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FISHERIES DIVISION

TECHNICAL REPORT

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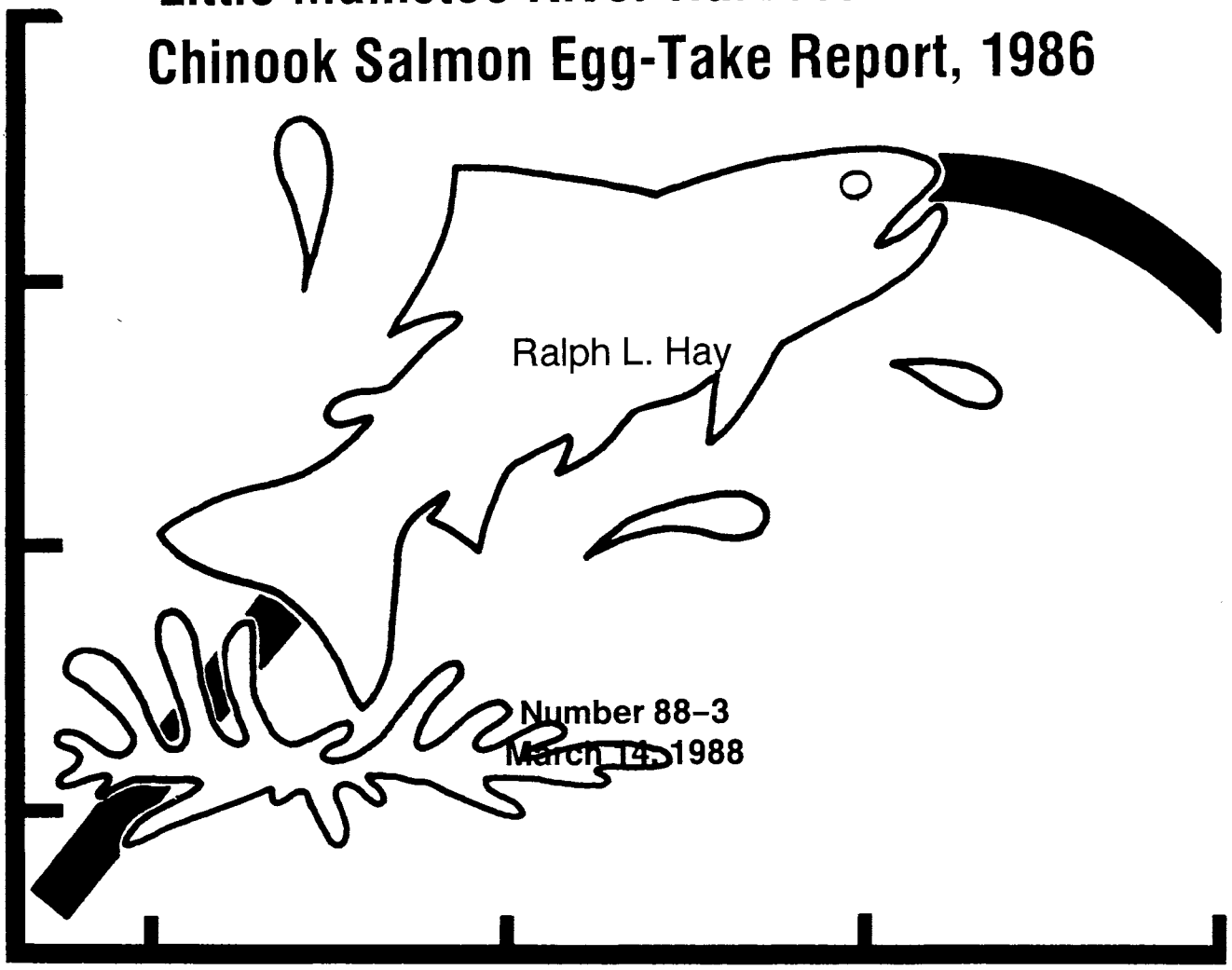

Ralph L. Hay

Number 88-3
March 14, 1988

Michigan Department of
Natural Resources

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LITTLE MANISTEE RIVER HARVEST WEIR AND CHINOOK SALMON EGG-TAKE REPORT, 1986

Ralph L. Hay

INTRODUCTION

As part of the Michigan Department of Natural Resources salmon management program for Lake Michigan, the Little Manistee River has been planted annually since 1967 with both coho and chinook salmon (Table 1). Construction of a blocking weir, fish ladder, holding ponds, and harvest facility on the river, about 5 miles upstream from Manistee Lake, Manistee County, began in 1967 and was completed in 1968 (Fig. 1). All chinook and coho salmon reaching the weir are harvested and sold to a commercial contractor. Normally, all other salmonids are passed upstream. The few salmon that enter the river when the weir is not in operation provide a limited stream fishery. The Little Manistee weir is Michigan's primary source for chinook eggs for in-state and out-of-state hatchery rearing and serves as a back-up (to the Platte River upper weir) for coho eggs. The facility is also used to monitor fall steelhead runs and each spring provides the majority of steelhead eggs for in-state hatchery rearing. Biological data have been collected on chinook and other anadromous salmonids since 1968.

From 1968 through 1978 chinook fingerlings were stocked in the Little Manistee River at an average rate of about 322,000 per year (Table 1). Beginning in 1979, the planting rate was increased by over 80% to an average of nearly 588,000 fingerlings. Substantial runs of returning adults have been produced but run size has not been closely related to stocking rate. The number of chinook actually harvested at the weir has varied between 11,136 (in 1977) and 39,359 (in 1983) (Table 2).

Chinook return to the weir at either age 0.1 (jacks), age 0.2, age 0.3, age 0.4, or age 0.5—but most commonly at age 0.2.[1] For the 1967, 1968, 1981, and 1982 year classes and plants, return rates were 0.4 to 1.9% at age 0.1, 3.1 to 3.5% at age 0.2, and 1.7 to 3.2% at age 0.3 (Table 3). For the 1981, and 1982 year classes, return rates were 1.2 and 1.1% at 0.4, respectively. Comparable estimates cannot be made for the 1969–80 plants because the age composition of the run has not been monitored consistently; however, for jacks alone returns have averaged 0.7%.

The return rate of chinook salmon to the weir was high initially (1960's), declined (1970's), then increased (1980's). Return rates by chinook of all ages were approximately 8.5% for the 1967 plant, 7.2% for the 1968 plant, 6.8% for the 1981 plant, and 8.9% for the 1982 plant (Table 3). Returns from plants in the 1970's must have been lower because relatively low

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[1]In aging anadromous fish, the number preceding the decimal denotes age at smolting (0 for most chinook, 1 for most coho) and the number following the decimal represents the number of annuli formed in the Great Lakes (mostly 1, 2, 3, 4, or 5 for chinook and 0 or 1 for coho). Note: a very recent study of scale samples from the Lake Michigan fishery indicates some chinook live to age 0.4 and 0.5. This finding suggests that some spawning chinook absorb one or two annuli from their scales while in the rivers and that the aging data given in preceding reports may be underestimates.

numbers came back to the weir in 1976–77 and 1980–82 (Table 2). Large runs, averaging 32,032 fish per year, occurred from 1983 through 1986. These originated from average plants of about 580,000 smolts in 1978–85—an average return rate of about 5.5% per plant. The return rates represent only the weir harvest and do not include the angler harvest, which has increased since the 1960's. In 1986, the estimated sport harvest from all stocks of chinook salmon in Michigan waters of Lake Michigan which were surveyed was 514,000 fish (G. Rakoczy, personal communication).

Growth rate of chinook has fluctuated considerably (Table 4, Fig. 2). Average weight has varied from 3.0 to 9.5 pounds for age 0.1, from 7.6 to 20.9 pounds for age 0.2, and from 12.7 to 29.2 pounds for age 0.3. The fluctuations were especially large during the 1970's. Overall, age-0.1 chinook salmon decreased in size from 5.9 pounds (1960's) to an average of 4.3 pounds (early 1980's), a 27% reduction. A similar but less dramatic reduction in size can be seen for older fish. Average size declined further in 1986 but this is due, in part, to better aging techniques.

Annual plants of yearling coho salmon in the Little Manistee River have varied widely, from 91,000 in 1971 to 700,000 in 1969 (Table 1). Annual runs of coho to the weir have varied from 2,314 (in 1972) to 108,400 (in 1970) (Table 5). The return rate of jacks (age 1.0) has been relatively low, <0.1% to 0.7%, compared to adults (age 1.1), 3.0% to 15.0% (Table 3, Fig. 3). The total return rate is usually between 11 and 15%, however, it declined to 8.5% for the 1983 plant and averaged only 3.8% for the 1984–85 plants. The return of the 1985 plant to the Platte River was low also (Pecor 1987). Possible reasons for the poor returns were discussed by Pecor (1987). As with chinook, these return rates represent only the weir harvest and do not include the angler harvest, which has also fluctuated annually. In 1986, anglers harvested an estimated 135,000 coho salmon from all stocks in Michigan waters of Lake Michigan which were surveyed (G. Rakoczy, personal communication).

The average weight of coho jacks (age 1.0) increased slightly from 1974–83, then gradually decreased (Fig. 4, Table 6). However, the size of adult coho decreased from 8.7 pounds in 1968 to less than 5.0 pounds in 1979, then stabilized at about 6.3 pounds. Like the chinook, there has been a decrease in average size of adult coho from the 1960's to the early 1980's, but in the last several years the average has been fairly constant. It is assumed that the annual variations in size are primarily related to a combination of predator density and forage density in Lake Michigan.

The Little Manistee River is one of the top quality steelhead streams in Michigan. The fishery is supported almost entirely by natural reproduction. However, a plant of 100,188 fall fingerlings was made in 1974, and from 1981 through 1983 annual plants were made in conjunction with a research project on steelhead production (Table 1). In 1984 a small planting of three strains of summer steelhead yearlings was made to extend the steelhead fishery. The

strains (Siletz, Rogue, and Umpqua River) were imported from the State of Oregon. The number of steelhead returning to the weir each fall has not been consistent, ranging from 320 in 1978 to 7,622 in 1971 (Table 7). Mean weight of steelhead (all age groups) has varied from 6.5 pounds in 1973 to 9.3 pounds in 1972 (Table 7). The estimated sport harvest of steelhead from all Michigan waters of Lake Michigan which were surveyed was 35,000 in 1986 (G. Rakoczy, personal communication). Indications are that the open-water catch will increase significantly in future years.

Small runs of anadromous brown trout occur in the Little Manistee River. The largest run, 238, was in 1975 (Table 8). Average size has ranged from 3.4 pounds (1974) to 6.8 pounds (1979). Annual runs in excess of 100 fish have occurred since 1984. In 1986, the estimated sport harvest from Michigan waters of Lake Michigan which were surveyed was 74,000 brown trout (G. Rakoczy, personal communication).

Atlantic salmon yearlings were first planted in the Little Manistee River in 1977 (Table 1). Subsequent plants have been made in an attempt to establish this new species. Until 1984 only an occasional fish had been captured. Of the several strains and hybrids planted only the Sebago strain (from Maine) shows promise.

A few pink salmon have been harvested in the last few years. Numbers harvested are generally less than 25.

HARVEST WEIR OPERATIONS, 1986

On August 22, 1986, the weir grates were installed to block anadromous fish. On September 4, the ponds were filled and the fish ladder was activated. Harvest began on September 8. The weir remained operational until November 12, at which time the grates were removed and the building was winterized. The weir was in operation for 83 days. All harvested chinook and coho salmon were sold on contract to Tempotech Industries, Hart, Michigan.

From September 9–11, 1986, heavy precipitation (5–7 inches) created severe flooding in the Little Manistee River. Water flowed over and around the weir for several days, allowing an unknown number of fish to negotiate the weir structure.

Chinook salmon

Harvest of chinook salmon began September 8 and ended November 7, a period of 61 days. Fish that were not ripe were harvested because, in other years, holding early-run chinook in maturation ponds resulted in high mortality. Two peak harvests occurred, the first during late September and the second near mid-October (Table 9). A relatively small, but significant run of chinook entered the facility in late August and early September. A second, major run began in mid-September and peaked in mid-October. A total of 22,131 chinook were harvested

in 1986 (Table 2). The calculated total weight of all chinook, in the round, was 298,188 pounds.

For several weeks during the run, biological data were obtained from a randomly selected sample of 700 chinook to provide information on age composition and growth. To overcome the problem of aging river fish with reabsorbed scales, chinook salmon length frequencies were converted to age frequencies by means of a length-age frequency table (Table 10). Data for this table was obtained from scale samples and length measurements collected from Lake Michigan fish during a creel census at several sites from August to November 1986. In applying the table to those length groups in which two or more age groups are represented, the lighter fish were assigned to the younger age group and the heavier fish to the older age group. The estimated total harvest consisted of 397 (1.8%) age-0.1 jacks weighing 1,684 pounds, 1,025 (4.6%) age-0.2 adults weighing 7,896 pounds, 13,850 (62.6%) age-0.3 adults weighing 173,230 pounds, 6,849 (30.9%) age-0.4 adults weighing 115,123 pounds, and 10 (<0.1%) age-0.5 adults weighing 255 pounds (Table 9). The 1986 run of jacks represented 0.1% of the fingerlings stocked in 1985. The returning age-0.2 adults were 0.1% of the 1984 plant, age-0.3 adults were 2.0% of the 1983 plant, age-0.4 adults were 1.1% of the 1982 plant, and age-0.5 adults were less than 0.1% of the 1981 plant.

