

TWELFTH BIENNIAL REPORT

OF THE

FISH AND GAME  
WARDEN

OF THE

STATE OF IDAHO

HISTORICAL SOCIETY

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JAN 31 1929

STATE OF IDAHO

1927-1928



R. E. THOMAS

State Game Warden

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HONORABLE H. C. BALDRIGE  
Governor of Idaho, a Lover of the Great Out-of-Doors

January 1, 1929.

*To His Excellency, H. C. BALDRIDGE, Governor, and the  
Members of the Twentieth Session of the Legislature  
of the State of Idaho:*

Gentlemen:

In accordance with the provisions of law, I have the honor to present herewith, the report of the Department of Fish and Game, for the biennium ending December 31, 1928.

This report gives a brief outline of the activities of the department, including constructions, improvements of a permanent nature, research work, fish planted, tabulation of fish and game licenses issued during the biennium and a tabulated statement of the receipts of the department, together with a classification of disbursements and a supplement naming and describing the various kinds of fishes found in our state.

Respectfully submitted,

R. E. THOMAS, *State Game Warden.*

OFFICIALS AND CLERICAL FORCE

R. E. THOMAS.....*State Game Warden*  
BOISE, IDAHO

W. M. KEIL.....*Fish Commissioner*  
BOISE, IDAHO

TURNER SPARKMAN.....*Chief Deputy*  
BOISE, IDAHO

VERN THOMAS.....*Chief Clerk*  
BOISE, IDAHO

STENOGRAPHER  
MAUDE WHITE  
BOISE, IDAHO

ASSISTANT CLERK  
PEARL THOMPSON  
BOISE, IDAHO

*Acknowledgement*

The department appreciates the helpful and growing interest manifested by the public in conservation work and is grateful to the various agencies which have in large measures contributed to whatever success may have been attained.

The cooperation and aid given us by the United States Game Wardens, the United States Bureau of Fisheries, the United States Forest Service, the sportsmen's associations, the railroad and other common carriers and the American Railway Express Company, to all these we extend our sincerest thanks.

To the field men, office force and the entire personnel of the Fish and Game Department who have entered wholeheartedly into its plans, and diligently and earnestly worked for its success, the Warden expresses his appreciation.



MOUNTAIN SHEEP IN THEIR NATURAL HABITAT IN CUSTER COUNTY

## Protection, Propagation and Conservation

Protection, propagation and conservation of game, fish and fur bearing animals is one of the big problems now confronting the various states.

The question of natural resources is one of the most vital to the interest of our state and one in which every patriotic public spirited man and woman should take the deepest interest. I am particularly thinking of one of our most interesting resources, our Wild Life. If we will pause and think, we will realize how much of our comfort and happiness depends upon this, and how many of our people make their livelihood from it. I refer to the taking of fur bearing animals during the open season, so if the people of Idaho ever realize this fully, then the work of protecting our fish, game and fur bearing animals will be wonderfully lightened, for the enforcement of the laws protecting these is a very heavy burden, in fact, they cannot be enforced properly unless the people themselves are in sympathy with our laws and we feel that when the people of our state realize the importance of our Wild Life to the welfare of Idaho, they will all demand that our laws be obeyed so that these treasures with which Nature has so liberally endowed us, will be ours for all time.

In this work of conservation of our Wild Life the boys and girls of our state should be interested. It will affect their after life in many and various ways and to them the Department makes a special plea that they incorporate in their course of study, some interesting educational feature along this line. Let this knowledge grow with their growth, and strengthen with their strength, so that when they are the men and women of Idaho, as they will be very soon, they can intelligently assist in this necessary work.

The Department feels that when the young folks thoroughly understand the value of our Wild Life they will bend every energy to assist in conserving it, so that we today will enjoy this great resource to the fullest and the generations to succeed us will have Wild Life in abundance.

The Department feels that the fate of our Wild Life really lies in the hands of the youth of our state and also feels sure that our young folks will be equal to this responsibility and do their utmost to assist in this work for the good of our state.

## Accomplishments

Aside from an advance in the protection and preservation of wild life, the propagation of fish and the stocking of streams, much has also been accomplished during the past biennium in the way of accumulation of important data on fish and game and in the development of public sentiment favoring wild life conservation and the enforcement of the fish and game laws.

Fish and game laws are being enforced now as never before and during the past biennium more arrests have been made than during any previous biennium and not only were practically all offenders arrested, but convictions have been secured in almost every instance.

## Big Game Conditions

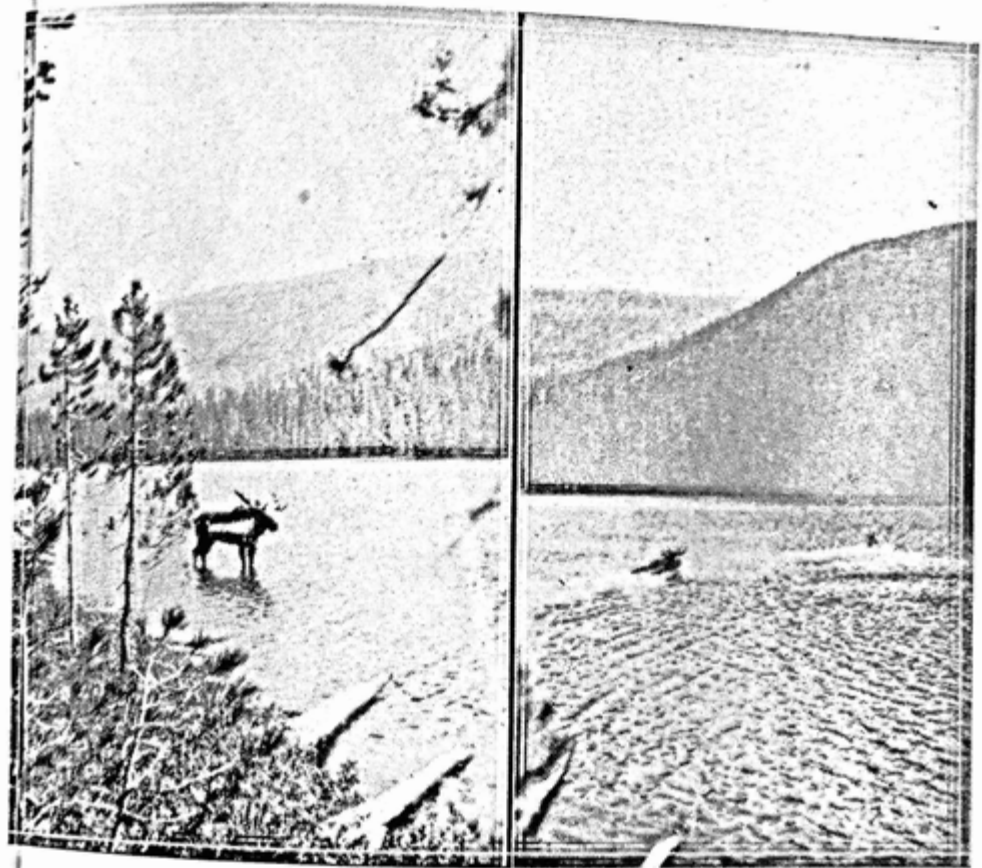
Big game have shown a very satisfactory increase during the past few years throughout this state. This is especially true in regard to deer in the southern counties, which are Bear Lake, Caribou, Franklin, Power, Oneida and Twin Falls. These counties have had a closed season on deer for several years. Deer have increased to such an extent during the past two years that it would be advisable to amend our present law at the next session of the legislature, allowing the counties above mentioned, a short open season.

## Moose

There are three general types of moose, that is, the Common or American moose, the Shiras moose and the Alaskan moose. The Shiras (*alces americanus shirasi*), a smaller animal with pale brown back, pale ears and small hoofs, is the type found in Wyoming, the Yellowstone Park region, Montana and Idaho. Moose have shown a very substantial increase in several of the counties of our state. They abound in Clearwater and Idaho counties in the Northern part of the state and also in Fremont county, in the South.

## Wapiti, or Elk

The elk is next to the moose, the largest of the deer family and is easily the handsomest, having superb widely branching antlers. It is gratifying to the game department to note that this animal is making a very noticeable increase throughout the state.



THE GIANT OF THE FOREST



WAPITI, OR ELK, ARE STEADILY INCREASING IN IDAHO

### Antelope

The antelope population in Idaho has doubled in the past few years and this fleet footed game animal is found in bands or groups in Owyhee, Butte and Custer counties. Antelope, as a rule, are not confronted with as many natural enemies as are the forest and mountain dwelling species of game. The coyote no doubt, is the antelope's most serious enemy, since it preys extensively on the young, as well as on the adults, when, as a result of poor range conditions, their vitality is reduced.



ANTELOPE. THE MOST PICTURESQUE AND THE FLEETEST OF ALL OUR NORTH AMERICAN QUADRUPEDS

### Rocky Mountain Goat

The mountain goat is found in substantial numbers in the mountainous sections of our state, special preference being shown for localities where crags and cliffs are the features of the landscape. He is strictly herbivorous in food habits, feeding upon scattered grasses and pine needles, among the rocks, and in the winter upon any exposed vegetation he may find.

### Mountain Sheep

During the nineteenth session of the legislature, the former law was amended and a ten day open season on mountain sheep in Lemhi and Valley counties was provided. This was brought about largely as a result of reports received from our field force to the effect that a short open season on these animals might prove beneficial. Mountain sheep are subject to scurvy and other diseases, the same as domestic sheep and it was believed that the shooting of them would tend to scatter them from their old bed grounds



ROCKY MOUNTAIN GOAT

which they had used year after year, thereby reducing their susceptibility to disease. The open season on these animals during the past two years has proven very beneficial.

### Regulating Big Game Conditions

We have reached the point in several localities, where, through enforcement of our game laws and the destruction of predatory animals, the supply of game animals already taxes the capacity of the available range. This is particularly true of elk in the Arbon Valley in Bannock county and in the Payette game preserve in Boise county. In these regions we are faced with the practical necessity of regulating the future size of game herds. If therefore, it is desired to prevent the herd from increasing beyond a certain limit, the only solution is to restrict the number of females, as well as males, to be taken, for whenever the number of game animals reaches the reasonable capacity of the forage resources available for game, further increases should be stopped. The herds can thereafter be kept to a fixed number only by a regulated kill of both sexes each year. When once the herd on a given range reaches the limit of its food supply and the sexes are represented in the desired ratio, the kill of each sex, plus losses, should each year exactly offset the increase. If less than that number of females are killed, the herd will eventually out-grow its food supply and trouble will follow. Those in whose hands is placed the administration of fish and game should have the power to open a season, where an emergency exists, to prevent the death of game animals from starvation, in sections where there is insufficient forage.

If the members of the legislature do not see fit to grant the head of this department the responsibility of opening a season on game animals, it is suggested that the Governor of our state, upon a satisfactory showing that an emergency exists, appoint a committee of three to make an investigation of actual conditions and report their findings to him. It is suggested further that if it is found that an emergency does exist and that a number of game animals should be taken, the head of the department be given power, by the Governor, to take the necessary steps to relieve the situation. The committee to be appointed by the Governor should consist of a member of the Fish and Game Department, a member of the Forest Service and a member of a sportsmen's association in the section where the emergency exists.



## Planting Sulphurized Salt for Big Game

It has been found by our experimentations in the past two or three years that supplying game animals with sulphurized rock salt, has proven very beneficial to these animals, which work is now a part of our yearly program. In the big game sections, the natural salt licks have become extinct from continual use by game animals. By depositing salt in the heart of some of the big game areas, we have every reason to believe that game animals are in better condition in such areas than in sections not supplied. Especially do we believe that a supply of sulphurized salt will prevent scurvy, a condition that will be found in southern and central Idaho. There have also been instances where game animals were infested with ticks but in sections where sulphurized salt has been distributed, this condition has also been relieved, due, it is thought, to the fact that the sulphurized salt penetrates the body of the animal and the sulphur repels the ticks.

On account of the inaccessibility of the big game sections and the difficulty of transportation in the spring of the year, it is necessary for us to have the salt transported to the big game districts in the fall, so that it can be distributed and planted by pack horse or man power, as the spring of the year is the time when game animals crave salt. During the past biennium the department has distributed several tons of sulphurized salt throughout the various big game sections of the state.

## Report of Big Game Killed

The only method we have of determining the number of big game killed by hunters during the open season, is from the record of game reported or checked out of the hunting districts by our local wardens, in cooperation with the officers of the Forest Service. Reports filed with this department show that there has been taken during the past biennium a total of 4,513 deer; 99 elk; 107 goats; 14 sheep and 34 bears. It is impossible to secure an actual check on the number of game animals killed during a season as our field force is not large enough to cover all of the avenues in and out of the big game sections. However, the above is a fairly accurate check.

Inasmuch as this department is vitally interested in getting an accurate check of the game animals, game fish, game birds and fur bearing animals taken each year from our forests and streams, I would recommend that a law be



ROCKY MOUNTAIN BIG HORN SHEEP



BRANCHES OF FIR TREES, HEAVILY LADEN WITH MOSS ARE CUT DOWN AND PILED FOR SUBSISTENCE OF DEER DURING SEVERE WINTERS IN THE JACK PINE FLATS OF BONNER COUNTY

passed compelling each license holder to report at the end of each year, the number and kind of game taken, for such information would be very valuable data to this department. At the present time we have the information as to the number of game fish and game birds that we are planting each year but we do not know the amount of game and game fish that is taken from our forests and streams each year.

