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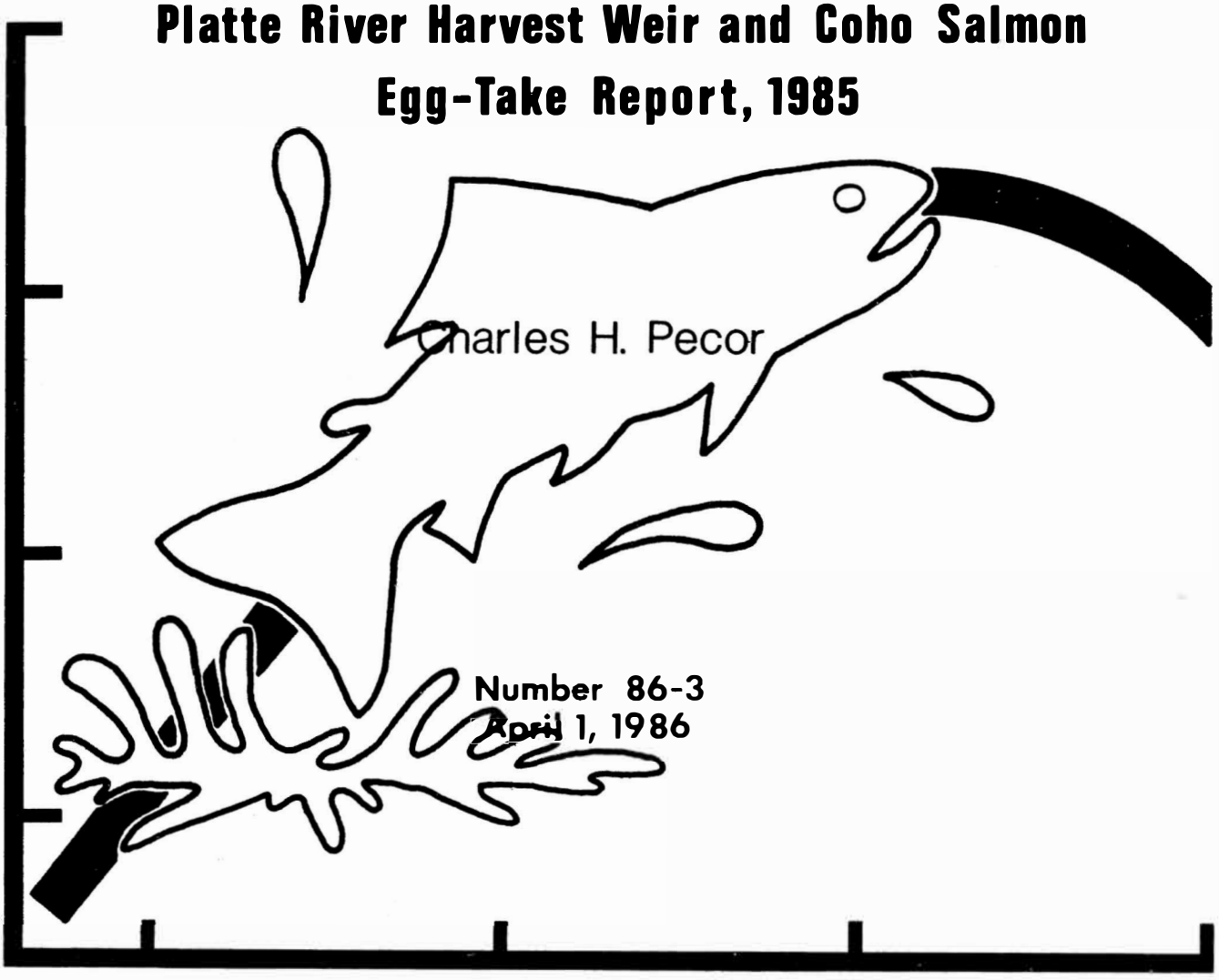
FISHERIES DIVISION

TECHNICAL REPORT

Platte River Harvest Weir and Coho Salmon Egg-Take Report, 1985



Charles H. Pecor

Number 86-3
April 1, 1986

Michigan Department of
Natural Resources

MICHIGAN DEPARTMENT OF NATURAL RESOURCES
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PLATTE RIVER HARVEST WEIR AND COHO SALMON EGG-TAKE REPORT, 1985

Charles H. Pecor

INTRODUCTION

Since 1966 the Platte River, Benzie County, has been the primary source of brood fish for Michigan's coho salmon stocking program. Eggs are collected each fall at the Platte River State Fish Hatchery, located 4.0 miles east of Honor (Fig. 1). The young coho are raised to the smolt stage (about 5.5 inches long) in 1.5 years and stocked at selected sites throughout Michigan.

Prior to 1979, between 265,000 and 1,092,000 (average 607,000) coho smolts were stocked in the Plate River (Table 1). This produced sufficient adults for egg-take operations plus a spectacular Lake Michigan sport fishery from Frankfort to Platte Bay in August and September. Since 1979 the annual plant has approximated 1,000,000 smolts. Annual returns to the weirs from the larger plants, prior to 1985, have ranged from 123,000 to 168,000 adults, or 12% to 16.4%.

The Platte River has two salmon blocking weirs. The lower weir is located 1.6 miles upstream from the river mouth (Fig. 1). Since 1980 it has been the primary site for harvesting surplus salmon. Steelhead runs are monitored there also. The upper weir, located at the Platte River Hatchery, has facilities for holding adults and collecting eggs.

Current in-state and out-of-state commitments require the collection of 14 to 16 million coho eggs annually. Depending on the size of the returning coho, the egg-take requires about 6,000–7,500 adult females (age 1.1).[1] To assure that enough females are available for egg-take, the Fisheries Division has directed that the first 30,000 salmon reaching the lower weir be passed upstream (allowed to swim through the open weir). An additional 3,000 salmon are passed each week to maintain a sport fishery in the river. However, the above numbers may be modified by the biologist-in-charge as conditions dictate.

Other salmon blocked by the lower weir (including surplus coho adults; a moderate run of chinook; and, in recent years, a few pink salmon) are collected and harvested. Coho jacks (age 1.0) are small enough to swim upstream through the weir grates. Trout that are collected during harvest operations are counted and released upstream. This includes a moderate run of steelhead plus small runs of brown trout and lake trout. All salmon collected at the upper weir are harvested, including the coho used for egg-take.

