a certain length

When was the first statewide season restriction regulation implemented in your state or province (please check appropriate decade)?

LMB: <1900 1900 1910 1920 1930 1940 1950 1960 1970 1980 1990

SMB: <1900 1900 1910 1920 1930 1940 1950 1960 1970 1980 1990

SPB: <1900 1900 1910 1920 1930 1940 1950 1960 1970 1980 1990

What was the rationale for the above mentioned historical regulations? Please rank from highest importance (1) to lowest importance.

LMB: Provide equitable distribution of harvest among anglers
 Protect spawning bass
 Change quality of bass harvest
 Change quality of prey (e.g., bluegill, crappie) population
 other _____
 other _____

SMB: Provide equitable distribution of harvest among anglers
 Protect spawning bass
 Change quality of bass harvest
 Change quality of prey (e.g., bluegill, crappie) population
 other _____
 other _____

SPB: Provide equitable distribution of harvest among anglers
 Protect spawning bass
 Change quality of bass harvest
 Change quality of prey (e.g., bluegill, crappie) population
 other _____
 other _____

Please list the subsequent decades up to but **NOT** including current statewide or provincial-wide regulations when these first regulations were changed, the type of regulation, and rationale.

LMB: decade _____ regulation type: _____
 rationale: _____
 decade _____ regulation type: _____
 rationale: _____
 decade _____ regulation type: _____
 rationale: _____
 decade _____ regulation type: _____
 rationale: _____
 decade _____ regulation type: _____
 rationale: _____

SMB: decade _____ regulation type: _____
 rationale: _____
 decade _____ regulation type: _____
 rationale: _____
 decade _____ regulation type: _____
 rationale: _____
 decade _____ regulation type: _____
 rationale: _____
 decade _____ regulation type: _____
 rationale: _____

SPB: decade _____ regulation type: _____
 rationale: _____
 decade _____ regulation type: _____
 rationale: _____
 decade _____ regulation type: _____
 rationale: _____
 decade _____ regulation type: _____
 rationale: _____
 decade _____ regulation type: _____
 rationale: _____

Special Regulations:

If your state or province has special regulations that differ from statewide regulations, please check below the most appropriate rationale for these regulations.

Special regulation: _____

- _____ Provide equitable distribution of harvest among anglers
- _____ Protect spawning bass
- _____ Change quality of bass harvest
- _____ Change quality of prey (e.g., bluegill, crappie) population
- _____ other _____

Special regulation: _____

- _____ Provide equitable distribution of harvest among anglers
- _____ Protect spawning bass
- _____ Change quality of bass harvest
- _____ Change quality of prey (e.g., bluegill, crappie) population
- _____ other _____

Special regulation: _____

- _____ Provide equitable distribution of harvest among anglers
- _____ Protect spawning bass
- _____ Change quality of bass harvest
- _____ Change quality of prey (e.g., bluegill, crappie) population
- _____ other _____

Where any of the regulations evaluated? Yes No

If so, please provide any citations or reports that evaluated these special regulations.

Please provide any additional comments or suggestions:

Thank you for completing this questionnaire

If you want a copy of the results, please check this box: ; the results will be mailed to the address you listed on page one.

Please return this questionnaire to:

Mike McNerny
Chair, North Central Division, American Fisheries Society, Centrarchid Technical Committee.
Minnesota Department of Natural Resources
20596 Highway 7
Hutchinson, MN 55350