### Report of Investigations in Regard to Big Game Conditions in the Lowman District

During the latter part of February, 1927, an article written from Lowman, Idaho, appeared in our local newspapers, stating that the big game in the Lowman district had not received proper protection and that they were dying in large numbers from the want of food and also that many had been killed by predatory animals.

Mr. Turner Sparkman, our Chief Deputy, was detailed to that district to make an investigation and report to this office the actual condition of big game in that vicinity. Upon his return he submitted a detailed report, giving actual conditions as he saw them, which is as follows:

TO HONORABLE R. E. THOMAS,  
STATE GAME WARDEN,  
BOISE, IDAHO.

In speaking of the big game district in Idaho the areas considered often cover several hundred square miles. These areas are generally inaccessible, except by pack horse transportation and for that reason, it is practically impossible to restock a range, once it is depleted, making it necessary to keep a sufficient breeding stock on the range to offset the numbers killed by hunters, predatory animals and those that die from natural causes. It is conceded by both the state and federal authorities that all big game is on the increase, except mountain sheep and they are holding their own. Deer are increasing in all parts of the state but it is estimated that there are seven does to one buck, which would make it seem that the enactment of the much discussed buck law would have been a serious mistake.

On March 4th, 1927, I made a trip up the South Fork of the Payette River on to a deer range where thousands of deer were coming through the unusually hard winter of 1926 and 1927, this being the time of the year when the heavy loss occurs on the old and weakened animals and also the yearlings, by reason of the fact that grass is just starting and at this time contains very little nourishment. Nevertheless, when the grass starts, the deer and elk will quit the browse and start grazing, which at the end of a week or so, leaves them in such condition that they cannot withstand the later snow storms that always come and last over short periods during March and April. Various reports were being circulated at that time to the effect that great numbers of deer were starving but I found condi-

enced guide and woodsman, to make an inspection trip to the Middle Fork game preserve on the Salmon river, during the winter of 1927-1928. The object of this inspection trip was to find out whether or not the boundary lines of the game preserve were properly posted and whether the boundary lines included the winter range of game animals. It was also desired to ascertain the amount and kind of forage found in this particular district, to secure, as nearly as possible, a check on the number and kind of animals wintering there and to learn whether or not they wintered within the boundaries of the game preserve.

Mr. Moore left Cascade on January 2, 1928 and returned on March 31. He reported seeing large numbers of big game animals, which were in very good condition. It was recommended by Mr. Moore that a few changes be made in that district, namely, the use of more boundary signs; the planting of sulphurized salt for game animals; employment of men during the winter months for the purpose of trapping and killing predatory animals, and a recommendation to the next legislature of a slight change in the boundary lines of the game preserve. All of the recommendations made by Mr. Moore have been carried out and this winter we have two predatory animal trappers in that section, a large quantity of sulphurized rock salt has been purchased and a number of signs have been placed along the boundaries of the preserve.

In the Lowman game preserve there has been built during the past year, a permanent cabin for the use of the deputy game warden in that district. There has also been two small cabins built in the Selway game preserve, to be used by predatory animal trappers during the winter months. It is the aim of the department to continue to improve conditions in the various game preserves throughout the state.

### Public Warned to Guard Against Tularemia

Tularemia, a serious and often fatal disease, known also as "rabbit fever" or "deer-fly fever," has spread so widely that Paul G. Redington, Chief of the Biological Survey of the United States Department of Agriculture, has issued a warning to all field men of the department to be on guard against it. The Department is making public this warning for the benefit of sportsmen, lumbermen, cattle and sheep tenders, farmers and others of the general public who may come in contact with the disease. Mr. Redington's

warning has been endorsed by the United States Public Health Service.

"Tularemia," Mr. Redington explains, "is a plague-like disease of rodents transmissible to man. Of 500 human cases reported in the United States, 20 have terminated in death."

In the western states the disease is carried from animal to animal and from animal to man by the bites of infected deer flies and ticks. Ticks also act as carriers in the southern states. Men also become infected by handling rabbit carcasses, as in dressing them for the table or cutting them up to use as food for animals or bait in fishing or trapping. In the east, such direct contact is the common means of infection.

The United States Department of Agriculture has recently issued a bulletin dealing with the disease above mentioned, giving the nature of the disease, symptoms and protective measures. A copy of this bulletin may be secured by anyone desiring same, by writing to the United States Department of Agriculture, Bureau of Biological Survey, Washington, D. C.

### Activities During Last Biennium

During the years 1927 and 1928 your State Game Warden visited practically every county in the State of Idaho and also made several inspection trips to the interiors of the various counties for the purpose of inspecting fish and game and to ascertain the actual conditions existing at various points.

It is pleasing to state that only words of praise and commendation have been received upon the manner in which the affairs of the State Game Department have been handled. Satisfaction has also been expressed in regard to shipments of fish received by applicants, game birds shipped to various districts and the protection given to fish and game by our field force.

Much of an educational nature has been accomplished and excellent results have been obtained in the solution of many difficulties. This has been brought about largely by attending meetings of sportsmen's associations and other civic organizations and discussing the problems with which the Game Department, as well as these associations, is confronted.

A great deal may be accomplished toward the protection of fish and game, through educational work in our schools. There should be lectures on natural resources, as

well as talks on wild life, including the description of various species of fish, game and fur bearing animals, their habits, the necessity of protection and the enactment of adequate laws for this purpose. To illustrate a portion of the Game Department's work along certain lines, several thousand feet of motion pictures have been taken, showing spawning operations, which work is carried on during the winter months. The eggs in some instances have to be transported with dog teams through deep snow. The motion pictures illustrate the hardships undergone by our field men in securing the necessary eggs for hatching fish with which to stock our streams. Fish distribution and hunting scenes are also included in the motion pictures, all of which are of an educational nature. The films are in great demand by sportsmen's clubs and organizations and will be available for use in schools and other institutions. It is firmly believed that any activities which might be carried on in the interest of wild life conservation, should be encouraged.

### Departmental Recommendations

It is recommended that section 2724 of the Idaho Compiled Statutes be amended to provide that all common carriers of the state, when accepting for shipment, any packages containing the skins of fur bearing animals, shall require that an affidavit in duplicate, be furnished by the shipper, setting forth the number and kind of furs contained in the package, one copy of the affidavit to be retained by the common carrier and the other to be forwarded to the State Game Warden. Parties making false statements would, under the law, be guilty of a misdemeanor.

Section 2701, which pertains to the shipment of fish from privately owned fish ponds, should be amended to allow the shipper, instead of filing a copy of his permit with the express company, merely to show his permit, as an indication that he is actually in possession of such.

Sections 2703 and 2705 should be amended by eliminating the words "white fish."

The Department has received a large number of requests from various sections of the state, for a law protecting black and brown bear. I would recommend that they be protected, but if a bill is introduced providing for a law of this kind, a provision should be included to protect farmers and stockmen against any loss that may be occasioned by bear.

It is recommended that Section 2681, "Game Fish Defined", be amended to include steelhead trout.

Section 2735 should be amended to provide that Goose creek and Goose lake and all its tributaries, in Adams county, be closed to fishing from January 1st to July 15th, both dates inclusive.

As a conservation measure, the taking of salmon after July 16th of each year, should be prohibited and a bag limit of two salmon in possession at any one time provided.

There are probably other changes or corrections in our present statutes which will be recommended, which, together with the foregoing, will be presented to the fish and game committees of the legislature.



FISH LADDER IN THE CLEARWATER DAM. THIS TYPE BEING ONE OF THE MOST PRACTICAL EVER CONSTRUCTED IN IDAHO

## Report of Fish Commissioner

While the biennium of 1927-1928 has unquestionably been the most successful ever experienced in the Fishery Branch of the Department, the accompanying figures showing the outputs of the various hatcheries will be misleading to many who might have reason to compare them with the reports of former years. With an almost complete readjustment of the hatchery and field force, it has been possible the past two years to more closely check the actual number of eggs collected, fish hatched, reared, and distributed to applicants. No attempt has been made to establish a record of numbers of fish planted; but every effort has been put forth to produce for the waters of our state, as many good sized, healthy fish as the capacity of our hatcheries and our resources would allow. It would be a comparatively simple matter for all of us in the Fishery Branch to juggle our figures around so that many more millions of fish would have been shown as being produced and planted, but what would have been gained in the end? The only thing that counts is results; and in fishery work this is the number of fish that survive after being planted in lake or stream and are available for the fishermen to catch. The natural tendency of almost every hatchery superintendent is to attempt to increase the output of his station over that of the previous season, and in many states the officials in charge encourage this idea with the hope that it may reflect back to their credit with the public. This is a foolish and dangerous procedure unless the actual capacities of the stations are also increased, for just so many fish may be safely carried in a given space and water supply, and to overcrowd them means either loss through disease or a product permanently stunted. The experience during the past few years in Idaho has shown that much better results are being secured in lake and stream, and the sportsmen throughout the state more generally satisfied at receiving a smaller number of large fingerling than with the former consignments of under-sized half dead fry that they were accustomed to have furnished them. At two of our larger stations—Ashton and Hayspur, while the number of fish propagated and distributed has been considerably less than reported in some previous bienniums, each of these establishments actually



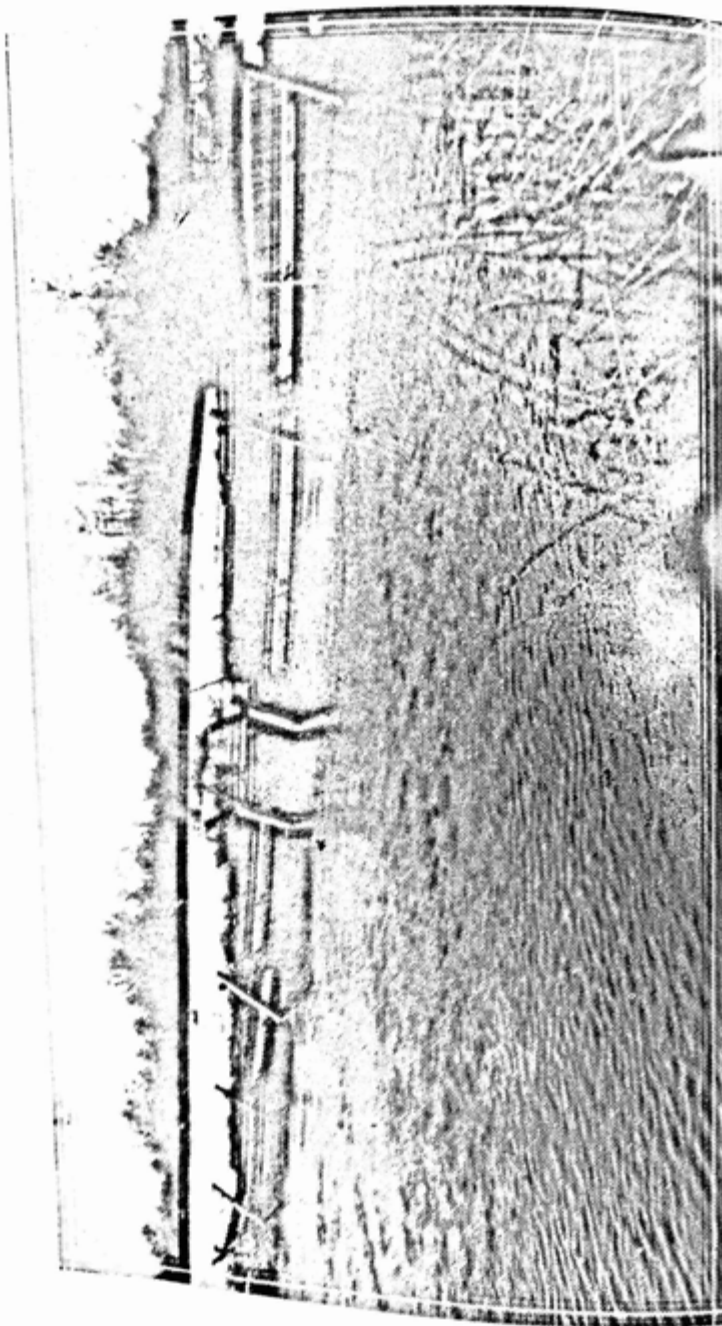
SNAKE RIVER NATIVE TROUT, FROM WHICH EGGS ARE BEING TAKEN AT AMERICAN FALLS RESERVOIR

turned out more than double the amount of fish (by weight) than were ever before produced at any State hatchery since the Department was organized.

Aside from the replacement of a large part of the worn out equipment at the various fishery stations, the following improvements, new construction and purchases were made during this biennium:

At Henry's Lake, a new hatchery 20 feet by 70 feet containing 28 standard hatching troughs and a two room cottage for the man in charge was completed with the exception of painting. A power driven food chopper and three additional rearing race-ways were installed at the Ruby Creek Rearing Station, near Bonner's Ferry. Twenty-five new hatching troughs and a new distribution truck were added to the Sandpoint hatchery. An electric motor for grinding fish food and six rearing pools have been installed at the Coeur d'Alene Station, together with a new ton and a half Ford truck for distributing fish in that district. At Hayspur electricity for power and lighting the various buildings has been installed, and a new electric food chopper and refrigeration facilities added. Twenty new hatching troughs, six large rearing tanks and 10 new rearing pools have helped increase the holding capacity of this station the past year. The tar paper roof on the hatchery building has been replaced with stained shingles and a three room assistant's cottage completed. At Ashton, a four room residence for the assistants adds considerably to the comfort of the employes at this station. A large addition to the hatchery building and a two room cottage for the fish culturist in charge has been constructed at the Mackay hatchery. The grounds have been enclosed with a stout wire fence and an ice house and storage room also added to this station. At Redfish Lake, in the Sawtooth country, two large rearing ponds and a log cabin for the caretaker was completed and in operation during the past season. At the Wolf Lodge Spawning station, a permanent lease was acquired for the necessary property and a crib sill with over-flow apron constructed across the 150 foot bed of the stream. It is hoped this will prevent the usual washing out of our racks during egg collections. A spawntaker's cabin and a large retaining pool for the ripening of spawning trout has also been completed at this point.

