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COST OF STOCKED WALLEYES CAUGHT BY ANGLERS IN ESCANABA LAKE

By James J. Kempinger

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ABSTRACT

Cost of walleyes stocked in Escanaba Lake in Vilas County and return to the angler was evaluated on the basis of 4 stockings between 1954 and 1961. Costs reported include fry production, rearing, and distribution costs, but do not include amortization of the rearing facilities. Results were strongly influenced by the fact that only one successful year class was established. Return to the angler averaged 3.8 percent, was 13.5 percent for the first year, and was less than 1 percent for each of the other three years. Cost per stocked walleye caught by anglers averaged $1.86, was $0.67 for the first year, and ranged from $4.60 to $76.68 for each of the other three years.

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INTRODUCTION

The walleye, Stizostedion vitreum vitreum (Mitchill), is the most sought after game fish in Wisconsin. It is found in 1,064 lakes and 3,427 miles of stream which encompass 952,000 acres, exclusive of the Great Lakes. Each year, one-half million anglers catch approximately 5 million walleyes in Wisconsin waters (Churchill 1974).

Since 1954, from 1 to 3 million walleye fingerlings have been stocked annually to augment native populations or to establish new populations. Adequate evaluation of stocking success is difficult to assess because of irregular occurrences of strong native year classes. Escanaba Lake, Vilas County, was stocked for 4 years with marked walleye fingerlings and their contribution to the anglers' catch was previously reported (Kempinger and Churchill 1972). The purpose of this paper is to augment that report in analysis of cost per stocked walleye from those releases subsequently harvested by anglers.

HISTORY OF ESCANABA LAKE WALLEYE POPULATION

Escanaba Lake, Vilas County, is 293 acres in size and has a maximum depth of 26 ft. The complete shoreline is undeveloped state-owned land with one public boat landing located at a contact station. Walleyes are not native to this lake. Stocking records show that approximately 5 million fry were stocked in the 10 years between 1933 and 1942. One or more of these fry stockings resulted in the establishment of a permanent population. The first known natural reproduction occurred in 1943 and year classes of varying sizes have been produced every year since 1947 (Kempinger and Churchill 1972).

PROCEDURE

Experimental plants of fin-clipped walleye fingerlings were made in 1954, 1958, 1959, and 1961 (Table 1). Stocking rates (Table 2) ranged from 38 to 166 and averaged 100 fingerlings/acre. All stocking was done late in the rearing season when fingerlings were largest and water was cool, to minimize mortality due to marking by removal of a pectoral fin. Churchill (1963) reported that this marking method had no effect on survival or growth of walleye fingerlings.

TABLE 1. Time of stocking, number and weight stocked, handling loss, and stocking cost of walleye fingerings in Escanaba Lake, 1954, 1958-59, and 1961.

Parameter	1954 (Oct. 1-26)	1958 (Sept. 11-16 Oct. 3-9)	1959 (Sept. 9-Oct. 8)	1961 (Aug. 25-30)
No. stocked (by source)				
Presque Isle Pond	38,100	18,576	7,374	21,000
St. Croix Pond #27	10,200			
Lake Katrine		38,227		
Heart Lake			10,641	
Total	48,300	56,803	18,015	21,000
Wt. stocked (lb.)	789	1,085	352	141
Handling loss				
Number	Negligible	21,000	7,000	Negligible
Percent	--	37	39	--
Cost/lb.				
Fry production	Unknown	$0.45	$0.24	$0.30
Rearing	$2.54	2.97	1.99	1.83
Distribution	2.98	1.88	2.80	4.20
Total	$5.52	$5.30	$5.03	$6.33
Total stocking cost	$4,355.28	$5,750.50	$1,770.56	$892.53

The majority of the stocked fish came from a northern Wisconsin rearing pond (Presque Isle Pond in Vilas County) and averaged 2.9 inches in total length. In 1954, 1958, and 1959, additional fish averaging 4.9 inches in length were obtained from other rearing ponds (Tables 1 and 3) throughout the state. These latter ponds included St. Croix Pond No. 27, Lake Katrine and Heart Lake in St. Croix, Dane, and Green Lake Counties, respectively. Native fingerlings averaged 5.8 inches at the time of stocking for the years 1958, 1959, and 1961.

Considerable prestocking mortality was noted in 1958 and 1959, both before and after marking. An affliction referred to as "white tail," cause unknown, was observed. To estimate and allow for immediate post-stocking mortality, samples of the fish were held in hatchery ponds or in enclosures in the lake for 24 hours prior to release. The number that survived this 24-hour period was the base used in calculating the number of fish stocked and the percentage returns of the stocked fish. If routine stocking procedure had been followed, the recorded number stocked would have been the total number delivered (total pounds were used for cost analysis) from the pond and the reported recovery percentages would be correspondingly lower and the cost per fish caught correspondingly higher. Methods used to determine survival of stocked walleye fingerlings and adults were described by Kempinger and Churchill (1972).

