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The Fish of COLORADO

COLORADO GAME AND FISH DEPARTMENT

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The Fish of COLORADO

By WILLIAM L. REAVLEY

Introduction

IF YOU, the new generation of Coloradoans, intend to enjoy fishing today and in the future, you will want to become familiar with the habits of our fish and with the many problems that affect your fishing. More and more people in an ever-expanding civilization means that preserving fishing as an outdoor sport for everyone's enjoyment will become more difficult as time passes.

A better understanding of the needs of sport fishing will rally public support behind efforts to keep fishing good in Colorado. Along with this understanding will come increased enjoyment from fishing itself.

It is the intent of this publication to acquaint you with the general problems faced by those who work to keep fishing good. For your convenience, the story of our fish has been divided into three parts:

(1) A discussion of fish management in the high country, followed by a description of each major species;

(2) a section on warm-water fish management and a description of each species;

(3) pertinent comments on the importance of research and hatchery operations in improving fishing.

In the years to come, fishing as a sport cannot continue if the angler merely buys his license and fishes. His active support for wise management will be required in many ways; and this support will come only through understanding the obstacles that stand in the way of good fishing for the future.

R. F. Gregg, Editor

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← Cover: *Upper Sandbar Lake* — photo by GEORGE ANDREWS

Fish of the High Country

COLORADO is the highest state of the 48. We have 1,143 mountains which reach an elevation of 10,000 feet or higher. Of all the area in the United States over 10,000 feet high, Colorado claims 75 per cent! Because the high mountains receive a great deal of snow, Colorado is well supplied with the cold waters in which trout live and grow.

Six major rivers have their beginning in the state. These are the Colorado, the Rio Grande, the Arkansas, the South Platte, the North Platte and the Republican. The tiny brooks and streams that form high in the mountains join as they travel down, and eventually form these mighty rivers. Small lakes, beaver dams, ponds and puddles form a part of these river systems.

But all of these waters are not alike. Trout, like any other living thing, require shelter, food and a good place for rearing their young. Some waters have a large food supply and plenty of shelter. Trout living here will grow fast. Another water may be too cold, with a limited food supply. The fish here cannot possibly grow very large. People who study these things can learn how satisfactory any water is by measurement. This is done by finding out how many pounds of fish — and there is a definite limit — can be supported by each acre of water.

This limit on the ability of water to support fish is important. Since there are 300,000 fishermen in Colorado, it would be well to maintain every water at top fish-producing capacity. But as the human population increases, it usually means that the waters become less and less productive of fish.

This is caused largely by the use of the land from which the water drains into the streams and rivers. Lands from which the waters drain are called watersheds. In Colorado, these watersheds are the lands that grow grass for cattle, food for sheep, timber for houses and many other uses. In addition, some watersheds are abundant in minerals that must be mined and milled. Each year the high country is being more heavily used for recreational purposes.

All of these uses have an effect upon the land, and in turn also effect the waters. When grass and plants are destroyed by too many hooved animals, when too many trees are cut and when forest fires remove the soil-protecting plants, the soil



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Small streams and beaver ponds provide much trout fishing.

begins to wash away. Soil and rocks can soon fill up a fine trout stream completely or can greatly reduce the ability of the stream to produce fish. Vegetation, in the form of mulch and as growing plants, protects the soil from washing into the streams. On over-used watersheds there is no plant "sponge" left to hold the water.

In addition to the watershed problem, water itself is becoming increasingly important to our ever-growing numbers of people. As more water is needed for domestic, industrial and agricultural uses, less will be available for fish. And when water is vitally needed it must be gathered and stored in dams. Dams alter the home of the fish and usually mean more problems for fish managers. Pollution, usually caused by dumping sewage and mining and manufacturing wastes into our waters, is also a serious threat to our remaining fishing waters.

All of these effects on fish and their waters are caused by man himself. Since the population of Colorado and the United States is still growing, there is no doubt that further activities of man will change and deplete much of the water that now produces fine fishing.

The thrill of casting a lure for trout in the clear, pine-bordered streams of Colorado depends upon how well we manage our lands. Keeping the watersheds covered with a blanket of green, and wisely using the waters for the greatest benefit of all the people, will be necessary if future generations are to prosper and enjoy the recreation of Colorado's high country.



NATIVE TROUT

THE MOST common name for the native is "cutthroat." The name comes from the bright red marking on the lower jaw. It was the only trout found in Colorado when the white man arrived.