During the past few years there has been many demands by the sportsmen for the development of new hatcheries in various sections of the state, but without a material increase in the revenue of the Department it would be impossible to efficiently operate any additional fish cul-



FISH TRAP AT SILVER CREEK SPAWN TAKING STATION

tural stations. At many of our hatcheries we are still lacking in much of the necessary equipment to prosecute our work in a manner commensurate with modern fish cultural methods; and until our present stations are all brought up to the highest possible standard, it would be extremely unwise to consider the construction and maintenance of others regardless of how much pressure might be brought to bear on the Department or Administration. It has been difficult to secure and properly train the number of fish cultural workers needed to carry out our increased program of fishery activity, and in order to retain their services against outside competition and to furnish an incentive for improved work some latitude must be allowed in the salaries that these men receive. Under our present law the maximum salary has been fixed at \$1500 a year regardless of the length of time employed or ability shown in their work.

### Propagation

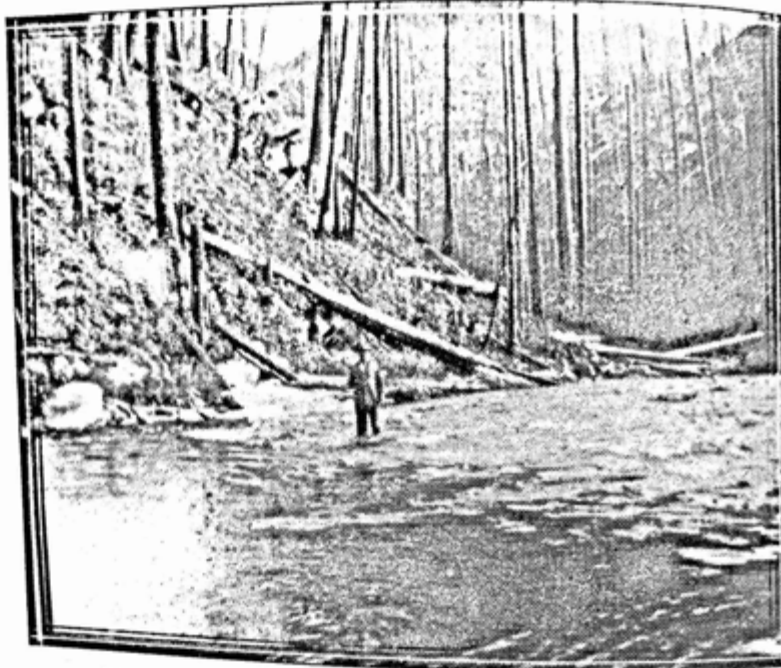
In the production of trout for the waters of the state, the Department operated four year-round stations, five summer stations and one field hatchery which was open about four months. There was also operated a sub-station at Ruby Creek where a large portion of the fish from the Sandpoint hatchery were transferred for more rapid development. In connection with the procuring of the number of eggs required to fill these hatcheries, nine spawntaking stations were conducted by our field force during the runs of breeding fish. Eggs were also taken from brook stock at Ashton, Hayspur and Sandpoint. From these sources during the biennium, 22,000,000 trout eggs with a market valuation of \$36,000 were collected at a cost of approximately \$6,000. It is impossible to compute this cost exactly, as a number of the deputy game wardens and regular hatchery employees assist on part time in this work. Five years ago with only four hatcheries operating, it was necessary for this Department to purchase from commercial growers from one to three million eggs each year.

The varieties of fish propagated at our several hatcheries are the rainbow, cut-throat or native, steelhead, and eastern brook trout. At times when the eggs can be secured, the landlocked salmon or ouananiche from Maine and the mackinaw trout from the Great Lakes are also handled.

In carrying out this propagation work, the Department has been fortunate in gathering together as skillful a group of fish cultural workers as is to be found in the entire country.

## Fish Food

One of the greatest problems confronting those in charge of fish cultural work today, is the procuring of an adequate supply of suitable fish food. Thousands of experiments carried out in various hatcheries over the world during the past twenty-five years, has convinced all those in close touch with this work that if economy is to be practiced, there is little hope in this direction. No artificial food procurable in the quantities needed for extensive work has so



NORTH FORK OF THE CLEARWATER RIVER, A TYPICAL MOUNTAIN STREAM

far been found to take the place of fresh beef liver. Mixtures of fresh meats with cereal products have been tried in every conceivable combination, none of which have proven satisfactory. Dried meals of refuse salt-water fishes, shrimps, clams, mussels, etc., either as a straight diet or in combination with fresh meats have failed to give the desired results. The addition of substances rich in vitamins, such as cod liver oil and yeast to those prepared foods that had lost these properties through drying has shown but little value when compared with fresh meats. Very often some substitute offered at a much lower cost gives one a

false impression of its actual value. The food that produces the most rapid growth with the least mortality is the most economical in the end. However the cost of beef liver in the past two years has increased to such an extent as to become almost prohibitive for feeding fish, and other less expensive meats had to be utilized in many of our fisheries. A careful feeding experiment to determine the value of canned horse meat was tried out at the Hayspur station last summer but had to be abandoned in about a month as the mortality in the control pool had increased almost 2,000 per cent over the normal death rate with regular foods.

In the following table is given the kinds, amounts and costs of fish foods used at the hatcheries and rearing stations during the years of 1927 and 1928:

Year 1927		
Kind of Food	Amount	Cost
Beef liver.....	63,219 lbs.	\$ 6,251.21
Beef hearts.....	10,365 lbs.	862.46
Sheep livers.....	7,555 lbs.	533.46
Sheep plucks.....	8,237 lbs.	452.06
Fresh fish.....	1,441 lbs.	38.47
	90,817 lbs.	\$ 8,137.66
Year 1928		
Kind of Food	Amount	Cost
Beef liver.....	70,527 lbs.	\$ 7,993.39
Beef hearts.....	24,851 lbs.	2,726.56
Plucks .....	33,184 lbs.	2,450.76
Fibrine .....	300 lbs.	23.40
Blood .....	496 lbs.	19.84
Fish .....	86 lbs.	3.51
	129,444 lbs.	\$13,217.46

## Sanitation and Disease

A large share of the success we have enjoyed the past two seasons in the cultivation of fishes can be attributed to the more careful attention our fish culturists have given to the matter of sanitation regards the preparation and storage of fish foods and every phase of the propagation work. Unsanitary conditions and diseases go hand in hand. No fish culturist can continue to be successful if he persists in allowing dirt of all kinds to accumulate around his hatchery



or grounds. If he is careless in one direction he will be in others, and unless extra precautions regarding cleanliness of food, water supply, hatching troughs and outside pools, disease is bound to creep in. And once established, it is most difficult to eradicate. Countless millions of pathogenic bacteria and protozoan organisms lurk in all decaying excrement and refuse food; and while serious troubles do not ordinarily manifest themselves unless the resistance of the fish is lowered by high temperature, long continued pollution or other unfavorable conditions, it is always best to be safeguarded by taking every sanitary precaution. Diseases of bacterial origin are usually transmitted through the agency of food or by water birds flying over the pools or source of water supply, but external parasites attacking the skin, fins or gills of fishes can more often be traced to a filthy condition of some part of the establishment.

### Distribution

On account of our recent policy of rearing the large percentage of all fishes propagated to the large fingerling size, the transportation of such fishes to all parts of the state has strained our resources to the utmost. The distribution season is necessarily of short duration and we are badly handicapped by a lack of trained men for this purpose. In spite of this fact, it is believed that in no state of the Union are fish delivered to applicants in better condition or with less loss in transit than in Idaho. Twenty-eight thousand five hundred forty-three ten gallon cans containing from 16 to 24 fluid ounces of fish were transported from the hatcheries to the nearest station by rail or direct to the stream or lake when taken by truck. In investigating the arrival of fish to applicants in all sections of the state, none but favorable comment has been heard regarding the size and condition of such fish when received. Were sufficient money available, we would make more rapid progress in the work of resuscitating depleted waters and maintaining others, could all phases of the distribution and planting be carried out by our own men trained for the purpose. It is certain that many hundreds of thousands of fish are wasted by improper handling after they are delivered by the distribution men to applicants. Lakes and streams are frequently ruined by the indiscriminate planting of several varieties in the same waters. Many applicants after agreeing to place the consignment in designated waters, will for some reason of their own plant them elsewhere. Fifty per cent of the accessible trout waters of the state

have been forever ruined as such by the introduction and establishment of yellow perch. If we expect to save the remainder, no fish of any variety should be transported and planted without the approval of the officers of the Department, nor should the Federal Bureau of Fisheries consign non-indigenous species to applicants in this state without such sanction. As an example of the promiscuous planting of many varieties in one water, Hayden Lake in Kootenai county might be cited. This lake formerly one of the finest trout waters in the northwest has been planted with the following species: Brook, rainbow, cut-throat, steelhead and mackinaw trout; chinook salmon, large-mouth black bass, yellow perch, and crappies. Fishermen using live minnows as bait have also been responsible for carp and tench becoming numerous in this water. The native varieties already existing there were native cut-throat trout, whitefish, squawfish and chubs.

### Cooperation With Sportsmen's Associations

The development of cooperative rearing ponds for which the Department supplies the fish and the sportsmen maintain has increased tremendously the past biennium. Properly conducted in suitable locations such establishments are an invaluable assistance to the Department, but in many instances demands are made upon the Department for fish without proper facilities for caring for them. It is not always pleasant to have to refuse such requests and very often a misunderstanding arises regarding the reasons for such action; but whenever it is possible for the Department to thoroughly investigate the conditions before such rearing ponds are established, little difficulty is experienced in convincing the sportsmen in regard to the suitability or unsuitability of the contemplated location. The following list gives the number of such ponds in operation together with the number and varieties of fish supplied during the biennium:

Association	Pond Location	Variety	Amount
Fremont County	Henry's Lake	Cut-throat	411,250
Jefferson County	Rigby	Rainbow	197,050
Bonneville County	Swan Valley	Rainbow	116,650
Bonneville County	Swan Valley	Cut-throat	153,000
Bingham County	Blackfoot	Rainbow	96,000
Bannock County	Pocatello	Rainbow	427,000
Southern Idaho	Twin Falls	Rainbow	446,000
Cassia County	Burley	Rainbow	65,350

Wagon Truck	Golden Eye	Rainbow	60,350
Wagon Truck	Eye	Rainbow	38,750
Wagon Truck	Eye	Brook Trout	114,000
Eye Variety	Eye	Rainbow	25,000
Eye Variety	Castorwood	Rainbow	158,000
Eye Variety	Lowman	Rainbow	100,000
Eye Variety	Crystal Creek	Rainbow	122,100
W. Mares	Crystal Creek	Cut-throat	159,000
W. Mares	County Hospital	Rainbow	137,975
Wagon	County Hospital	Cut-throat	81,700
Wagon			

### Ashton Station

R. GRANT CASTLEY, Superintendent      MARLOWE FUNK, Assistant

The property contains about 16 acres of land surrounding what was formerly known as Black Springs. The hatchery building 22 by 154 feet is equipped with 56 standard hatching troughs. Ten outside rearing pools of concrete construction allow the trout to be carried to large fingerling size before distribution. A large brood stock pond accommodates sufficient adult rainbow trout to furnish the eggs required for this station as well as a surplus to be transferred to other hatcheries. In addition to the hatchery the station is comprised of the following buildings: A six room superintendent's residence; a four room cottage for the assistant and a barn, ice house, vegetable cellar and coal house. All of these buildings are in first class condition and are lighted with electricity. The following table gives the output for the past two seasons together with the number of eggs shipped to other state hatcheries:

Variety	Size	1927	1928
Rainbow	Fingerlings	1,297,645	849,800
Cut-throat	Fingerlings	536,875	614,800
Totals		1,744,520	1,464,600
Eggs Shipped to Other Stations		Cans Fish Distributed	
1927 Rainbow	574,900	1927	4,396
1928 Rainbow	292,400	1928	3,467

### Coeur d'Alene Station

FRANK CLARK, Superintendent      ALAN J. CLARK, Assistant

Despite almost every handicap under which a fish cultural station can be operated, this hatchery has made a very creditable showing during the past biennium. With an



CUT THROAT TROUT HEADED FOR SPAWNING GROUNDS

additional pipe line taking surface water of a higher temperature than can be obtained from the city water supply, and the recent construction of six outside rearing pools, the fish have shown a more rapid growth than under former conditions. On account of the increasing demand for rainbow and cut-throat trout in districts served by this station, an attempt has been made to propagate these fish from eggs shipped from other parts of the state. This has been but partially successful on account of the extreme variation in water temperatures and peculiar dissolved gas content of the water supply. The run of spawning rainbow trout is showing a gradual increase in numbers in local waters, and it is hoped that within a short period of time a sufficient collection of these eggs may be developed to supply the needs of this hatchery. Such eggs would produce fish less susceptible to the peculiar water conditions than those from outside. A considerable amount of repair work is necessary to place this hatchery in good physical condition. All brook trout eggs collected at the Elk River Spawning Station are incubated at this hatchery for transfer to other stations. The output of fish and eggs for the biennium follows:

Variety	Size	1927	1928
Brook Trout.....	Fingerlings		
Rainbow.....	Fingerlings	1,310,500	610,650
Cut-throat.....	Fingerlings	394,500	446,600
Totals.....		1,705,000	1,300,825
Eggs Shipped to Other Stations		Cans Fish Distributed	
1927 Brook trout.....	1,208,400	1927.....	1,119
1928 Brook trout.....	900,000	1928.....	1,535

### Cascade Station

A. C. LAWS, Superintendent

With the addition of two rearing ponds this little field hatchery with only 12 troughs and a very limited water supply made a splendid showing the past two seasons. Many of the high mountain lakes as well as streams tributary to both the North and South Forks of the Payette River have been generously planted from this fishery. A truck has been purchased for direct planting from the hatchery, which is also used for a part of the distribution from the Evergreen station.

