DEPARTMENT OF COMMERCE
R. P. LAMONT, Secretary
BUREAU OF FISHERIES
HENRY O'MALLEY, Commissioner

Bureau of Fisheries Document No. 1062

WHITEFISH, GRAYLING, TROUT, AND SALMON OF THE INTERMOUNTAIN REGION

By S. B. LOCKE

APPENDIX V TO REPORT OF COMMISSIONER OF FISHERIES
FOR THE FISCAL YEAR 1929

UNITED STATES
GOVERNMENT PRINTING OFFICE
WASHINGTON : 1929

For sale by the Superintendent of Documents, Washington, D. C. - - - - Price 10 cents

WHITEFISH, GRAYLING, TROUT, AND SALMON OF THE INTERMOUNTAIN REGION[1]

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INTRODUCTION

[By R. H. Rutledge, District Forester, Intermountain District]

The maintenance of conditions favorable to fish life in our mountain streams is largely dependent upon the preservation of the forests. In fact, the fish life within the national forests may well be considered one of their resources, which may be favorably influenced in proportion to our ability properly to administer the forests. In this region the sources of the principal fish streams lie within the national forests. The maintenance of a timber cover tends to insure a constant flow of cold water and other conditions essential to the growth and development of game fish. The practice of forestry both inside and outside the national forests is of vital interest to the fisherman who desires to see his sport perpetuated. Under the practice of forestry the mature trees are harvested, but the young growth is protected and the forest cover maintained. This means that favorable stream conditions will be preserved. All rearing of trout in hatcheries or protecting them by closed seasons is wasted unless suitable conditions for survival exist in the lakes and streams. Several specific examples are on record of how trout have been killed directly as a result of forest fires. Besides these are the cases in which the burning of the forest cover has resulted in the streams filling with mud and silt, the water ceasing to flow during dry periods, or becoming too warm for fish life.

The greatest problem in the protection of the national forests is the prevention of forest fires. A much too large proportion of such fires is caused by the carlessness of persons seeking recreation there. This pamphlet has been prepared for your use and information in connection with your sport. We hope it will add to your interest and pleasure in fishing. In return, greater appreciation of the necessity of the preservation of forests to the maintenance of fishing is desired, and full cooperation in the prevention of forest fires is expected.

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[1] Appendix V to the Report of the U. S. Commissioner of Fisheries for 1929. B. F. Doc. 1062. Submitted for publication Feb. 4, 1929.

[2] Key reviewed and much valuable assistance given by Dr. W. C. Kendall, ichthyologist, U. S. Bureau of Fisheries. Illustrations from publications of the U. S. Bureau of Fisheries and the California Fish and Game Commission in part.

RELATION TO GEOGRAPHIC DIVISIONS

The intermountain region as here discussed coincides roughly with United States Forest Service District No. 4, including Nevada, the Snake River drainage in Idaho south of the Salmon River and in Wyoming, the Great Basin in Utah, and the Colorado River drainage in Utah and Wyoming. Within each of the geographic divisions are one or more species of the fish discussed in this paper, with considerable local variation in the native trout. The connection and discharge from the ancient Lake Bonneville into the Snake River gives very similar fish species in the Great Basin and upper Snake River. Apparently Shoshone Falls has long been a barrier to fish, since there are in general different species in the Snake River Basin

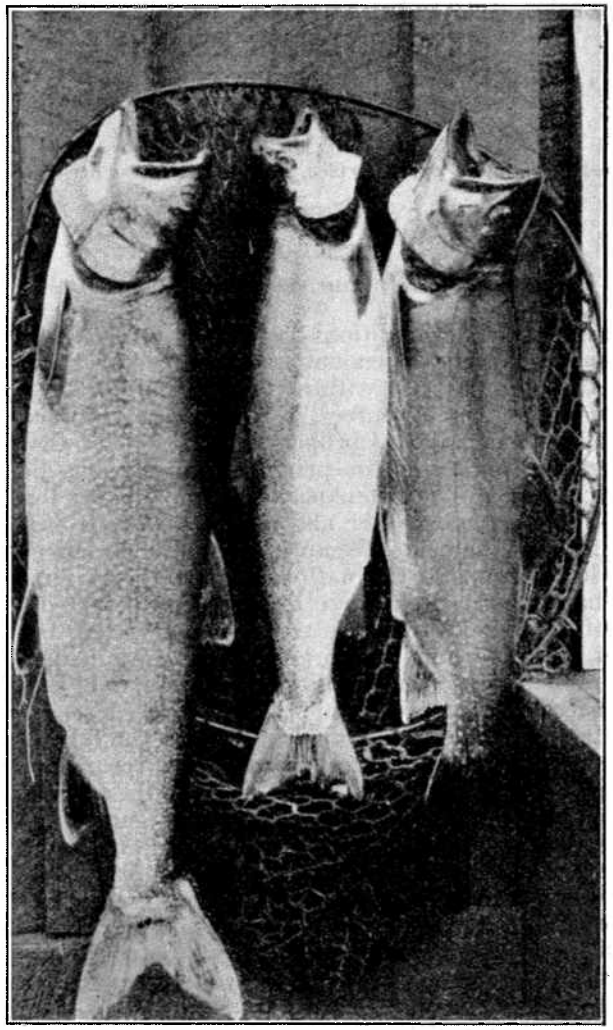

FIGURE 1.—Mackinaw, rainbow, and eastern brook trout

above and below these. Until planted by white men, the Lost River Basin held only whitefish. Fish culture has introduced several new species and mixed those native to several of these divisions. The introduced species also have been mixed, the brown trout with the Loch Leven and the steelhead with the rainbow.

IDENTIFICATION OF FISH SPECIES

Only a small amount of knowledge is necessary to enable one to undertake the identification of the various trout species. The ability to distinguish these gives the fishermen greater interest in his sport and the opportunity to observe and interpret more clearly facts regarding their life history.

The native trout, as represented here in the cutthroat or black-spotted group, are apparently inclined to vary in minor characteristics in response to differences in their habitat or restrictions to interbreeding imposed by isolation. This results in local variations not always constant and not sufficiently distinct to make separate species. On the other hand, the whitefish or mountain herring is very stable and, except in Bear Lake, there is only one species over the entire area. To constitute separate species does not require very marked differences if these are constant and no intermediate forms occur. Very distinct and noticeable differences, if they are not uniform and intergrading forms occur, are not sufficient to make separate species. There are some puzzling cases, more particularly with the three groups of western trout—rainbow, steelhead, and cutthroat—in which there is difficulty in separating closely related species, but these seldom occur in the same locality. Under normal conditions it is unusual to find natural hybrid trout unless among very closely related species and then probably resulting from fish culture. According to W. M. Keil, Idaho fish commissioner, intermediate types between rainbow and cutthroat trout are not uncommon there, being found often in the Henry Lake section. In most waters heavily fished and planted from hatcheries the introduced species better adapted to fish culture have largely replaced native trout. In a very few cases there is confusion in the general classification of trout species. The key is far from infallible, but with the exceptions noted identification is not difficult, and it is hoped the information will be of value.

