

XXVI.—REPORT OF DISTRIBUTION OF CARP, DURING THE SEASON OF 1881-'82, BY THE UNITED STATES FISH COMMISSION.

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The first applications for German carp were filed in 1876, one year subsequent to the successful importation of this fish and to the establishment of breeding ponds at Druid Hill Park. The total number of applications filed during this year was 3. In 1877 the number increased to 20; in 1878 to 98; and in 1879, when the first distribution was made, the number of applications for the year was 324.

The fragmentary records of this first distribution show that there were distributed directly to 181 applicants 6,203 carp, being an average of 34 to each applicant. In addition there were distributed to State Commissioners and agents of distribution 4,743 carp, making a total distribution for the year of 10,946 carp.

In 1880 the number sent to applicants direct had risen to 31,443, and to State Commissioners and agents 19,021, making a total for the season of 50,464.

In 1881 we were confronted with the problem of distributing 160,000 fish over a much wider geographical range and at a consequent increase in the cost per applicant.

To relieve the messenger service of the pressure of the increased work, and to reduce the cost of the distribution, recourse was had to express shipments in all cases where applicants were willing to defray the increased cost of delivering. The shipping packages first used were wood-bound tin cans, holding about eight gallons of water, and making a shipping package weighing about 65 pounds. The principal lines of express transportation promptly responded to the request of the Commissioner and arranged a tariff of reduced rates of charges to all points reached by their routes. Even at the reduced rates the cost to applicants of express delivery was quite a serious matter, ranging from \$1 for the nearest points to \$6, \$8, \$10, and \$12 for the more remote. Early in the season, by direction of the Commissioner, a half can was substituted for the can first used. This materially reduced the weight of the shipping package and the express charges in each case. Parties receiving these cans had the option of retaining them at a stipulated price or of returning them. When parties declined taking the cans, they

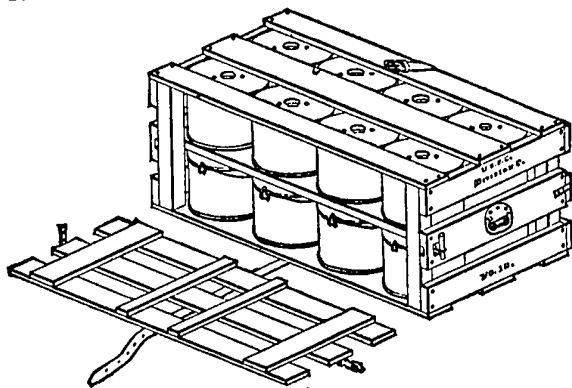
were, under our arrangements with the express companies, returned free.

The distribution made prior to December 15 was accomplished by the methods above indicated; meanwhile experiments were inaugurated looking to reduction both in the weight and bulk of the shipping packages.

An account of the result of these experiments will be found in Vol. I, p. 215, Bulletin of the United States Fish Commission. So satisfactory were they that early in December I was instructed by the Commissioner to take charge of the Division of Distribution, and to inaugurate, systematize, and perfect the more economical methods of distribution rendered practicable by the reduction in the cost, size, and weight of the shipping packages. The standard package adopted was a covered tin bucket having a capacity of 4 quarts. For facility of aeration several holes were punched in the cover of each bucket.

A shipping-tag with room for the address on one side and the requisite printed instructions on the other was devised by Mr. S. C. Brown, so as to inclose securely a blank postal receipt, to be filled and returned by applicant on receipt of the fish. The buckets were to be returned by the applicants in all cases, the cost of the same (20 cents) being added to the express charges, and collected from the express agent in advance.

Where a number of buckets were to be sent to one destination, for convenience in handling and better safety in transmission, light crates were prepared, each having a capacity of 16 buckets, and weighing about 100 pounds. As from their shape several of the crates may be stacked up on each other, it is practicable to pack 1,000 fish on a floor-space not greater than that occupied by two of our ordinary transportation cans. The convenience and economy of these methods of transportation is therefore apparent.



Shipping crate.

All arrangements having been perfected and all necessary material having been collected, express shipments were made in the small buckets instead of the larger tin cans, to all points within a radius of 500

miles from Washington. The weight of the shipping packages was thus reduced from 60 pounds to about 8 pounds, with corresponding reduction in express charges.

