

# **SUMMARY OF SMALLMOUTH BASS ASSESSMENTS IN SELECTED AREAS OF DOOR COUNTY 2004**

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Smallmouth bass populations have been surveyed in selected areas of Door County periodically since 1991 to determine the biological status of this very popular sport fish. In spring 2004, populations were sampled in Little Sturgeon Bay and Sturgeon Bay, primarily in the area known as the "flats", from late April through early June. Rowley Bay was sampled from early May through early June. These three areas were last sampled for bass during the mid 1990s.

## **Methods**

Fyke nets were set in Little Sturgeon Bay and Sturgeon Bay in late April and the first week in May in Rowley Bay. Nets were lifted and fish removed every 24 to 48 hours. Nets were left open or removed from the water during weekends. Smallmouth were removed from the nets, total length was measured to the nearest millimeter (converted to inches) and several scales were removed from a subsample of the total bass caught for aging. A small portion of the top of the tail of each bass was clipped prior to release to provide a mark for estimation of population size. All other fish were identified to species, counted and released. All nets were removed from the three locations during the first week in June.

Population estimates were calculated using the Chapman Modification of the Schnabel Method.

An assessment of nesting success was conducted with SCUBA or snorkel gear in selected areas of each of the bays. Divers swam along predetermined transects, counted nests and made note of the presence of eggs and/or fry. This survey has been conducted almost yearly since the mid 1990s in Sturgeon Bay in an area known as the "flats".

A crude estimate of relative abundance of round gobies was also made in each bay. Four square metal structures measuring a meter per side ( $m^2$ ) and made of flat steel were randomly dropped on the bottom of each bay and left overnight. The location of each square was marked with a floating plastic bottle. The following day, divers slowly swam underwater to each structure and attempted to count the number of gobies inside each structure. Relative abundance was calculated as the mean number of gobies in the four squares in each bay.

Information on the sport fishery for smallmouth in the outlying waters off Door County was obtained through records from the contact angler creel survey conducted annually since the 1970s.

## **Results and Discussion**

### **Age Composition**

The age composition of bass sampled in Rowley Bay in 2004 was similar to that sampled in 1996, although in 2004 there were more fish age 10 and older (Figure 1). Since this is a spawning survey, very few fish younger than age 5 were captured. The mature population consisted of 11 age classes, ranging from 5 to 15-year-olds. There appeared to be good recruitment of fish to age 5 and older.

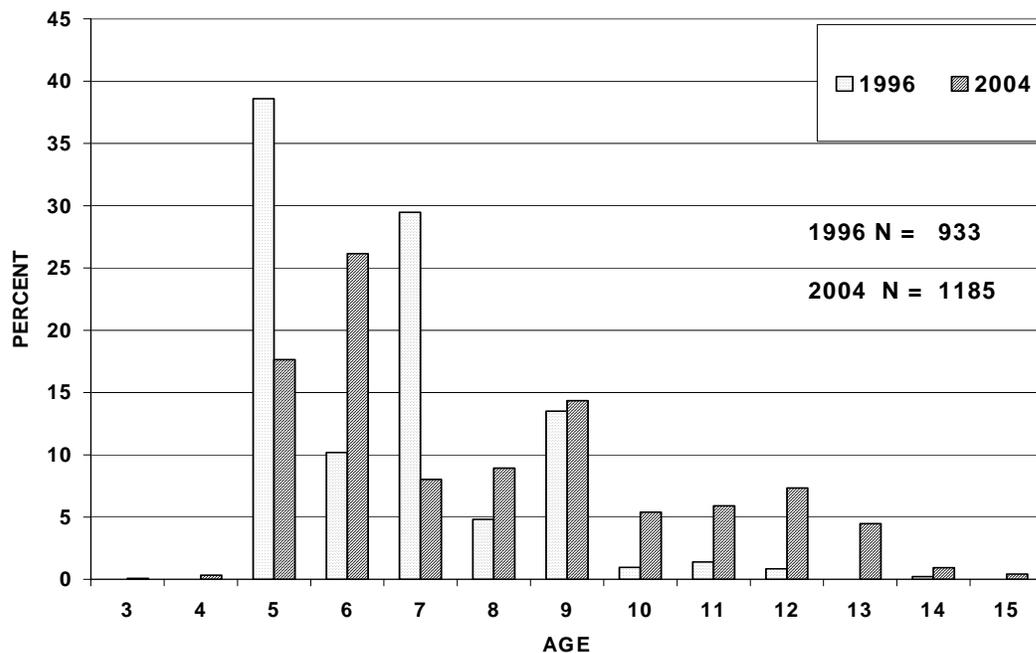


Figure 1. Comparison of age composition of smallmouth bass sampled in Rowleys Bay in 1996 and 2004.

