FISHERIES DIVISION

TECHNICAL REPORT

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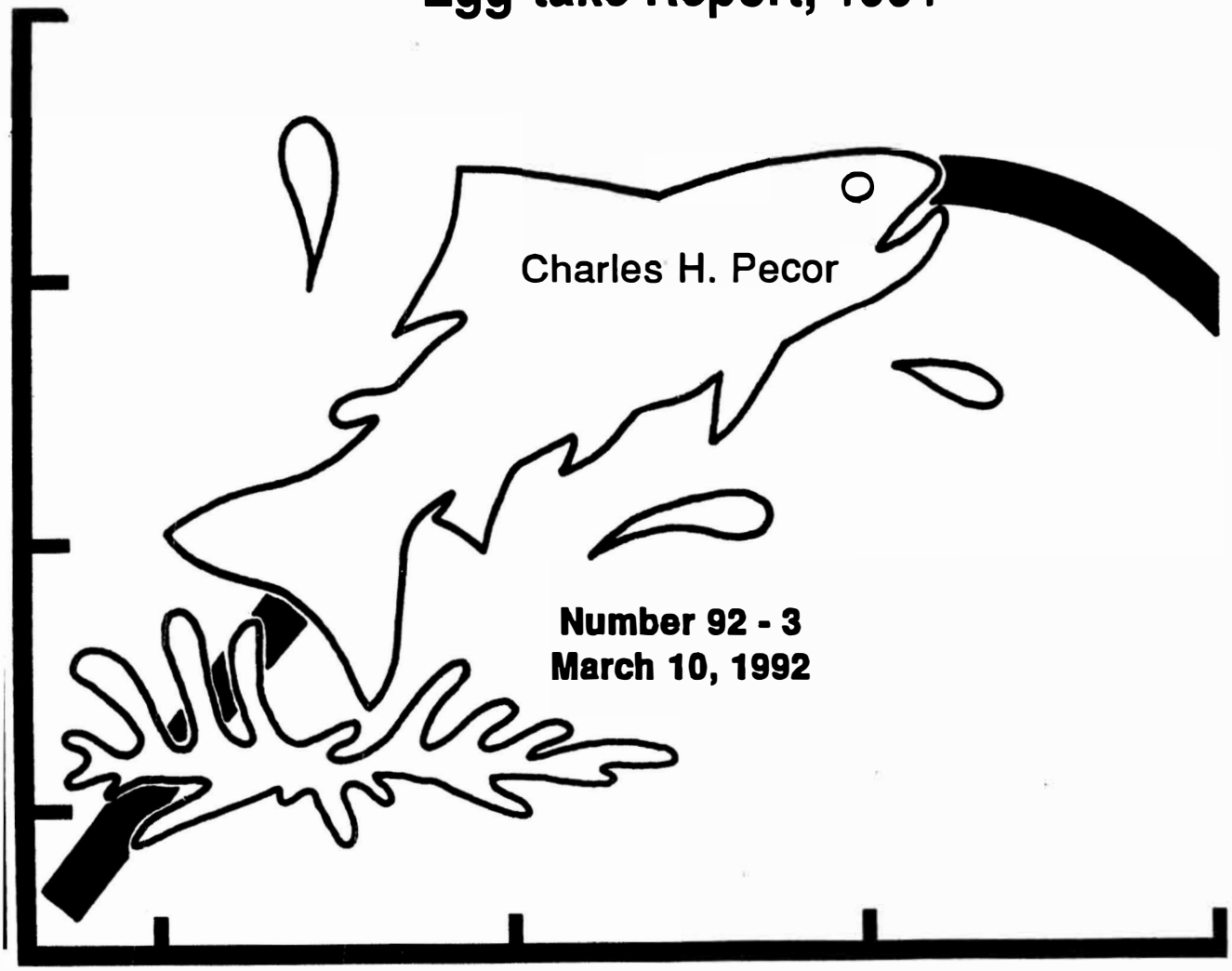

Charles H. Pecor

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FISHERIES DIVISION

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PLATTE RIVER HARVEST WEIR AND COHO SALMON EGG-TAKE REPORT, 1991

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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 (Figure 1). The 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 736,535) 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 1984, produced annual returns to the weir of 12.0% to 16.4%. The 1984 plant produced a 1985 return of only 80,354 coho adults, or 8.1%. Plants since 1984 decreased to a low of 622,079 smolts in 1987 and then increased to 923,544 in 1988. The 1990 plant was 636,775 smolts. Adult returns have remained relatively low.

The Platte River has two salmon blocking weirs. The lower weir is located 1.6 miles upstream from the river mouth (Figure 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.

Historically, in-state and out-of-state commitments required the collection of 12 to 14 million coho eggs annually. Depending on the size of the returning coho, the egg-take required 5,750-7,000 adult females (age 1.1).[1] To assure that enough females were available for egg-take, Fisheries Division 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 were passed each week to maintain a sport fishery in the river. However, from 1988 to 1991 the egg-take and weir operations were altered as a result of a court ruling in a suit filed by Platte Lake Improvement Association regarding phosphorus released from Platte River Hatchery and returning salmon which die in the river. The court orders for the 1988, 1989, and 1990 salmon runs are described in previous weir reports (Pecor 1989, 1990, and 1991). During 1991, the court again allowed the passage of the first 20,000 adult salmon and then 1,000 a week up to

[1]Age 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.

October 15. The court also mandated that dead fish be picked up from the river and lakes and that a portion of the fish released above the lower weir be weighed, measured, and tagged so corresponding data could be collected at the upper weir. The weir was operated until December 2 when the grates were removed and the buildings winterized.

Salmon blocked by the lower weir (including surplus coho; a moderate run of chinook; and, in recent years, a few pink salmon) are collected and harvested. Coho jacks (age-1.0) were blocked for the third consecutive year by the addition of smaller-spaced (15/16 inch) 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 1991 salmon run was typical when compared to the low returns of the past few years. The fish concentrated off Frankfort and Platte bays during the last 2 weeks in August and migrated up the river during the last 15 days in September as expected. The open-water fishery was poor due to the low number of fish returning and bad weather. The river fishery was excellent. The salmon stayed in Loon Lake and the lower Platte River for an extended period of time. The egg-take was delayed this year because a large portion of the fish did not move up to the hatchery until after the middle of October.

Lower Weir Operation, 1991

The weir grates were installed on August 19. On August 28, additional smaller-spaced weir grates were placed on top of the existing grates to prevent coho jacks from escaping upstream without being counted. Between August 22 and August 27, the weir gate was closed at night and the accumulated fish were processed the next morning. The weir gate was left open during the day. National Park Service personnel assisted in this operation by closing the weir gate at night. Beginning August 27, the weir gate was closed and not opened again except to pass fish and to pass boat traffic during the Labor Day weekend. The smaller "jack" grates were removed on October 5 after the jack run was over. Employees of Tempotech Industries manned the weir 24 hours per day from September 13 to November 4, and intermittently between November 5 and December 2. Tempotech Industries has the contract with the State of Michigan to harvest surplus salmon.

A total of 26,519 salmonids (salmon plus trout) were actually counted through the weir between September 1 and October 14. All fish swimming through the weir were counted by species. Separate counts were made for coho and chinook jacks but chinook jacks were difficult to identify and were probably counted as adult coho in many cases (Table 2). The coho and chinook runs peaked on September 26 and October 10, respectively (Figures 2 and 3).

Harvest operations began September 13 and continued intermittently until December 2. Salmon were actually harvested on 30 days during this period but on only 13 of the harvest days did salmon numbers exceed 200 fish. All salmon harvested were sent to Tempotech Industries in Hart, Michigan. All trout collected during harvesting were transferred upstream from the weir.

Coho Salmon

The harvest of coho salmon began on September 13 and ended on December 2, a period of 91 days. However, 66% of the coho were harvested between September 19 and September 26 (Figure 2). A total of 8,428 adult coho weighing 64,961 pounds and 1,161 jack coho weighing 1,661 pounds were harvested (Table 3). Weighted seasonal mean weights of coho adults and jacks were 7.6 and 1.4 pounds, respectively (Table 4). An additional 20,475 adult coho were passed upstream for egg-take operations at the upper weir (Table 2). A weekly summary of the number and weight of coho passed and harvested by age and sex is shown in Table 5.

The total run of 28,903 adult coho in the lower Platte River represented a return of

only 4.5% of the 1990 smolt plant. This was the third lowest percent return during the period 1979-91 (Table 6). Although returns to the weir were relatively low, the spring fishery for coho in southern Lake Michigan was spectacular.

Most 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 27.1 inches and 8.1 pounds and females averaged 25.8 inches and 7.2 pounds.

During harvest operation 1,161 age-1.0 coho were harvested and all were males (jacks). They had an average length of 15.3 inches and average weight of 1.4 pounds (Table 4). The one age-1.2 coho harvested was a female that was 35.3 inches long and weighed 16.0 pounds (age confirmed by scale aging).

During the harvest operations a total of 3,358 adult coho and 284 jack coho were sampled for biological data. Most of the sampling was done at the Tempotech plant in Hart, Michigan, by Fisheries Division personnel in an attempt to facilitate and consolidate the sampling. Nineteen (0.6%) lamprey wounds were observed on adult coho in the biological samples, and 9 adults and 13 jacks had fin clips. The fin clips on adult coho were adipose (Ad, 3 fish) and left pectoral (LP, 6 fish). The Ad fin clip is reserved for fish containing coded-wire microtags in their snouts but no tags were recovered so the origin of the Ad-clipped fish is unknown. The LP-clipped fish were planted as accelerated growth fall fingerlings in the Kewaunee River during the fall of 1989 by the Wisconsin Department of Natural Resources (WDNR). The right pectoral (RP) clip was the only mark found on the 13 jack coho. These fish were also planted as accelerated growth fall fingerlings in the Kewaunee River during the fall of 1990 by the WDNR.

In summary, a total of 28,903 adult coho salmon reached the lower Platte River weir during the fall of 1991—13,238 (45.8%) males and 15,665 (54.2%) females (Table 5). The total adult run was 4.5% of the 1990 plant of 636,775 age-1.0 smolts (Table 6).

