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Abstract.–Michigan walleye *Stizostedion vitreum* rearing and stocking costs were estimated for 1994. Expenses included in estimates were labor, travel, and materials for egg-take, incubation, fingerling rearing, and stocking operations. Costs not included were capital investments for the incubation facilities. Average stocking costs/fish for fry, spring fingerlings, and fall fingerlings were estimated at $0.00091, $0.044, and $0.581. Fry were stocked as sac fry, and spring and fall fingerlings averaged 4.2 cm and 11.9 cm. The cost of stocking fall fingerling walleye, attaining lengths representative of wild fall fingerlings (12.7 cm), was $1.23/fish. Stocking costs/ha for fry, spring fingerlings, and 12.7 cm fall fingerlings were $4.49/ha, $2.73-$10.87/ha, and $60.27-$121.77/ha. Fingerling rearing costs increased very little over the previous 15 to 20 years. The total cost for rearing and stocking 18,445,000 fry, 7,795,972 spring fingerlings, and 56,122 fall fingerlings was $395,191. Labor, travel, and materials accounted for 63.9%, 5.1%, and 31.0% of total cost. Total labor expended was 6.0 full time equivalents (FTEs). Volunteers provided 10.9% of total program cost, including 0.8 FTEs of total labor. Fingerling rearing is conducted in earthen ponds and the ten year average annual cost for pond purchases, construction, and major renovations was $58,729.

Michigan has an extensive history of stocking walleye *Stizostedion vitreum* in Great Lakes and inland waters. Stocking prior to 1970 was described by Anonymous (1974). Walleye were first stocked in Michigan waters in appreciable numbers in 1882. Eggs were collected from the Saginaw Bay stock, incubated in hatcheries, and distributed as fry to innumerable inland lakes as well as the Great Lakes. By 1920, one billion fry had been stocked and similar stocking rates continued through 1929. Production of walleye fry averaged 100 million per year during 1932 - 1942, but dropped to zero by 1947. Fisheries were established by stocking fry in at least twelve lakes in the upper peninsula between 1930 and 1950. Attempts to rear walleye to fingerling size during this period failed. During 1950 to 1964, stocking policies for walleye were targeted at stocking fingerlings in lakes where natural spawning was lacking. Fry stocking diminished but fingerling rearing programs began in 1951. Fingerling walleye were stocked in 60-70 lakes during 1951-1963. Some new introductions were made while others were to maintain populations in lakes where walleye reproduction was inadequate. Successes were variable and frequently unsatisfactory

(Schneider 1969). The reasons for stocking prior to 1970 are not well documented but much of the stocking in inland waters was likely for establishing new populations, along with periodic supplemental stocking of populations established in earlier years. Some transfers of adult walleye were even conducted during this period for sport fishing purposes. Other likely reasons for stocking were for restoration and to supplement indigenous populations. Many indigenous walleye populations suffered declines during this period as a result of overfishing, or the elimination of spawning habitat through logging, pollutants, or damming (Schneider and Leach 1979).

Both fry and fingerling stocking increased substantially beginning in the 1970s (Figure 1). Increases in stocking during this period were in response to abrupt declines in many of the major Great Lakes spawning stocks between 1940 and 1975 (Schneider and Leach 1979). Reasons for the decline of these stocks included high exploitation, pollution, and interaction with foreign species. Fry stocking during this period reached a peak in the early 1970s, and stabilized at levels near 20 million during the 1990s. Presently, fry stocking is generally limited to turbid waters where survival tends to be higher, and to surpluses not needed for the fingerling rearing program. Occasionally, fry are stocked into waters following chemical reclamation projects designed to remove all fish from entire lake or river systems. Fingerling stocking began to increase in the late 1970s and increased substantially as rearing techniques improved. Fingerling stocking peaked in 1994 at just over 8 million, and has ranged from approximately 6 to 8 million since 1990. In 1994, Fisheries Division stocked 7,852,094 fingerlings (Table 1). Private sources stocked 313,119 fingerlings.

Walleye stocking was important in restoring indigenous Great Lakes populations, especially in Lake Michigan (Schneider et al. 1991) and Lake Huron (Mrozinski et al. 1991, Reckahn and Thurston 1991). In 1994, more than 525,496 ha of Great Lakes and 92,875 ha of inland waters in Michigan were stocked with walleye (Table 2). Great Lakes waters provide the largest sport fisheries, but inland waters provide substantial fisheries in Michigan.

Walleye stocking serves an important role in current fisheries management in Michigan, and will continue to do so in the future. The primary reasons for stocking walleye include restoration of indigenous populations, supplemental stocking to support sport fisheries, and research studies. The purpose of this investigation was to quantify costs of rearing and stocking walleye in Michigan. This information will assist in benefit-cost analysis of management programs, and help determine the proper sizes of fish to stock.