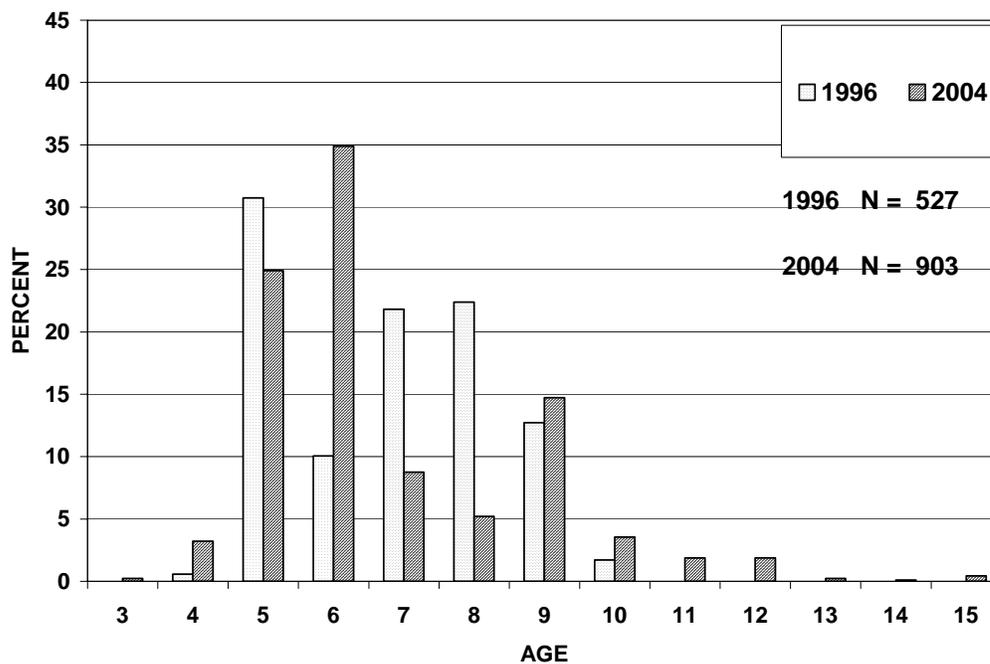


Figure 2. Comparison of age composition of smallmouth bass sampled in Sturgeon Bay and Little Sturgeon Bay in 1996 and 2004.

Fish sampled in Little Sturgeon were pooled with those from Sturgeon Bay and the age composition looked similar to that from 1996 (Figure 2). The mature population consisted of 11 age classes, as in Rowley Bay, and there were slightly more fish for some of the ages over 10 compared to 1996.

## Growth

Average lengths of fish at age in 2004 were similar, although bass from Rowley Bay ages 6 and 7 were about an inch larger compared to the same ages in Sturgeon Bay/Little Sturgeon (Figure 3). Average lengths in 2004 were similar to those found in the mid 1990s (Figure 4). A bass reaches the current 14 - inch size limit at about age 6. This size limit allows bass to spawn at least once and probably twice before they can be legally harvested. Growth in both areas is similar to statewide averages for smallmouth bass.

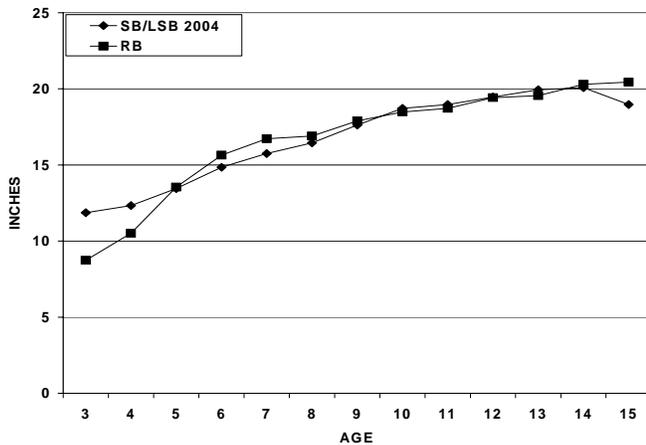


Figure 3. Comparison of length at age for smallmouth bass sampled in Sturgeon Bay (SB)/Little Sturgeon Bay (LSB) and Rowley Bay (RB) in 2004.