### FISH AND GAME WARDEN

Variety	Size	1927	1928
Rainbow Trout.....	Fingerling	92,000	244,200
Cut-throat.....	Fingerling	495,300	371,000
Totals.....		587,300	615,200

### Cedar Creek Station

This field hatchery established in 1925 at the head of Roseworth Reservoir principally as an egg collecting station had to be abandoned in 1928 for lack of spawning fish. In the previous biennium upwards of 3,000,000 eggs were collected at this point, and 350,000 hatched and returned to local waters. For the past two years the water has been drawn so low for irrigation purposes that virtually all the adult trout have been caught out or destroyed. Most of the equipment at this station has been transferred for spawning work to the American Falls Reservoir. That which remains—the racking, traps and the caretaker's cabin would not be worth the cost of removal.

Variety	Size	1927
Rainbow Trout.....	Eyed eggs*	216,000
Eggs Shipped to Other Stations		
1927 Rainbow.....	257,000	

\*These eggs consigned to the Southern Idaho Fish & Game Association.

### Evergreen Station

EARL MILLER, Superintendent

Owing to an abnormal spell of cold weather after the eggs had been shipped into this station the spring of 1928, results in both the hatching and development of the fingerlings afterwards were less successful than in the previous season. The rainbow trout especially were affected to the extent of more than 50 per cent loss. Great difficulty was also experienced in obtaining a regular and adequate supply of fish food. Much improvement was made in the appearances of this station by leveling off and grading the grounds and in planting shrubbery and lawns. Most of the distribution of fish was by truck direct from hatchery to the streams with the Department's truck and own men. The Forest Service and many sportsmen also cooperated in

planting some of the more inaccessible waters with pack horses. The production of fish for the biennium follows:

Variety	Size	1927	1928
Rainbow Trout.....	Fingerlings	128,000	84,600
Cut-throat.....	Fingerlings	390,000	349,550
Totals.....		518,000	434,150

## Grangeville Station

C. H. PEMBLE, Superintendent

The most discouraging conditions have existed at this station the past two years. The spring creek from which the water supply is taken has been so low that an insufficient amount was to be had for running to the full capacity of troughs and outside pools. Low water temperatures also prevailed during the early incubation period which resulted in a late hatch and a corresponding slow growth in the fingerling fish. The past season early distribution was necessary on account of the danger of over-crowding under the rapidly decreasing supply of water. A half million fish is all this station should attempt to propagate under the conditions.

The hatchery property has been enclosed with a stout wire fence and all buildings and equipment are in excellent shape.

Variety	Size	1927	1928
Rainbow Trout.....	Fingerlings	365,000	302,000
Cut-throat.....	Fingerlings	285,500	497,000
Totals.....		650,500	799,000
		Cans Fish Distributed	
		1927 .....	573
		1928 .....	656

## Hayspur Station

D. N. GRIM, Superintendent

HARRY LAWS, Assistant

The large amount of improvements carried out at this station during the past two seasons places this establishment in the finest possible condition for efficient work. Twenty new standard hatching troughs have replaced those in bad condition; six large rearing tanks have been added

at the back of the hatchery, and ten rearing pools covered with a wire house constructed at the supply spring. All fish distributed last season from this hatchery were large fingerlings from 2½ to 4 inches in length. An outbreak of "furunculosis" among the eastern brook caused a loss of about 25,000 of these fish, but the disease was checked without affecting any of the other varieties. A few thousand yearling landlocked salmon that were being held for Sawtooth planting became infected with an external parasite known as "Dermasporidium dorsalis" and which responded so slowly to treatment that few of the salmon survived. The extensive spawntaking operations prosecuted on Silver Creek are handled from this station, and the eggs eyed and packed for shipment by the hatchery force. The output for the biennium is given below:

Variety	Size	1927	1928
Rainbow Trout.....	Fingerlings	1,481,850	997,400
Rainbow Trout.....	Eyed Eggs*		230,000
Eastern Brook.....	Fingerlings	146,000	96,000
Ouananiche.....	Yearlings	2,400	
Totals.....		1,630,250	1,323,400
Eggs Shipped to Other Stations		Cans Fish Distributed	
1927 Rainbow.....	410,400	1927 .....	5,275
1928 Rainbow.....	1,456,000	1928 .....	4,622

## Henry's Lake Station

B. D. AINSWORTH, Superintendent. CLARENCE SHERWOOD, Assistant

On property purchased from the Sherwood Estate and a portion donated to the Department by the Pittsburg Club, a new hatchery building and dwelling was constructed during the past season. The hatchery is equipped with 28 standard hatching troughs and is supplied with spring water through a 6-inch pipe line 520 feet in length. The water after passing through the hatching troughs is conveyed to a large rearing pond with a capacity of several hundred thousand fingerlings. This new station was badly needed on account of the extensive spawntaking operations carried out on the lake tributaries during the early spring. As many as three million eggs are in process of incubation at one time at this station where they are packed for shipment to all parts of the state. About a half million eggs are retained each season, hatched and reared for planting in



PACKING TROUT EGGS AT FIELD STATION FOR TRANSFERRING TO HATCHERIES

local waters. With the larger capacity of the new station a greater number of eggs and fingerling fish can be handled than formerly.

Variety	Size	1927	1928
Cut-throat.....	Advanced Fry	484,000	465,000
Eggs Shipped to Other Stations			
1927 Cut-throat.....		2,699,400	
1928 Cut-throat.....		3,196,220	

### Mackay Station

JOHN COLEMAN, Superintendent

This station was enlarged during 1928 to accommodate four additional troughs and two rearing ponds were constructed outside. A small cottage was also completed for the man in charge and new ice house and garage constructed. There has been a noticeable increase in the number of eggs collected in Warm Springs Creek during the past two seasons, and an improvement in the fishing in the entire Lost River country since the establishment of this hatchery.

Variety	Size	1927	1928
Rainbow Trout.....	Fingerlings	597,910	719,756
Eggs Shipped to Other Stations		Cans Fish Distributed	
1928 Rainbow.....		1927	521
		1928	702

### Sandpoint Station

H. B. GARRISON, Superintendent

A. L. AINSWORTH, in Charge Ruby Creek Sub-Station

Since the establishment of the rearing station at Ruby Creek near Bonners Ferry, the bulk of the fish hatched at the Sandpoint hatchery are transferred as early in the spring as possible to the sub-station for development. Such fish make a larger growth in a few months than if held for a full year in the cold, spring water at Sandpoint. It is the intention of the Department to build a permanent rearing station at Ruby Creek as soon as the property can be acquired. The Sandpoint hatchery building is in bad condition and the foundation and side walls must be repaired if this station is to be utilized. The pipe line for the water

supply is also completely worn out and should be renewed in its entire length. The output as shown for the biennium includes both those fish distributed from Sandpoint and those from the sub-station at Ruby Creek.

Variety	Size	1927	1928
Rainbow Trout.....	Fingerlings	307,525	318,950
Eastern Brook.....	Fingerlings	302,975	184,470
Cut-throat.....	Fingerlings	213,832	488,940
Totals.....		824,332	992,360

Cans fish Distributed	
1927 .....	884
1928 .....	1,805

### Total Distribution for All Hatcheries During Biennium

Stations	1927	1928
Ashton .....	1,744,520	1,464,600
Coeur d'Alene .....	1,705,000	1,300,825
Cascade .....	587,300	615,200
Cedar Creek* .....	216,000	
Evergreen .....	518,000	434,150
Grangeville .....	650,500	799,000
Hayspur .....	1,630,250	1,323,400
Henry's Lake .....	484,000	465,000
Mackay .....	597,910	719,756
Sandpoint .....	824,332	992,360
Totals .....	8,957,812	8,114,291

\* Abandoned.

Respectfully submitted,

W. M. KEIL,

Fish Commissioner.

## FINANCIAL

The Department is dependent upon revenues received from fines, the sale of licenses, permits, confiscations and miscellaneous revenues, accruing under our laws, for its financial support. The major portion of the funds received comes from the sale of fish and game licenses.

In former years, the early spring fishing season was a material factor in more or less equalizing the distribution of sales throughout the year. From a study of the license sales it is very evident that the sportsmen throughout the state vary in their desires to participate in hunting and fishing. Those in former years who had purchased licenses in the early spring that they may enjoy that season's offerings, will hereafter, forego the purchase of their license until the arrival of the new open season, which was designated by the nineteenth session of our state legislature.

Undoubtedly, the changing of the open season for trout fishing was for a wise purpose and will eventually show its merit in assisting in conservation efforts.

The changing of the open season made necessary the rearranging of our financial program that had been previously outlined. Immediately following the approval of the fish and game bill, all avenues of probable receipts and disbursements were considered from various angles and the necessary adjustment followed out. The final program outlined proved adept to conditions and we have not experienced serious difficulty in building a balance in the state treasury to the credit of the fish and game fund, sufficient to carry on the activities of the department through the non-revenue producing period, which is from January first to June first of each year.

Our present law covering the open seasons on fish and game did not go into effect until the third day of May, 1927. That year a period of twelve days only was closed to trout fishing and could not be considered as a criterion of what effect the law governing seasons would have on revenues.

The year 1928 offers the first opportunity for information sufficiently complete and authentic on which to base estimates of receipts. In anticipating receipts and disbursements for future periods ample provision should be made for contingencies that very frequently arise when condi-

tions are not so favorable as they have been during the past year. The early part of the year 1927 had a disastrous effect upon native upland game birds and those same climatic conditions were responsible for the water conditions of the late spring months of that year, which made fishing non-inviting to the sportsman. When unfavorable conditions arise there will be a decline in license sales which makes it very essential that a sufficient balance be on hand to insure against retarding the spring operations which are vital to the department and in particular to our fish cultural activities.

Fish and game licenses are distributed throughout the state by deputy game wardens and as far as possible placed where they may be readily obtained by persons in remote regions of our state. In former years more or less difficulty has been experienced in perfecting settlement after the close of the license year, which is March 31st. During the last biennium we have been successful in closing all outstanding license accounts for the years 1924-1926 and 1927. There remains unsettled on the closing date of the biennium one license account, that of John T. Salisbury, for the year 1925. This matter is in the hands of the Attorney General and has been since the preceding biennium, when a civil action was instituted in the District Court of Ada County, making John T. Salisbury and the United States Fidelity and Guaranty Company defendants in an action to recover \$2,171.62. We are holding in the Game Warden's Suspense Fund the last month's salary and expense claim amounting to \$184.33 which was assigned to the Department by ex-deputy game warden Salisbury. The amount involved in the court action and the assigned claim accounts for the balance shown upon the State Auditor's books for the year 1925, which is in the amount of \$2,355.95.

The financial affairs of the Department as revealed by this report, indicate a sound and healthy condition, assuring continued progress for the coming year. We are just entering the six months of the year generally referred to as the non-revenue period but we are not facing that period under serious financial handicaps. With conservative outlays based on carefully made estimates, the average rate of expenditure for that period should not exceed the estimate of \$15,000 per month.

While the balance shown on exhibits "A" and "G" is not sufficient to take care of the total estimated expenditures for the first six months of the year 1929, there will be sufficient revenues coming in to cover this apparent deficiency, as well as to take care of the accrued obligations for the first fifteen

days in December, which have not been taken into account in this report.

The detail and source of all revenues received by the Department during the biennium is shown under exhibits "C" and "H" and a comparative statement of receipts by years from the year 1923 to and including the year 1928, is shown under exhibit "N". The increase in revenue during this period of time has been gradual and indicates steady growth and development in keeping with the permanent development of our state.

During the year 1928 revenues from the sale of licenses and permits amounted to \$178,486.00, an increase of \$8,264.60 over revenues from the same source for the year 1927, which also exceeded revenues for the preceding years.

The decrease in commissions allowed to vendors of licenses has a bearing on the increased revenue during the biennium but the major part of the increase comes from the increase in the number of licenses and permits sold. Under exhibit "M" a comparative statement of the number of the various classes of licenses for which revenues were received during the year, is set out. The number of sales for the year 1926 exceeded those of the year 1927. The increase in revenue for the year 1927 over that of 1926 is accounted for in the decrease of commissions on sales and the increase in the sale price of non-resident licenses. The year 1928 not only exceeds in revenue but also accounts for the largest number of sales.

