# Bluegill Population Dynamics Following Implementation of No-Harvest Regulations

Margaret A. Harings, Derek H. Ogle -- Natural Resources Department, Northland College



### 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**

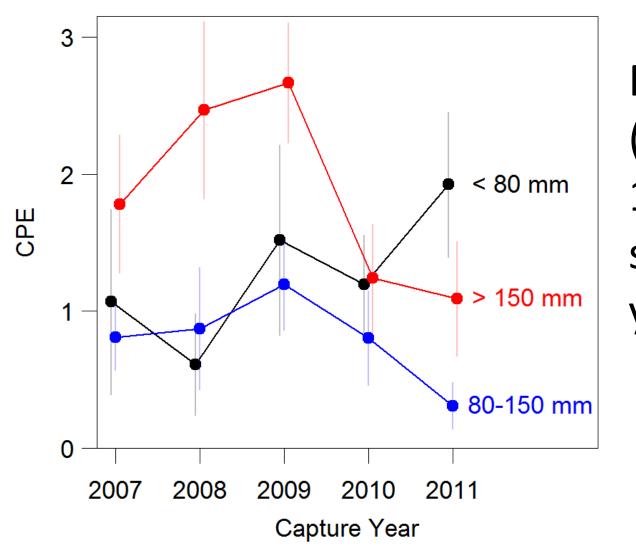
Assess the bluegill population following the implementation of no harvest regulations for all species

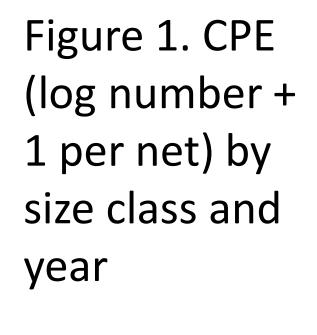
#### **METHODS**

- ☐ 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  $\geq$ 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)
- $\square$  Mean length of fish  $\ge$ 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)





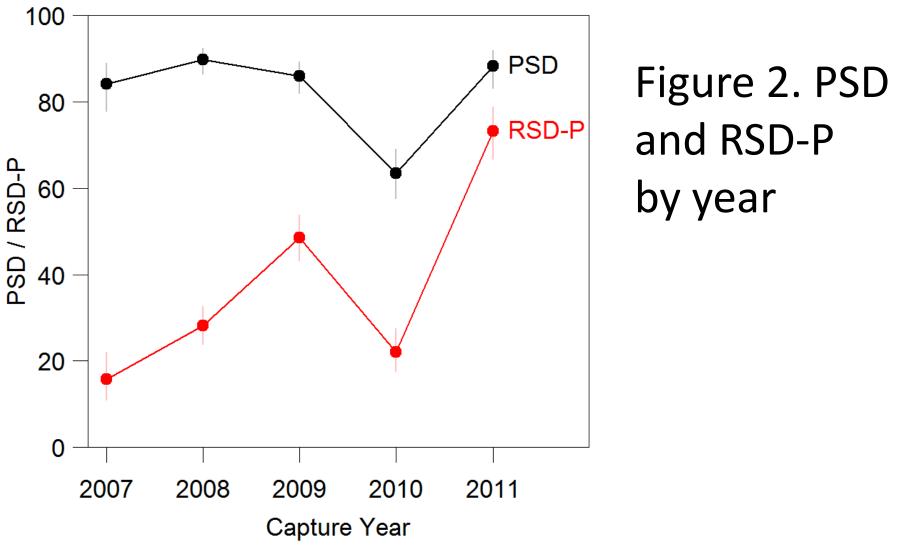
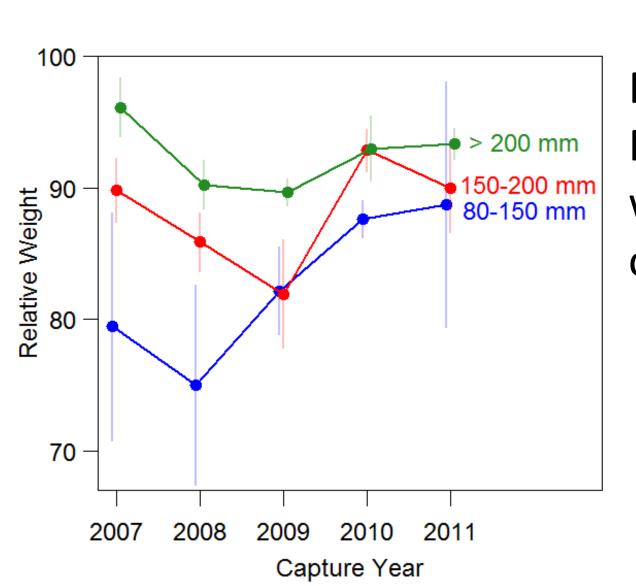
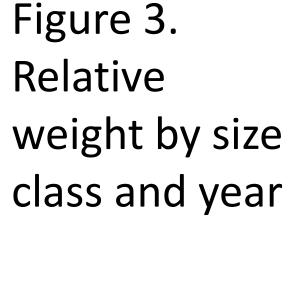
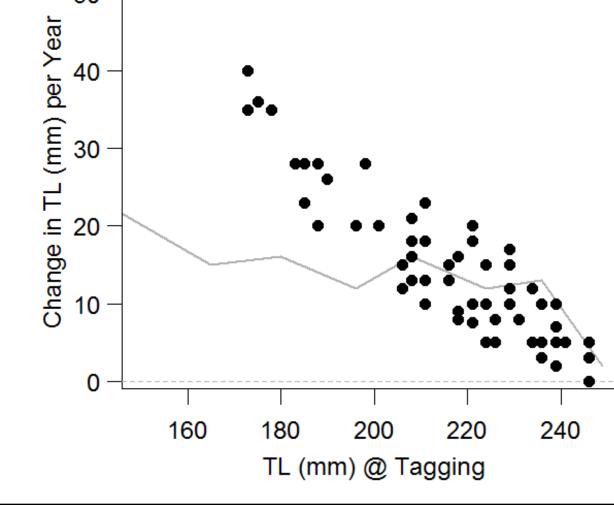


Figure 4.
Annual growth increment per year by initial size. Average for northern WI lakes shown by

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