At the time I was placed in charge of the work of distribution messenger shipments were in progress in the South Atlantic and Gulf States, portions of Georgia, Alabama, Mississippi, and Tennessee, and all of Florida being at that date (December 15) still unsupplied. The messenger lists necessary to regulate the distribution were at once prepared, and the fish destined for the supply of Southern Georgia and Florida sent forward in charge of Mr. Newton Simmons. Mr. George H. H. Moore and Mr. F. L. Donnelly were then in the field, one in Alabama, the other in Mississippi. They were directed not to return to Washington, but to await instructions at Meridian and Jackson, Miss. To these points messenger lists and explicit instructions and the number of carp necessary to complete the distribution were forwarded by express from Washington. These bucket shipments reached them in excellent condition, and by December 24 the distribution in the sections referred to had been completed. Texas, with 950 applicants, Arkansas, Indian Territory, Western Louisiana, and Missouri, with an aggregate of 150 widely scattered applicants, still remained to be supplied. It was planned to accomplish this work by one movement of our refrigerator car No. 1. All details of the distribution were arranged before we left Washington, the route to be traversed definitely determined, and notices forwarded by mail to each applicant informing him at about what date to expect his fish. So far as practicable, arrangements were made by which each should receive his fish either from the car *en route* or from one of the messengers temporarily detached for the purpose of supplying those remote from the route traversed by the car. It was not thought safe to attempt to carry more than 12,000 fish in the car. It was therefore arranged to have the additional number needed forwarded by express in lots of 2,000. Arrangements were made to have the fish rested and the water changed at Saint Louis. As these methods were novel, and the results considered doubtful by the most experienced messengers, it was thought best that I should accompany the expedition in order to enforce the observance of the necessary conditions of success and to take the responsibility of whatever failure there should be. It was thought prudent to make use of both methods of transportation. The complement of the car was therefore made up as follows: 40 large cans containing each 100 carp; 7 large cans containing each 150 carp; 18 crates containing each 320 carp; 3 crates containing each 400 carp. This made a total of 12,000 fish in the car.

The crew of the car consisted of Mr. J. F. Ellis, messenger in charge; Newton Simmons, George H. H. Moore, M. S. Thompson, messengers; and the cook.

We left Washington at 4 p. m. January 3, 1882, going through to Saint Louis on the fast express of the Pennsylvania Railroad. I did

not think it necessary to examine the fish or change the water until we reached Saint Louis, where all the cans and buckets were overhauled and the water changed except in the crates containing 400 fish each, which were left undisturbed until we reached Texarkana. The fish were all found to be in good condition and the change was made rather as a precaution than as a necessity. At Washington I had placed 100 fish in a 6-quart bucket as an extreme test. At Saint Louis these carp showed signs of suffering and were turned over to Dr. Steedman. From Saint Louis seven buckets of fish were forwarded by express, to applicants in the first Congressional district of Iowa, who had been overlooked in the previous distribution. They reached their destination safely, though two days *en route* and in very severe weather.

On the 5th of January at 9 p. m. the car left Saint Louis by the Iron Mountain route and reached Texarkana the next day. On the way fish were delivered to all applicants in Arkansas who were accessible, postal notifications having been previously sent from Washington directing them when and where to meet us. At Texarkana a complete change of water was made on all the fish. The three crates of 1,200 fish which had not been touched since leaving Washington were found to be in fair condition, though a few were dead and the remainder apparently weak. They had traveled three and a half days without any change of water.

The rise in temperature as we proceeded south made it prudent to take measures looking to refrigeration. Application to the railroad authorities procured a ton of ice, which was placed in the ice-chests, and the refrigerator portion of the car maintained at a temperature of 50° from that time onward until the distribution was completed.

At Texarkana I detached Mr. Moore with a supply of fish for Shreveport, Western Louisiana, and for such applicants in Texas as he could reach conveniently by the route he traveled. Mr. Simmons was sent with a supply for applicants along the narrow-gauge road between Texarkana and Waco.

After remaining at Texarkana twenty-four hours in order to rest the fish and to give due notice of our coming, we started Sunday morning, January 8, for Sherman, Tex., delivering fish on the way to all applicants in that section of the State. Moore rejoined the car at Dallas, and Simmons at Fort Worth, while I proceeded from Sherman to the Indian Territory to supply applicants in the Choctaw Nation, and returned via Sherman to Dallas.

Dallas being the point to which the express shipments were to be sent, I had arranged to rendezvous the car and all the messengers there, and thought it best to await the arrival of all the express shipments, as it would be safer to transport the fish south in the car than to trust to their being forwarded by express. The first lot forwarded from Washington came as far as Saint Louis in charge of Messenger Donnelly; there the water was changed, and the fish expressed to Dallas. Donnelly remained at Saint Louis to re-ship subsequent lots, which followed

at intervals of twenty-four hours. These shipments, amounting to about 6,000 fish (scale carp), reached Dallas in fair condition, though they were much weaker than the leather variety brought in the car, and less fitted to endure rough travel.