Exhibits "F" and "K" classify arrests where cases have been completed during the particular year indicated. Exhibit "R" is a comparative statement of confiscations, arrests and fines from the year 1923 to and including the year 1928. Violations of our fish and game laws are now looked upon by our courts with more seriousness than in former years. The increased penalties imposed not only meets the approval of the true sportsman but also are pleasing to the general public. The confiscation of guns, fishing equipment, traps or other paraphernalia cannot be considered seriously as a revenue producing source but as an enforcement measure it is of supreme importance. Anyone possessing a good gun or an assortment of fishing equipment takes pride in its possession and seldom permits desire or enthusiasm to risk the violation of our laws.

Under exhibits "D" and "I" we are showing by months the warrant issue for the years 1927 and 1928. The detail of expenditure by object and purpose for respective years immediately follows exhibit "S", which is a comparative

statement of expenditures by years, beginning with the year 1925 and ending with the year 1928.

The handling of receipts and disbursements must necessarily be accorded the same consideration as employed in other governmental activities. Sound purpose of expenditure is always productive of results. The total outlay for the year 1928 exceeds that of any of the previous years shown, but was well within the income for that year. In other sections of this report direct reference is made to improvements and betterments at the various hatcheries and at the game farm, which makes further reference to capital outlay unnecessary.

**EXHIBIT "A"**  
**OPERATION IN FUNDS**

For the Biennium Beginning Jan. 1st, 1927 and Ending Dec. 15th, 1928

**GAME FUND**

<b>Receipts:</b>		
Balance on hand Jan. 1st, 1927.....		\$ 58,067.16
From sale of licenses year 1927.....	\$170,221.40	
Other revenue receipts 1927.....	17,702.02	
Cancellation of warrant 1927.....	5.00	\$187,928.42
<hr/>		
From sale of licenses 1928.....	\$178,486.00	
Other revenue receipts 1928.....	17,849.90	
Cancellation of Warrants 1928.....	41.19	196,377.09
<hr/>		
		384,305.51
		<hr/>
		\$442,372.67
<hr/>		
<b>Disbursements:</b>		
Warrants issued 1927.....	\$159,218.99	
Transferred to G. W. Pred, A. Fund....	6,000.00	\$165,218.99
<hr/>		
Warrants issued 1928.....	\$178,393.19	
Transferred to G. W. Pred. A. Fund....	6,000.00	
Check charged out 1928.....	33.64	\$184,426.83
<hr/>		
Reserve for claims filed with auditor 1928.....	2,025.54	
Claims on file with Dept. 1928.....	4,453.50	
Balance Dec. 15, 1928.....	86,247.81	\$ 92,726.85
<hr/>		
		\$277,153.68
		<hr/>
		\$442,372.67

**GAME WARDEN'S PREDATORY ANIMAL FUND**

<b>Receipts:</b>		
Balance Jan. 1st, 1927.....		\$ 2,687.06
Transferred from Game Fund 1927.....	\$ 6,000.00	
Sale of furs 1927.....	440.00	\$ 6,440.00
<hr/>		
Sale of furs 1928.....	\$ 102.00	

**FISH AND GAME WARDEN**

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Transferred from Game Fund 1928.....	6,000.00	6,102.00	
<hr/>			12,542.00
<b>Disbursements:</b>			
Warrants issued 1927.....			\$ 15,229.06
Warrants issued 1928.....	\$ 4,252.02		
Balance Dec. 15, 1928.....	5,463.93		\$ 9,715.95
<hr/>			5,513.11
<b>Suspense:</b>			
Balance on hand Jan. 1st, 1928.....			\$ 15,229.06
Paul Changnon assignment 1927.....			
Paid in (Paul Changnon) 1928.....	\$ 175.00		\$ 184.33
<hr/>			1,156.25
Total received.....			\$ 1,331.25
Transferred to Game Fund -928.....		\$ 1,331.25	
<hr/>			1,331.25
Balance on hand Dec. 15, 1928.....			\$ 184.33

**EXHIBIT "B"**  
**OPERATION IN FUNDS, YEAR 1927**

**GAME FUND**

<b>Receipts:</b>		
Balance on hand Jan. 1, 1927.....		\$ 58,067.16
Received from sale of licenses.....	\$170,221.40	
Other cash receipts.....	17,702.02	
Cancellation of warrant.....	5.00	
<hr/>		
		187,928.42
<hr/>		
		\$245,995.58
<hr/>		
<b>Disbursements:</b>		
Warrants issued.....	\$159,218.99	
Transferred from Game Fund to Pred.....	6,000.00	
<hr/>		
		165,218.99
Reserve for claims filed 1927 accts.....	\$ 2,401.06	
Balance on hand Dec. 15, 1927.....	78,375.53	80,776.59
<hr/>		
		\$245,995.58

**GAME WARDEN'S PREDATORY ANIMAL FUND**

<b>Receipts:</b>		
Balance on hand Jan. 1, 1927.....		\$ 2,687.06
From game fund by transfer.....	\$ 6,000.00	
Sale of furs.....	440.00	6,440.00
<hr/>		
		\$ 9,127.06
<hr/>		
<b>Disbursements:</b>		
Warrants issued.....	\$ 4,252.02	
Reserve for claims filed.....	58.00	
Balance on hand Dec. 15, 1927.....	4,816.54	
<hr/>		
		\$ 9,127.06

**GAME WARDEN'S SUSPENSE FUND**

Balance on hand Jan. 1, 1927 (J. T. Salisbury).....		184.33
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Assignment by Paul Changnon.....

175.00

\$ 359.33

**EXHIBIT "C"**

Covering all revenue received by the Department of Fish and Game for the period beginning January 1st, 1927, and ending December 15th, 1927, including monies received from the sale of licenses for the year 1927, and prior years and miscellaneous revenues:

**Receipts—License Sales:**

No.	Class or Kind	Amount
70,500	Resident fish and game licenses.....	\$133,216.50
146	Non-resident fish and game licenses.....	6,008.75
420	Non-resident bird licenses.....	3,990.00
3,307	Non-resident fish licenses.....	14,599.20
1,876	Tourist fishing licenses.....	3,550.40
2	Alien fish and game licenses.....	142.50
74	Alien fish licenses.....	703.00
12	Alien gun licenses.....	57.00
1,085	Resident trappers licenses.....	5,153.75
14	Non-resident trappers licenses.....	332.50
20	Resident sheep licenses.....	475.00
24	Non-resident sheep licenses.....	1,140.00
1,057	Re-shipping permits.....	422.80
20	Taxidermist licenses.....	200.00
10	Selling and shipping permits.....	100.00
13	Private pond permits.....	130.00

78,580 Total received from license sales..... \$170,221.40

**Receipts other than received from the sale of licenses:**

196	Fines.....	\$ 6,312.15
65	Confiscations.....	427.45
	Sale of beaver pelts.....	9,550.75
	Sale of pheasant eggs.....	191.00
	Commission saved.....	229.55
	Donations.....	412.15
	Sale of non-game fish.....	224.87
	Sale of duplicate shipping permits.....	1.60
	Sale of old material.....	24.00
	Sale of reclassified licenses.....	43.90
	Sale of pelts (other than beaver).....	70.05
	Sale of ducks.....	36.00
	Sale of domestic hens.....	75.74
	Sale of turkeys.....	30.45
	Sale of game.....	4.75
	Sale of motion picture film.....	50.00
	Refund on warden's costs.....	5.00
	Refund on express.....	2.01
	Refund on telephone calls.....	10.60

Total miscellaneous receipts..... \$ 17,702.02

Total cash receipts (game fund).....

\$187,923.42

**GAME WARDEN'S PREDATORY ANIMAL FUND**

Receipts from sale of predatory pelts..... \$ 440.00

## FISH AND GAME WARDEN

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Total receipts (G. W. Pred. A. Fund).....

\$ 440.00

**GAME WARDEN'S SUSPENSE FUND**

Assignment by Paul Changnon..... \$ 175.00

Total receipts (Suspense Fund).....

175.00

Total receipts from all sources.....

\$188,538.42

**EXHIBIT "D"****WARRANT ISSUE BY MONTH AND BY FUND**  
For Year 1927

Month	Game Fund	Predatory	Total for Month
January	\$ 4,036.81	\$ 300.00	\$ 4,336.81
February	13,810.07	687.17	14,497.34
March	10,600.85	1,408.23	12,009.08
April	12,449.99	821.52	13,271.51
May	14,732.62	250.00	14,982.62
June	16,247.78		16,247.78
July	16,261.32		16,261.32
August	15,248.04		15,248.04
September	16,905.95	75.67	16,981.62
October	13,718.86	175.53	13,894.39
November	15,209.34	135.90	15,345.24
December 15	9,997.26	398.00	10,395.26
Total warrant issue	\$159,218.99	\$ 4,252.02	\$163,471.01

**EXHIBIT "E"**

Tabulation of receipts from the sale of licenses of the Series of 1924-1925, 1926-1927, received by the Department during the year 1927:

No.	Class	Kind	Value Each Class	
<b>Series of 1924:</b>				
8	1A	Resident fish and game.....	\$ 1.80	14.40
2	2C	Non-resident fish.....	2.70	5.40
5	1D	Resident trapper.....	4.75	23.75
15 Total for series of 1924.....				43.55
<b>Series of 1925:</b>				
12	1A	Resident fish and game.....	1.80	21.60
5	1D	Resident trapper.....	4.75	23.75
17 Total for series of 1925.....				45.35
<b>Series of 1926:</b>				
7,315	1A	Resident fish and game.....	1.80	13,167.00
39	2A	Non-resident fish and game.....	23.75	926.25
115	2B	Non-resident bird.....	9.50	1,092.50
539	2C	Non-resident fish.....	2.75	1,455.30
14	2E	Tourist fish.....	.90	12.60
3	3B	Alien Fish.....	9.50	28.50
1	3C	Alien game.....	4.75	4.75

708	1D	Resident trapper	4.75	3,363.00
7	2D	Non-resident trapper	23.75	166.25
		Re-shipping permits	.40	247.60
619		Taxidermist licenses	10.00	20.00
2		Selling and shipping permits	10.00	20.00
2		Private pond permits	10.00	20.00
2				
9,366		Total for series of 1926		20,523.75
<b>Series of 1927:</b>				
		Resident fish and game	\$ 1.90	\$120,013.50
63,165	1A	Resident fish and game	47.50	5,082.50
107	2A	Non-resident fish and game	9.50	2,897.50
305	2B	Non-resident bird	4.75	13,138.50
2,766	2C	Non-resident fish	1.90	3,537.80
1,862	2E	Tourist fish	71.25	142.50
2	3A	Alien fish and game	9.50	674.50
71	3B	Alien fish	4.75	52.25
11	3C	Alien gun	4.75	1,743.25
367	1D	Resident trapper	23.75	166.25
7	2D	Non-resident trapper	23.75	475.00
20	4A	Resident sheep	47.50	1,140.00
24	5A	Non-resident sheep	.40	175.20
438		Re-shipping permits	10.00	180.00
18		Taxidermist	10.00	80.00
8		Selling and shipping permits	10.00	110.00
11		Private pond permits	10.00	
69,182		Total for series of 1927		149,608.75
78,580		Total for all series		\$170,221.40

**EXHIBIT "F"**

Segregation of cases reported and compiled during the year.  
(All actions come under the criminal class.):

**Violation of Laws Pertaining to Fish:**

Fines paid	73
Cases dismissed	4
Suspended sentences	2
Fines remitted by court	6
Otherwise disposed of	9
Total arrests this class	94

**Violation of Laws Pertaining to Game Birds:**

Fines paid	52
Cases dismissed	1
Suspended sentences	5
Fines remitted by court	2
Acquittals	4
Otherwise disposed of	2
Total arrests this class	66

**Violation of Laws Pertaining to Game Animals:**

Fines paid	21
Sentenced to jail	5
Otherwise disposed of	4
Total arrests this class	30

**Violation of Laws Pertaining to Fur Bearing Animals:**

Fines paid	17
Cases dismissed	4
Fines remitted by court	2
Otherwise disposed of	7
Total arrests this class	30

**Game Law Violations in General:**

Fines paid	33
Sentenced to jail	3
Cases dismissed	2
Otherwise disposed of	5
Total arrests this class	43
Total arrests for year 1927	263

**RECAPITULATION**

Fines paid	196
Sentenced to jail	8
Cases dismissed	11
Suspended sentences	7
Fines remitted by court	10
Acquittals	4
Otherwise disposed of	27
Total arrests	263
Revenue	\$ 6,312.15

**EXHIBIT "G"**

**OPERATION IN FUNDS—YEAR 1928  
GAME FUND**

**Receipts:**

Balance on hand Dec. 16, 1927	\$ 80,776.59
Received from sale of Fish & Game Licenses	\$178,486.00
Other Cash Receipts	17,849.90
Cancellation of Warrants	41.19
	\$196,377.09
	\$277,153.68

**Disbursements:**

Warrants issued	\$178,393.19
Transferred to G. W. Predatory Animal Fund	6,000.00
Charged out Grasteit Check	33.64
Reserve for Claims on file with Auditor	2,025.54
Claims on file with Department	4,453.50
Balance Dec. 15, 1928	86,247.81
	\$277,153.68

**GAME WARDEN'S PREDATORY ANIMAL FUND**

**Receipts:**

Balance on hand Dec. 16, 1927	\$ 4,875.04
Received from Sale of Pred. Animal Pelts	\$ 102.00
Received by Transfer from Game Fund	6,000.00
	6,102.00
	\$ 10,977.04