Chinook Salmon

The chinook salmon run in the lower Platte River spanned the period from September 1 to November 20, although 75% of the run was harvested between September 23 and October 14 (Figure 3). A total of 3,873 chinook, including 1,671 adults (age 0.2 to 0.5) and 2,202 jacks (age 0.0 and 0.1), weighing 34,859 pounds were harvested (Table 7). The average weights of adults and jacks were 14.3 and 4.9 pounds, respectively. An additional 572 chinook were passed upstream at the lower weir (Table 2). A weekly summary of chinook passed and harvested combined, by age and sex, is shown in Table 8.

Biological data were collected from 448 adult chinook randomly sampled during the harvest operation. In addition, biological data were collected from 576 jack chinook sorted out of the harvest. Chinook salmon length frequencies were converted to age frequencies by means of a length-age frequency table (Table 9) constructed by District 6 personnel at the Harrietta warehouse. They used scale samples and length measurements obtained during creel census at Ludington, Manistee, Frankfort, and Grand Traverse Bay, for the months August through October 1991. 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 estimates of age composition of the 1991 chinook harvest were <0.1 % age 0.0, 56.2% age 0.1, 9.3% age 0.2, 24.6% age 0.3, 9.5% age 0.4, and 0.3% age 0.5 (Table 8). Average lengths and weights for each age group are presented in Table 10.

Lamprey wounds were observed on 5 (1.1%) of the adult chinook salmon sampled for biological data, compared to 0.5% in 1990 and 1.3% in 1989. No lamprey wounds were observed on chinook jacks. A total of 93 chinook with fin clips were recorded during the harvest operations, 12 adults and 81 jacks. Of the adults, 1 fish had a LP clip, 1 fish had a left ventral (LV) clip, 2 fish had both ventrals (BV) clipped, 2 fish had a right pectoral-left ventral (RP-LV) clip, and 6 fish

had an AD clip. The LP clip designated chinook planted at Chicago (Diversey Harbor) in 1989 by the Illinois Department of Conservation. The LV was of unknown origin. The BV clips designated chinook planted at Nunn's Creek, Lake Huron, during 1988 by the Michigan Department of Natural Resources (MDNR). One of the RP-LV clipped fish was planted in Trail Creek in 1989 by the Indiana Department of Natural Resources (IDNR). The second RP-LV clipped fish did not match up with any known planting based on its assigned age. However, if this fish was actually 1 year younger than its assigned age then it matches up to a plant made at Swan Creek, Lake Huron, in 1988 by the MDNR. Micro tags were recovered and read from four of the six Ad-clipped fish. All four were fish planted by the WDNR at Strawberry Creek (1 fish, 1988 and 1 fish, 1989), Racine (1 fish, 1988) and Sheboygan (1 fish, 1988). The fish planted at Racine and Sheboygan were fish that had been chemically treated to induce sterility. Both fish were mature. The other two Ad-clipped fish were of unknown origin since no microtags were found.

Of the 81 marked chinook jacks, 1 was RP clipped, 2 were LV clipped, 9 were right ventral (RV) clipped, and 69 were Ad clipped. The origin of the RP-clipped fish is unknown. The LV-clipped fish designated chinook planted at several lake front sites (Michigan City, Burns Harbor, East Chicago and Wihala Park) in 1990 by the IDNR. The RV-clipped fish were from plants made in the Boardman or Little Manistee rivers in 1990 by the MDNR. Coded-wire microtags were recovered and read from 65 of the 69 Ad-clipped jacks. Fifty four (83%) of these fish were planted in Medusa Creek, seven (11%) were planted in the Little Manistee River, two (3%) were triploids planted in the Little Manistee River, and two (3%) were from Strawberry Creek, Wisconsin. The origin of the four fish without microtags is unknown. All chinook jacks were planted in 1990.

The total run of 4,445 chinook at the lower weir in 1991 was about average for the 12-year period 1979-91 (Table 11). The average return for this period was 4,484 chinook. The average weight of adult chinook in 1991 was 0.9 pounds greater than in 1990 (Table 11). Adult males and females comprised 67.2% and 32.8% of the adult run, respectively. Jacks comprised 56.2% of the overall run (Table 12). 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 normally run the Platte River only during odd-numbered years. However, only three pink salmon were harvested and one more was passed upstream. These salmon averaged 17.1 inches and 1.8 pounds. Pink salmon numbers in the Platte peaked in 1987 when 137 were harvested or passed upstream.

Steelhead Trout

The steelhead run was strong throughout the fall but peaked the week of October 21 (Table 13). During the harvest operation 2,219 steelhead were handled. This was the second largest number of steelhead handled during the period 1980-present (Table 14). An additional 964 steelhead were passed upstream through the open weir gate and the total steelhead run of 3,183 was the largest recorded for the lower Platte River. A weekly summary of the number and weight of steelhead returning to the lower Platte weir by age and sex is presented in Table 15.

Biological information, including scale samples, were collected from 384 steelhead. All scale samples (including steelhead and brown trout) were aged by District 6 personnel at Harrietta warehouse. A total of 10 age groups were recorded in 1991 (Table 15) as compared to 10 in 1990 and 11 in 1989. Fish in age-group 2.2 were the most numerous (31.3%) and fish in age-group 2.4 were the least numerous (0.9%). Most (53.5%) of the steelhead smolted after two summers in the river and 46.5% smolted after one summer in the river. In 1990, 69.0% smolted after two

summers in the river. The average length and weight for each age group are shown in Table 16.

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 (Table 17), as was true in the other years. Steelhead which had spent two or three summers (age _.1 and _.2) in Lake Michigan accounted for 75.6% of the run. Fish which had spent four and five summers in Lake Michigan were represented at lower numbers (Table 17). A summary of fall steelhead runs in the lower Platte River is presented in Table 18.

No lamprey scars or wounds were observed on any steelhead. Seven steelhead had Ad fin clips and two had LP fin clips. The Ad-clipped fish corresponded to smolts planted in 1988 (2 fish), 1989 (4 fish) and 1991 (1 fish) at various Michigan ports including Frankfort. The LP-clipped fish corresponded to a 1988 plant of "skamania" steelhead by Wisconsin in the Oconto River.

Overall, steelhead in 1991 had a mean length of 26.3 inches and a mean weight of 7.7 pounds, and consisted of 47.8% males and 52.2% females. Steelhead scales showing one or more spawning checks accounted for 20.0% of the sample.

Brown Trout and Lake Trout

Brown trout and lake trout are only minor components of the salmonid run in the Platte River (Tables 13 and 14). A total of 50 brown trout and 3 lake trout were handled, counted and transferred upstream in 1991. Four additional brown trout were passed upstream when the coho salmon were passed. This gives total runs in 1991 of 54 brown trout and 3 lake trout.

Biological information was obtained from 46 brown trout. Five age groups were identified: age-1.0 (2 fish), age-1.1 (31 fish), age-2.1 (7 fish), age 1.2 (12 fish), age-2.2 (2 fish). Lengths ranged from 13.2 to 27.8 inches (average 22.8) and weights ranged from 1.0 to 11.4 pounds (average 6.2). The sex ratio was 59.3% male to 40.7% female.

Only three lake trout were passed upstream, one each on September 28, October 12 and 14. Biological data was collected from only one of these lake trout. This fish was a male, 25.6 inches long, weighed 5.5 pounds and had a left pectoral (LP) fin clip. The LP-clipped lake trout was planted in 1985 at Frankfort and Empire as well as numerous other ports on Lake Michigan.

Upper Weir Operation, 1991

The operation at the upper Platte River weir is primarily for egg-taking and does not have the capability of harvesting a large number of salmon efficiently. The facility consists of a weir, fish passageway, 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 September 4 and the facility was fully operational by September 5.

Coho Salmon

The first coho salmon (1 jack) reached the maturation ponds on September 6. The first large group of coho did not reach the upper weir until September 29 and a second large group of fish arrived on October 25. The fish stayed in the river system for an extended period of time and delayed egg-take operations.

Egg-taking operations started on October 14. A total of 9,216,574 eggs were collected and fertilized during six working days between October 14 and October 31. Of these eggs, 7,126,234 (77.3%) were for in-state rearing and 2,090,340 (22.7%) were for out-of-state commitments (i.e., Indiana, 0.89 million; and Illinois, 1.2 million).

The 1991 egg-take was modified for the third year to allow inspections for bacterial kidney disease (BKD) in potential spawners. The eggs from any coho exhibiting gross

symptoms of BKD were discarded and all materials coming in contact with the infected fish were disinfected in an iodine solution. Approximately 5.3% of the females cut during egg-take had visible BKD symptoms compared to 8.4% and 8.6% in 1989 and 1990, respectively. In almost all cases the spleen was the primary organ which showed symptoms. This procedure identified only fish with visible BKD symptoms and not fish with lesser infections of BKD. Males were not inspected. Egg quality appeared to be excellent throughout the egg-take operations. Water temperatures at the lower weir were below 19°C (66°F) during the major migration into the lower river and below 14°C (57°F) at the hatchery during the maturation period.

The eye-up rate of coho salmon eggs incubated at the Platte River Hatchery was poor. The average eye-up rate for eggs collected was 57.3%, with a daily range from 36.3% to 65.7%. All coho eggs had to be "picked" a second time because the eggs continued to die after the first "picking". The use of an iodophor for the second year during water-hardening to control BKD may have adversely impacted the development and survival of the coho eggs. Coho eggs incubated in 1990 showed similar losses with an eye-up rate of only 58.6%. Coho eye-up rates during the previous 10 years ranged from 50.4% (1984) to 79.0% (1988) and averaged 69.7%.

A total of 3,219 female coho salmon were stripped to collect the 9.2 million eggs (Table 19), an average of 2,863 eggs per female. A check of the actual fecundity of coho was not done this year.

The egg-take and harvest operation at the upper weir accounted for 15,496 coho, including 4,251 (27.4%) jacks and 11,245 (72.6%) adults (Table 19). The number of adults harvested at the upper weir was 55.2% of the estimated total number of adults passed at the lower weir. An additional 483 dead adult coho were picked up by the river crew and 93 dead adults were removed from the weir grates at the lower weir. Thus 11,821 (57.7%) adult coho of the 20,475 adult coho passed upstream were harvested and 8,654 adult coho were not accounted for. Between 1983 and 1987, 67% to 76.5% of the adult coho passed reached the upper weir. Between 1988 and 1990, only 43% to 58% reached the upper weir. Coho jacks harvested at the upper weir and picked up as mortalities from the river accounted for 94.7% (4,272 jacks) of the 4,512 jacks passed upstream.

