

PROPAGATION EXPERIMENTS

Interesting Report Made by Superintendent P. C. Reed of the Hatcheries.

A GREAT WORK IS DONE

Full Details of the Year's Work at the Hatcheries—A Large Number of Young Fish Turned Out—The Prospects.

To the President of the C. R. P. S. P. Co.

Having been engaged by the directors of the above company on the 25th day of May, at a meeting held in Astoria, I began preparations toward proceeding up the Clackamas river to build racks across the stream and erect buildings necessary for hatching salmon eggs.

Prior to this time, several of the Columbia river hatcheries had engaged Game Protector McEldred to go to the Clackamas with Mr. Hubbard, superintendent of the United States hatchery, to look out a suitable location for a salmon hatchery. Mr. Hubbard, however, declined the services of Mr. McEldred as a guide, and they made the trip and returned to Portland the latter part of May, and Mr. McEldred made his report to the directors at a meeting held in Portland on the 25th day of May, stating that they had found a good location at a certain point on the upper Clackamas, where the Indians had for years past caught their salmon. I at once ordered a supply of tools and provisions and engaged six men, and on the 4th day of June left Oregon City for the season's operation.

Mr. McEldred having made an offer to pack all supplies from Oregon City to the hatchery at a satisfactory rate, was engaged to do the packing for the season. I engaged a team to take the men and our blankets from Oregon City to Leum, as far as we could go with a wagon, and on the morning of the 7th took the trail for the month's work. On the third day's travel we arrived at the site selected by Mr. McEldred. On the morning of the third day, June 9th, I looked around a little and then asked Mr. McEldred where the hatchery site was. He said, "Right here." True enough, there was a good place to build a hatchery, as the ground was level and not much timber on it, but the site for building racks and catching salmon to take eggs from was altogether different, being a succession of rough and rocky rapids as far as could be seen both up and down stream, without one spot of gravel where salmon could spawn, or a deep pool where they could stay until they were ready to spawn. The place where the rack was to be built was a bed of boulders, from the size of a small bucket up to a small haystack. It is true that the Indians had built racks across here for many years, but as they caught all their fish with spears it answered their purpose very well, but for a place to collect salmon eggs for the purpose of propagation I had to look for another place. Being fully satisfied that this was no place for a hatchery, I got Mr. Austin, who was well acquainted in that locality, to go with me to the river to look for a location. After going about two miles I found some gravel bars and some deep pools, and finally selected the place where the buildings now stand, of which I will give you a more detailed report.

On June 10th I began a rack across Oak Grove creek (which is a tributary of the Clackamas) and about three miles below the hatchery. A large number of salmon would go up this stream if not stopped by the rack. We finished this rack the next day and set the camp up to the place where we immediately began building a rack across the Clackamas, which we had completed on the 14th.

I then began clearing the ground of brush and timber where the buildings now stand. The buildings consist of a messhouse, 18x21 feet, with 8-foot walls, and is built of round timber, with one or two sides boarded when necessary, with roof shingled with shakes and walls covered with cedar bark, which makes a very comfortable house for warm weather.

The hatchery is in two buildings, each 20x21 feet, with 8-foot walls. They stand side by side, six feet apart, and are built of the same material as the messhouse, with regular shake roof and the eaves overhanging on the walls, except the gable ends, which are boarded down to the plates. They have strong truss roofs, one-half inch to one inch snow, and the walls are well braced. My reasons for putting up two buildings instead of one are: First, timber of suitable size was hard to get and had to be paid for in advance, and for a building six feet the roof would have to be built of heavy timber to stand the snow, which was so heavy that it would fall from the roof to four feet deep there some times. Second, in such a wide building with low walls and no skylights in the roof it would have been too dark in the center to tend eggs or young fish. Each of these buildings contains four double and one single row of troughs, each row having four troughs or 72 in all; each trough is 18 feet long, holding 1500 eggs, which, by putting 15,000 eggs in each tray, gives the hatchery a capacity of about 4,500,000 eggs, or by crowding the trays, an account of not getting wire for trays fast enough, we put 20,000 eggs in a tray, which would make the capacity about 1,800,000 eggs.