Females constituted about 50% of the total run — 5.3% of age 0.1, 19.3% of age 0.2, 56.7% of age 0.3, and 44.9% of age 0.4. No age-0.5 females were collected (Table 9). Mean lengths and weights of males and females combined were: age 0.1, 21.0 inches and 4.2 pounds; age 0.2, 28.3 inches and 7.6 pounds; age 0.3, 33.6 inches and 12.7 pounds; age 0.4, 36.9 inches and 17.1 pounds; and age 0.5 (males only), 42.0 inches and 25.5 pounds (Table 11). Growth was nearly linear on a weight basis (Fig. 5). In general, females were slightly larger than males at each age.

The 1986 chinook egg-take operation began September 23 and ended October 24. During the 32-day period 17 million eggs were collected of which 13 million were for in-state rearing and 4 million were for out-of-state commitments (Table 12). A total of 3,572 female chinook (ages 0.2, 0.3 and 0.4) were stripped, excluding those which yielded low-quality eggs or were otherwise unsatisfactory. Assuming that about 6,000 females were handled to provide the 17 million eggs, a total run of 12,000 chinook (6,000/50% females) should provide sufficient eggs for current in-state and out-of-state requirements.

Egg-take operations began when the proportion of ripe females approached 40%. The "wet" method of egg fertilization was again used in 1986. Eggs were collected in a plastic pan and several milliliters of sperm were added. River water was quickly added, the mixture was stirred for several seconds and then allowed to stand for several minutes. The fertilized eggs were rinsed and allowed to water harden in milk cans (with flowing water) prior to transportation. Excluding the egg-take on September 26, the percent eye-up was normal for

chinook salmon with a range of 67.3% (September 29) to 73.0% (September 23 and 24) (Table 12). No explanation can be given for the very poor eye-up for eggs taken on September 26.

During the egg-take operation, maximum river water temperature was 61 °F (September 28) and minimum water temperature was 42 °F (October 18) (Fig. 6). Slightly over 50% of the eggs were collected when the river water temperature exceeded 50 °F.

Fecundity data were not collected in 1986.

No fin clips were found on 700 randomly examined chinook salmon.

Only 1.4% of the chinook sampled had a lamprey wound (Table 13). This was the highest since 1971, but still considerably below scarring rates in the 1960's and early 1970's.

Coho salmon

In 1986 the coho harvest coincided with the chinook harvest (September 8 through November 7, a total of 61 days). Peak harvests occurred during the first and third weeks of September and since coho were not held for egg-take, the harvest dates roughly coincide with migration of coho into the river (Table 14). Like the chinook, the coho runs had decreased significantly by late October.

A total of 16,724 coho were harvested. The total weight calculated from biological samples was 92,165 pounds (Table 5). This was the second smallest harvest and rate of return since 1975.

The age composition of the harvested coho was 125 (0.7%) age-1.0 jacks weighing 177 pounds and 16,599 (99.3%) age-1.1 adults weighing 91,988 pounds (Table 14). The returning age-1.0 jacks were 0.04% of the 1986 plant and the age-1.1 adults were 4.4% of the 1985 plant.

All age-1.0 and 44.4% of the age-1.1 coho were males. The total run consisted of 55.2% females. Mean lengths and weights were: age-1.0 males, 16.3 inches and 1.4 pounds; age-1.1 males, 25.7 inches and 5.7 pounds; age-1.1 females, 25.0 inches and 5.5 pounds; and age-1.1 sexes combined, 25.3 inches and 5.5 pounds (Table 15). Adult males were slightly larger than females.

Only 0.1% of the coho had lamprey wounds (Table 13). This rate was significantly less than the 1960's.

No coho eggs were taken at the Little Manistee weir in 1986.

A total of 700 adult coho were randomly checked for fin clips. Of these fish, 2 (0.3%) had left ventral (LV) fin clips. These fish could have been planted in 1985 by the Michigan Department of Natural Resources into Lake Superior at Dead River (135,000Y), Black River (70,000Y), Portage Canal (52,000Y), or Munising Bay (45,000Y), or into Lake Michigan at the Platte River (60,000Y).

Skin color was examined on 700 coho salmon sampled at approximately weekly intervals (Table 16). Most early run coho had silver skin, however, as the season progressed, fish lost

their silver sheen and by late October most coho were dark colored. Females retained their silver color long than males.

Steelhead trout

Fall steelhead began entering the river in late August and the run peaked during mid-October (Table 17). Approximately 50% of the total run occurred during this 2-week period. As in most previous years, all steelhead were passed above the weir.

The 1986 run of 4,720 fish was less than last year (6,356), but was the second best run since 1975 (Table 7). Forty-three percent (43%) of the returning adults were age 1.2 or 2.2 (Table 17). These two age groups also represented 49% of the total estimated weight of 34,342 pounds. Mean lengths and weights for 11 different age groups are given in Table 18 and Figure 7. Size of returning adults is more dependent upon years spent in Lake Michigan than on age at smolting.

A total of 588 steelhead were randomly checked for fin clips. Fifty-one (8.7%) had fin clips as follows:

Fin clip	Number of fish
Adipose (Ad)	1
Dorsal-adipose (DAd)	2
Adipose-left ventral (AdLV)	13
Adipose-both ventrals (AdBV)	17
Adipose-right ventral (AdRV)	2
Adipose-left pectoral (AdLP)	1
Adipose-left pectoral-right ventral (AdLPRV)	2
Adipose-left pectoral-both ventrals (AdLPBV)	3
Left pectoral (LP)	1
Right pectoral (RP)	2
Right pectoral-left ventral (RPLV)	1
Left pectoral-right ventral (LPRV)	1
Both pectorals-right ventral (BPRV)	2
Left ventral(LV)	1
Both ventrals (BV)	1
Adipose-right pectoral (AdRP)	1

The DAd fish (2) were planted in the Little Manistee River in 1983. The AdRV fish (2) and AdLP fish (1) were planted in Lake Michigan by Wisconsin in 1984. The AdLV fish (13 Umpqua strain of summer steelhead), AdBV fish (17 Siletz strain of summer steelhead), LPRV fish (1 Rogue strain of summer steelhead), and AdRP fish (1 Skamania strain of summer steelhead) were all planted in Lake Michigan by Michigan in 1984. Origins of the 14 remaining fish could not be decided because fin clips, age (from scales), and planting records did not coincide.

An intensive study of steelhead and their reproduction in the Little Manistee River has been concluded by Paul Seelbach, Institute for Fisheries Research, Ann Arbor, Michigan.

Brown trout

The anadromous brown trout run peaked in late September and lingered into November (Table 19). All but 10 brown trout were passed above the weir.

The 1986 run of 99 fish was down from the previous 2 years (Table 8). About 86% of the returning adults were age 1.1 or 1.2 (Table 19). These two age groups represented 85% of the total estimated weight of 554 pounds. Mean lengths and weights for the six represented age groups are given in Table 20 and Figure 8. Size of returning adults is more dependent upon years spent in Lake Michigan than on age at smolting.

A total of 93 brown trout were randomly checked for fin clips. Only 5 (5.4%) had fin clips. Observed fin clips were included: left pectoral (LP, 1 fish); right pectoral (RP, 1 fish); left pectoral-right pectoral (LPRP, 2 fish); and left maxillary (LM, 1 fish). Origins of these fish could not be determined because fin clips, age 1 from scales, and planting records did not coincide.

Brown trout are not planted in the Little Manistee River. Therefore, it is assumed that these anadromous fish are from wild stock or from hatchery stock planted in Lake Michigan at Manistee.

Atlantic salmon

No Atlantic salmon were collected at the weir in 1986.

Pink salmon

No pink salmon were collected at the weir in 1986.

SUMMARY

In 1986 the Little Manistee harvest weir was in operation from August 22 through November 12 (83 days). Harvest of chinook and coho salmon and passage of other anadromous salmonids occurred from September 8 through November 12.

The entire salmon run of 22,131 chinook (298,188 pounds) and 16,724 coho (92,165 pounds) was harvested and sold to Tempotech Industries, Hart, Michigan.

The chinook run consisted of 397 age-0.1 jacks (0.1% of the 1985 fingerling plant), 1,025 age-0.2 adults (0.1% of the 1984 fingerling plant), 13,850 age-0.3 adults (2.0% of the 1983 fingerling plant), 6,849 age-0.4 adults (1.1% of the 1982 fingerling plant), and 10 age-0.5 adults (less than 0.1% of the 1981 fingerling plant). Mean sizes were: age 0.1, 21.0 inches (4.2 pounds); age 0.2, 28.3 inches (7.6 pounds); age 0.3, 33.6 inches (12.7 pounds); age 0.4, 36.9 inches (17.1 pounds); and age 0.5, 42.0 inches (25.5 pounds). During chinook egg-take operations (September 23 through October 24) 3,572 females (ages 0.2, 0.3, and 0.4) were

stripped to obtain 16,613,648 eggs. The percent eye-up ranged from 18.5% (September 26) to 73.0% (September 23 and 24). During the first 9 days of egg-take, the river water temperature exceeded 50 °F.

The 1985 coho run was composed of 125 age-1.0 jacks (0.04% of the 1986 yearling plant) and 16,599 age-1.1 adults (4.4% of the 1985 yearling plant). Mean sizes were: age 1.0, 16.3 inches (1.4 pounds); and age 1.1, 25.3 inches (5.5 pounds).

The 1986 fall steelhead run of 4,720 fish included 11 different age groups. Forty-three percent (43%) of the fish were age 1.2 or 2.2 (three summers in Lake Michigan). Nearly two-thirds of the fin-clipped steelhead were summer strains (Umpqua, Siletz, Rogue, and Skamania) planted in Lake Michigan by Michigan in 1984.

The fall brown trout run of 99 fish was less than the previous 2 years. About 86% of the returning adults were age 1.1 or 1.2.

No Atlantic salmon or pink salmon returned to the weir in 1986.

RECOMMENDATIONS FOR 1987

Use only data from biological samples to calculate weekly weights of chinook and coho salmon harvested. Do not scale sample river-run chinook salmon because their scales are severely eroded and are missing annuli; instead, collect scale samples from Lake Michigan chinook in the fall. Utilize the "dry" method for chinook egg-take. This method involves mixing eggs (from several females) with sperm in a 5-gallon plastic pail without water and letting the mixture stand for 30 minutes before water-hardening.

ACKNOWLEDGMENTS

Data collection, tabulation, and scale reading were done by Alfred Allen, Janice Sapak, Simeon Syrewicze, and Steve Lazar. Kelley Smith developed a computer program for data analyses and provided technical advice.

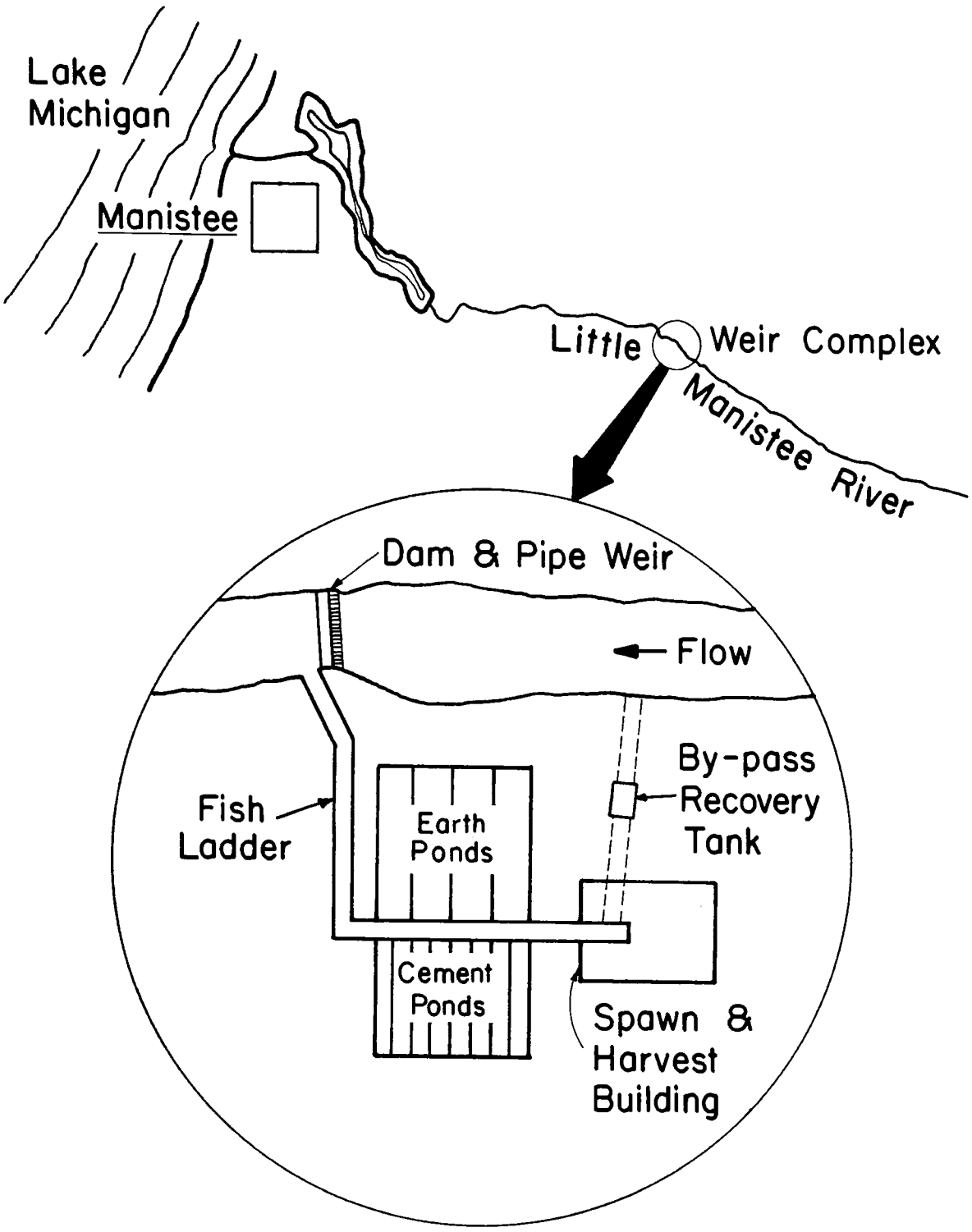

Figure 1. Location and schematic diagram of the Little Manistee River weir complex.