The adult run at the upper weir consisted of 47.7% male and 52.3% female, based on the actual numbers of fish harvested. Males averaged 27.7 inches in length and 7.7 pounds in weight, and females averaged 26.1 inches in length and 6.9 pounds in weight. Overall, the adult coho averaged 26.9 inches and 7.3 pounds. Coho at the upper weir were longer but 0.3 pounds lighter than coho harvested at the lower weir. Ninety percent of the adult coho handled at the upper weir were used in the egg-take operations. The total weight of adult and jack coho harvested at the upper weir was 83,066 pounds (Table 20).

A total of 4,185 jack coho (100% males, age 1.0) were harvested at the upper weir (Table 19). The total jack run in the Platte River, including jacks harvested at the lower weir, was 5,346. This represents 0.7% of the total coho smolt plant in 1991 and 15.4% of the total run of 34,699 coho (adults and jacks) in the Platte River during 1991.

The weighted mean length and weight of jacks for 1991 were 15.3 inches and 1.4 pounds. In 1988, 1989, and 1990 the jacks averaged 15.3, 15.6, and 15.4 inches in length and 1.3, 1.5, and 1.5 pounds in weight, respectively.

Chinook Salmon

Only 489 chinook were harvested at the upper weir (Table 21) and most were jacks (84%). The average weight of all chinook (adults and jacks combined) was 5.5 pounds. The harvest of 489 fish plus the 32 dead chinook picked up in the river was 91.1% of the number of chinook (572 fish) passed upstream at the lower weir.

Summary

The 1991 run of coho salmon in the Platte River consisted of 28,903 adults (45.8% male and 54.2% female) and 5,673 jacks (100% male). Mean sizes at the lower weir were 27.1 inches and 8.1 pounds for adult males and 25.8 inches and 7.2 pounds for adult females, and 15.3 inches and 1.4 pounds for jacks. Mean sizes at the upper weir were 27.7 inches and 7.7 pounds for adult males, 26.1 inches and 6.9 pounds for adult females, and 15.3 inches and 1.4 pounds for jacks.

A grand total of 25,085 coho adults and jacks weighing 149,688 pounds were harvested. A total of 9,589 adults and jacks weighing 66,622 pounds were harvested at the lower weir and 15,496 adults and jacks weighing 83,066 pounds were harvested at the upper weir. The upper weir harvest included 3,219 stripped females weighing 17,319 pounds, from which 9.2 million eggs were taken. Egg quality was good but eye-ups were poor as reflected in an average eye-up of 57.3% for eggs collected at the Platte River Hatchery.

The 1991 run of 4,445 chinook (85.6% males and 14.4% females) was about average for the period 1979 to 1991. Ultimately, 4,362 of these chinook (98.1%, 37,566 pounds) were harvested—3,873 at the lower weir and 489 at the upper weir. The age composition of the chinook run was <0.1%, age-0.0 jacks; 56.2%, age-0.1 jacks; 9.3%, age-0.2 adults; 24.6%, age-0.3 adults; 9.5%, age-0.4 adults; and 0.3%, age-0.5 adults. The mean weights of age groups 0.0 through 0.5 were 0.5, 4.9, 9.2, 13.9, 20.0, and 27.0 pounds, respectively.

The 1991 fall steelhead run of 3,183 fish (49% males and 51% females) was the largest recorded during the past 12 years. Ten different age groups were identified but fish which had spent two or three summers in Lake Michigan (age groups 1.1, 2.1, 1.2, and 2.2) accounted for 75.6% of the run. Overall the steelhead averaged 26.3 inches long and weighed 7.7 pounds.

Other salmonids passed upstream or harvested included 54 brown trout, 3 lake trout, and 4 pink salmon.

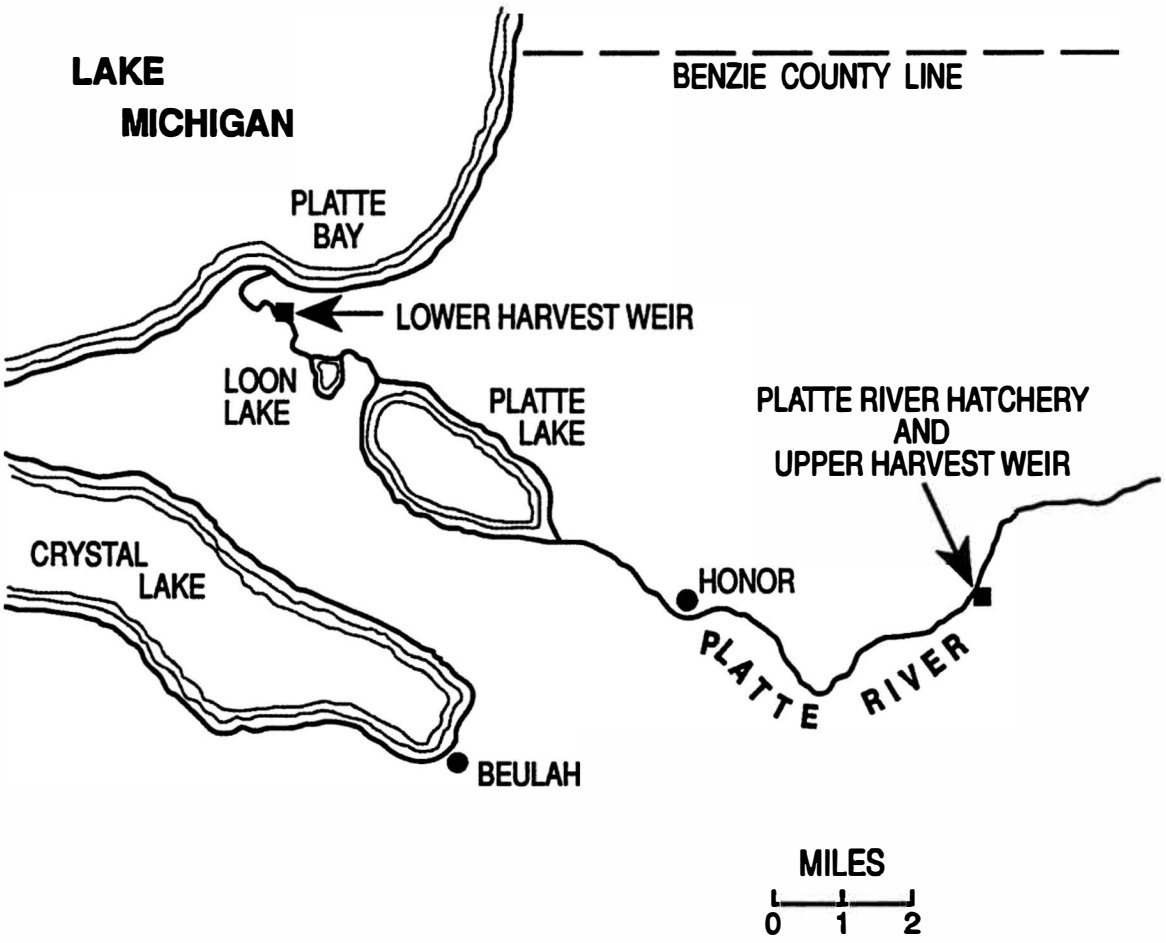

Figure 1.—Location of the Platte River Hatchery and the upper and lower harvest weirs.

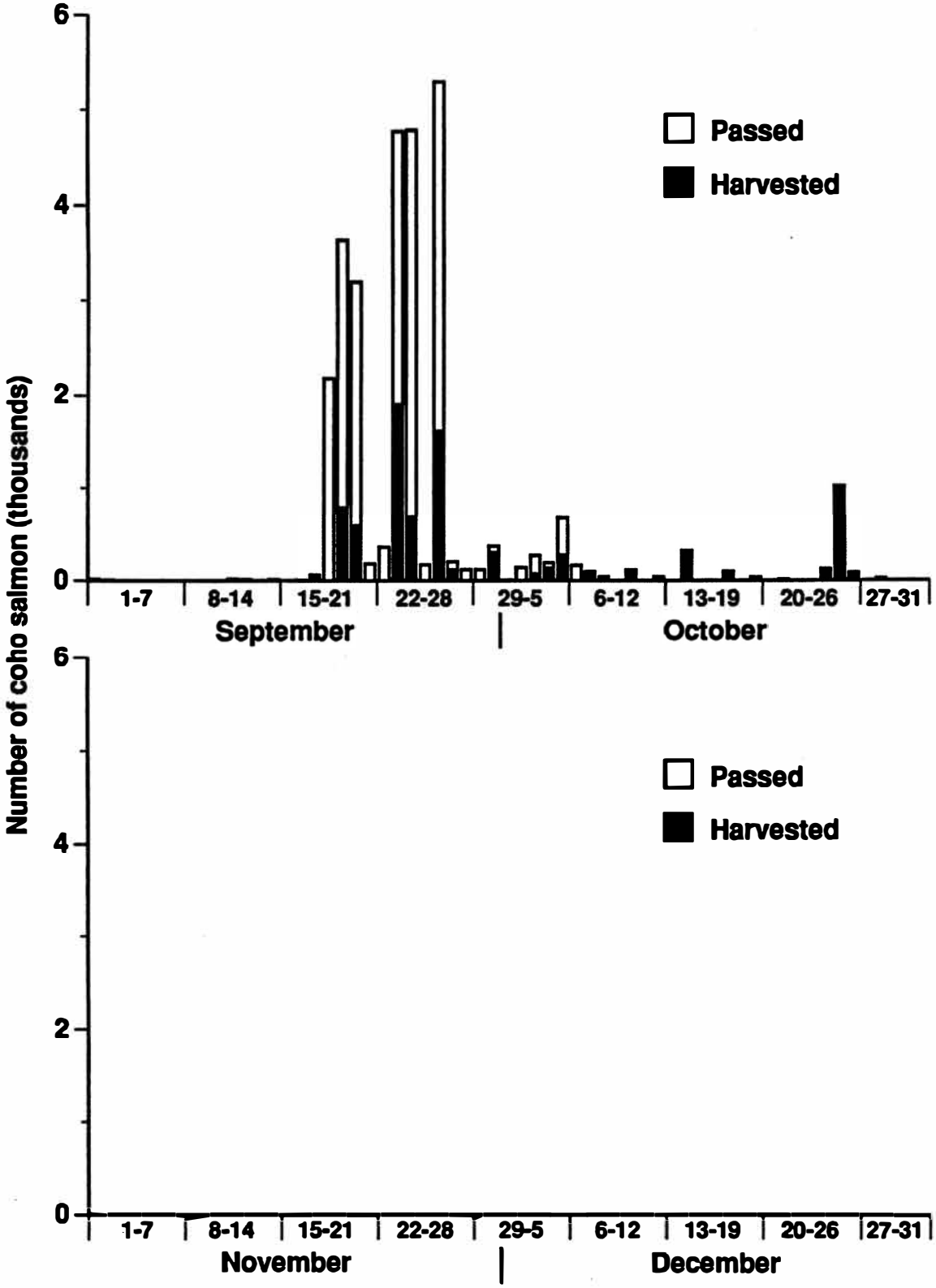

Figure 2.—Periodicity of coho salmon passed upstream or harvested at the lower Platte River weir, fall 1991.