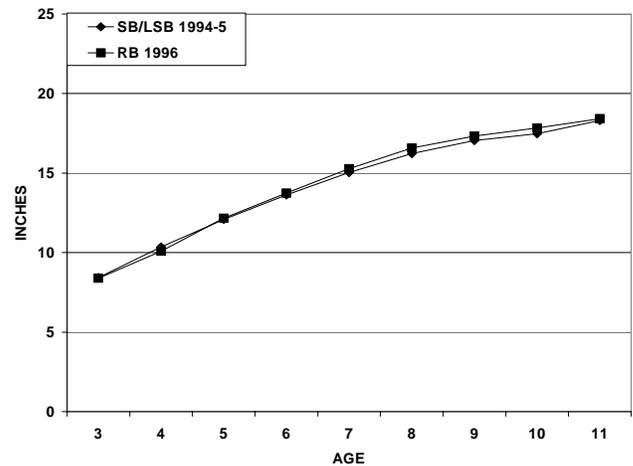


Figure 4. Comparison of length at age for smallmouth bass sampled in Sturgeon Bay (SB)/Little Sturgeon Bay (LSB) and Rowley Bay (RB) in the mid 1990s.

## Population Estimates

The population estimate of mature fish age 5 and older in 2004 for Rowley Bay was almost triple compared to the 1996 estimate, which was the smallest for the three sites (Table 1). The population estimates for bass in Little Sturgeon were similar in 1994 and 2004. The estimate in 2004 for Sturgeon Bay was substantially larger than the other two sites but confidence in the estimate is low due to very few recaptures. There was no estimate made for Sturgeon Bay 1996.

Table 1. Population estimates for smallmouth bass age 5 and older captured during spring assessments in Sturgeon Bay/Little Sturgeon Bay and Rowley Bay in 1994, 1996 and 2004.

LOCATION AND DATE	POPULATION ESTIMATE	95 % CONFIDENCE INTERVAL
STURGEON BAY 2004	24,887	9,105 - 62,218
LITTLE STURGEON BAY 1994	8,494	5,916 - 12,650
LITTLE STURGEON BAY 2004	7,641	4,678 - 13,173
ROWLEY BAY 1996	1,397	1,220 - 1,599
ROWLEY BAY 2004	4,125	3,644 - 4,671

## Sport Fishery

The sport catch in Door County waters, estimated from the contact creel survey of the ramp, pier and shore fisheries, has usually been well above 100,000 fish per year since the mid 1990s (Figure 5).

Estimated harvest has dropped from about 17,500 in 1996 to an average of about 8,900 fish annually in recent years (Figure 6).

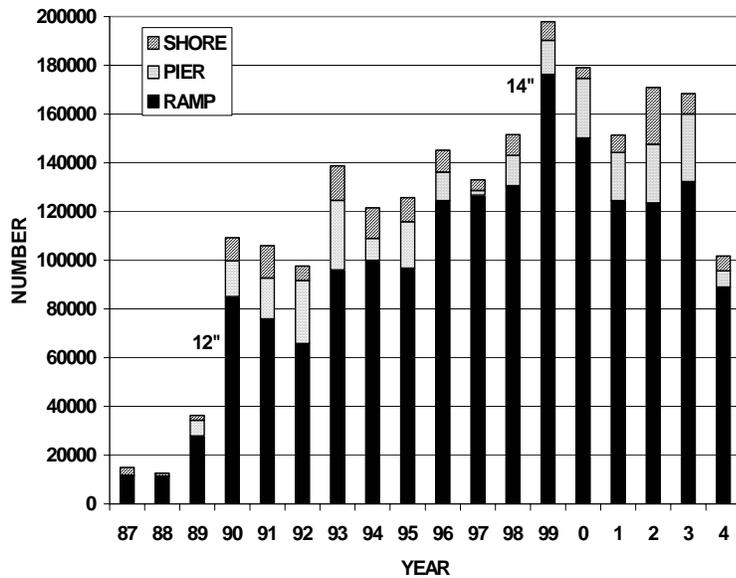


Figure 5. Estimated catch of smallmouth bass in the ramp, pier and shore sport fishery in the Green Bay and Lake Michigan waters off Door County. Years when size limits changed are indicated on the graph.