Liking clear and cool waters, the native is being crowded out of its former range, both by the effects of civilization on the waters and by other species of trout. With proper management the native can still produce excellent fishing, especially in lakes.

Native trout spawn in the spring, from March into July, depending upon water temperature. Laid in nests, the eggs are covered with a few inches of gravel.

The native is relatively unknown except in the west, and every effort should be made to preserve it for fishing in future years. (See full color painting of native on back cover.)

RAINBOW TROUT

ONCE a West Coast trout, the rainbow has been introduced to much of the United States. The steelhead, which many identify as a separate species, is a true rainbow that runs into the ocean.

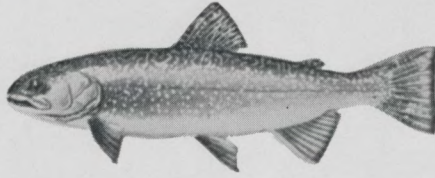
Almost half of the trout caught in Colorado are rainbow. Its fighting ability makes the rainbow popular with all anglers.

The name "rainbow" comes from the brilliant reddish streak found on the side. This coloration varies according to season and environment.

Fortunately the rainbow is one of the easiest of trouts to handle in the hatchery, and is easily caught. More rainbow are raised and planted in Colorado waters than any other trout.

Rainbow spawn in the spring in Colorado, the exact time depending upon altitude and the temperature of the water.





BROOK TROUT

AN INTRODUCED species to Colorado, the eastern brook is native to the northeastern United States, the Great Lakes region and parts of Canada.

The small mountain streams of Colorado abound with brook trout. This fish makes up about 40 per cent of the state trout catch from streams.

In many small, cold streams the brook trout does not grow very large. Often these small fish are mature adults. Removal of the size limit on trout may help reduce their numbers in these waters, and allow the remaining fish to reach a larger size.

Brook trout spawn in the fall from September to December, depending upon water conditions. The eggs hatch in spring.

The common mark of the brook trout is the white edging on the lower side of the fins.

BROWN TROUT

THE BROWN trout was imported into the United States from Germany in 1883. It is now well scattered over much of the United States and is common in Colorado. In the West this fish is also called "Loch Leven."

Creel census studies show that the brown trout makes up about eight per cent of the total trout catch.

Brown trout thrive under modern stream conditions, which include warm and slightly muddy waters. They prefer the lower stretches of larger streams. Browns are generally hard to catch.

This trout spawns in the fall or winter, and the eggs hatch in spring.

Brown trout have spots only on the upper edge of the tail. Other trout are spotted all over the tail, although these spots on the brook are rather faint.





LAKE TROUT

THE LAKE or mackinaw trout is found only in the deeper lakes of Colorado. It inhabits the lower depths of lakes 50 to 150 feet deep or deeper and for this reason its range in Colorado is somewhat restricted.

Of Colorado trout, the mackinaw is the largest. Catches up to 29 pounds have been made at Twin Lakes near Leadville. The record rod and reel catch stands at 63 pounds, from Canada, while the record catch by commercial fishermen is 80 pounds.

This fish spawns in the late fall in the shoal areas of the lakes. It remains in deep water during the summer and is usually taken by trolling deep. However, during the spring and fall the fish come into shallow water and may be taken on light tackle.

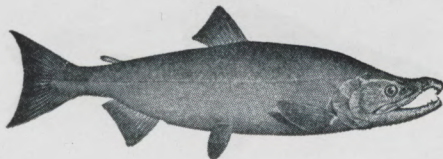
The mackinaw is recognized by its dusky gray color, darker above than below. The sides of the fish are somewhat mottled.

KOKANEE SALMON

THE KOKANEE is a fresh-water relative of the sockeye or red salmon. Not nearly so large as the salmon that live in the ocean, they are similar in many ways. Although called various names wherever introduced into western United States, kokanee is the most common.

Kokanee were released in Granby, Green Mountain and Skagway reservoirs in 1951. Kokanee eat plankton — small plants and animals that live their lives floating in the water.

Kokanee usually spawn in the autumn of their fifth year. Like the salmon of the west coast they die after spawning. In some western states it is legal to snag the fish during the spawning season. At other times the fish are taken on small spinners and sometimes on flies. While not famed as a fighter among anglers, they are very delicious eating.



OF COLORADO



MOUNTAIN WHITEFISH

THE WHITEFISH is found in the White, Elk and Yampa rivers of northwestern Colorado. It cannot be mistaken for a trout, but is sometimes called grayling—a different fish.