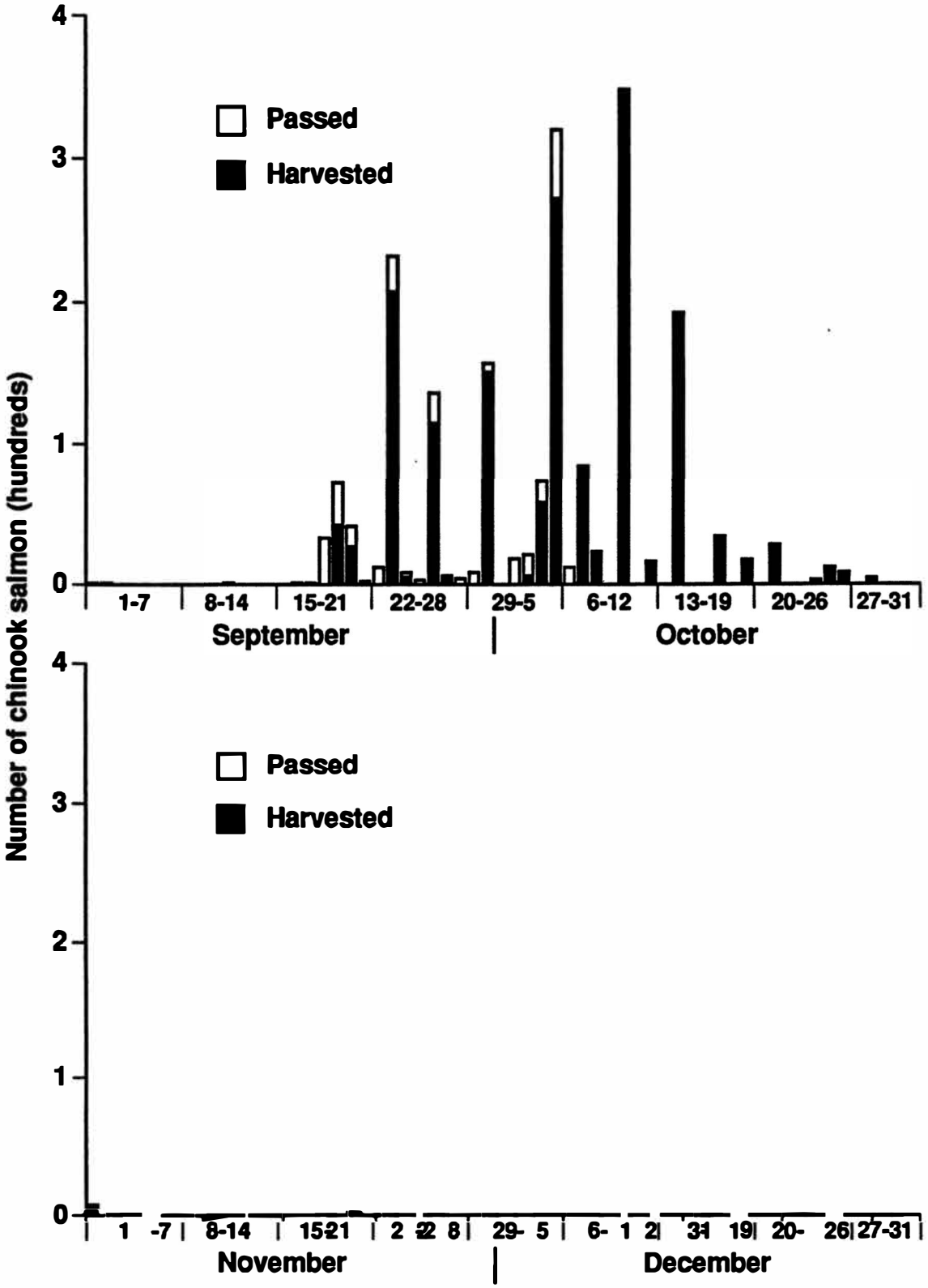

Figure 3.—Periodicity of chinook salmon passed upstream or harvested at the lower Platte River weir, fall 1991.

Table 1.—Number of anadromous salmonids planted in the Platte River, 1966-91.

Year	Coho (yearlings)	Chinook (spring fingerlings)	Steelhead (yearlings)	Atlantic salmon (yearlings)
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	1,000,000	—	—	—
1983	953,499	—	—	—
1984	989,192	—	—	—
1985	817,483	—	—	—
1986	751,183	—	—	—
1987	622,079	—	—	—
1988	923,544	—	—	—
1989	806,190	—	—	—
1990	636,775	—	—	—
1991	814,885	—	—	—
Total	19,149,912	94,130	394,910	7,308

Table 2.—Total number of adult and jack coho and chinook salmon passed upstream at the lower Platte River weir, fall 1991.

Date	Coho		Chinook	
	Adults	Jacks	Adults	Jacks
9/01	13	3	1	0
9/02	4	0	1	0
9/07	0	1	0	0
Weekly total	17	4	2	0
9/11	16	160	1	3
9/12	9	291	0	0
9/14	8	33	0	0
Weekly total	33	484	1	3
9/16	1	86	0	0
9/17	13	0	0	0
9/18	2,180	2,059	33	18
9/19	2,853	790	30	11
9/20	2,604	380	14	41
9/21	178	24	2	4
9/22	359	51	12	20
Weekly total	8,188	3,390	91	94
9/23	2,874	162	25	24
9/24	4,104	209	3	18
9/25	168	26	3	0
9/26	3,690	130	21	77
9/27	85	15	1	0
9/28	114	13	4	0
9/29	116	17	8	2
Weekly total	11,151	572	65	121
9/30	71	7	6	0
10/01	3	0	0	0
10/02	137	9	18	7
10/03	201	11	15	11
10/04	60	4	15	5
10/05	391	29	48	38
10/06	159	2	12	20
Weekly total	1,022	62	114	81

Table 2.—Continued:

Date	Coho		Chinook	
	Adults	Jacks	Adults	Jacks
10/07	12	0	0	0
10/08	2	0	0	0
10/10	15	0	0	0
10/12	1	0	0	0
Weekly total	30	0	0	0
10/14	12	0	0	0
10/17	13	0	0	0
10/25	9	0	0	0
Weekly total	34	0	0	0
Annual total	20,475	4,512	273	299

Table 3.—Summary of adult and jack coho salmon harvested at the lower Platte River weir, fall 1991.

Date	Coho harvested: Jacks age 1.0	Coho harvested: Adult age 1.1	Coho harvested: Mortalities	Cumulative total	Jack total weight (pounds)	Adult total weight (pounds)
9/13	99	1	0	100		
Weekly total	99	1	0		126	6
9/16	113	1	0	214		
9/17	716	45	0	975		
9/19	105	785	0	1,865		
9/20	40	588	1	2,494		
Weekly total	974	1,419	1		1,396	10,078
9/23	29	1,896	0	4,419		
9/24	12	680	0	5,111		
9/26	16	1,605	1	6,733		
9/27	2	117	0	6,852		
Weekly total	59	4,298	1		100	34,186
9/30	5	300	2	7,159		
10/03	2	69	4	7,234		
10/04	3	132	2	7,371		
10/05	0	276	3	7,650		
Weekly total	10	777	11		18	5,770
10/07	0	84	1	7,735		
10/08	0	35	2	7,772		
10/10	0	95	0	7,867		
10/12	0	38	0	7,905		
Weekly total	0	252	3		0	1,911
10/14	0	306	0	8,211		
10/17	1	63	2	8,277		
10/19	0	32	0	8,309		
Weekly total	1	401	2		1	3,292

Table 3.—Continued:

Date	Coho harvested: Jacks age 1.0	Coho harvested: Adult age 1.1	Coho harvested: Mortalities	Cumulative total	Jack total weight (pounds)	Adult total weight (pounds)
10/21	0	11	0	8,320		
10/24	1	121	0	8,442		
10/25	15	1,008	0	9,465		
10/26	2	83	0	9,550		
Weekly total	18	1,223	0		20	9,428
10/28	0	21	0	9,571		
11/01	0	12	0	9,583		
Weekly total	0	33	0		0	234
11/11	0	0	0	9,583		
Weekly total	0	0	0		0	0
11/14	0	0	0	9,583		
Weekly total	0	0	0		0	0
11/20	0	3	0	9,586		
Weekly total	0	3	0		0	28
12/02	0	3	0	9,589		
Weekly total	0	3	0		0	28
Annual total	1,161	8,410	18	9,589	1,661	64,961

Table 4.—Mean total length (inches) and weight (pounds), by age and sex, of coho salmon harvested at the lower Platte River weir, fall 1991. Two standard errors in parentheses.

