

# **SALMON AND STEELHEAD RUNS, 1900 TO 1940**

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## **INTRODUCTION**

Salmon and steelhead runs to the Clackamas River in 1900 — though below historic levels — remained substantial compared to the size of present day runs. While information on run size is limited, hatchery and harvest records suggest that large runs of salmon and steelhead still returned to the Clackamas River. Gillnetters caught about 12,000 adult spring chinook on the lower Clackamas in 1893. Hatchery egg collectors also regularly saw large adult returns. In 1897, hatchery operators collected 1,672,275 chinook eggs from the lower Clackamas near Clear Creek and another 5,045,000 eggs from the upper river.

The resilience of these runs was further tested after the turn of the century. Activities in the basin — including timber harvest, road building, agriculture and other uses — continued to escalate in the lower basin and slowly began to spread into parts of the upper basin. The building and operating of the Cazadero and River Mill hydroelectric projects on the Clackamas River in the early 1900s also affected the basin's anadromous fish runs. While the dams were equipped with ladders, they were usually blocked to capture fish for eggs. The ladders were also damaged repeatedly by high flows and needed regular repair. These factors limited fish migration to the upper basin. Then, in 1917 the ladder at Cazadero Dam was allowed to completely deteriorate after suffering extensive flood damage. Natural fish production was further reduced by hatchery egg collections immediately below the dams until 1940. In addition, fish harvest remained heavy during much of the period.

Growth and development along the lower Willamette River further affected Clackamas River salmon and steelhead runs. By the early 1920s, the Willamette River had become the dumping ground for untreated waste from all industries and municipalities along the river — with pulp and paper mills producing much of the waste pollution. Consequently, pollution in the Willamette River reached alarmingly high levels. By the time the river reached the Portland harbor area it was extensively polluted (Gleeson 1972).

## **FISH PRODUCTION**

Hatchery efforts grew after the turn of the century. The programs continued to focus primarily on spring chinook production, but some steelhead and coho were also raised at the facilities. For instance, production at River Mill Hatchery included about 493,000 steelhead in 1918 and 637,000 coho in 1914 (Table 3).

**Table 3.** Chinook Egg-Takes at Clackamas River Hatcheries from 1900 to 1940 (Wallis 1960).

<b>Year</b>	<b>Lower Clackamas</b>	<b>Upper Clackamas</b>	<b>Cazadero/River Mill</b>
1900	1,725,000	2,607,000	
1901	10,018,000	5,104,000	
1902	8,610,000	1,454,000	
1903	10,180,000	3,334,000	
1904	3,691,000	1,297,500	
1905	no data	no data	
1906	no data	no data	
1907	no data		2,495,000
1908	2,582,000		5,431,000
1909	4,079,300		3,191,000
1910	2,376,000		1,264,000
1911	no data		382,000
1912	no data		no data
1913	no data		15,000
1914	no data		84,000
1915	no data		195,000
1916	10,002,000		77,000
1917	3,019,500		398,000
1918	10,936,500		227,000
1919	2,845,000		1,266,000
1920	1,308,000		2,080,000
1921	360,000		841,000
1922	7,636,800		857,000
1923	2,750,600		1,721,500
1924	11,005,400		2,291,000
1925	2,223,000		1,721,500
1926			689,200
1927			
1928			1,165,000
1929			570,000
1930			2,025,000
1931			2,428,000
1932			540,000
1933			
1934			1,600,000
1935			1,650,000
1936			1,035,000
1937			300,000
1938			218,000
1939			520,000

Fish culture remained more art than science in the early 1900s as hatchery operators continued to experiment with techniques and adapt them based on their successes and failures. For instance, in 1901 operators of the lower hatchery station reported heavy losses after feeding the fry canned salmon and clippings from the gauge knives used in canneries. These losses declined after they began feeding the fry liver mixed with cereal and seasoned with salt. The report also mentions that eggs incubated at the hatchery in 1901 hatched after 50 days and most were planted soon after (6,000,000 planted and 2,412,000 retained) because the hatchery lacked space for rearing. When hatchery propagators reached their capacity at the hatchery early that year, they opened the station's rack and allowed the remaining salmon to pass upstream (Carter 1901).

In 1900, propagators moved the lower Clackamas station downstream because the old site at the mouth of Clear Creek had an insufficient egg supply and poor water quality. The hatchery was moved to the present site of the Oregon Fish Commission Research Laboratory where it was operated until 1942. Hatchery records from 1901 note that personnel built a rack below the station in early August and began fishing with gillnets in late September. They continued collecting eggs until early November because of lack of space in the hatchery (Hubbard 1890-1891).