The whitefish lives in fast clear waters the same as trout. It is receptive to bait or flies but is difficult to catch due to the small, soft mouth. Although slightly more bony than a trout, the flesh of the whitefish is very good to eat.

Whitefish spawn in the fall. The eggs are small and each female lays more of them than do trout of the same size. This fish is able to survive fairly heavy fishing without the aid of artificial rearing and planting.

Whitefish may be caught during the winter in Colorado. Winter fishing for whitefish is becoming more popular each year and is a welcome diversion when few other sports are available.

GRAYLING

THE GRAYLING is native to the tributaries of the Missouri River in Montana. Grayling have been raised in hatcheries in several western states and released into likely waters. Colorado raises some grayling and a recent plant was made in Grand Lake.

Grayling have a very large bright-colored back fin. This fin is larger than on otherwise similar fishes and it is the best way to recognize the grayling.

Grayling will live in lakes or streams with clean, cool water and gravel bottoms. They are known to do well in waters containing native trout, but gradually disappear if brown, rainbow or brook trout are present. Grayling eat the same food as trout.

Having small mouths and being very agile, grayling are more difficult to hook than are trout. They provide exciting sport and enjoyable eating.





SUCKERS

SUCKERS usually have a bad reputation among trout fishermen. It has been claimed (but not proved) that suckers eat large numbers of trout eggs. Young suckers in the high country provide food for trout.

Under certain conditions, usually in lakes, suckers may become so numerous as to compete with trout for food, which lowers the trout-producing capacity of that lake.

The western white sucker is common on the eastern slope. The flannel-mouth sucker, the bluehead mountain sucker and perhaps other varieties are found in the Colorado River basin.

Suckers and other rough fish are often called "forage fish" because they provide food for game fish. Minnows and chubs are two other types of forage fish found in the high country. These fish are discussed in more detail below.

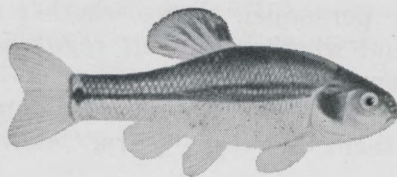
MINNOWS

ALL SMALL fish are often, and incorrectly, called "minnows." Actually, there is a family (*Cyprinidae* is its Latin name) which numbers among its members chubs, dace, shiners, squawfish, carp and several species commonly known as minnows, including the fat-head minnow illustrated below.

Most of these fish are small even as adults, but the Colorado River squawfish may reach a weight of 80 pounds!

The minnows are important. Although they eat food used by other fish, they themselves are excellent food for game fish. Thus they help our waters support larger numbers of game fish.

Minnows live in both cold and warm waters, from weedy lakes to swift streams, all over the state. The food of any species will vary somewhat according to the water in which they live. Minnows spawn in spring and summer.



Research

“**R**ESearch” means nothing more than fact finding. Research seeks the facts that must be determined to solve a problem. Fact finding tends to make fish management programs scientific rather than “hit or miss.”

Fact finding is a slow process. Years may be required before results can be actually applied to improvement of fishing. Sportsmen may become impatient, and demand that more of their license fees be spent on such things as fish planting. But research is necessary and has proved its worth in better fishing many times down through the years.

For example, here's the story of a research project conducted at Parvin Lake northwest of Fort Collins. Parvin Lake is fenced on all sides—all fishermen must enter and leave through one gate. Fish caught are thus easily checked by Game and Fish Department personnel, and much information can be gathered. In this particular project, a certain percentage of all fish released in the lake were marked by tags in the jaw or by fin-clipping. A plant of 7 to 10-inch trout brought good fishing—many of the marked fish were caught. But later a plant of two-inch trout was made, and returns of marked fish showed that *even better fishing was provided by the smaller fish.*

This fact, discovered by research, has a real cash value. Since the smaller and more cheaply raised trout provide better fishing in some lakes than more expensive, larger fish, the latter can be planted in streams. Two-inch fish can be reared and planted in many lakes. The cost of this discovery was small, yet the increased efficiency in our planting programs means a continuous saving so long as fish are reared and planted.

Learning how, when, what sizes and what kinds of fish to raise and release is but a small part of fish research work.

For instance, fishing regulations are constantly being studied. An annual creel census helps determine new regulations by revealing how many fish are caught, the kind and size, time required to catch them, etc. This information, gathered by game wardens and other personnel, shows whether fishing is getting better or worse, and whether current regulations, such as bag limits, should be changed or not.