Week beginning	Measure-ment	Age 1.0		Age 1.1	
		Male	Female	Male	Female
9/09	Length	14.7	—	—	24.7
		(0.135)	—	—	—
	Weight	1.3	—	—	5.8
		(0.040)	—	—	—
9/16	Length	15.3	—	26.3	25.5
		(0.204)	—	(0.363)	(0.299)
	Weight	1.4	—	7.3	6.9
		(0.067)	—	(0.290)	(0.227)
9/23	Length	15.9	—	27.4	26.0
		(0.397)	—	(0.151)	(0.135)
	Weight	1.7	—	8.5	7.5
		(0.109)	—	(0.136)	(0.108)
9/30	Length	16.5	—	27.3	25.1
		(0.989)	—	(0.390)	(0.431)
	Weight	1.8	—	8.1	6.6
		(0.253)	—	(0.361)	(0.310)
10/07	Length	—	—	26.8	26.7
		—	—	(1.697)	(0.960)
	Weight	—	—	7.3	7.6
		—	—	(1.354)	(0.790)
10/14	Length	15.0	—	28.4	26.7
		—	—	(0.628)	(0.569)
	Weight	1.3	—	8.9	7.4
		—	—	(0.649)	(0.457)
10/21	Length	16.0	—	28.4	27.2
		(0.450)	—	(0.537)	(0.365)
	Weight	1.1	—	8.1	7.4
		(0.125)	—	(0.512)	(0.303)
10/29	Length	—	—	28.1	26.0
		—	—	(1.252)	(1.364)
	Weight	—	—	7.6	6.8
		—	—	(1.024)	(1.134)
11/18	Length	—	—	30.2	—
		—	—	(0.987)	—
	Weight	—	—	9.4	—
		—	—	(1.701)	—
Weighted seasonal mean	Length	15.3	—	27.1	25.8
		(0.161)	—	(0.144)	(0.122)
	Weight	1.4	—	8.1	7.2
		(0.052)	—	(0.120)	(0.094)
Sexes combined	Length	15.3		26.4	
		(0.161)		(0.095)	
	Weight	1.4		7.6	
		(0.052)		(0.076)	

Table 5.—Summary of the number and weight, by age and sex, of jack and adult coho salmon returning to the lower Platte River weir (harvested plus passed), fall 1991.

Week beginning	Male		Female		Total	
	Number	Pounds	Number	Pounds	Number	Pounds
Age 1.0						
9/09	587	747	—	—	587	747
9/16	4,364	6,253	—	—	4,364	6,253
9/23	631	1,069	—	—	631	1,069
9/30	72	129	—	—	72	129
10/07	—	—	—	—	—	—
10/14	1	1	—	—	1	1
10/21	18	20	—	—	18	20
10/28	—	—	—	—	—	—
11/18	—	—	—	—	—	—
Total	5,673	8,219	—	—	5,673	8,219
(Percent)	(16.4)	(3.6)	—	—	(16.4)	(3.6)
Age 1.1						
9/09	—	—	51	296	51	296
9/16	4,406	32,197	5,202	35,993	9,608	68,190
9/23	7,066	60,107	8,384	62,752	15,450	122,859
9/30	865	7,049	945	6,204	1,810	13,253
10/07	107	779	178	1,357	285	2,136
10/14	231	2,047	206	1,522	437	3,569
10/21	544	4,401	679	5,027	1,223	9,428
10/28	13	99	20	135	33	234
11/18	6	56	—	—	6	56
Total	13,238	106,735	15,665	113,286	28,903	220,021
(Percent)	(38.3)	(46.8)	(45.3)	(49.6)	(83.6)	(96.4)

Table 6.—Summary of adult (age 1.1) coho salmon runs at the lower Platte River weir, 1979-91.

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	516,202	7.1	23.1	4.4
1980	76,480[1]	46,633	123,113	973,032	12.7	26.9	7.6
1981	38,874	129,175	168,049	1,028,038	16.3	27.0	6.8
1982	38,951	90,412	129,363	944,205	13.7	25.8	6.2
1983	35,600	120,758	156,358	1,000,000	15.6	26.6	6.9
1984	36,572	105,530	142,102	953,499	14.9	24.8	5.5
1985	30,736	49,659	80,354	989,192	8.1	25.7	6.1
1986	36,124	16,646	52,770	817,488	6.5	24.4	5.3
1987	30,437	24,707	55,144	751,183	7.3	26.1	6.1
1988	4,860	21,258	26,118	622,079	4.2	25.5	6.2
1989	21,250	28,543	49,793	923,544	5.4	26.2	6.3
1990	21,609	11,212	32,821	806,190	4.1	26.2	6.6
1991	20,475	8,428	28,903	636,775	4.5	26.4	7.6

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

Table 7.—Summary of chinook salmon harvested at the lower Platte River weir, fall 1991.

Date	Chinook harvested: Jacks ages 0.0-1.0	Chinook harvested: Adults ages 0.2-0.5	Mortalities	Cumulative total	Total weight (pounds)
9/16	1	1	0	2	
9/17	10	1	0	13	
9/19	169	42	0	224	
9/20	52	27	0	303	
Weekly total	232	71	0		2,097
9/23	244	207	0	754	
9/24	22	5	0	781	
9/26	205	115	0	1,101	
9/27	3	5	0	1,109	
Weekly total	474	332	0		7,248
9/30	121	151	0	1,381	
10/03	15	6	0	1,402	
10/04	83	58	0	1,543	
10/05	370	272	0	2,185	
Weekly total	589	487	0		9,370
10/07	110	84	0	2,379	
10/08	18	23	0	2,420	
10/10	375	348	1	3,144	
10/12	25	16	0	3,185	
Weekly total	528	471	1		9,735
10/14	238	192	0	3,615	
10/17	57	34	0	3,706	
10/19	11	17	0	3,734	
Weekly total	306	243	0		5,233
10/21	30	28	0	3,792	
10/24	4	3	1	3,800	
10/25	17	12	0	3,829	
10/26	7	8	0	3,844	
Weekly total	58	51	1		911
10/28	4	4	0	3,852	
11/01	4	8	0	3,864	
Weekly total	8	12	0		207
11/14	1	0	0	3,865	
11/20	6	2	0	3,873	
Weekly total	7	2	0		58
Annual total	2,202	1,669	2	3,873	34,859

Table 8.—Summary of the number and weight, by age and sex, of chinook salmon returning to the lower Platte River weir (harvested plus passed), fall 1991.

Week beginning	Male		Female		Total	
	Number	Pounds	Number	Pounds	Number	Pounds
Age 0.0						
9/16	—	—	—	—	—	—
9/23	1	1	—	—	1	1
9/30	—	—	—	—	—	—
10/07	—	—	—	—	—	—
10/14	—	—	—	—	—	—
10/21	—	—	—	—	—	—
10/28	—	—	—	—	—	—
11/18	—	—	—	—	—	—
Total	1	1	—	—	1	1
(Percent)	(<0.1)	(<0.1)	—	—	(<0.1)	(<0.1)
Age 0.1						
9/16	329	1,566	—	—	329	1,566
9/23	594	2,887	—	—	594	2,887
9/30	670	3,233	—	—	670	3,233
10/07	528	2,570	—	—	528	2,570
10/14	306	1,577	—	—	306	1,577
10/21	58	267	—	—	58	267
10/28	8	39	—	—	8	39
11/18	7	36	—	—	7	36
Total	2,500	12,175	—	—	2,500	12,175
(Percent)	(56.2)	(30.4)	—	—	(56.2)	(30.4)
Age 0.2						
9/16	25	228	—	—	25	228
9/23	90	886	13	151	103	1,037
9/30	122	1,090	11	89	133	1,179
10/07	78	659	11	107	89	766
10/14	39	368	9	86	48	454
10/21	8	71	4	31	12	102
10/28	1	9	—	—	1	9
11/18	1	9	—	—	1	9
Total	364	3,320	48	464	412	3,784
(Percent)	(8.2)	(8.3)	(1.1)	(1.2)	(9.3)	(9.5)

Table 8.—Continued:

Week beginning	Male		Female		Total	
	Number	Pounds	Number	Pounds	Number	Pounds
Age 0.3						
9/16	61	734	39	589	100	1,323
9/23	160	2,182	19	296	179	2,478
9/30	217	2,772	160	2,338	377	5,110
10/07	172	2,373	89	1,473	261	3,846
10/14	73	1,003	60	904	133	1,907
10/21	29	373	6	92	35	465
10/28	6	74	3	45	9	119
11/18	1	13	—	—	1	13
Total	719	9,524	376	5,737	1,095	15,261
(Percent)	(16.2)	(23.8)	(8.4)	(14.3)	(24.6)	(38.1)
Age 0.4						
9/16	18	334	22	427	40	761
9/23	64	1,298	45	950	109	2,248
9/30	34	621	53	1,033	87	1,654
10/07	61	1,248	55	1,120	116	2,368
10/14	34	705	30	590	64	1,295
10/21	2	39	2	38	4	77
10/28	1	21	1	19	2	40
11/18	—	—	—	—	—	—
Total	214	4,266	208	4,177	422	8,443
(Percent)	(4.8)	(10.6)	(4.7)	(10.4)	(9.5)	(21.0)
Age 0.5						
9/16	—	—	—	—	—	—
9/23	6	148	—	—	6	148
9/30	4	99	—	—	4	99
10/07	—	—	6	185	6	185
10/14	—	—	—	—	—	—
10/21	—	—	—	—	—	—
10/28	—	—	—	—	—	—
11/18	—	—	—	—	—	—
Total	10	247	6	185	16	432
(Percent)	(0.2)	(0.6)	(0.1)	(0.5)	(0.3)	(1.1)

Table 9.—Length-age distribution (in percent by inch group) for chinook salmon scale sampled during creel census at Ludington, Manistee, Frankfort, and Grand Traverse Bay, during the period August to October, 1991. This table was developed by District 6 personnel at the Harrietta warehouse.

