

Game, Fur Animal and Fish

INTRODUCTIONS INTO UTAH⁽¹⁾

By

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and

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ABSTRACT

Introductions of game birds, mammals and fishes into Utah have ranged from high successes to disappointing failures. Introductions and transplants are currently being made of fishes, birds and mammals in the hope of increasing the range of established species or the filling of vacant range with new game.

Thirty-six species, 25 of fishes, 6 of upland game birds, and 5 of game and fur mammals, have been introduced into Utah since 1869.

Of the introduced game birds, the pheasant, California quail, and Hungarian partridge are well established in the State and are either highly successful or show promise of becoming so. The Bobwhite, Chukar partridge, and Wild turkey have not, to date, responded favorably to Utah conditions.

Editor's Notes

Since the completion of this manuscript, large scale releases of chukar partridge have been made in several sections of the state. There is some evidence that considerable reproduction in the wild areas has resulted. In addition to the birds raised by the state and released, several plants have been made of chuckars, wild trapped in Turkey, by the Fish and Wildlife Service and released in Utah by the State Fish and Game Department.

Of the five species of game and fur mammals introduced into the State, all are reported to be present today. The introductions of dark muskrats and nutria have not met with much success. Elk introductions have been highly successful, while antelope introductions and transplants are surviving and showing signs of increasing. Bison are increasing slightly but are not receiving much encouragement as a game animal for wide-spread distribution throughout the State.

Nine species of introduced fish have successfully established themselves. Most successful of these are the rainbow, brown and eastern brook trout and the carp, channel catfish and black bullhead. Five introduced fishes including the kokanee, lake trout, America grayling, largemouth bass, and black crappie have survived Utah conditions and are present in limited numbers and in restricted areas. Eleven species have not succeeded in establishing themselves following transplanting and are not known to live in Utah at the present time.

INTRODUCTION

For a number of years wildlife workers have realized the significance of the past histories of introduced species in considering further introductions either in the same or in new localities. Emphasis in recent years has been directed toward introductions as a means of providing more game and fish for more hunters and fishermen. Increases in hunting and fishing pressure have been noted in Utah for the past 40 years. It is hoped that this compilation of the histories of the introduced fish, game and fur species of Utah will be of value to sportsmen and wildlife managers alike in planning future introductions.

The information included in this bulletin was obtained from United States Government reports, Utah Territorial reports, Utah State reports, newspapers and periodicals, personal interviews, and from questionnaires sent to state wardens.

The United States Government reports which were used included Bureau of Fisheries reports from 1870 to 1939 and Fish and Wildlife Service reports from 1940 to 1948. Utah Territorial reports covered the period from 1850 to 1895, and Utah State reports covered the time from 1896 until the present.

Newspapers used in the search for material included the Deseret Evening News from 1860 to 1915, the Deseret News Weekly from 1870 to 1900, the Salt Lake Tribune from 1915 to 1948, and the Ogden Standard Examiner from 1930 to 1940. Other periodicals searched were the Journal History of the Latter-day Saints Church, the Transactions of the Utah Academy of Arts, Sciences, and Letters, and the Utah Educational Review.

An effort was made to interview all present and former officials, now living, of the Utah State Fish and Game Department. Also personally contacted were sportsmen and wildlife federation officers known to have been active in fish and game work. Most of the data necessary to plot the distribution maps were obtained from questionnaires sent to all wardens in the State. Distribution maps have been verified by the officials of the State Fish and Game Department whose work is most closely connected with the animals in question.

It is recognized that the exact dates and circumstances pertaining to some of the early introductions are somewhat confused. However, an effort has been made to include only material which

appears to be substantiated with facts and references. It is possible that in some cases introductions were made prior to those indicated herein as first introductions. It is also possible that, in some instances, early workers may have used incorrect or different scientific and common names than those in use today, which may have led to errors. In most cases, however, it is felt that the materials and figures are reasonably accurate.

Since introductions and transplants of game species are continually being made, this account will serve only as a history of what has taken place. Efforts have been made to include records of game and fur animal introductions to 1950.

The text is prepared to show for each species the name of the animal, the first known introduction, subsequent introductions, and a brief statement of the present status. It is not the purpose of this bulletin to present life history material or extensive discussion on the present status of the animal. In some instances, the releases of stock represent an extension of the original range of the species; in others it represents merely the placing of animals into range either formerly used or in use at the time of release. In the text those animals brought into the State are referred to as "introductions," while those which were taken from one part of the State to another are referred to as "transplants." In a few instances re-introductions have been made where animals formerly occupying the range had disappeared.

GAME BIRDS

When the Mormon pioneers first came to Utah they found members of the grouse family in great abundance. The dusky grouse, the ruffed grouse, the sharp-tailed grouse, and the sage grouse frequently graced pioneer tables. The opening of the land to agriculture removed much of the natural habitat of these native birds. This, along with continued shooting, reduced the numbers of native game birds, and, as early as 1870, a few far-sighted individuals could see that protective measures would be necessary to preserve these species. The sharp reduction in numbers of native game birds prompted some sportsmen to attempt the introduction of species not native to the State. The accounts of these introductions are of interest and importance to sportsmen and game managers of today.

The desire of sportsmen to find birds which would furnish good upland bird shooting has undoubtedly been the major factor in the exotic bird introductions into Utah.

Through the years since the settlement of the country many thousands of game birds from other lands have been brought to and released on the land in attempts to improve hunting (Phillips, 1928). Most of those released, perhaps fortunately, have been dismal failures. However, the bright spots in this picture are represented by the introduced pheasant, Hungarian partridge, and, in scattered localities, perhaps the Chukar.

Concurrent with the random introductions were the releases of game-farm pheasants in areas of good pheasant habitat or on marginal range.

Objective studies on the values of farm-reared pheasants as a method of supplying shooting and breeding birds have been made in many parts of the country during the past decade. It has long been recognized that the vast majority of shootable birds come from native-raised birds and that largely the use of farm-reared birds should be to supplement the wild stock when it has been reduced because of adverse conditions. In Michigan, Tubbs (1943, 1946) and Hoffmaster (1946) have shown that stocking game-farm birds to directly supplement shooting is not a profitable practice. Indiana workers (Ginn, 1946) have shown that return of farm-raised birds to hunters' bags is very small, while in Massachusetts, Wandell (1945), in studies on restocking coverts with farm-raised birds, showed low returns of the birds to hunters' bags. Bishop (1944) in Connecticut pointed out that although the release of game, farm birds was ineffective in supplying a great deal of hunting, releases at some seasons of the year were better than at others. MacNamara and Koziacky (1949) in New Jersey, while pointing out the low return of farm-raised birds, showed a relatively high return on birds released during the hunting season or in three weeks prior to the opening season. Wisconsin (Buss, 1946) has dealt with the effects of "violent" and "gentle" release methods in game-farm pheasant releases. Many other states have made studies of pheasant restocking programs.

In Utah, Rasmussen and McKean in 1945 (McAtee, 1945) pointed out that "no critical appraisals, however, have been made of the effects of the propagating and transplanting programs that constitute the major efforts of all the western states in their work with pheasants." Further, those workers assert that "on the basis of field observations in states of the intermountain region during the past five years, it appears very doubtful that the propagating of increased numbers of game-farm pheasants is justified . . . Now almost all suitable areas have been colonized for

majority of the herd was located east of Hanksville, Wayne County, on the east side of Henry Mountains (Figure 9). Their move carried them from the San Rafael Grazing District, where the original agreement was made, into the Richfield Grazing District.

Present Status—At the present time the species in Utah appears to be quite secure as far as the animal's ability to care for itself. However, some complaints have already come from live-stock interests in the range occupied by the buffalo. The increase in the size of the herd during the last few years permitted a kill of 10 head in the fall of 1950, the first legal buffalo hunt in the State. It is possible that under management and protection a buffalo herd of a limited size can be maintained in this general area. There appears to be little reason for increasing or for transplanting to other areas herds of buffalo, as they cannot be easily controlled and conflicts with agricultural and grazing interests would likely develop.

FISHES

Early settlers in Utah found cutthroat trout and whitefish numerous in many of the streams and lakes of the territory. These fish furnished an important part of the diets of these early settlers. Year round fishing and unrestricted methods of taking fish greatly reduced the numbers of these native fishes.

At Latter-day Saints Church Convention held in Salt Lake City in 1870, a committee on fish propagation was appointed. This committee was composed of A. M. Musser, A. P. Rockwood, Brower Petit, and Reuben Mitchell. Two of these men, Musser and Rockwood, were later very active in early introductions of exotic fish into Utah.¹

Most early fish introductions were made primarily for the purpose of increasing the food supply of the territory. A program for the propagation and distribution of food fishes was inaugurated by the United States Fish Commission in 1872. Until 1899 the majority of the fish introductions into Utah were a part of this program.

¹Deseret Evening News, October 31, 1870.

Since 1900, most introductions of exotic fish species have been made in the interests of sportsmen. Increased fishing pressures made introductions and the subsequent propagation of the successfully introduced species necessary. At the present time Utah's 12 state hatcheries propagate and distribute chiefly the same species of fishes which were originally introduced into the State.

Introductions are currently taking place with new species not tried before as well as some which have met with only partial success in earlier works. Attempts were made to introduce the white bass in 1950 but the stock died prior to reaching Utah. In some late transplantations there has not been sufficient time elapse to judge the success of the plant.

The scientific names of all fish species have been taken from "A list of Common and Scientific Names of the Better Known Fishes of the United States and Canada," special publication No. 1 of the American Fisheries Society (1948).

AMERICAN SHAD

Scientific Name—*Alosa sapidissima*.

Common Names—American Shad; Common Shad.

