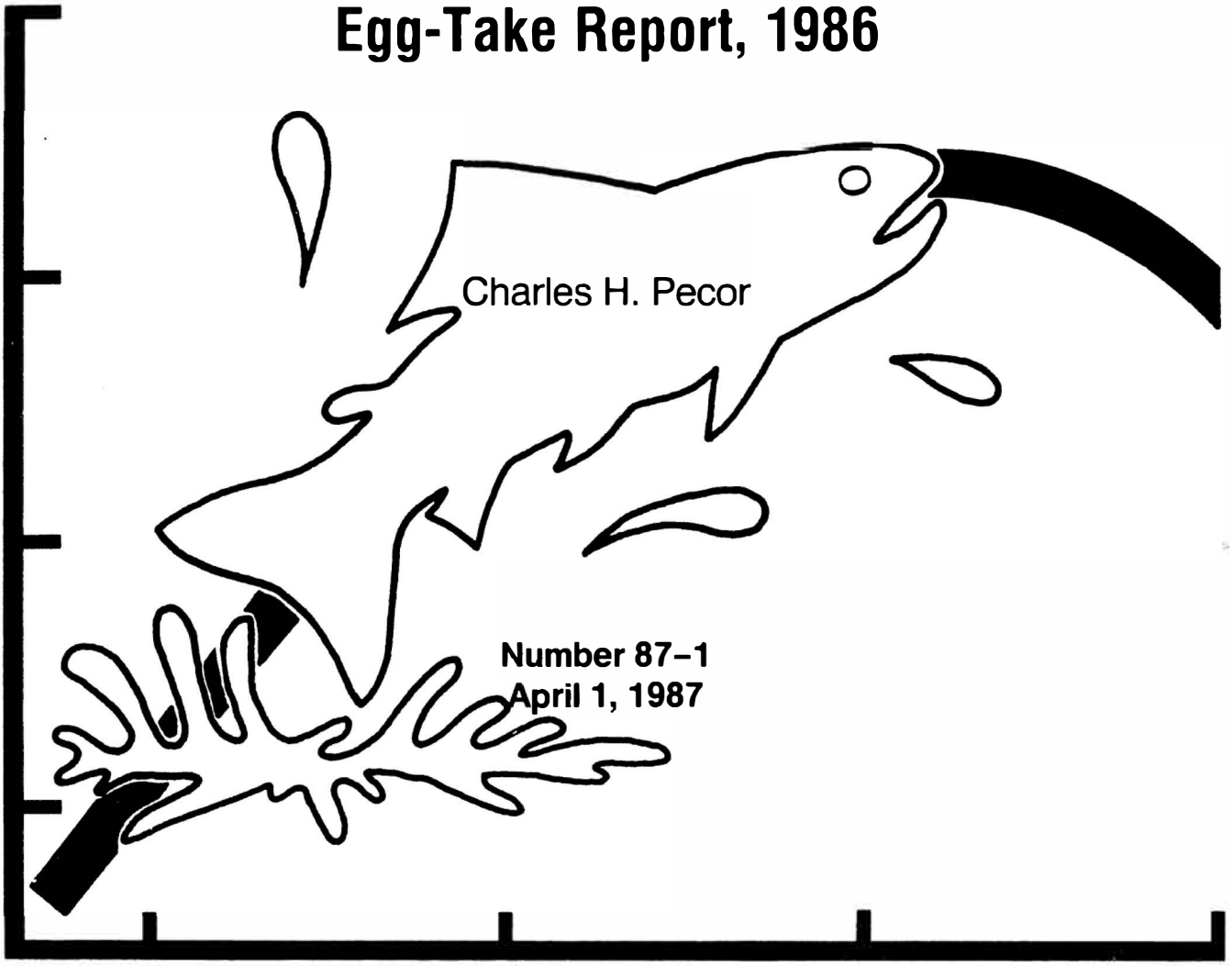
87-1

FISHERIES DIVISION

TECHNICAL REPORT

Platte River Harvest Weir and Coho Salmon Egg-Take Report, 1986



Charles H. Pecor

Number 87-1
April 1, 1987

Michigan Department of
Natural Resources

MICHIGAN DEPARTMENT OF NATURAL RESOURCES
FISHERIES DIVISION

Fisheries Technical Report No. 87-1

April 1, 1987

PLATTE RIVER HARVEST WEIR AND COHO SALMON EGG-TAKE REPORT, 1986

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 Platte 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. The annual plants for 1979–84 approximated 1 million smolts and these plants, with the exception of the 1984, produced annual returns to the weir of 123,000 to 168,000 adults, or 12% to 16.4%. The 1984 plant produced a 1985 return of only 80,354 coho adults, or 8.1%. The 1986 adult run was from a plant of 817,483 coho smolts made in the spring of 1985.

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 12 to 14 million coho eggs annually. Depending on the size of the returning coho, the egg-take requires about 5,750–7,000 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 1986 salmon run was atypical. High water, low numbers of returning adults, and an early migration contributed to one of the poorest coho runs on record. For the second year in a row the coho 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 considered to be

---

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

poor by most fishermen. The salmon entered the river 1.5 to 2.5 weeks earlier than normal as evidenced by reports of good catches of coho in Loon Lake the first week of September. Salmon that were passed at the lower weir moved slowly up to the hatchery and provided a good river fishery.

The river stage at the lower weir was very high, averaging over 1 foot higher than last year, and during one period the water level was 3 inches from the top of the weir grates. The high water levels caused a problem at the holding pond because there was no waterfall at the discharge end of the pond. The waterfall tends to attract the fish into the pond and without it they were reluctant to move into the pond. If Lake Michigan water levels continue to rise, the lower weir and holding pond will become ineffectual.

