

SMALLMOUTH BASS REPORT: SHUBENACADIE (GRAND) LAKE

Co-ordinates

44° 55' N

63° 36' W



Surface Area: 1841 Ha

Max. Depth: 45 m

County: Halifax and Hants

Water Clarity: 14 TCU

Shoreline Length: 43 .1 km

Recreational traffic: Heavy



Summary

From 1991 to present, a total of 1271 tournament-caught smallmouth bass were sampled. Mean length of tournament smallmouth was 30.6cm (12 in). Bass over 35.5cm (14 in) represented 18% of the sample while bass over 45.5cm (18 in) represented only 1% of the sample. Length varied significantly from year to year, as much as 5.6cm (2.2 in), however there was no significant long-term trend. Smallmouth bass in Grand Lake appear to be in good condition compared to other Nova Scotia Lakes with a mean relative weight of 87. Smallmouth growth in Grand Lake is typical for Nova Scotia with bass reaching 25.4cm (10 in) and 35.5cm (14 in) after 5 and 9 years, respectively. The average 5-bass bag limit required to win a tournament on Grand Lake is 3.6 kg (8 lb) and the average tournament lunker is 1.2 kg (2.7 lb). No long-term or seasonal trend in the quality of tournament angling was observed.



Photo: E.A. Halfyard

An angler displays a large smallmouth taken from Grand Lake.



General Information

Smallmouth bass are thought to have been first introduced to the Shubenacadie Grand Lake system around 1961 (LeBlanc, 2008 *draft report*) and directed angling has steadily grown in popularity.

Grand Lake offers many angling opportunities and is popular with recreational boaters. Laurie and Oakfield provincial parks are both situated on the shores of Grand Lake and offer shore angling opportunities. Furthermore, an excellent boat launch at Oakfield park and a smaller launch on the Wellington and District Recreation Association (WADRA) parklands (extreme southern end of lake) provide large boat access.

Grand Lake is the 7th and largest lake in the historic Shubenacadie canal that provided shipping access from Dartmouth to the Minas Basin. Today the remnants of the canal can still be seen next to Fletcher's run in Wellington. Grand Lake is a large, deep lake which drains 59 named lakes and numerous streams. The lake is largely viewed as two sections. The main lake extends from Wellington in the South to the narrows between Walsh Point and Home Settlement. The second section is the area known as "Little Grand Lake" which is the large embayment at the North end of the lake. These sections differ in surficial geology with the main lake dominated by metamorphic slates and greywacke while Little Grand is primarily sedimentary carbonates and evaporites. Thus, the main lake offers primarily rock cover while Little Grand offers primarily aquatic vegetation cover.

Length of Grand Lake Bass

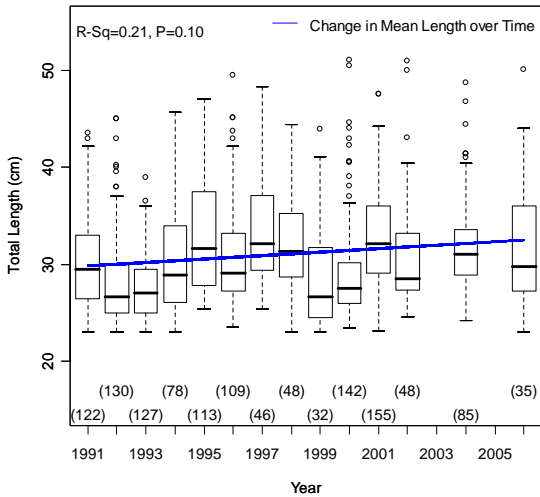


Figure 1—Length of tournament-caught smallmouth bass. Centre of boxes represent median values. Blue line indicates trend.

“Based on historical tournament data, only 1% of all Smallmouth Bass weighed-in were longer than 45.5cm (18 in)!”

The average length of Grand Lake smallmouth bass brought to tournament weigh-in scales from 1991 to 2006 was 30.6 cm (12 in) (S.E. = 0.15) as calculated from 1271 smallmouth bass over 23cm (9 in) – the minimum size permitted in many tournaments.