The lumber for the troughs I had sawed with a whip saw by contract, and is the finest cedar, sawed from large timber, sound and clear of knots, and they are good for many years to come. The price paid for the lumber was \$20 per 1,000 feet delivered at hatchery.

The last and best building on the place is a log house for winter or cold weather, 12x15 feet, 8-foot walls, with log roof, all well chinked between the logs and shingled with shakes. It has a good chamber, the end of the wagon road, which he did, and there I engaged Mr. Davis to pack them in and do the rest of the packing for the season at the same price paid McEldred.

WATER SUPPLY.

The water for hatching purposes we take from a small creek which flows from springs on the hills about one mile from the hatchery. I built a dam about three feet high across this creek, which gave sufficient fall to run the water through the buildings. There appeared to be plenty of water in the creek at this time, but as the season advanced with no rain the supply of water decreased, so in the time we were done taking eggs, September 1st, we had the very lowest supply of water with which we could hatch the eggs successfully. And when the eggs began to hatch and the young fish had to have more room we were obliged to put more troughs at the end of the main in use, so as to use the same water over again.

I consider the water supply the greatest, if not the only, drawback to this location. While it is true all the

mountain streams were low this season, and this no lower than others near here when the water was the lowest I went down to the site selected by McEldred and Hubbard and found that creek with no more water than this. I think some action should be taken to secure a better supply of water, if possible. I think the cheapest way to do this is to build a higher dam and make a pond or reservoir to hold sufficient water for use through the dry season. The dam should be ten feet higher than the present dam, and the pond should be about forty feet on top. This would make a pond which, by a rough estimate, would hold about 3,000,000 gallons of water. At the lowest supply this season there was about 1,000 gallons per hour running through the hatchery, or 24,000 gallons per day. Therefore the pond holding 3,000,000 would supply us with 100 days, which, with the running supply of the creek, would enable us to use more troughs and still run more water in them. The flume leading from the dam to the hatchery is made of spruce cedar in Y shape. This should be rebuilt another season, and made square or box shape, 4x6 inches buried, or sawed lumber, so that it can be fixed in the ground the greater part of the distance from the dam to the hatchery, thereby obviating the danger of timber falling across and breaking the flume. The water, I think, is very good for hatching purposes, as it is fairly pure and does not get thick or muddy when it rains. The temperature is quite steady, the highest 67 degrees in August, but it gradually grew lower as the weather got cooler, and the first week in November, which was quite cool there, fell to 45 degrees, but the variation during the day in the hottest weather was only four or five degrees between morning and noon.

RUN OF SALMON AND TAKING EGGS

I saw the first salmon below the rack on the 20th of June, or six days after the rack was completed. I am well satisfied that no fish went up past before the rack was put in, and not more than ten fish made their appearance till after the 20th of July, when they began coming up ten or fifteen at a time, and lay in a deep pool just below the rack. I began catching a few about the 15th of July, but got none ready to spawn till the 22d, when we got one. The increase from that time till about the middle of August, when they were more plentiful. The 17th was our largest day's work, when we saw 400 eggs, and at this time the wire for trays gave out or nearly so, and I was compelled to limit the number of fish taken to what I could provide trays for. Had we been prepared with plenty of trays at this time I think we could have taken over 2,000,000 eggs a day for a week, but as we could use only so many fish we made only one haul with the seine, and saved what we could use by putting them in small corrals, and the rest we would put back into the river, and as there were very few fish to be seen, and we could not get up the river, I am of the opinion that some of them dropped back down stream and spawned in the best places they could find, and to prevent a repetition of this another season I would recommend the building of another rack on the rapids below to stop them from going back, and then they would be in a large corral with no very good chance to spawn.