LOWER WEIR OPERATION, 1986

The lower harvest weir was in place and ready for operation on September 4. Beginning on September 7, the weir was closed at night, the accumulated fish were processed the next morning, and the weir was left open during the day. The weir was manned 24 hours per day from September 10 to October 17. Due to the early run it appears that substantial number of salmonids moved upstream prior to the September 7 starting date. A total of 25,091 salmonids (salmon plus trout) were actually counted through the weir between September 7 and October 17 (Table 2). However, it is likely that about 38,985 fish passed the lower weir, a calculation based on the number of fish harvested at the upper weir and the assumption (based on data from previous years) that 75% of the fish that pass the lower weir reached the upper weir. Subtracting the actual number of fish counted (25,091) from the estimated number of fish passed (38,985) implies that about 13,899 salmonids passed upstream prior to September 7 (Table 2). This was the earliest run of salmon in the lower Platte in the past 10 years. The only major run of salmon to reach the lower weir after the start of operations was on September 12. The estimated 38,985 salmonids passed upstream was an increase of about 2% over the average for the previous 5 years. The species composition of these fish is assumed to be the same as that of the fish actually handled during each week of harvesting. Additional trout were sorted out during harvesting and transferred upstream from the weir.

Harvesting began September 12 and continued intermittently until October 17. Salmon were actually harvested on only 9 days during this period and five of the harvests were primarily to obtain biological samples. One full semitrailer load and eight partial loads were sent to Tempotech Industries in Hart, Michigan.

Coho salmon

The harvest of coho salmon began on September 12 and ended October 17, a period of 36 days. However, 80% of the coho were harvested on only 3 harvest dates, September 12, 21,

and 23 (Fig. 2). A total of only 16,646 adult coho weighing 86,634 pounds were harvested (Table 3). Mean weight of the harvested coho was 5.26 pounds (Table 4). An estimated 36,124 additional coho were passed upstream for egg-take operations at the upper weir (Tables 2 and 4).

The total run of 52,770 adult coho in the lower Platte represented a return of only 6.5% of the 1985 smolt plant and was for the second year in a row about one-half the number expected to return (Table 5). The low coho return was not restricted to the Platte River. Very low returns were also reported for the Little Manistee River (Ralph Hay, personal communication) and other streams tributary to Lake Michigan. There are indications that coho returns were low throughout the Great Lakes.

The cause of the low returns in the Platte River and other Lake Michigan tributaries is not known. The hypotheses presented for the low returns last year (Pecor 1986) are not substantiated by the data collected this year. A compilation of historical data on Platte River coho returns from 1968 to the present, based on data in Hay 1983 and Table 5, showed an average return to the river of 12.6%. However, there were a number of years during which very low returns were reported. The lowest returns were recorded in 1972 (6.7%), 1978 (8.1%), 1979 (7.1%), 1985 (8.1%), and 1986 (6.5%). The average return to the weir, excluding these five low return years, was 14.5%. The low return years appear to be in a 6- to 7-year cycle. The history of the coho in Lake Michigan is too short to determine if this cycle is real or artificial. However, even if the cycle is real and predictable, no explanation for the low returns can be offered.

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 25.1 inches and 5.50 pounds and females averaged 24.4 inches and 5.26 pounds.

During the harvest operation, 105 age-1.0 coho were harvested. All were males (jacks). They had an average length of 15.7 inches and an average weight of 1.77 pounds. No age-1.2 coho were observed in the harvest.

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

During the seven weekly biological surveys, a total of 944 adult coho were randomly sampled and an additional 2,909 were checked for fin clips. No lamprey wounds or scars were observed on the coho in the biological samples. Of the 3,043 coho checked for fin clips, 383 had clips. The clips were left ventral (LV, 217 fish), right ventral (RV, 116 fish), and adipose (Ad, 50 fish). The LV and RV clips were part of a diet study conducted at the Platte River Hatchery and were expected. These clips will be discussed further in the Upper Weir Operation section. The Ad clipped adults could have come from plants made by Illinois in the waters of Lake Michigan; they represented 1.6% of the adult coho harvested.

One adult coho harvested on September 23, 1986, had a Wisconsin Floy tag attached at the base of the dorsal fin. The reply from Wisconsin indicated that the fish was tagged on August 15, 1986, near Two Rivers, Wisconsin, an across-lake distance of over 75 miles.

In summary, a total of 52,770 adult coho salmon reached the lower Platte River weir during the fall of 1986—18,947 (35.9%) males and 33,823 (64.1%) females (Table 4). The total adult run was 6.5% of the 1985 plant of 817,483 age-1.0 smolts (Table 5), about one-half the expected rate of return.

Chinook salmon

The chinook salmon run in the lower Platte River spanned the period from September 12 to October 17, although 92.6% of the run was harvested after September 20 (Table 6). A total of 2,678 chinook, including 2,585 adults (age 0.2 to age 0.4) and 93 jacks (age 0.0 and 0.1), weighing 32,377 pounds were harvested (Table 6). The average weights of adults and jacks were 12.9 and 4.01 pounds, respectively. The average adult was 1.0 pound lighter than in 1985 (13.9 pounds). It was estimated that an additional 2,469 chinook were passed upstream at the lower weir (Table 2).

Biological data were collected from 448 adult chinook randomly sampled during the harvest operation. In addition, biological data were collected on 69 of the 93 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 Pentwater, Ludington, Manistee, Frankfort, Leland, Grand Traverse Bay, Manistee Lake, Big Manistee River, Betsie River, and Platte River for the months September through November 1986. In applying this table to those length groups in which two or more age groups are represented, the lighter fish were arbitrarily assigned to the younger age group and the heavier fish were assigned to the older age group. The resulting estimate of age composition of the 1986 chinook harvest was 0.1% age 0.0, 3.3% age 0.1, 7.6% age 0.2, 74.4% age 0.3, and 14.6% age 0.4 (Table 7). Average lengths and weights for each age group are presented in Table 7.

