

Bluegill Population Dynamics Following Implementation of No-Harvest Regulations

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INTRODUCTION

- ❑ Inch Lake is a 31-acre soft-water seepage lake in Bayfield County, WI
- ❑ The fish community is dominated by bluegill, largemouth bass, and bluntnose minnows with substantial numbers of adult black crappie and annually variable numbers of young yellow perch
- ❑ Fishing was allowed prior to 2006
- ❑ No-harvest regulations enacted for all species after 2006



OBJECTIVE

Assess the bluegill population following the implementation of no harvest regulations for all species

METHODS

- ❑ Fyke net sampling from 2007 to 2011
- ❑ Total length (mm) and weight (g) recorded for all fish
- ❑ Fish ≥ 150 mm were individually tagged
- ❑ CPE, PSD, RSD-P, mean length, and mean relative weight were calculated for bluegills each year
- ❑ Stock, quality, and preferred sizes were 80, 150, and 200 mm, respectively

RESULTS

- ❑ CPE of fish < 80 mm indicated fairly constant annual recruitment (Fig. 1)
- ❑ CPEs of 80-150 mm and ≥ 150 mm fish declined significantly in 2010 and 2011 (Fig. 1)
- ❑ Except in 2010, the RSD-P increased each year while the PSD remained constant (Fig. 2)
- ❑ Mean length of fish ≥ 80 mm increased from 2007-2011, except in 2010
- ❑ Relative weight declined for all fish in 2008-9 and rebounded in 2010-11, though the rebound was greater for fish < 200 mm (Fig. 3)
- ❑ The growth of fish < 200 mm exceeded, whereas growth of fish ≥ 200 mm was similar to, the average growth of fish in other northern region lakes (Fig. 4)