As would be expected, the majority of bass caught at Grand lake tournaments are considered small and 59% of the total bass sample were smaller than 30.5cm (12 in). Of all tournament caught bass sampled, 18% were longer than 35.5cm (14 in), 6% were longer than 40.5cm (16 in) and only 1% were longer than 45.5cm (18 in). In any given year, the mean length of tournament angled bass varied from a low

of 27.7 cm (10.9 in) in 1993 to a high of 33.3 cm (13.1 in) in 1997. Length of tournament bass varied significantly from year to year. For example, for the period of 1995 through 1998 and again in the 2004 and 2006, the average length of tournament-caught smallmouth was larger than in the early 1990’s as well as 1999 and 2000. Though mean length

has increased over time, this trend is not statistically significant (ANOVA, P=0.10) and may reflect angling conditions on tournament dates (Figure 1). Year class strength may affect mean length of tournament bass, however no obvious trends in cohort strength is observed (Figure 2) potentially indicating a relatively stable population.

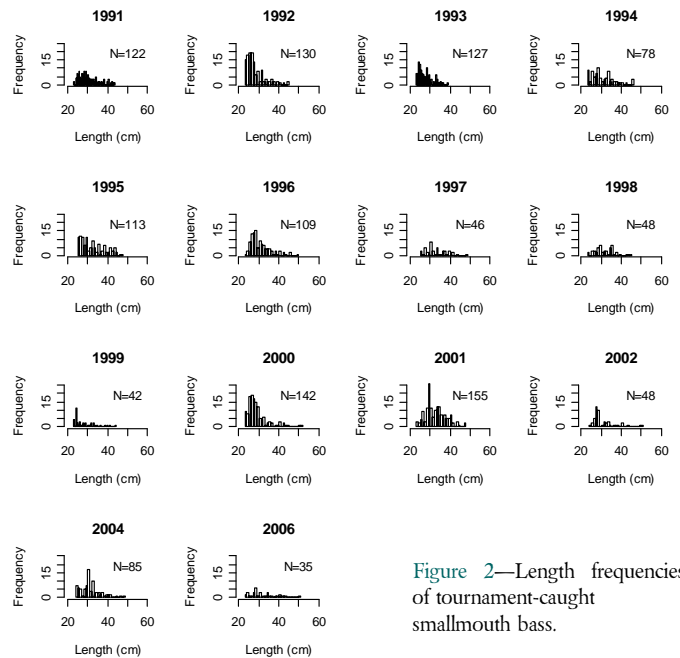


Figure 2—Length frequencies of tournament-caught smallmouth bass.

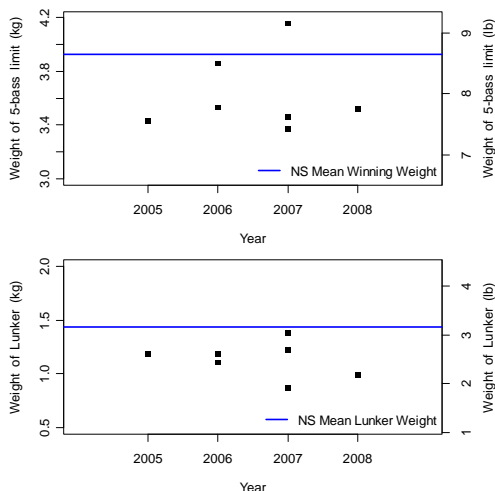


Figure 3— Weight of winning 5-bass tournament bag limits and lunkers from 2005 to 2008. Each point represents a tournament winning weight or lunker. NS mean represents all lakes for 2004–2008.

Tournament Results

Since comprehensive tournament reporting was initiated in 2004, the average weight of a 5-bass limit required to win a tournament on Grand Lake was 3.62 kg (8.0 lb). The largest 5-bass bag was 4.16 kg (9.2 lbs) (Figure 3). On average, the weight required to finish in the top 5 of any given tournament was 2.66 kg

(5.85 lbs) for 5 bass. A lunker is the single largest bass weighed in at a tournament. The mean size of tournament-winning lunker bass was 1.2 kg (2.7 lbs) while largest single lunker (out of 2037 bass) was 2.02 kg (4.5 lbs). No clear seasonal trend was observed for the quality of angling (i.e. weight of 5-bass limit).