The 1985 salmon run in the lower Platte River was about 50% smaller than expected. Consequently, the open-water fishery in the Frankfort-Platte Bay area was not as good as in recent years. The fish were in the area for about 3 weeks but limit catches were the exception rather than the rule. The salmon entered the river when expected but the run decreased rapidly

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[1]An age of 1.1 for an anadromous fish means that one winter was spent in the river prior to smolting and one winter was spent in Lake Michigan after smolting.

after the first large group moved upriver. Salmon that were passed at the lower weir moved slowly up to the hatchery and provided a good river fishery.

LOWER WEIR OPERATION, 1985

The lower harvest weir was in place and ready for operation on September 10. The weir was manned 24 hours per day from September 10 to October 21. Very few salmon appeared at the weir until September 21 when the major run occurred. Harvesting began September 21 and ended October 21. The harvests (3) between October 6 and 21 were primarily to obtain biological samples and remove chinook salmon. During the 11 days salmon were actually harvested, 13 semi-trailer loads of salmon were shipped to Tempotech Industries in Hart, Michigan. Nearly twice as many (23) loads were shipped last year.

From September 11 to October 21, a total of 32,938 salmonids (salmon plus trout) were allowed to pass through the open weir (Table 2). This is a reduction of about 15% compared to the last few years. The species composition of these fish is assumed to be the same as that of fish actually handled during each week of harvesting. Additional trout were sorted out during harvesting and transferred upstream from the weir.

Coho salmon

The harvest of coho salmon began on September 21 and ended October 21, a period of 31 days. However, 87% of the coho were harvested during the 6-day period between September 21 and September 26 (Fig. 2). A total of 49,618 adult coho weighing 301,180 pounds were harvested (Table 3). Mean weight of the harvested coho was 6.1 pounds (Table 4). An estimated 30,736 additional coho were passed upstream for egg-take operations at the upper weir (Tables 2 and 4).

The total run of 80,354 adult coho in the lower Platte represented a return of only 8.1% of the 1984 smolt plant and was about one-half the number expected to return (Table 5). Returns during the previous 5 years ranged between 12.7% and 16.3% of the smolt plants. Adult coho returns at the Little Manistee River weir were also about half of the expected amount (R. Hay, personal communication).

The cause of the lower returns is not known. One hypothesis is that fishing pressure reduced the coho stocks in Lake Michigan; however, fishing reputedly was below par in spring, summer, and fall of 1985. It appears that Lake Michigan coho stocks had been reduced prior to the spring of 1985. A second hypothesis is that a low forage base reduced the survival of coho smolts; however, low forage base should also have been reflected in reduced coho growth but, in fact, 1985 adults were larger than 1984 adults. A third hypothesis is that the smolts did not survive after planting because of a problem in the hatchery during rearing; however, a

check of Platte River Hatchery rearing records showed that the smolts were healthy at plant-out and that no unusual problems were encountered during the rearing cycle. A fourth hypothesis is that the phenomenal and unprecedented brown trout fishery in the near-shore waters of Lake Michigan from Ludington north to Platte Bay during the spring and summer of 1984, when the smolts for the 1985 run were planted, may have reduced smolt numbers through predation. There were numerous unconfirmed reports of brown trout feeding heavily on coho smolts. None of these hypotheses can be substantiated at the present time. Data from the 1986 run may give us some additional clues as to the cause of the low return in 1985.

Virtually all of the harvested coho were age 1.1. The average lengths and weights for age-1.1 males and females calculated from weekly biological samples are shown in Table 4. Males averaged 26.2 inches and 6.13 pounds and females averaged 25.4 inches and 6.03 pounds.

During the harvest operation, 41 age-1.0 and 1 age-1.2 coho were harvested. Of the age-1.0 fish, 40 were males (jacks) and 1 was a female (jenny). They had an average length of 15.9 inches and an average weight of 1.63 pounds. The age-1.2 coho (4 years old) was 33.5 inches long and weighed 12.9 pounds.

No grading of coho for skin or flesh color was done.

During the four weekly biological surveys, a total of 588 adult coho were randomly sampled. One fish had a healed lamprey wound and 14 had fin clips. The fin clips were adipose (AD, 11 fish), left pectoral (LP, 2 fish), and left ventral (LV, 1 fish). The AD clip was given to smolts reared at the Platte River Hatchery and planted in Lake Superior. This clip is discussed further in the Upper Weir Operation section. The LP clipped adults could have come from plants made by Illinois in waters of Lake Michigan or plants made by Ohio in waters of Lake Erie. The LV clipped adult could also have come from Ohio waters of Lake Erie.

In summary, a total of 80,354 adult coho salmon reached the lower Platte River weir during the fall of 1985—33,495 (41.7%) males and 46,859 (58.3%) females (Table 4). The total adult run was 8.1% of the 1984 plant of 989,192 age-1.0 smolts (Table 5), about one-half the expected rate of return.

Chinook salmon

Contrary to previous years when the major chinook harvest occurred after the peak coho harvest, chinook were harvested in significant numbers throughout the harvest period in 1985 (Table 6). In the past coho would stack-up below the weir and chinook would back down the river until coho numbers were reduced. This year coho were harvested or passed upstream as soon as they arrived so they did not stack-up below the weir and chinook stayed at the weir. A total of 3,093 chinook, 2,820 adults (age 0.2 to age 0.5) and 273 jacks (age 0.1), weighing 40,527 pounds were harvested (Table 6). The average weights of the adults and jacks were 13.9

and 4.38 pounds, respectively. The average adult was 0.9 pound lighter than in 1984 (14.8 pounds). It was estimated that an additional 1,772 chinook were passed upstream at the lower weir (Table 2).

Biological data were collected from 489 adult chinook randomly sampled during the harvest operation. In addition, biological data were collected on 190 of the 273 jack chinook sorted out of the harvest. Chinook salmon length frequencies were converted to age frequencies by means of a length-age frequency table (Appendix 1) constructed by District 6 personnel at the Harrietta warehouse. They used scale samples and length measurements obtained during creel census at Traverse City, Frankfort, Manistee, and Ludington (September-November 1985) and the Big Manistee River (August-November 1985) to develop this table. The district personnel felt that aging chinook from scales collected at the harvest weirs (as was done in other years) was inaccurate because of the inconsistent reabsorption of the scales during the spawning runs. Thus, they developed the length-age frequency table for aging weir-caught chinook in 1985. In applying this table to those length groups in which two or more age groups are represented, I arbitrarily assigned the lighter fish to the younger age group and the heavier fish to the older age group. The resulting estimate of age composition of 1985 chinook harvest was 8.8% age 0.1, 17.0% age 0.2, 52.3% age 0.3, 20.3% age 0.4, and 1.6% age 0.5 (Table 7). Average lengths and weights for each age group are presented in Table 7. Comparison with 1984 age and growth data is inappropriate because of the questionable accuracy of the 1984 data.