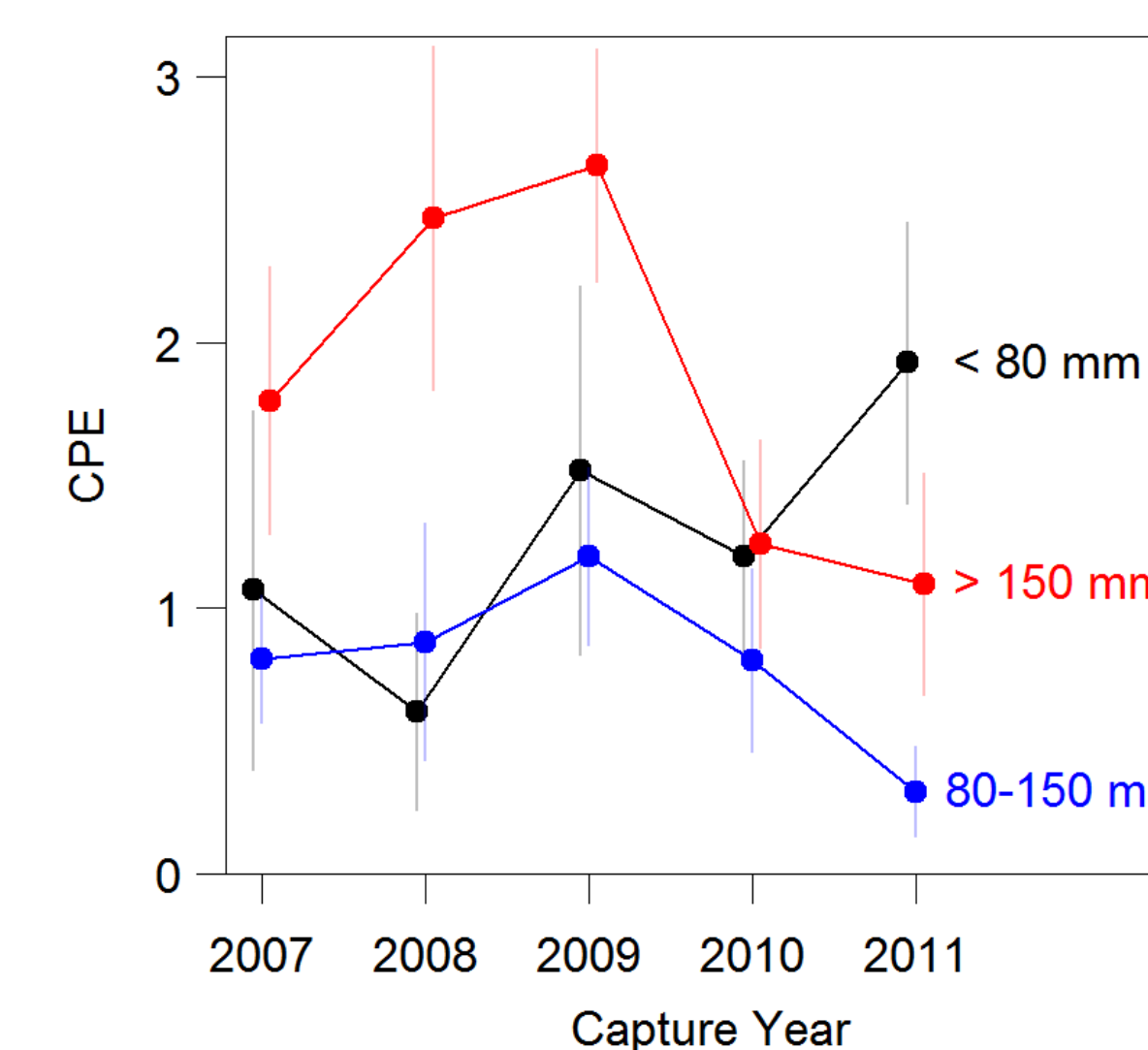


Figure 1. CPE (log number + 1 per net) by size class and year

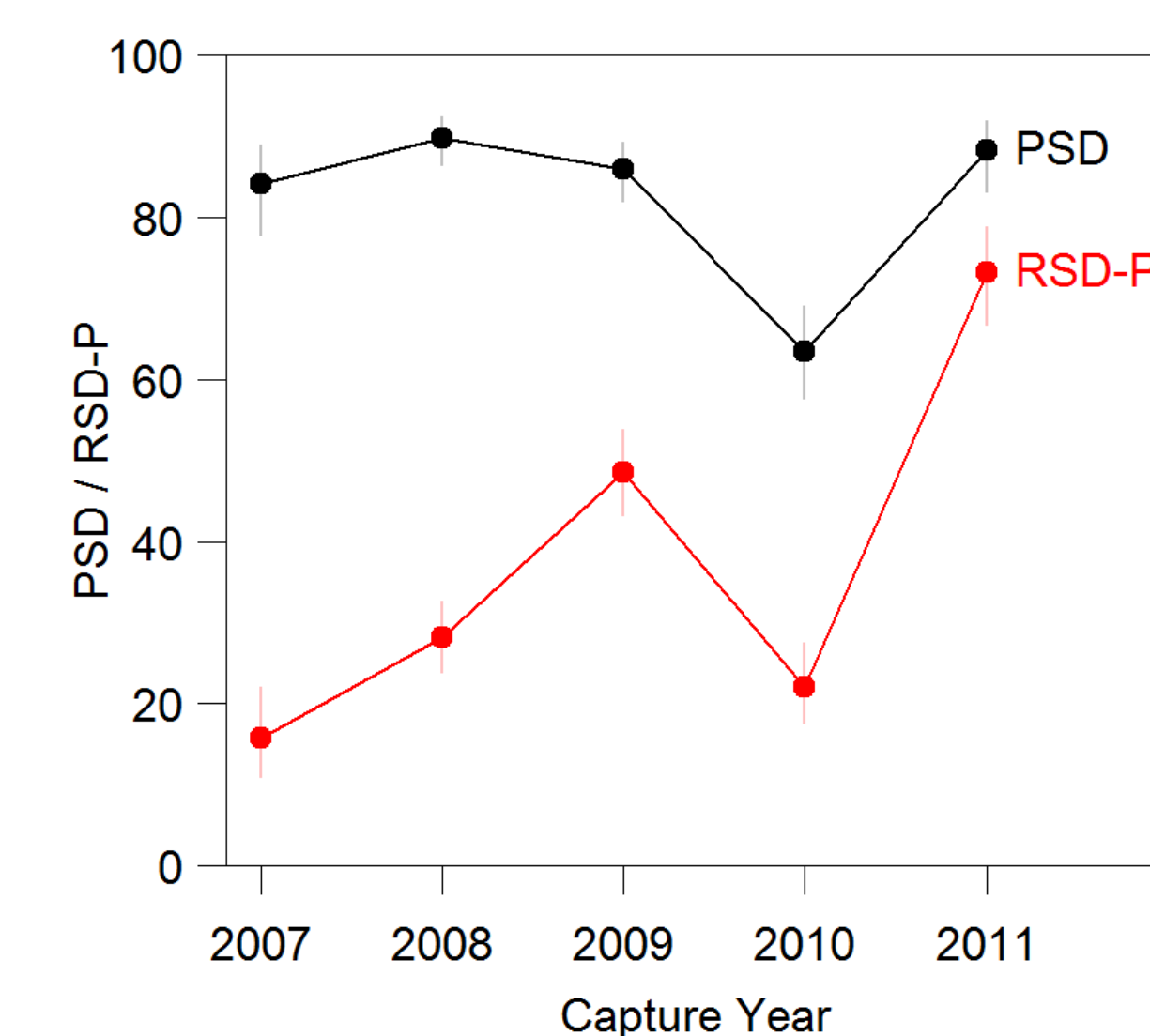


Figure 2. PSD and RSD-P by year

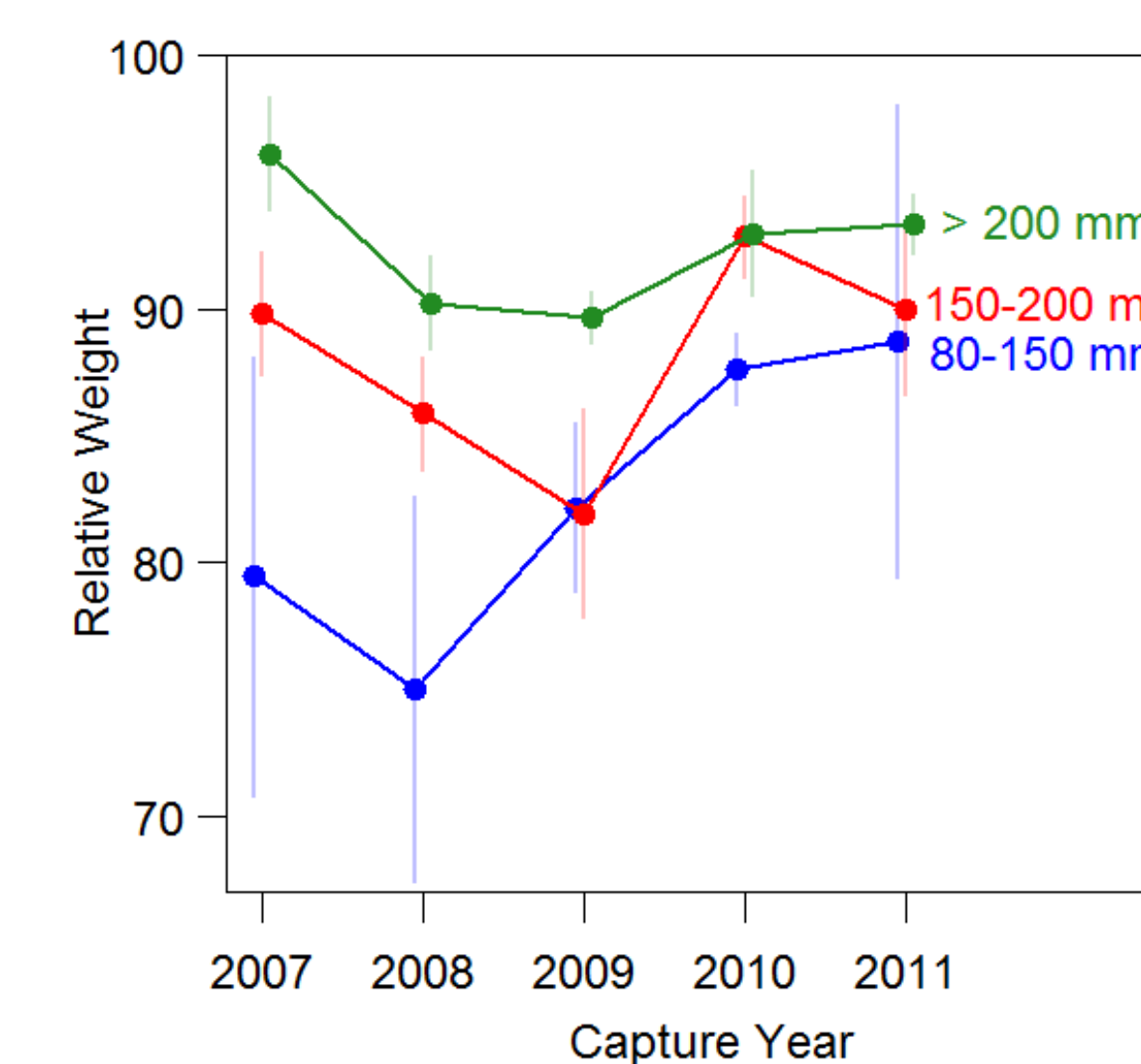


Figure 3. Relative weight by size class and year

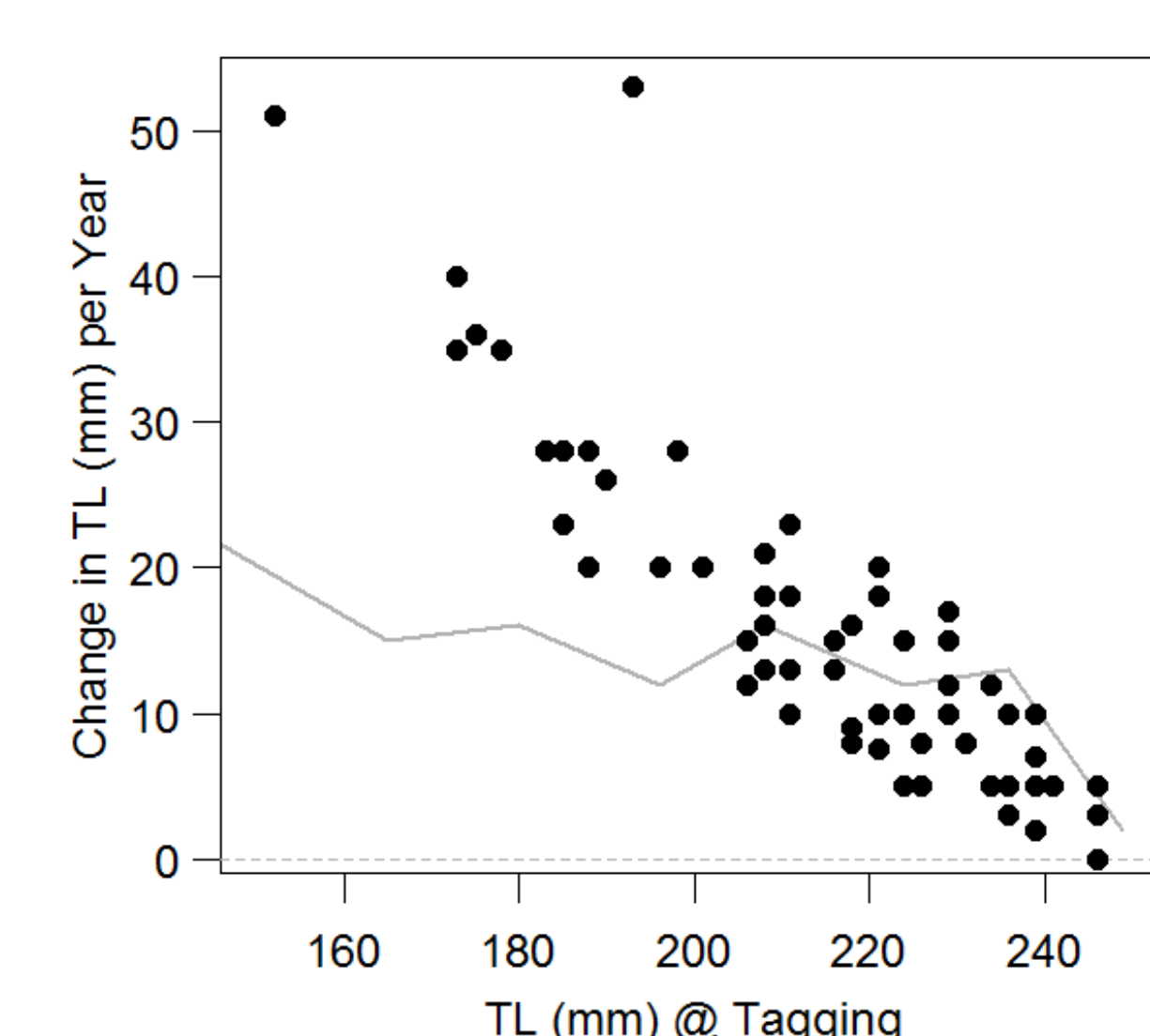


Figure 4. Annual growth increment per year by initial size. Average for northern WI lakes shown by grey line

CONCLUSIONS

- ❑ A decline in the proportion of intermediate-sized fish (80-150 mm) was noted during the study period. This may be due to the gear types used, increased mortality due to predation, or extremely rapid growth of small bluegills
- ❑ Future research will use alternative gears to target intermediate-sized fish, diet and bioenergetics studies of potential bluegill predators, and age assessment for a more comprehensive growth analysis
- ❑ We will continue to monitor all fish populations in Inch Lake to assess the long-term effects of the no-harvest regulations