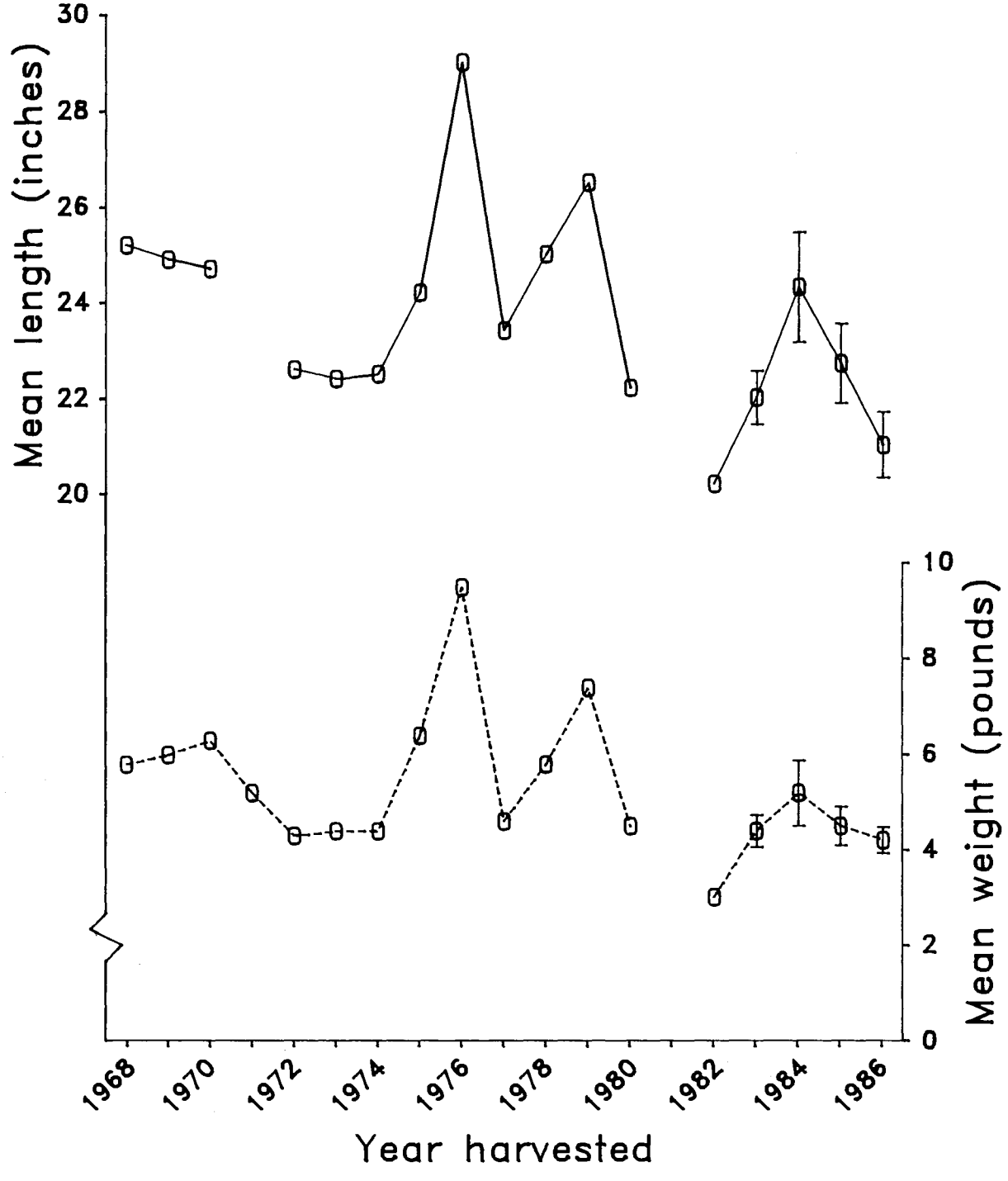

Figure 2. Mean total length (inches) and round weight (pounds) of age-0.1 (jack) chinook salmon harvested at the Little Manistee River weir. Vertical bars indicate two standard errors.

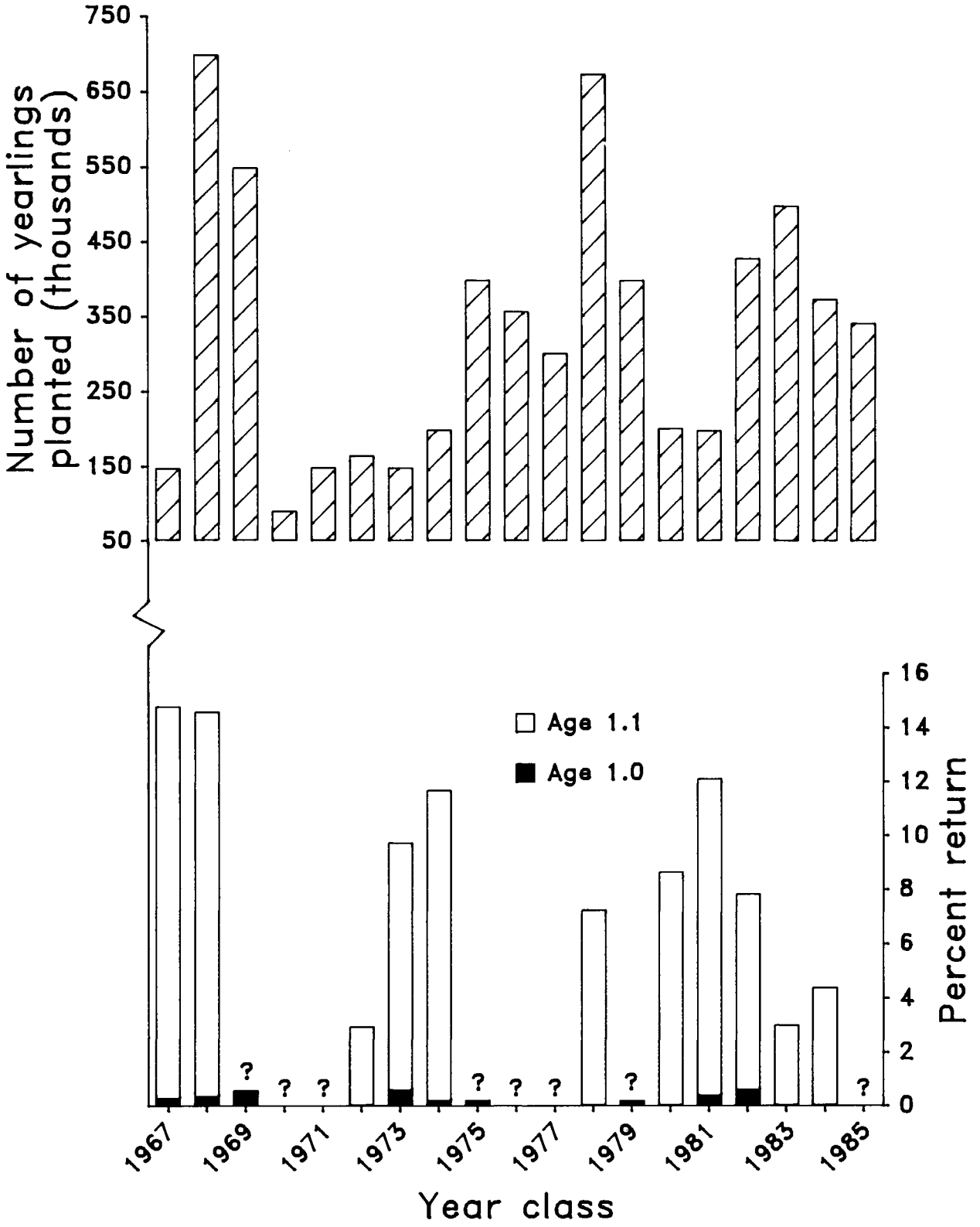

Figure 3. Percent return, by age, of coho salmon year classes to the Little Manistee River weir compared with the number of yearlings planted. Question marks (?) indicate incomplete return data.

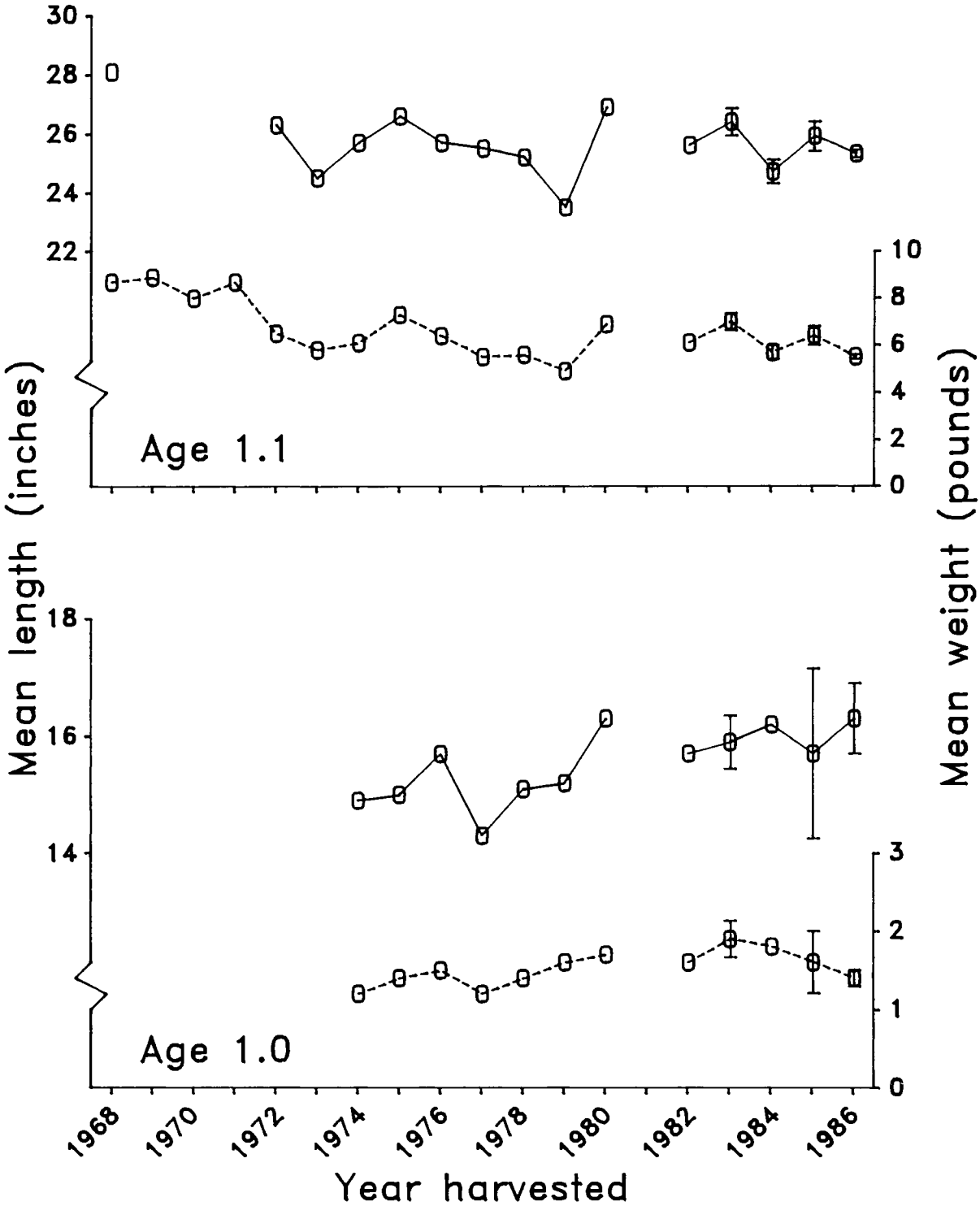

Figure 4. Mean total length (inches) and round weight (pounds) of age-1.0 and age-1.1 coho salmon harvested at the Little Manistee River weir. Vertical bars indicate two standard errors.