One chinook with a fresh lamprey wound and three with healed lamprey wounds were recorded during the biological samples. No fin-clipped chinook were observed in the biological samples or harvest.

The total run of 4,865 chinook at the lower weir in 1985 was slightly above the 1979–84 average of 4,623 (Table 8). However, the average weight of chinooks in 1985 was the lowest recorded. Adult males and females comprised 45.4% and 54.1% of the run, respectively. All chinook were either strays from other plants, escapees from the Platte River Hatchery, or the result of natural reproduction since chinook are not planted in the Platte River.

Pink salmon

Pink salmon showed up at the lower weir during 1985, as expected, since they normally run in odd-numbered years. The magnitude of the pink salmon run in the Platte River is difficult to assess because most run before the weir is in place and are small enough to swim through the weir grates. Overall, 46 pink salmon were passed through the weir and 7 were harvested. Of the harvested fish, 3 were males and 4 were females averaging 19.3 inches in length and 2.3 pounds in weight.

Steelhead trout

The steelhead run peaked with the coho run during the week of September 21 (Tables 2 and 9). This is a change from previous years when the peak steelhead run occurred well after the peak coho run. This again, as with the chinook, may have been due to the relatively small run of coho and the reduced buildup of coho below the weir. The steelhead probably maintained their position at the weir instead of being driven back down the river by large numbers of coho as in past years.

Many steelhead run the river after the weir grates are removed; therefore, the weir counts are only a rough index of the magnitude of the steelhead run. Steelhead actually counted and transferred above the weir in 1985 totaled 796 (Table 9). This was the lowest number handled since 1980 and 1981 when 124 and 682, respectively, were handled. During 1982, 1983, and 1984, the numbers of fish handled were 1,276, 1,545, and 1,292, respectively. In addition to the 796 steelhead handled, an estimated 393 steelhead passed through the weir with the coho salmon. Thus, the total run of steelhead during the period of weir operation was 1,189 (Table 9).

Biological information including scale samples, was collected from 243 steelhead. The scales were aged by District 6 personnel at the Harrietta warehouse. A total of nine age groups were recorded (Table 10). The most common age groups were 2.2 (42.8%) and 2.1 (25.1%). Other common age groups were 1.0 (7.4%), 2.0 (7.8%), and 1.2 (10.7%). Age group 1.1, which last year was the second most common age group (16.7%), accounted for only 2.9% of the run this year. The low return of age-1.1 steelhead may be related to the low return of age-1.1 coho. However, age-2.1 steelhead, which smolted the same year (1984), were relatively frequent in the run (25.1%).

Most (76.9%) steelhead had spent two summers (age 2._) in the river prior to smolting, some (21.0%) had smolted after one summer (age 1._), and few (2.0%) had smolted after three summers (age 3._). Last year (1984) steelhead in age groups 1._ and 2._ accounted for 45% and 54% of the run, respectively.

The size of the returning steelhead was more dependent upon the years spent in Lake Michigan then on age at smolting or years in the river, as was true in other years (Table 11). Steelhead which had spent three summers (two winters) in Lake Michigan represented the largest age group to return during 1985. This age group (_.2) accounted for 55.1% of the run and had a mean length and weight of 28.3 inches and 8.63 pounds, respectively (Table 11).

Overall, the steelhead in 1985 had a mean length of 25.2 inches and a mean weight of 6.71 pounds, and consisted of 51.9% males and 48.1% females. No lamprey scars or fin clips were observed on any steelhead.

Brown trout and lake trout

Brown trout and lake trout are only minor components of the salmonid run in the Platte River (Table 9). A total of 79 brown trout were counted and transferred upstream in 1985, as compared to 74 in 1984, 58 in 1983, 38 in 1982, 78 in 1981, and 7 in 1980. A total of 20 lake trout were counted and transferred upstream in 1985, as compared to 69 in 1984, 7 in 1983 and 38 in 1982. Lake trout were not observed in the runs during 1980 and 1981. During 1985, it was estimated that an additional 35 brown trout and 6 lake trout were passed upstream with the coho salmon. This gives total runs in 1985 of 114 brown trout and 26 lake trout. This was the largest return of brown trout recorded at the lower weir. For both species, the peak runs occurred after October 1.

Biological information was obtained from 7 brown trout which died after being passed upstream. Only two age groups were identified, 2.1 (6 fish) and 3.1 (1 fish). Lengths ranged from 21.3 to 25.0 inches (average 23.1) and weights ranged from 4.4 to 7.5 pounds (average 6.2). The sex ratio was 29% male to 71% female.

Fifteen of the lake trout were checked for fin clips and all but one had a fin clip. Observed fin clips were both ventrals (BV, 7 fish), left ventral (LV, 4 fish), and right ventral (RV, 3 fish). The BV clip was assigned to lake trout planted offshore in 1980 at either Good Harbor Bay Reef (located about 18.6 miles north of Platte River) or South Fox Island Shoal (located about 43.5 miles north of Platte River). Lake trout with the BV clip accounted for 55% of the run in 1984 and 47% in 1985. The other two fin clips recorded, LV and RV, had not been seen at the weir before. These clips were assigned to year classes rather than locations but it is assumed that they were from plants made at Frankfort, about 6 miles south of Platte River. The RV clip was assigned to fish planted in 1977 and 1982, but since the fish were relatively small they probably came from the 1982 plant. The LV clip was assigned to fish planted in 1979. No biological data were collected for lake trout other than fin clip.

UPPER WEIR OPERATION, 1985

The operation at the upper Platte River weir is primarily for egg-taking and does not have the capability of harvesting large numbers of salmon efficiently. The facility consists of a weir, fish passage way, fish ladder, maturation ponds, and egg-take building. The weir blocks the upstream migration of salmonids and directs them up the fish ladder into the maturation ponds. Two to three thousand fish can be held in each of the six maturation ponds. The salmon are held in these ponds for up to 3 weeks while the eggs mature or "ripen", then the eggs are stripped and fertilized.