At the start I tried to catch the fish with a gillnet, but soon found this to be too slow and expensive, and ordered a seine, with which most of the fish were caught. By taking four or five men late in the afternoon, when the fish began to move, I would send one man up to the rack with a seine to drive the fish down into the deep water, and then throw the seine around them and catch nearly all that were in the pool, sometimes hauling 100 or 200 salmon, and after picking out what was ripe let the rest go in the river again and catch them the same way the next day. This went on for about thirty minutes to one hour, after which the men could go back to their work.

The following table will show the number of female fish spawned each day and the number of eggs taken:

Table with 4 columns: Date, No. Female Fish, No. Eggs. Rows include dates from July 22 to August 31, with corresponding egg counts ranging from 3,000 to 2,582,900.

You will see by the above table that we stopped taking eggs on August 21st. We did not stop, however, till the 12th of September, but the number of fish taken after September 1st was small, perhaps 12 fish in all, and the eggs taken from them I used to experiment with, and did not count them with the rest, but the same part of them hatched as of the others. On the 23d of September I went down the river as far as Oak Grove creek and followed the river to the way back, and as I could see no salmon on their way up I concluded the run was over, and so dried the nets and put them away and discharged all the help, except the foreman and one man to take care of the fish, but there could be caught in traps in the rack.

Another thing you will notice in the table is the variation in the number of salmon on different days. This is the result of having some salmon that were not fully ready to spawn, and only part of the eggs could be taken, and in some cases they had been injured, and though apparently perfectly ripe the eggs could not be taken. Had what few eggs we got from these two kinds of salmon not been counted, the average number of eggs per fish would have been about 6,000, and from one very large fish over 9,000 eggs were taken. The fish were all large. Out of the 44 fish we took eggs from, I am quite sure that not less than ten of them would weigh less than 20 pounds, which is large for female fish. While the table shows that only a little more than 2,500,000 of eggs were taken, I am confident that with the same run of fish and with plenty of traps at hand, and the knowledge gained as to the run and actions of the fish, that there could be nearly 4,000,000 of eggs taken another season.

THE INDIAN QUESTION.

As much has been said during the season through the papers in regard to the bad Indians who would come and murder the whole crew up there if they were not allowed to catch salmon, as they had done for ages past and I believe the report was in one paper that they had killed us all, for when I arrived in Portland on the 30th day of July one Indian made his appearance at our camp one Sunday just after we had eaten our dinner. The first thing he did was to show me his pass from the agent at the reservation

(which I found out afterward was bogus, and I found the Indian was no better), but as I was all alone, the rest of the boys having gone hunting and fishing, he must have thought it beneath the dignity of the Indians to attack me alone, and as he made no attempt to harm me, and he looked very tired and hungry I gave him some dinner, and then he went on his way, showing a sign over pretty thoroughly. He, of course, wanted to catch salmon, as he had been in the habit of doing for many years, I thought that if he had seen the Boston man could catch all the salmon he wanted and the poor Indian should be shut off. I simply told him that no Indian would be allowed to catch salmon on the Clackamas or Oak Grove creek this season, but that I would give them all the salmon I caught after I had taken the spawn from them, and if that did not please them they could go back to the reservation as quick as possible.

When I got back to camp from my trip to Portland I found two Indian policemen from the reservation waiting for me with a letter from the agent, which I will hand you with this report, marked letter A, as well as several others I received from the agent, marked B, C, etc. In the order I received them, to show you the order in which they came, saying some hard things against the agent, he was willing to do all he could toward making the hatchery a success, I felt that it was very good for hatching purposes, as you will see by letter A, the policemen were sent to gather up all Indians who were hunting or fishing in that section of the river, and to see that they did not catch any fish. I told the policemen and wrote the agent by them, the same as I told the first Indian, "That if they would come and camp near the hatchery and did as I wanted them to do, they could have all the fish I handled." The policemen gathered up Indian No. 1, and with my letter to the agent left for the reservation.