A few terms used in descriptions must be understood, but these are rather simple and are not difficult of application. The proportions of different parts of a fish after maturity do not change greatly in the various sizes of the same species, so length or size of such parts is expressed in proportion to other parts. The arrangement of scales and the fin structure are also constant within certain narrow limits. The scale count used most often is the number of diagonal rows immediately above the lateral line (marking the middle of the side), from the head to the last vertebra in front of the tail, not counting the last very small scales on the base of the tail. The length of the body is taken from the nose to the last vertebra, the same point to which the scales are counted. The bones

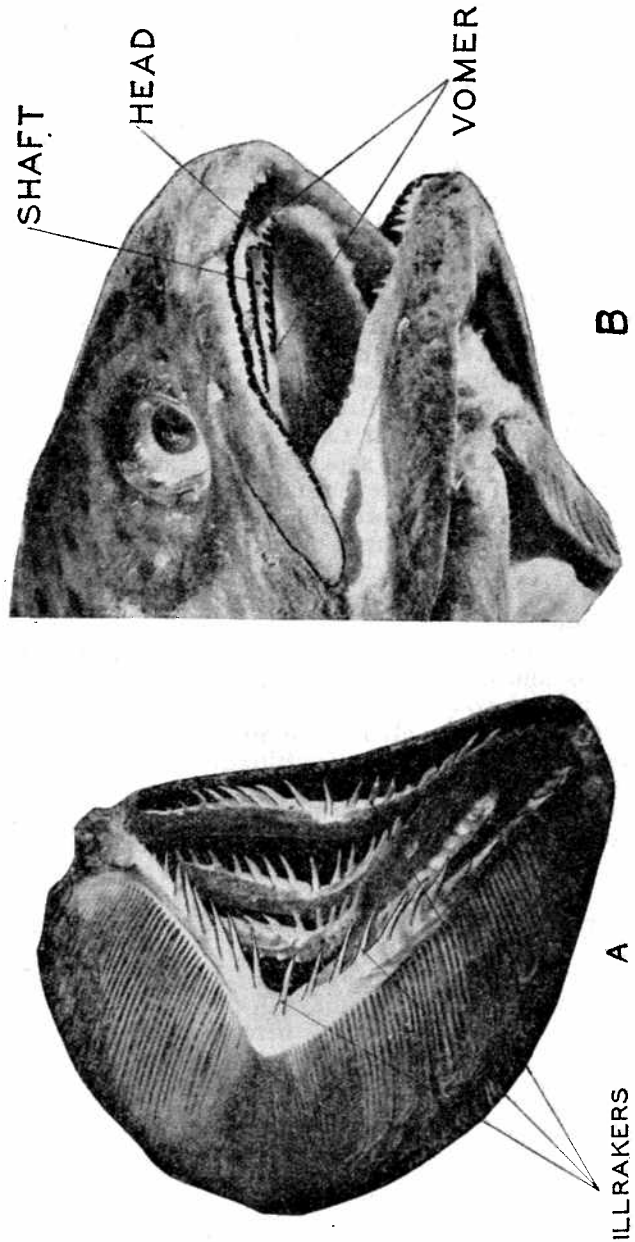

FIGURE 2.—A, Gill arch of silver salmon; B, head of rainbow trout

that support the fins are known as "rays." The maxillary is the flattened plate on the side of the upper jaw. The vomer is the bone in the front central part of the roof of the mouth. It is concealed by membrane and, although of high value in fish classification, will require rather careful observation for the fisherman to use it. The vomer has the front part or "head," from which the "shaft" extends backward. The gill rakers are located on the front or anterior part of the gill arch opposite the "breathing" part of the gills; when few, they are shaped like fingers or hooks, and when numerous they resemble a fine-toothed comb.

Color of the flesh is a very uncertain factor that depends largely on the nature of the food and the condition of the fish as well as the age. Colors and spotting in general are somewhat unreliable, being modified by the nature of the water and the color of the bottom as well as by the maturity and condition of the fish. Large trout with reddish or yellowish flesh are often known as salmon trout, but they are not distinct from some of the local trout of smaller size and light-colored flesh. Male trout and salmon are generally more

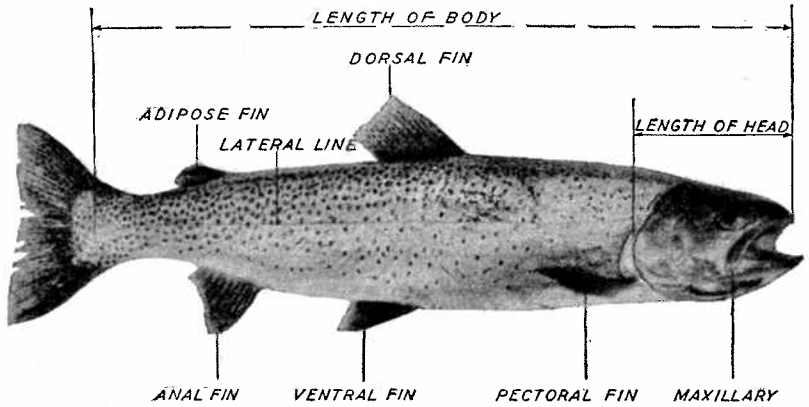

FIGURE 3.—Black-spotted or cutthroat trout (*Salmo lewisi*) from upper Snake River

deeply colored externally, particularly in spawning condition, and the heads of the males are usually coarser than in the females. Generally young trout and salmon and sometimes trout maturing at small size in cold headwater streams have dark bars or "parr" markings on the sides. Young fish have more deeply forked tails and larger eyes in proportion than the fully matured ones.

USE OF KEY

Any fish caught in this region, having the soft adipose fin present, can be placed in this key, except the catfish, which has also stiff, sharp spines on several fins and no scales. A person using the key will compare the specimen at hand with the two descriptions under the first numbered heading, determining with which description the specimen agrees. At the end of the description agreeing with the specimen a reference is made to a page number or another numbered heading. If this reference is to a numbered heading, the same process is repeated with this as with the first one and continued until

the fish is named and a reference found to a page number for additional information. Under numbered paragraphs 3 and 7 a page reference is made to a description of a genus, the species being described in other numbered paragraphs. The key contains the more complete and technical description, while more general identification terms are given under the discussion for each species.