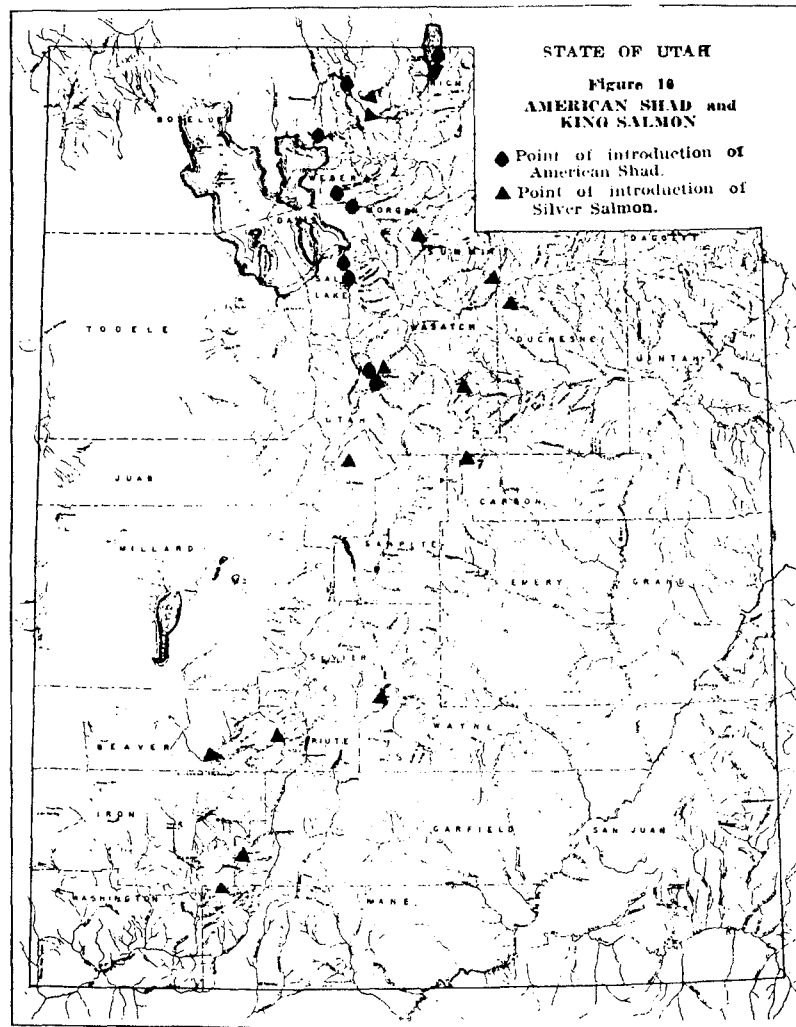
First Introduction—The first shad introduced into Utah were liberated in the Weber River a few days prior to June 28, 1871. This planting consisted of 200 young shad.¹ No records of results from this planting are known.

Subsequent Introductions—On June 30, 1873, 5,000 shad fry were put in the Jordan River near Great Salt Lake by Livingston Stone, Assistant U. S. Fish Commissioner. These shad came from Albany, New York, and very few were lost in transit (Baird, 1874).¹ No subsequent information is known of this plant.

In 1887 Territorial Fish Commissioner, A. M. Musser, through Marshall McDonald of the U. S. Fish Commission, received 3,000,000 shad fry, the majority of which were in good condition upon arrival. One million of these were put into the Jordan River and 2,000,000 into Utah Lake (Musser, 1895). These fish came from Point Lookout on Chesapeake Bay.² It was reported that shortly

¹Deseret Evening News, June 28, 1871.

²Deseret Evening News, June 8, 1887.



after these plantings were made, dead shad fry were found by the thousands along the shores of the Jordan River and Utah Lake.³

On May 22, 1888, Commissioner Musser advertised for persons familiar with the habits and needs of young shad.² Early in June, 1888, U. S. Fish Car No. 2 arrived in Salt Lake City with a

¹Information obtained from David H. Madsen, Fish and Game Commissioner, Utah State Fish and Game Dept. (1910-1926), Salt Lake City, Utah.

²Deseret Evening News, May 22, 1888.

full load of eggs from the Delaware River. The eggs were hatched on the car, and the resulting 2,000,000 fry were placed in Utah Lake.¹ The Deseret Evening News of November 30, 1888, carried a notice that Commissioner Musser had received three six-inch shad from M. P. Madsen, a Utah Lake commercial fisherman. On November 10, 1889, 100 young shad were offered for sale on the Salt Lake City market. These were netted from Utah Lake by a Lehi commercial fisherman. These shad averaged one and three-fourths pound a piece.²

In 1891, 2,300,000 shad fry were received in Utah from an eastern U. S. fish station. One-half million of these were planted in the Weber River, 500,000 in the Bear River in Box Elder County, and 1,300,000 in Bear Lake. It was reported that after each of these introductions many thousands of dead fry were observed on the shores of the waters planted. In 1891 Utah Lake fishermen were occasionally taking young shad in their nets.³ In this same year nine large tubs of marine plants filled with microscopic life, upon which shad feed, were put three in each of the Bear, Weber, and Jordan Rivers (Musser, 1895).

In 1892, 1,998,000 fry were placed in the Bear River at Cache Junction (McDonald, 1894). Other than the usual dead fry observed, no results of this planting were reported.

A total of nine known introductions of shad into the state have been made (Table V.)

TABLE V. Shad fry introductions in Utah.

Year	Locality	County	No. planted
1871	Weber River	Weber	200
1873	Jordan River	Salt Lake	5,000
1887	Jordan River	Salt Lake	1,000,000
1887	Utah Lake	Utah	2,000,000
1888	Utah Lake	Utah	2,000,000
1891	Weber River	Weber	500,000
1891	Bear River	Box Elder	500,000
1891	Bear Lake	Rich	1,300,000
1892	Bear River	Cache	1,998,000
Total			9,303,200

¹Deseret Evening News, June 12, 1888.

²Deseret Evening News, November 10, 1889.

³Information obtained from David H. Madsen, Fish and Game Com.

Present Status—After about 1894 shad were not reported by commercial fishermen (Figure 10).

CHUM SALMON

Scientific Name—*Oncorhynchus keta*.

Common Names—Chum Salmon; Dog Salmon.

First Introduction—Available records indicate that the first introduction of chum salmon into Utah was made in 1939, when 94,080 fingerlings were shipped into the state by the U. S. Bureau of Fisheries (Leach, 1939). These were liberated in Strawberry Reservoir and Fish Lake.¹ In 1940, another shipment of 120,680 fingerlings from the U. S. Bureau of Fisheries was received in the state. These, also, were put in Strawberry Reservoir and Fish Lake (Leach, 1940). No records are known of chum salmon being taken from Utah waters.¹

Present Status—Chum salmon are not present in Utah today.¹

SILVER SALMON

Scientific Name—*Oncorhynchus kisutch*.

Common Names—Silver Salmon; Coho Salmon; White Salmon; Kisutch Salmon; Quisutch Salmon.

First Introduction—In the early spring of 1925, in excess of 500,000 silver salmon eggs were shipped into Utah from U. S. Bureau of Fisheries egg-taking stations on the Pacific Coast. These were hatched at the Springville Hatchery and the resulting fry planted in Strawberry Reservoir and Fish Lake (Figure 10). This introduction was made by State Fish and Game Commissioner, David H. Madsen (Meacham, 1929.)

Subsequent Introduction—Between 1925 and 1940, millions of silver salmon eggs from Pacific Coast egg-taking stations were shipped into Utah. These were hatched at State Fish and Game Department Hatcheries, and the resulting fry planted in public waters (Table VI).

¹Information obtained from M. J. Madsen, Utah State Fish and Game Dept., Salt Lake City, Utah.

TABLE VI. Silver Salmon fry introductions in Utah. Data taken from Biennial Reports of the Utah State Fish and Game Dept.

Year	Locality	County	Number
1925	Strawberry Res.	Wasatch	250,000
1925	Fish Lake	Sevier	250,000
1926	Logan River	Cache	13,000
1926	Blacksmith Fork	Cache	13,000
1926	Bear Lake	Rich	90,000
1927	Minersville Res.	Beaver	10,000
1927	Puffer Lake	Beaver	10,000
1927	Panguitch Lake	Garfield	30,000
1927	Navajo Lake	Kane	4,375
1927	Fish Lake	Sevier	50,000
1927	Utah Lake	Utah	325,000
1927	Strawberry Res.	Wasatch	200,000
1928	Bear Lake	Rich	400,000
1928	Scotfield Res.	Carbon	250,000
1928	Strawberry Res.	Wasatch	257,000
1928	Panguitch Lake	Garfield	40,000
1928	Navajo Lake	Kane	40,000
1928	Fish Lake	Sevier	42,800
1929	Fish Lake	Sevier	160,000
1929	Nebo Res.	Juab	200,000
1929	Strawberry Res.	Wasatch	285,000
1930	Strawberry Res.	Wasatch	75,000
1931	Bear Lake	Rich	200,000
1931	Fish Lake	Sevier	300,000
1931	Strawberry Res.	Wasatch	375,000
1932	Strawberry Res.	Wasatch	85,000
1932	Fish Lake	Sevier	100,000
1934	Scotfield Res.	Carbon	87,000
1934	Fish Lake	Sevier	100,000
1938	Puffer Lake	Beaver	8,500
1938	Unknown		306,600
1938	Unknown		38,400
1938	Scotfield Res.	Carbon	30,000
1938	Strawberry Res.	Wasatch	107,840
1939	Minersville Res.	Beaver	60,000
1939	Puffer Lake	Beaver	62,000
1939	Scotfield Res.	Carbon	100,000
1939	Fish Lake	Sevier	100,000

1939	Strawberry Res.	Wasatch	100,000
1939	Granddaddy Lake	Duchesne	50,000
1939	Mirror Lake	Summit	50,000
1939	Echo Res.	Summit	56,000
1939	Strawberry Res.	Wasatch	150,000
Total			5,461,515

A 1927 report indicated that fishermen at Strawberry Reservoir and Fish Lake were occasionally taking silver salmon (Meacham, 1929). Between 1927 and 1935, these two bodies of water furnished excellent silver salmon fishing. As late as 1950 no favorable results had been reported from any of the other bodies of water planted.¹ A study made during the winter of 1935, by missioner, Utah State Fish and Game Dept. (1910-1926), Salt Lake City, Utah. Dr. D. I. Rasmussen of the Utah State Agricultural College, showed a severe winter kill of this species in Strawberry Reservoir and Fish Lake (Cook, 1936).