The weir stop-logs were in place by September 6 and the fish holding; egg-taking facility was fully operational by September 10.

Coho salmon

The first coho salmon (a few adults and some jacks) reached the maturation ponds the day after the weir logs were installed (as usual). Larger numbers of coho started showing up at the weir by September 16. No main run of coho occurred, instead, the salmon held back in the river system and slowly migrated into the maturation ponds. All six maturation ponds were full by October 9 and additional fish were held in the river below the weir.

The fish in the maturation ponds were checked weekly for egg condition (green or ripe) starting October 4 and ending October 30. Egg-taking operations started when the proportion of ripe females was 50% or above. The percentage of ripe females on October 4, 9, 14, 22, and 30 were 43, 79, 77, 100, and 99%, respectively. A total of 14,042,500 eggs were collected and fertilized on 10 working days between October 10 and October 23. Of these eggs 6,470,100 (46.1%) were for in-state rearing and 7,572,400 (53.9%) were for out-of-state commitments (i.e., Indiana, 0.5 million; Wisconsin, 1.5 million; Illinois, 1.5 million; Pennsylvania, 3.4 million; and Ohio, 0.6 million).

The 1985 egg take was carried out as a routine operation. Two slight modifications included using two cutters for taking the eggs instead of one and putting the eggs in the incubators for water-hardening instead of water-hardening them in milk cans in the spawn building. Egg quality was very good throughout the egg-take operations. Water temperatures at the lower weir were below 16°C (61°F) during the major run into the lower river and below 14°C (57°C) at the hatchery during the maturation period.

The eye-up rate of coho salmon eggs incubated at the Platte River Hatchery also reflected the good quality of the 1985 eggs. The average eye-up rate for the three egg-take days was 77.3% with a daily range from 74.0% to 81.1%. Coho eye-up rates during the previous 6 years ranged from 50.4% (1984) to 82.2% (1980) and averaged 66.7%.

A total of 5,916 female coho salmon were stripped to collect the 14 million eggs (Table 12), an average of 2,374 eggs per female. A check of the fecundity of 25 individual females at the end of the run showed an average of 2,850 eggs per female with a range of 1,726 to 3,639. The difference between 2,374 and 2,850 represents the eggs that were retained by stripped females during the egg-take operation. The average fecundities of the 25 individual fish sampled during 1983 and 1984 were 3,204 and 2,290 eggs per female, respectively.

The egg-take and harvest operation at the upper weir accounted for 24,914 coho, including 1,392 (5.6%) jacks and 23,522 (94.4%) adults (Table 12). The number of adults harvested at the upper weir was 76.5% of the estimated total number of adults passed at the lower weir. In other words, 7,214 (23.5%) adult coho salmon did not swim from the lower to the upper weir. I suspect that a major portion of this loss can be attributed to fishing mortality. During 1983 and 1984, 8,732 (24.5%) and 12,075 (33%), respectively, did not swim to the upper weir.

The adult run at the upper weir consisted of 47.8% male and 52.2% female, based on biological samples. Males averaged 26.3 inches in length and 6.16 pounds in weight, and females averaged 25.6 inches in length and 6.15 pounds in weight. Overall the adult coho averaged 25.9 inches and 6.16 pounds—almost identical in size to the coho harvested at the lower weir. Eighty percent (80%) of the adult coho handled at the upper weir were used in the egg-take and about 4,480 fish were harvested as surplus. In all (adults and jacks), 135,825 pounds of coho salmon were harvested at the upper weir (Table 13).

A total of 1,392 jack coho salmon (100% males, age 1.0) were harvested at the upper weir. Assuming that this number represents 76.5% of the number passed at the lower weir, as was true of adults, then the total 1985 jack run was estimated to be 1,820. This represents 0.2% of the total coho smolt plant in 1985 and 2.2% of total estimated run of 82,174 coho in the Platte River during 1985.

Mean length and weight of jacks calculated from periodic biological samples were 15.2 inches and 1.24 pounds. In 1984 the jacks averaged 15.8 inches in length and 1.41 pounds in weight.

All jacks and 598 adult coho salmon were checked for fin clips during biological sampling. Of the adult coho sampled, 33 fish (5.5%) had adipose (AD) clips. The AD clip was given to smolts reared at Platte River Hatchery and planted in Lake Superior. The frequency of adipose clips is too high to represent an incidental escapement of clipped fish during rearing so it has to be assumed that these fish actually migrated back from Lake Superior after planting. In addition, a check of hatchery records indicated that plant-out inventories agreed with rearing inventories so there was not an unaccountable loss of these fish. No other fin clips were recorded for adults at the upper weir.

Five fin clips were recorded for the jack coho salmon: adipose (AD, 22 fish); right ventral (RV, 39 fish); left ventral (LV, 55 fish); right pectoral (RP, 1 fish); and left pectoral (LP, 3 fish). The RV and LV clips were given to Platte River smolts as part of a diet evaluation study. For the diet study 100,000 smolts were clipped in a ratio 40% RV to 60% LV. The jacks with clips returned in almost the same ratio, 41% RV to 59% LV. The LP, RP, and AD clips were assigned to Ohio for smolts planted in Lake Erie. The RP and AD clips were also assigned to Wisconsin and Illinois, respectively, for smolts planted in Lake Michigan.

Chinook salmon

Most (81%) of the chinook at the upper weir were harvested after October 21 (Table 14). The run was composed of 50.0% adult males, 29.5% jack males and 20.5% adult females. The average weight of the chinook (adults and jacks combined) was 10.23 pounds. The total

harvest of 391 fish was only 22.1% of the estimated number of chinook passed at the lower weir. Again, fishing mortality is suspected as the major cause of this loss.

SUMMARY

The 1985 run of coho salmon in the Platte River consisted of 80,354 adults (42% male and 58% female). This is a return of 8.1% on the smolts planted in 1984 and is the lowest return since 1979. Mean sizes at the lower weir were 26.2 inches and 6.13 pounds for adult males and 25.4 inches and 6.03 pounds for adult females. Mean sizes at the upper weir were 26.3 inches and 6.03 pounds for adult males, 25.6 inches and 6.14 pounds for adult females, and 15.2 inches and 1.24 pounds for jacks.