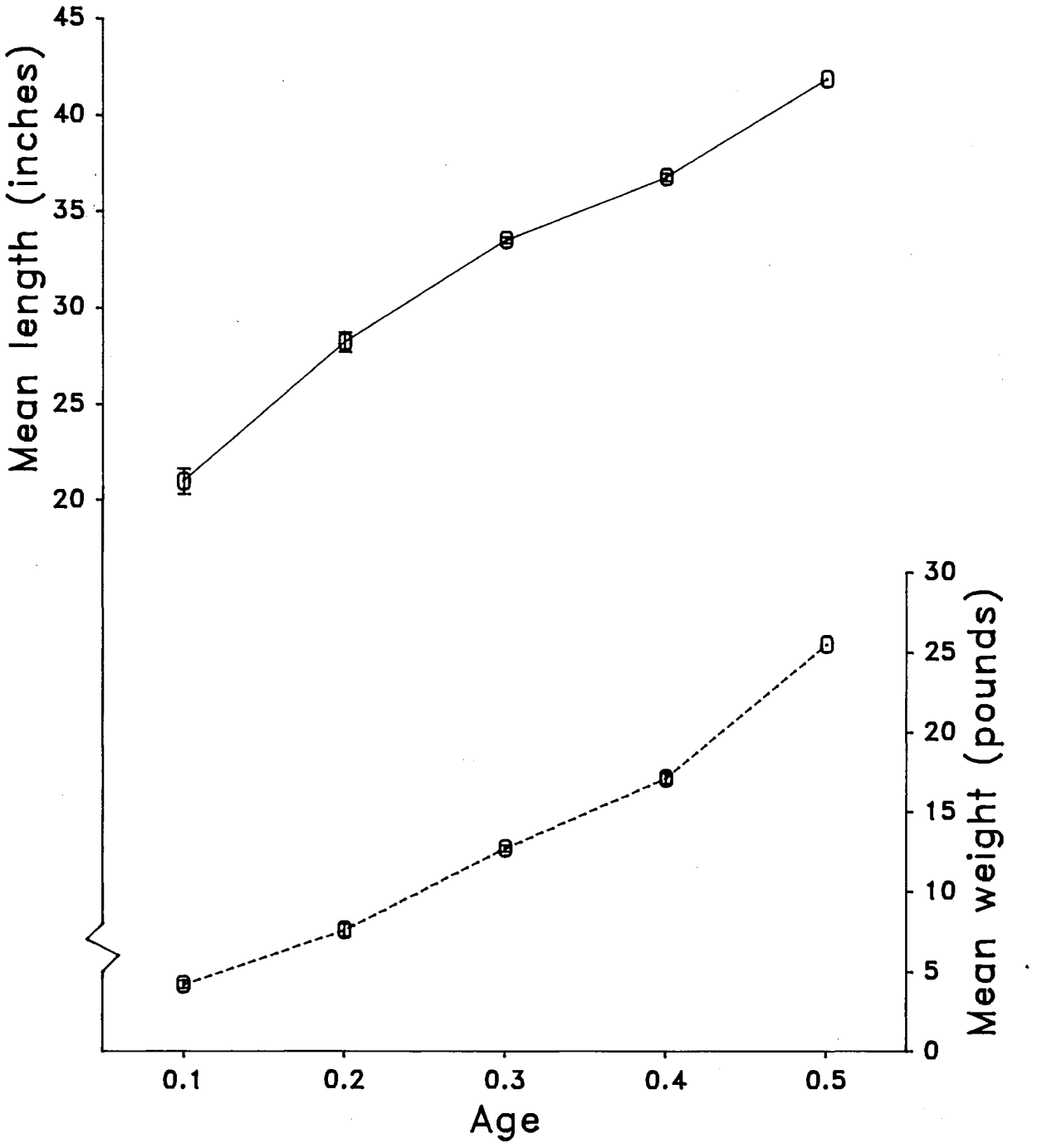

Figure 5. Mean total length (inches) and round weight (pounds), by age, of chinook salmon harvested at the Little Manistee River weir, fall 1986. Vertical bars indicate two standard errors.

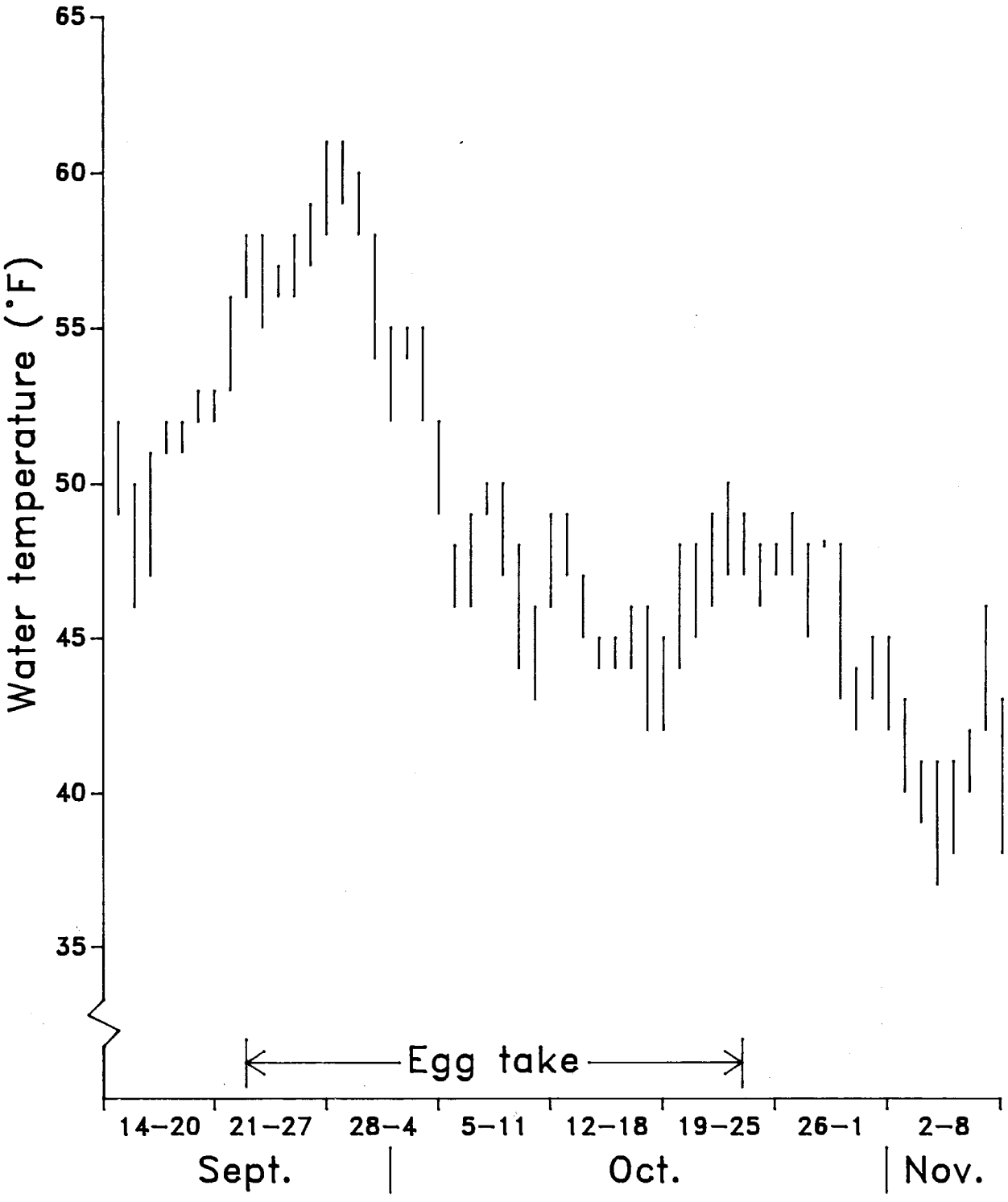

Figure 6. Daily minimum and maximum water temperatures for the Little Manistee River, fall 1986.

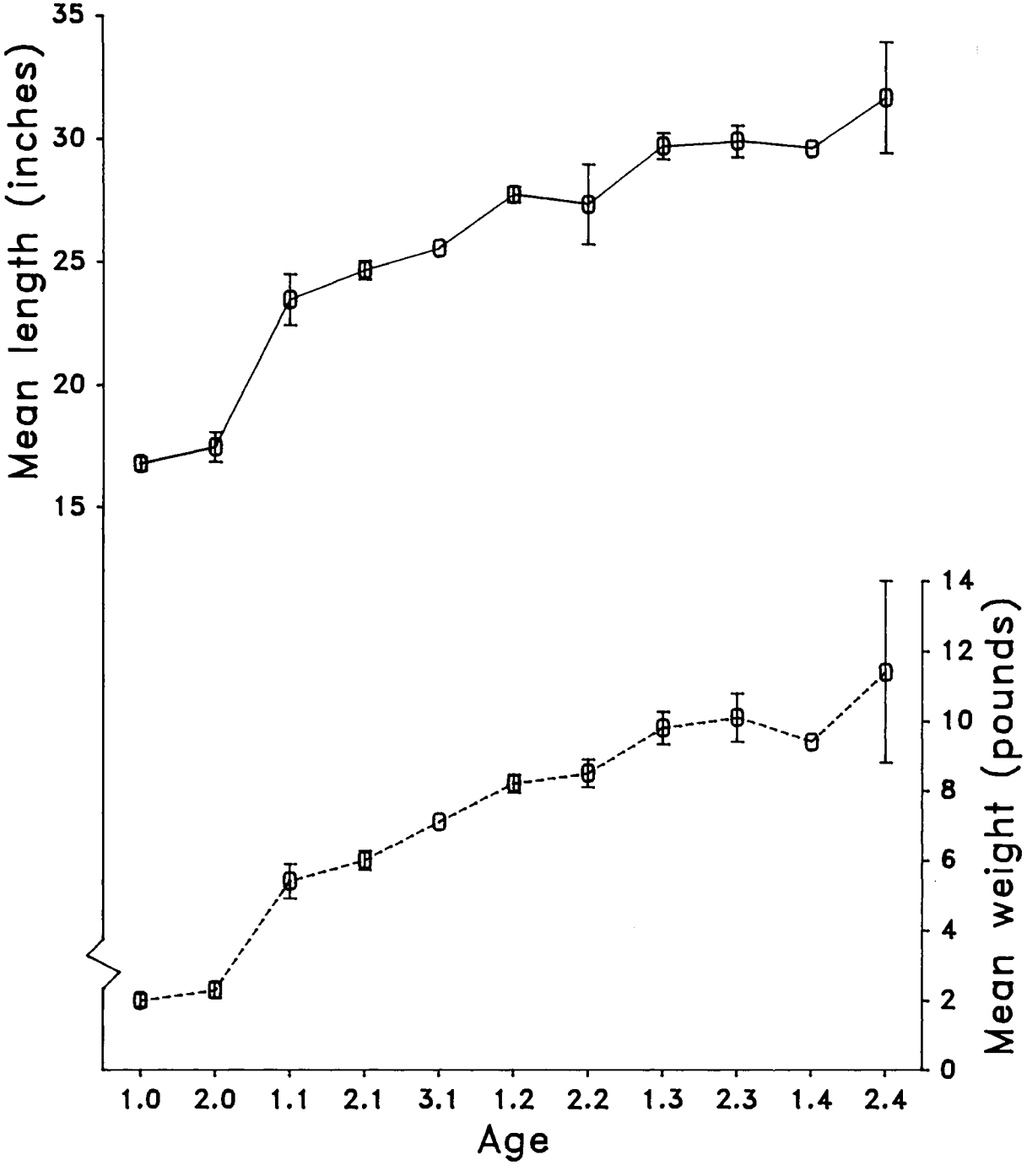

Figure 7. Mean total length (inches) and round weight (pounds), by age, of steelhead passed upstream at the Little Manistee River weir, fall 1986. Vertical bars indicate two standard errors.

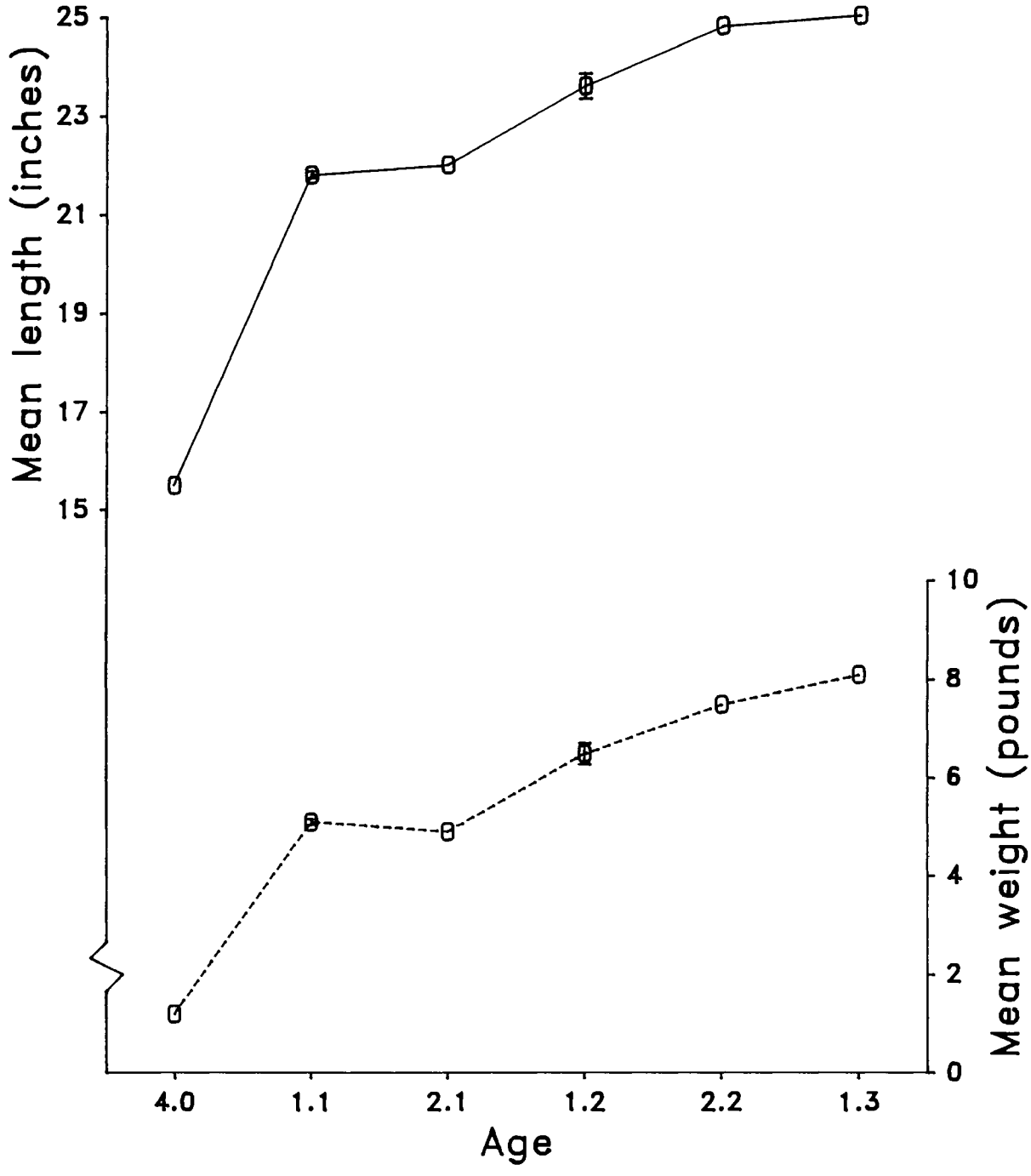

Figure 8. Mean total length (inches) and round weight (pounds), by age, of brown trout passed upstream at the Little Manistee River weir, fall 1986. Vertical bars indicate two standard errors.

