

WALLEYE HOOKING MORTALITY AT LAKE MEREDITH

by

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ABSTRACT

A hooking mortality study was conducted during spring (April-June) 1988 at Lake Meredith to assess the impact of catch and release fishing on survival of walleye, Stizostedion vitreum vitreum. Creel survey data collected for 3 years prior indicated walleye fishing effort and catch were highest during this period. Three replicate fishing experiments were conducted in which fish were held for at least 72 h. Forty-seven walleyes were caught (43 on live bait and 4 on artificial bait). Approximately 50% of the fish collected were below legal (406 mm) length. Surface water temperature was 21C. No mortality of walleyes was observed during the study. Catch and release of walleye should allow increased fishing recreation by allowing multiple catches without negatively impacting survival.

INTRODUCTION

On September 1, 1987, a 406 mm minimum length limit was imposed for walleye, Stizostedion vitreum vitreum, in Texas. Prior to this regulation there was no minimum length restriction. The bag limit was lowered from 10 to 5 fish per day on September 1, 1988. Restrictive length limits have become commonly used techniques for managing sport fish populations (Novinger 1984). However, length limits would be ineffective if mortality of caught and released fish is high. If sub-legal size fish die after catch-and-release, yield per recruit will be lower (Waters and Huntsman 1986).

Few walleye hooking mortality studies were found in the literature. Fletcher (1987) found 1.1% mortality for walleyes caught in Porcupine Bay, Washington. The study was conducted while water temperatures ranged from 8 to 11C and the author cautioned that mortality could be higher at warmer temperatures. In a study involving two Minnesota ponds (Payer et al 1989), mortality of walleyes caught and released by anglers was 5%. They concluded that low mortality from angler catch-and-release would result in reduced overall fishing mortality and expand recreational fishing opportunities. Schaffer (1989) reported 0.8% mortality for walleyes caught in northwestern Ontario.

The success of a length limit regulation is dependent on the proportion of released fish that survive. The objective of this study was to assess hooking mortality of walleye during spring at Lake Meredith.

MATERIALS AND METHODS

This study was conducted at Lake Meredith a 6,475-hectare reservoir located 56 km northeast of Amarillo, Texas in Hutchinson, Moore and Potter Counties. Walleye were introduced in 1965 and developed a self-sustaining population by 1968.

Three replicate fishing experiments were conducted on May 26th, 27th and June 5th, 1989 (Table 1). A spring study period was chosen because creel data indicated most walleye fishing effort and catch at Lake Meredith occurs during this season (Table 2). Walleyes were caught on rod and reel by anglers using either artificial bait or live nightcrawlers on single hooks. Total length measurements (mm) were used to identify individual fish for separation by bait type. Surface water temperature and approximate time at capture was recorded for each fish. Fish were confined for 0.5 to 5.0 hr in aerated live wells or hauling tanks and then transported to a holding net. Nets were 3.67 m³ with a closed flat bottom. They were constructed of multifilament nylon with 12.5 mm (stretched) mesh. The holding net top line was supported 14.7 cm above the water surface by attachment to floating docks. Weights were attached to each bottom corner to hold the net open. Captured fish were held for at least a 72-h period for observation. The holding net was raised at the end of this period, all fish counted, total length measured and survival noted.

RESULTS AND DISCUSSION

A total of 47 walleyes were caught by anglers (Table 1). Mortality was 0% for all three replicates.

Hooking Mortality and Bait Type

Forty-three walleyes were caught using nightcrawlers and four were caught using artificial bait. Fletcher (1987) found low mortality (1.1%) for fish caught with nightcrawlers as bait. Payer et al (1989) reported higher mortality for fish caught on leeches (10.3%) than on artificial baits (0.0%). Schaefer (1989) reported low mortality for walleye caught on minnows and on artificial baits (0.8%). Findings from these studies indicated that regardless of bait type, survival of hooked walleye was high.

Hooking Mortality and Fish Length

Length distribution of walleyes caught at Lake Meredith ranged from 258 mm to 687 mm. Forty-nine percent of these fish were below the minimum length limit of 406 mm. Payer et al (1989) reported a similar length range (289 to 600 mm) of walleye available to anglers during his study. Survival of fish was high for both studies (100% and 95%) regardless of the length of fish collected.

Hooking Mortality and Water Temperature

Fletcher (1987) suggested water temperature above 11C could cause higher mortality among released walleye. Surface water temperature at Meredith Reservoir during the three replicates was 21C. Surface water temperatures reported by Payer et al (1989) and Schaefer (1989) ranged from 13-28C and 16-20C, respectively. Hooking mortality of walleye was low for each study although a wide range of water temperatures was encountered.

MANAGEMENT IMPLICATIONS

Results from this study indicate mortality of hooked and released walleye during spring months would be negligible. Under the 406 mm minimum length limit for walleye at Lake Meredith, catch and release fishing should provide increased fishing recreation without negatively impacting survival.

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Table 1. Hooking mortality statistics for walleyes captured with rod and reel and held a minimum of 72 hours at Meredith Reservoir, Texas, 1989.

Replicate	Date	Water Temp(C)	Number of Fish Caught by Bait Type		Fish Length (mm)	Range of Time Time Confined (Hours)	Mortality
			Night- crawler	Artificial			
1.	5/26	21	9	1	367-687	99.5 to 103.5	0
	5/27	21	3	1	382-415	72.0 to 82.0	0
2.	5/27	21	13	2	258-606	72.0 to 83.5	0
3.	6/05	21	18	0	344-605	96.0 to 100.5	0

Table 2. Quarterly creel statistics for walleye at Meredith Reservoir, Texas. Three year average for 1986, 1987 and 1988.

Quarter	Total fish per hour	No. harvested per hectare	Manhours per hectare	Directed fishing effort (%)
1-1 to 3-31	0.01	0.02	0.37	18.9
4-1 to 6-30	0.06	1.84	6.58	24.0
7-1 to 9-30	0.01	0.13	1.63	13.3
10-1 to 12-31	0.02	0.09	0.48	16.7