Michigan's walleye rearing and stocking process consists of collection of eggs from wild populations, incubation to the fry stage in hatcheries, stocking of fry into ponds (or public waters for fry stocking), rearing to the fingerling stage in earthen ponds (Gustafson 1996), followed by harvest from ponds and stocking of fingerlings into public waters. Primary egg sources during 1994 were the Muskegon River and Bay De Noc stocks (Figure 2). Muskegon River strain eggs were incubated at Wolf Lake Hatchery, and Bay De Noc strain eggs were incubated at Thompson Hatchery. Muskegon River strain walleye were stocked primarily in southern lower peninsula waters, and Bay De Noc strain walleye were stocked in upper peninsula and northern lower peninsula waters.

The 1994 rearing program began in spring with collection of eggs from wild populations. Eggs were transported to hatcheries for incubation, and hatching generally occurred in 17-25 d. Fry were stocked by field management districts into public waters or rearing ponds three to five days after hatching. Fry stocked into rearing ponds were harvested and stocked into public waters at the spring fingerling or fall fingerling stage. Walleye were considered spring fingerlings if harvested from ponds and stocked prior to July 1, and fall fingerlings if harvest and stocking occurred from July 1 through December 31.

Methods

Costs for the 1994 program were determined by first estimating expenses for rearing each strain to the fry stage. Fry rearing costs included

expenses incurred during egg-take and hatchery incubation operations. Costs for egg-take included all labor, transportation, and material expenses specific to this operation. Hatchery costs included all labor, transportation, materials, and electrical and maintenance expenses for the incubation facilities. Not included in costs were capital investments for original construction and purchase of the incubation facilities. Fry rearing costs were allotted to each management district based on the number of fry of each strain used.

Total cost of the program was determined by summing the rearing and stocking costs of thirteen field management districts within Fisheries Division (Figure 2). Management district costs were estimated separately for fry stocking, spring fingerling rearing and stocking, and fall fingerling rearing and stocking. Cost per fish values were based on the number of fish stocked into public waters.

Fry stocking costs included fry rearing expenses, labor, meals, and mileage expenses associated with transportation from the hatchery to the stocking site. Spring fingerling rearing and stocking costs included fry rearing expenses, operation, maintenance, construction, and major renovation expenses for rearing ponds, and materials and stocking expenses. All labor, transportation, and meal expenses were incorporated. Material expenses included fertilizers, chemicals, oxygen, net supplies, and other equipment. Rearing pond operation and maintenance expenses included dike maintenance, grass and brush control, pest control, and fertilization. Pond construction and renovation expenses were estimated for each district based on a ten year average (1985-1994). These costs included expenses for pond purchase, pond construction, or major renovations, such as outlet structure replacement and bottom excavations. Pond construction and renovation costs included money provided through the Michigan Inland Fisheries Grant Program. Stocking costs included pond harvest and transportation to stocking sites. Fall fingerling rearing and stocking costs included the same expenses as those for spring fingerlings, and sometimes an additional cost for fathead minnow rearing and stocking. Fathead minnows were used as forage for rearing fall fingerling walleye.

Spring and fall fingerling cost per unit length values (CPUL) were determined for individual field management districts and for the entire state. These values were calculated by dividing cost per fingerling by average fingerling length (cm). Averages for the entire state were calculated by averaging CPUL of all districts, weighted by number stocked for each district.

Standard rates for labor and equipment rental were used for determining expenses throughout the state (Appendix 1). Labor rates used were maximum Michigan Civil Service rates for each classification, and included Federal Insurance Contribution Act and retirement benefit expenses. Volunteer labor was valued the same as short-term worker labor. The meal rate was the standard Civil Service lunch allowance. The mileage rate was the average Michigan Department of Transportation rate for the types of vehicles used. Equipment rates were based on local rental rates.

Results

Egg-take and incubation costs

Egg-take and incubation expenses for Muskegon River and Bay De Noc strain walleye were estimated (Appendices 2-4). These costs were summarized into Michigan and non-Michigan use categories (Table 3). The non-Michigan use category incorporated costs of egg-take and incubation of eggs and fry given to other agencies. Expenses and labor for non-Michigan uses were excluded from Michigan fry and fingerling rearing and stocking values.

Both egg-take and fry costs per unit were based on the number of fry produced for each strain. Greater numbers of eggs were collected but fry production was the determining factor for these operations. All Bay De Noc strain walleye were incubated at Thompson Hatchery. Some Bay De Noc strain eggs were collected for distribution to other agencies. A total of 9,454,000 Bay De Noc strain fry were produced

for Michigan use at a cost of $0.00097/fry (Table 3).

All Muskegon River strain walleye were incubated at Wolf Lake Hatchery. Some Muskegon River strain fry were provided to other agencies. A total of 23,160,000 Muskegon River strain fry were produced at a cost of $0.00066/fry (Table 3). Some additional fry of other strains were also reared at Wolf Lake Hatchery.