A grand total of 74,532 coho adults and jacks weighing 437,105 pounds were harvested. A total of 49,618 adults weighing 301,180 pounds were harvested at the lower weir and 24,914 adults and jacks weighing 135,815 pounds were harvested at the upper weir. The upper weir harvest included 5,916 stripped females weighing 27,362 pounds, from which the 1985 consignment of 14,042,500 eggs were taken. The quality of the 1985 eggs was good as reflected in an average eye-up of 77.3% for eggs incubated at the Platte River Hatchery.

The 1985 run of 4,865 chinook (50.5% males and 49.5% females) was slightly above average. Ultimately, 3,484 of these chinook (71.6%, 44,528 pounds) were harvested—3,093 at the lower weir and 391 at the upper weir. The age composition of the chinook run was 8.8% age-0.1 jacks, 17% age-0.2 adults, 52.3% age-0.3 adults, 20.3% age-0.4 adults, and 1.6% age-0.5 adults. The mean weights of age-groups 0.1 through 0.5 were 4.4, 8.7, 13.4, 18.0, and 22.5 pounds , respectively.

Pink salmon ran into the lower river in relatively low numbers. Just 53 were passed or harvested.

The 1985 fall steelhead run of 1,189 fish (51.9% males and 48.1% females) was a decline from the previous 2 years (1,898 in 1983 and 1,693 in 1984). Nine different age groups were identified but fish which had spent three summers in Lake Michigan (age groups 1.2, 2.2, and 3.2) were the most numerous (55.1%). Overall the steelhead averaged 25.2 inches long and weighed 6.71 pounds.

Other salmonids passed upstream at the lower weir included 114 brown trout and 26 lake trout. Based on the lake trout fin clips, the fish originated from plants made at Good Harbor Bay Reef, South Fox Island Shoal, and Frankfort.

Report approved by W. C. Latta

Typed by G. M. Zurek

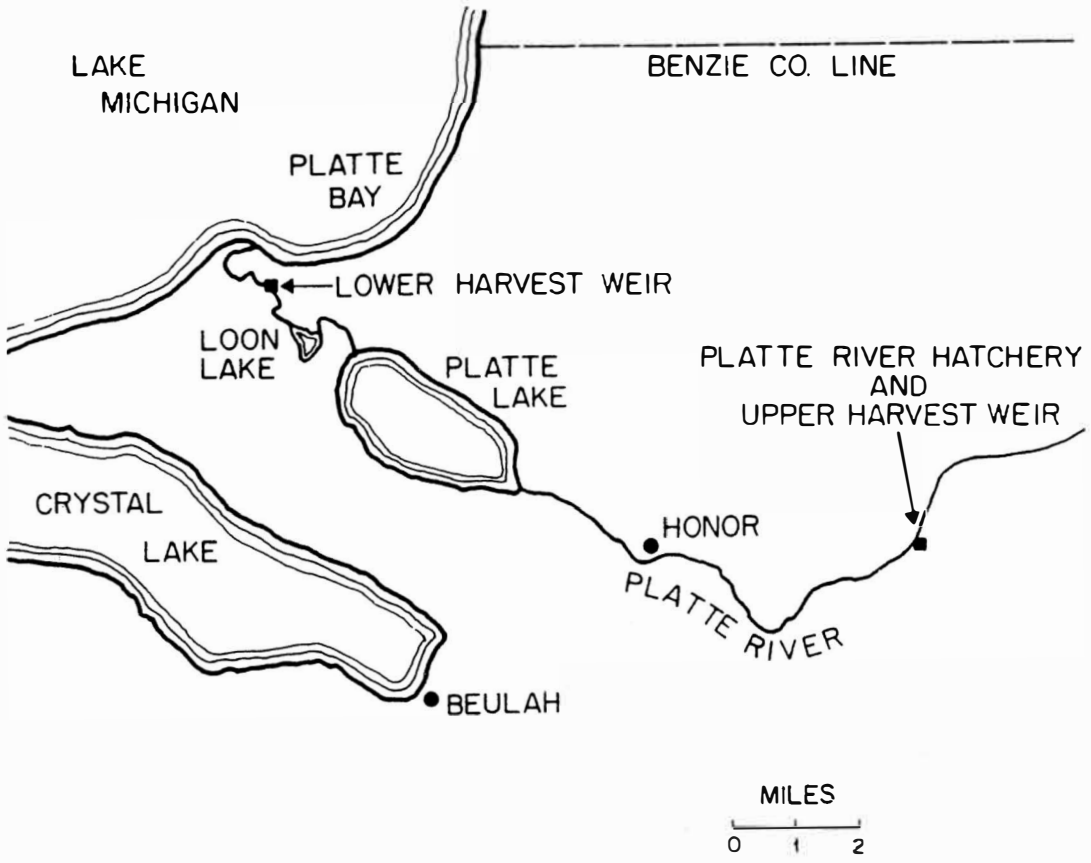

Figure 1. Location of the Platte River Hatchery and the upper and lower harvest weirs.