KEY

1. Dorsal fin large and saillike, having not less than 20 rays and with orange or rose spots. Scales large, 85 to 100 diagonal rows along lateral line. Few black spots on upper part of body in front of dorsal fin.
Grayling (Family THYMALLIDÆ), p. 180.
Dorsal fin with 12 rays or less---Whitefish and salmon and trout families, 2.
2. Small mouth, not extending to point below middle of eye; teeth weak or lacking; scales large, 70 to 90 diagonal rows along lateral line. No black spots except sometimes a few relatively large ones in young.
Whitefish (Family COREGONIDÆ), p. 180.
Mouth cleft beyond point below center of eye. Teeth strong.
Salmon and trout (Family SALMONIDÆ), 3.
3. Anal fin long, 13 to 17 rays. Vomer narrow, long, and flat, with weak teeth.
Pacific salmon (Genus ONCORHYNCHUS), p. 181.
Anal fin short, 9 to 12 rays---------*Atlantic salmon, trout, and charrs*, 7.
4. Back and upper fins with numerous round or X-shaped black spots, few on lower part of tail. Body deep, size large, 5 to 50 pounds, seldom under 8 pounds. Silvery when freshly run but turning dark in fresh water. Scales 135 to 155 diagonal rows along lateral line. Gill rakers short and stout, less than 25 in number, on front gill arch on one side.
Chinook salmon, p. 181.
Black spots lacking or few and small on upper back and tail. Generally under 8 pounds in weight. Gill rakers slender, length nearly equaling or equaling diameter of eye. Scales 125 to 135 diagonal rows along lateral line ---------5.
5. Gill rakers less than 25, on front gill arch on one side; head very round, body slender and flattened, eye small; back bluish green or olive brown. Scales easily loosened---------*Silver or coho salmon*, p. 182.
Gill rakers over 30, on front gill arch on one side. Very red in spawning condition. Bright silver with blue back in normal condition. Scales not noticeably loose---------6.
6. Size large, weight 2 to 7 pounds; body slender and rounded; seldom any black spots except few and very small in fish in spawning condition. Diameter of eye rarely contained less than six times in length of head.
Blueback salmon, big redfish, p. 182.
Size small, 6 to 14 inches in length. Body flattened (compressed). Diameter of eye rarely contained over five and one-half times in length of head.
Little redfish, silver trout, silverside, skipjack, p. 183.
7. Spots principally dark on a lighter background. Backward extension of vomer straight and its toothed surface flat. Teeth on both head and shaft or backward extension of vomer. (In old Atlantic salmon seldom teeth on shaft of vomer and only one or two on head.) Scales 110 to 180 or more diagonal rows along lateral line.
Atlantic salmon and true trout (Genus SALMO) (p. 183 for description of genus), 8.
Red, gray, or yellow markings or spots paler than ground color of skin. Vomer boat shaped, without teeth on its backward extension or shaft. Scales usually 200 or more---------*Charrs*, 13.
8. No rosy wash on sides nor dash of red on throat. Black markings on head, back, dorsal fin, and upper side, but generally none on tail except sometimes as obscure markings. Often red spots on sides. Scales 112 to 130 diagonal rows along lateral line---------9.

Rose or flesh color on side of head and as band or wash on side, or a conspicuous patch of red on membrane of throat between forks of jaws. Black markings on tail. No red spots on side. Scales 120–180 or more diagonal rows along lateral line---------11.
9. Outer or first rays of ventral and anal fins not definitely white. No red spots on sides except in young, and then lacking a blue circle. X-shaped or irregular black spots on body, generally several large spots on side of head. Sides silvery. Breeding fish, particularly males, variously colored, often with yellowish markings on the tails. Scales 112 to 118 along lateral line.
Landlocked or fresh-water salmon from Maine; Ouananiche, p. 184.
Outer or first rays of ventral and anal fins definitely white; often red spots on sides. Scales 118 to 130 along lateral line---------10.
10. Body slender, greatest depth 4¼ to 4½ in length of body less tail. Adipose fin small, width one-half length. Depth of narrowest part of body in front of tail three-eighths of depth of body and equal combined length of snout and eye. Eye usually 5½ to 6 in length of head. Head two-ninths to one-fifth of length of body less tail. Spots often with light border or ring---------*Loch Leven trout, Scotch lake trout*, p. 185.
Body short and deep, greatest depth 4 in length of body less tail. Adipose fin long and expanded at end. Depth of narrowest part of body in front of tail two-fifths of greatest depth or of length of head. Eye usually 5 in length of head. Head one-fourth of length of body less tail. Generally red spots mixed with black. Young have red spots within bluish circle.
Brown trout, Von Behr trout, p. 185.
11. Generally rose or flesh color on side of head and as a band or wash on side of body. No conspicuous patch of red on membrane of throat between forks of jaws. Maxillary seldom extends beyond back of eye except in old males. Lower fins often touched with white---------12.
Rose color on side usually lacking. Generally definite red dash on lower jaw and membrane between jaws. Seldom any black spots or white border on lower fins. Often an interrupted red (not rose) stripe along side, particularly in small fish. Scales ordinarily 150 to 180 or more along lateral line. Maxillary extending well beyond eye.
Cutthroat trout, black-spotted trout, p. 187.
12. Black spots generally small and irregular in shape and not extending to lower side or lower fins. Sometimes scantily and sometimes profusely spotted, particularly on tail. Sea-run specimens silvery, turning dark in spawning condition, when males have deep red cheeks and sides. Length from nose to front of dorsal fin less than half the length of body to base of tail. The Columbia River steelhead typically has 60 vertebræ. Ocean-run fish slender when reaching Idaho. Scales about 120 to 135 diagonal rows along lateral line.
Steelhead trout, salmon trout, steelhead salmon, p. 186.
Generally profusely covered with round black spots extending well over lower side and lower fins. Spots usually larger than in steelhead. Sometimes rose-colored or reddish mark on under jaw or throat, particularly of mature males, but no definite dash of deep red on throat membrane. Length of nose to front of dorsal fin equal one-half length of body to base of tail. Vertebræ in typical McCloud rainbows are 63. Scales 140 to 155 diagonal rows along lateral line.
Rainbow trout, McCloud River rainbow, p. 186.
13. Tail strongly forked. Gray or yellow spots, not definitely red. Upper body with dusky or yellowish markings, underfins often touched with yellow crest. Scales 180 to 205 diagonal rows along lateral line.
Mackinaw or Great Lakes trout, p. 188.
Tail square or slightly forked. Either underfins with white on edges only and usually red spots on side or underfins with considerable white and red spots lacking. Underfins, when edged with white, usually contain also black and red. Vomer without raised crest and with teeth only on head and not on flattened backward extension or shaft. Scales 215 to 250 diagonal rows along lateral line, too small to be counted easily.
Genus SALVELINUS, 14.
14. Marbled or worm-shaped markings on head, back, back fins, and tail. Red spots on side with purplish or bluish ring. Body deep and not rounded.
Eastern brook trout, p. 188.

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No marbled or worm-shaped markings on head, back, back fins, or tail. Red spots, when present, without purplish or bluish ring----------15.

15. Yellow or reddish spots (not marbling) on side, back, and head. Generally bright red spots on side, without purplish or bluish ring. Head large, flattened on top, its length contained less than 4 in length of body. Body round. Underfins often edged with white.

Dolly Varden, bull trout, charr in northern Idaho, p. 189.

Back without spotting. No red spots. Few of the yellow spots on side extend above lateral line. Head small, length contained four and one-half to five times in length of body. Golden sheen on scales. Belly of male orange and underfins with considerable white in breeding season.

Sunapee golden trout, white trout or *saibling*, p. 190.