From 1935 to 1941, silver salmon were taken only occasionally from Strawberry Reservoir and Fish Lake. Favorable results were not reported from any of the other plantings made after 1935.² Fish and Game Dept. (1931-1940), Mantua, Utah. Since 1940, silver salmon eggs have been so difficult to obtain that no further introductions have been made.

Present Status—Silver salmon are not found in any of the waters of the state today.³

KOKANEE

Scientific Name—*Oncorhynchus nerka kennerlyi*.

Common Names—Kokanee; Little Redfish Salmon; Walla; Kennerley's Salmon; Yank; Silversides; Blueback.

First Introductions—According to available records this species was first introduced into Utah in 1922; a shipment of 250,000

¹ Information obtained from David H. Madsen, Fish and Game Com-

² Information obtained from Newell B. Cook, Commissioner, Utah State

³ Information obtained from M. J. Madsen, Utah State Fish and Game Dept., Salt Lake City, Utah.

kokanee fry was received from the state of Washington in the fall of that year (Madsen, 1923). In the early spring of 1923, the surviving 224,000 were planted as fingerlings in Bear Lake in Rich County (Madsen, 1925).

Subsequent Introductions—In 1937, 98,000 kokanee fry were planted in Strawberry Reservoir by the U. S. Bureau of Fisheries. The source of this shipment of fry is not known (Leach, 1937). In 1938, 401,200 kokanee fry were procured by the State Fish and Game Department from Pend Oreille Lake in Idaho, and planted in Swan Creek, a tributary to Bear Lake (Leach, 1938). Some of these showed up in a fish trap in Swan Creek during the summer of 1939 (Cook, 1940). In 1939, 244,000 eggs from Idaho were received and hatched at the U. S. Fish Hatchery, Springville, Utah. The resulting fry were planted in Strawberry Reservoir and Bear Lake (Ryan, 1939.) About 1941 kokanee began to show up occasionally in these two bodies of water. During the early spring of 1946, several were observed in the fish trap at Bear Lake.

In 1947, 40,000 fingerlings, raised from eggs obtained in Idaho, were planted in Strawberry Reservoir. On January 7, 1948, 500,000 eggs were received from the hatchery at Sand Point, Idaho, and the resulting fry distributed as follows: Panguitch Lake 42,000 fry, Navajo Lake 42,000 fry, Scofield Reservoir 208,000 fry and Strawberry Reservoir 208,000.¹ According to Curtis Earl (1949) a few small kokanee were taken by fishermen from Strawberry Reservoir during the 1948 season.

Present Status—Until the present time introductions of kokanee into Utah waters have not been too successful. Limited populations are probably in Strawberry and Scofield Reservoirs, Panguitch and Navajo Lakes, and possibly Bear Lake at the present time (Figure 11).

KING SALMON

Scientific Name—*Oncorhynchus tshawytscha*.

Common Names—King Salmon; Chinook Salmon; Spring Salmon; Tyee; Quinnot.

¹ Information obtained from M. J. Madsen, Utah State Fish and Game Dept., Salt Lake City, Utah.

hatched at the Springville Hatchery and the resulting fry planted in Carbon, Duchesne, Juab, Sevier, Utah, Wasatch, and Rich Counties (Meacham, 1929). In 1929, two king salmon were reported taken from Fish Lake; however no authoritative verification of this was made.¹ It is believed that these introductions were as unsuccessful as those made during the period 1873 to 1879.

Present Status—the king salmon is not found in Utah today.

SEBAGO SALMON

Scientific Name—*Salmo salar sebago*.

Common Names—Sebago Salmon; Land-locked Salmon; Lake Salmon.

First Introduction—The first known introduction of the sebago salmon into Utah waters was made on March 7, 1873. On this date A. P. Rockwood of Salt Lake City, received a shipment of 1,000 sebago salmon eggs from Caledonia, New York. On March 14, 1873, Rockwood received a second shipment of 600 eggs from New Castle, Canada.² Whether these eggs hatched, and what disposition was made of the resulting fry if they did hatch, is unknown.

Subsequent Introduction—Early in 1875, A. P. Rockwood received another shipment of sebago salmon fry. The number of fry in this shipment is not known. These were sent to him by Mr. Seth Green of Rochester, New York. In August of 1875, an estimated 300 of these salmon were reported to be doing well in a pond on his farm near Salt Lake City.³ What happened to these young sebago salmon is unknown.

Five thousand eggs of this species were received at the Murray Hatchery in 1899, from the U. S. Fish Cultural Station, at Green Lake, Maine (Sharp, 1901). In 1900, 10,000 eggs were

¹Information obtained from David H. Madsen, Fish and Game Commissioner, Utah State Fish and Game Dept. (1910-1926), Salt Lake City, Utah.

²Deseret Evening News, March 17, 1873.

³Deseret Evening News, August 19, 1875.

sent to the Murray Hatchery from Maine by the U. S. Fish Commission (Ravenel, 1901). In June of 1901, 5,000 sebago salmon fry were planted in the Spring Run, a stream near Murray (Sharp, 1903). In 1902 and 1903, 20,000 eggs were received at the Murray Hatchery from the U. S. Fish Cultural Station at Green Lake, Maine (Bowers, 1904; Titcomb, 1905). No records are available as to the disposition of the fry resulting from these eggs.

In 1924, 30,000 fry hatched from eggs sent to Utah from a U. S. Fish Culture Station, Rangeley Lake, Maine, were planted in Fish Lake, in Sevier County (Madsen, 1925). No reports are available from this planting. From 1931 to 1935, 137,400 sebago salmon fingerlings were sent to Utah from Maine by the U. S. Bureau of Fisheries (Leach, 1931, 1933, 1934, 1935). Records do not indicate the bodies of water in which these fingerlings were planted. It is believed, however, that they were planted in Strawberry Reservoir, Scofield Reservoir, and Fish Lake.¹ Records of any sebago salmon being taken by anglers in the state of Utah are not known.

Present Status—The sebago salmon is not known to be present in the state today.

RAINBOW TROUT

Scientific Name—*Salmo gairdneri*.

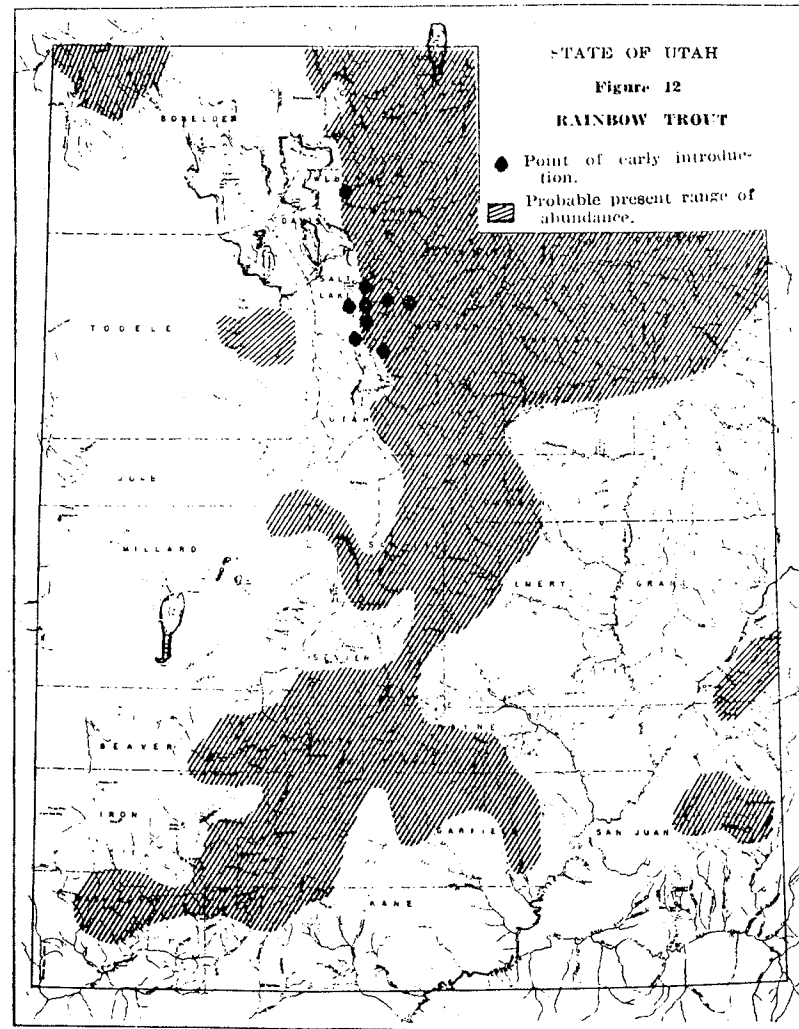
Common Names—Rainbow Trout; Rainbow.

First Introduction—It is believed that the earliest introduction of rainbow trout into Utah was made in 1883. Dr. J. D. M. Crockwell of Salt Lake City, received a shipment of eggs from the McCloud River, California. These were hatched in April of that year.² What distribution was made of the resulting fry is unknown. It is possible that they were liberated in the vicinity of Dr. Crockwell's home near Salt Lake City.

Subsequent Introductions—In 1893 G. W. Thayer of Provo received a shipment of 10,000 eggs from the McCloud River, U. S. Fish Station (Worth, 1894). The disposition of these eggs or fish is unknown. During the years 1894 and 1895, applicants in Utah received 43,880 eggs from the Neosho, Missouri, U. S. Fish Station

¹Information obtained from M. J. Madsen, Utah State Fish and Game Dept., Salt Lake City, Utah.

²Deseret Evening News, April 18, 1883.



(Bean, 1895; Ravenel, 1896). The disposition of the fish resulting from these eggs is unknown.

The first fry sent to Utah by the U. S. Fish Commission were received in 1896 by State Fish and Game Warden, John Sharp. A total of 4,050 fry were received and planted: 1,125 in the Ogden River at Ogden; 1,125 in Big Cottonwood Creek near Salt Lake City; and 1,800 in a pond near Pleasant Grove in Utah County.