<b>Disbursements:</b>		
Warrants Issued	\$ 5,462.09	
Balance December 15, 1928	5,512.11	10,974.20
<b>Receipts:</b>		
Balance on hand Dec. 15, 1927	\$ 214.99	
Settlement Chagson License Account	1,154.25	
	\$ 1,369.24	
Transferred to Game Fund	1,521.25	
Balance on Hand Dec. 15, 1928		\$ 141.25

**EXHIBIT "H"**

Covering Revenue Received for the Period Beginning December 15, 1927 and Ending December 15, 1928

<b>Licenses:</b>		
No.	Class or Kind	Amount
15,720	Resident Fish & Game	\$142,568.66
55	Non-Resident Fish & Game	2,542.50
269	Non-Resident Bird	2,555.50
1,612	Non-Resident Fishing	14,272.40
1,160	Tourist Fishing	6,669.20
1	Alien Fish & Game	71.25
74	Alien Fishing	762.00
17	Alien Gun	175.75
1,175	Resident Trapper	2,581.25
11	Non-Resident Trapper	241.25
10	Resident Mountain Sheep	227.50
7	Non-Resident Mountain Sheep	222.50
1,262	Re-shipping Permits	504.00
17	Taxidermist Licenses	170.00
9	Killing and Shipping Permits	90.00
15	Private Pond Permits	150.00
Total received from License Sales		\$178,194.00

**Receipts Other Than Received From License Sales:**

231	Fines	\$ 7,321.10
41	Confiscations	411.60
	Sale of Beaver	8,720.20
	Sale of Non-Game Fish	740.75
	Sale of Pheasant Eggs	70.04
	Commissions Saved	75.75
	Sale of Muskrats and Pelts	125.50
	Sale of Game (not confiscations)	12.50
	Ducks, Geese and Wilkies	44.50
	Sale of Supplies	10.35
	Sale of Domestic Hens	170.90
	Sale of Beaver Castors	9.00
	Refunds	123.26
	Excess License Charge	4.95
	Total Miscellaneous Receipts	\$ 17,849.90
	Total Game Fund Receipts	\$196,043.90

<b>Productory Animal:</b>		
Date of Sale	\$ 102.00	\$ 102.00
<b>Receipts:</b>		
Food Chagson Settlement	\$ 1,154.25	1,154.25
Total Receipts		\$1,256.25
Less Transfer from Subsequent Fund		1,154.25
Total Cash Receipts		\$102.00

**EXHIBIT "I"**

WARRANTS ISSUED BY MONTH AND BY FUND For the Year 1928

Month	Game Fund	Productory	Total for Month
January	\$ 14,405.92	\$ 1,052.48	\$ 15,458.40
February	12,214.15	1,812.11	14,026.26
March	12,465.17	1,009.99	13,475.16
April	17,368.09	909.17	18,277.26
May	14,290.00	305.00	14,595.00
June	15,229.70	88.29	15,318.00
July	19,290.24		19,290.24
August	17,409.42	142.50	17,551.92
September	17,461.10	100.00	17,561.10
October	13,404.45	100.00	13,504.45
November	24,429.73	297.10	24,726.83
December	10,000.00	200.00	10,200.00
Total Warrant Issue	\$178,292.09	\$ 1,862.95	\$180,155.04

**EXHIBIT "J"**

TABULATION OF RECEIPTS FROM THE SALE OF LICENSES OF THE SERIES OF 1926, 1927, 1928, FOR WHICH REVENUE WAS RECEIVED DURING YEAR 1928

No.	Class	Kind	Each	Value	Total For Series
<b>Series of 1926:</b>					
104	1	Resident Fish & Game	\$ 1.00	\$ 1,000.00	
2	211	Non-Resident Bird	9.00	26.00	
19	267	Non-Resident Fishing	2.70	51.00	
8	200	Tourist Fishing	.90	7.20	
2	211	Alien Fishing	9.00	18.00	
31	113	Resident Trapper	4.75	147.25	
22		Re-shipping Permits	.40	8.00	
					\$ 1,221.25
<b>Series of 1927:</b>					
10,627	1	Resident Fish & Game	\$ 1.90	\$ 20,191.30	
25	2A	Non-Resident Fish & Game	47.00	1,147.50	
93	211	Non-Resident Bird	9.00	831.00	
258	267	Non-Resident Fishing	4.75	1,223.25	

507	2E	Tourist Fishing.....	1.90	963.30
8	3B	Alien Fishing.....	9.50	76.00
1	3C	Alien Gun.....	4.75	4.75
1,023	1D	Resident Trapper.....	4.75	4,859.25
6	2D	Non-Resident Trapper.....	23.75	142.50
964		Re-shipping Permits.....	.40	385.60
1		Selling & Shipping.....	10.00	10.00
1		Private Pond Permit.....	10.00	10.00
13,514				\$ 29,939.20
<b>Series of 1928:</b>				
64,499	1	Resident Fish & Game.....	\$ 1.90	\$122,548.10
50	2A	Non-Resident Fish & Game.....	47.50	2,375.00
173	2B	Non-Resident Bird.....	9.50	1,643.50
2,736	2C	Non-Resident Fishing.....	4.75	12,996.00
2,653	2E	Tourist Fishing.....	1.90	5,038.80
1	3A	Alien Fish & Game.....	71.25	71.25
64	3B	Alien Fishing.....	9.50	608.00
36	3C	Alien Gun.....	4.75	171.00
121	1D	Resident Trapper.....	4.75	574.75
5	2D	Non-Resident Trapper.....	23.75	118.75
10	4A	Resident Mountain Sheep.....	23.75	237.50
7	5A	Non-Resident Mountain Sheep.....	47.50	332.50
276		Re-shipping Permits.....	.40	110.40
17		Taxidermist Licenses.....	10.00	170.00
8		Selling & Shipping.....	10.00	80.00
14		Private Pond Permits.....	10.00	140.00
70,670				\$147,215.55
Total License Collections..				\$178,486.00

**EXHIBIT "K"**

**SEGREGATION OF CASES REPORTED AND COMPLETED DURING THE YEAR 1928**

<b>Violation of Laws Pertaining to Fish:</b>		
Fines Paid.....	92	
Jail Sentences.....	11	
Cases Dismissed.....	1	
Sentences Suspended.....	2	
Remitted by Court.....	11	
Acquittals.....	4	
Otherwise disposed of.....	14	
Total Arrests This Class.....	135	
<b>Violation of Laws Pertaining to Game Birds:</b>		
Fines Paid.....	69	
Cases Dismissed.....	4	
Sentences Suspended.....	2	
Remitted by Court.....	2	
Otherwise Disposed of.....	22	
Total Arrests This Class.....	99	
<b>Violation of Laws Pertaining to Game Animals:</b>		
Fines Paid.....	26	
Jail Sentences.....	2	
Cases Dismissed.....	4	

**FISH AND GAME WARDEN**

Sentences Suspended.....		
Remitted by Court.....	2	
Acquittals.....	1	
Otherwise Disposed of.....	2	
Total Arrests This Class.....	1	
<b>Violation of Laws Pertaining to Fur Bearing Animals:</b>		
Fines Paid.....	21	
Jail Sentences.....	4	
Cases Dismissed.....	1	
Sentences Suspended.....	3	
Otherwise Disposed of.....	2	
Total Arrests This Class.....	31	
<b>Game Law Violations in General:</b>		
Fines Paid.....	23	
Sentences Suspended.....	4	
Remitted by Court.....	2	
Otherwise Disposed of.....	6	
Total Arrests This Class.....	35	
Total Arrests for Year 1928.....	338	

**RECAPITULATION**

1928

Fines Paid.....	231	
Sentenced to Jail.....	17	
Cases Dismissed.....	10	
Sentences Suspended.....	13	
Remitted by Court.....	16	
Acquittals.....	6	
Otherwise Disposed of.....	45	
Total Arrests.....	338	
Revenue.....		\$ 7,321.10

**EXHIBIT "M"**

Comparative statement showing the number of various kinds and classes of licenses sold for which remittance therefor was received by the department during the year indicated.

Kind	Year 1925	Year 1926	Year 1927	Year 1928
Resident.....	66,169	72,687	70,500	75,720
Non-Resident Fish & Game.....	152	142	146	75
Non-Resident Bird.....	516	448	420	269
Non-Resident Fish.....	6,248	6,532	3,307	3,013
Tourist Fishing.....	275	462	1,876	3,160
Alien Fish & Game.....	1	1	2	1
Alien Fish.....	79	80	74	74
Alien Gun.....	32	35	12	37
Resident Trapper.....	1,112	1,267	1,085	1,175
Non-Resident Trapper.....	2	14	14	11
Resident Sheep.....			20	10
Non-Resident Sheep.....			24	7
Re-shipping Permits.....	1,179	1,194	1,057	1,262
Taxidermist.....	13	21	20	17
Selling & Shipping.....	21	20	10	9
Private Pond.....	19	10	13	15
Total by Year.....	75,818	82,913	78,580	84,855

## EXHIBIT "N"

## COMPARATIVE STATEMENT OF REVENUE RECEIVED BY YEARS

Year	Receipts From License Sales	Other Receipts	Total Receipts By Years
1923	\$146,009.20	\$ 13,922.93	\$159,932.13
1924	152,471.05	12,317.86	164,788.91
1925	150,955.15	14,253.62	165,208.77
1926	164,830.10	17,953.86	182,783.96
1927	170,221.40	18,317.02	188,538.42
1928	178,486.00	19,108.15	197,594.15
Total	\$962,972.90	\$ 95,873.44	\$1,058,846.34

## COMPARATIVE STATEMENT OF WARRANTS ISSUED BY YEAR AND BY FUND

Year	Game Fund	Predatory Animal Fund	Total Warrants Issued by Years
1923	\$154,413.76	\$ 3,283.30	\$157,697.06
1924	137,921.79	18,267.97	156,189.76
1925	163,867.51	15,277.33	179,144.84
1926	160,949.68	10,322.34	171,272.02
1927	159,218.99	4,252.02	163,471.01
1928	178,393.19	5,463.93	183,857.12
Total	\$954,764.92	\$ 56,866.89	\$1,011,631.81

## EXHIBIT "R"

Comparative statement by years showing number of arrests made where cases were completed during the year indicated, together with the number of fines imposed and the revenue derived therefrom.

Year	No. of Arrests	No. of Fines	Amount of Fines
1923	291	217	\$ 6,199.75
1924	303	229	6,122.25
1925	430	301	7,812.20
1926	305	221	6,187.35
1927	263	196	6,312.15
1928	338	231	7,321.10
Total	1,928	1,395	\$ 39,954.80

Comparing the number of confiscations made by years and revenue derived from the sale of confiscated articles.

Year	No. of Confiscations	Amount Received From Sales
1923	93	\$ 871.70
1924	74	582.95
1925	93	1,250.60
1926	78	632.24
1927	65	427.45
1928	81	411.60
Total	484	\$ 4,176.04

## EXHIBIT "S"

Comparative statement of cost of operation for the years 1925, 1926, 1927 and 1928 for the particular activity shown.

Purpose	Year 1925	Year 1926	Year 1927	Year 1928
General Administration	\$118,736.72	\$114,655.59	\$111,180.24	\$119,314.00
Pred. Animal Control	15,277.33	10,322.34	4,152.02	5,463.93
Game Farm	2,802.14	8,447.81	9,970.39	8,081.32
Ashton Hatchery	8,120.43	9,057.00	8,696.67	10,257.82
Hayspur Hatchery	6,506.65	5,785.84	7,241.39	11,487.11
Sandpoint Hatchery	5,371.52	4,638.33	5,425.43	6,285.70
Coeur d'Alene Hatchery	4,273.77	5,295.42	3,560.97	6,123.49
Grangeville Hatchery	3,231.62	2,012.00	2,094.46	2,164.59
Evergreen Hatchery	2,155.95	1,328.86	1,391.10	1,407.17
Mackay Hatchery		1,210.54	1,618.87	2,294.65
Cascade Hatchery		1,441.85	803.30	1,506.61
Henry's Lake Hatchery		896.15	1,201.20	3,149.17
Cedar Creek Hatchery			1,244.05	
Spawn Taking	2,996.06	2,851.82	1,071.82	1,679.77
Fish Distribution	3,337.69	3,328.47	3,819.10	3,780.09
Field Station	6,334.96			
Redfish Lake Rearing Pond				861.67
Total Expenditures for year	\$179,144.84	\$171,272.02	\$163,471.01	\$183,857.12

## Classification of Disbursements

## A. PERSONAL SERVICES

## Fish &amp; Game General

Year 1927

A1	Salaries of officers and employees	\$ 71,781.22
	Total for personal services	\$ 71,781.22
	<b>B. SERVICES OTHER THAN PERSONAL</b>	
B1	Transportation of persons by rail, auto or other means	\$ 20,593.39
B2	Transportation of things by freight, express or other means	440.37
B3	Board and lodging	1,708.81
B4	Repairs and use of horses	759.20
B5	Communication services	1,182.34
B6	Printing	4,086.12
B7	Publication of notices	232.66
B8	Furnishing of heat, light and power	140.00
B9	Public office fees	4.00
B10	Protective services	106.90
B11	Photography	325.70
	Total for services other than personal	\$ 29,579.49

## D. SUPPLIES

D1	Office supplies	\$ 312.67
D2	Fuel	.60
D3	Mechanics', engineers' and electricians' supplies	17.11



THE OUANANICHE OR LANDLOCKED SALMON

## Introduction

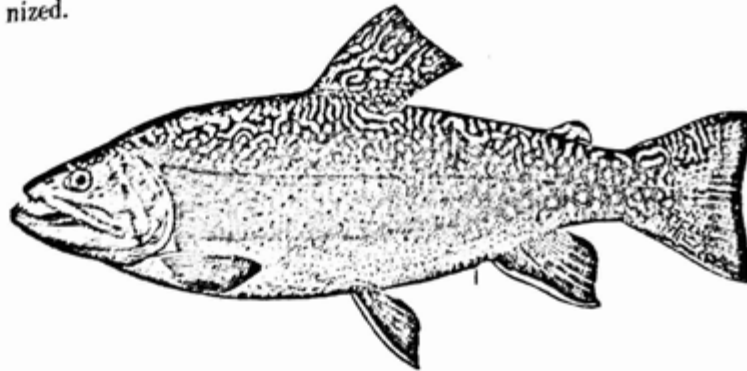
The following brief description of the various native and introduced fishes inhabiting the waters of Idaho, together with cuts illustrating a portion of them, are given for the purpose of aiding those who angle in this state a means of identifying such specimens as they may capture. It is not intended to be scientific, and all technical terms have been avoided other than those made necessary in grouping the different classes as to family and genus. To those who would go more deeply into the subject, it is advised they consult any of the several general works on fishes usually available at any public library. No exhaustive study has been made of the fishes of this state, and while the surveys made by Doctors Jordan, Evermann and Gilbert in the early 1890's should serve as a basis upon which any later investigations are prosecuted, they were far from complete at that time and many important species were scarcely touched upon or overlooked entirely.