DESCRIPTION OF SPECIES

Montana grayling (*Thymallus montanus*)

Found originally only in the waters of the Missouri River above the Great Falls, the range of this fish has been somewhat enlarged by fish-cultural operations. It is identified by its small mouth, large scales, black spots on front part of body, and large sail-like dorsal fin with orange or rose marking. Grayling fishing is available in the Madison River, Big Hole Basin, and in

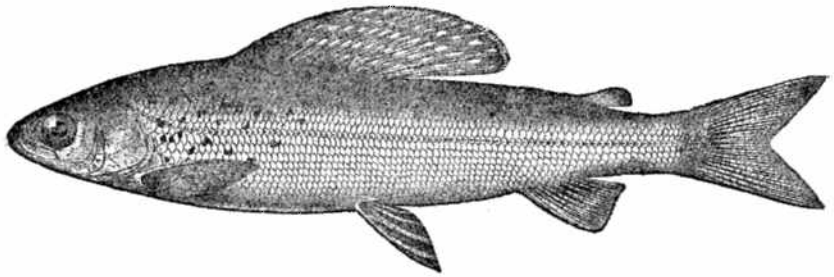

Figure 4.—Montana grayling, *Thymallus montanus*

Yellowstone National Park. This attractive fish ordinarily does not exceed 12 inches in length and a pound in weight but may reach 4 pounds. The fish ascends long distances to the headwaters to spawn in May. It is an active, gamey fish, taking a fly readily, and the flesh is superior to that of the trout. The large back fin is very brilliantly colored and is a ready means of identification. It has been planted in the headwaters of the Salmon River and in Utah.

Rocky Mountain whitefish (*Coregonus williamsoni*)

The Rocky Mountain whitefish is distributed widely throughout this region, the same species occurring in the Great Basin, Lahonta Basin in Nevada, and the Green River and Snake River watersheds. It is also called mountain herring and sometimes miscalled grayling. It is identified by the small mouth, large scales, lack of black spots, and back fin not long. It occurs in clear, cold lakes and streams and spawns in early winter. It ordinarily reaches a growth of about a foot in length, although it may reach about 4 pounds in weight. In several lakes in Idaho great numbers of them averaging around 8 inches long run into inlets to spawn in early winter. They take a fly or bait readily and are quite game fighters but not as much so as the trout. The flesh is white and very sweet. Owing to their small mouth, a small hook (No. 10 or 12) is best for their capture.

In Bear Lake are three other species found only in that water. The Bonneville whitefish (*Coregonus spilonotus*) reaches 2½ pounds in weight, has heavy

and deep body with large head, 74 to 80 rows of scales along the lateral line, and the depth is contained 3.6 in the length of the body. Young up to 10 inches in length have large dusky black spots on the back. The Bear Lake whitefish (*Coregonus abbissicola*) reaches 8 to 12 inches in length, has a slender head and body, 69 to 78 rows of scales along the lateral line, no black spots, and the depth is contained about 4½ in length of body. The Rocky Mountain whitefish has 83 to 87 scales along the median line. The Bonneville cisco or peak nose (*Leucichthys gemmifer*) is a slender little fish reaching about 7½ inches in length, the depth is contained 5½ or more in length of body, and it has 71 to 77 rows of scales along the lateral line. This is an interesting little fish, as it is the only western representative of this genus of which several species occur in the Great Lakes and more eastern waters.

Pacific salmon (genus Oncorhynchus)

This group, containing five or more species, is of great commercial importance on the Pacific coast and in Alaska. The soft bones and the habit of almost universally dying after once spawning are peculiar to this genus. The steelhead trout has been known as a salmon, but it is a true trout and usually recovers from spawning, as do also the salmon of Atlantic waters. Pacific salmon may be distinguished from all other trout and salmon by the long anal or under rear fin, with never less than 13 rays, and the slenderness of the body in front of the tail. During the spawning season great changes in color and shape take place, there being a tendency then to turn red or very dark

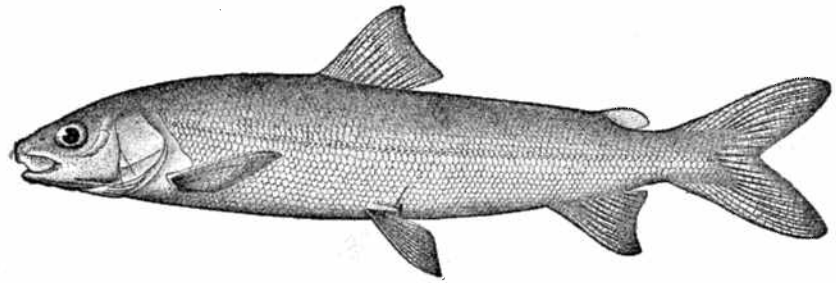

Figure 5.—Rocky Mountain whitefish, *Coregonus williamsoni*

and for the males to develop coarse teeth and hooked noses so that there is little resemblance to the fish in its normal condition. At the end of spawning period the fins are frayed, the body often is covered with sores, and the flesh is so soft that the entire fish quickly disintegrates soon after death. The fish from the ocean do not feed after once definitely starting the spawning migration, but live on fat stored in the body and flesh, so that the flesh loses color and flavor as the fish are longer in fresh water. They are found here principally in the tributaries to lower Snake River, but some species have been planted in lakes in other sections.

Chinook salmon (*Oncorhynchus tschawytscha*)

This is the largest and most important species of Pacific salmon. It is at present found in this region principally in the watershed of the Salmon River in Idaho. Plantings have been made in some Utah lakes. It is identifiable by its large size (seldom under 8 pounds), stout body, fine scales, and small black spots on its back and under fins. It ascends sometimes over 1,000 miles from the ocean to spawn in the headwaters in July, August, and September. The little salmon spend about a year in fresh water and then migrate to the ocean, from which they return in from four to seven years to spawn and die. This fish has been known to reach 100 pounds in weight, and specimens weighing 50 pounds have been taken in Idaho, but ordinarily it does not exceed 20 pounds in these waters. In the latter part of the spawning season the males turn very dark and develop hooked snouts, being known locally as "dog salmon." The true dog salmon (*Oncorhynchus keta*) spawns near the ocean and

never reaches Idaho. Ordinarily it is captured by spearing but may be taken on a spoon or wabbler when gathered in pools prior to spawning and often will strike at a spoon or other bait when on the spawning riffles. The flesh is quite palatable when the fish first reaches the spawning waters but soon loses firmness and flavor.

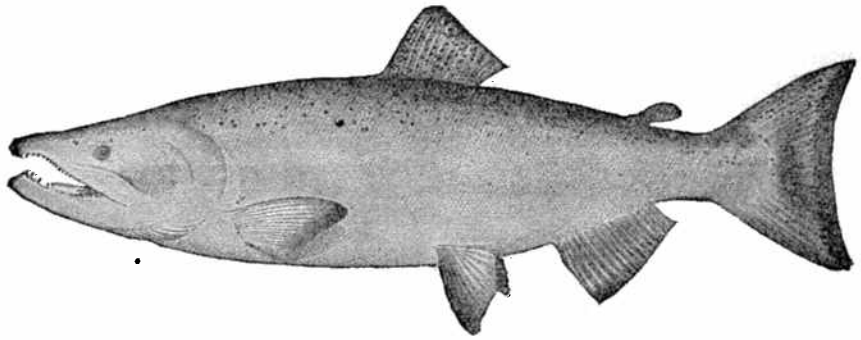

FIGURE 6.—Chinook salmon, breeding male, *Oncorhynchus tschawytscha*

SILVER OR COHO SALMON (*Oncorhynchus kisutch*)

This species is found in the short coastal streams of the Pacific coast, from California to Alaska. It has been planted quite extensively in Utah lakes, this being its only occurrence here, and it is the only one used much in Utah. It is identified by having 125 to 135 diagonal rows of loosely attached scales along the lateral line, a very round head, and a small eye. It is third in commercial importance. The flesh, although of excellent flavor, is light in color. It weighs, from the ocean, from 3 to 15 pounds. In fresh water it offers good fishing tem-

