



IMMEDIATE, DELAYED AND TOTAL MORTALITY
FROM CATCH AND RELEASE WALLEYE TOURNAMENT
FORT PECK RESERVOIR, MONTANA

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Two, catch and release walleye tournaments were held concurrently on Fort Peck Reservoir during July 10 - 13, 1991. The Montana Department of Fish, Wildlife and Parks attempted to evaluate the mortality of fish handled during these tournaments. Immediate fish mortality was to be ascertained by observing angler-caught walleye during and after weigh-in. An estimate of delayed mortality would be determined by holding a portion of healthy, angler-caught walleye, in live cages. Finally, an estimate of total fish mortality resulting from the tournament was to be determined by combining immediate and delayed mortality figures.

METHODS

It was assumed that total mortality resulting from these fishing tournaments was composed of two elements, immediate and delayed mortality.

Fish designated as immediate mortalities were those that arrived at weigh-in obviously dead, or those which could not maintain an upright position when returned to the reservoir. The state of angler-caught fish was determined prior to release, by holding fish in live cars for roughly 5-10 minutes.

Delayed mortality of releasable tournament fish was estimated by holding a portion of walleye in cages for a 24, or 48 hour period. Holding cage dimensions were 4'x 4'x 6'. A maximum of 26 tournament fish and 6 control fish were held in each cage. Walleye used as controls were captured with frame traps set during the night, prior to each tournament day. Control fish were placed in the same live cages as tournament fish to compare mortality rates. One or two cages were used to hold walleye sampled from each tournament day. Cages were placed in 20' of water to provide protection from waves and warm surface temperatures.

The percentage of delayed mortality was determined for tournament and control fish by dividing the number of dead fish after 24 or 48 hours, by the number of fish initially placed in the cage in each category.

RESULTS

Fisheries personnel handled or observed a total of 1,051 walleye/sauger from both tournaments. Fish from each tournament were combined on days when tournaments coincided. Tournament fish were handled as follows: The captured fish were placed in live wells on each boat (usually held for several hours); at weigh-in, fish were carried in water filled plastic bags from the boat dock to shore; fish were transferred to perforated plastic tubs and carried approximately 200' to the stage with pauses at cooled circulating water tanks spaced at short intervals; after fish were weighed, they were carried to hatchery trucks with oxygenated water (average loading time, approximately 15-20 min.); trucks transported fish to release site (maximum travel time, 10 min.); fish were dip netted from trucks and placed in live cars along reservoir shoreline to evaluate condition; fish were released after approximately 5-10 minutes.

Immediate mortality for fish handled in these catch and release events ranged from 11.8% - 20.0%, and averaged 14.3% (Table 1). Fish mortality was greater on tournament days with high wind velocities (days 2 and 4), than on relatively calm days (days 1 and 3). Few, if any angler-caught fish, appeared to suffer from extended gas bladders, a condition resulting from capture at extreme depths. Fish afflicted with this malady, typically have normal gill action, but are unable to right themselves.

Control fish, from the first two days of tournament fishing, were held in submerged cages for 48 hours. After substantial loss of control fish (67%), and angler-caught fish (86%), the holding period was reduced to 24 hours (Tables 2 and 3).

Holding fish for 24 hours reduced mortality of control fish to 22%, and angler-caught fish to 30% (Tables 2 and 3). The continued loss of control fish however, prevented an accurate assessment of delayed mortality for tournament fish. Warm water temperatures of 66-68°F in the vicinity of the holding cages was presumed to be the major factor in fish mortality.

Table 1. Immediate walleye mortality resulting from fishing tournaments, Fort Peck Reservoir, July 10 - 13, 1991.

	<u>Tournament Day</u>				<u>Total</u>
	<u>1</u>	<u>2</u>	<u>3</u>	<u>4</u>	
Total No. Walleye Caught	206	342	458	45	1,051
Immediate Mortality	26	61	54	9	150
% Mortality	12.6	17.8	11.8	20.0	14.3
Temperature Water Surface	74°F	68°F	72°F	70°F	
<u>WEATHER CONDITIONS</u>					
Maximum Air Temperature ¹	84°F	80°F	83°F	91°F	
Average Wind Velocity ² (7am - 4pm)	7mph	16mph	8mph	15mph	

¹ U.S. Army Corps of Engineers, Ft. Peck, MT

² U.S. Weather Bureau, Glasgow, MT

Table 2. Observed mortality of angler-caught walleye held in cages during fishing tournaments at Fort Peck Reservoir, July 10 - 13, 1991.

No. of Cages	<u>Cages from Tournament Day</u>				<u>Total</u> (6)
	<u>1</u> (1)	<u>2</u> (2)	<u>3</u> (2)	<u>4</u> (1)	
Holding Time	<u>48hrs.</u>		<u>24hrs.</u>		
Total No. Walleye Held	25	51	50	25	151
Deaths	23	42	8	17	90
% Mortality	<u>92.0</u>	<u>82.4</u>	<u>16.0</u>	<u>68.0</u>	59.6
% Mortality for Period	86.0%		30.0%		
Temperature Water Depth 20'	66°F	66°F	66°F	68°F	

Table 3. Observed mortality of control fish (walleye), held in cages in Fort Peck Reservoir, July 10 - 13, 1991.

	<u>Cages from Tournament Day</u>				<u>Total</u>
	<u>1</u> (1)	<u>2</u> (2)	<u>3</u> (2)	<u>4</u> (1)	
No. of Cages					
Holding Time	<u>48hrs.</u>		<u>24hrs.</u>		
Total No. Walleye Held	5	10	6	3	24
Deaths	5	5	1	1	12
% Mortality	<u>100.0</u>	<u>50.0</u>	<u>16.7</u>	<u>33.3</u>	50.0
% Mortality for Period	66.7%		22.2%		
Temperature					
Water Depth 20'	66°F	66°F	66°F	68°F	

DISCUSSION

It is believed that close scrutiny of angler-caught fish during these tournaments provided an accurate assessment of immediate walleye mortality. Estimates of delayed mortality, however, were obscured due to death of control fish. Loss of control fish probably resulted from high water temperatures during trapping, transport and handling, and cage impoundment.

Despite the difficulty in obtaining a reliable estimate of delayed mortality, it is apparent that tournament-caught walleye suffered considerable loss. Results show that in addition to an immediate mortality of 14.3%, tournament-caught walleye died at a greater rate than control walleye. Death of tournament fish held in cages for 48 hours was 19.3% greater than control fish, and 7.8% greater than control fish when walleye were held for 24 hours.

In summary, catch and release tournaments obviously cause less mortality than non-catch and release events, but the impact to the resource can be further reduced by avoiding tournaments during hot summer months, and/or by reducing the number of fish contestants may bring to weigh-in. During this tournament, only one fish, of the sanctioned four fish limit, was measured and released immediately. An expansion of this type of format in future tournaments is encouraged. Fish should be measured and released as soon as possible, rather than being held for several hours in boat live wells until official weigh-in.