Table 1. Planting history of anadromous salmonids in the Little Manistee River since 1967. Age of fish at planting are spring fingerling (SF), fall fingerling (FF), and yearling (Y).

	Salmon			Trout
Planting year	Chinook (All SF)	Coho (All Y)	Atlantic (All Y)	Steelhead
1967	590,830	433,215	—	—
1968	321,912	148,365	—	—
1969	300,000	700,002	—	—
1970	308,900	550,012	—	—
1971	301,868	91,674	—	—
1972	300,908	150,067	—	—
1973	356,140	165,714	—	—
1974	402,330	150,067	—	100,188(FF)
1975	300,144	200,601	—	—
1976	301,300	400,282	—	—
1977	250,200	358,832	7,497	—
1978	400,028	302,980	15,000	—
1979	603,098	675,000	—	—
1980	550,272	400,158	—	—
1981	500,204	202,815	19,529	93,673(FF)
	—	—	—	30,700(Y)
1982	600,294	200,000	25,030	100,000(FF)
	—	—	—	30,000(Y)
1983	677,250	429,612	—	16,428(Y)
1984	805,773	500,066	—	5,079(Y)[1]
	—	—	—	5,000(Y)[2]
	—	—	—	4,817(Y)[3]
1985	500,012	375,283	—	—
1986	450,273	343,121	—	—
	19,721[4]	—	—	—
Total	8,841,457	6,777,866	67,056	293,861(FF)
	—	—	—	92,024(Y)
Average	442,073	338,893	16,764	97,954(FF)
	—	—	—	23,006(Y)

[1]Siletz River strain of summer steelhead.

[2]Rogue River strain of summer steelhead.

[3]Umpqua River strain of summer steelhead.

[4]Triploid chinook salmon.

Table 2. Number, by age, of chinook salmon harvested at the Little Manistee River weir, fall 1968–86. Weight (pounds) is in parentheses.

	Age[1]							
Year	0.1	0.2	0.3	0.4	0.5	Adult[2]	Mortalities[3]	Total
1968	9,597	0	0	—	—	—	1,633	11,230
1969	5,175	18,693	0	—	—	—	2,420	26,288
1970	4,670	11,100	18,420	—	—	—	0	34,190
1971	2,885	11,913	6,415	—	—	—	—	21,213
1972	1,900	—	—	—	—	23,094	—	24,994
1973	1,153	—	—	—	—	15,323	—	16,476
1974	1,938	—	—	—	—	21,412	806	24,156
1975	762	—	—	—	—	27,106	1,360	29,228
1976	2,738	12,560	805	—	—	—	56	16,159
1977	—	—	—	—	—	—	—	11,136
1978	—	—	—	—	—	—	—	20,230
1979	—	—	—	—	—	—	—	22,925
1980	1,891	6,620	7,250	—	—	—	—	15,761
	—	—	—	—	—	—	—	(234,366)
1981	—	—	—	—	—	—	—	11,811
	—	—	—	—	—	—	—	(188,939)
1982	2,077	—	—	—	—	12,281	—	14,358
	—	—	—	—	—	—	—	(165,412)
1983	8,865	17,637	12,857	—	—	—	—	39,359
	—	—	—	—	—	—	—	(534,595)
1984	5,914	18,342	8,376	—	—	—	—	32,632
	—	—	—	—	—	—	—	(436,057)
1985	2,005	6,326	19,437	5,990	248	—	—	34,006
	—	—	—	—	—	—	—	(442,153)
1986	397	1,025	13,850	6,849	10	—	—	22,131
	—	—	—	—	—	—	—	(298,188)

[1]See footnote in Introduction about aging.

[2]Ages 0.2 through 0.5 combined.

[3]Mortalities are included under age group headings in some years.

Table 3. Numbers, and in parentheses percent, by age, of chinook and coho salmon in various year classes returning to the Little Manistee River weir 1 to 5 years after stocking.

Year class	Number stocked	Age 0.1	0.2	0.3	0.4	0.5	Total
Chinook[1]							
1967	590,830	11,230 (1.9)	20,588 (3.5)	18,420 (3.1)	— —	— —	50,238 (8.5)
1968	321,912	5,700 (1.8)	11,100 (3.4)	6,415 (2.0)	— —	— —	23,215 (7.2)
1981	500,204	2,077 (0.4)	17,637 (3.5)	8,376 (1.7)	5,990 (1.2)	10 (<0.0)	34,090 (6.8)
1982	600,294	8,865 (1.5)	18,342 (3.1)	19,437 (3.2)	6,849 (1.1)	— —	53,493 (8.9)

Year class	Number stocked	Age 1.0	1.1	Total
Coho				
1967	148,365	501 (0.3)	22,306 (15.0)	22,807 (15.4)
1968	700,002	2,880 (0.4)	105,006 (15.0)	107,886 (15.4)
1973	150,067	979 (0.7)	15,334 (10.2)	16,313 (10.9)
1974	200,601	492 (0.2)	23,525 (11.7)	24,017 (12.0)
1981	200,000	873 (0.4)	24,264 (12.1)	25,137 (12.6)
1982	429,612	2,704 (0.6)	33,764 (7.9)	36,468 (8.5)
1983	500,066	218 (<0.0)	15,177 (3.0)	15,395 (3.1)
1984	375,283	79 (<0.0)	16,599 (4.4)	16,678 (4.4)

[1]See footnote in Introduction about aging.

Table 4. Mean total length (L, in inches) and weight (W, in pounds), by age, of chinook salmon harvested at the Little Manistee weir, fall 1968–86. For chinook in 1972–75 and 1982, lengths and weights shown under age 0.2 are for ages 0.2 and older combined.

	Age									
	0.1		0.2		0.3		0.4		0.5	
Year	L	W	L	W	L	W	L	W	L	W
1968	25.2	5.8	—	—	—	—	—	—	—	—
1969	24.9	6.0	34.2	15.9	—	—	—	—	—	—
1970	24.7	6.3	34.7	16.6	39.8	23.0	—	—	—	—
1971	—	5.2	—	15.0	—	22.7	—	—	—	—
1972	22.6	4.3	35.6	17.7	—	—	—	—	—	—
1973	22.4	4.4	36.0	17.8	—	—	—	—	—	—
1974	22.5	4.4	34.9	16.7	—	—	—	—	—	—
1975	24.2	6.4	37.1	20.2	—	—	—	—	—	—
1976	29.0	9.5	37.5	20.9	41.7	29.2	—	—	—	—
1977	23.4	4.6	34.6	15.0	38.1	20.1	—	—	—	—
1978	25.0	5.8	30.3	10.1	35.0	15.5	—	—	—	—
1979	26.5	7.4	34.6	15.1	35.7	16.9	—	—	—	—
1980	22.2	4.5	34.3	15.4	36.4	19.3	—	—	—	—
1981	—	—	—	—	—	—	—	—	—	—
1982	20.2	3.0	35.3	14.5	—	—	—	—	—	—
1983	22.0	4.4	33.6	14.0	37.0	19.3	—	—	—	—
1984	24.3	5.2	34.3	13.4	38.3	18.9	—	—	—	—
1985	22.7	4.5	30.8	9.5	34.4	13.4	37.3	17.7	41.1	22.0
1986	21.0	4.2	28.3	7.6	33.6	12.7	36.9	17.1	42.0	25.5

[1] Ages of chinook prior to 1977 were determined from length-frequency distributions; in 1977–80 and 1983–86, from scale samples and length-frequency distributions. See footnote in Introduction regarding uncertainties of aging age-0.2 and older chinook.

Table 5. Number, by age, of coho salmon harvested at the Little Manistee River weir, fall 1968–86. Weight (pounds) is in parentheses.

Year	Age		Mortalities[1]	Total
	1.0	1.1		
1968	490	58,422	1,336	60,248
1969	2,831	21,925	430	25,186
1970	3,300	102,100	3,000	108,400
1971	—	—	—	59,123
1972	—	—	—	2,314
1973	—	—	—	11,872
1974	939	4,928	262	6,129
1975	470	14,633	760	15,863
1976	978	23,480	47	24,505
1977	—	—	—	25,255
1978	—	—	—	23,696
1979	—	—	—	27,925
1980	900	49,104	—	50,004
	—	—	—	(353,043)
1981	—	—	—	(96,733)
1982	873	17,585	—	18,458
	—	—	—	(110,745)
1983	2,704	24,264	—	26,968
	—	—	—	(175,157)
1984	218	33,764	—	33,982
	—	—	—	(192,071)
1985	79	15,177	—	15,256
	—	—	—	(96,798)
1986	125	16,599	—	16,724
	—	—	—	(92,165)

[1]Mortalities are included under age group headings in some years.

Table 6. Mean total length (L, in inches) and weight (W, in pounds), by age, of coho salmon harvested at the Little Manistee River weir, fall 1968–86.

	Age			
	1.0		1.1	
Year	L	W	L	W
1968	—	—	28.1	8.7
1969	—	—	—	8.9
1970	—	—	—	8.0
1971	—	—	—	8.7
1972	—	—	26.3	6.5
1973	—	—	24.5	5.8
1974	14.9	1.2	25.7	6.1
1975	15.0	1.4	26.6	7.3
1976	15.7	1.5	25.7	6.4
1977	14.3	1.2	25.5	5.5
1978	15.1	1.4	25.2	5.6
1979	15.2	1.6	23.5	4.9
1980[1]	16.3	1.7	26.9	6.9
1981	—	—	—	—
1982	15.7	1.6	25.6	6.1
1983	15.9	1.9	26.4	7.0
1984	16.2	1.8	24.7	5.7
1985	15.7	1.6	25.9	6.4
1986	16.3	1.4	25.3	5.5

[1]Ages of coho in 1980 were determined from a length-frequency distribution.

Table 7. Number and mean total length (L, in inches) and weight (W, in pounds) of steelhead (ages combined) collected at the Little Manistee River weir, fall 1968–86.

	Number				Mean	
Year	Passed	Transferred	Mortalities	Total	L	W
1968	1,297	0	25	1,322	25.1	7.3
1969	2,987	0	56	3,043	25.6	7.8
1970	7,322	0	89	7,411	—	8.7
1971	7,523	0	99	7,622	—	8.8
1972	3,515	0	46	3,561	27.4	9.3
1973	421	1,478[1]	27	1,926	24.3	6.5
1974	2,270	1,200[1]	18	3,488	26.4	7.3
1975	4,722	1,300[1]	99	6,121	26.7	8.0
1976	503	45	30	578	26.8	7.6
1977	2,031	—	—	2,031	26.7	6.8
1978	320	—	—	320	—	—
1979	640	—	—	640	25.6	6.7
1980	1,111	—	—	1,111	25.6	7.0
1981	849	—	—	849	—	—
1982	347	—	—	347	25.2	6.9
1983	3,100	—	—	3,100	24.3	6.8
1984	1,830	—	79	1,909	26.0	7.1
1985	6,187	—	169	6,356	27.1	7.4
1986	4,646	16[2]	58	4,720	26.0	7.3

[1]Transferred to Big Manistee and Pine rivers.

[2]Summer strain steelhead transferred to Wolf Lake Hatchery.

Table 8. Number and mean total length (L, in inches) and weight (W, in pounds) of brown trout (ages combined) collected at the Little Manistee River weir, fall 1968–86.

	Number			Mean	
Year	Passed	Mortalities	Total	Length	Weight
1968	28	—	28	—	—
1969	36	—	36	—	—
1970	123	—	123	—	5.6
1971	69	—	69	—	—
1972	5	—	5	—	—
1973	45	3	48	—	—
1974	159	2	161	19.4	3.4
1975	238	0	238	21.8	5.0
1976	104	2	106	22.9	5.8
1977	98	—	98	19.3	3.5
1978	51	—	51	—	—
1979	100	—	100	23.4	6.8
1980	28	—	28	18.6	3.4
1981	101	—	101	—	—
1982	62	—	62	21.4	4.9
1983	43	—	43	22.4	6.0
1984	134	7	141	22.4	5.3
1985	162	15	177	23.2	6.2
1986	89	10	99	22.4	5.6

Table 9. Summary of the number and weight, by age and sex, of chinook salmon harvested at Little Manistee River weir, fall 1986. Weight of stripped females was recalculated into round weight and, therefore, the total weight of chinook does not correspond with the weight shipped to Tempotech Industries.