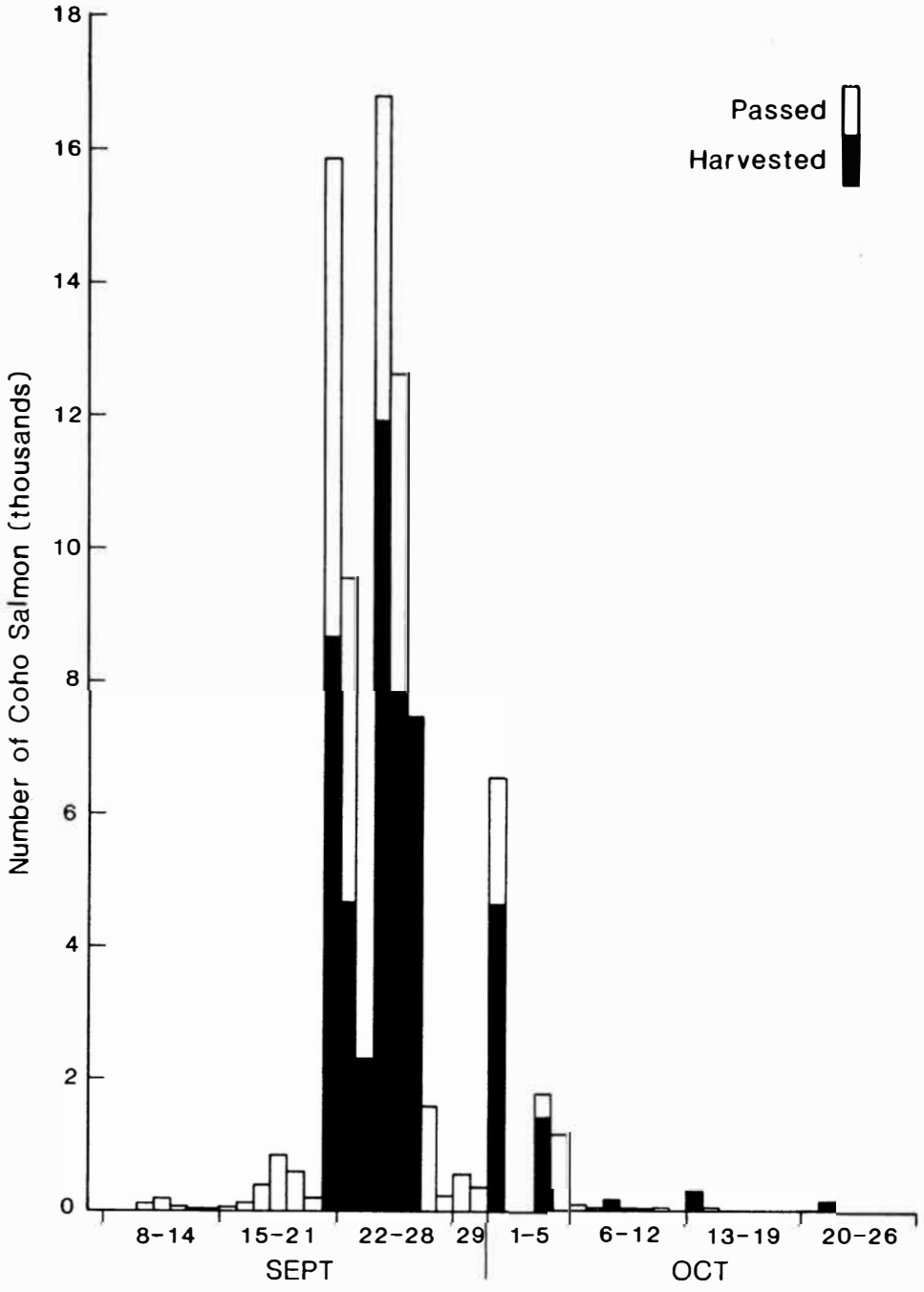

Figure 2. Periodicity of coho salmon harvested and passed upstream at the lower Platte River weir, fall 1985.

Table 1. Number of anadromous salmonids planted in the Platte River, 1966–85.

Year	Coho	Chinook	Steelhead	Atlantic salmon
1966	265,000	—	—	—
1967	503,000	—	—	—
1968	309,000	—	—	—
1969	1,092,069	—	—	—
1970	777,640	—	—	—
1971	390,381	53,500	—	—
1972	406,330	40,630	—	—
1973	918,135	—	206,924	—
1974	804,131	—	100,386	7,308
1975	800,202	—	87,600	—
1976	500,903	—	—	—
1977	606,814	—	—	—
1978	516,202	—	—	—
1979	973,032	—	—	—
1980	1,028,038	—	—	—
1981	944,205	—	—	—
1982	1,000,010	—	—	—
1983	953,499	—	—	—
1984	989,192	—	—	—
1985	817,483	—	—	—
Total	14,595,266	94,130	394,910	7,308

Table 2. Total number of salmonids (salmon plus trout) and estimated number of coho and chinook salmon passed upstream at the lower Platte River weir, fall 1985.

Date	Salmonids passed	Coho		Chinook	
		Percent in harvest[1]	Estimated number passed	Percent in harvest[1]	Estimated number passed
9/10	84				
9/11	227				
9/12	68				
9/13	47				
9/14	7				
Weekly total	433	85.7	371	14.3	62
9/15	30				
9/16	66				
9/17	422				
9/18	881				
9/19	640				
9/20	232				
9/21	7,500				
Weekly total	9,771	95.7	9,374	3.4	366
9/22	5,000				
9/24	5,000				
9/25	5,000				
9/27	1,631				
9/28	256				
Weekly total	16,887	97.0	16,386	2.0	342
9/29	598				
9/30	410				
10/01	2,082				
10/04	377				
10/05	1,304				
Weekly total	4,771	92.2	4,400	5.1	245
10/06	396				
10/07	195				
10/09	165				
10/10	109				
10/11	91				
Weekly total	956	17.2	166	75.6	722

Table 2. Continued:

Date	Salmonids passed	Coho		Chinook	
		Percent in harvest[1]	Estimated number passed	Percent in harvest[1]	Estimated number passed
10/14	120				
Weekly total	120	30.6	39	54.3	65
Annual total	32,938	93.3	30,736	5.8	1,772

[1]Percentage of the harvested or handled salmonids which were either coho or chinook.

Table 3. Summary of adult coho salmon harvested at the lower Platte River weir, fall 1985.

Date	Coho harvested			Total weight (pounds)
	Adult age 1.1	Mortalities	Cumulative total	
9/21	8,710	0	8,710	52,260
Weekly total	8,710	0		52,260
9/22	4,680	0	13,390	28,080
9/23	2,275	7	15,672	13,692
9/24	11,960	0	27,632	72,358
9/25	7,800	0	35,432	47,190
9/26	7,490	0	42,922	45,315
Weekly total	34,205	7		206,635
10/01	4,640	20	47,582	29,444
10/04	1,430	15	49,027	9,190
Weekly total	6,070	35		38,634
10/08	185	0	49,212	1,165
Weekly total	185	0		1,165
10/13	240	0	49,452	1,440
Weekly total	240	0		1,440
10/21	133	33	49,618	1,046
Weekly total	133	33		1,046
Annual total	49,543	75	49,618	301,180

Table 4. Estimated number of adult male and female coho salmon returning to the lower Platte River weir and their mean length and weight (± standard error of mean) based on weekly biological samples, fall 1985.