The Department of Fish & Game will gladly undertake to identify any specimens upon which there is any doubt as to its classification. If such specimens are small they may be forwarded to the Department in glass jars or wide mouth bottles in five per cent formalin as a preservative. With large examples, the skins well covered with dry salt should be forwarded, or the entire fish may be sent if care is used in packing so that it will not spoil in transit.

## Family—Salmonidae

THE CHARRS—*Salvelinus*

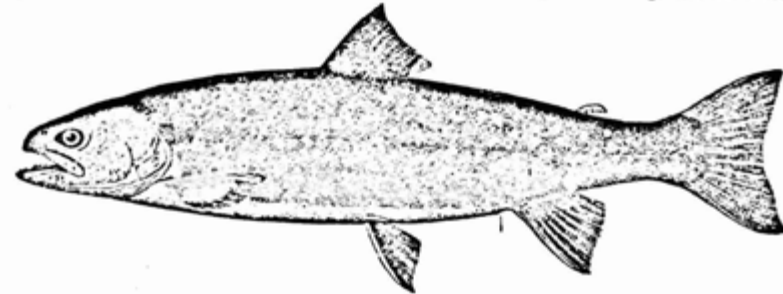
The charrs differ from the true trouts and salmones chiefly in the smaller scales, more brilliant coloration, lack of black spots and the peculiar arrangement of the vomerine teeth in the roof of the mouth. Western America has only one native representative—the Dolly Varden trout. On the Atlantic coast, seven distinct species have been recognized.

THE EASTERN BROOK OR SPECKLED TROUT—(*Salvelinus fontinalis*)

This is one of the most beautiful and widely known of American game fishes. It is native only to the Atlantic drainage north of the Carolinas, but through fish cultural operations has become well established into almost every part of western America. It is easily distinguished from the other trouts by the pronounced vermiculations or marblings on the back, dorsal fin and tail and by crimson spots surrounded by blue aureole or halo scattered over the sides. It varies greatly in coloration and markings with different food and water conditions. It is a lover of pure, cold water, but prefers the more quiet meadow streams and the still waters of deep, high lakes. The average weight of this fish in Idaho waters is about a pound, although specimens have been taken weighing upwards of five pounds in the high lakes of the Sawtooth country. The greatest authentic recorded weight of this trout in American water was 14½ pounds. The lakes and rivers of northern Idaho furnish rather excellent angling for this fish, and it is particularly abundant in the streams of Clearwater County. In cold, clear lakes and streams it has a delicious flavor; takes almost any lure readily and fights vigorously when hooked. Its spawning season in the various sections of Idaho extends from early September until late November.

THE DOLLY VARDEN OR BULL TROUT—(*Salvelinus parkii*)

This is the native charr of the western United States. In general appearance it closely resembles the eastern brook trout, but lacks the worm-like markings or marblings on the back and upper fins. The red spots are ordinarily paler than in the brook trout and extend upward over the back. Compared with the brook trout in shape, it is generally more slender with longer and sharper head. It is not regarded anywhere in the west with very great favor as a game fish, but it is not unattractive as such when taken in the larger sizes in the northern lakes by trolling. It is one



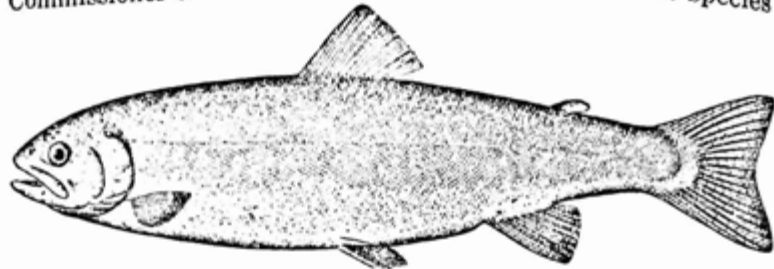
DOLLY VARDEN TROUT

of the most voracious of the trout family, and for this reason has received little attention from fish culturists and fortunately its range has not been extended to waters where it is not native. It is found in almost every section of Idaho with the exception of the Bear Lake and upper Snake River drainages. It reaches a weight of 20 pounds and spawns in the fall.

SUNAPEE TROUT OR AMERICAN SAIBLING—(*Salvelinus aureolus*)

This is one of the most rare and beautiful charrs in the world. It is indigenous to only four lakes and these all in the New England states. It is supposed to have evolved from the Greenland charr and to have been carried down from the Arctic region during the last great glacial disturbances. In beauty of form and delicate coloring it surpasses all other trout and charrs. No cut or even color plate can do justice to the dainty pastel shades of coloring with which this fish is clothed. In the adult form, specimens fresh from the water show the following coloration: Back a dark olive, blending into a cream colored side with belly of pale lemon yellow. Each scale on the sides seems flecked with pure gold. The lower fins are yellow with faint indications of pink and margined with white bands. The immature examples appear not unlike a yearling eastern brook with pronounced finger-

mark blotches across the sides. The adult fish has indistinct markings on the back with numerous orange yellow spots on the sides. Many attempts have been made from time to time to establish this charr into other waters thought suitable for its development and reproduction, but no apparent results have ever followed such introductions with the exception of those planted by the Idaho Fish & Game Department into several vacant lakes of the Sawtooth country. Through an exchange arranged by the writer with the Fish Commissioner of New Hampshire, 5,000 eggs of this species



SUNAPEE TROUT

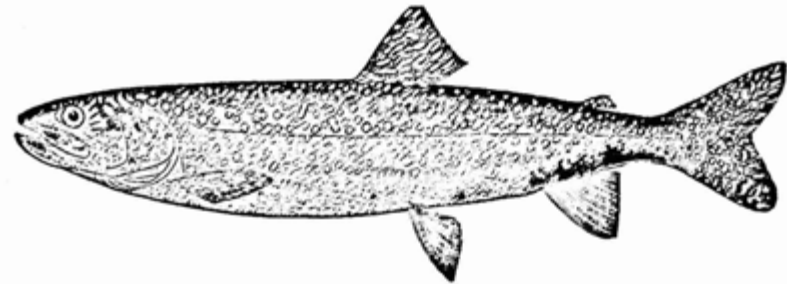
were received from Lake Sunapee, New Hampshire in March, 1925. These were hatched at the Hayspur State Hatchery and, as three inch fingerlings, were planted in four lakes previously selected. In August, 1928 these fish were in evidence in three of the four lakes planted, and several specimens taken. Fishing for them has been discouraged as much as possible until they have had an opportunity to spawn, which should be during the fall of 1928. This is an interesting experiment and probably would have been followed by failure had these lakes been inhabited by fish of any kind.

Little will be known of what coloration or form they may assume in their new environment until another season has passed and they reach physical maturity. This charr spawns on rocky reefs in the lake itself and does not require running streams or gravel beds for successful reproduction.

THE LAKE TROUT; MACKINAW TROUT—(*Cristivomer namaycush*)

With the exception of the chinook salmon this fish is the largest of all the Salmonidae. Examples of it have been taken from the Great Lakes weighing 100 pounds. In Canadian waters it ranges from the Atlantic to the Pacific oceans. In the United States, it was formerly found in all the larger, deep lakes bordering the International line from Maine to Montana, but there is no evidence that it occurred naturally in the northern Idaho lakes. In 1925 the Idaho

Fish & Game Department planted 100,000 fingerling lake trout in waters tributary to Lake Pend d'Oreille and a few examples have been reported taken since that time. It is a splendid food and game variety, but on account of its size and voracious habits is a dangerous one to introduce into any except lakes of extensive area. It is a deep water trout almost exclusively, although found occasionally in large rivers where conditions are favorable. At Jackson's Lake, Wyoming, these fish frequently leave the lake under certain unusual water conditions and are taken by anglers in the South Fork of the Snake River many miles below. The color varies greatly with different water and food conditions, but in a general way may be said to be a grayish olive above,



MACKINAW TROUT

fading into a pinkish white on the sides and lower part of body. The upper part of body is covered with large irregularly-shaped yellowish-olive spots. Usually this trout is decidedly elongate in form, rather heavy amid-ships, but tapering rapidly from the middle of the body towards the tail which is more deeply forked than in any species of trout. It is very erratic in its feeding habits and for this reason its capture uncertain. It is taken more frequently by deep trolling or still fishing over baited areas and rarely leaps clear of the water when hooked but bores down into the depths shaking its head from side to side in a bull dog manner.

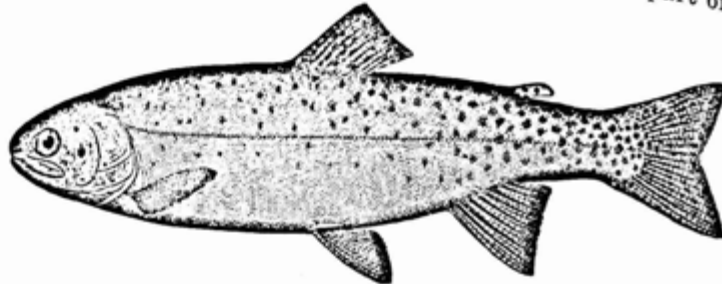
### GENUS—SALMO

THE NATIVE TROUT; CUTTHROAT TROUT—(*Salmo clarkii*)

This series of trout are found throughout the entire Rocky Mountain region from Canada to northern Mexico, and on the Pacific slope from southern California to the Arctic Ocean. It has a great number of sub-specific forms or intermediate types than any other salmonoid, and originally nearly every river system had its own distinct variety

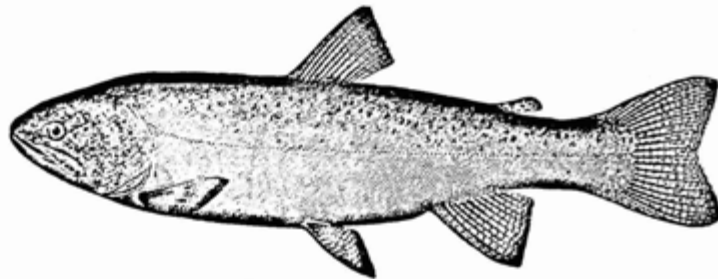


which was easily distinguished by the most casual observer. The variable colorations, shapes and markings differ so greatly in the several sections of Idaho, that any attempt in a general way to describe them would be confusing. In the northern part of the state and in the Salmon, and Clearwater drainage, the type predominating has well defined large black spots located almost entirely on the posterior part of



CUTTHROAT TROUT

body. The red markings on the membranes of the lower jaw or throat are also constant in these northern varieties, and may be used as a means of identification. In the upper Snake River region, especially that territory adjoining Yellowstone Park, the black spots appear more uniformly distributed over the body; while in the lower Snake and Bear Lake drainages, the spots are smaller, less distinct and more numerous towards the tail. In the Wood River and Payette Lakes sections a variety occurs in which the red throat slashing

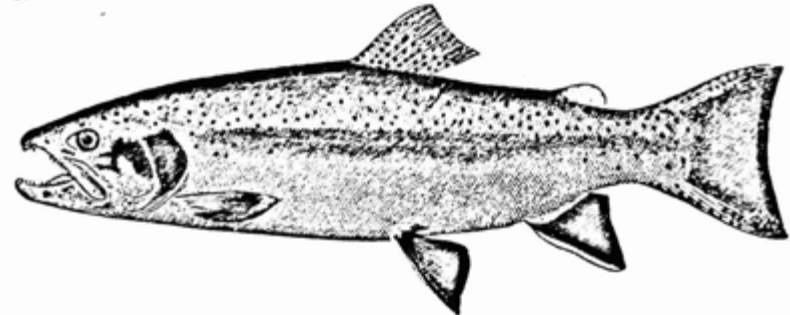


BEAR LAKE TROUT

on the jaws are very indistinct or totally absent. This variety is known as the *Salmo gibbsii*, and presumably intergrades with the steelhead in scale count, markings and coloration.