Research men study our waters and determine what fish will thrive best in them. In recent years, Colorado has imported,



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Waters are tested to see how much fish food is produced.

from other states, the kokanee salmon, white bass, walleyed pike and others in an effort to improve fishing.

Research may help create new fishing waters. One project, a cooperative effort between the Silverton Fish and Game Club and the Department, offers a model other clubs might follow. After three years of work and \$6000 expense — with \$1000 provided by the club — a significant fishing water was created for public use. It was named Andrews Lake in honor of the Department's fish manager, who was instrumental in getting authorization for the project.

Improving fish productivity of existing bodies of water may be approached in several ways, although not a great deal of such work has been done in Colorado. Removal of undesirable fish, fertilizing the waters to increase food production, providing shelter for fish and increasing spawning areas are examples of this type of work. It is most successful in small lakes.

Research, whether it consists of checking fishermen or working in the laboratory, adds up to the same thing — fact finding. And your chances for good fishing depend in large measure on the success of this never-ending search.

Warm-water Fish

ALTHOUGH known for its mountains, Colorado has a vast area east of the divide which consists of high plains. Across this country wind the eastern slope rivers on their way to the Missouri and the Mississippi. Reservoirs on these rivers, as well as smaller streams, lakes and ponds, make up the bulk of Colorado's habitat for bass, pike, perch, catfish and other species which are called "warm-water fish."

Fishing our warmer waters is becoming increasingly popular. Anglers who live in eastern Colorado must travel long distances to catch trout, but if other game fish could be established close to home, the trek to the mountains would not be necessary. Most lakes below 7,000 feet are open to fishing through the ice in winter — an added advantage to the warm-water fisherman.

Colorado is not naturally blessed with a sizeable amount of ideal waters for warm-water fish. Most of the eastern slope reservoirs do not have water levels that remain the same throughout the year. This fluctuating water level limits the amount of fish food which the reservoirs can produce. It also may interrupt spawning, or the eggs may not hatch.

Where conditions are ideal for such warm-water species as bluegills and crappie, other vexing fish management problems arise. These fish are able to reproduce rapidly — they lay huge numbers of eggs every year. If the eggs hatch, and unless many of the fish are caught by fishermen or eaten by other fish, the water may soon become overpopulated.

Overpopulated waters — waters in which there are too many fish and not enough food — mean that fish do not get enough to eat, and cannot grow very large. Year around fishing seasons and large bag limits may help reduce the population, but not always — the fish may be too small to attract fishermen.

Another method of combating overpopulations is to introduce fish whose main diet is other fish. The walleyed pike is an example of this predatory type. The walleye will feed heavily on small bluegill or crappie and the numbers of fish may be brought into balance with the food-producing capacity of the water. Larger, more healthy fish will be the result.

Eastern slope waters are frequently plagued by overpopulation of carp or other "rough" fish — a phrase used to describe



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More and more Coloradoans are enjoying warm-water fishing.

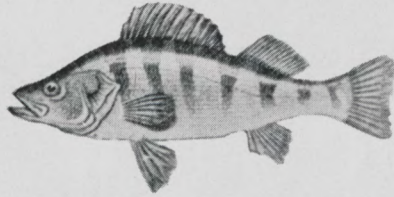
species which are not considered game fish. Not many people care to fish for carp; not many are harvested by anglers. And the carp is such a hardy fish that it can survive conditions that are fatal to game fish. Thus in many waters the carp eventually become the dominant species.

Great numbers of carp in a water means less food for game fish, and makes the establishment of desirable fish less difficult. One way out is to remove the rough fish. Occasionally the water can be seined efficiently, but more often poisoning is required. In the most frequently-employed poisoning process, called derising, a compound is poured or pumped into the water which cuts off the oxygen supply and suffocates the fish.

Another fundamental problem in warm water fish management in Colorado is the lack of well-distributed, productive waters.

Construction of farm ponds, usually in conjunction with the U. S. Soil Conservation Service, is a good way to increase our supply of fishable water. Water storage projects, however, still support the bulk of eastern slope game fish.

Every body of water, warm or cold, is different. Individual surveys of each lake and stream will result in the best management of Colorado's warm water fish program. Our waters are limited, sometimes far from ideal; and the demand for good backyard fishing is growing stronger every day.