Week beginning	Number of coho			Mean	
	Harvested	Passed	Total	Length (inches)	Weight (pounds)
Age 1.1 male					
9/08	0	141	141	—	—
9/15	3,310	3,562	6,872	26.1±0.26	6.11±0.20
9/22	14,609	6,997	21,606	26.1±0.21	6.03±0.15
9/29	2,662	1,918	4,580	26.5±0.21	6.58±0.17
10/06	81	72	153	—	—
10/13	105	7	112	—	—
10/20	31	0	31	26.2±0.36	6.11±0.26
Annual	20,798	12,697	33,495	26.2[1]	6.13[1]
Age 1.1 female					
9/08	0	230	230	—	—
9/15	5,400	5,812	11,212	25.1±0.15	5.86±0.11
9/22	19,603	9,389	28,992	25.6±0.15	6.07±0.12
9/29	3,443	2,482	5,925	25.2±0.16	6.19±0.13
10/06	104	94	198	—	—
10/13	135	32	167	—	—
10/20	135	0	135	25.3±0.13	5.93±0.10
Annual	28,820	18,039	46,859	25.4[1]	6.03[1]
Sexes combined	49,618	30,736	80,354	25.7	6.07

[1] For computing weighted means, means for week of September 15 were extrapolated to week of September 9 and means for week of September 29 were extrapolated to the weeks of October 6 and October 13.

Table 5. Summary of adult coho (age 1.1) runs at the lower Platte River weir, 1979–85.

Year	Estimated number passed	Number harvested	Total run	Plant in previous year	Percent return	Mean length (inches)	Mean weight (pounds)
1979	36,404	0	36,404	516,200	7.1	23.1	4.36
1980	76,480[1]	46,633	123,113	973,032	12.7	26.9	7.61
1981	38,874	129,175	168,049	1,028,038	16.3	27.0	6.83
1982	38,951	90,412	129,363	944,205	13.7	25.8	6.15
1983	35,600	120,758	156,358	1,000,010	15.6	26.6	6.86
1984	36,572	105,530	142,102	953,449	14.9	24.8	5.49
1985	30,736	49,659	80,354	989,192	8.1	25.7	6.07

[1]Fish not counted; estimated from harvest at upper weir.

Table 6. Summary of all chinook harvested at the lower Platte River weir, fall 1985.

Date	Chinook harvested			Cumulative total	Total weight (pounds)
	Adults ages 0.2–0.5	Jacks age 0.1	Mortalities		
9/21	313	21	0	334	4,540
Weekly total	313	21	0		4,540
9/23	410	21	1	766	5,832
9/24	113	10	0	889	1,627
9/26	195	29	0	1,113	2,740
Weekly total	718	60	1		10,199
10/01	169	17	0	1,299	2,350
10/04	171	26	24	1,520	2,716
Weekly total	340	43	24		5,066
10/08	729	76	0	2,325	11,060
Weekly total	729	76	0		11,060
10/13	482	43	5	2,855	6,621
Weekly total	482	43	5		6,621
10/21	208	30	0	3,093	3,041
Weekly total	208	30	0		3,041
Annual total	2,790	273	30	3,093	40,527

Table 7. Age composition and mean lengths and weights (± standard error of mean) of chinook harvested at the lower Platte River weir, based on length-frequency samples and Appendix 1, fall 1985.

Age and sex	Number harvested	Percent of total sample	Percent of age group	Mean length (inches)	Mean weight (pounds)
Age 0.1					
Male	273		100	22.6±0.09	4.38±0.05
Female	0		0	—	—
Both	273	8.8		22.6±0.09	4.38±0.05
Age 0.2					
Male	379		72.2	29.6±0.30	8.47±0.20
Female	146		27.8	31.4±0.30	9.37±0.30
Both	525	17.0		30.0±0.25	8.65±0.17
Age 0.3					
Male	667		41.2	34.9±0.15	13.31±0.14
Female	950		58.8	34.3±0.12	13.39±0.14
Both	1,617	52.3		34.6±0.09	13.36±0.09
Age 0.4					
Male	220		35.1	38.1±0.23	18.05±0.27
Female	407		64.9	36.9±0.18	17.90±0.23
Both	627	20.3		37.3±0.15	17.96±0.17
Age 0.5					
Male	28		54.9	41.6±0.16	23.37±0.26
Female	23		45.1	39.8±0.30	21.33±0.51
Both	51	1.6		40.8±0.36	22.46±0.44
All	3,093	100		31.1±0.22	11.05±0.19

Table 8. Summary of chinook runs at the lower Platte River weir, 1979–85.

Year	Estimated number passed	Number harvested	Total run	Adult (ages 0.2–0.5) Mean length (inches)	Adult (ages 0.2–0.5) Mean weight (pounds)
1979	4,159	543	4,702	0.0	0.00
1980	2,736[1]	1,699	4,435	32.8	14.51
1981	1,391	2,172	3,563	34.7	15.56
1982	1,393	1,606	2,999	34.4	14.00
1983	1,275	4,839	6,114	33.6	14.73
1984	1,566	4,358	5,924	34.8	14.75
1985	1,772	3,093	4,865	34.8	13.91

[1]Fish not counted; estimated from harvest at upper weir.

Table 9. Number of trout released upstream at the lower Platte River weir, fall 1985.[1]

	Steelhead		Brown trout		Lake trout	
Date	Handled	Passed	Handled	Passed	Handled	Passed
9/21	53		5		—	
Weekly total	53	57	5	4	0	0
9/22	63		5		—	
9/23	50		—		—	
9/24	50		—		—	
9/25	96		7		—	
9/26	59		2		—	
Weekly total	318	152	14	7	0	0
10/01	101		7		—	
10/04	60		7		5	
Weekly total	161	117	14	9	5	4
10/08	61		14		—	
Weekly total	61	55	14	13	0	0
10/13	86		15		11	
Weekly total	86	12	15	2	11	2
10/21	117		17		4	
Weekly total	117	0	17	0	4	0
Annual total	796	393	79	35	20	6
Combined total		1,189		114		26

[1] Released trout include those actually handled, counted, then transferred upstream, and those (estimated) which swam through the weir when it was open.

Table 10. Age composition and mean lengths and weights (±1 standard error of mean) of 243 steelhead trout sampled at the lower Platte River weir, fall 1985.