In 1904, the state transferred ownership of the upper Clackamas hatchery to the U.S. Bureau of Fisheries, giving the federal agency full control over salmon propagation in the Clackamas River Basin. The facility was abandoned in 1906 after operating for 10 years. During its years of operation, egg collection at the upper Clackamas hatchery ranged from 1.3 million to 5.1 million eggs, with more than 5 million eggs taken in two of the years.

Hatchery operations were moved again once Cazadero Dam was completed on the Clackamas River. Records show that the Cazadero fish hatchery was planned to be operational at the time the dam was completed, although a fish ladder was constructed with the dam. The hatchery was originally to be built on the right bank of the river about one mile below the dam. Instead, fish propagators built a temporary station on the left bank below the dam's wooden flume. Before a permanent facility could be developed, propagators decided to abandon the site in favor of a new station below River Mill Dam, which was under construction.

Reports from fish propagators below Cazadero Dam show that the spring chinook run was still strong at the time. They reported in 1907 that they had collected spawn from 529 female and 1,010 male spring chinook at the site below the dam. They added that their collection was hampered by the bottom morphology in the rack enclosure allowing about one-third of the fish to spawn naturally

within the confines of the racks (Oregon Department of Fisheries 1909). Thus, about 2,309 spring chinook were taken at Cazadero Dam in 1907. This is a large number considering the river had been raked for hatchery egg collection since the late 1800s. From 1907 to 1911, more than 12.5 million salmon eggs were taken below Cazadero Dam.

In 1911, fish propagators moved the hatchery and egg-taking operations from the Cazadero site to one immediately below the newly constructed River Mill Dam. Hatchery construction coincided with the building of the dam. During construction of River Mill Dam, the Bureau of Fisheries asked the Oregon Water Power and Railway Company, Portland General Electric's predecessor, to place a pipe in the dam's bulkhead to supply water for the hatchery. Eggs were taken at this site below River Mill Dam from 1913 through 1939, when the hatchery was abandoned. Many eggs taken after 1935 were transferred to other hatcheries (Wallis 1960).

The Clackamas Hatchery continued to operate at the present site of the Oregon Fish Commission Research Laboratory until 1942. Eggs for the hatchery were collected on the Clackamas near the hatchery site and from below River Mill Dam. Eggs were also transferred in from as far away as Butte Creek and Battle Creek in California and the McKenzie River in Oregon. Releases of all races, local and foreign, were made directly into the Clackamas River.

In 1936, the U.S. Fish and Wildlife Service established a hatchery on Delph Creek, a tributary to Eagle Creek, on property that had previously been used for a state trout hatchery. The hatchery raised mainly spring chinook to rebuild the run in Eagle Creek. Some coho and steelhead were also reared at the facility.

## **FISH PASSAGE**

Despite the dams, egg-taking operations, fish harvest, and habitat degradation, salmon and steelhead periodically passed over the dams to upriver habitat until 1917. Weirs and traps regularly washed out during floods or high flows and were not reinstalled until many fish had passed. For instance, correspondence shows that following a flood during the winter of 1909-1910 the company and Master Fish Warden agreed to postpone making fish ladder repairs until summer when high flows receded. This suggests that some fish were allowed to escape over the ladder that year. In 1917, the fish ladder at Cazadero suffered comprehensive damage during high flows. The company decided to let the ladder deteriorate since egg-take operations prevented salmon from ascending the stream.

Between 1917 and 1939 when the ladder was repaired, some steelhead and salmon continued to

escape over River Mill Dam. According to records from about 1930, fish that reached the River Mill Dam tailrace before it was racked would negotiate the ladder. Portland General Electric correspondence in 1930 mentions that a considerable number of steelhead had been seen going up the ladder at River Mill Dam. The author reported that, while some fish went as far as Cazadero Dam, a greater number were scattered between the dam and powerhouse where they spawned each year. Records over the years also show that managers sometimes opened the ladder rack to allow fish to pass upstream. Fish are not believed to have passed above Cazadero Dam after the ladder washed out in 1917 (Eicher 1977).

Charles Mack, a longtime Gladstone resident who fished the Clackamas River until the early 1940s, recalls strong runs of spring chinook in the lower Clackamas through the late 1930s. In 1939 he caught 68 spring chinook on the lower Clackamas, with each fish averaging about 19 pounds. He saw very few coho salmon or steelhead while fishing the river. He remembers that in the mid- to late-1930s few spring chinook escaped over the fish ladder at River Mill and large numbers of would-be spawners collected at the foot of the dam (Mack, personal communication 1998).