Week beginning	Male		Female		Total	
	Number	Pounds	Number	Pounds	Number	Pounds
Age 0.1						
9/07	185	872	—	—	185	872
9/14	31	123	—	—	31	123
9/21	104	380	—	—	104	380
9/28	35	130	—	—	35	130
10/05	—	—	—	—	—	—
10/12	—	—	—	—	—	—
10/19	21	95	21	84	42	179
10/26	—	—	—	—	—	—
11/02	—	—	—	—	—	—
Total	376	1,600	21	84	397	1,684
(Percent)	(1.7)	(0.5)	(0.1)	(<0.0)	(1.8)	(0.6)
Age 0.2						
9/07	82	668	41	344	123	1,012
9/14	31	230	10	95	41	325
9/21	130	1,011	26	156	156	1,167
9/28	177	1,161	—	—	177	1,161
10/05	78	611	26	226	104	837
10/12	220	1,716	74	644	294	2,360
10/19	83	691	21	195	104	886
10/26	17	97	—	—	17	97
11/02	9	51	—	—	9	51
Total	827	6,236	198	1,660	1,025	7,896
(Percent)	(3.7)	(2.1)	(0.9)	(0.6)	(4.6)	(2.6)
Age 0.3						
9/07	411	5,121	884	11,467	1,295	16,588
9/14	261	3,304	396	5,233	657	8,537
9/21	518	5,905	1,218	15,748	1,736	21,653
9/28	994	12,602	1,278	17,253	2,272	29,855
10/05	752	8,855	778	9,769	1,530	18,624
10/12	2,129	25,122	2,203	27,758	4,332	52,880
10/19	647	7,501	751	9,986	1,398	17,487
10/26	185	2,139	218	2,723	403	4,862
11/02	104	1,206	123	1,538	227	2,744
Total	6,001	71,755	7,849	101,475	13,850	173,230
(Percent)	(27.1)	(24.1)	(35.5)	(34.0)	(62.6)	(58.1)

Table 9. Continued:

Week beginning	Male		Female		Total	
	Number	Pounds	Number	Pounds	Number	Pounds
Age 0.4						
9/07	226	4,015	226	3,754	452	7,769
9/14	156	2,711	146	2,239	302	4,950
9/21	155	2,818	440	8,003	595	10,821
9/28	745	12,949	319	5,707	1,064	18,656
10/05	570	9,146	389	6,597	959	15,743
10/12	1,615	25,840	1,101	18,717	2,716	44,557
10/19	146	2,380	396	6,747	542	9,127
10/26	101	1,626	39	611	140	2,237
11/02	57	918	22	345	79	1,263
Total	3,771	62,403	3,078	52,720	6,849	115,123
(Percent)	(17.0)	(20.9)	(13.9)	(17.7)	(30.9)	(38.6)
Age 0.5						
9/07	—	—	—	—	—	—
9/14	10	255	—	—	10	255
9/21	—	—	—	—	—	—
9/28	—	—	—	—	—	—
10/05	—	—	—	—	—	—
10/12	—	—	—	—	—	—
10/19	—	—	—	—	—	—
10/26	—	—	—	—	—	—
11/02	—	—	—	—	—	—
Total	10	255	—	—	10	255
(Percent)	(<0.0)	(0.1)	—	—	(<0.0)	(0.1)

Table 10. Length-age distribution (in percent of inch group) for chinook salmon scale sampled during creel census at Pentwater, Ludington, Manistee, Frankfort, Leland, Grand Traverse Bay, Manistee Lake, Big Manistee River, Betsie River, and Platte River, September-November 1986.[1]

Length (inches)	Age					
	0.0	0.1	0.2	0.3	0.4	0.5
14	100	—	—	—	—	—
15	—	—	—	—	—	—
16	—	—	—	—	—	—
17	—	—	—	—	—	—
18	—	100	—	—	—	—
19	—	100	—	—	—	—
20	—	100	—	—	—	—
21	—	100	—	—	—	—
22	—	100	—	—	—	—
23	—	100	—	—	—	—
24	—	60	40	—	—	—
25	—	33	67	—	—	—
26	—	—	100	—	—	—
27	—	—	100	—	—	—
28	—	—	100	—	—	—
29	—	—	100	—	—	—
30	—	—	89	11	—	—
31	—	—	46	54	—	—
32	—	—	40	60	—	—
33	—	—	10	90	—	—
34	—	—	4	82	14	—
35	—	—	—	81	19	—
36	—	—	—	63	37	—
37	—	—	—	40	60	—
38	—	—	—	17	83	—
39+	—	—	—	—	71	29

[1]Table developed by District 6 personnel at the Harrietta warehouse.

Table 11. Mean total length (inches) and weight (pounds), by age and sex, of chinook salmon harvested at the Little Manistee River weir, fall 1986. Two standard errors in parentheses.

Week beginning	Measurement	Age 0.1 Male	Age 0.1 Female	Age 0.2 Male	Age 0.2 Female	Age 0.3 Male	Age 0.3 Female
9/07	Length	21.1	—	29.4	28.9	33.5	33.5
		(0.773)	—	(0.465)	(0.600)	(0.882)	(0.396)
	Weight	4.7	—	8.1	8.4	12.5	13.0
		(0.493)	—	(0.777)	(2.200)	(0.800)	(0.526)
9/14	Length	21.6	—	27.2	31.9	33.7	33.5
		(0.467)	—	(3.180)	—	(1.005)	(0.503)
	Weight	4.0	—	7.4	9.5	12.7	13.2
		(0.968)	—	(2.439)	—	(0.932)	(0.603)
9/21	Length	20.5	—	28.9	28.7	32.9	33.5
		(1.005)	—	(0.841)	—	(0.904)	(0.426)
	Weight	3.7	—	7.8	6.0	11.4	12.9
		(0.252)	—	(1.011)	—	(0.908)	(0.685)
9/28	Length	21.0	—	26.3	—	34.2	33.7
		—	—	(1.743)	—	(0.664)	(0.289)
	Weight	3.7	—	6.6	—	12.7	13.5
		—	—	(1.007)	—	(0.718)	(0.518)
10/05	Length	—	—	28.3	30.0	34.1	33.7
		—	—	(0.333)	—	(0.831)	(0.463)
	Weight	—	—	7.8	8.7	11.8	12.6
		—	—	(0.851)	—	(0.723)	(0.660)
10/19	Length	23.7	19.4	29.1	30.4	33.2	33.3
		—	—	(0.287)	—	(0.816)	(0.621)
	Weight	4.5	4.0	8.3	9.3	11.6	13.3
		—	—	(0.263)	—	(0.692)	(0.606)

Table 11. Continued:

Week beginning	Measurement	Age 0.1 Male	Age 0.1 Female	Age 0.2 Male	Age 0.2 Female	Age 0.3 Male	Age 0.3 Female
10/26	Length	—	—	26.5	—	34.0	33.4
		—	—	(1.964)	—	(0.673)	(0.375)
	Weight	—	—	5.7	—	11.6	12.5
		—	—	(1.361)	—	(0.573)	(0.491)
Weighted seasonal mean	Length	21.1	19.4	28.0	29.6	33.7	33.6
		(0.543)	—	(0.570)	(0.585)	(0.322)	(0.170)
	Weight	4.3	4.0	7.5	8.2	12.1	13.1
		(0.303)	—	(0.415)	(2.146)	(0.308)	(0.244)
Sexes combined	Length	21.0		28.3		33.6	
		(0.683)		(0.507)		(0.165)	
	Weight	4.2		7.6		12.7	
		(0.273)		(0.386)		(0.197)	

Table 11. Continued:

Week beginning	Measure-ment	Age 0.4 Male	Age 0.4 Female	Age 0.5 Male	Age 0.5 Female
9/07	Length	37.3	35.9	—	—
		(0.882)	(0.562)	—	—
	Weight	17.8	16.6	—	—
		(1.390)	(1.266)	—	—
9/14	Length	37.4	35.6	42.0	—
		(0.670)	(0.408)	—	—
	Weight	17.4	15.3	25.5	—
		(1.103)	(0.697)	—	—
9/21	Length	38.1	36.7	—	—
		(0.876)	(0.612)	—	—
	Weight	18.2	18.2	—	—
		(2.967)	(1.129)	—	—
9/28	Length	37.5	36.5	—	—
		(0.590)	(0.607)	—	—
	Weight	17.4	17.9	—	—
		(0.767)	(1.275)	—	—
10/05	Length	37.5	36.7	—	—
		(0.501)	(0.692)	—	—
	Weight	16.0	17.0	—	—
		(0.851)	(1.203)	—	—
10/19	Length	37.7	36.1	—	—
		(1.003)	(0.405)	—	—
	Weight	16.3	17.0	—	—
		(0.807)	(0.769)	—	—

Table 11. Continued:

Week beginning	Measure-ment	Age			
		0.4		0.5	
		Male	Female	Male	Female
10/26	Length	37.1	35.8	—	—
		(0.647)	(0.438)	—	—
	Weight	16.1	15.7	—	—
		(1.105)	(0.733)	—	—
Weighted seasonal mean	Length	37.5	36.3	42.0	—
		(0.284)	(0.239)	—	—
	Weight	17.0	17.2	25.5	—
		(0.450)	(0.453)	—	—
Sexes combined	Length	36.9		42.0	
		(0.203)		—	
	Weight	17.1		25.5	
		(0.318)		—	

Table 12. Summary of the chinook egg-take operation at the Little Manistee River weir, fall 1986.. Eggs taken on September 23–24, 1986, were "eyed" at Wolf Lake Hatchery then transferred to Platte River Hatchery for rearing.

Date	Number of females stripped	Number of eggs collected	Percent eye-up	Destination
9/19	6	24,739	—	MSU*
9/23	242	997,800	73.0	Wolf Lake
9/24	240	1,222,920	73.0	Wolf Lake
9/26	290	1,471,000	18.5	Thompson
9/27	284	1,200,000	72.9	Platte River
9/29	252	1,104,232	67.3	Platte River
9/30	244	1,070,972	69.4	Platte River
9/30	6	26,335	—	MSU*
10/01	288	1,383,616	70.0	Platte River
10/02	282	1,233,946	71.4	Platte River
10/06	198	907,428	—	Indiana
10/07	234	1,094,254	—	Illinois
10/09	20	90,000	—	MSU*
10/09	138	621,000	—	Wolf Lake (MSU)*
10/13	278	1,263,880	—	South Dakota
10/14	18	90,000	—	MSU*
10/14	132	665,200	—	South Dakota
10/15	204	1,147,998	—	Wolf Lake
10/16	210	968,328	—	Wolf Lake (MSU)*
10/24	6	30,000	—	MSU*
Total	3,572	16,613,648	—	
In-state	2,730	12,682,886	—	
Out-of-state	842	3,930,762	—	

*MSU = Michigan State University.

Table 13. Percent lamprey scarring of anadromous salmonids captured at the Little Manistee River weir, fall 1968–86.

	Salmon		Trout	
Year	Chinook	Coho	Steelhead	Brown
1968	3.7	4.3	6.0	—
1969	4.7	2.5	0.9	—
1970	4.0	1.0	2.0	—
1971	2.8	1.5	0.0	—
1972	—	0.4	—	—
1973	0.7	0.0	0.0	—
1974	0.8	0.9	0.0	0.0
1975	1.0	0.4	0.3	0.0
1976	0.0	0.0	0.0	<0.1
1977	0.0	0.0	0.0	0.0
1978	—	—	—	—
1979	—	—	—	—
1980	0.3	0.2	0.0	0.0
1981	—	—	—	—
1982	0.0	0.0	0.0	0.0
1983	0.1	0.0	0.0	0.0
1984	0.1	0.1	0.0	0.0
1985	0.5	0.2	0.0	0.0
1986	1.4	0.1	0.2	0.0

Table 14. Summary of the number and weight, by age and sex, of coho salmon harvested at the Little Manistee River weir, fall 1986.

Week beginning	Male		Female		Total	
	Number	Pounds	Number	Pounds	Number	Pounds
Age 1.0						
9/07	81	117	—	—	81	117
9/14	14	15	—	—	14	15
9/21	—	—	—	—	—	—
9/28	26	39	—	—	26	39
10/05	4	6	—	—	4	6
10/12	—	—	—	—	—	—
10/19	—	—	—	—	—	—
10/26	—	—	—	—	—	—
11/02	—	—	—	—	—	—
Total	125	177	—	—	125	177
(Percent)	(0.7)	(0.02)	—	—	(0.7)	(0.2)
Age 1.1						
9/07	2,425	13,152	1,536	8,133	3,961	21,285
9/14	793	4,777	584	3,186	1,377	7,963
9/21	1,471	8,578	2,733	15,141	4,204	23,719
9/28	1,052	5,704	1,551	8,270	2,603	13,974
10/05	178	961	262	1,389	440	2,350
10/12	585	3,289	687	3,595	1,272	6,884
10/19	552	3,358	1,230	7,082	1,782	10,440
10/26	200	1,167	406	2,223	606	3,390
11/02	117	679	237	1,304	354	1,983
Total	7,373	41,665	9,226	50,323	16,599	91,988
(Percent)	(44.1)	(45.2)	(55.2)	(54.6)	(99.3)	(99.8)

Table 15. Mean total length (inches) and weight (pounds), by age and sex, of coho salmon harvested at the Little Manistee River weir, fall 1986. Two standard errors in parentheses.