Three chinook 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 5,147 chinook at the lower weir in 1986 was above the 1979–85 average of 4,657. However, the average weight of adult chinooks in 1986 was the lowest recorded (Table 8). Adult males and females comprised 44.3% and 55.7% 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 were not expected this year and did not show up in the harvest or around the weir. Pink salmon normally run only during the odd numbered years.

Steelhead trout

The peak steelhead run occurred between September 28 and October 10 (Table 9). Although the peak run occurred at the normal time, the total run of steelhead was very small. During the harvest operation only 364 steelhead were handled; this was the lowest number since 1980 (Table 10). It was estimated that an additional 343 steelhead were passed upstream through the open weir gate and that total steelhead run in the lower Platte River was 707 fish. The small steelhead run coincides with the unusually small coho run.

Biological information, including scale samples, was collected from only 54 steelhead. All scale samples (including steelhead, brown trout, and lake trout) were aged by District 6 personnel at Harrietta warehouse. A total of seven age groups were recorded in 1986 (Table 11) as compared to nine in 1985 and ten in 1984 (Table 12). Fish in the age-group 1.2 were the most numerous (27.8%) and fish in age-group 2.0 were the least numerous (1.8%). Most (72.2%) of the steelhead smolted after one summer in the river and the remaining 27.8% smolted after two summers in the river. In 1984 and 1985, only 45% and 21%, respectively, smolted after one summer in the river.

The size of the returning steelhead was more dependent upon the years spent in Lake Michigan than on age-at-smolting or years in the river, as was true in other years (Table 13). Steelhead which had spent three summers (age_.2) in Lake Michigan were the most frequent age group (37.1%) to return in 1986, although steelhead which spent one, two, and four summers in Lake Michigan were well represented (Table 13).

Overall the steelhead in 1986 had a mean length of 24.1 inches and a mean weight of 6.10 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 (Tables 9 and 10). A total of 31 brown trout and 14 lake trout were counted and transferred upstream in 1986. It was estimated that an additional 30 brown trout and 22 lake trout were passed upstream with the coho salmon. This gives total runs in 1986 of 61 brown trout and 36 lake trout.

Biological information was obtained from seven brown trout which died after being passed upstream. Only one age group was identified, age 1.1. Lengths ranged from 19.8 to

24.7 inches (average 21.6) and weights ranged from 3.3 to 6.7 pounds (average 4.8). The sex ratio was 57% male to 43% female.

Thirteen of the lake trout were checked for fin clips and all had a fin clip. Observed fin clips were both ventrals (BV, 8 fish), left ventral (LV, 3 fish), right ventral-adipose (RV-Ad, 1 fish), and left ventral-adipose (LV-Ad, 1 fish). The BV, LV-Ad, and RV-Ad clips were assigned to lake trout planted offshore in 1980, 1979, and 1978, respectively, at either Good Harbor Bay Reef (located about 18.6 miles north of the Platte River) or South Fox Island Shoal (located about 43.5 miles north of the Platte River). The LV clip was assigned to lake trout planted in 1979 at many locations but it is assumed they came from the closest plant at Frankfort (located about 6 miles south of the Platte River). Lake trout with the BV clip accounted for 62% of the run in 1986 as compared to 47% in 1985 and 55% in 1984. Biological data were collected from only one lake trout which died at the weir. This was a 29.6-inch, 10.9-pound female that had the LV-Ad fin clip. Scale aging and the fin clip both indicated the fish was 8 years old.

UPPER WEIR OPERATION, 1986

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-taking building. The weir blocks the upstream migration of salmonids and directs them up the fish ladder into the 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 August 29 and the facility was fully operational by September 1.

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). All six ponds were full by September 16—the earliest date all ponds have been full. Although the fish ran early they matured late. Holding the adult fish in the ponds for about a month resulted in higher than normal mortalities.

The fish in the maturation ponds were checked weekly for egg condition (green or ripe) from September 17 to October 27. Egg-taking operations started when the proportion of ripe females was 50% or above. The percentage of ripe females on September 17 and October 1, 8, 13, 20, and 27 were 0, 30, 39, 82, and 91, respectively. A total of 12,548,100 eggs were collected and fertilized on 9 working days between October 13 and October 28. Of these eggs 7,101,000 (56.6%) were for in-state rearing and 5,446,700 (43.4%) were for out-of-state

commitments (i.e., Indiana, 0.5 million; Wisconsin, 1.2 million; Illinois, 1.1 million; Pennsylvania, 2.0 million; and Ohio, 0.6 million).

The 1986 egg-take was carried out as a routine operation. Egg quality was very good throughout the egg-take operations. Water temperatures at the lower weir were below 15.5 °C (60 °F) during the major run into the lower river and below 14 ° (57 °F) 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 1986 eggs. The average eye-up rate for the 4 egg-take days was 78%, with the daily range from 73.4% to 82.0%. Coho eye-up rates during the previous 7 years ranged from 50.4% (1984) to 82.2% (1980) and averaged 69.1%.

A total of 6,144 female coho salmon were stripped to collect the 12.5 million eggs (Table 14), an average of 2,043 eggs per female. A check of the fecundity of 25 individual females at the end of the run showed an average of 2,251 eggs per female with a range of 1,297 to 3,278. The difference between 2,042 and 2,251 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, 1984, and 1985 were 3,204, 2,290, and 2,850 eggs per female, respectively.

The egg-take and harvest operation at the upper weir accounted for 28,620 coho, including 1,527 (5.3%) jacks and 27,093 (94.7%) adults (Table 14). The number of adults harvested at the upper weir was probably 75% of the estimated total number of adults passed at the lower weir. In other words, 9,031 (25%) adult coho salmon did not swim from the lower to the upper weir. A portion of this loss can be attributed to fishing mortality. During 1983, 1984, and 1985, 8,732 (24.5%), 12,075 (33%), and 7,214 (23.5%), respectively, did not swim to the upper weir.