Length (inches)	Age					
	0.0	0.1	0.2	0.3	0.4	0.5
<15	100	—	—	—	—	—
16	—	100	—	—	—	—
17	—	100	—	—	—	—
18	—	100	—	—	—	—
19	—	100	—	—	—	—
20	—	100	—	—	—	—
21	—	100	—	—	—	—
22	—	100	—	—	—	—
23	—	100	—	—	—	—
24	—	100	—	—	—	—
25	—	100	—	—	—	—
26	—	10	90	—	—	—
27	—	10	80	10	—	—
28	—	—	75	25	—	—
29	—	—	56	44	—	—
30	—	—	42	58	—	—
31	—	—	40	60	—	—
32	—	—	6	81	13	—
33	—	—	15	70	15	—
34	—	—	—	95	5	—
35	—	—	—	64	36	—
36	—	—	—	67	33	—
37	—	—	—	25	75	—
38	—	—	—	20	80	—
39	—	—	—	—	100	—
40	—	—	—	—	75	25
41	—	—	—	—	—	—

Table 10.—Mean total length (inches) and weight (pounds), by age and sex, of chinook salmon harvested at the lower Platte River weir, fall 1991. Two standard errors in parentheses.

Week beginning	Measurement	Age 0.0		Age 0.1		Age 0.2	
		Male	Female	Male	Female	Male	Female
9/16	Length	—	—	22.8	—	29.2	—
		—	—	(0.311)	—	(1.004)	—
	Weight	—	—	4.8	—	9.1	—
		—	—	(0.206)	—	(0.382)	—
9/23	Length	12.0	—	23.3	—	30.4	32.1
		—	—	(0.351)	—	(0.979)	(1.800)
	Weight	0.5	—	4.9	—	9.8	11.6
		—	—	(0.217)	—	(0.719)	(0.800)
9/30	Length	—	—	23.3	—	29.7	28.3
		—	—	(0.255)	—	(0.621)	(3.733)
	Weight	—	—	4.8	—	8.9	8.1
		—	—	(0.161)	—	(0.481)	(3.712)
10/07	Length	—	—	23.5	—	28.8	30.6
		—	—	(0.365)	—	(0.671)	(1.400)
	Weight	—	—	4.9	—	8.4	9.8
		—	—	(0.230)	—	(0.545)	(1.700)
10/14	Length	—	—	24.1	—	29.8	30.2
		—	—	(0.323)	—	(1.880)	(0.600)
	Weight	—	—	5.2	—	9.4	9.5
		—	—	(0.235)	—	(1.477)	(1.200)
10/21	Length	—	—	23.6	—	30.0	28.8
		—	—	(0.592)	—	(1.692)	(1.900)
	Weight	—	—	4.6	—	8.9	7.8
		—	—	(0.394)	—	(1.962)	(0.500)
10/28	Length	—	—	23.8	—	30.5	—
		—	—	(1.110)	—	—	—
	Weight	—	—	4.8	—	9.2	—
		—	—	(0.642)	—	—	—
11/18	Length	—	—	24.5	—	29.5	—
		—	—	(1.769)	—	—	—
	Weight	—	—	5.1	—	8.7	—
		—	—	(1.305)	—	—	—
Weighted seasonal mean	Length	12.0	—	23.4	—	29.7	30.3
		—	—	(0.129)	—	(0.368)	(0.917)
	Weight	0.5	—	4.9	—	9.1	9.7
		—	—	(0.082)	—	(0.280)	(0.855)
Sexes combined	Length	12.0		23.4		29.8	
		—		(0.129)		(0.349)	
	Weight	0.5		4.9		9.2	
		—		(0.082)		(0.274)	

Table 10.—Continued:

Week beginning	Measurement	Age 0.3		Age 0.4		Age 0.5	
		Male	Female	Male	Female	Male	Female
9/16	Length	31.7	33.9	35.8	35.7	—	—
		(0.970)	(0.941)	(2.476)	(2.132)	—	—
	Weight	12.0	15.1	18.5	19.4	—	—
		(1.044)	(1.285)	(2.284)	(3.401)	—	—
9/23	Length	33.2	35.0	37.7	37.3	41.0	—
		(0.758)	(2.850)	(1.501)	(1.596)	—	—
	Weight	13.6	15.6	20.3	21.1	24.7	—
		(0.861)	(2.572)	(1.869)	(2.962)	—	—
9/30	Length	32.6	34.0	36.9	36.5	40.7	—
		(0.586)	(0.699)	(1.490)	(0.967)	—	—
	Weight	12.8	14.6	18.3	19.5	24.8	—
		(0.618)	(0.776)	(1.180)	(1.257)	—	—
10/07	Length	33.5	35.8	38.1	36.6	—	42.5
		(0.916)	(0.654)	(1.518)	(1.147)	—	—
	Weight	13.8	16.5	20.5	20.4	—	30.9
		(0.922)	(0.844)	(1.457)	(1.692)	—	—
10/14	Length	33.6	34.0	37.3	36.1	—	—
		(1.082)	(0.812)	(2.869)	(1.297)	—	—
	Weight	13.7	15.1	20.7	19.7	—	—
		(1.139)	(0.910)	(4.592)	(2.066)	—	—
10/21	Length	33.2	34.1	39.1	35.5	—	—
		(1.316)	(4.125)	—	—	—	
	Weight	12.9	15.3	19.5	19.2	—	—
		(1.325)	(4.070)	—	—	—	—
10/28	Length	33.0	33.2	39.0	35.0	—	—
		(1.631)	(5.107)	—	—	—	—
	Weight	12.3	14.9	20.9	18.8	—	—
		(1.352)	(4.932)	—	—	—	—
11/18	Length	34.3	—	—	—	—	—
		—	—	—	—	—	—
	Weight	12.5	—	—	—	—	—
		—	—	—	—	—	—
Weighted seasonal mean	Length	33.0	34.4	37.5	36.5	40.9	42.5
		(0.320)	(0.353)	(0.756)	(0.541)	—	—
	Weight	13.2	15.3	19.9	20.1	24.7	30.9
		(0.338)	(0.398)	(0.943)	(0.878)	—	—
Sexes combined	Length	33.5		37.0		41.5	
		(0.256)		(0.458)		—	
	Weight	13.9		20.0		27.0	
		(0.283)		(0.620)		—	

Table 11.—Summary of chinook salmon runs at the lower Platte River weir, 1979-91.

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	14.5
1981	1,391	2,172	3,563	34.7	15.6
1982	1,393	1,606	2,999	34.4	14.0
1983	1,275	4,839	6,114	33.6	14.7
1984	1,566	4,358	5,924	34.8	14.8
1985	1,772	3,093	4,865	34.8	13.9
1986	2,469	2,678	5,147	33.6	12.9
1987	2,451	5,336	7,787	34.1	13.5
1988	460	4,186	4,646	34.4	14.0
1989	191	1,708	1,899	33.8	14.0
1990	140	1,621	1,761	33.1	13.4
1991	572	3,873	4,445	33.6	14.3

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

Table 12.—Percentage-age composition of chinook salmon runs in the lower Platte River, 1984-present. Number in parentheses is actual number of fish returning for that age group.

Year	Total run	Age					
		0.0	0.1	0.2	0.3	0.4	0.5
1984	5,924	0.0 (0)	5.0 (296)	14.8 (877)	80.2 (4,751)	0.0 (0)	0.0 (0)
1985	4,865	0.0 (0)	8.8 (428)	17.0 (827)	52.3 (2,544)	20.3 (988)	1.6 (78)
1986	5,147	0.1 (5)	3.3 (170)	7.6 (391)	74.4 (3,829)	14.6 (752)	0.0 (0)
1987	7,787	0.1 (11)	11.6 (905)	8.4 (656)	38.3 (2,983)	38.1 (2,965)	3.4 (267)
1988	4,646	0.1 (5)	19.7 (915)	10.6 (493)	53.1 (2,466)	15.9 (739)	0.6 (28)
1989	1,899	0.2 (4)	17.4 (331)	7.6 (144)	46.2 (878)	28.1 (534)	0.4 (8)
1990	1,761	0.3 (5)	38.0 (670)	17.8 (314)	30.4 (535)	12.9 (227)	0.6 (10)
1991	4,445	<0.1 (1)	56.2 (2,500)	9.3 (412)	24.6 (1,094)	9.5 (422)	0.3 (16)

Table 13.—Number of trout released upstream at the lower Platte River weir, fall 1991. Released trout include those actually handled, counted, then transferred upstream (handled), and those which were counted as they swam through the weir gate when it was open (passed).

Date	Steelhead		Brown trout		Lake trout	
	Handled	Passed	Handled	Passed	Handled	Passed
9/02	—	2	—	—	—	—
9/03	—	1	—	—	—	—
9/07	—	2	—	—	—	—
Weekly total	0	5	0	0	0	0
9/11	—	4	—	—	—	—
9/12	—	9	—	—	—	—
9/13	2	—	—	—	—	—
9/14	—	6	—	—	—	—
Weekly total	2	19	0	0	0	0
9/16	2	2	—	—	—	—
9/17	26	—	—	—	—	—
9/18	—	55	—	1	—	—
9/19	19	47	—	1	—	—
9/20	13	68	—	—	—	—
9/21	—	16	—	—	—	—
9/22	—	19	—	—	—	—
Weekly total	60	207	0	2	0	0
9/23	24	64	1	—	—	—
9/24	9	174	—	—	—	—
9/25	14	23	—	1	—	—
9/26	22	147	1	—	—	—
9/27	21	45	1	—	—	—
9/28	—	21	—	—	1	—
9/29	—	37	—	—	—	—
Weekly total	90	511	3	1	1	—
9/30	46	15	—	—	—	—
10/01	25	—	—	—	—	—
10/02	4	50	—	—	—	—
10/03	—	43	—	—	—	—
10/04	24	12	1	—	—	—
10/05	51	52	—	1	—	—
10/06	—	50	—	—	—	—
Weekly total	150	222	1	1	0	0

Table 13.—Continued:

Date	Steelhead		Brown trout		Lake trout	
	Handled	Passed	Handled	Passed	Handled	Passed
10/07	74	—	4	—	—	—
10/08	33	—	1	—	—	—
10/10	21	—	5	—	—	—
10/12	90	—	4	—	1	—
Weekly total	218	0	14	0	1	0
10/14	305	—	4	—	—	—
10/17	17	—	3	—	1	—
10/19	15	—	1	—	—	—
Weekly total	337	0	8	0	1	0
10/21	8	—	—	—	—	—
10/24	293	—	5	—	—	—
10/25	789	—	7	—	—	—
10/26	29	—	4	—	—	—
Weekly total	1,119	0	16	0	0	0
10/28	60	—	1	—	—	—
11/01	183	—	7	—	—	—
Weekly total	243	0	8	0	0	0
Annual total	2,219	964	50	4	3	0
Combined total	3,183		54		3	

Table 14.—Annual numbers of fall steelhead, brown trout, and lake trout handled during the harvest of coho salmon at the lower Platte River weir, 1980-91.