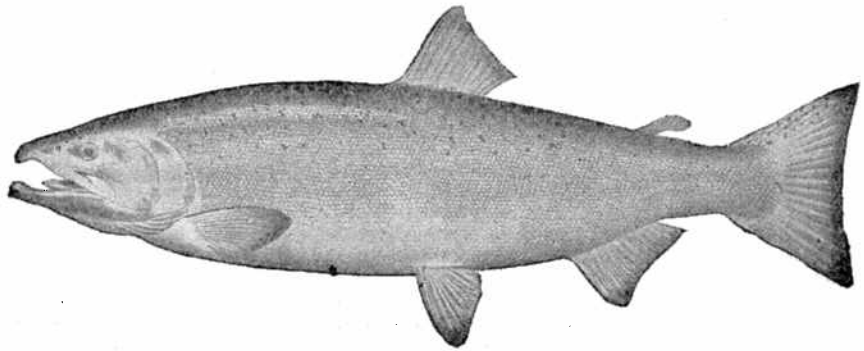

FIGURE 7.—Silver or coho salmon, breeding male, *Oncorhynchus kisutch*

porarily but seldom reproduces there and dies when fully mature. It is sometimes confused in name with the landlocked salmon from Maine.

BIG REDFISH OR BLUEBACK SALMON (SOCKEYE OR RED SALMON IN ALASKA) (*Oncorhynchus nerka*)

Formerly this salmon spawned in inlets to Payette Lake and Redfish Lakes, but it is unable to reach them now. Occasionally it is found below the Sunbeam Dam and may enter lower Payette waters. It may be identified by its slender body, general lack of black spots, large scales, and size (4 to 7 pounds). In the Columbia River it enters only streams with lakes at their sources and spawns in the lake inlets. Both males and females become bright red when in spawning condition, the males developing humped backs and

greatly distorted jaws. Commercially it is the most valuable of the salmons and furnishes the choice "Alaska red" salmon.

LITTLE REDFISH; SILVER TROUT; SILVERSIDE (*Oncorhynchus kennerlyi*)

This fresh-water relative of the big redfish occurs in numerous waters in western North America and in this region is known from Payette Lake, Warm Lake, near Knox, and the Redfish Lakes in Idaho. It has been planted rather extensively as silver trout. It can be identified by its small size (6 to 14 inches), flattened body, few small black spots on the upper back and tail, large eye, and the fact that there are never less than 13 rays in the anal fin. It enters inlets whenever available for spawning, generally in August but sometimes later. In Alturas and Payette Lakes it averages about 11 inches long and weighs one-half pound, while in the other lakes it ranges from 6 to 8 inches long. In ordinary condition in the lakes it is very bright silvery with bluish back and delicate head; but when spawning it turns a dirty red to a bright red, with olive-green head, and the males develop hooked jaws. A school of the brilliant red spawning fish circling over the clear shallows of the lake inlets makes a very interesting spectacle. In Payette and Alturas Lakes this fish may be caught by trolling a fly or a small spoon and by still fishing with bait in

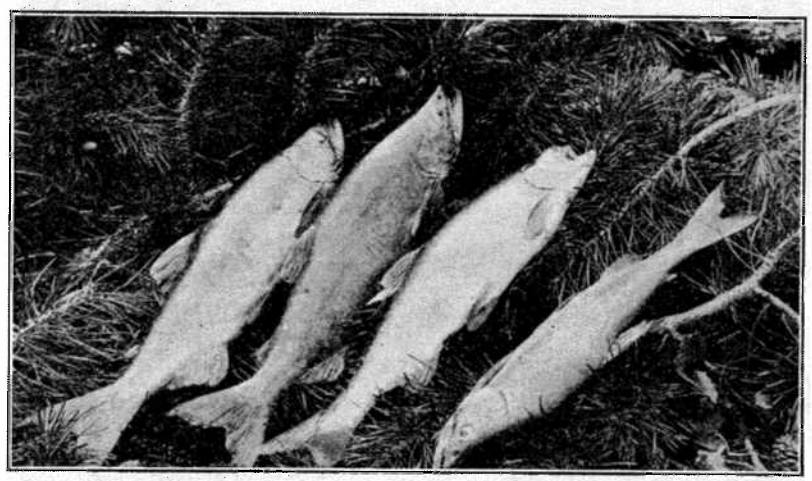

FIGURE 8.—Little redfish, silver trout, silverside, *Oncorhynchus nerka kennerlyi*

deep water. At Alturas Lake it feeds largely on the surface over deep water from sundown to dark and is best taken then but may be taken at any time by trolling deeper. Owing to the tenderness of its mouth, careful handling is required to land it. It is a game fighter. The flesh is of very fine quality except during the spawning season. Owing to the small size attained in other than the two waters mentioned above, and to the tender mouth, it is difficult to catch these fish there by angling.

ATLANTIC SALMON AND TRUE TROUT (GENUS SALMO)

This group includes the western trout with black spots and the introduced fresh-water Atlantic salmon and European trout. From the standpoint of the fish-culturist or fisherman in this region, these are the most important of all fishes. It can be identified by the small anal or back under fin, dark spots on lighter background, and seldom over 150 diagonal rows of scales along lateral line.

There are three general groups of these fish native to western America—the steelhead, rainbow, and cutthroat. Over the entire range these groups are not

clear-cut, and intergrading forms occur, but in a given locality it is not hard to separate them. However, there are several different species of rainbow trout, two or more of which have been used in fish culture and often mixed. These have also been mixed with steelhead stock, so that a clear-cut identification of the planted steelhead and rainbow is extremely difficult. The female rainbow or steelhead have more delicate heads and less spotting than the males, particularly where the fish have made rapid growth and attained large size before spawning. These female fish with delicate heads, silvery color, and scanty spotting are often classed by fishermen as "steelheads" and the males or mature females as "rainbows." It is stated that in typical specimens the McCloud River rainbow has 63 and the Columbia River steelhead 60 vertebræ, but few fishermen will be tempted to make this count except, perhaps, after the fish have been through the fry pan. The silver trout (*Salmo gibbsii*), which occurs in lower Snake River waters such as Wood, Payette, and Salmon Rivers, has about 140 rows of scales along the lateral line, a rosy wash on the cheeks