The adult run at the upper weir consisted of 42.0% male and 58.0% female, based on the actual numbers of fish harvested. Males averaged 24.7 inches in length and 4.62 pounds in weight, and females averaged 24.2 inches in length and 4.68 pounds in weight. Overall, the adult coho averaged 24.4 inches and 4.66 pounds—almost identical in length but 0.6 pound lighter in weight than the coho harvested at the lower weir. Sixty-four percent (64%) of the adult coho handled at the upper weir were used in the egg-take and about 9,788 fish were harvested as surplus. In all (adults and jacks) 124,808 pounds of coho salmon were harvested at the upper weir (Table 5).

A total of 1,527 jack coho salmon (100% males, age 1.0) were harvested at the upper weir (Table 14). Assuming that this number represents 75% of the number passed at the lower weir, as was estimated for adults, then the total 1986 jack run was estimated to be 2,306. This represents 0.27% of the total coho smolt plant in 1986 and 3.7% of total estimated run of 54,806 coho in the Platte River during 1986.

Mean length and weight of jacks calculated from periodic biological samples were 15.4 inches and 1.45 pounds. In 1985 the jacks averaged 15.2 inches in length and 1.24 pounds in weight. No fin clips were observed on the jacks in the biological samples.

A total of 7,307 adult coho were checked for fin clips during the weekly biological samples and daily random samples. Three fin clips were recorded: left ventral (LV, 515 fish), right ventral (RV, 278 fish), and adipose (Ad, 85 fish). The LV and RV clips were issued during a diet study at the Platte River Hatchery and were expected. The Ad clip was assigned to a plant(s) made by Illinois in Lake Michigan. The Ad clip was found on 1.16% of the fish checked at the upper weir and 1.64% of the coho at the lower weir. The weighted average percentage of fish with Ad clips was 1.3%. Based on this percentage, the total run of Ad clipped fish in the Platte River was 686 fish.

The diet study involving the LV and RV clips was conducted at the Platte River Hatchery during 1984–85. During spring 1985, 387,573 coho salmon smolts reared on a low-phosphorus (T-2) diet and 429,911 coho salmon smolts reared on the normal Oregon Moist Pellet (OMP) diet were planted in the Platte River. Forty thousand (40,000) of the T-2 diet fish were marked with a RV clip and 60,000 of the OMP diet fish were marked with a LV clip. Jacks returning in fall 1985 had a clip ratio almost identical to the planted ratio (40% RV to 60% LV) (Pecor 1986). Approximately 20% (10,350 fish) of the adult coho run in the Platte River during 1986 were checked for fin clips associated with the diet study. The total number of clipped fish from both the upper and lower weirs were: LV, 732 fish and RV, 394 fish. The clip ratio in this case was 35% RV to 65% LV, a slight deviation from the planted ratio in favor of the OMP fed fish. The RV and LV clipped fish had corresponding average lengths and weights of 24.5 and 24.7 inches and 4.57 and 4.80 pounds, respectively. The data suggest that the fish fed the OMP diet returned at a better rate and a larger size than the fish fed the T-2 diet.

There is one possible problem with the LV clip data. There was another group of coho at Platte River Hatchery during the same time period which were marked with the LV clip. These fish were planted in Lake Superior. Last year, 1985, a large number of clipped coho (5.5% of the run) returned to the Platte River from the lot planted in Lake Superior. Consequently, it is probable that some LV marked coho from Lake Superior also returned this year. The LV clip coho from the diet study and the LV clip coho from the Lake Superior study cannot be distinguished on the basis of growth or other characteristics. The return of Lake Superior coho to the Platte River is probably due to imprinting and smolting before the fish were stocked out.

Chinook salmon

Most (72%) of the chinook at the upper weir were harvested after October 26 (Table 16). The run was composed of 62% adult males, 16% jack males, and 22% adult females. The

average weight of all chinook (adults and jacks combined) was 10.50 pounds. The total harvest of 690 fish was only 27.9% 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 1986 run of coho salmon in the Platte River consisted of 52,770 adults (35.9% male and 64.1% female). This is a return of 6.5% on the smolts planted in 1985 and is the lowest percent return ever. Mean sizes at the lower weir were 25.1 inches and 5.50 pounds for adult males and 24.4 inches and 5.26 pounds for adult females. Mean sizes at the upper weir were 24.7 inches and 4.62 pounds for adult males, 24.2 inches and 4.68 pounds for adult females, and 15.4 inches and 1.45 pounds for jacks.

A grand total of 45,266 coho adults and jacks weighing 211,442 pounds were harvested. A total of 16,646 adults weighing 86,634 pounds were harvested at the lower weir and 28,620 adults and jacks weighing 124,808 pounds were harvested at the upper weir. The upper weir harvest included 6,144 stripped females weighing 22,469 pounds, from which the 1986 consignment of 12,548,100 eggs were taken. The quality of the 1986 eggs was good as reflected in an average eye-up of 78% for eggs incubated at the Platte River Hatchery.

The 1986 run of 5,147 chinook (50.5% males and 49.5% females) was above average. Ultimately, 3,368 of these chinook (65.4%, 39,621 pounds) were harvested—2,678 at the lower weir and 690 at the upper weir. The age composition of the chinook run was 0.1% age-0.0 jacks, 3.3% age-0.1 jacks, 7.6% age-0.2 adults, 74.4% age-0.3 adults, and 14.6% age-0.4 adults. The mean weights of age-groups 0.0 through 0.4 were 0.7, 4.2, 6.4, 12.5, and 16.9 pounds, respectively.

The 1985 fall steelhead run of 707 fish (51.9% males and 48.1% females) was the smallest since 1980. Seven different age groups were identified but fish which had spent three summers in Lake Michigan (age-groups 1.2 and 2.2) were the most numerous (37.1%). Overall the steelhead averaged 24.1 inches long and weighed 6.10 pounds.

Other salmonids passed upstream at the lower weir included 61 brown trout and 36 lake trout. Based on fin clips, the lake trout originated from plants made at Good Harbor Bay Reef, South Fox Island Shoal, and Frankfort.