Pond construction and renovation costs

Annual pond construction and renovation costs were estimated by averaging these costs for the period 1985-1994. A ten year average was used because pond construction and major renovations do not occur annually in each district. Costs and labor for Fisheries Division and volunteers were estimated for each management district (Table 4). The estimated average annual cost for each field management district was added to their 1994 rearing and stocking costs. Fisheries Division costs ranged from zero to $13,929 annually. Volunteer costs ranged from zero to $4,000 annually. Fisheries Division supplied nearly all of the labor. The total annual average cost for pond construction and renovation in Michigan was estimated at $58,729.

Rearing and stocking costs

Fry stocking and fingerling rearing and stocking costs were estimated for each management district in the state (Appendices 5-16). Management district labor and expenses were summarized separately for Fisheries Division and volunteers, and Fisheries Division only (Tables 5 and 6). Total program costs were represented by Fisheries Division and volunteer expenses combined.

Fry stocking into public waters was conducted by four management districts (Table 5). The amount of effort expended on fry stocking was small and average cost/fish stocked was $0.00091. All districts stocked spring fingerlings and the greatest amount of effort was spent rearing and stocking this stage. Spring fingerling cost/fish averaged $0.044, but was variable among districts, ranging from $0.012 to $0.186. The average size of spring fingerlings stocked was 4.2 cm (1.6 in, Table 1). Five districts reared fall fingerlings with a moderate amount of labor expended. Average cost/fall fingerling was $0.581, ranging from $0.225 to $12.26. The average size of fall fingerlings stocked was 11.9 cm (4.7 in, Table 1).

Fisheries Division cost per stocked fish for fry, spring fingerling, and fall fingerling averaged $0.00091, $0.040, and $0.473 (Table 6). Volunteer contributions were very low for fry stocking so Fisheries Division costs were not different than total cost. More volunteer effort was provided for spring and fall fingerling rearing and stocking, so Fisheries Division costs were lower than total cost. The amount of volunteer contributions was variable among management districts.

Costs specific to each phase of the 1994 walleye rearing and stocking program were summarized in Table 7. The total cost of rearing and stocking 18,445,000 fry, 7,795,972 spring fingerlings, and 56,122 fall fingerlings was $395,191. Most of the cost and effort was expended on spring fingerlings. Fisheries Division contributed the largest percentage of cost and labor. Total labor expended was 6.0 FTEs with 5.2 FTEs of Fisheries Division labor. The bulk of costs (86%) and effort (4.8 FTE) were expended by field management districts. Hatcheries were involved primarily in the egg-take and incubation operations, and accounted for 3% of total costs and labor. Volunteer contributions accounted for 11% of total cost and 13% of total labor. Labor accounted for the greatest amount of total program cost, followed by material and travel costs.

Rearing and stocking costs per centimeter

Rearing and stocking cost per unit length (CPUL) were compared for individual field management districts, and for spring and fall fingerling averages (Figure 3). CPUL was $0.004 to $0.018 for fingerlings less than 4.2 cm. CPUL varied from $0.003 to $0.025 at

lengths from 4.3 to 11.1 cm. CPUL ranged from $0.064 to $0.709 at lengths from 12.4 to 17.3 cm. The average CPUL of spring and fall fingerling walleye were $0.01 and $0.049. The CPUL of one 17.3 cm group of fall fingerlings was excluded from the figure for presentation purposes. This group was representative of a fall fingerling pond with low survival, and was included in the fall fingerling average.

Discussion

The recommended rate for stocking fry in Michigan waters in 1994 was 4,938/ha (2,000/ acre, Borgeson 1987). At an average cost of $0.00091/fry, the stocking cost per hectare was $4.49 ($1.82/acre). This low cost would indicate fry stocking was a favorable walleye management practice for Michigan lakes. However, fry survival in most Michigan lakes was perceived to be poor (Laarman 1978, Laarman and Schneider 1986), and fry stocking was limited to lakes where predation on fry was expected to be low. Lakes with expected low predation rates were highly turbid lakes and lakes treated with piscicides to remove or reduce fish population numbers. At the recommended stocking rate, fry stocking for all Michigan waters could not be supported by collection of eggs from wild populations. In 1994, 35,390,000 fry were reared which would have supported stocking 7,136 ha of water. Managed waters generally were stocked in alternate years so this level of fry rearing would have supported managing 14,272 ha of water. This was substantially below the total surface hectares of water managed for walleye by stocking (Table 2). Increasing fry production is unlikely because managers do not recommend increasing egg take from the two principal wild stocks (O'Neal and Siler 1995). These stocks are still considered in the recovery stage and the ability to sustain these stocks through natural reproduction is uncertain. There is potential to collect eggs from two other Michigan stocks, Saginaw Bay and St. Mary's River (Figure 2), but it is unlikely the addition of these stocks could support fry stocking in all waters.