Age and sex	Number sampled	Percent of total sample	Percent of age group	Mean length (inches)	Mean weight (pounds)
Age 1.0					
Male	13		72.2	15.4±0.22	1.59±0.11
Female	5		27.7	15.5±0.33	1.43±0.11
Both	18	7.4		15.4±0.18	1.55±0.09
Age 2.0					
Male	15		78.9	16.8±0.22	2.11±0.15
Female	4		21.1	15.0±0.34	1.27±0.06
Both	19	7.8		16.4±0.25	1.93±0.15
Age 1.1					
Male	3		42.9	23.8±0.33	5.73±0.25
Female	4		57.1	24.1±1.13	5.46±0.71
Both	7	2.9		24.0±0.62	5.57±0.39
Age 2.1					
Male	31		50.8	23.4±0.37	5.15±0.21
Female	30		49.2	24.1±0.22	5.75±0.17
Both	61	25.1		27.7±0.22	5.44±0.14
Age 3.1					
Male	—		0	—	—
Female	1		100	25.3	6.72
Both	1	0.4		25.3	6.72
Age 1.2					
Male	14		53.8	28.0±0.37	8.56±0.44
Female	12		46.2	27.8±0.36	8.49±0.46
Both	26	10.7		27.9±0.26	8.52±0.31
Age 2.2					
Male	47		45.2	28.7±0.23	8.79±0.23
Female	57		64.8	28.1±0.18	8.54±0.17
Both	104	42.8		28.4±0.15	8.65±0.14

Table 10. Continued:

Age and sex	Number sampled	Percent of total sample	Percent of age group	Mean length (inches)	Mean weight (pounds)
Age 3.2					
Male	2		50.0	29.9±0.27	9.37±0.55
Female	2		50.0	27.5±0.69	8.21±0.50
Both	4	1.6		28.7±0.75	8.79±0.45
Age 2.3					
Male	1		33.3	32.5	11.57
Female	2		66.7	30.7±0.12	10.36±0.88
Both	3	1.2		31.3±0.61	10.76±0.65
Total					
Male	126	51.9		—	—
Female	117	48.1		—	—
Both	243	100.0		25.2±0.30	6.71±0.18

Table 11. Age composition and mean length and weight (±2 standard errors), summarized by summers of growth in Lake Michigan, for steelhead trout sampled at the lower Platte River weir, fall 1985.

Age	Summers in lake	Percent of sample	Mean length (inches)	Mean weight (pounds)
_.0	1	15.2	15.9±0.3	1.75±0.18
_.1	2	28.4	23.8±0.4	5.47±0.26
_.2	3	55.1	28.3±0.3	8.63±0.24
_.3	4	1.2	31.3±1.2	10.77±1.30
All			25.17	6.71

Table 12. Number of coho salmon harvested at the upper Platte River weir, fall 1985.

Date	Jacks	Males	Females		Mortalities
			Round	Stripped	
10/04	21	74	37	0	144
Weekly total	21	74	37	0	144
10/09	35	62	91	0	168
10/10	325	950	380	640	17
10/11	329	1,140	570	1,008	126
Weekly total	689	2,152	1,041	1,648	311
10/14	158	1,330	570	1,008	79
10/16	55	603	124	304	150
10/17	108	1,207	249	608	98
10/18	45	1,061	220	679	22
Weekly total	366	4,201	1,163	2,599	349
10/21	12	570	85	312	48
10/22	62	760	103	685	153
10/23	123	1,301	510	672	12
10/24	46	842	808	0	36
Weekly total	243	3,473	1,506	1,669	249
10/30	62	1,140	1,260	0	63
Weekly total	62	1,140	1,260	0	63
11/20	11	204	226	0	13
Weekly total	11	204	226	0	13
Annual total	1,392	11,244	5,233	5,916	1,129

Table 13. Weight (pounds) of coho salmon harvested at the upper Platte River weir, fall 1985.

Date	Jacks	Males	Females		Mortalities
			Round	Stripped	
10/04	26	443	224	0	865
Weekly total	26	443	224	0	865
10/09	43	376	583	0	1,053
10/10	403	5,762	2,435	3,200	107
10/11	408	6,911	3,644	4,444	790
Weekly total	854	13,049	6,662	7,644	1,950
10/14	196	7,581	3,420	4,657	466
10/16	68	3,439	746	1,404	900
10/17	134	6,878	1,492	2,809	600
10/18	56	6,048	1,320	3,137	129
Weekly total	454	23,946	6,978	12,007	2,095
10/21	15	3,249	510	1,441	283
10/22	77	4,332	618	3,165	903
10/23	153	8,717	3,006	3,105	76
10/24	57	5,638	4,851	0	230
Weekly total	302	21,936	8,985	7,711	1,492
10/30	77	7,105	7,853	0	392
Weekly total	77	7,105	7,853	0	392
11/20	14	1,273	1,407	0	81
Weekly total	14	1,273	1,407	0	81
Annual total	1,727	67,752	32,109	27,362	6,875
Mean weight	1.24	6.03	6.14	4.63	6.09

Table 14. Number and weight (pounds) of chinook salmon (adults and jacks combined) harvested at the upper Platte River weir, fall 1985.

	Males		Females		Mortality		Total	
Date	Number	Weight	Number	Weight	Number	Weight	Number	Weight
10/10	3	29	0	0	24	232	27	261
10/11	8	69	4	40	10	91	22	200
Weekly total	11	98	4	40	34	323	49	461
10/14	4	34	1	16	5	28	10	78
10/16	5	44	0	0	0	0	5	44
10/17	1	10	3	39	2	12	6	61
10/18	5	47	0	0	0	0	5	47
Weekly total	15	135	4	55	7	40	26	230
10/21	1	5	0	0	1	5	2	10
10/22	4	14	0	0	0	0	4	14
10/23	30	239	4	62	0	0	34	301
10/24	72	634	16	235	0	0	88	869
Weekly total	107	892	20	297	1	5	128	1,194
10/30	110	1,057	25	364	5	53	140	1,474
Weekly total	110	1,057	25	364	5	53	140	1,474
11/20	24	292	17	256	7	94	48	642
Weekly total	24	292	17	256	7	94	48	642
Annual total	267	2,474	70	1,012	54	515	391	4,001
Mean weight		9.27		14.46		9.53		10.23

Appendix 1. Length-age distribution (in percent of inch group) for chinook salmon scale sampled during creel census at Traverse City, Frankfort, Manistee, and Ludington (September-November 1985), and the Big Manistee River (August-September 1985).[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.