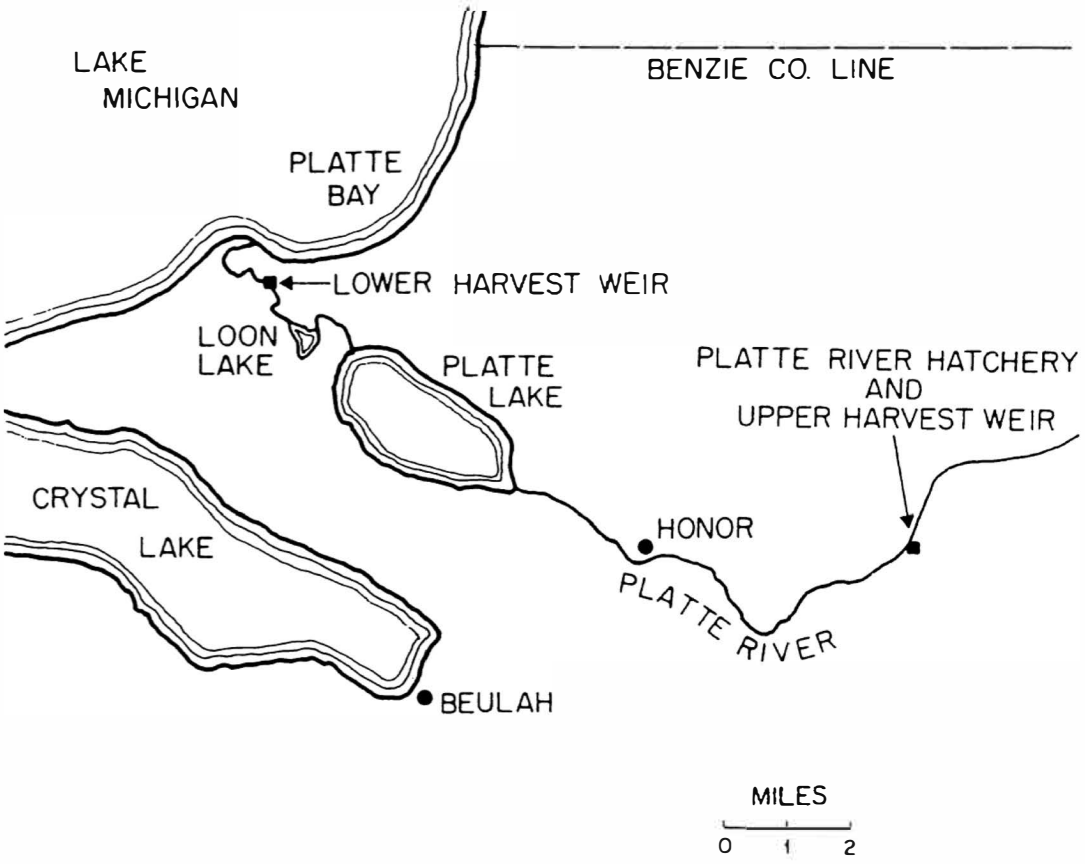


Figure 1. Location of the Platte River Hatchery and the upper and lower harvest weirs.