The average cost of rearing and stocking spring fingerlings in 1994 was $0.044/fish, ranging from $0.012 to $0.186 among management districts. The ratio of highest to lowest cost among districts was 15.5. This diversity in costs is considered normal and costs vary annually within each management district. Variations in annual costs are primarily caused by substantial changes in survival during the rearing cycle and changes in labor and associated training. Poor survival occurs commonly in earthen ponds and can substantially reduce production for an individual management district, if it occurs in even one pond. Training new employees adds significantly to labor costs because additional time is needed for the training process. Districts with the lowest cost rates in 1994 operated single, large pond systems located near their work station, and had no significant pond construction costs. Single pond systems located close to work stations significantly reduce travel and labor costs.

The recommended rates for stocking spring fingerlings were 62-247/ha (25-100/acre). Using the average rearing and stocking cost, the cost for stocking spring fingerlings ranged from $2.73-$10.87/ha ($1.10- $4.40/acre).

Relatively small numbers of fall fingerlings were reared and stocked in 1994. The average cost/fish for rearing fall fingerlings was $0.58, and ranged from $0.18 to $12.26. The highest rate resulted from very poor survival in one rearing pond. The costs for Districts 2 and 10 were most representative of fall fingerlings (Table 5). These fish were fed with minnows during the rearing cycle and attained sizes (average 12.7 cm, 5 in) representative of wild fall fingerling fish in Michigan. Only a few management districts had ponds suitable for rearing fall fingerling fish. The average cost for rearing fall fingerlings in field districts 2 and 10 was $1.23/fish. The recommended stocking rates for fall fingerlings were 49-99/ha (20-40/acre). At these rates, stocking costs for 12.7 cm fall fingerling walleye ranged from $60.27-$121.77/ha ($24.60-$49.20/acre). These costs were substantially higher than spring fingerling costs. Studies have been initiated to determine if survival rates of fall fingerlings justify the

increased rearing costs. The results of these studies were not available at the time this manuscript was written.

Laarman and Reynolds (1975) estimated the cost of rearing fingerlings in Michigan in 1971. A total of 72,641 fingerlings, with an average size of 7.1 cm (2.8 in), were reared in earthen ponds at a cost of $0.033/fish. Costs did not include capital investments for incubation facilities, rearing pond construction costs, or stocking costs. Unpublished data for southern Michigan, from 1975-1979, estimated costs for rearing 678,000 (3.8-7.6 cm) fingerlings at $0.036/fish. Expenses included in these estimates were not documented. Unpublished data for District 7, from 1974-1979, estimated costs for rearing 900,548 fingerlings at $0.049/fish. Sizes of fish were not indicated, but most were spring fingerlings based on stocking records and numbers stocked. These costs did not include capital investments for incubation facilities or fry stocking costs, but some pond renovation costs were included. The average spring fingerling cost of $0.044/fish, with an average size of 4.2 cm (1.6 in), estimated for 1994 indicates rearing and stocking costs in Michigan have increased very little over the past 15 to 20 years. This is attributed to stocking larger numbers of small fingerlings, and to improvements in techniques and efficiency of the overall program.

Fenton et al. (1996) found only two published accounts of walleye rearing costs in North America. They surveyed the operating costs of rearing fingerling walleye for 29 agencies in North America between 1986 and 1991. Operating costs did not include hatchery capital investments or transport costs for stocking. Operational cost estimates ranged from $0.03/cm ($0.08/in) to $0.14/cm. The median cost was $0.02/cm. The average 1994 Michigan estimates for spring and fall fingerlings were $0.01/cm and $0.05/cm. Michigan's rearing and stocking costs in 1994 were comparable to rearing costs in the lower range for other agencies described by Fenton et al. (1996), even though Michigan's costs incorporated transport expenses not included by the other agencies.

Nearly 25% of egg collections or fry rearing was conducted to provide walleye to other agencies, in 1994. However, the overall cost of these egg collections and fry rearing operations was a small portion of the total walleye rearing and stocking program. Most Fisheries Division effort for the program was provided by field management districts. Field personnel conducted most of egg-take, fingerling rearing, and stocking activities. Hatcheries provided a small amount of labor but were responsible for the critical egg and fry incubation operations and maintenance of incubation facilities. Labor accounted for the greatest portion of total expenses in the rearing and stocking program. Six FTEs of effort were required to complete the program in 1994. Fisheries Division provided 5.2 FTEs and volunteer labor accounted for the other 0.8 FTEs. Volunteers provided 10.9% of the total rearing and stocking program costs when labor and monetary contributions were considered. This was a substantial contribution and indicates the strong interest this program receives from partner groups and most Michigan anglers.