In about ten days the same two policemen returned with 11 or 12 families of Indians, about 60, including women and children. They went into camp where I told them to camp, and I gave them, and I don't think they got any more, as I never caught them trying to catch any. To show how much we feared them, they came out our camp one day and borrowed some of our ammunition we had to go hunting with (this was after the game law was out), and when they returned from their hunt we saw the game law on the ground, and they were done running, and they got their salmon dried about the middle of September, when they were sent back to their homes, and I gave them a blessing on us and our undertaking, and then saying they would be back next season if they lived. They departed in peace.

Arrangements having been made with Mr. Austin to look after the place this winter, and the eggs nearly all hatched, I left the hatchery, and on the 1st of October, leaving Mr. Spurgeon with Mr. Austin to help, giving Mr. Spurgeon orders to remain until November 23d, as by that time the winter would be upon us, and if a few were left, Mr. Austin could put them out when they were large enough.

The trail from the settlement is over pretty rough ground, with two hard mountains to climb going in and three coming out. I think the distance is nearly forty miles. On my way back I looked for a way for a new trail. By following the river down the first and hardest mountain can be avoided, and the distance shortened four or five miles, and the trail can be made in one day, and a cost of less than \$100 per mile.

It is not a miracle. It won't cure everything, but it will cure piles. That's what DeWitt's Witch Hazel Salve will do, because it has done it in hundreds of cases. Chas. Rogers.

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A little ill, then a little pill. The ill has gone, the pill has done it. DeWitt's Little Early Risers are the little pills that cure great ills. Chas. Rogers.

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By using Dr. Foster's... guaranteed to cure all nervous debility, and restore the system to its normal condition. It is a powerful tonic, and restores the system to its normal condition. It is a powerful tonic, and restores the system to its normal condition.

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50 REAL 10-CIGARS MAILED TO EVERYBODY.

ON RECEIPT OF \$1.00 MONEY ORDERS. CHECK POSTAGE.

Tide Table for May, 1896.

Tide table with columns for DATE, HIGH WATER (A.M., P.M.), and LOW WATER (A.M., P.M.). Rows list days from Friday to Sunday.

more pleasant place than I saw when I went there last spring.

Another very important thing in connection with this place is the ownership of the land. I advised last summer that you correspond with United States Commissioner McDonald and see if he could not get a section or township set off for hatchery purposes. I think if Senators Mitchell and McBride are made to understand the necessity of this they can easily accomplish the object.

As per table, you will see that we took 2,582,900 eggs and will turn out but a little over 2,000,000 young fish. This shows a greater loss of eggs than I would like to have, but so things were against us this season which I hope can be avoided next. First, at the time we were getting the most of our eggs, my truck was employed from early morn till late at night in making trays, and I think the eggs were not as carefully taken as they might have been, could I have attended to it myself. Being short of wire we were obliged to put 20,000 eggs in each tray, when 15,000 is plenty. These, combined with a short supply of water, occasioned the loss of more eggs than necessary had conditions been otherwise, as I am satisfied that with proper care from 30 to 35 per cent of the eggs taken can be hatched and the young fish turned loose.

There are sufficient provisions at the camp to last the men in charge till June next, and then there should be some left. I took no inventory of the material and supplies on hand, as everything that was sent in is there, with the exception of some of the provisions which have been devoured, and one or two which were lost, and all the material and tools are worth the price paid for them for use there.

All bills, as far as I know, up to this time have been paid, with the exception of my own, which I herewith present. Respectfully submitted, F. C. REED, Supt. Mainland Hatchery, Astoria, Or., Nov. 25, 1895.

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MENU FOR MONDAY.

- Things sweet to taste prove in digestion sour. -Richard Hill. Breakfast. Salmon Croquettes. Tomato Toast. Broiled Spring Lamb Chops. Fried Potatoes. Strawberry. Luncheon. Clam Chowder. Chicken Muffins. Chicken Patties. Griddle Muffins. Canned Apples. Dinner. Pure of Pheasant a la Reine. Lyons Sausage. Olives. Baked Bluefish, Spiced sauce. Potato Croquettes. Spring Chicken, Hungarian Style. Lima Beans. Ragout of Beef, New Carrots. Cheddar Cheese. Wafer Thins. Coffee.

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