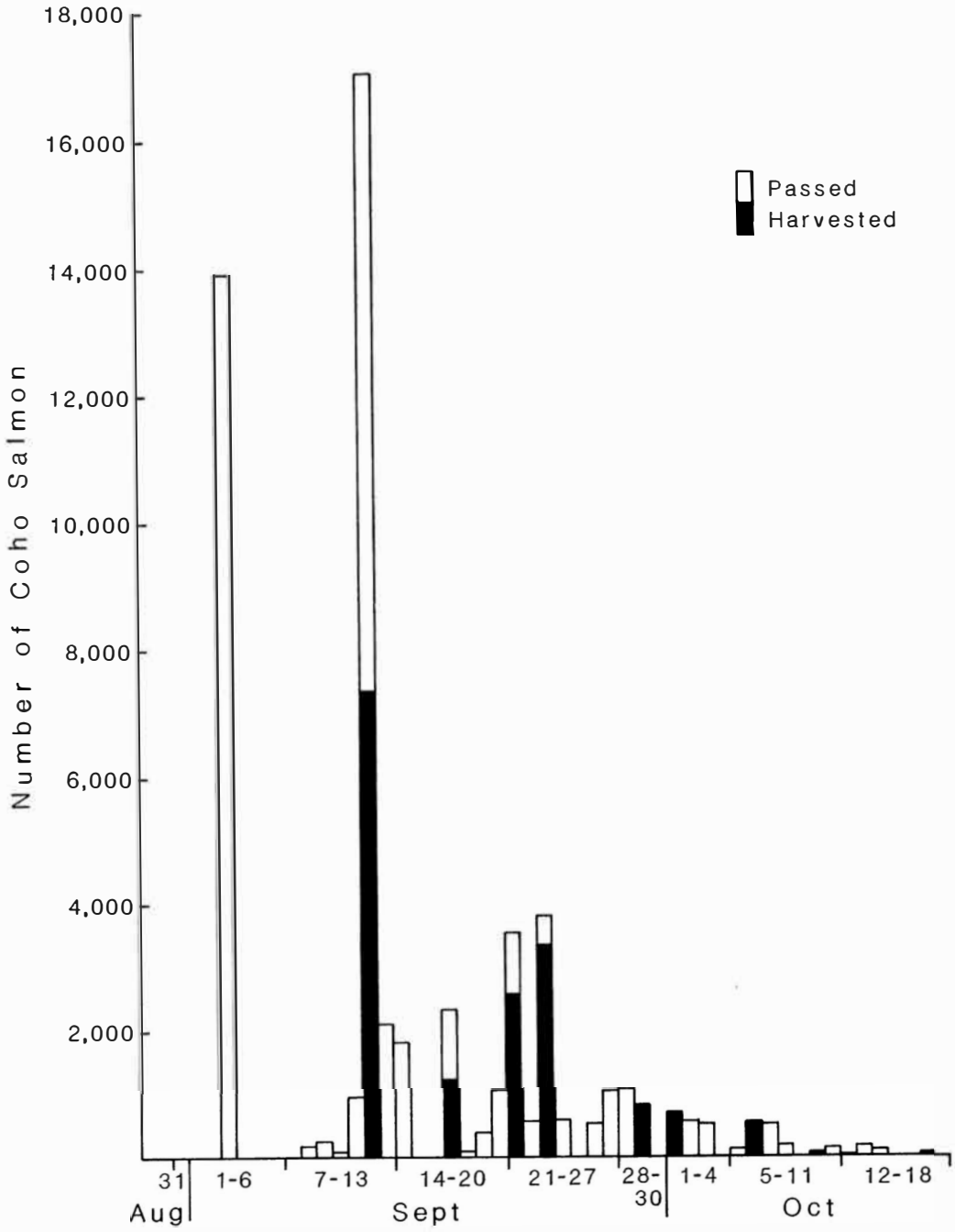


Figure 2. Periodicity of coho salmon harvested and passed upstream at the lower Platte River weir, fall 1986.

Table 1. Number of anadromous salmonids planted in the Platte River, 1966–86.

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	—	—	—
1986	751,183	—	—	—
Total	15,346,449	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 1986.

Date	Salmonids passed	Coho		Chinook	
		Percent in harvest[1]	Estimated number passed	Percent in harvest[1]	Estimated number passed
8/31	13,894				
Weekly total	13,894	98.6	13,699	1.4	193
9/08	177				
9/09	251				
9/10	45				
9/11	966				
9/12	10,000				
9/13	2,133				
Weekly total	13,572	98.6	13,377	1.4	186
9/14	1,816				
9/17	1,060				
9/18	30				
9/19	406				
9/20	1,056				
Weekly total	4,368	94.2	4,116	4.1	179
9/21	975				
9/22	545				
9/23	273				
9/24	598				
9/26	509				
9/27	1,016				
Weekly total	3,916	93.5	3,661	5.8	227
9/28	1,030				
10/02	559				
10/03	508				
Weekly total	2,097	50.7	1,063	43.8	919
10/05	117				
10/07	502				
10/08	198				
10/11	127				
Weekly total	944	18.2	172	68.3	644

Table 2. Continued:

Date	Salmonids passed	Coho		Chinook	
		Percent in harvest[1]	Estimated number passed	Percent in harvest[1]	Estimated number passed
10/12	7				
10/13	135				
10/14	52				
Weekly total	194	18.3	36	62.5	121
Annual total	38,985	92.7	36,124	6.3	2,469

[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 1986.

Date	Coho harvested			Total weight (pounds)
	Adult age 1.1	Mortalities	Cumulative total	
9/12	7,384	0	7,384	40,243
Weekly total	7,384	0		40,243
9/17	1,204	44	8,632	6,065
Weekly total	1,204	44		6,065
9/21	2,573	6	11,211	12,121
9/23	3,312	18	14,541	17,316
Weekly total	5,885	24		29,437
9/29	800	0	15,341	4,160
10/01	730	9	16,080	3,843
Weekly total	1,530	9		8,003
10/06	520	0	16,600	2,652
10/10	25	2	16,627	137
Weekly total	545	2		2,789
10/17	19	0	16,646	97
Weekly total	19	0		97
Annual total	16,567	79	16,646	86,634

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 1986.

Week beginning	Number of coho			Mean	
	Harvested	Passed	Total	Length (inches)	Weight (pounds)
Age 1.1 male					
8/31	0	5,178	5,178	—	—
9/07	2,791	5,057	7,848	25.2±0.17	5.71±0.12
9/14	295	971	1,266	24.4±0.18	4.87±0.11
9/21	2,287	1,417	3,704	24.9±0.14	5.07±0.08
9/28	406	281	687	24.8±0.21	5.09±0.15
10/05	181	57	238	24.7±0.17	5.19±0.11
10/12	9	17	26	24.8±0.47	5.02±0.29
Annual	5,969	12,978	18,947	25.1[1]	5.50[1]
Age 1.1 female					
8/31	0	8,521	8,521	—	—
9/07	4,593	8,320	12,913	24.2±0.14	5.28±0.09
9/14	953	3,145	4,098	23.7±0.12	4.86±0.08
9/21	3,622	2,244	5,866	24.1±0.09	4.84±0.06
9/28	1,133	782	1,915	23.9±0.12	4.90±0.07
10/05	366	115	481	24.1±0.12	5.10±0.08
10/12	10	19	29	24.4±0.67	5.17±0.38
Annual	10,677	23,146	33,823	24.1[1]	5.13[1]
Sexes combined	16,646	36,124	52,770	24.4	5.26

[1] For computing weighted means, means for week of September 7 were extrapolated to week of August 31.

Table 5. Summary of adult coho (age 1.1) runs at the lower Platte River weir, 1979–86.

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
1986	36,124	16,646	52,770	817,483	6.5	24.4	5.26

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

Table 6. Summary of all chinook harvested at the lower Platte River weir, fall 1986.

Date	Chinook harvested			Cumulative total	Total weight (pounds)
	Adults ages 0.2–0.5	Jacks ages 0.0–0.1	Mortalities		
9/12	102	2	0	104	1,428
Weekly total	102	2	0		1,428
9/17	51	2	3	160	737
Weekly total	51	2	3		737
9/21	37	4	2	203	505
9/23	317	5	2	527	4,019
Weekly total	354	9	4		4,524
9/29	771	16	0	1,314	9,654
10/01	513	21	10	1,858	6,501
Weekly total	1,284	37	10		16,155
10/06	673	35	0	2,566	8,207
10/10	46	0	1	2,613	588
Weekly total	719	35	1		8,795
10/17	57	8	0	2,678	738
Weekly total	57	8	0		738
Annual total	2,567	93	18	2,678	32,377

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 1986.