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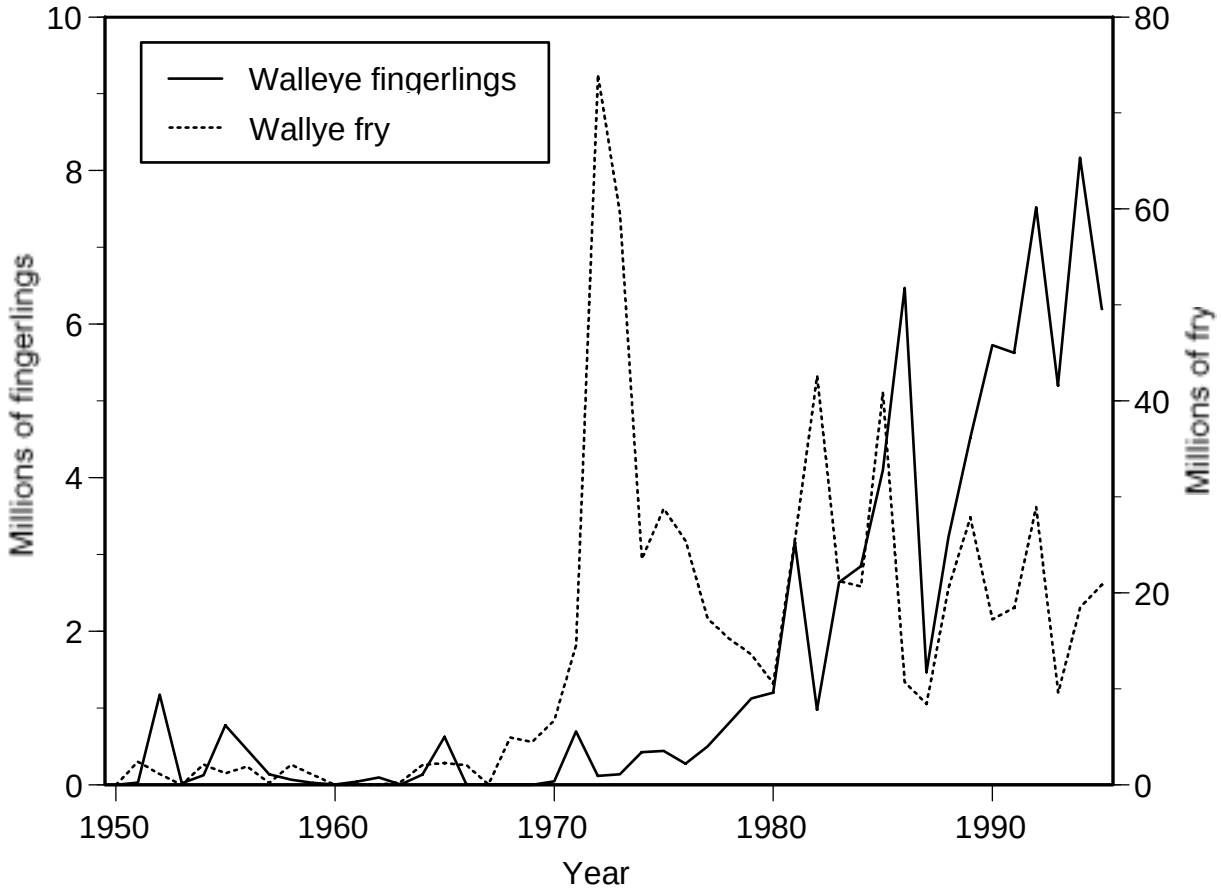

Figure 1.–Walleye fry and fingerling stocking in Michigan, from 1950-95. Fingerling numbers represent spring and fall fingerlings combined.