Week beginning	Measurement	Age 1.0 Male	Age 1.0 Female	Age 1.1 Male	Age 1.1 Female
9/07	Length	15.9	—	25.4	25.0
		(0.600)	—	(0.438)	(0.578)
	Weight	1.5	—	5.4	5.3
		(0.100)	—	(0.327)	(0.372)
9/14	Length	14.4	—	26.1	25.1
		—	—	(0.462)	(0.497)
	Weight	1.1	—	6.0	5.5
		—	—	(0.368)	(0.357)
9/21	Length	—	—	25.7	24.8
		—	—	(0.455)	(0.331)
	Weight	—	—	5.8	5.5
		—	—	(0.352)	(0.228)
9/28	Length	18.5	—	25.8	25.0
		—	—	(0.426)	(0.371)
	Weight	1.5	—	5.4	5.3
		—	—	(0.285)	(0.252)
10/12	Length	—	—	26.0	24.9
		—	—	(0.481)	(0.453)
	Weight	—	—	5.6	5.2
		—	—	(0.376)	(0.314)
10/19	Length	—	—	26.2	25.0
		—	—	(0.539)	(0.365)
	Weight	—	—	6.1	5.8
		—	—	(0.390)	(0.244)
10/26	Length	—	—	26.3	25.4
		—	—	(0.662)	(0.319)
	Weight	—	—	5.8	5.5
		—	—	(0.436)	(0.252)
Weighted seasonal mean	Length	16.3	—	25.7	25.0
		(0.593)	—	(0.201)	(0.172)
	Weight	1.4	—	5.7	5.5
		(0.099)	—	(0.151)	(0.116)
Sexes combined	Length	16.3		25.3	
		(0.593)		(0.134)	
	Weight	1.4		5.5	
		(0.099)		(0.093)	

Table 16. Relationship between skin color and sex for coho salmon harvested at the Little Manistee River weir, fall 1986.

Week beginning	Percent			
	Silver		Dark	
	Male	Female	Male	Female
9/07	37	35	25	3
9/14	53	40	5	2
9/21	5	52	30	13
9/28	1	32	40	27
10/12	2	3	44	51
10/19	1	9	30	60
10/26	3	6	30	61

Table 17. Summary of the number and weight, by age and sex, of steelhead passed upstream at the Little Manistee River weir, fall 1986.

Week beginning	Male		Female		Total	
	Number	Pounds	Number	Pounds	Number	Pounds
Age 1.0						
9/07	1	1	—	—	1	1
9/14	—	—	—	—	—	—
9/21	7	14	36	67	43	81
9/28	8	14	67	122	75	136
10/05	3	6	26	59	29	65
10/12	48	115	95	181	143	296
10/19	—	—	106	233	106	233
10/26	12	12	12	26	24	38
11/02	—	—	—	—	—	—
Total	79	162	342	688	421	850
(Percent)	(1.7)	(0.5)	(7.3)	(2.0)	(8.9)	(2.5)
Age 2.0						
9/07	2	3	—	—	2	3
9/14	—	—	1	2	1	2
9/21	7	23	13	27	20	50
9/28	4	8	29	58	33	66
10/05	10	24	23	53	33	77
10/12	48	108	71	166	119	274
10/19	—	—	26	60	26	60
10/26	—	—	—	—	—	—
11/02	9	23	—	—	9	23
Total	80	189	163	366	243	555
(Percent)	(1.7)	(0.6)	(3.5)	(1.1)	(5.2)	(1.6)
Age 1.1						
9/07	2	10	3	12	5	22
9/14	1	3	1	7	2	10
9/21	16	87	10	40	26	127
9/28	21	102	33	174	54	276
10/05	7	45	20	110	27	155
10/12	24	127	48	290	72	417
10/19	53	228	53	323	106	551
10/26	—	—	36	235	36	235
11/02	9	45	9	45	18	90
Total	133	647	213	1,236	346	1,883
(Percent)	(2.8)	(1.9)	(4.5)	(3.6)	(7.3)	(5.5)

Table 17. Continued:

Week beginning	Male		Female		Total	
	Number	Pounds	Number	Pounds	Number	Pounds
Age 2.1						
9/07	3	15	—	—	3	15
9/14	—	—	—	—	—	—
9/21	3	14	13	82	16	96
9/28	8	41	63	352	71	393
10/05	13	68	29	185	42	253
10/12	119	697	71	419	190	1,116
10/19	79	461	79	474	158	935
10/26	24	145	83	587	107	732
11/02	9	62	36	182	45	244
Total	258	1,503	374	2,281	632	3,784
(Percent)	(5.5)	(4.4)	(7.9)	(6.6)	(13.4)	(11.0)
Age 3.1						
9/07	—	—	—	—	—	—
9/14	—	—	—	—	—	—
9/21	3	21	—	—	3	21
9/28	—	—	—	—	—	—
10/05	—	—	—	—	—	—
10/12	—	—	—	—	—	—
10/19	—	—	—	—	—	—
10/26	—	—	—	—	—	—
11/02	—	—	—	—	—	—
Total	3	21	—	—	3	21
(Percent)	(0.1)	(0.1)	—	—	(0.1)	(0.1)
Age 1.2						
9/07	27	201	7	54	34	255
9/14	8	60	10	76	18	136
9/21	39	303	94	723	133	1,026
9/28	38	338	63	500	101	838
10/05	36	313	49	398	85	711
10/12	48	331	309	2,524	357	2,855
10/19	185	1,599	158	1,309	343	2,908
10/26	71	607	95	809	166	1,416
11/02	—	—	45	335	45	335
Total	452	3,752	830	6,728	1,282	10,480
(Percent)	(9.6)	(10.9)	(17.6)	(19.6)	(27.2)	(30.5)

Table 17. Continued:

Week beginning	Male		Female		Total	
	Number	Pounds	Number	Pounds	Number	Pounds
Age 2.2						
9/07	12	98	2	15	14	113
9/14	1	8	2	13	3	21
9/21	39	343	20	170	59	513
9/28	25	213	17	141	42	354
10/05	16	151	46	364	62	515
10/12	24	149	48	403	72	552
10/19	132	1,338	106	877	238	2,215
10/26	107	873	36	294	143	1,167
11/02	27	211	90	689	117	900
Total	383	3,384	367	2,966	750	6,350
(Percent)	(8.1)	(9.9)	(7.8)	(8.6)	(15.9)	(18.5)
Age 1.3						
9/07	—	—	1	8	1	8
9/14	1	10	2	19	3	29
9/21	13	126	—	—	13	126
9/28	17	171	8	73	25	244
10/05	10	102	10	80	20	182
10/12	119	1,211	48	398	167	1,609
10/19	106	1,092	79	774	185	1,866
10/26	24	190	47	481	71	671
11/02	45	442	18	198	63	640
Total	335	3,344	213	2,031	548	5,375
(Percent)	(7.1)	(9.7)	(4.5)	(5.9)	(11.6)	(15.7)
Age 2.3						
9/07	2	21	—	—	2	21
9/14	—	—	—	—	—	—
9/21	7	72	13	121	20	193
9/28	17	169	—	—	17	169
10/05	7	72	16	144	23	216
10/12	71	705	—	—	71	705
10/19	132	1,296	26	343	158	1,639
10/26	24	268	12	134	36	402
11/02	45	454	63	601	108	1,055
Total	305	3,057	130	1,343	435	4,400
(Percent)	(6.5)	(8.9)	(2.8)	(3.9)	(9.2)	(12.8)

Table 17. Continued:

Week beginning	Male		Female		Total	
	Number	Pounds	Number	Pounds	Number	Pounds
Age 1.4						
9/07	—	—	—	—	—	—
9/14	—	—	—	—	—	—
9/21	—	—	—	—	—	—
9/28	—	—	—	—	—	—
10/05	—	—	—	—	—	—
10/12	—	—	—	—	—	—
10/19	—	—	—	—	—	—
10/26	12	109	—	—	12	109
11/02	—	—	9	88	9	88
Total	12	109	9	88	21	197
(Percent)	(0.3)	(0.3)	(0.2)	(0.3)	(0.4)	(0.6)
Age 2.4						
9/07	—	—	—	—	—	—
9/14	—	—	—	—	—	—
9/21	—	—	—	—	—	—
9/28	—	—	—	—	—	—
10/05	3	29	—	—	3	29
10/12	—	—	—	—	—	—
10/19	—	—	—	—	—	—
10/26	—	—	—	—	—	—
11/02	36	418	—	—	36	418
Total	39	447	—	—	39	447
(Percent)	(0.8)	(1.3)	—	—	(0.8)	(1.3)

Table 18. Mean total length (inches) and weight (pounds), by age and sex, of steelhead passed upstream at the Little Manistee River weir, fall 1986. Two standard errors in parentheses.

Week beginning	Measurement	Age 1.0 Male	Age 1.0 Female	Age 2.0 Male	Age 2.0 Female	Age 1.1 Male	Age 1.1 Female	Age 2.1 Male	Age 2.1 Female
9/07	Length	13.6	—	17.3	—	23.7	22.4	23.5	—
		—	—	(1.800)	—	(3.200)	(0.945)	(0.811)	—
	Weight	1.0	—	1.7	—	5.2	3.8	5.0	—
		—	—	(0.600)	—	(2.500)	(0.751)	(0.240)	—
9/14	Length	—	—	—	16.0	20.1	24.5	—	—
		—	—	—	—	—	—	—	—
	Weight	—	—	—	1.7	3.4	6.8	—	—
		—	—	—	—	—	—	—	—
9/21	Length	16.4	16.1	18.2	17.4	23.5	20.9	22.0	25.0
		(1.700)	(0.670)	(1.000)	(0.635)	(0.994)	(5.834)	—	(1.694)
	Weight	2.1	1.9	3.3	2.1	5.4	4.0	4.5	6.3
		(0.700)	(0.249)	(0.100)	(0.208)	(0.508)	(2.533)	—	(0.822)
9/28	Length	16.0	16.0	16.7	16.7	22.8	22.9	22.8	23.2
		(0.800)	(0.591)	—	(1.226)	(1.905)	(1.282)	(2.600)	(1.148)
	Weight	1.7	1.8	2.1	2.0	4.9	5.3	5.2	5.6
		(0.200)	(0.215)	—	(0.220)	(1.025)	(0.786)	(1.700)	(0.713)
10/05	Length	17.1	17.4	18.7	17.4	25.4	23.9	23.2	25.1
		—	(0.879)	(0.346)	(0.863)	(1.200)	(0.282)	(1.887)	(0.640)
	Weight	1.9	2.3	2.4	2.3	6.4	5.5	5.3	6.4
		—	(0.374)	(0.406)	(0.391)	(0.800)	(0.504)	(1.066)	(0.390)
10/12	Length	17.9	17.4	18.4	18.1	23.5	24.6	24.9	25.3
		(0.500)	(0.660)	(0.400)	(1.849)	—	(0.700)	(1.040)	(0.416)
	Weight	2.4	1.9	2.3	2.3	5.3	6.1	5.9	5.9
		(0.200)	(0.424)	(0.100)	(0.706)	—	(0.500)	(0.848)	(0.305)

Table 18. Continued:

Week beginning	Measurement	Age 1.0 Male	Age 1.0 Female	Age 2.0 Male	Age 2.0 Female	Age 1.1 Male	Age 1.1 Female	Age 2.1 Male	Age 2.1 Female
10/19	Length	—	16.7	—	15.1	21.5	24.3	24.0	24.4
		—	(0.690)	—	—	(7.000)	(0.500)	(2.099)	(0.867)
	Weight	—	2.2	—	2.3	4.3	6.1	5.8	6.0
		—	(0.503)	—	—	(2.600)	(0.600)	(1.444)	(0.643)
10/26	Length	15.3	17.7	—	—	—	25.7	25.0	26.3
		—	—	—	—	—	(1.249)	(0.600)	(0.662)
	Weight	1.0	2.2	—	—	—	6.5	6.1	7.1
		—	—	—	—	—	(0.940)	(0.500)	(0.525)
11/02	Length	—	—	18.0	—	23.1	22.4	25.7	24.0
		—	—	—	—	—	—	—	(2.073)
	Weight	—	—	2.6	—	5.0	5.0	6.9	5.1
		—	—	—	—	—	—	—	(1.509)
Weighted seasonal mean	Length	17.1	16.8	18.3	17.2	22.6	24.1	24.5	24.8
		(0.415)	(0.316)	(0.297)	(0.980)	(3.696)	(0.423)	(0.834)	(0.355)
	Weight	2.0	2.0	2.4	2.2	4.9	5.8	5.8	6.1
		(0.164)	(0.205)	(0.087)	(0.367)	(1.381)	(0.296)	(0.612)	(0.254)
Sexes combined	Length	16.8		17.5		23.5		24.7	
		(0.287)		(0.609)		(1.028)		(0.373)	
	Weight	2.0		2.3		5.4		6.0	
		(0.186)		(0.228)		(0.489)		(0.272)	

Table 18. Continued:

Week beginning	Measurement	Age 3.1 Male	3.1 Female	1.2 Male	1.2 Female	2.2 Male	2.2 Female	1.3 Male	1.3 Female
9/07	Length	—	—	27.8	28.2	28.4	27.6	—	29.0
		—	—	(0.485)	(0.820)	(0.750)	(0.700)	—	—
	Weight	—	—	7.5	7.7	8.2	7.4	—	8.0
		—	—	(0.362)	(0.939)	(0.546)	(1.100)	—	—
9/14	Length	—	—	27.9	27.3	29.3	27.2	30.4	29.7
		—	—	(1.219)	(0.578)	—	(1.400)	—	(0.199)
	Weight	—	—	7.5	7.6	7.9	6.6	9.7	9.5
		—	—	(1.105)	(0.470)	—	(0.100)	—	(1.200)
9/21	Length	25.6	—	27.2	27.3	28.7	28.3	29.8	—
		—	—	(1.076)	(0.392)	(1.079)	(0.499)	(0.574)	—
	Weight	7.1	—	7.8	7.7	8.8	8.5	9.7	—
		—	—	(0.816)	(0.262)	(1.029)	(0.369)	(1.087)	—
9/28	Length	—	—	28.4	27.6	28.2	27.4	30.6	29.5
		—	—	(0.889)	(0.386)	(0.826)	(1.021)	(0.947)	(0.800)
	Weight	—	—	8.9	7.9	8.5	8.3	10.1	9.1
		—	—	(0.681)	(0.202)	(0.790)	(0.698)	(1.069)	(0.700)
10/05	Length	—	—	28.5	27.6	29.1	27.8	30.5	28.3
		—	—	(0.787)	(0.619)	(1.765)	(0.692)	(2.467)	(0.577)
	Weight	—	—	8.7	8.1	9.4	7.9	10.2	8.0
		—	—	(0.820)	(0.663)	(1.699)	(0.572)	(3.688)	(0.874)
10/12	Length	—	—	26.0	27.9	27.3	15.8	30.2	28.1
		—	—	(1.300)	(0.715)	—	(25,900)	(1.459)	(1.800)
	Weight	—	—	6.9	8.2	6.2	8.4	10.2	8.3
		—	—	(0.800)	(0.554)	—	—	(1.644)	(0.200)