Age and sex	Number harvested	Percent of total sample	Percent of age group	Mean length (inches)	Mean weight (pounds)
Age 0.0					
Male	4		100	11.8±1.03	0.72±0.16
Female	0		0	—	—
Both	4	0.1		11.8±1.03	0.72±0.16
Age 0.1					
Male	89		100	22.2±0.13	4.21±0.08
Female	0		0	—	—
Both	89	3.3		22.2±0.13	4.21±0.08
Age 0.2					
Male	180		88	26.3±0.34	6.26±0.17
Female	24		12	28.5±0.68	7.45±0.43
Both	204	7.6		26.6±0.32	6.40±0.16
Age 0.3					
Male	835		42	33.3±0.16	12.05±0.15
Female	1,154		58	33.6±0.10	12.86±0.12
Both	1,989	74.4		33.5±0.09	12.52±0.10
Age 0.4					
Male	172		44	37.4±0.23	17.11±0.31
Female	220		56	35.9±0.12	16.76±0.23
Both	392	14.6		36.5±0.14	16.92±0.19
All	2,678	100		31.5±0.22	11.23±0.18

Table 8. Summary of chinook runs at the lower Platte River weir, 1979–86.

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	—	—
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
1986	2,469	2,678	5,147	33.6	12.87

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

Table 9. Number of trout released upstream at the lower Platte River weir, fall 1986.[1]

Date	Steelhead		Brown trout		Lake trout	
	Handled	Passed	Handled	Passed	Handled	Passed
8/31	—		—		—	
Weekly total	0	5	0	2	0	0
9/12	3		1		—	
Weekly total	3	5	1	2	0	0
9/17	17		1		5	
Weekly total	17	54	1	3	5	16
9/21	9		4		5	
9/23	22		3		3	
Weekly total	31	19	7	4	8	5
9/28	56		5		—	
10/01	99		6		—	
Weekly total	155	107	11	8	0	0
10/06	133		6		—	
10/10	6		4		1	
Weekly total	139	118	10	9	1	1
10/17	19		1		—	
Weekly total	19	35	1	2	0	0
Annual total	364	343	31	30	14	22
Combined total	707		61		36	

[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. Annual fall runs of steelhead, brown trout, and lake trout handled during the harvest of coho at the lower Platte River weir, 1980–86.

Year	Steelhead	Brown trout	Lake trout
1980	124	7	0
1981	682	78	0
1982	1,276	38	38
1983	1,545	58	7
1984	1,292	74	69
1985	1,189	79	20
1986	364	31	14

Table 11. Age composition and mean lengths and weights (±1 standard error of mean) of 54 steelhead trout sampled at the lower Platte River weir, fall 1986.

Age and sex	Number sampled	Percent of total sample	Percent of age group	Mean length (inches)	Mean weight (pounds)
Age 1.0					
Male	9		100	16.1±0.64	1.97±0.16
Female	0		0	—	—
Both	9	16.7		16.1±0.64	1.97±0.16
Age 2.0					
Male	1		100	16.8±0.00	2.09±0.00
Female	0		0	—	—
Both	1	1.8		16.8±0.00	2.09±0.00
Age 1.1					
Male	3		33.3	22.4±0.63	4.37±0.58
Female	6		66.7	23.3±0.39	5.48±0.22
Both	9	16.7		23.0±0.35	5.11±0.29
Age 2.1					
Male	2		22.2	24.9±0.08	6.17±0.44
Female	7		77.8	24.3±0.43	5.95±0.42
Both	9	16.7		24.5±0.34	6.00±0.33
Age 1.2					
Male	7		46.7	27.2±0.72	7.91±0.44
Female	8		53.3	27.1±0.49	8.13±0.46
Both	15	27.8		27.1±0.41	8.03±0.31
Age 2.2					
Male	3		60.0	27.5±1.31	8.05±0.90
Female	2		40.0	26.5±0.47	7.61±0.33
Both	5	9.2		27.1±0.77	7.87±0.51
Age 1.3					
Male	3		50	28.1±0.86	8.49±1.27
Female	3		50	27.8±0.53	8.19±0.38
Both	6	11.1		28.0±0.46	8.34±0.60
Total					
Male	28	51.9		—	—
Female	26	48.1		—	—
Both	54	100.0		24.1±0.60	6.10±0.34

Table 12. Age composition and average length and weight by age group for the steelhead runs in the lower Platte River 1984–86.

	1984		1985		1986	
Age	Percent	Average length (in) weight (lbs)	Percent	Average length (in) weight (lbs)	Percent	Average length (in) weight (lbs)
1.0	14.9	16.0 1.83	7.4	15.4 1.55	16.7	16.1 1.97
2.0	14.9	16.9 2.18	7.8	16.4 1.93	1.8	16.8 2.09
3.0	—	—	—	—	—	—
4.0	0.4	18.7 3.09	—	— —		— —
1.1	16.7	23.8 5.73	2.9	24.0 5.57	16.7	23.0 5.11
2.1	24.6	24.1 6.06	25.1	27.7 5.44	16.7	24.5 6.0
3.1	0.7	24.4 5.84	0.40	25.3 6.72	—	—
4.1	—	—	—	—	—	—
1.2	12.7	27.8 8.49	10.7	27.9 8.52	27.8	27.1 8.03
2.2	13.8	27.6 8.31	42.8	28.4 8.65	9.2	27.1 7.87
3.2	—	—	1.6	28.7 8.79	—	—
4.2	—	—	—	—	—	—
1.3	0.7	29.5 10.58	—	—	11.1	28.0 8.34
2.3	0.7	33.0 12.57	1.2	31.3 10.76	—	—
3.3	—	—	—	—	—	—
Average		22.8 5.49		25.2 6.71		24.1 6.10

Table 13. 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 1986.