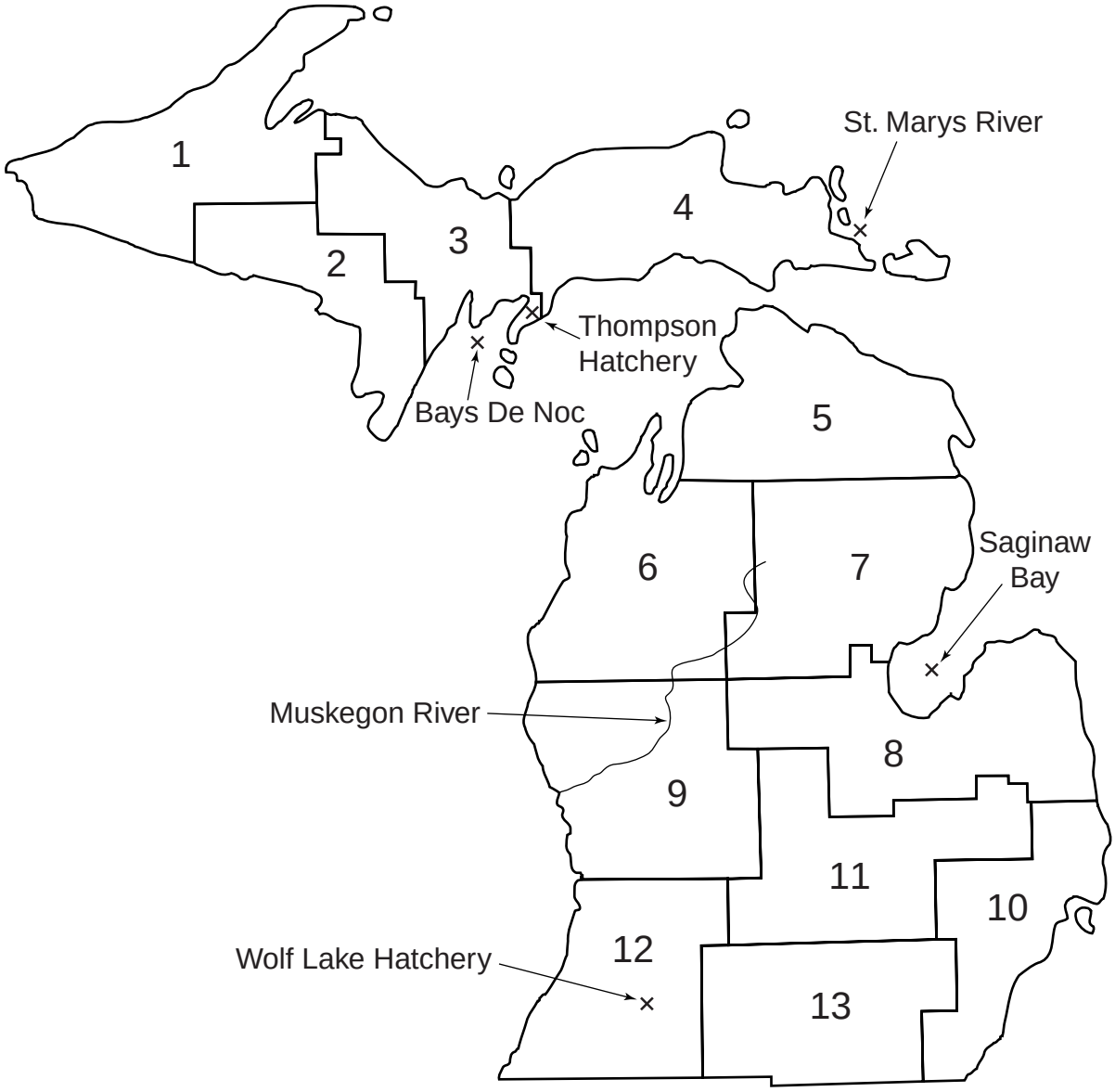

Figure 2.–Michigan Department of Natural Resources management districts, some walleye stocking locations, walleye egg-take locations, and walleye incubation facilities used in 1994.