Private applicants in the state received 20,000 fry in 1896 from the U. S. Fish Commission (Ravenel, 1897). In 1897, 1,000 fry from the McCloud River, U. S. Fish Station were planted in the Jordan River, near Utah Lake. In the same year, 1,500 fry were distributed to private Salt Lake City applicants (Ravenel, 1898). In 1898, 4,000 rainbow fry from the McCloud River, U. S. Fish Station were liberated in Silver Islet Lake, near Park City, by John Sharp (Ravenel, 1899). The results of these early introductions of rainbow trout into Utah are not known.

The completion of the new Murray Hatchery in 1898 increased possibilities for the introduction of this species into public waters. In excess of 200,000 eggs were received at the hatchery during 1899 and 1900. These eggs were sent to Utah from the U. S. Fish Cultural Station at Portland, Oregon. In 1900, a number of plants of rainbow fry were made in the streams of Salt Lake County. James L. Walker, the hatchery superintendent, liberated 500 in Little Cottonwood Creek; 1,000 in Big Cottonwood Creek; 500 in Mill Creek; and 7,000 in the Jordan River (Sharp, 1901). Shortly after 1900, fishermen began regularly to take these trout from some waters of the state.¹

By 1913 more rainbow trout were reared in State Fish and Game Department Hatcheries than any other species (Chambers, 1915). By this time rainbow trout had been introduced into almost all of the waters of the state, and many favorable reports of their growth and increase had been received.

Of the 8,353,706 rainbow trout planted from state fish hatcheries during 1947 and 1948, approximately one-half were of legal size (Leonard, 1948).

Present Status—Today the rainbow is found in almost all bodies of water in the state which will support trout (Figure 12).

¹Information obtained from David H. Madsen, Fish and Game Commissioner, Utah State Fish and Game Dept., (1910-1926), Salt Lake City, Utah.

GOLDEN TROUT

Scientific Name—*Salmo aqua-bonita*.

Common Name—Golden Trout.

First Introduction—According to available records the only introduction of golden trout into Utah was made in 1936. In this year, 11,100 golden trout fingerlings, from the Springville, U. S. Fish Station, were planted in waters of the state (Leach, 1937). Records do not indicate the exact places in the Uintah Mountains where these trout were liberated.

Present Status—Golden trout are not known to exist in Utah today, although there is the possibility they may be present in the Uintah Mountains.¹

BROWN TROUT

Scientific Name—*Salmo trutta fario*.

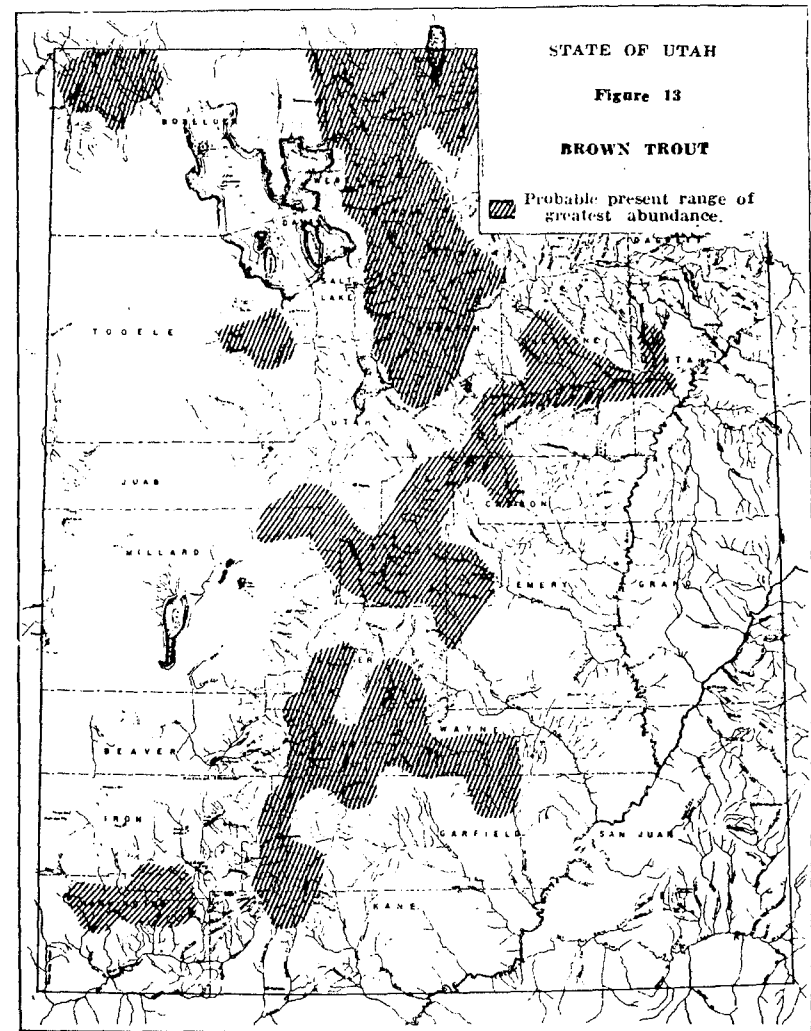
Common Names—Brown Trout; German Brown Trout; Von Behr Trout; Loch Leven Trout.

First Introduction—In 1895 an application for a supply of brown trout was made to the U. S. Fish Commissioner by John Sharp (Sharp, 1897). Records of shipments of this species into Utah prior to 1908 are not available. However, David H. Madsen, State Fish and Game Commissioner, recalled catching brown trout in a spring near Provo about 1900. This would indicate that the date of the first introduction must have been sometime prior to 1900.

Subsequent Introductions—In the fall of 1908 a large shipment of brown trout eggs from the East was received at the Murray Hatchery. The resulting fry were planted in many areas of the state in 1909. Detailed accounts of these plantings are not available. By 1910 locally raised browns were being planted regularly in most trout waters throughout the state (Chambers, 1911).

Chambers (1913) indicated that brown trout were quite numerous in the Provo and Weber Rivers in 1912. By 1913 the brown was one of the important artificially propagated fish in state hatcheries (Chambers, 1915). At present (1950) the brown

¹Information obtained from M. J. Madsen, Utah State Fish and Game Dept., Salt Lake City, Utah.



is still one of the most important hatchery-reared fish; during 1947 and 1948, 5,888,710 were planted in public waters from state hatcheries (Leonard, 1948).

Present Status—The brown trout is found today in most trout waters of Utah (Figure 13). It is probably more numerous, however, in the lower reaches of trout streams.

EASTERN BROOK TROUT

Scientific Name—*Salvelinus fontinalis*.

Common Names—Brook Trout; Speckled Trout; Squaretail.

First Introduction—According to available data the eastern brook trout was first introduced into Utah in 1875. A. P. Rockwood of Salt Lake City, received a shipment of 300 brook trout, ranging in size from 1 to 4 pounds, from Seth Green of Rochester, New York. These were planted in a stream on Mr. Rockwood's farm near Salt Lake City.¹ The results of this planting are not known.

Subsequent Introductions—From 1875 to 1894 there are no records available of any introductions of eastern brook trout into Utah. It is believed, however, by G. R. Walker of Salt Lake City, that his uncle, Samuel Sharp Walker, had a few brook trout fry brought in from the East in 1884. These were held in ponds at the mouth of Big Cottonwood Canyon.

Two thousand yearling eastern brooks from the Leadville, Colorado, U. S. Fish Station were sent to the territory by Col. Marshall McDonald, the U. S. Fish Commissioner in 1894. The average length of these fish was 12 inches. Of these 1,500 were put in Utah Lake, and 500 were liberated in City Creek near Salt Lake City.² By 1895 no successes had been reported from any of the previous plantings.

In the spring of 1895 at the request of John Sharp, Territorial Fish and Game Warden, 2,325 adult eastern brook trout were received from the Leadville, Colorado, U. S. Fish Station (Sharp, 1897). A number of these were found to be dead upon arrival; and of those remaining 300 were planted in Miller Creek in Carbon County, and 1,000 were placed in Utah Lake (Ravenel, 1896). In 1897, 5,000 eastern brook fry and 400 adults were received from the East. Three hundred of the fry were liberated in Santaquin Creek in Utah County, and the remainder were put in Parley's Canyon Creek in Salt Lake County (Sharp, 1899). The 400 adults were placed in the Jordan River where it leaves Utah Lake. In this same year 55,000 eastern brook eggs were shipped to five Salt Lake City applicants from U. S. Fish stations in the east (Ravenel, 1898).

¹Deseret Evening News, August 19, 1875.

²Deseret Evening News, December 1, 1894.

In 1898, 15,000 eastern brook fry from the Leadville, Colorado, U. S. Fish Station were planted in the "dell" in Parley's Canyon by Mart Carn (Sharp, 1899). In this same year private applicants in Salt Lake City received 60,000 eggs from U. S. Fish stations in the East (Ravenel, 1899).

In 1899, thousands of eastern brook eggs and fry were received at the new Murray Hatchery. The following counties of the state were planted with young eastern brook trout in 1900: Box Elder, Cache, Carbon, Davis, Juab, Morgan, Summit, Sevier, Sanpete, Salt Lake, Tooele, Piute, Weber, Utah, and Wasatch (Sharp, 1901). A number of these trout were reported taken in Salt Lake County in 1901, including one specimen weighing over seven pounds from Big Cottonwood Canyon (Sharp, 1903).

By 1903 most of the trout streams of the state had been planted with eastern brook trout (Sharp, 1905). During 1904, 1905, and 1906, continued heavy plantings were carried on in the state. In 1905 eastern brook trout were reported to be doing well in the Provo, Weber, Logan, and Blacksmith Fork Rivers, as well as in Fish Lake (Sharp, 1907.) A 1911 report indicated that they were increasing in Fish Lake (Chambers, 1913).

In 1913 the state turned most of its facilities over to the production of rainbow and brown trout, and from that time until the present eastern brook trout have been propagated only in limited numbers at state hatcheries (Chambers, 1915).

Present Status—In a number of instances the introduction of this species into the high lakes of Duchesne, Uintah, and Summit Counties in the past 12 years has proved to be successful. Eastern brook trout are found in most of the trout waters of Utah today, although in limited numbers (Figure 15).

fry were put in Blanche and Martha lakes, at the head of Big Cottonwood Canyon, by Alex Mitchell. On June 25, 6,000 fry were planted in East Canyon Creek in Summit County near Kimballs Junction, and 6,000 were put in Silver Lake at the head of Big Cottonwood Canyon by Commissioner Sharp and the Salt Lake County Warden (Sharp, 1901). The results of these introductions are unknown.

