Sport Fish Restoration
Research Findings

The Relationship of Catch Per Unit Effort Data to Estimated Density of YOY and Yearling Walleyes in Spirit, East Okoboji, Clear and Storm Lakes, and an Evaluation of the Use of Trend Data for Managing Natural Lakes in Northwest Iowa

Project Duration: 1996-2000
Location: Spirit, East Okoboji (Dickinson County), Storm (Buena Vista County) and Clear Lake (Cerro Gordo County) Lakes
Study Number: 7014

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Catch per unit effort (CPE) data is one of the most common types of fisheries data collected by management agencies across the United States. Electrofishing CPE has been used to index Walleye populations in Iowa's natural lakes, but it is unknown if these CPE models are an accurate reflection of Walleye abundance. This project tried to determine if this relationship exists and to develop a standard method of analyzing past and present trend datasets.

Goals

- To develop a model capable of accurately predicting density of Walleye in natural lakes using night electrofishing CPE data in Spirit, East Okoboji, Clear, and Storm lakes.
- Determine the factors affecting the catchability of walleye in these same lakes.
- To develop a standardized method to analyze catch electrofishing CPE data obtained from natural lakes in Iowa

Results

- Over 54,000 young-of-the-year (YOY) and 17,000 yearling Walleye were marked in 525 hours of electrofishing effort.
- YOY year-classes were highly variable from a low of 16 YOY per hour to over 500 per hour.
- Walleye YOY and yearling population estimates also varied greatly in each lake.
- YOY Walleye electrofishing CPE was significantly related to the estimated YOY density in Spirit and East Okoboji lakes, but not significant in Clear or Storm lakes.
- Yearling Walleye electrofishing CPE was significantly related to the estimated yearling density in Spirit and Clear lakes, but not significant in East Okoboji or Storm lakes.
- Combined lake regression models for YOY and yearling Walleye explained 63% and 57% of the variation in Walleye density.
- A standardized method of analyzing CPE data was developed using percentile rankings to classify the relative strength of a year-class.

Conclusions

Fall electrofishing CPE was significantly related to the density of both YOY and yearling Walleyes in Iowa's natural lakes. Therefore, the use of CPE data as an index of Walleye abundances appears to be justified. Because Walleye CPE data is so strongly correlated to Walleye densities, year-class strengths can be objectively assessed by using percentile rankings. This type of objective analysis of Walleye CPE data should work for most applications. The predictive equations, however, may be used to estimate YOY and yearling densities. Caution should be used when applying the overall lake models to predict Walleye densities in different lakes. If possible, lake-specific models should be used and developed if needed. No significant relationships or trends between YOY and yearling Walleye catchability and other factors (e.g. water temperature, secchi readings, etc.) were identified. The largest factor affecting catchability was Walleye population density.