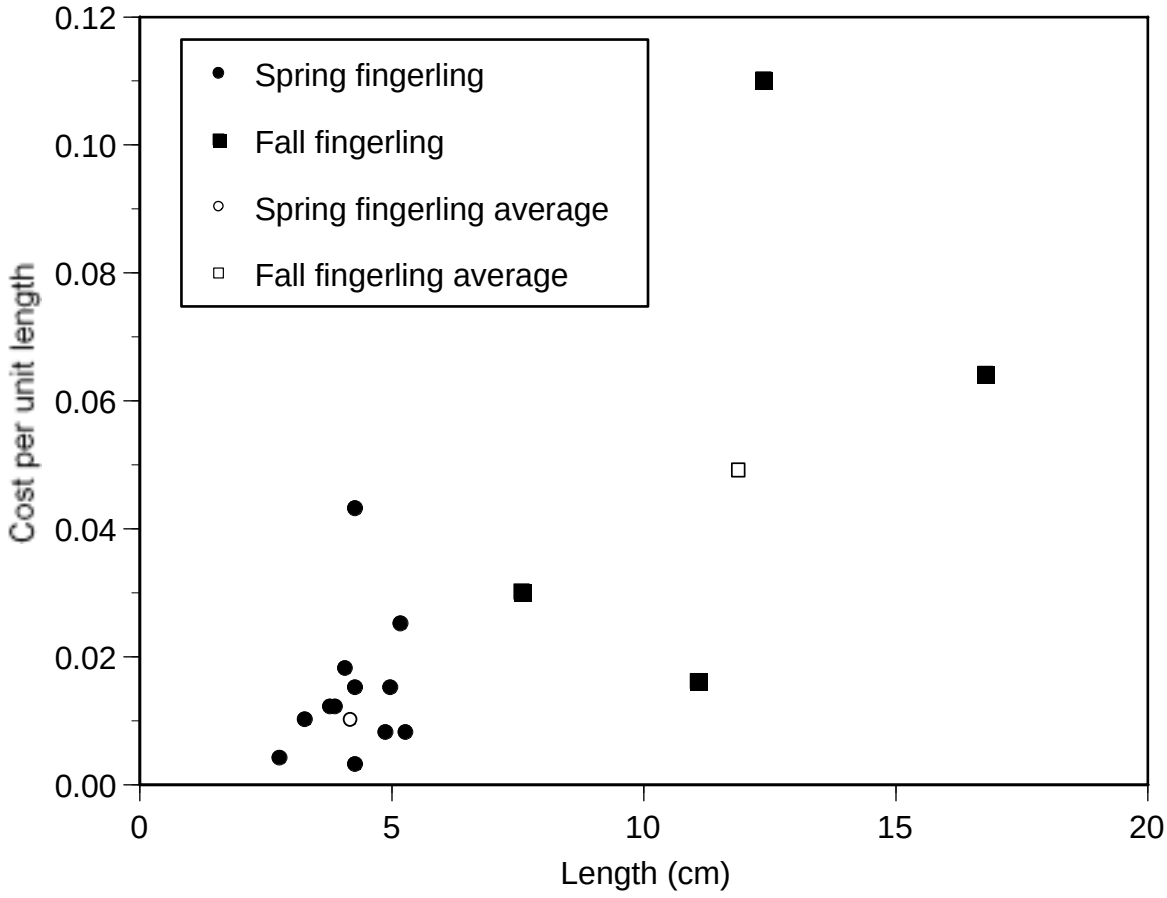

Figure 3.–Rearing and stocking cost/cm for walleye in Michigan Department of Natural Resources management districts, and averages for spring and fall fingerlings.

Table 1.–Number of walleye reared, average lengths, and numbers stocked in Michigan's Fisheries Division management districts during 1994. Blanks indicate zeros.

Management district	Spring fingerling			Fall fingerling		
	Number reared	Average length (cm)	Number stocked	Number reared	Average length (cm)	Number stocked
1	178,842	4.3	178,842			13,082
2	316,744	5.2	662,867	9,033	16.8	11,033
3	1,150,624	5.3	1,275,810			
4	1,238,400	4.3	847,962	147	17.3	19,427
5	622,300	3.8	622,300			1,400
6	145,357	4.3	256,163			
7	794,350	3.9	863,244	30,910	11.1	30,910
8	802,742	4.9	802,742			6,683
9	1,165,078	3.3	1,165,078			2,120
10	276,012	5.0	276,012	10,497	12.4	
12	386,230	4.1	386,230			1,783
11&13	719,293	2.8	713,293	5,535	7.6	17,735
Total or average	7,795,972	4.2	8,050,543	56,122	11.9	114,670

Table 2.–Surface hectares of inland and Great Lakes waters managed by stocking in Michigan during 1994. Blanks indicate zeros.

Management district	Inland waters (ha)	Great Lakes waters (ha)	Great Lakes water body
1	6,938	2,430	Lake Superior, Huron Bay and Ontonogon River area
2	5,978	217,728	
3	5,774	unknown	Lake Michigan, Little Bay De Noc
4	9,542	unknown	St. Mary's River
5	13,891	unknown	Lake Huron, Thunder Bay
6	12,211		
7	17,227	9,072	Lake Huron, Saginaw Bay
8	865	296,266	Lake Huron, Saginaw Bay
9	8,187		
10	2,721		
12	7,324		
11&13	2,217		
Total	92,875	> 525,496	

Table 3.–Summary of 1994 walleye egg-take and incubation costs, for Bay De Noc and Muskegon River strain fish. Egg-take costs represent fry produced (not eggs collected), with the exception of Bay De Noc eggs collected for non-Michigan use. FTE means full time equivalent position (2,080 hr). NA indicates not applicable. Blanks indicate zeros.

	Michigan use				Non-Michigan use					
Operation	Number of fry	Cost ($)	Cost/fry ($)	Labor (FTEs)	Number of eggs or fry	Cost ($)	Cost/fry ($)	Labor (FTE's)	Total cost	Total labor
Bay De Noc strain										
Egg take	9,454,000	4,793	0.00051	0.08	3,151,333[1]	1,655	0.00051	0.03	6,448	0.11
Incubation	9,454,000	4,369	0.00046	0.08					4,369	0.08
Total	9,454,000	9,162	0.00097	0.16	3,151,333	1,655	0.00051	0.03	10,817	0.19
Muskegon River strain										
Egg take	23,160,000	10,631	0.00046	0.18	7,720,000	3,561	0.00046	0.06	14,192	0.24
Incubation	25,785,000[2]	5,117	0.00020	0.05	7,720,000	1,699	0.00020	0.02	6,816	0.07
Total	23,160,000	15,748	0.00066	0.23	7,720,000	5,260	0.00066	0.08	21,008	0.31
Total	32,714,000	24,910	0.00069	0.39	10,871,333	6,915	NA	0.11	31,825	0.50

[1] Eggs were collected and directly transported to a non-Michigan user.
[2] 2,625,000 fry of other strains were reared at Wolf Lake Hatchery; costs were not separated for each strain.