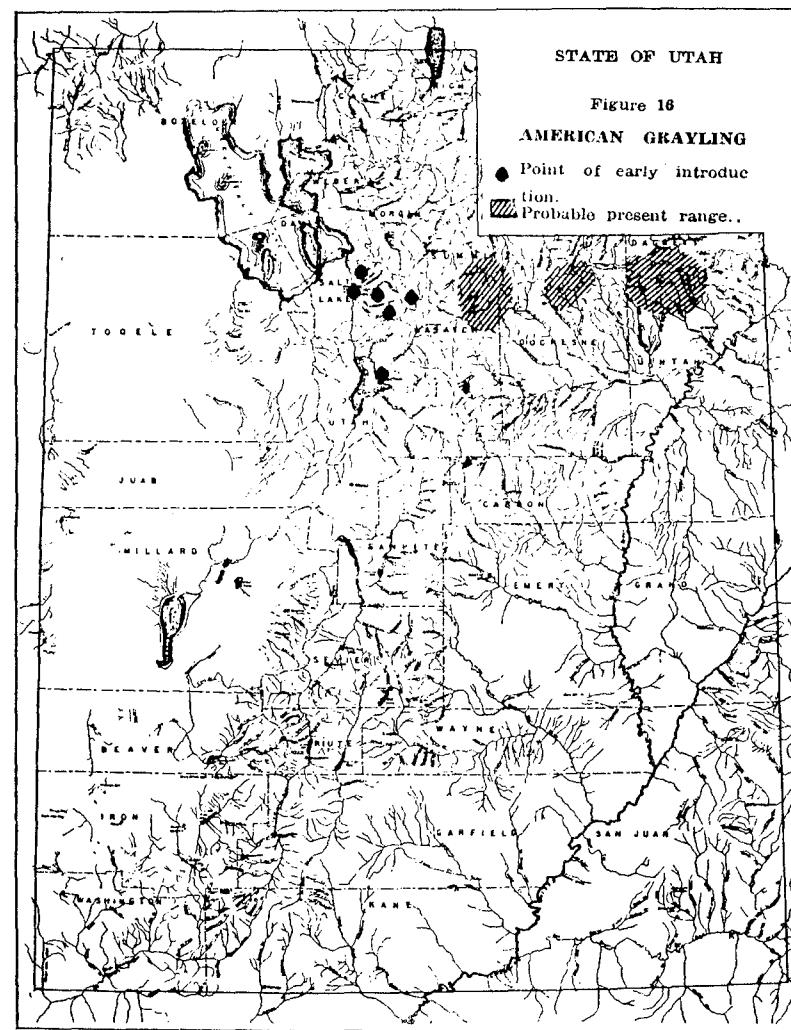
Subsequent Introductions—In August of 1899, 30,000 fry, hatched by the Cold Spring Trout Company near Salt Lake City from eggs purchased in Montana by Commissioner Sharp, were liberated in Spring streams tributary to Utah Lake (Sharp, 1901).

During the two years 1901 and 1902, 120,000 grayling fry were put into the Spring Runs near Murray by Hatchery Superintendent, James Walker. In June, 1902, 10,000 fry were released in Mill Creek just east of State Street, in Salt Lake City (Sharp, 1903). By 1903 very few grayling had been reported by fishermen.¹

In 1927, 150,000 fry, from the Springville Hatchery, were placed in Cache and Summit county streams (Meacham, 1929). Each year, from 1934 until the present time (1950) an average of about 200,000 grayling fry have been planted annually in the high lakes and streams of Uintah, Duchesne, and Summit counties. About 1936 grayling catches from a few of these lakes were first reported.²

¹Information obtained from David H. Madsen, Fish and Game Commissioner, Utah State Fish and Game Dept. (1910-1926), Salt Lake City, Utah.

²Information obtained from M. J. Madsen, Utah State Fish and Game Dept., Salt Lake City, Utah.



Present Status—Some of the high lakes and a few of the higher streams of the Uintah Mountains in Uintah, Duchesne, Daggett, and Summit counties now offer grayling fishing (Figure 16):

AMERICAN EEL

Scientific Name—*Auguilla bostoniensis*.

Common Names—American Eel; Common Eel; Fresh-Water Eel.

First Introduction—In July, 1872, 500 eels of unknown sizes were put in a pond on Zion's Cooperative Fish Farm near Salt Lake City. The eels soon disappeared from the pond. In 1874 an eel weighing one and one-half pounds was caught in Utah Lake near the mouth of the Provo River.¹ To get to this point, this eel, if from the stock planted in 1872, must have traveled downstream to the Jordan River, and then upstream into Utah Lake.

Subsequent Introductions—Commissioner A. M. Musser arranged with Seth Green of Rochester, New York, for shipment of eels in 1887.² Eighty 18-inch eels were received shortly after this, and these were released in the Jordan River (Musser, 1895). By 1894 several eels had been reported taken from Utah Lake. One specimen 30 inches long was caught by a Newell of Provo.³

Present Status—American eels are not known to exist in Utah today.

GOLDFISH

Scientific Name—*Carassius auratus*.

Common Name—Goldfish.

First Introduction—Very few details of the one known introduction of goldfish into Utah are available. In the spring of 1889, 47 adult goldfish from the U. S. Fish Commission were received by four applicants in the state. (Anon., 1892). What distribution was made of these is unknown.

It is highly possible that some introductions of this species may have been made by private owners of domestic goldfish.

Present Status—At this time goldfish are not known to exist in the wild state in Utah.⁴

¹Deseret Evening News, September 15, 1874.

²Deseret Evening News, May 28, 1887.

³Deseret Evening News, January 20, 1894.

⁴Information obtained from M. J. Madsen, Utah State Fish and Game Dept., Salt Lake City, Utah.

CARP

Scientific Name—*Cyprinus carpio*.

Common Names—Carp; German Carp; European Carp.

First Introduction—According to available records the first carp were shipped into Utah in 1881, from the Washington, D. C., U. S. Fish Station. This shipment was ordered by Joseph L. Barfoot and consisted of 130 adult carp. They were distributed among five counties (McDonald, 1884). The names of these five counties are not known. Barfoot stated at this time that fish culturists would do well to replace worthless varieties of fish with carp.¹

Subsequent Introductions—In 1882 a letter from the U. S. Fish Commissioner, indicating that a number of carp shipments could be made to Utah in that year, was received by Commissioner Barfoot.² Subsequently, 200 carp were introduced into the state in that year. They were sent from the Washington, D. C., U. S. Fish Station, and all were in good condition upon arrival. These carp were planted in the following counties: Box Elder 20; Iron 20; Kane 20; Piute 20; Millard 20; Salt Lake 20; Summit 40; and Weber 20 (McDonald, 1884). The bodies of water planted are unknown.

According to the Deseret Evening News of February 23, 1883, J. D. N. Crockwell received a shipment of carp, which he distributed to interested parties in Salt Lake City.

Beginning in 1886, large numbers of carp were shipped into Utah. In 1886, 11,960 young carp were planted in 20 counties (McDonald, 1889). During 1887, and the first six months of 1888, 14,446 young carp were planted in 27 counties of the state (Anon., 1891). Between November 7, 1888 and March 6, 1889, 17,400 carp were liberated in 21 counties (Anon., 1892). All of these carp were obtained from the U. S. Fish Commission. By 1890 favorable results from previous carp introductions were being reported from most counties of the state.

Shipments of carp into Utah were continued by the U. S. Fish Commission until about 1903. From 1890 to 1900 a number of transplants from already established carp populations were made to new areas within the state.³

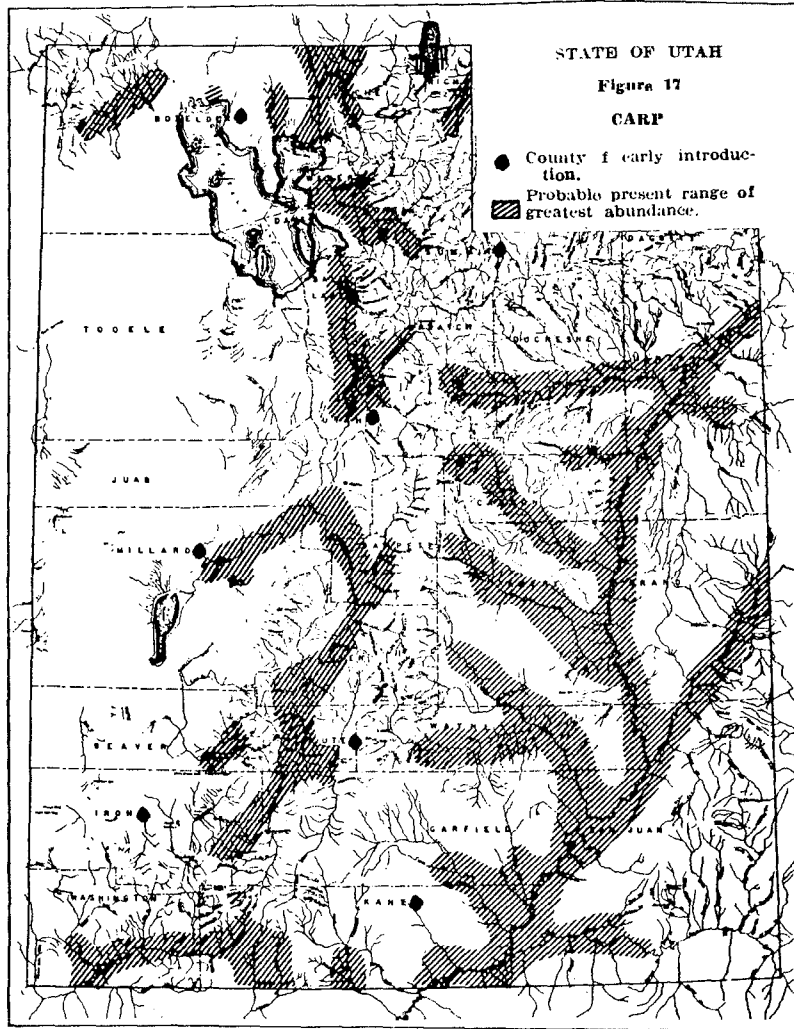
¹Deseret Evening News, December 31, 1881.