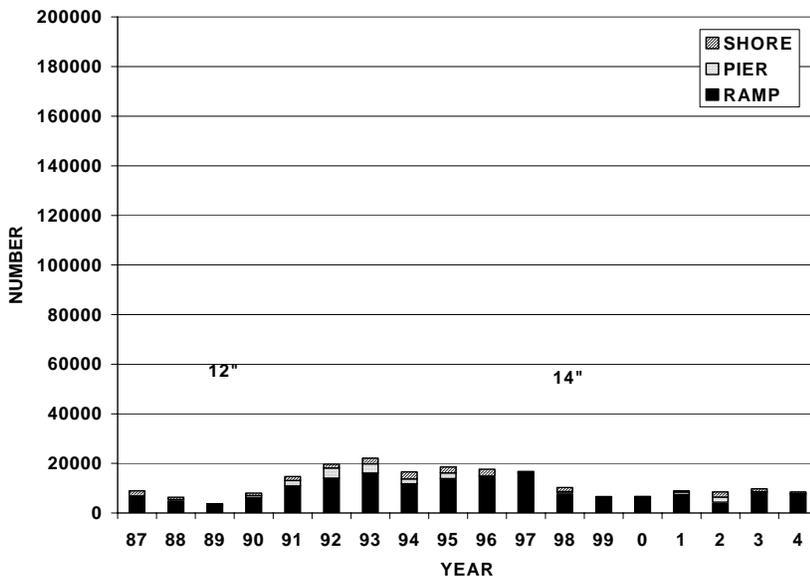


Figure 6. Estimated harvest of smallmouth bass in the ramp, pier and shore sport fishery in the Green Bay and Lake Michigan waters off Door County. Years when size limits changed are indicated on the graph.

## Nesting Success

Periodic underwater observations during the past decade have indicated continued good nesting success with medium to high numbers of nests containing live eggs and/or fry, especially in the area of Sturgeon Bay known as the "flats". Although only a relatively small area of the available spawning habitat has been sampled, bass continue to successfully protect nests against the invasive egg predator round goby, as evidenced by the schools of fry commonly observed.

## Round Goby Abundance

Round gobies were very common in Sturgeon Bay and Little Sturgeon Bay, averaging 9 per meter<sup>2</sup> and 7 per meter<sup>2</sup>, respectively. No live gobies were found in Rowley Bay but what looked like one dead goby was observed.

Gobies were first discovered in Sturgeon Bay in 1999 and have since reached "epidemic" levels along much of the Green Bay shoreline of Door County. Since most of the bass we sampled in 2004 were hatched before the goby invasion, we don't know if they have had a noticeable impact on bass recruitment since 1999. They have been documented as very aggressive egg predators in bass nests in Sturgeon Bay (Tim Kroeff WDNR, personal communication). Eventually gobies will probably become common in all nearshore waters of Door County.

## Management Recommendations

We do not believe the biological information we collected in 2004 indicates any apparent stress on the populations surveyed. Age composition, growth and population estimates all indicate the populations are in similar or better condition than they were almost a decade ago. The sport fishery seems to be primarily a catch and release fishery. **Consequently, we do not believe that the available information justifies the need to recommend any changes to the current fishing regulations at this time.**

However, we do believe that the enormous abundance of round goby in the Green Bay waters off Door County is capable of impacting bass recruitment to some extent. We base that on observations made here by WDNR staff and elsewhere in the Great Lakes where bass and gobies co-exist and there is an allowable fishery during the bass spawning period. **As such, we do recommend that the survey conducted in 2004 be repeated no later than 2007 to determine if there has been any substantial change in recruitment of recent year classes to the adult population.**

At the statewide Conservation Congress hearings in 2003, attendees voted 2 to 1 in favor of changing the bass regulations on Green Bay and Lake Michigan waters off Door County to reduce the harvest during the spawning season to help maintain or improve the quality of fishing. The question was only advisory and no action was taken by the WDNR.

We would like to know if the public would still support a rule change to provide more protection to spawning bass in the Green Bay and Lake Michigan waters off Door County, in light of the new biological information above. Please contact Mike Toneys (920-746-2864; [michael.toneys@dnr.state.wi.us](mailto:michael.toneys@dnr.state.wi.us)) or Tim Kroeff (920-746-5107; [kroeft@dnr.state.wi.us](mailto:kroeft@dnr.state.wi.us)) at the Sturgeon Bay DNR office with your thoughts, concerns and comments. We appreciate your interest.