Table 18. Continued:

Week beginning	Measurement	Age 3.1 Male	3.1 Female	1.2 Male	1.2 Female	2.2 Male	2.2 Female	1.3 Male	1.3 Female
10/19	Length	—	—	28.0	27.2	29.7	27.5	30.3	29.4
		—	—	(1.135)	(1.229)	(1.623)	(1.266)	(1.313)	(1.387)
	Weight	—	—	8.6	8.3	10.1	8.3	10.3	9.8
		—	—	(1.026)	(1.203)	(1.136)	(1.164)	(0.648)	(0.702)
10/26	Length	—	—	28.9	28.3	28.3	28.1	28.0	30.1
		—	—	(0.418)	(0.582)	(1.465)	(2.117)	(1.400)	(0.250)
	Weight	—	—	8.6	8.5	8.2	8.2	7.9	10.2
		—	—	(0.338)	(0.620)	(1.164)	(1.683)	—	(0.695)
11/02	Length	—	—	—	27.4	27.3	27.1	30.4	29.6
		—	—	—	(1.645)	(1.405)	(0.642)	(1.167)	(1.300)
	Weight	—	—	—	7.4	7.8	7.7	9.8	11.0
		—	—	—	(1.052)	(1.419)	(0.741)	(1.051)	(1.000)
Weighted seasonal mean	Length	25.6	—	27.9	27.7	28.7	26.0	30.1	29.2
		—	—	(0.493)	(0.367)	(0.739)	(3.346)	(0.681)	(0.657)
	Weight	7.1	—	8.3	8.1	8.8	8.1	10.0	9.5
		—	—	(0.434)	(0.317)	(0.552)	(0.410)	(0.632)	(0.313)
Sexes combined	Length	25.6		27.8		27.4		29.8	
		—		(0.307)		(1.646)		(0.532)	
	Weight	(7.1)		(8.2)		8.5		9.8	
		—		(0.257)		(0.399)		(0.464)	

Table 18. Continued:

Week beginning	Measurement	Age 2.3 Male	Age 2.3 Female	Age 1.4 Male	Age 1.4 Female	Age 2.4 Male	Age 2.4 Female
9/07	Length	31.0	—	—	—	—	—
		(1.000)	—	—	—	—	—
	Weight	10.6	—	—	—	—	—
		(1.200)	—	—	—	—	—
9/14	Length	—	—	—	—	—	—
		—	—	—	—	—	—
	Weight	—	—	—	—	—	—
		—	—	—	—	—	—
9/21	Length	30.5	28.9	—	—	—	—
		(2.900)	(0.668)	—	—	—	—
	Weight	10.3	9.3	—	—	—	—
		(2.300)	(0.812)	—	—	—	—
9/28	Length	30.3	—	—	—	—	—
		(0.699)	—	—	—	—	—
	Weight	9.9	—	—	—	—	—
		(0.493)	—	—	—	—	—
10/05	Length	30.5	29.2	—	—	30.2	—
		(3.600)	(0.869)	—	—	—	—
	Weight	10.3	9.0	—	—	9.5	—
		(2.500)	(0.456)	—	—	—	—
10/12	Length	30.2	—	—	—	—	—
		(2.041)	—	—	—	—	—
	Weight	9.9	—	—	—	—	—
		(1.073)	—	—	—	—	—

Table 18. Continued:

Week beginning	Measurement	Age 2.3 Male	Age 2.3 Female	Age 1.4 Male	Age 1.4 Female	Age 2.4 Male	Age 2.4 Female
10/19	Length	29.5	30.0	—	—	—	—
		(1.810)	—	—	—	—	—
	Weight	9.8	13.2	—	—	—	—
		(1.763)	—	—	—	—	—
10/26	Length	31.9	31.8	29.7	—	—	—
		(0.300)	—	—	—	—	—
	Weight	11.1	11.2	9.1	—	—	—
		(0.500)	—	—	—	—	—
11/02	Length	30.5	29.3	—	29.6	32.0	—
		(1.150)	(0.733)	—	—	(2.391)	—
	Weight	10.1	9.5	—	9.8	11.6	—
		(0.649)	(0.938)	—	—	(2.758)	—
Weighted seasonal mean	Length	30.1	29.6	29.7	29.6	31.8	—
		(0.917)	(0.496)	—	—	(2.254)	—
	Weight	10.0	10.3	9.1	9.8	11.4	—
		(0.797)	(0.617)	—	—	(2.600)	—
Sexes combined	Length		30.0		29.7		31.8
			(0.647)		—		(2.254)
	Weight		10.1		9.4		11.4
			(0.691)		—		(2.600)

Table 19. Summary of the number and weight, by age and sex, of brown trout passed upstream at the Little Manistee River weir, fall 1986.

Week beginning	Male		Female		Total	
	Number	Pounds	Number	Pounds	Number	Pounds
Age 4.0						
9/07	—	—	—	—	—	—
9/14	—	—	—	—	—	—
9/21	—	—	—	—	—	—
9/28	—	—	—	—	—	—
10/05	—	—	—	—	—	—
10/12	1	1	—	—	1	1
10/19	—	—	—	—	—	—
10/26	—	—	—	—	—	—
11/02	—	—	—	—	—	—
Total	1	1	—	—	1	1
(Percent)	(1.0)	(0.2)	—	—	(1.0)	(0.2)
Age 1.1						
9/07	—	—	3	15	3	15
9/14	2	12	1	6	3	18
9/21	4	23	7	39	11	62
9/28	2	10	12	58	14	68
10/05	—	—	3	15	3	15
10/12	1	5	8	36	9	41
10/19	—	—	8	45	8	45
10/26	—	—	6	30	6	30
11/02	—	—	3	15	3	15
Total	9	50	51	259	60	309
(Percent)	(8.9)	(9.0)	(50.5)	(46.8)	(59.4)	(55.8)
Age 2.1						
9/07	2	10	1	5	3	15
9/14	—	—	—	—	—	—
9/21	1	6	1	5	2	11
9/28	—	—	—	—	—	—
10/05	—	—	—	—	—	—
10/12	—	—	2	9	2	9
10/19	—	—	—	—	—	—
10/26	—	—	—	—	—	—
11/02	—	—	—	—	—	—
Total	3	16	4	19	7	35
(Percent)	(3.0)	(2.9)	(4.0)	(3.4)	(6.9)	(6.3)

Table 19. Continued:

Week beginning	Male		Female		Total	
	Number	Pounds	Number	Pounds	Number	Pounds
Age 1.2						
9/07	2	9	3	18	5	27
9/14	1	7	—	—	1	7
9/21	6	40	1	7	7	47
9/28	2	16	2	16	4	32
10/05	—	—	—	—	—	—
10/12	3	22	5	26	8	48
10/19	—	—	—	—	—	—
10/26	—	—	—	—	—	—
11/02	—	—	—	—	—	—
Total	14	94	11	67	25	161
(Percent)	(13.9)	(17.0)	(10.9)	(12.1)	(24.8)	(29.1)
Age 2.2						
9/07	—	—	1	7	1	7
9/14	—	—	—	—	—	—
9/21	—	—	—	—	—	—
9/28	—	—	1	8	1	8
10/05	—	—	—	—	—	—
10/12	—	—	—	—	—	—
10/19	—	—	—	—	—	—
10/26	—	—	—	—	—	—
11/02	—	—	—	—	—	—
Total	—	—	2	15	2	15
(Percent)	—	—	(2.0)	(2.7)	(2.0)	(2.7)
Age 1.3						
9/07	1	3	—	—	1	3
9/14	—	—	—	—	—	—
9/21	—	—	—	—	—	—
9/28	—	—	1	10	1	10
10/05	—	—	—	—	—	—
10/12	—	—	2	20	2	20
10/19	—	—	—	—	—	—
10/26	—	—	—	—	—	—
11/02	—	—	—	—	—	—
Total	1	3	3	30	4	33
(Percent)	(1.0)	(0.5)	(3.0)	(5.4)	(4.0)	(6.0)

Table 20. Mean total length (inches) and weight (pounds), by age and sex, of brown trout passed upstream at the Little Manistee River weir, fall 1986. Two standard errors in parentheses.

Week beginning	Measurement	Age 4.0 Male	Age 4.0 Female	Age 1.1 Male	Age 1.1 Female	Age 2.1 Male	Age 2.1 Female
9/07	Length	—	—	—	21.7	22.5	21.8
		—	—	—	(1.568)	(0.900)	—
	Weight	—	—	—	5.1	5.2	4.9
		—	—	—	(0.462)	(0.300)	—
9/14	Length	—	—	23.4	24.2	—	—
		—	—	(0.700)	—	—	—
	Weight	—	—	6.2	6.1	—	—
		—	—	(1.300)	—	—	—
9/21	Length	—	—	22.4	21.9	23.0	21.7
		—	—	(0.467)	(0.906)	—	—
	Weight	—	—	5.6	5.5	5.9	4.8
		—	—	(0.481)	(0.907)	—	—
9/28	Length	—	—	20.9	21.4	—	—
		—	—	(1.300)	(0.916)	—	—
	Weight	—	—	4.8	4.8	—	—
		—	—	(0.900)	(0.491)	—	—
10/05	Length	—	—	—	21.5	—	—
		—	—	—	—	—	—
	Weight	—	—	—	5.1	—	—
		—	—	—	—	—	—
10/12	Length	15.5	—	22.0	21.3	—	21.3
		—	—	—	(0.648)	—	(2.100)
	Weight	1.2	—	4.9	4.5	—	4.3
		—	—	—	(0.634)	—	(0.500)

Table 20. Continued:

Week beginning	Measure-ment	Age 4.0 Male	Age 4.0 Female	Age 1.1 Male	Age 1.1 Female	Age 2.1 Male	Age 2.1 Female
10/19	Length	—	—	—	22.2	—	—
		—	—	—	(0.769)	—	—
	Weight	—	—	—	5.6	—	—
		—	—	—	(0.510)	—	—
10/26	Length	—	—	—	21.6	—	—
		—	—	—	(1.450)	—	—
	Weight	—	—	—	5.1	—	—
		—	—	—	(1.101)	—	—
11/02	Length	—	—	—	22.1	—	—
		—	—	—	(0.467)	—	—
	Weight	—	—	—	4.9	—	—
		—	—	—	(0.200)	—	—
Weighted seasonal mean	Length	15.5	—	22.2	21.7	22.7	21.5
		—	—	(0.117)	(0.093)	—	—
	Weight	1.2	—	5.5	5.1	5.4	4.6
		—	—	(0.120)	(0.073)	—	—
Sexes combined	Length	15.5		21.8		22.0	
		—		(0.079)		—	
	Weight	1.2		5.1		4.9	
		—		(0.064)		—	

Table 20. Continued:

Week beginning	Measure-ment	Age 1.2 Male	Age 1.2 Female	Age 2.2 Male	Age 2.2 Female	Age 1.3 Male	Age 1.3 Female
9/07	Length	22.3	22.6	—	24.2	20.2	—
		(4.200)	(2.800)	—	—	—	—
	Weight	4.7	6.0	—	7.4	3.4	—
		(2.000)	(1.834)	—	—	—	—
9/14	Length	24.4	—	—	—	—	—
		—	—	—	—	—	—
	Weight	6.5	—	—	—	—	—
		—	—	—	—	—	—
9/21	Length	23.7	24.2	—	—	—	—
		(1.299)	—	—	—	—	—
	Weight	6.7	7.4	—	—	—	—
		(0.919)	—	—	—	—	—
9/28	Length	25.3	25.6	—	25.3	—	27.0
		(5.100)	(3.300)	—	—	—	—
	Weight	7.8	7.8	—	7.6	—	9.5
		(2.100)	(1.700)	—	—	—	—
10/05	Length	—	—	—	—	—	—
		—	—	—	—	—	—
	Weight	—	—	—	—	—	—
		—	—	—	—	—	—
10/12	Length	25.0	21.7	—	—	—	26.3
		(2.228)	(2.065)	—	—	—	(3.600)
	Weight	7.4	5.2	—	—	—	9.8
		(1.988)	(2.273)	—	—	—	(2.900)

Table 20. Continued:

Week beginning	Measurement	Age 1.2 Male	Age 1.2 Female	Age 2.2 Male	Age 2.2 Female	Age 1.3 Male	Age 1.3 Female
10/19	Length	—	—	—	—	—	—
		—	—	—	—	—	—
	Weight	—	—	—	—	—	—
		—	—	—	—	—	—
10/26	Length	—	—	—	—	—	—
		—	—	—	—	—	—
	Weight	—	—	—	—	—	—
		—	—	—	—	—	—
11/02	Length	—	—	—	—	—	—
		—	—	—	—	—	—
	Weight	—	—	—	—	—	—
		—	—	—	—	—	—
Weighted seasonal mean	Length	24.1 (0.245)	22.9 (0.462)	—	24.8 —	20.2 —	26.5 —
	Weighted	6.7 (0.173)	6.1 (0.508)	—	7.5 —	3.4 —	9.7 —
Sexes combined	Length	23.6 (0.256)		24.8 —		25.0 —	
	Weight	6.5 (0.217)		7.5 —		8.1 —	

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