²Deseret Evening News, May 28, 1874.

³Information obtained from David H. Madsen, Fish and Game Commissioner, Utah State Fish and Game Dept. (1910-1926), Salt Lake City, Utah.

Present Status—At this time carp are found in all of the major drainage systems of Utah (Figure 17). For the most part they are confined to waters of lower elevation, however, they are now present in some of Utah's best trout waters.

Recently, the State Fish and Game Department has instituted a program to utilize the carp and other non-game fish for fish feed and other commercial feeds which should aid in reducing numbers of these less desirable fishes.



CHANNEL CATFISH

Scientific Name—*Ictalurus lacustris*.

Common Names—Channel Catfish; Speckled Catfish; Fiddler.

First Introduction—In 1888 there was some correspondence between the U. S. Fish Commissioner and the Utah Territorial Fish Commissioner concerning the possible introduction of the channel catfish into Utah.¹ Records of introductions of this species into Utah prior to 1911, however, are not available.

In the summer of 1911, an unknown number of channel catfish from the East were planted in streams tributary to Utah Lake (Chambers, 1913)

Subsequent Introductions—During 1919 and 1920, shipments of channel catfish from the U. S. Bureau of Fisheries were put in Utah Lake, Bear River, and Weber River (Siddoway, 1921). The numbers of catfish in these shipments are not known. A channel catfish planting was made in 1922 in Bear River by V. Tingey and party, while another small planting of these fish was made in the same river in 1924 (Madsen, 1925).

In 1932, 200 channel fry were planted in the Bear River, in Box Elder County, and at the same time 80 fry were put in the Bear River, in Cache County. These fry were raised from eggs at the Springville Hatchery (Cook, 1934). In 1935, 150 channel catfish of assorted sizes were transplanted from the Green River in Uintah County, to the Bear River in Box Elder County (Cook, 1936). It is believed that recorded introductions of this species into the Green and Colorado rivers in Wyoming occurred prior to 1930 (Simon, 1946). Records show that the first introduction of channel catfish into these two rivers in Utah took place in 1939. At that time, a number of channel catfish from the Mississippi River were planted in the Green and Colorado rivers in Uintah and Grand counties.

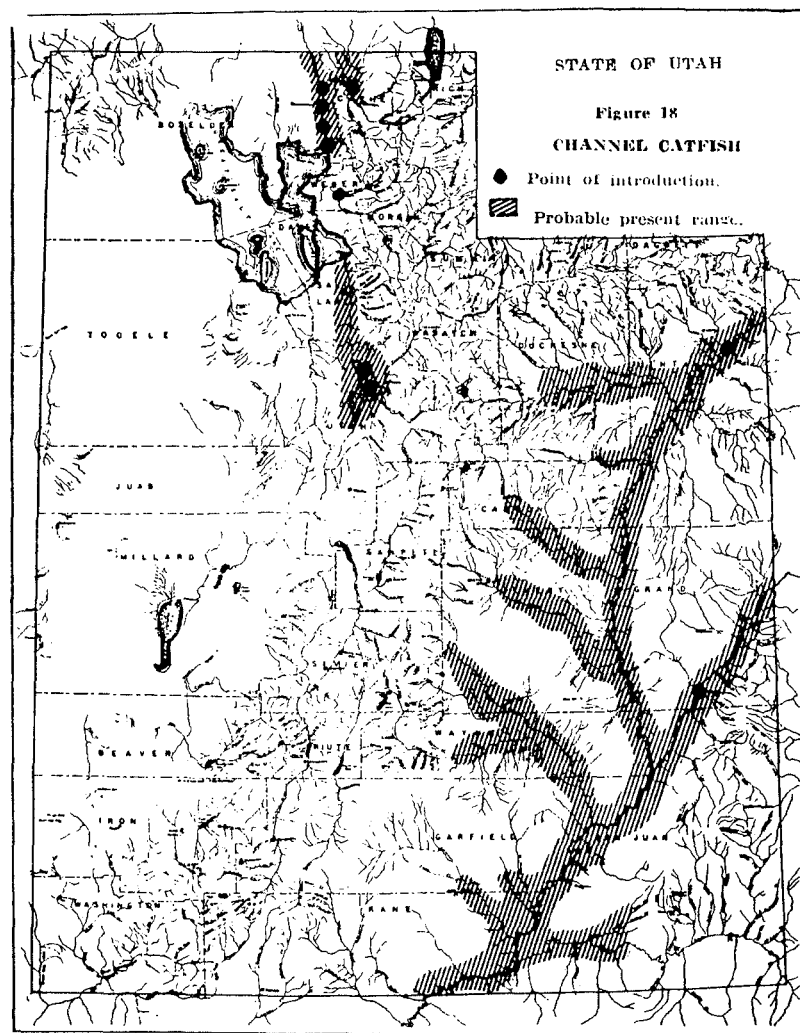
In 1939, 750 channel catfish of assorted sizes were transplanted from the Green River to Utah Lake by members of the Utah County Wildlife Federation (Cook, 1940). Since 1939, a number of Wildlife Federations in the state have made transplants of channel catfish from the Green River to other bodies of water in

¹Deseret Evening News, November 19, 1888.

²Information from Vance Tingey, Utah State Agricultural College.

the state.

Present Status—At this time channel catfish are well established in the Green and Colorado rivers (Figure 18). They are showing promise in the Bear River and in Utah Lake.



BLACK BULLHEAD

Scientific Name—*Ameiurus melas*.

Common Names—Black Bullhead; Common Bullhead; Horned Pout; Northern Bullhead.

First Introduction—In 1871 a number of young bullhead fry from the midwest were put into the Jordan River, in Salt Lake County, by A. P. Rockwood. In the fall of the same year several three inch bullheads were reported taken by fishermen from the Jordan River.¹

Subsequent Introductions—In 1874 another introduction of black bullhead fry was made into the Jordan River by Rockwood. During the spring of 1874 several bullheads were taken from the Jordan River.²

In October of 1893, 1,000 black bullheads, ranging in size from 9 to 15 inches, were received in Utah from a Midwest U. S. fish station. These were liberated in Utah Lake by Commissioner A. M. Musser (Musser, 1895). It was hoped by the commissioner that the introduction of this species would add greatly to the food supply of Utah.³ Several years later anglers began catching black bullheads in Utah Lake.⁴

About 1900 commercial fishermen began taking black bullheads from Utah Lake in significant numbers. In 1901, 13,765 pounds were taken and marketed at \$.08 per pound. In 1903 16,000 pounds were caught and marketed at the same figure (Sharp, 1903). During 1903 and 1904, 110,000 pounds were sold by Utah Lake commercial fishermen (Sharp, 1905).

The State Fish and Game Commissioner recommended a year-round open season on this species in 1909, in view of their rapid increase (Chambers, 1911). In 1914 many thousands of fingerlings from Utah Lake were planted in all counties of the state. At this time black bullheads from several different sections of the state were being marketed commercially (Chambers, 1915).

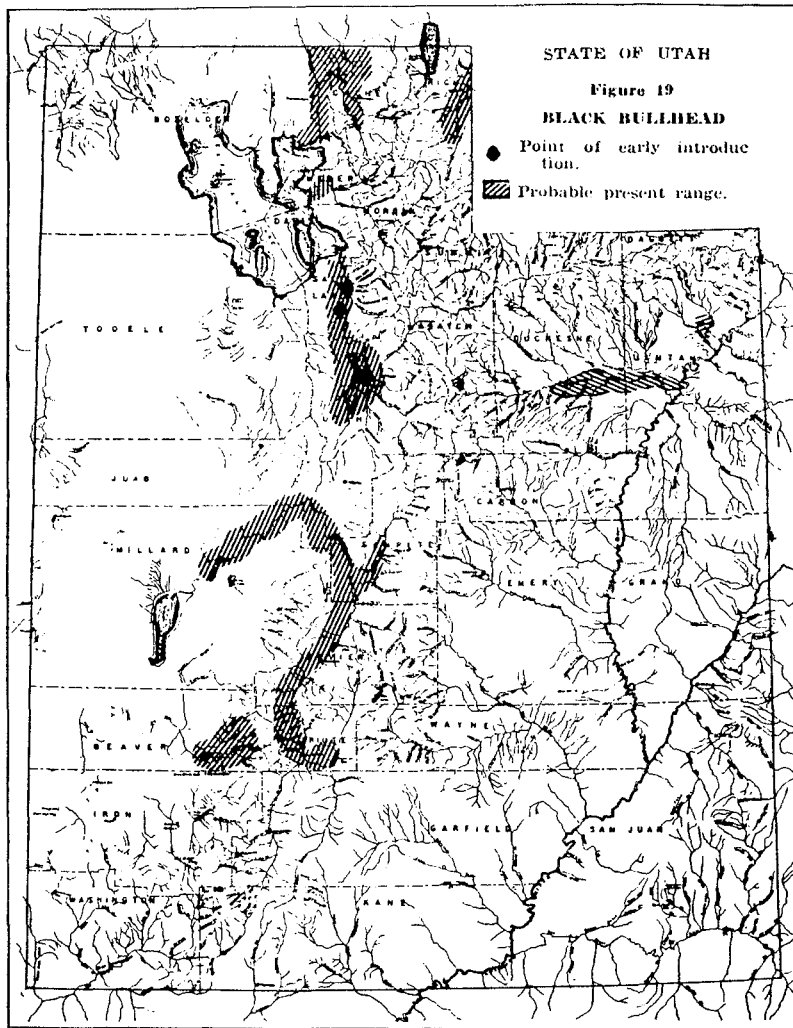
Licenses to market these fish were still being sold by the State Fish and Game Department in 1924 (Madsen, 1925).

¹Deseret Evening News, October 26, 1871.

²Deseret Evening News, May 28, 1871.

³Deseret Evening News, October 26, 1893.

⁴Information obtained from David H. Madsen, Fish and Game Commissioner, Utah State Fish and Game Dept. (1910-1926), Salt Lake City, Utah.