YELLOW PERCH

THE YELLOW perch is widely distributed throughout the country and is found in many waters in Colorado. It does best in lakes of middle and lower altitudes.

The perch is very productive and often becomes so numerous in certain lakes that breeding adults are only between four and six inches long. Under ideal conditions, perch may measure 12 inches and weigh one pound.

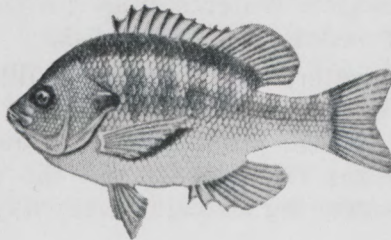
The perch is one of the easiest fish to catch and minnows are one of the best baits. Unlike many warm water fish, the perch is hungry all winter and is often the main catch through the ice. Although it has spiny fins and gill covers and is difficult to clean, the flesh is sweet and delicious.

Perch spawn in the spring and lay large numbers of eggs.

SUNFISH

THE BLUEGILL is the most popular of the sunfishes because of its fair size, the fishing it offers year around, and its choice flesh. Essentially a lake fish, bluegills are usually found in schools in the shallower water near beds of vegetation. The bluegill has a dark, almost-black "earflap" on the gill cover. Bluegills lay their eggs in nests which are found in colonies.

The pumpkinseed sunfish is not usually as large as the bluegill. The "earflap" on this fish is a bright red. Pumpkinseed are a popular fish with children because they are easy to catch and do not require expensive equipment. Pumpkinseed have a strong tendency to overpopulate, which results in large numbers of fish too small to be attractive to anglers. Sunfish, crappies and perch are sometimes called "pan fish."





CHANNEL CATFISH

THE EASIEST way to identify the channel catfish is by the forked tail. Irregular-shaped small black spots are scattered over the body of the fish, which is usually yellow-green in color. Channel "cats" may reach a weight of 20 to 25 pounds, and four to eight pounders are often caught.

This catfish is more active than its near relatives, and lives in clearer, swifter waters. It is considered to top all other catfish as a fighter and as a table delicacy.

The channel cat seems to eat most anything, animal or vegetable. The most successful fishermen use baits with a strong, sour smell.

The black bullhead is another catfish common in Colorado. It is smaller than the channel cat, and has a square tail.

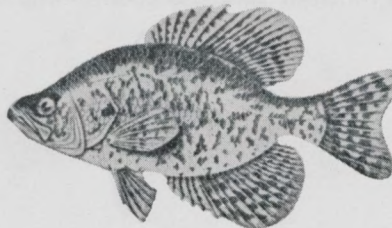
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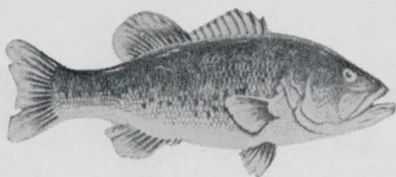
THERE are two kinds of crappies in Colorado waters. The black crappie normally has seven or eight spines in the large fin on the back, while the white crappie normally has six.

In properly balanced and productive lakes, crappie 12 inches long are common. They are gamey when hooked and are a good table fish. They take lures and flies readily from near the surface of the water at certain times.

Crappie eat small fish, insect larvae and plankton. Spring spawners, they build nests in the gravel or sand bottoms in the shallower regions of the lake.

The crappie is one of the more popular warm-water fish, mainly because it is pleasing to catch and is large enough to furnish sport and food.





BLACK BASS

PROPERLY called the Largemouth Bass, this fish has been introduced into Colorado from its native haunts in the East and South. Actually a member of the sunfish family, this bass is shaped somewhat like a trout. It prefers to live in sluggish weed bordered waters.

A game fish in every way, the black bass will strike the lure in a vicious manner and will put up a thrilling battle to the very end. Like many other fish, older bass are difficult to catch.

Bass are frequently placed in waters to reduce populations of pan fish so the latter will not become stunted from lack of food. Actually bass prefer insects and crustaceans to fish.

Spawning in the spring, a single female may have as many as 10,000 eggs.

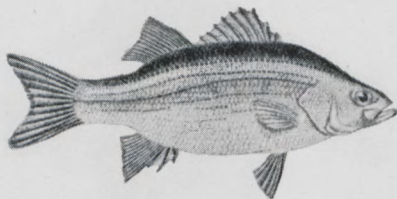
WHITE BASS

FIRST PLANTED in Colorado in 1948 in John Martin Reservoir, these fish are now found in Adobe Creek Reservoir, Bonny Reservoir, Loveland Lake and others.