Table 4.–Average annual labor and costs for pond construction and renovation in each management district. FTE indicates full time equivalent position (2,080 h). Blanks indicate zeros.

Management district	Fisheries Division labor (FTEs)	Volunteer labor (FTEs)	Fisheries Division cost ($)	Volunteer cost ($)	Total cost ($)
1					
2	0.16		11,119	900	12,019
3	0.01		1,263	2,065	3,328
4	0.02		1,174		1,174
5	0.01	0.01	4,598	1,760	6,358
6	0.02		5,614	4,000	9,614
7			3,419	3,328	6,747
8	0.08		13,929		13,929
9	0.03		4,560	1,000	5,560
10	0.02		1,393	36	1,429
11					
12					
13	0.01		330		330
Total	0.32	0.01	45,676	13,052	58,729

Table 5.–Summary of walleye stocking, costs, and labor for Fisheries Division and partners during 1994. FTE indicates full time equivalent position (2,080 h). Blanks indicate zeros.

Management District	Fry			Spring fingerling			Fall fingerling			Total FTEs
	Number stocked	Cost/fish ($)	Labor (h)	Number reared	Cost/fish ($)	Labor (h)	Number reared	Cost/fish ($)	Labor (h)	
1	1,600,000	0.00116	8	178,842	0.066	279				0.14
2				316,744	0.129	677	9,033	1.082	336	0.49
3	1,950,000	0.00136	33	1,150,624	0.045	1,485				0.73
4				1,238,400	0.014	257	147	12.258	57	0.15
5				622,300	0.046	880				0.42
6				145,357	0.186	647				0.31
7				794,350	0.047	1,177	30,910	0.177	210	0.67
8	1,100,000	0.00088	8	802,742	0.041	618				0.30
9	13,795,000	0.00082	84	1,165,078	0.034	1,411				0.72
10				276,012	0.073	669	10,497	1.366	577	0.60
12				386,230	0.076	1,077				0.52
11&13				719,293	0.012	318	5,535	0.225	42	0.17
Total or average	18,445,000	0.00091	133	7,795,972	0.044	9,495	56,122	0.581	1,222	5.22

Table 6.–Summary of walleye stocking, costs, and labor for Fisheries Division during 1994. FTE indicates full time equivalent position (2,080 h). Blanks indicate zeros.

Management District	Fry			Spring fingerling			Fall fingerling			Total FTEs
	Number stocked	Cost/fish ($)	Labor (h)	Number reared	Cost/fish ($)	Labor (h)	Number reared	Cost/fish ($)	Labor (h)	
1	1,600,000	0.00116	8	178,842	0.066	279				0.14
2				316,744	0.106	613	9,033	0.891	231	0.41
3	1,950,000	0.00136	29	1,150,624	0.040	1,319				0.65
4				1,238,400	0.014	257	147	12.258	57	0.15
5				622,300	0.041	680				0.33
6				145,357	0.142	487				0.23
7				794,350	0.040	1,023	30,910	0.170	204	0.59
8	1,100,000	0.00088	8	802,742	0.036	568				0.28
9	13,795,000	0.00082	84	1,165,078	0.030	1,003				0.52
10				276,012	0.071	629	10,497	0.973	412	0.50
12				386,230	0.075	1,029				0.49
11&13				719,293	0.011	268	5,535	0.225	42	0.15
Total or average	18,445,000	0.00091	129	7,795,972	0.040	8,155	56,122	0.473	946	4.44

Table 7.–Summary of walleye rearing and stocking costs, and labor, for Fisheries Division and partners during 1994. FTE indicates full time equivalent position (2,080 h).

Unit or operation	Fry		Spring fingerling		Fall fingerling		Total cost ($)	Total labor (FTEs)[1]
	Number stocked	Cost ($)	Number reared	Cost ($)	Number reared	Cost ($)		
Fisheries Division								
Districts, egg-take[1]								0.2
Hatcheries, egg-take[1]								0.1
Hatcheries, incubation[1]								0.1
Districts, rearing & stocking	18,445,000	16,799	7,795,972	308,899	56,122	26,561	352,259	4.8
Volunteer								
Rearing & stocking		26		36,842		6,064	42,932	0.8
Total	18,445,000	16,825	7,795,972	345,741	56,122	32,625	395,191	6.0
Percent Fisheries Division		99.9		89.3		81.4	89.1	86.7
Percent volunteer		0.1		10.7		18.6	10.9	13.3
Percent labor							63.9	
Percent travel							5.1	
Percent material							31.0	

[1] Expenses for district egg-take ($12,481), hatchery egg-take ($2,943), and hatchery incubation ($9,486) activities were incorporated in district rearing and stocking costs.

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