Shortly after this the black bullhead was raised to the status of a game fish and was protected at certain times of the year.¹

Present Status—At the present time the black bullhead has become well established in a number of places in the state and has become quite important to sportsmen in local areas (Figure

¹Information obtained from David H. Madsen, Fish and Game Commissioner, Utah State Fish and Game Dept. (1910-1926), Salt Lake City, Utah.

YELLOW PERCH

Scientific Name—*Perca flavescens*.

Common Names—Yellow Perch; Common Perch; Ringed Perch; Striped Perch.

First Introduction—On September 8, 1890 a carload shipment of mixed fishes, received in Utah from the Illinois River, contained an unknown number of yellow perch. These fish were sent to A. M. Musser by Dr. Bartlett. About one-fourth of the shipment was put into the Weber River at Ogden and the remainder into Utah Lake (Musser, 1895).

Subsequent Introductions—In 1891, 636 yellow perch fry from the Midwest were received by A. M. Musser; 436 of these were planted in Utah Lake, and the remaining 200 were put into the Weber River at Ogden (McDonald, 1893). In 1894 yellow perch were reported to be multiplying in Utah Lake.¹ After this very little was heard of this species for a number of years.

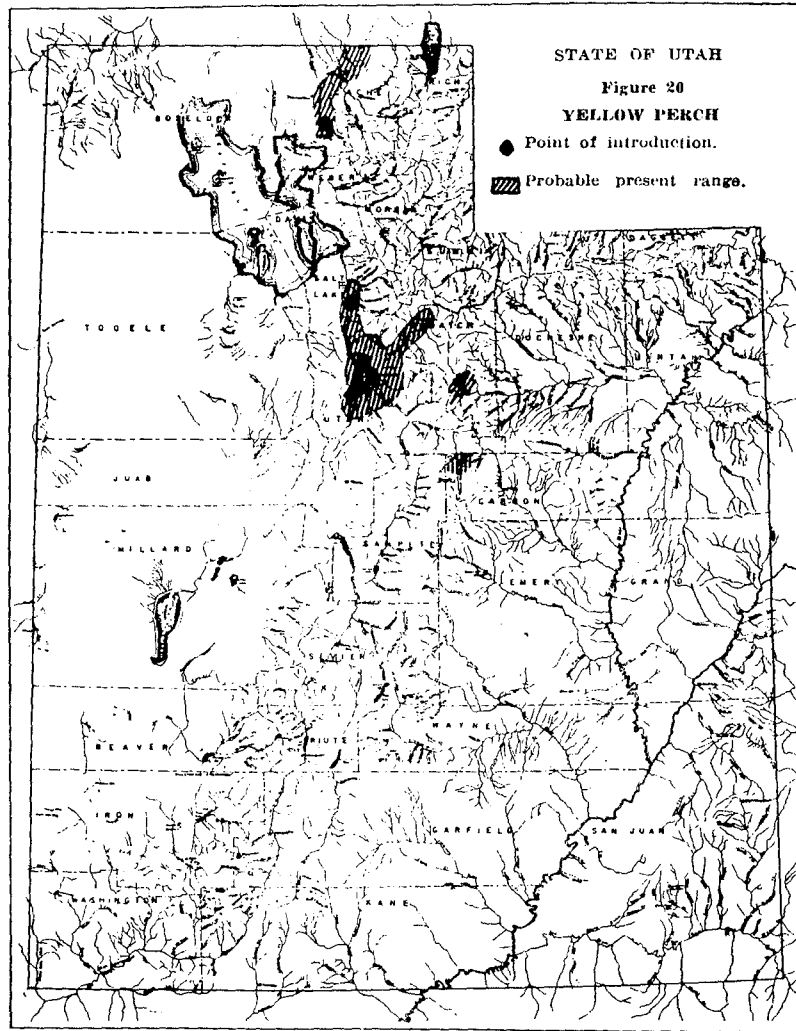
In 1923 a shipment of 175,000 yellow perch fry was distributed in Bear River, Jordan River, and Utah Lake (Meacham, 1929). The source of this shipment is unknown. Several thousand yellow perch annually were put into Utah Lake during the summers of 1931, 1932, and 1933. These were sent to Utah from the East by the U. S. Bureau of Fisheries.² In 1932, 5,000 perch from 2 to 6 inches long were planted in the Bear River, in Box Elder County, from the Springville Hatchery (Cook, 1934).

By 1933 yellow perch had become fairly well established in Utah Lake. The extreme drought of 1934 killed many of the Utah Lake yellow perch.² Four thousand adult yellow perch from the Springville Hatchery were distributed in Box Elder, Juab, Sevier, and Utah counties in 1934. Those planted in Box Elder Counties were put in Locomotive Springs (Cook, 1936).

Present Status—The yellow perch is now well established in several sections of the state so well in fact that a number of stunted populations have resulted (Figure 20). The yellow perch furnishes sport fishing in Utah Lake and Deer Creek Reservoir.

¹Deseret Evening News, July 28, 1894.

²Information obtained from Dr. Vasco M. Tanner, Brigham Young University, Provo, Utah.



SMALLMOUTH BASS

Scientific Name—*Micropterus dolomieu*.

Common Names—Smallmouth Black Bass; River Bass; Black Bass.

First Introduction—During the summer of 1912, 160 adult smallmouth black bass were planted in Spring Creek, a tributary

to Utah Lake. These were sent to Utah from the Midwest by the U. S. Bureau of Fisheries (Chambers, 1913; Smith, 1914).

Subsequent Introductions—In 1914, 600 fingerlings, shipped into Utah by the U. S. Bureau of Fisheries, were liberated in Spring Lake in Utah County (Chambers, 1915). Fifty adult smallmouths from the East were planted in Spring Creek in Cache County in 1915 by the U. S. Bureau of Fisheries (Johnson, 1915). So far as is known, no favorable reports have been received from any of these introductions.

Present Status—This species is not known to be present in Utah today.

LARGEMOUTH BASS

Scientific Name—*Micropterus salmoides*.

Common Names—Northern Largemouth Black Bass; Largemouth; Bigmouth; Straw Bass; Green Trout; Green Bass.

First Introduction—The largemouth black bass was first introduced into Utah on September 8, 1890. On this date a mixed carload of largemouth black bass, perch, crappies and sunfish was received in Utah. These fish were seined from the Illinois River Bottoms and were sent by Dr. Bartlett. There were estimated to be about 2,000 largemouths of various sizes in the carload. About one-fourth of this shipment was put into the Weber River at Ogden, and the remainder into Utah Lake (Musser, 1894). After this introduction the taking of bass in Utah waters was prohibited by law for three years (Sharp, 1899). No results have been reported from the Weber River planting.

Subsequent Introductions—In 1891, 1,700 largemouth fry were received from the U. S. Bureau of Fisheries, and these were released in Utah Lake (McDonald, 1893). State Fish and Game Warden, A. M. Musser, reported the bass to be doing well in Utah Lake in 1892. In 1893 the largemouth black bass season was opened and a few specimens, the largest weighing three pounds, were taken from Utah Lake.

During 1894 largemouths were taken regularly from Utah Lake for domestic and commercial use. Besides those taken for transplanting purposes, about 30,000 pounds were taken by commercial fishermen. During this year many were transplanted from Utah Lake to other waters in the state (Musser, 1894). In 1895,

100 adult largemouth black bass were planted in Utah Lake by a representative of the U. S. Fish Commission (Ravenel, 1896). About 2,000 spawners from Utah Lake were furnished to private individuals in the state for stocking purposes in 1895.

Commercial fishermen took 32,000 pounds of bass from Utah Lake during 1895. These were sold at \$0.12 per pound (Sharp, 1897). About 10,000 adult bass from Utah Lake were planted throughout the state in 1896 and 1897. This large-scale transplanting program was continued during 1898 and 1899. Sixty-one thousand pounds were sold by Utah Lake commercial fishermen during 1897 and 1898. A shipment of 5,000 largemouth fry from Utah County was sent to Colorado in 1898 (Sharp, 1899).

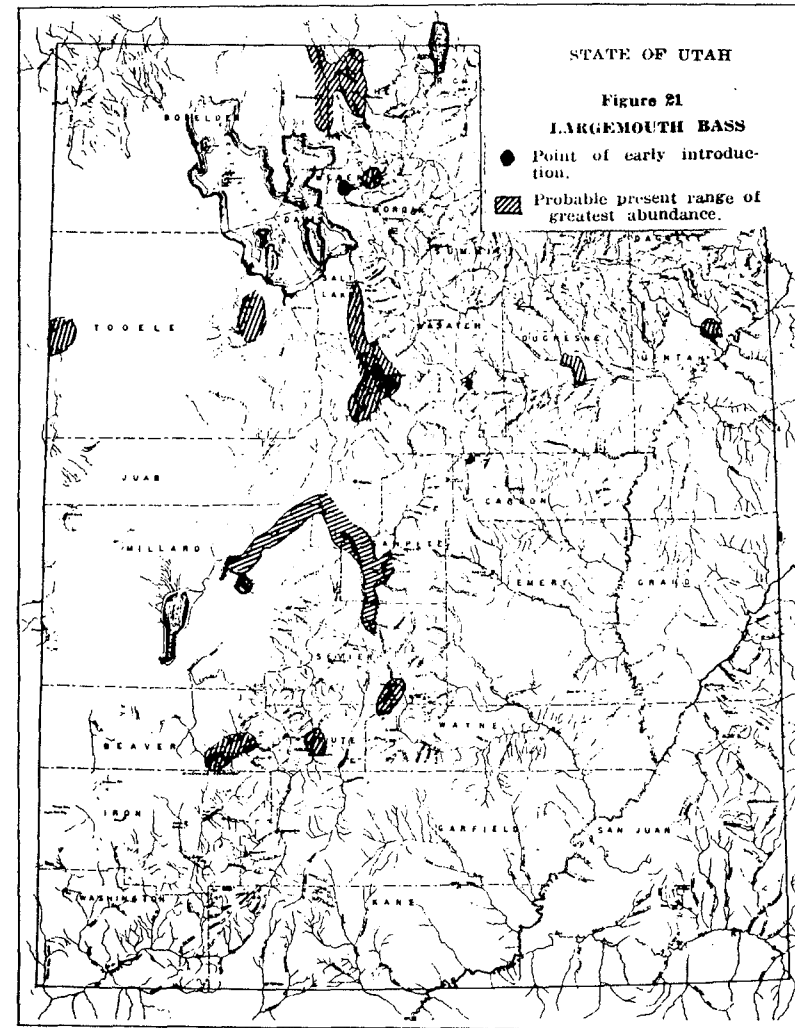
By 1902 the annual take of largemouth bass by Utah Lake commercial fishermen had decreased noticeably. It was believed by John Sharp, State Fish and Game Commissioner, that the lowering of Utah Lake had greatly decreased the spawning grounds of these fish. In 1905 John Sharp reported that the numbers of largemouth black bass in Utah Lake had greatly decreased, and he strongly urged the providing of protected spawning areas. Reports from Cache and Box Elder Counties indicated that this species was doing well in the Bear River at this time (Sharp, 1907).