Public sentiment about the lack of passage over the dams was mixed. For instance, a 1921 letter to the editor of *The Oregonian* complained about lack of fish passage on the Clackamas River. The letter drew a response from the editor of the editorial page who wrote that the “concrete fishway built into the dam at River Mill is said to be one of the best in the Country” and that “there was formerly a fish ladder at Cazadero, but it washed out and has not yet been rebuilt. The law requires owners of dams to maintain fishways (Eicher 1977).

Poor water quality in the Willamette River influenced decisions about improving fish passage to the upper Clackamas River. By the 1920s, growing pollution in the Willamette River began to reduce the amount of dissolved oxygen in the river. By the mid-1920s, the dissolved oxygen content in the Portland harbor fell below the level of five parts per million (ppm) — the minimum level needed to support healthy fish. Water quality dropped below this level during the months of July, August and September in each year, and often from June into October. In 1929, the oxygen content in the Willamette River was measured at 3.9 ppm at the Sellwood Bridge and was likely completely exhausted through the Portland harbor area. It reached less than 0.5 ppm near the confluence of the Willamette and Columbia rivers (Gleeson 1972). These low oxygen levels influenced the health and survival of fish in the river — including fish destined for the Clackamas River. The situation prompted fish managers to suggest that pollution of the Willamette River in late summer was an important contributor to the decline of fall chinook when the run dropped in 1928 (USFWS 1950). The fear that poor water quality in the Willamette River was influencing salmon production in the

Clackamas influenced management decisions for further hatchery production, including egg collection from the Clackamas below the dams.

During the 1930s, interest grew in Clackamas County for the rebuilding of fish ladders over Cazadero and River Mill dams. In 1936, the Clackamas County Planning Commission petitioned the Oregon Fish Commission to sue Portland General Electric to build new ladders over Oak Grove and Cazadero dams and to improve the fish ladder at River Mill Dam. This action generated discussions between representatives of Portland General Electric, the Clackamas County Planning Department, U.S. Bureau of Fisheries, Commercial Fishermen's Protective Unions, and the state fish and game commissions. Generally, during the discussions, staff with the state fish commission and commercial fishermen's union expressed satisfaction with the present situation of racking the river at the dam for spawn, while the representative from the game commission questioned whether a certain number of salmon should be allowed to ascend upriver.

On August 3, 1936, Fred Foster, Regional Director of the U.S. Bureau of Fisheries, sent a letter to Lew Wallace, chair of the Oregon State Game Department. As shown, the letter discussed the situation and proposed a solution to the problem.

*“As you know, our Bureau has collected eggs from the spring chinook run at River Mill Dam for a good many years. The procedure has been to block the ladder so that the fish at the dam cannot ascend and then to net and spawn them as they become ripe. The eggs are then taken to our Clackamas hatchery where they are hatched and the young fish reared to an age suitable for liberation below the dam. There are certain serious difficulties, such as trouble in removing the ripe fish from the impounded school below the dam, attendant to this routing which have led me to question its efficiency. This is particularly true when we consider that the run remained at the rather low level of from 1,500 to 2,000 adult spawners for a good many years.*

*Therefore, I was particularly pleased when our Bureau was able to secure the Delph Creek Hatchery because it gave us an opportunity to establish a program of artificial propagation, which we hope will be a distinct forward step in improving the run of spring chinook in the Clackamas. Our plan is briefly this. We propose to take the eggs from our collection to the Delph Creek and Clackamas stations. As soon as the young fry are old enough for safe transportation, all of them will be taken from the Clackamas station to Delph Creek where all of the young fish will be held and reared until they are of proper age for liberation. They will all be liberated in Delph Creek at that time.*

*Because of the well known homing instincts of chinook salmon, it is expected that these fish will return as adults to Eagle and Delph creeks. We can then rack Eagle Creek and hold our fish and take our eggs at that location more easily and efficiently than below the dam as at present. You will, of course, note that this plan amounts to a transfer of the chinook run from its present return location to that of Eagle and Delph creeks.*

*Since the run reaching the dam numbers only some 1,500 to 2,000 spawners, it is obvious that we cannot carry on our proposed program and at the same time permit enough spawners to ascend the*

*dams to have any material effect on naturally restocking the upper reaches of the Clackamas. In view of these facts, I would propose the following program, which is briefly, that our Bureau continue to take the eggs from the fish returning to the dam for the next four or five years and liberate the resulting fingerlings in Delph Creek. At the end of that period we should have our run established on Eagle and Delph Creeks and will be able to carry on our operations as planned.*

*In the meantime, it should be possible for you to secure spring chinook from your state sources, and to plant them in the headwaters of the river each year. These fish will return at the end of four years and at the same time that we will have established our run at Delph Creek, yours will have salmon returning from your plantings. We could then discontinue our egg-taking operations at the dam and let your run pass on to the upper river unhindered. In this way we can both accomplish our desired programs without hindrance.”*

Records suggest this plan was carried out. In 1936, all hatchery spring chinook releases were made in Delph Creek. The state game commission also stocked salmon and steelhead in the upper Clackamas River during the year. Propagators continued to place racks in the Clackamas below the River Mill powerhouse through 1939 to catch chinook (Eicher 1977).