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	796	79	20
1986	364	31	14
1987	1,079	23	4
1988	655	14	2
1989	847	29	3
1990	2,434	42	3
1991	2,219	50	3

Table 15.—Summary of the number and weight, by age and sex, of steelhead returning to the lower Platte River weir, fall 1991.

Week beginning	Male		Female		Total	
	Number	Pounds	Number	Pounds	Number	Pounds
Age 1.0						
9/09	13	13	—	—	13	13
9/16	69	91	—	—	69	91
9/23	23	33	—	—	23	33
9/30	7	9	—	—	7	9
10/07	13	22	—	—	13	22
10/14	—	—	—	—	—	—
10/21	—	—	—	—	—	—
10/28	5	7	—	—	5	7
Total	130	175	—	—	130	175
(Percent)	(4.1)	(0.7)	—	—	(4.1)	(0.7)
Age 2.0						
9/09	13	17	—	—	13	17
9/16	5	4	—	—	5	4
9/23	—	—	11	15	11	15
9/30	—	—	7	19	7	19
10/07	9	18	—	—	9	18
10/14	—	—	—	—	—	—
10/21	37	78	18	45	55	123
10/28	—	—	5	21	5	21
Total	64	117	41	100	105	217
(Percent)	(2.0)	(0.5)	(1.3)	(0.4)	(3.3)	(0.9)
Age 1.1						
9/09	—	—	—	—	—	—
9/16	9	33	5	21	14	54
9/23	11	58	23	108	34	166
9/30	7	20	49	260	56	280
10/07	13	57	4	29	17	86
10/14	6	34	6	37	12	71
10/21	37	198	18	115	55	313
10/28	—	—	—	—	—	—
Total	83	400	105	570	188	970
(Percent)	(2.6)	(1.6)	(3.3)	(2.3)	(5.9)	(3.9)

Table 15.—Continued:

Week beginning	Male		Female		Total	
	Number	Pounds	Number	Pounds	Number	Pounds
Age 2.1						
9/09	—	—	—	—	—	—
9/16	—	—	14	74	14	74
9/23	—	—	45	260	45	260
9/30	14	82	14	89	28	171
10/07	4	12	17	85	21	97
10/14	25	149	37	216	62	365
10/21	18	122	110	658	128	780
10/28	14	81	23	150	37	231
Total	75	446	260	1,532	335	1,978
(Percent)	(2.4)	(1.8)	(8.2)	(6.2)	(10.5)	(8.1)
Age 1.2						
9/09	—	—	—	—	—	—
9/16	14	105	32	234	46	339
9/23	79	741	68	542	147	1,283
9/30	49	408	63	513	112	921
10/07	30	270	30	253	60	523
10/14	44	365	31	231	75	596
10/21	165	1,344	202	1,565	367	2,909
10/28	42	389	33	262	75	651
Total	423	3,622	459	3,600	882	7,222
(Percent)	(13.3)	(14.7)	(14.4)	(14.7)	(27.7)	(29.4)
Age 2.2						
9/09	—	—	—	—	—	—
9/16	37	361	60	501	97	862
9/23	125	1,132	125	1,047	250	2,179
9/30	21	160	35	272	56	432
10/07	34	319	21	179	55	498
10/14	62	561	62	464	124	1,025
10/21	183	1,757	165	1,254	348	3,011
10/28	47	439	19	182	66	621
Total	509	4,729	487	3,899	996	8,628
(Percent)	(16.0)	(19.3)	(15.3)	(15.9)	(31.3)	(35.1)

Table 15.—Continued:

Week beginning	Male		Female		Total	
	Number	Pounds	Number	Pounds	Number	Pounds
Age 1.3						
9/09	—	—	—	—	—	—
9/16	—	—	14	141	14	141
9/23	11	110	23	181	34	291
9/30	14	133	21	191	35	324
10/07	21	207	—	—	21	207
10/14	—	—	19	192	19	192
10/21	37	339	73	686	110	1,025
10/28	5	53	9	84	14	137
Total	88	842	159	1,475	247	2,317
(Percent)	(2.8)	(3.4)	(5.0)	(6.0)	(7.8)	(9.4)
Age 2.3						
9/09	—	—	—	—	—	—
9/16	—	—	—	—	—	—
9/23	23	254	34	338	57	592
9/30	42	464	21	186	63	650
10/07	9	110	9	73	18	183
10/14	12	130	12	119	24	249
10/21	18	167	18	128	36	295
10/28	28	325	9	101	37	426
Total	132	1,450	103	945	235	2,395
(Percent)	(4.1)	(5.9)	(3.2)	(3.8)	(7.4)	(9.8)
Age 1.4						
9/09	—	—	—	—	—	—
9/16	5	37	5	58	10	95
9/23	—	—	—	—	—	—
9/30	—	—	7	83	7	83
10/07	—	—	4	39	4	39
10/14	6	75	6	51	12	126
10/21	—	—	—	—	—	—
10/28	—	—	—	—	—	—
Total	11	112	22	231	33	343
(Percent)	(0.3)	(0.5)	(0.7)	(0.9)	(1.0)	(1.4)

Table 15.—Continued:

Week beginning	Male		Female		Total	
	Number	Pounds	Number	Pounds	Number	Pounds
Age 2.4						
9/09	—	—	—	—	—	—
9/16	—	—	—	—	—	—
9/23	—	—	—	—	—	—
9/30	—	—	—	—	—	—
10/07	—	—	—	—	—	—
10/14	6	100	—	—	6	100
10/21	—	—	18	189	18	189
10/28	—	—	5	30	5	30
Total	6	100	23	219	29	319
(Percent)	(0.2)	(0.4)	(0.7)	(0.9)	(0.9)	(1.3)

Table 16.—Mean total length (inches) and weight (pounds), by age and sex, of steelhead passed at the lower Platte River weir, fall 1991. Two standard errors in parentheses.

Week beginning	Measurement	Age 1.0		Age 2.0		Age 1.1	
		Male	Female	Male	Female	Male	Female
9/09	Length	13.5	—	14.6	—	—	—
		—	—	—	—	—	—
	Weight	1.0	—	1.3	—	—	—
		—	—	—	—	—	—
9/16	Length	14.7	—	15.1	—	20.5	22.2
		(0.505)	—	—	—	(2.000)	—
	Weight	1.3	—	0.8	—	3.7	4.1
		(0.142)	—	—	—	(1.800)	—
9/23	Length	15.8	—	—	15.5	23.5	22.6
		(2.100)	—	—	—	—	(0.800)
	Weight	1.5	—	—	1.4	5.3	4.7
		(0.300)	—	—	—	—	(1.200)
9/30	Length	16.1	—	—	18.9	19.7	23.5
		—	—	—	—	—	(1.467)
	Weight	1.3	—	—	2.7	2.8	5.3
		—	—	—	—	—	(1.048)
10/07	Length	15.5	—	—	—	22.1	25.8
		(1.804)	—	16.6	—	(1.834)	—
	Weight	1.7	—	(0.500)	—	4.4	7.2
		(0.702)	—	2.1	—	(0.721)	—
10/14	Length	—	—	(0.100)	—	21.0	23.8
		—	—	—	—	—	—
	Weight	—	—	—	—	5.6	6.2
		—	—	—	—	—	—
10/21	Length	—	—	17.3	16.2	23.4	23.2
		—	—	(1.300)	—	(3.400)	—
	Weight	—	—	2.1	2.5	5.3	6.4
		—	—	(0.200)	—	(1.700)	—
10/28	Length	13.7	—	—	18.9	—	—
		—	—	—	—	—	—
	Weight	1.3	—	—	4.1	—	—
		—	—	—	—	—	—
Weighted seasonal mean	Length	14.9	—	16.5	16.8	22.4	23.3
		(0.564)	—	(1.021)	—	(2.121)	(0.956)
	Weight	1.3	—	1.8	2.4	4.8	5.4
		(0.129)	—	(0.157)	—	(1.074)	(0.755)
Sexes combined	Length	14.9		16.6		22.9	
		(0.564)		(0.860)		(0.769)	
	Weight	1.3		2.1		5.2	
		(0.129)		(0.243)		(0.499)	

Table 16.—Continued:

Week beginning	Measure-ment	Age 2.1 Male	Age 2.1 Female	Age 1.2 Male	Age 1.2 Female	Age 2.2 Male	Age 2.2 Female
9/09	Length	—	—	—	—	—	—
		—	—	—	—	—	—
	Weight	—	—	—	—	—	—
		—	—	—	—	—	—
9/16	Length	—	23.5	26.7	27.0	28.6	27.7
		—	(1.157)	(3.143)	(1.799)	(0.902)	(0.710)
	Weight	—	5.3	7.5	7.3	9.8	8.3
		—	(0.667)	(2.802)	(0.674)	(1.336)	(0.854)
9/23	Length	—	23.9	28.0	26.8	27.9	27.4
		—	(0.585)	(1.719)	(0.427)	(0.988)	(0.874)
	Weight	—	5.8	9.4	8.0	9.1	8.4
		—	(0.443)	(1.200)	(0.291)	(1.038)	(0.882)
9/30	Length	23.6	24.7	27.5	27.5	27.0	27.0
		(1.000)	(0.600)	(1.435)	(0.620)	(1.881)	(0.903)
	Weight	5.9	6.4	8.3	8.1	7.6	7.8
		(0.100)	(0.100)	(1.166)	(0.412)	(2.163)	(0.974)
10/07	Length	20.3	22.5	28.2	27.7	29.0	27.8
		—	(2.758)	(0.881)	(1.322)	(1.474)	(1.084)
	Weight	3.1	5.0	9.0	8.4	9.4	8.5
		—	(1.461)	(0.860)	(1.551)	(1.387)	(1.378)
10/14	Length	24.3	24.8	27.4	26.0	28.5	26.7
		(1.396)	(1.513)	(0.935)	(0.788)	(0.912)	(0.709)
	Weight	6.0	5.8	8.3	7.5	9.1	7.5
		(0.827)	(0.440)	(0.769)	(0.937)	(0.714)	(0.561)
10/21	Length	24.4	23.9	27.4	26.9	28.6	27.1
		—	(1.206)	(2.113)	(0.796)	(1.188)	(1.255)
	Weight	6.8	6.0	8.1	7.7	9.6	7.6
		—	(0.799)	(1.447)	(0.815)	(0.765)	(1.193)
10/28	Length	23.5	24.5	28.1	26.6	28.3	28.1
		(2.034)	(0.983)	(1.569)	(1.509)	(0.642)	(0.808)
	Weight	5.8	6.5	9.3	7.9	9.3	9.6
		(1.235)	(0.755)	(1.303)	(1.390)	(0.639)	(0.804)
Weighted seasonal mean	Length	23.8	24.0	27.6	27.0	28.3	27.3
		(0.807)	(0.574)	(0.894)	(0.394)	(0.505)	(0.486)
	Weight	5.9	5.9	8.6	7.8	9.3	8.0
		(0.460)	(0.358)	(0.625)	(0.383)	(0.401)	(0.471)
Sexes combined	Length	24.0		27.3		27.8	
		(0.460)		(0.467)		(0.365)	
	Weight	5.9		8.2		8.7	
		(0.299)		(0.358)		(0.345)	

Table 16.—Continued:

Week beginning	Measure-ment	Age 1.3		Age 2.3		Age 1.4	
		Male	Female	Male	Female	Male	Female
9/09	Length	—	—	—	—	—	—
		—	—	—	—	—	—
	Weight	—	—	—	—	—	—
		—	—	—	—	—	—
9/16	Length	—	29.3	—	—	27.4	30.1
		—	(1.913)	—	—	—	—
	Weight	—	10.1	—	—	7.3	11.5
		—	(1.604)	—	—	—	—
9/23	Length	28.0	26.5	30.6	28.4	—	—
		—	(0.500)	(0.500)	(1.277)	—	—
	Weight	10.0	7.9	11.1	9.9	—	—
		—	(1.500)	(1.500)	(0.481)	—	—
9/30	Length	28.5	28.7	30.5	28.9	—	29.7
		—	(0.933)	(0.730)	(1.768)	—	—
	Weight	9.5	9.1	11.1	8.9	—	11.9
		(1.000)	(1.361)	(0.808)	(1.749)	—	—
10/07	Length	29.2	—	31.0	27.3	—	29.3
		(0.920)	—	(1.700)	(1.900)	—	—
	Weight	9.8	—	12.3	8.1	—	9.8
		(0.852)	—	(0.500)	(2.100)	—	—
10/14	Length	—	28.9	30.4	28.5	31.3	27.5
		—	(1.604)	(0.800)	(2.100)	—	—
	Weight	—	10.1	10.8	9.9	12.5	8.5
		—	(1.405)	(0.400)	(4.900)	—	—
10/21	Length	28.7	29.0	28.7	26.1	—	—
		(0.900)	(1.588)	—	—	—	—
	Weight	9.1	9.4	9.3	7.1	—	—
		(0.700)	(1.924)	—	—	—	—
10/28	Length	29.4	28.8	30.7	30.0	—	—
		—	(1.100)	(1.026)	(0.200)	—	—
	Weight	10.5	9.3	11.6	11.2	—	—
		—	(3.400)	(1.472)	(1.200)	—	—
Weighted seasonal mean	Length	28.7	28.6	30.3	28.2	29.5	29.1
		(0.507)	(0.759)	(0.376)	(0.712)	—	—
	Weight	9.6	9.3	11.0	9.2	10.1	10.5
		(0.449)	(0.936)	(0.515)	(0.802)	—	—
Sexes combined	Length	28.6		29.4		29.3	
		(0.507)		(0.588)		(2.187)	
	Weight	9.4		10.2		10.4	
		(0.615)		(0.543)		(2.623)	

Table 16.—Continued:

Week beginning	Measurement	Age 2.4 Male	Age 2.4 Female
9/09	Length	—	—
		—	—
	Weight	—	—
		—	—
9/16	Length	—	—
		—	—
	Weight	—	—
		—	—
9/23	Length	—	—
		—	—
	Weight	—	—
		—	—
9/30	Length	—	—
		—	—
	Weight	—	—
		—	—
10/07	Length	—	—
		—	—
	Weight	—	—
		—	—
10/14	Length	34.0	—
		—	—
	Weight	16.6	—
		—	—
10/21	Length	—	29.0
		—	—
	Weight	—	10.5
		—	—
10/28	Length	—	26.8
		—	—
	Weight	—	6.0
		—	—
Weighted seasonal mean	Length	34.0	28.5
		—	—
	Weight	16.6	9.5
		—	—
Sexes combined	Length	29.7	
		—	
	Weight	11.0	
		—	

Table 17.—Age composition, mean length (inches), and mean weight (pounds) summarized by summers growth in Lake Michigan, for steelhead trout sampled at the lower Platte River weir, fall 1991.

Age	Summers in lake	Percent of sample	Mean length (inches)	Mean weight (pounds)
_.0	1	7.4	15.7	1.7
_.1	2	16.5	23.6	5.6
_.2	3	59.1	27.6	8.5
_.3	4	15.2	29.0	9.8
_.4	5	1.9	29.5	10.7
All			26.3	7.7

Table 18.—Summary of fall steelhead runs in the lower Platte River, 1980-91.

Year	Total run	Mean length (inches)	Mean weight (pounds)	Lake age - percentage composition					
				_.0	_.1	_.2	_.3	_.4	_.5
1980	216	24.9	7.2	—	—	—	—	—	—
1981	682	25.0	6.7	—	—	—	—	—	—
1982	1,276	24.3	6.6	—	—	—	—	—	—
1983	1,898	25.6	7.5	—	—	—	—	—	—
1984	1,693	22.8	5.5	30.1	42.0	26.4	1.4	0.0	0.0
1985	1,189	25.2	6.1	15.2	28.4	55.1	1.2	0.0	0.0
1986	707	24.1	6.1	18.5	33.3	37.1	11.1	0.0	0.0
1987	2,963	25.1	6.6	19.4	7.8	64.9	7.9	0.0	0.0
1988	974	23.2	5.4	31.5	23.0	39.6	5.6	0.0	0.0
1989	973	22.9	5.5	30.8	31.3	30.4	6.8	0.5	0.1
1990	3,016	25.2	6.8	10.1	37.3	45.4	6.3	0.6	0.3
1991	3,183	26.3	7.7	7.4	16.5	59.1	15.2	1.9	0.0

Table 19.—Number of coho salmon harvested at the upper Platte River weir, fall 1991.

Date	Jacks	Males	Females		Mortalities
			Round	Stripped	
9/20	75	0	0	0	4
Weekly total	75	0	0	0	4
9/24	846	0	0	0	4
Weekly total	846	0	0	0	4
10/4	1,744	0	0	0	16
10/5	416	0	0	0	3
Weekly total	2,160	0	0	0	19
10/7	344	0	0	0	41
Weekly total	344	0	0	0	41
10/14	27	96	8	58	36
10/15	65	1,554	314	805	18
10/16	163	755	229	774	17
Weekly total	255	2,405	551	1,637	71
10/21	126	610	196	924	31
Weekly total	126	610	196	924	31
10/29	46	349	158	285	32
10/31	47	1,330	1,078	373	19
11/01	238	420	420	0	0
Weekly total	331	2,099	1,656	658	51
11/12	46	84	84	0	51
Weekly total	46	84	84	0	51
12/02	2	47	46	0	42
Weekly total	2	47	46	0	42
Annual total	4,185	5,245	2,533	3,219	314[1]

[1]Mortality included 248 adults and 66 jacks.

Table 20.—Weight (pounds) of coho salmon harvested at the upper Platte River weir, fall 1991.

Date	Jacks	Males	Females		Mortalities
			Round	Stripped	
9/20	97	0	0	0	24
Weekly total	97	0	0	0	24
9/24	1,100	0	0	0	24
Weekly total	1,100	0	0	0	24
10/04	2,442	0	0	0	98
10/05	582	0	0	0	18
Weekly total	3,024	0	0	0	116
10/07	516	0	0	0	250
Weekly total	516	0	0	0	250
10/14	40	682	54	302	220
10/15	98	11,033	2,104	4,185	110
10/16	245	5,361	1,534	4,024	104
Weekly total	383	17,076	3,692	8,511	434
10/21	176	4,758	1,431	5,234	189
Weekly total	176	4,758	1,431	5,234	189
10/29	69	2,897	1,106	1,548	195
10/31	70	11,039	7,546	2,026	116
11/01	357	3,486	2,940	0	0
Weekly total	496	17,422	11,592	3,574	311
11/12	69	697	588	0	311
Weekly total	69	697	588	0	311
12/02	3	390	322	0	256
Weekly total	3	390	322	0	256
Annual weight	5,864	40,343	17,625	17,319	1,915
Mean weight	1.4	7.7	7.0	5.4	6.1

Table 21.—Number and weight (pounds) of chinook salmon harvested in the upper Platte River weir, fall 1991.

Date	Male jacks	Female adults	Male adults	Mortality	Total
Sep 30-Oct 6					
Number	11	0	1	7	19
Weight	48	0	12	77	137
Oct 7-13					
Number	4	0	0	4	8
Weight	11	0	0	44	55
Oct 14-20					
Number	356	6	44	6	412
Weight	1,566	96	491	66	2,219
Oct 21-27					
Number	31	1	5	0	37
Weight	130	16	65	0	211
Oct 28-Dec 2					
Number	8	0	0	5	13
Weight	30	0	0	55	85
Annual total number	410	7	50	22[1]	489
Annual total weight	1,785	112	568	242	2,707
Mean weight	4.4	16.0	11.4	11.0	5.5

[1]Mortality included 12 adults and 10 jacks.

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