From Dallas the car with the full complement of messengers proceeded to Austin via Hearne, supplying as arranged all applicants along the route. In order to provide for supplying the numerous applicants in the vicinity of Corsicana it was found necessary to lie over at that place twelve hours, the train agent kindly making arrangements to take us up on the next train. On reaching Austin I was met by Mr. R. R. Robertson, the Texas Fish Commissioner, who was kind enough to take charge of the delivery of carp to applicants in that vicinity. From Austin we proceeded to San Antonio, where I remained, but sent the car on to Laredo. At Laredo Mr. Ellis was detached with enough fish to supply applicants in the extreme south of the State. From San Antonio we returned via the Sunset route to Houston, where I left the car, and with Messenger Thompson proceeded via New Orleans to Washington. I delivered on the way fish to isolated persons who could not be reached in any other way. Meanwhile the car proceeded to Houston and was here joined by Mr. Ellis, who had been instructed from Washington to take the car to Saint Louis and await further orders.

The routes traveled by the car and detached messengers were planned so as to completely reach every part of the State, and the measures taken beforehand to notify applicants were so thorough that of upwards of 800 applicants not more than 7 were unsupplied.

The fish were delivered to the applicants or their authorized agents, or else they were left at the most accessible point and the recipient so notified.

The satisfactory issue of our work is largely due to the liberal facilities accorded us by the various lines of railroad traversed. Anything in the way of supplies or service was unfailingly rendered. Special acknowledgments are due Mr. H. M. Hoxie, the general manager of the Saint Louis, Iron Mountain, and Southern Railway. From Saint Louis westward until our return to that point, free transportation for car was granted on all lines of railroad traversed by us.

The result of the work demonstrated that in making shipments by the car-load we can carry a much greater number of fish by using small buckets instead of cans, and also that buckets can be used with great advantage and economy in shipping by express, provided the passage does not last more than thirty-six or forty-eight hours. I am not satisfied, however, that this mode of shipment is practicable in warm weather. This must be decided by experiments.

The State of Texas seems to possess extraordinary facilities for raising carp, and as many of the recipients went to great expense to prepare ponds it is believed that carp-raising will soon become a valuable industry in that State.

The following summary of the distribution by States is respectfully submitted :

Summary of carp distribution for the year 1881-'82.

State.	Number of communities represented.	Number of applicants supplied by express.	Number of applicants supplied by messenger.	Total number of applicants supplied.	Total number of fish furnished.	Number of applicants remaining unsupplied.	Total number of applicants.
Alabama.....	38	28	60	88	1,856	70	158
Arizona.....	2					7	7
Arkansas.....	17	5	28	33	818	5	38
California.....	24					38	38
Colorado.....	9	1		1	20	18	19
Connecticut.....	8	21	71	92	2,220	14	106
Dakota.....	5					8	18
Delaware.....	8	10	42	58	2,100	1	59
District of Columbia.....	1	1	3	4	86	7	11
Florida.....	11	2	23	25	432	5	30
Georgia.....	94	30	380	410	7,081	133	543
Idaho.....	2					2	2
Illinois.....	62	23	139	162	2,844	24	186
Indiana.....	52	135	10	145	3,890	27	172
Indian Territory.....	1		18	18	317		18
Iowa.....	29	1	15	16	292	28	44
Kansas.....	45	5	105	110	2,360	17	127
Kentucky.....	70	7	489	496	9,732	84	580
Louisiana.....	24	1	51	52	1,276	6	58
Maine.....	6			6	116	5	11
Maryland.....	28	15	240	255	22,424	9	264
Massachusetts.....	10	24	3	27	745	21	48
Michigan.....	20	3	37	40	1,848	9	49
Minnesota.....	18	4	1	5	100	17	22
Mississippi.....	55	139	369	528	9,445	97	625
Missouri.....	50	2	208	210	4,126	54	264
Montana.....	2					2	2
Nebraska.....	11	6	1	7	120	8	15
Nevada.....	2					2	2
New Hampshire.....	6	6		6	140	5	11
New Jersey.....	19	40	21	70	1,352	11	81
New Mexico.....	3					6	6
New York.....	40	140	50	190	4,610	68	258
North Carolina.....	56	47	115	162	3,104	91	253
Ohio.....	62	172	35	207	4,258	89	296
Oregon.....	13					35	35
Pennsylvania.....	54	208	141	350	7,250	73	423
Rhode Island.....	4	5	20	25	1,140	2	27
South Carolina.....	26	9	236	245	11,884	11	256
Tennessee.....	46	34	165	199	4,209	55	254
Texas.....	112	15	926	941	10,580	9	950
Utah.....	5	5		5	130	5	10
Vermont.....	3	4		4	76	2	6
Virginia.....	68	172	304	476	11,609	30	506
Washington.....						11	11
West Virginia.....	21	35	41	76	1,035	6	82
Wisconsin.....	19	10	4	14	296	15	29
Wyoming.....	1		2	2	200	2	4
Total.....	1,256	1,387	4,371	5,758	143,606	1,244	7,002

The number actually sent out in 1881 was from six to eight thousand greater than appears from the subjoined table, many having been distributed through agents whose reports were not available when this table was made. There should also be added the number of carp distributed in the spring of 1882, those being of the 1881 crop and amounting to five or six thousand. The crop of 1881 aggregated about 160,000.