Age	Summers in lake	Percent of sample	Mean length (inches)	Mean weight (pounds)
_.0	1	18.5	16.2±1.2	1.98±0.29
_.1	2	33.3	23.7±0.6	5.55±0.48
_.2	3	37.1	27.1±0.7	7.99±0.51
_.3	4	11.1	28.0±0.9	8.34±1.19
All			24.06	6.10

Table 14. Number of coho salmon harvested at the upper Platte River weir, fall 1986.

Date	Jacks	Males	Females		Mortalities
			Round	Stripped	
9/17	484	1,496	2,354	0	0
Weekly total	484	1,496	2,354	0	0
9/29	0	0	0	0	260
10/01	4	44	50	0	263
Weekly total	4	44	50	0	523
10/06	0	0	0	0	283
10/08	16	42	101	0	168
Weekly total	16	42	101	0	451
10/13	89	986	492	291	203
Weekly total	89	986	492	291	203
10/20	91	1,164	325	1,150	418
10/21	180	1,440	372	1,400	56
10/22	112	800	186	784	64
10/23	50	606	108	550	66
10/24	83	612	118	658	36
Weekly total	516	4,622	1,109	4,542	640
10/27	0	1,417	2,067	385	0
10/28	353	1,292	665	926	286
10/29	52	453	905	0	23
Weekly total	405	3,162	3,637	1,311	309
11/14	10	126	255	0	0
Weekly total	10	126	255	0	0
12/03	3	16	31	0	0
Weekly total	3	16	31	0	0
Annual total	1,527	10,494	8,329	6,144	2,126

Table 15. Weight (pounds) of coho salmon harvested at the upper Platte River weir, fall 1986.

Date	Jacks	Males	Females		Mortalities
			Round	Stripped	
9/17	736	7,630	12,005	0	0
Weekly total	736	7,630	12,005	0	0
9/29	0	0	0	0	1,352
10/01	6	193	223	0	1,157
Weekly total	6	193	223	0	2,509
10/06	0	0	0	0	1,443
10/08	22	175	460	0	756
Weekly total	22	175	460	0	2,199
10/13	124	4,467	2,269	1,006	928
Weekly total	124	4,467	2,269	1,006	928
10/20	136	5,238	1,562	4,140	1,946
10/21	270	6,318	1,786	5,040	261
10/22	168	3,600	893	2,822	298
10/23	75	2,727	518	1,980	307
10/24	125	2,754	566	2,369	167
Weekly total	774	20,637	5,325	16,351	2,979
10/27	0	7,148	10,544	1,501	0
10/28	494	6,403	3,432	3,611	1,459
10/29	73	2,332	4,665	0	117
Weekly total	567	15,883	18,641	5,112	1,576
11/14	14	580	1,173	0	0
Weekly total	14	580	1,173	0	0
12/13	5	82	158	0	0
Weekly total	5	82	158	0	0
Annual total	2,248	49,647	40,254	22,469	10,190
Mean weight	1.47	4.73	4.83	3.66	4.79

Table 16. Number and weight (pounds) of chinook salmon (adults and jacks combined) harvested at the upper Platte River weir, fall 1986.

	Males		Females		Mortality		Total	
Date	Number	Weight	Number	Weight	Number	Weight	Number	Weight
9/17	8	89	1	11	0	0	9	100
Weekly total	8	89	1	11	0	0	9	100
10/03	2	22	0	0	0	0	2	22
Weekly total	2	22	0	0	0	0	2	22
10/20	54	481	16	203	46	534	116	1,218
10/21	36	350	3	38	8	93	47	481
10/22	13	144	0	0	0	0	13	144
10/23	6	66	2	25	4	46	12	137
10/24	0	0	0	0	4	46	4	46
Weekly total	100	1,041	21	266	62	719	192	2,026
10/27	151	1,537	55	671	0	0	206	2,208
10/28	37	346	3	37	14	162	54	545
10/29	117	1,069	35	435	7	81	159	1,585
Weekly total	305	2,952	93	1,143	21	243	419	4,338
11/14	41	450	19	234	0	0	60	684
Weekly total	41	450	19	234	0	0	60	684
12/03	8	74	0	0	0	0	8	74
Weekly total	8	74	0	0	0	0	8	74
Annual total	464	4,628	134	1,654	83	962	690	7,244
Mean weight		9.97		12.34		11.59		10.50

LITERATURE CITED

Pecor, C. H. 1986. Platte River harvest weir and coho salmon egg-take report, 1985. Michigan Department of Natural Resources, Fisheries Technical Report 86–3, Ann Arbor.

Hay, R. L. 1983. Anadromous fish report for District 6, 1982. Michigan Department of Natural Resources, Fisheries Division, July 1983.

Report approved by W. C. Latta

Typed by G. M. Zurek

Appendix 1. 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 in September-November 1986.[1]

Length (inches)	Age					
	0.0	0.1	0.2	0.3	0.4	0.5
12	100	—	—	—	—	—
13	—	—	—	—	—	—
14	—	—	—	—	—	—
15	—	—	—	—	—	—
16	—	—	—	—	—	—
17	—	—	—	—	—	—
18	—	100	—	—	—	—
19	—	100	—	—	—	—
20	—	100	—	—	—	—
21	—	100	—	—	—	—
22	—	100	—	—	—	—
23	—	50	50	—	—	—
24	—	25	75	—	—	—
25	—	—	100	—	—	—
26	—	—	100	—	—	—
27	—	—	100	—	—	—
28	—	—	80	20	—	—
29	—	—	50	50	—	—
30	—	—	12	88	—	—
31	—	—	5	95	—	—
32	—	—	—	100	—	—
33	—	—	—	100	—	—
34	—	—	—	100	—	—
35	—	—	—	54	46	—
36	—	—	—	38	62	—
37	—	—	—	11	89	—
38	—	—	—	—	100	—
39	—	—	—	—	100	—
40	—	—	—	—	100	—
41	—	—	—	—	50	50
42	—	—	—	—	—	100

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