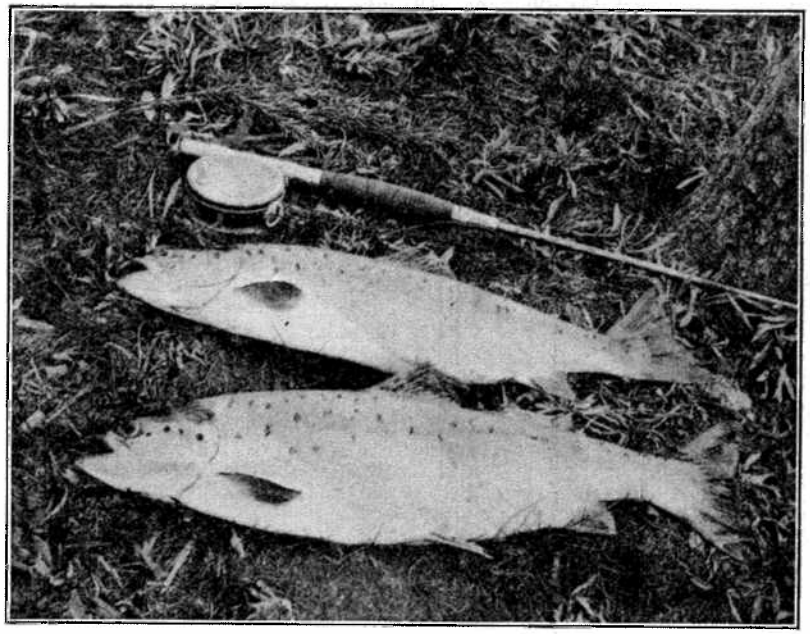

FIGURE 9.—Landlocked salmon, *Salmo sebago*

and sides, and sometimes a dash of red on the throat. In general appearance it resembles closely the rainbow or steelhead and very probably is a resident form derived from the Columbia River steelhead.

LANDLOCKED SALMON; OUANANICHE (*Salmo sebago*)

This fresh-water salmon occurred originally in four lake basins in Maine, and a closely related form was found in eastern Canada, but its range has been extended somewhat by cultivation. It is a lake fish but enters streams connected with lakes and spawns in such waters, generally in November. Ordinarily it does not die after spawning, as do the Pacific salmons. It is not found naturally in the absence of the fresh-water smelt, which constitutes its chief food, and it has never been established successfully where this food is lacking. Plantings of the Schoodic salmon from eastern Maine have been made in Payette Lake and several lakes in the Sawtooth Mountains and in the

TIMBERED SLOPES MEAN CLEAR STREAMS; CLEAR STREAMS MEAN GOOD TROUT WATER

latter locality have given encouraging results. They have also been planted with some success in Fish Lake, Utah. This fish may be identified by the lack of red or rose color, its large scales, X-shaped or irregular spots, broad and more or less forked tail, and the narrowness of the body in front of the tail. The weight varies in different waters—in some from 3 to 5 pounds and in others up to 10 or 15 pounds and to a maximum of 20 to 35 pounds. It has a well-deserved reputation for being a game fighter, many experienced fishermen placing it above all the trout, and its flesh is of very excellent quality. In cold streams or lakes it rises well to a fly, but in large lakes in midsummer it is more often taken by still fishing with a live bait or by trolling.

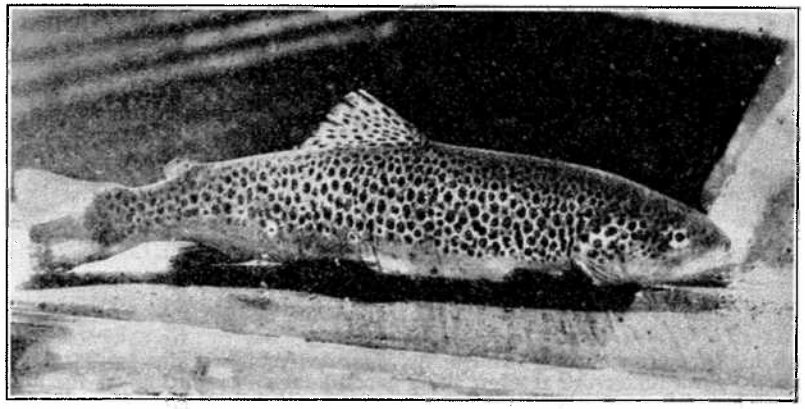

FIGURE 10.—Loch Leven trout, *Salmo trutta levenensis*

LOCH LEVEN OR SCOTCH LAKE TROUT (*Salmo levenensis*); BROWN OR VON BEHR TROUT (*Salmo fario*)

These two trouts have been introduced from Europe, where the brown trout is widely distributed. It can be distinguished from the other trouts by its large scales, heavy spotting, and generally both dark and red spots on the side. The Loch Leven trout is claimed to be peculiar to the Scotch lake of the same name. There has been considerable confusion in distinguishing between these two as planted in this country, and much mixing or hybridizing has resulted.

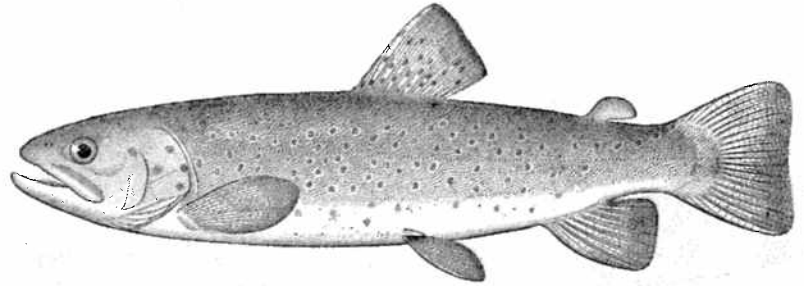

FIGURE 11.—Brown trout or von Behr trout, *Salmo fario*

The Loch Leven trout occurs in the headwaters of the south fork of the Snake River and in the Madison River. It can be identified by its slender shape and short adipose fin. The brown trout has been planted in the Madison River and in a number of streams in the Great Basin. It is identified by its short and deep body and long adipose fin. These two species spawn in early winter. A specimen weighing 25¼ pounds was taken in the Logan River, but ordinarily a 5 to 10 pound fish is considered very large. Particularly in the smaller streams they take a fly readily, but the larger fish in the lower streams are taken more often on bait or artificial lures. They are game fighters and

of excellent quality for table use. They are considered to be detrimental to the other trout, and their introduction is not advised except in waters unfavorable for the other trout. Brown trout are spawn eaters, even making a meal of their own spawn.

Steelhead trout (*Salmo gairdnerii*)

This fish is generally migratory in habits, entering the ocean and returning to fresh water to spawn, although in certain Snake River waters resident types are to be found. It has been planted in Great Basin waters and mixed with rain-

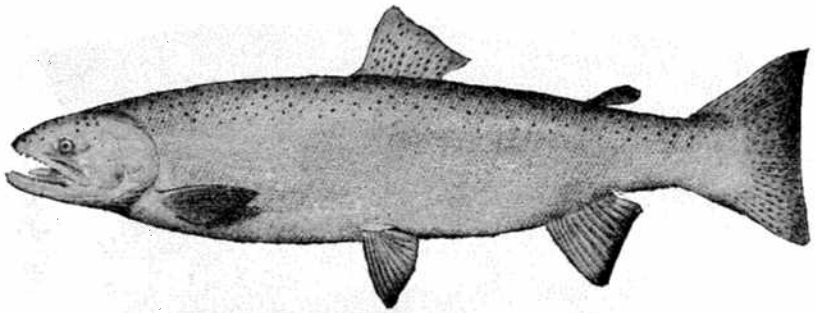

Figure 12.—Steelhead trout, *Salmo gairdnerii*

bows in fish-cultural work. It can be identified by its scales in 120 to 135 diagonal rows along the median line; general lack of spotting on its lower side or lower fins; the smallness of the spots; and length from nose to front of dorsal fin, which is generally less than half the length of the body to base of tail. It reaches Idaho waters from the sea from December to early spring, spawning in the headwaters from late winter to spring. The largest ever taken on a rod weighed 22 pounds, although they seldom exceed 15 pounds in this region. In the Salmon River they are known as salmon trout, generally being slender and having red colors there. The planted fish in inland waters are taken largely by fly fishing, but those from the sea are generally taken with bait or a small spinner. They are probably more game than any other native trout, and, except when out of condition from spawning, the flesh is very good.