Bass Growth in Grand Lake

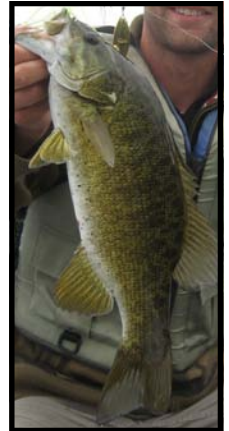


Photo: E.A. Halfyard

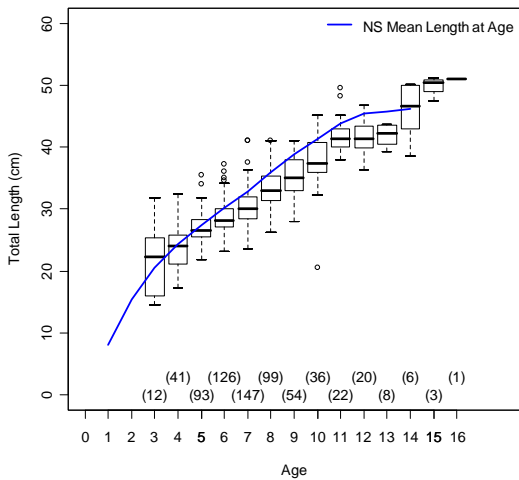


Figure 4 — Length at age for Grand Lake bass. Centre of the boxes represents the median values. Values in () indicate sample size. Blue line is NS mean.

Nova Scotia lies at the northerly end of the smallmouth's range and thus exhibits slower growth than other parts of North America. Additionally, lakes in Nova Scotia tend to be less productive than elsewhere. In previous studies, MacMillan et al. (2002) indicated that Grand Lake exhibited average growth when compared to the provincial average though recent data suggest slightly slower growth at older ages. Similarly, young smallmouth not often captured in tourna-

ments (ages 1, 2 and 3 years) tend to grow slower than the North American average (Dunlop 2004). Bass in Grand Lake grow to 25.4cm (10 in) after 5 years, 30.5cm (12 in) after 7 years and to 35.5cm (14 in) after 9 years (Figure 4). Large specimens are notoriously difficult to age however bass as old as 17 years have been sampled in Grand Lake.

Relative Weight

The weight of bass increases with its length. Using this relationship the relative weight, or "plumpness" of individual bass may be assessed. On average, the relative weight of smallmouth from Grand Lake is approx. 87 (S.E. = 0.30). Yearly mean relative weights ranged from a high

of 101.9 in 1992 to a low of 80.5 in 2002 (Figure 5).

These values are moderate to high when compared to the Nova Scotia mean of 77, yet low when compared to bass in New Brunswick and Maine or the North American average of 100.

The relative weight of

Grand Lake bass appears to have decreased slightly over time however this trend is not statistically significant ($R^2=0.19$, $P=0.12$). Relative weight is affected by food supply, competition from other predators such as chain pickerel as well as climate.

"It takes 6-7 years for a Grand Lake Bass to reach 30cm (12 in) while a 50cm (20 in) bass may be 17 years of age or older!"

Common Prey and Competitor Species



Yellow perch

Many fish species inhabit Grand Lake including striped bass, landlocked Atlantic salmon, brook trout, chain pickerel, white perch, yellow perch, brown bullhead, American eel, rainbow smelt, alewife

(gaspereau) and American shad. Grand Lake is rich in littoral zone forage such as banded killifish, sticklebacks and aquatic insects which likely form the majority of the smallmouth's diet. Mice, frogs and other amphibians often fall prey to Grand Lake bass and large submerged weedbeds provide ample insect production. Seasonal changes in

abundance of anadromous smelts and juvenile alewife may affect relative weight at the population level.

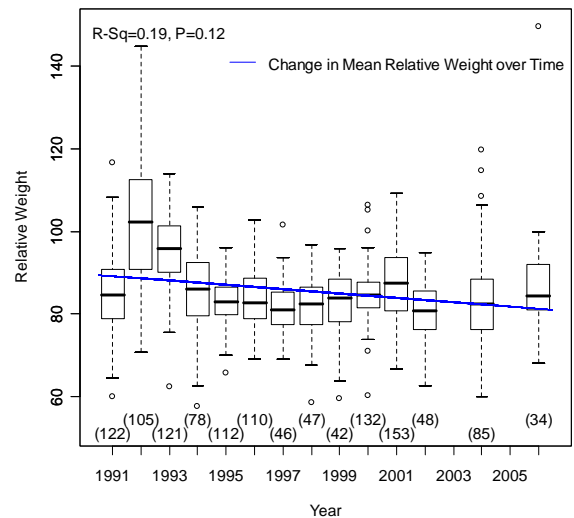


Figure 5 — Relative weight of tournament-caught smallmouth from 1991 to 2006. Blue line represents trend. Sample size in (). Centre of boxed represents median values.