A fine game fish, the white bass is caught on minnow-like artificial lures and on Colorado and airplane spinners. Real sport can be had from this fish, which may reach a weight of four pounds. They are excellent eating.

The general color of the white bass is silvery with yellowish under-parts. The sides are streaked with regular rows of narrow, dusky lines.

If this fish can become established successfully it will soon be familiar to many eastern Colorado fishermen. It's a fine fish that deserves every effort toward increasing its numbers.





WALLEYED PIKE

ANOTHER recent import to Colorado, the walleyed pike is a member of the perch family. It roughly resembles the yellow perch in body shape but is much larger. This fish is occasionally caught at weights up to 25 pounds. It is famed for its delicious flavor.

The walleye prefers clean, hard-bottomed lakes. In some areas it will live in streams but there are few likely streams here. The bulk of the diet of larger walleyes is made up of fish. It is often introduced to reduce overpopulation in lakes.

An excellent game fish, the walleye responds well to both artificial and natural baits. Still-fishing with minnows, on the bottom, gives the best results in Colorado. Good catches are now being made in eastern Colorado.

FRESHWATER DRUM

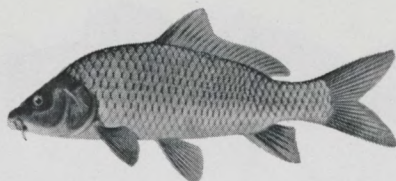
THE FRESHWATER drum was introduced into Bonny Dam in 1951. The drum is a large, coarse fish with a body similar to that of a carp. It is generally a silvery color, ranging from very dark to light. It has a long fin on the back extending over most of the body length.

The drum is a favorite among fishermen in certain areas.

This species spawns about mid-June at 15 inches or over. Spawning size is generally reached within two or three years. The drum may attain a length of over two feet and weights of 60 pounds have been recorded.

The freshwater drum has the power of producing a peculiar grunting sound, which has led to many common names such as thunder-pumper, bubbler, croaker and drummer.





CARP

THE CARP is widely distributed over much of Colorado. It is found in both streams and lakes. Warm water is preferred.

For over 4000 years the carp has been highly cultivated for food in China, and for hundreds of years in Europe. It was introduced into the United States in the 19th century.

Thriving under very adverse conditions and producing a great many young, carp are difficult to remove from waters where more desirable fish are wanted.

Carp grow to a fair size and do have some value as they are caught for food for human consumption and for mink in fur farms. In Colorado they are fed in cooked form to trout at the hatcheries and rearing units.

The carp occasionally reaches a weight of fifty pounds.

Production

YOUR Game and Fish Department has 25 fish hatcheries and rearing units distributed throughout the state. In 1951 fish raised and released amounted to 293 tons, or 9,600,000 individual fish! Without this tremendous planting program many a fisherman would have come home empty-handed.

In the hatcheries, fish eggs are placed in shallow troughs with a constant supply of water flowing over them. Usually the eggs will hatch in 50 days in water at 50° F. After hatching, the young fish are fed ground liver. When over an inch long, the fish are moved outside and fed a diet of cooked carp with small amounts of oatmeal and salt. It usually takes a year to grow a six-inch fish.

Release of fish into the streams and lakes is done on a planned system. State-raised fish are released only in waters open to the public. The number of fish planted is determined by



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These men are sorting out large fish for stocking purposes.

two factors: the amount of fishing pressure on the water, and the number of fish that the water can support. Hatchery fish are released so that every fish has a fair chance of entering the basket of the fisherman.

Fish raised by man serve well when released in waters so heavily fished that nature itself cannot produce enough for all the anglers. This is called the "put-and-take" system. Hatchery fish also are stocked in new reservoirs or other waters that do not contain fish. New species of fish are established by hatchery methods.

Fish raised by artificial means are important. But this method of helping fishing is by no means the only way possible. Man-raised fish are very expensive. In Colorado, the Game and Fish Department gets no money from general taxes, and the money used to raise fish is more than that collected from fishing licenses. If the only fish to be caught were those released from hatcheries, the amount of money required to produce good fishing would be much greater than the fisherman could afford. Unless cheaper methods of fish raising are discovered, it is possible that the great and increasing demand for hatchery fish will force the Department to increase fees on fishing licenses.

Back Cover: *Native Trout* — painting by CHARLES HJELTE →

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