Rainbow trout

Several species of rainbow trout occur throughout the entire length of the Pacific coast and in Alaska. The species used first and most extensively in fish

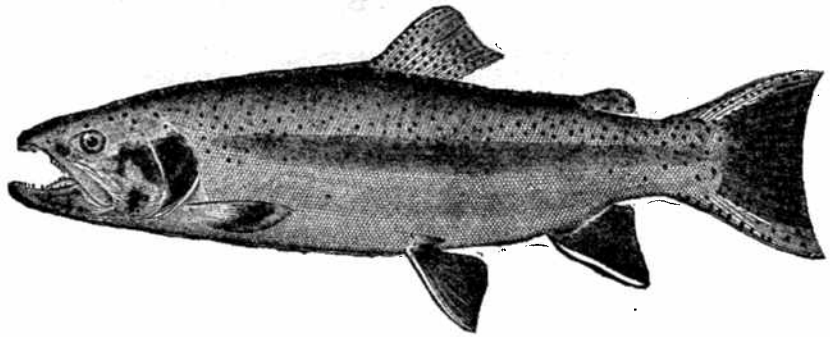

Figure 13.—Rainbow trout, *Salmo shasta*

culture was the McCloud River rainbow, which has relatively fine scales. Mixtures of these and rainbows having larger scales from the Klamath Basin and also with steelhead are common. It may be identified by larger and more profuse spotting than in the steelhead, 140 to 155 diagonal rows of scales along

the median line, and the fact that the length from the nose to front of dorsal fin generally equals one-half the length of the body to base of tail. The rainbow trout, in general, has become very popular and in this region is more productive, makes more rapid growth, and is easier to handle in fish culture than any others. It spawns from midwinter in warm, spring-fed waters to July in cold waters at high elevations. It maximum size here is from 10 to 15 pounds, chiefly in lakes, but the average in streams is not over a pound. The record fish taken with a rod weighed 26 pounds, but the identification was not positive.

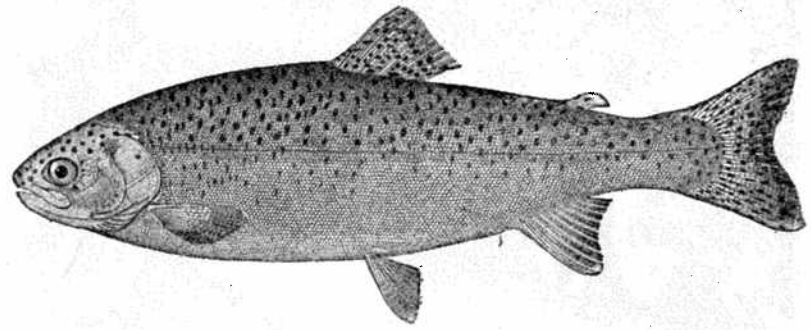

Figure 14.—Rainbow trout, heavily spotted type, *Salmo trideus*

It is a game fighter, taking a fly well and leaping vigorously from the water when hooked. Except from sluggish water or where there is considerable decaying vegetation its flesh is of excellent quality.

Cutthroat or black-spotted trout

This is the "native" trout, and originally each main drainage basin contained a separate species as did also the upper and lower Snake River waters. These have been mixed considerably by cultivation, but, except for the silver trout in lower Snake River, all of these are characterized by a definite red dash on the throat membrane. It can be identified by this red dash, its small scales, large head, and maxillary extending well beyond the eye. The spotting and coloring vary considerably among the different species and in different water, but the following gives the average condition in the different drainages:

The Colorado River trout, represented here principally in Green River waters, has large spots, lacking or few on the head. The Utah trout has small spots, often well down on the sides, and a purplish tint to the lower fins. The Yellowstone trout of the upper Snake River has less abundant spots, evenly distributed, and tends toward yellow coloring on the belly. The lower Snake River trout are heavily marked on the rear part of the body with rather small spots and tend toward red colors, the so-called "red-sides" of Salmon River being particularly brilliantly colored. The Nevada trout has relatively large, well-scattered spots, often oval shaped, and tends toward yellow, if any color, on the belly; in alkaline waters there is a tendency toward pale colors. In deep water in Bear Lake the Utah trout develop a peculiar coloring and are known locally as "blue-nose" trout. The cutthroat trout spawn from early spring to early summer. In small streams and lakes they are an excellent fly fish but in larger waters are taken more often by trolling or bait fishing. Ordinarily they weigh from 1 to 5 pounds but may reach a weight of 15 pounds or more. One taken from Pyramid Lake, Nev., weighed 41 pounds, and they are said to have reached 22 pounds in Bear Lake. They are "shier biters" than any other species, and there are certain times when it is difficult to get them to bite at all. Their flesh is of very superior quality, particularly from cold streams and lakes.

A CLEAN CAMP IS A SAFE CAMP. KEEP YOUR CAMP CLEAN

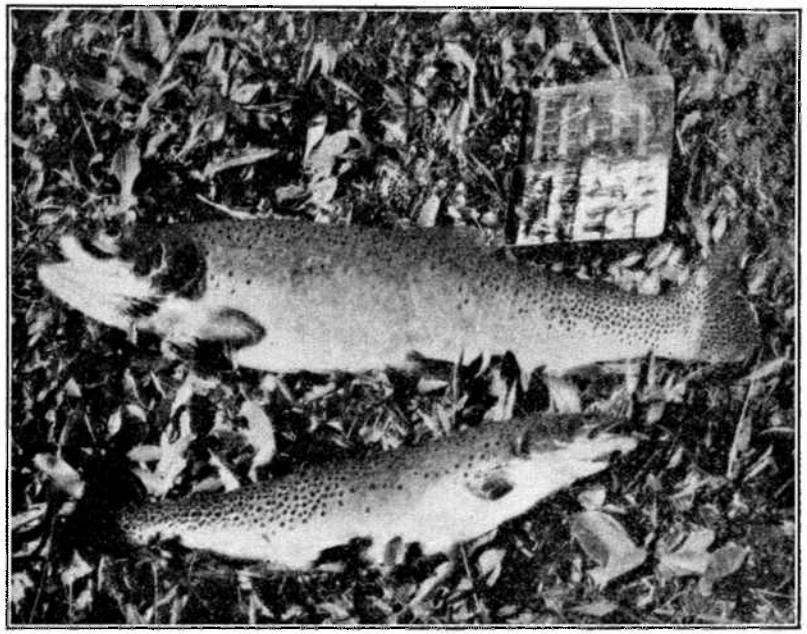

FIGURE 15.—Cutthroat or blackspotted trout, Salmon River type, *Salmo lewisi*

MACKINAW OR GREAT LAKES TROUT (*Cristivomer namaycush*)