In 1909 Powells Slough, near Utah Lake, was set aside as a natural bass hatchery. This was stocked each year with spawners seined from the Lake (Chambers, 1911). In 1912, 5,000,000 fry were hatched in Powells Slough, and a number of these were transplanted to other waters. At this time Utah Lake was quite famous for its bass fishing (Chambers, 1913).

The last year that Powells Slough was maintained as a natural largemouth bass hatchery was 1913 (Chambers, 1915).

From 1913 to 1930 very little attention was paid to the propagation of black bass in Utah. In 1930 Locomotive Springs in Box Elder County were purchased by the state and stocked with largemouths. A few hundred fingerlings were distributed to applicants from the Whiterock Hatchery in 1931 (Cook, 1932). From this time until the present, most of the largemouth black bass planted in waters of the state have come from the Springville, U. S. Fish Station. In the past 10 years a number of farm fish ponds have been planted with bass from this hatchery.

Present Status—At the present time the largemouth bass is generally confined to waters of lower elevation in Utah (Figure 21). The recent interest in farm fish ponds has helped to establish this species in many new areas of warm water in the state.



ROCK BASS

Scientific Name—*Ambloplites rupestris*.

Common Names—Rock Bass; Northern Rock Bass; Redeye; Goggle-eye.

First Introduction—According to records the first introduction of this species into Utah was made in 1896, when 190 adult rock bass were planted in the Bear River near Brigham City. These were planted by a representative of the U. S. Fish Commission (Ravenel, 1898). No records of any of these being taken from Bear River are available.

Subsequent Introductions—In 1909, 150 fingerling rock bass were planted in Gifford Spring, near Lund, in Iron County. These were sent to Utah from the East by the U. S. Bureau of Fisheries (Bowers, 1909). In the following year 200 fingerlings were liberated in Bur Oak Spring in this same area. These were also shipped into the state from the East by the U. S. Bureau of Fisheries (Bowers, 1910). The results of these two introductions are not known.

In 1914, 200 rock bass fingerlings were put in McComie's Pond near Ogden (Johnson, 1914). In 1916 another planting of 200 fingerlings was made in a spring pond near Murray (O'Malley, 1916.) Available records do not indicate the results of either of these plantings.

Present Status—The rock bass is not known to exist in Utah today.¹

BLACK CRAPPIE

Scientific Name—*Pomoxis nigro-maculatus*.

Common Names—Black Crappie; Calico Bass; Strawberry Bass; Grass Bass.

First Introduction—The black crappie was first introduced into Utah in 1890 in a carload shipment of fishes from the Illinois River Bottoms. One fourth of these were put into the Weber River at Ogden and the remainder were put into Utah Lake (Musser, 1895). No early reports of black crappies being taken in either of these places are available.

¹Information obtained from M. J. Madsen, Utah State Fish and Game Dept., Salt Lake City, Utah.

Subsequent Introductions—In 1895, 25 adult black crappies were put into Utah Lake by A. M. Musser. These were sent to Utah by the U. S. Fish Commission (Ravenel, 1896). The source of this shipment is unknown. From this time until 1930, little was heard of this species in Utah.

During 1931, 1932, and 1933, several thousand young crappies were planted in Utah Lake at the mouth of the Provo River. These were sent to Utah from the East by the U. S. Bureau of Fisheries. Many of these were known to have died during the extreme drought of 1934.¹ Since this time crappies have occasionally been taken from Utah Lake.

In 1934, 190 adult crappies were put in Locomotive Springs in Box Elder County. These were raised at the Springville Hatchery (Cook, 1936).

In 1939, 32,000 legal sized crappies from the Murray Hatchery were planted, 26,500 in Salt Lake County and 5,500 in Tooele County (Cook, 1940).

Present Status—At the present time black crappies are found only in a few places in Utah. Because of the interest in farm fish ponds it is possible that some unknown introductions of this species may have been made recently.

GREEN SUNFISH

Scientific Name—*Lepomis cyanellus*.

Common Names—Green Sunfish Blue-spotted sunfish.

First Introduction—The green sunfish was probably first introduced into Utah in 1890, in a mixed carload shipment of fishes from the Illinois River. These were introduced into the Weber River at Ogden and into Utah Lake (Musser, 1895). The results of this introduction are not known.

Subsequent Introductions—Between 1931 and 1940, 45,385 "sunfish" fry were planted in Utah waters by the U. S. Bureau of Fisheries (Leach, 1931; 1933; 1937; 1939; 1940). During this period both green sunfish and bluegills were distributed as "sunfish" by the U. S. Bureau of Fisheries. A number of these introductions

¹Information obtained from Dr. Vasco M. Tanner, Brigham Young University, Provo, Utah.

were undoubtedly successful as green sunfish are now commonly found in waters at lower elevations in the state.

Present Status—The green sunfish is found in many warm waters of the state but because of its small size is not considered as a good sport fish.

BLUEGILL

Scientific Name—*Lepomis macrochirus*.

Common Names—Common Bluegill; Redbreasted Sunfish; Blue Bream; Blue Sunfish; Copper-Nosed Sunfish; Dollardee.

First Introduction—It is possible that bluegills may have been present in the mixed carload shipment of fishes from the Illinois River which were received in Utah 1890. The report of this introduction indicates that a number of sunfishes were included, and it is possible that bluegills may have been among these. The fish in this shipment were planted in the Weber River and in Utah Lake (Musser, 1895).

Subsequent Introductions—Bluegills were reported to be common throughout the state in sloughs and ponds in 1915 (Chambers, 1917). In view of this it is possible that some introductions, of which the details are unknown, occurred between 1890 and 1915.

In 1934, 4,100 bluegill fingerlings, from the Springville Hatchery, were planted in Locomotive Springs in Box Elder County (Cook, 1936). Arnold Christensen, Box Elder County Warden, reported that since 1934 bluegills have been taken occasionally by fishermen at Locomotive Springs.

In 1935 the Springville, Utah, U. S. Fish Station began the distribution of bluegills to applicants in the state. Since this time many thousands of bluegills have been planted in both public and private waters of the state.¹ Recently this species has been very much in demand for planting in farm fish ponds.

Present Status—At this time bluegills are found in waters at lower elevations in the state. They are reported to be doing well in many farm fish ponds.¹

¹Information obtained from Fred Richins, former superintendent, Springville, Utah, U. S. Fish Station.

SUMMARY

1. The general increased interest in the field of wildlife conservation and management throughout the past half century, coupled with the desire to increase game populations in face of constantly increasing numbers of hunters and fishermen, has stimulated interest in introducing exotic species of game birds and mammals.
2. Since 1869, when the first known introductions were made, a total of 36 species of fish and game are known to have been introduced into Utah.
3. Six species of game birds have been introduced into Utah. These include the Hungarian partridge, Chukar partridge, bobwhite quail, California quail, ring-necked pheasant, and wild turkey.
4. Three species of big game mammals have been introduced and subsequently transplanted into various parts of the State. These include the elk, antelope, and buffalo.
5. Two fur animals known to have been introduced into the State are the nutria and a dark form of muskrat.
6. Of the introduced game birds, the pheasant has shown best results and has spread into practically all irrigable lands of the State. The California quail has been confined in greater numbers to the northern counties. The Hungarian partridge, which has recently migrated into the State, is becoming firmly established in Box Elder County.
7. Bobwhite quail is apparently not increasing from the original introductions, and does not show promise of becoming an important game bird. Chukar partridge and the wild turkey, although not successful from previous stocking, should be encouraged through additional plants of birds in carefully selected habitat. Merriam's turkey, a form native to the Southwest, should be used in future turkey stocking.
8. Of the three big game animals introduced into Utah, the elk has proved the most successful, while the antelope is increasing in many parts and holds promise of becoming more successful. Bison are increasing slowly in one small area near the Henry Mountains.
9. The nutria, or South American swamp beaver, is established in several marshes in Utah, but does not appear to be increasing at a rapid rate. The dark furred muskrat which has been introduced does not appear to be thriving.

10. Nine species of introduced fish have successfully established themselves and are distributed throughout much of the State. The rainbow, brown and Eastern brook trout are the most widely distributed of the introduced popular game fish; carp, channel catfish and black bullhead have also spread from the original transplanted stock. Yellow perch, green sunfish and bluegill fish have established themselves in Utah's waters but are not widely utilized as sport fish.
11. Five introduced fishes including the kokanee, lake trout, American grayling, largemouth bass and black crappie have adapted themselves to Utah's conditions and are present in limited numbers in a few waters of the state.
12. Eleven species of introduced fishes have not succeeded in establishing themselves and are not known to live in Utah at the present time, 1950. Greatest efforts were made to establish the American shad, silver salmon, king salmon, and lake whitefish.
13. In the interests of costs and possible disappointments, it is recommended that, before further introductions of new species treated in this paper are considered, careful study be made of past records and other factors which may influence the possible success of future introductions. Transplanted animals cannot be expected to survive or increase to the "harestable surplus" stage when food, cover, or climatic conditions on their release site are at variance with those which occurred in their original homes. Intelligent stocking of exotic or extirpated species must be based upon a thorough knowledge of the animal's living requirements.

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