TABLE 2. Population estimates and harvest of stocked walleye year classes in Escanaba Lake, 1954, 1958-59, and 1961.

Parameter	1954	1958	1959	1961
NUMBER STOCKED				
Fingerlings, fall	48,300	35,800*	11,000*	21,000
Fingerlings/acre, fall	166	123	38	72
POPULATION ESTIMATES				
Yearlings, fall	6,400	--	--	--
Age III	3,200	--	--	--
Age IV	1,900	--	--	--
Age V	1,500	--	--	--
HARVEST (Cumulative)				
Age I				
No.	1,760	6	0	6
Percent	4	--	--	--
Age II				
No.	3,859	26	16	83
Percent	8	0.1	0.1	0.4
Age III				
No.	5,061	45	48	132
Percent	10	0.1	0.4	0.6
Age IV				
No.	5,451	58	54	162
Percent	11	0.2	0.5	0.7
Age V				
No.	5,682	63	55	178
Percent	12	0.2	0.5	0.8
Total (through 1972)				
No.	6,523	75	85	194
Percent	13.5	0.2	0.8	0.9
COST				
Total cost of stocking	$4,355.28	$5,750.50	$1,770.56	$892.53
Cost per walleye caught	$ 0.67	$ 76.68	$ 20.83	$ 4.60

*Number delivered minus estimated number lost through handling.

TABLE 3. Relative size (total length in inches) of stocked walleye fingerlings and size of native walleye fingerlings at time of stocking in Escanaba Lake, 1954, 1958-59, and 1961.

Year	Size of Walleye Fingerlings (inches) Native	Stocked
1954	--	
Presque Isle Pond		3.0
St. Croix Pond #27		5.0
1958	6.2	
Presque Isle Pond		2.7
Lake Katrine		5.0
1959	5.8	
Presque Isle Pond		3.1
Heart Lake		4.6
1961	5.5	
Presque Isle Pond		2.7

The number of stocked walleyes caught by anglers from each year class was determined through a compulsory checking system. Free permits were issued at a contact station located at the only landing on the lake. At the end of the angler's fishing trip, each catch was inspected by Department personnel and marked fish were recorded. Cost of walleyes caught from each stocking was calculated from cost and production figures maintained by the Bureau of Fish Management for the years involved. Cost per fingerling returned was determined by total stocking cost divided by the number retained for each year class. These costs do not include amortization of the rearing facilities.

FINDINGS

Cost of producing fry and rearing and distributing fingerlings (Table 1) for the four stocking experiments ranged from $5.03 to $6.33/lb and averaged $5.54/lb. Total weight of walleye stocked annually ranged from 141 to 1,085 lb and averaged 592 lb/stocking.

1954. In the fall of 1955, the 1954 stocked year class (Table 2) at Age I was estimated at 6,400 (Kempinger and Churchill 1972). Spring estimates at Ages III-V were 3,200, 1,900, and 1,500, respectively. Through Age XVIII, anglers harvested 6,523 or 13.5 percent of the number stocked. Sixty percent of these were caught before they reached Age III (at which time the walleyes were an average total length of 11.0 inches). Cost per stocked walleye returned through the creel census was calculated at $0.67 per fish.

1958, 1959, and 1961. Too few walleye fingerling survived 2 weeks after stocking in 1958, 1959, and 1961 to estimate their survival rate (Kempinger and Churchill 1972). Through 1972, anglers caught 75, 85 and 194 stocked walleyes from the 1958, 1959, and 1961 year classes, respectively. Cost per walleye stocked in 1958, 1959, and 1961 and returned through the creel census was $76.68, $20.83, and $4.60 per fish, respectively.

DISCUSSION AND CONCLUSIONS

From three of the stocked year classes, yield to the angler was less than 1 percent of the number stocked. Anglers harvested 13.5 percent of the walleye fingerlings stocked in 1954. The average return to the angler from the four releases was 3.8 percent.

Cost per walleye caught by anglers ranged from $0.67 for those returned from the 1954 stocking to $76.68 for those stocked in 1958. The average cost per stocked walleye harvested was $1.86, a figure that is strongly influenced by the single relatively successful 1954 release. These are minimum costs which include fry production, rearing, and distribution costs but do not include amortization of the rearing facilities.

Analysis of the statewide total annual harvest estimate in relation to propagation records and data on survival of native and stocked year classes (Kempinger and Churchill 1972) indicates that native walleyes provide the bulk of the estimated 5 million walleyes caught in Wisconsin waters annually by anglers. Propagation records indicate the average annual production of walleye fingerlings is 1.9 million fish. A 5-percent return to the angler (Escanaba Lake averaged 3.8 percent for the 4 stockings) of that number would result in a statewide harvest of 95,000 hatchery-produced walleyes. Those 95,000 walleyes would comprise only 1.9 percent of the total estimated (5 million) annual walleye harvest.

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