Newspaper articles during the period show support for rebuilding salmon and steelhead runs in the upper Clackamas system and low tolerance for egg-taking operations. For instance, an article from *The Oregonian*, January 14, 1940, states that the state fish commission had opposed the building of the fishway ladders and may now prevent its use. They declare that “the people who secured the erection of these ladders will not tolerate the taking of eggs from salmon runs in the Clackamas River” (*The Oregonian* 1940).

In 1939, Portland General Electric completed construction of the new Cazadero ladder and modifications at River Mill Dam. The Bureau of Fisheries removed their racks from below River Mill Dam in January 1940 and fish passage to habitats above the dam was reopened.

## **SUMMARY**

Salmon and steelhead populations in the Clackamas River Basin continued to fall through the early 1900s and reach low levels by 1939. The Clackamas River Basin saw many changes between 1900 and 1940.

According to Fred Foster, U.S. Bureau of Fisheries Regional Director in 1936, the spring chinook runs had averaged between 1,500 and 2,000 spawners “for a good many years”. Harvest and hatchery egg-take records also show a decline.

In many ways, the decline of salmon and steelhead production was linked to the area's growth in population and the subsequent demand for more timber, power, salmon and other resources. Key events that shaped conditions in the Clackamas basin during this time are recapped below.

### Key Events and Developments from 1900 to 1940

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|------|---|
| 1900 | Clackamas hatchery moved downstream because of insufficient egg supply and poor water quality at the old site.  |
| 1901 | Hatchery operators report problems finding appropriate fish food, causing heavy losses. They also make early releases due to lack of rearing space.   |
| 1902 | Timber harvest in lower basin continues to grow. Hatchery staff report seeing about 2,000 cords being floated down Clackamas River.                   |
| 1902 | Oregon Water, Power and Railway Co. starts work on Cazadero Dam.  |
| 1904 | Plat for town of Estacada filed.  |
| 1904 | More than 100,000 cords of wood hauled to Portland on Estacada line.  |
| 1906 | Upper Clackamas hatchery abandoned.   |
| 1907 | Cazadero Dam begins operating, complete with a wooden fish ladder.  |
| 1907 | Hatchery and egg-taking operations initiated below Cazadero Dam. From 1907 to 1911, more than 12.5 million salmon eggs taken below the dam.           |
| 1907 | Site investigations started for North Fork Dam.   |
| 1908 | Railroad extended from Cazadero to North Fork Dam site.   |
| 1908 | Only five or six commercial operators still fishing on Clackamas River.   |
| 1909 | Work begins on River Mill Dam.  |
| 1910 | Seasons designated for commercial fishing on Clackamas.   |
| 1911 | River Mill Dam completed, includes a concrete fish ladder.  |
| 1911 | Fish propagators move hatchery and egg-taking operations from a site below Cazadero to site below River Mill Dam fish ladder.                         |
| 1917 | Fish ladder at Cazadero Dam suffers extensive damage in flood and is not rebuilt due to egg-taking operations below the dam.                          |
| 1917 | Production at Clackamas Hatchery continues with eggs from stations on the Clackamas and from other areas.   |
| 1920 | One half commercial catch of chinook on Columbia River are fall race.   |
| 1920 | Forest Service builds roads to upper basin, including the Skyline Road.   |
| 1929 | Water pollution in Willamette River begins to affect fish health/survival.  |
| 1936 | Federal fish managers establish hatchery on Delph Creek and try to move chinook production from lower Clackamas to Eagle and Delph creeks.            |
| 1936 | U.S. Bureau of Fisheries regional director writes that the spring chinook runs had averaged between 1,500 and 2,000 spawners "for a good many years." |
| 1939 | PGE rebuilds Faraday Dam ladder and modifies River Mill ladder.   |
| 1939 | Five year program to transfer spring chinook runs to Delph Creek ends.  |
| 1939 | Dam operators recall that large salmon runs no longer arrive at River Mill.   |
| 1940 | Bureau of Fisheries stopped collection of chinook eggs at River Mill Dam. Egg-taking transferred to the Eagle Creek Hatchery.                         |
| 1940 | Passage to upper Clackamas above River Mill and Cazadero dams reopened.   |