Nesting

Nesting activity in Grand Lake is not unlike that of other lakes. While Grand Lake was not included in recent nesting surveys, it is evident that despite its size, the majority of spawning activity occurs in only a few areas. The Northern portion of the lake offers the most suitable habitat though pockets exist to the South. Male bass excavate nests from mid-May through June in shallow water (usually <1m), primarily over gravel and cobble and usually associate nests with nearby cover such as logs, rocks or docks. Females deposit eggs and retreat to deep water while the male bass guards the nest and eggs until the fry disperse sometime in late June (Figure 6).

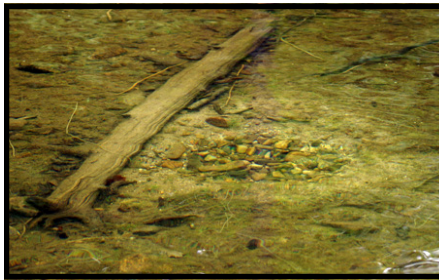


Figure 6—A typical Grand Lake bass nest (bottom) with a guarding male (top).

Photos: J. LeBlanc

Bass Fishing Tips

Bass in Grand Lake prefer rock piles, docks and weeds depending on the time of year. In spring, try sheltered coves with rock and sand bottoms. The heat of summer means early morning and late evening fishing. Focus your effort on docks and rock piles near deep water. Topwater lures, soft plastic minnow baits and grubs on leadhead jigs are top choices. In fall, be sure to cover lots of water. Fast moving horizontal presentations with crankbaits, spinnerbaits and jerkbaits will catch fish. Little Grand lake (Horne Settlement to Montavista), the Shubenacadie River and the extreme Southern end of the lake (Wellington) provide excellent bass angling.

Angling Regulations

Current as of July 2008, smallmouth bass regulations in Grand Lake are designed for trophy management. As such, anglers are permitted to angle smallmouth bass from

April 1st to December 31st. From April 1st to June 30th, no smallmouth bass may be retained to protect spawning bass. From July 1st to the end of season, anglers are permitted to retain three (3) smallmouth bass with a maximum length of 35 cm (13.8 in). For additional information, please refer to the Angler's Handbook.



Report compiled by:

E. A. Halfyard (Fisheries Biologist)

For more information, contact;

Warmwater Fisheries Biologist

Jason LeBlanc
leblanje@gov.ns.ca
902-485-7029



Fisheries and Aquaculture

Inland Fisheries Division

P.O. Box 700,
Pictou Nova Scotia,
B0K-1H0
Phone: 902-485-5056
Fax: 902-485-4014
<http://www.gov.ns.ca/fish/sportfishing>

References:

Davis, D. and S. Browne (eds). 1997. The Natural history of Nova Scotia—Theme Regions. Nimbus—Nova Scotia Museum. Halifax, NS.

Dunlop, E.S. and B.J. Shuter. 2004. Native and introduced populations of smallmouth bass differ in concordance between climate and somatic growth. *Trans. Amer. Fish. Soc.* **135**: 1175-1190

LeBlanc, J.E. 2008. Geographic distribution of smallmouth bass in Nova Scotia. Draft report. Nova Scotia Department of Fisheries and Aquaculture Technical Report Series. 2008-01.

MacMillan, J. L., A.J. MacNeill, R.G. Heighton and M.S. Ridgeway. 2002. Life history characteristics of smallmouth bass populations in Nova Scotia based on tournament monitoring. **Black bass: ecology, conservation and assessment. American Fisheries Society symposium.** 31 pp. 535-544.

Acknowledgements:

We wish to thank members of the Canadian Association of Smallmouth Anglers, the Bronzeback Bass Club and Nova Bassmasters. Also, a special thank you to Ralph Heighton who conducted much of the tournament sampling and provided reliable aging of scale samples.