This fish is distributed in the waters of northern North America from the Atlantic to the Pacific and has been planted in lakes in this region. It can be identified by its large size, small scales, forked tail, lack of red spots, large head, and strong teeth. It has been taken weighing 34 pounds in the Jackson Hole section and 28 pounds at Fish Lake, Utah, and in the Great Lakes has been known to weigh 100 pounds. Spawning takes place in the early winter. It is a coarse fish of predatory habit, and because it is generally taken in

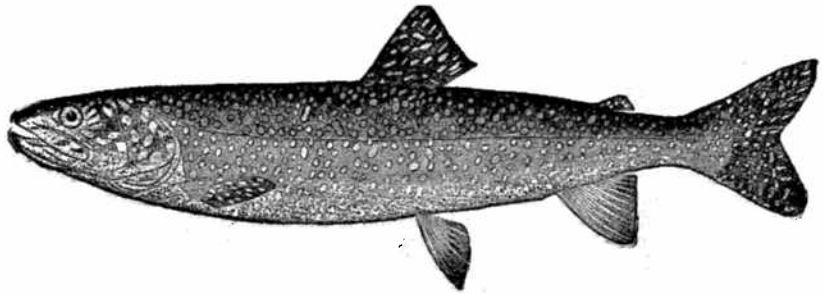

FIGURE 16.—Mackinaw trout, *Christivomer namaycush*

deep water on heavy tackle it does not offer as much sport in its capture as do the other trouts, its size being the chief attraction. The flesh is of very delicate flavor and is particularly rich in oil, which makes it superior for baking purposes.

EASTERN BROOK TROUT, SPECKLED TROUT (*Salvelinus fontinalis*)

This fish is of wide distribution in eastern North America, where it is the species most desired by anglers. It has been planted quite extensively in

this section, being best known from Fish Lake in Utah and Lost River in Idaho. The upper Snake River waters also yield very large specimens. It can be identified by its deep body, mottlings on back and fins, red spots in a bluish circle, and square tail. It likes quiet waters and is at its best in high mountain

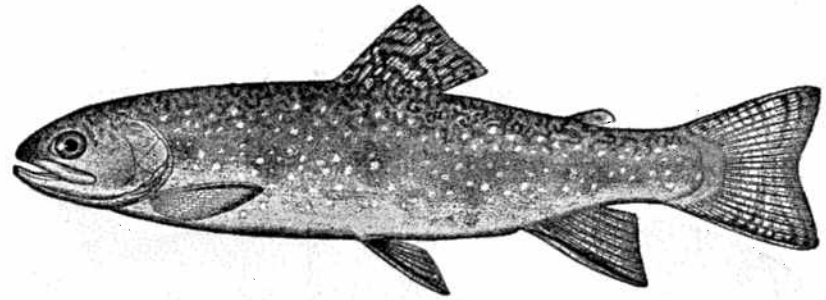

FIGURE 17.—Eastern brook trout, *Salvelinus fontinalis*

lakes. It spawns in streams in October and November. Specimens have been taken weighing from 8 to 14½ pounds, but 4-pound fish are uncommon. It takes a fly readily and is a vigorous if not showy fighter. In cold water its flesh is of excellent flavor, but, owing to the large amount of oil in the flesh, it does not remain firm as long as does that of trout having drier and less rich meat. Its beauty and free-feeding habits without "off periods" when it is difficult to take them by angling make it a valuable addition to the native fish species.

DOLLY VARDEN OR BULL TROUT (*Salvelinus spectabilis*)

This western representative of the group known as charrs occurs in Pacific waters from northern California to Alaska and can be identified by its large head, round body, red or yellow spots without a bluish circle, and forked tail. It is quite common in lower Snake River waters in lakes and streams. Large individuals ascend headwater creeks in early fall to spawn. It occasionally reaches 10 pounds or more in weight. It is a voracious and cannibalistic fish and is considered detrimental to other species, being particularly destructive to salmon eggs and fry. It is an irregular feeder, and it is often

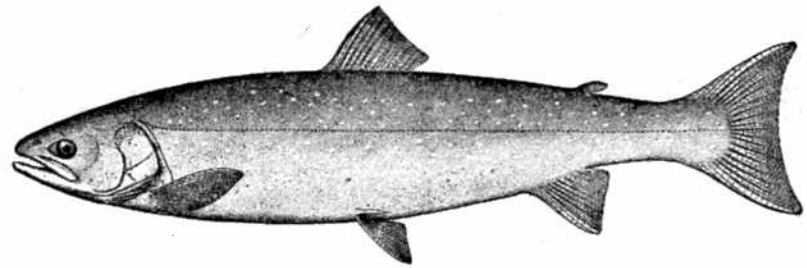

FIGURE 18.—Dolly Varden trout, *Salvelinus spectabilis*

difficult to get them to take bait. It is a fairly game fighter in swift water, being generally taken with salmon eggs or a bait. Its flesh is not as good as that of other trout. This is a rather coarse fish, not particularly attractive to the angler, and is the poorest of the charrs.

KILL YOUR CAMP FIRE—THEN BURY IT

SUNAPEE GOLDEN TROUT, WHITE TROUT, SAIBLING (*Salvelinus aureolus*)

Occuring only in a few waters in New Hampshire, Vermont, and one lake in Maine, this beautiful charr is not widely known. It is a lake fish and retires to deep water in summer. It can be identified by the lack of spotting or marking on back and fins, small head, golden sheen on scales, and under fins with white but lacking black. The maximum weights are from 6 to 8 pounds, but the average is much less. Spawning takes place in shoals in lakes in late fall. It has been planted in several high lakes in the Sawtooth Mountains and has been taken by trolling in Alice Lake. In these cold lakes it may

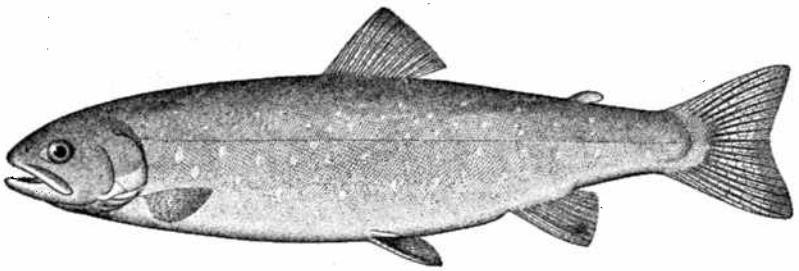

FIGURE 19.—Golden trout of Sunapee Lake, *Salvelinus aureolus*

probably be found away from deep water, but the usual method of taking it is with bait in from 40 to 100 feet of water. In such waters it may not grow to large size but probably will be brilliantly colored. Wherever found it is held in high esteem by anglers on account of its beauty of form and color, game qualities, and excellency for the table.

AFTERWORD

Forest fires destroy game birds and their nests, kill fish and wild animals, but of more serious consequences is the destruction of the opportunity for fish and game to survive and multiply. This loss is replenished only after the slow process of adequate replacement of food and shelter.

Fish and game survive no longer than their natural habitat. Every forest fire is dangerous to them. For your sport's sake—

BE CAREFUL WITH FIRE!

Green forests mean good fishing and good hunting. As many as 100 forest fires in a single year have been caused by recreation seekers on the national forests of the Intermountain District.

DON'T CAUSE ONE!

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