A very beautiful variety which is now extinct formerly occurred in Waha Lake in Nez Perce County. This trout

was almost immaculate as to markings with the exception of a few large spots on the posterior part of body just immediately in front of the tail. One of the best methods of identifying any of the blackspotted or native cutthroat series is in the position of these spots on the body. In nearly every instance where a pure type of cutthroat trout is encountered, it will be found that the black spots are much more numerous from the middle of the side towards the tail. In all other species of trout, while the spots may vary in size, number and shape, they will be nearly uniform in their distribution over the upper part of body. In some Idaho waters, especially the deep lakes or reservoirs, these trout are exceedingly silvery with an almost absence of markings; in others, they assume an almost blood red coloration and



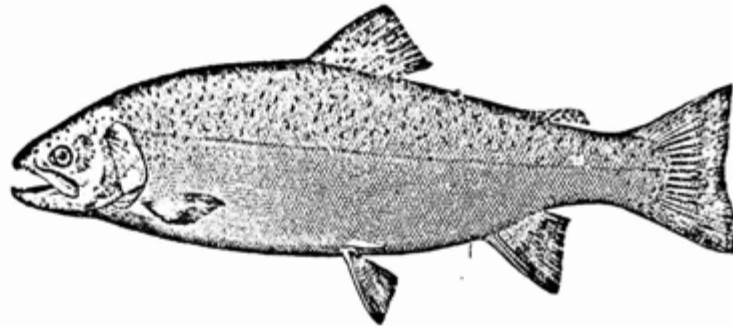
RAINBOW TROUT

are densely spotted. The variety illustrated as Bear Lake Trout is peculiar both as to coloration and habits. It is locally known as "Blue Nose Trout" and formerly was taken from Great Bear Lake in large numbers by gill net fishermen. While it reaches an immense size in these waters and ascends tributary streams in the spring for spawning, it is not known to take a lure of any kind. The well known red-side of the Salmon River country and the little mountain brook trout of only a few inches in length, belong to this same series of trout regardless of how much different they may appear to the observer. While all varieties of this trout are regarded as excellent game fishes, none of them are as popular with the angler as the rainbow trout. It is considered by many to be far superior to other trout as a pan fish. Specimens of the Snake River native have recently been taken weighing over 20 pounds.

THE RAINBOW TROUT—(*Salmo shasta* or *irideus*)

There are several varieties of rainbow trout, none of which occurred naturally in Idaho waters. The type found

throughout the state at the present time resulted from artificially propagated fish distributed by the Fish & Game Department. The records do not show from where the original stock was procured, but in all probability are the California or McCloud variety (Shasta). There is a very great variation in the markings of rainbows even in the same waters. The typical coloration is a bluish green on the back; sides silvery and belly white. Along the lateral line of the side is a pinkish band which is heightened during the spawning season. This trout can easily be distinguished from any of the cutthroat by the coarser scales, more uniform black markings, smaller head and the fact that the reddish band if present follows the lateral line of the side rather than below. There is the greatest difficulty, however, in separating it from the steelhead trout which is almost identical in



STEELHEAD TROUT

structure, coloration and general appearances. The rainbow is considered by almost all anglers as being the most spectacular fighter of any of the trout family. It leaps repeatedly from the water when hooked and struggles vigorously until exhausted. It is exceedingly migratory and particularly susceptible to low water temperatures. Unless planted in waters above reservoirs or impassable falls, the adult examples drop down until favorable conditions are found where they may pass the winter months in deep water. In waters of slightly alkaline character and where food is abundant, this trout grows rapidly and will attain a weight of 30 pounds.

STEELHEAD TROUT—(*Salmo gairdneri*)

This is a large migratory trout ascending all Pacific coast rivers from California to the Yukon. Unless prevented by barriers it seeks the extreme headwaters of such streams and spawns usually in April or early May. In Idaho par-

ticularly, it is regarded as a salmon and is taken as such under our laws during the spawning season. Fresh run from the ocean, it is a beautiful fish, bright silvery with only the faintest indication of any markings on the head, back and upper fins. Later on as spawning time approaches, the black spots stand out prominently and the cheek, middle of side and lower fins take on a deep rosy coloration. At this time it is almost impossible to distinguish it from the rainbow trout except by anatomical measurements. The head of the steelhead is always smaller in proportion to the body than in the rainbow. The dorsal or back fin in its relation to the vertebra is located farther forward than in the rainbow. The secondary gill cover is almost always of a sharper angle or less rounded in the steelhead than in the other trout. Through fish cultural operations these fish have become so badly inter-bred with the rainbow trout that it is seldom that one of pure type is encountered. To the sportsmen though, it little matters which species is hooked, for one fights equally vigorous with the other. While in the silvery coat this trout unquestionably is the hardest fighting salmonoid in the world. It landlocks readily into fresh water, and if prevented from migrating during the second year after hatching will remain permanently resident where food and water conditions are favorable. In deep lakes the landlocked form is normally bright silvery, but upon the approach of the spawning season assumes the faint pink flush down the side characteristic of the rainbow. The Fish & Game Department has planted these fish in Hayden Lake, Pend d'Oreille and American Falls Reservoir. Angling for the sea run steelheads in the Clearwater River above Lewiston and on the Payette River below Black Canyon Dam provides exciting sport for a short period during the spring months.

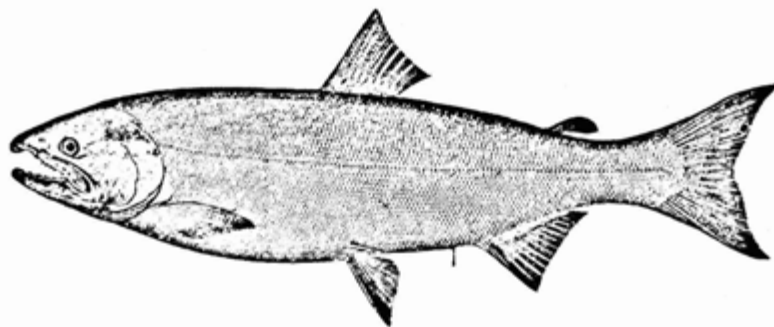
KAMLOOPS TROUT—(*Salmo kamloops*)

A sub-species of steelhead trout common to the lakes and streams of British Columbia is abundant during the spring spawning migration in the Kootenai River and tributaries in Idaho. A considerable run occurs in Deep Creek, Boundary County and the Fish & Game Department has collected a few eggs from this source. Coloration is a dark olive above, bright silvery to below the lateral line with back densely covered with small black spots. The tail is unusually broad and decidedly forked. This species has been landlocked for so many generations that it has no inclination to return to the sea and is perhaps the best form for introduction into interior lakes.

LANDLOCKED SALMON: OUANANICHE— (*Salmo sebago*)

Illustrated on Front Page

Structurally this fish is identical with the Atlantic salmon, differing principally in the markings and the excessive development of its fins and tail. To be exact it is simply a dwarfed non-migratory form of the *Salmo salar* or salmon of the north Atlantic in both America and Europe. It is native to the lakes of Maine, eastern Canada and Norway and Sweden. This salmon has recently been introduced into Idaho from Maine and is fairly well established in several of the Sawtooth Lakes. It is a splendid game fish, rises readily to the artificial fly and leaps repeatedly when hooked. In form, it is exceedingly symmetrical, with small sharply pointed head and well developed fins and tail. It can be distinguished from any of the Pacific salmon by the larger scales, larger spots and by the number of rays in the anal fin. The body has many large and small dark spots, irregular in outline and many of them decidedly X-shaped. The gill cover has a number of large round and oblong blackish spots that are distinctive to this variety. The general color is a dark bluish green above with sides and lower parts iridescent silvery. It is the most difficult of all the Salmonidae to successfully propagate.



CHINOOK SALMON

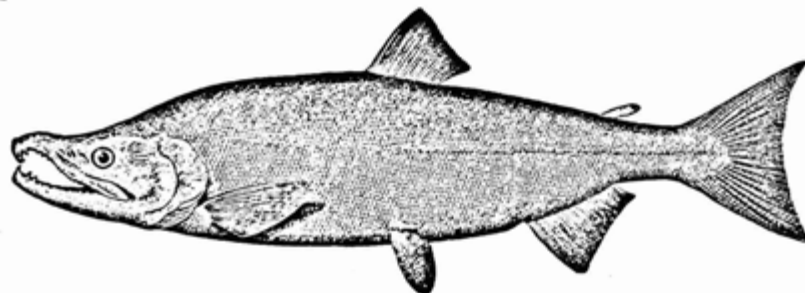
## GENUS—ONCORHYNCHUS

The genus *Oncorhynchus* contains only the five species and one sub-species of Pacific salmon. All species of this genus die after reproducing once. Three of these are represented in Idaho—the chinook, the blueback or sockeye and the little redfish.

THE CHINOOK, QUINNAT OR KING SALMON—(*Oncorhynchus tshawytscha*)

This is the largest and commercially the most valuable of the Pacific salmon. The greatest weight recorded is 154

pounds. This salmon leaving the ocean for the purpose of spawning, ascends the rivers to the extreme headwaters, in many instances a distance of over a thousand miles. Idaho is in reality only a spawning ground for these fish, as they have little value either from a food standpoint or one of sport when taken in our waters. Both sexes when they have reached the spawning territories have lost the plump silvery sea-run appearance and become emaciated and covered with unsightly blotches of fungus. The males develop pronounced hooked jaws and in consequence are frequently called dog salmon. A few of the spring run chinooks reach the lower Snake, Salmon and Clearwater Rivers in fair condition and are netted by commercial fishermen. The run in Idaho waters will probably become extinct within a few years unless the spearing of them in the upper reaches of the rivers is prohibited by law.

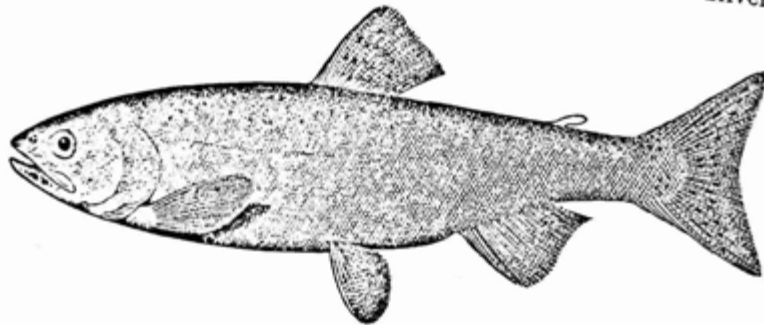
THE BLUEBACK OR SOCKEYE SALMON—(*Oncorhynchus nerka*)

The sockeye salmon or "big redfish" formerly ascended the Salmon and Payette Rivers in countless numbers. Investigations have shown that these salmon will not ascend any stream for the purpose of reproducing unless such stream finds its source in a good sized lake. It is a small species in comparison with the chinook, rarely reaching the weight of 8 pounds. The run in the Salmon River has almost disappeared on account of the construction of the Sunbeam Dam, and it is not believed that any examples have attempted to ascend the Payette River for many years.

THE LITTLE REDFISH; SILVERSIDE—(*Oncorhynchus kenerlyi*)

This is the landlocked form of the "big redfish" or blueback salmon. It is found in Alturas, Pettit, Redfish and Stanley Lakes in the Sawtooth country, and in Payette and Warm Lakes in Valley County. In Wallowa Lake, Oregon, it is locally known as the "yank" and in lakes throughout Washington as silver trout. At Payette Lakes it is commonly

called "silverside" when taken by anglers in the sexually immature stages, and was formerly considered a separate species from the brilliantly colored "little redfish" during the spawning season. The life history of this little salmon is of particular interest to scientists and is deserving of greater attention than has been given it in the past. It reaches spawning age in its fourth and fifth years; ascends the tributaries of the lakes during the late summer or fall; assumes a brilliant red coloration, spawns and dies. So rapid is the disintegration of the body after reproduction that few dead fish are observed in these spawning tributaries. Until reaching sexual maturity, this salmon is one of the most beautiful and graceful of the Salmonidae. Fresh from the water, the back shows a dark sea green coloration, tinged with indigo, which rapidly dissolves into the brilliant silver



LITTLE REDFISH

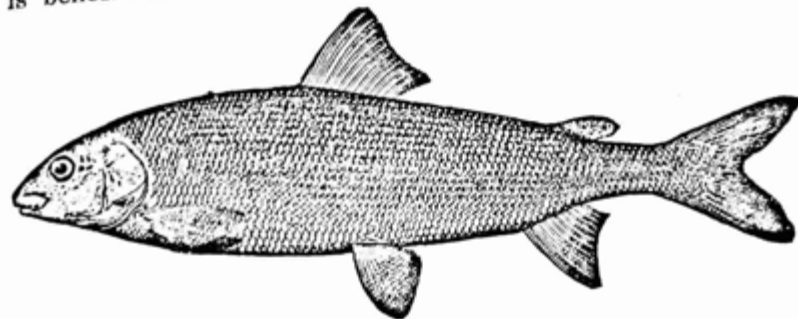
of the sides. There are only the faintest indications of a few spots on the gill covers and back when first taken from the water. It is taken by deep still-fishing with worms or grubs during the warmer summer months, and by surface trolling with small spinner or fly in the late evenings or during seasons when the upper water is cooler. It rarely exceeds a length of 15 inches with an average in most waters of about 10 inches.

#### GENUS—COREGONUS

ROCKY MOUNTAIN WHITEFISH—(*Coregonus willamsoni*)

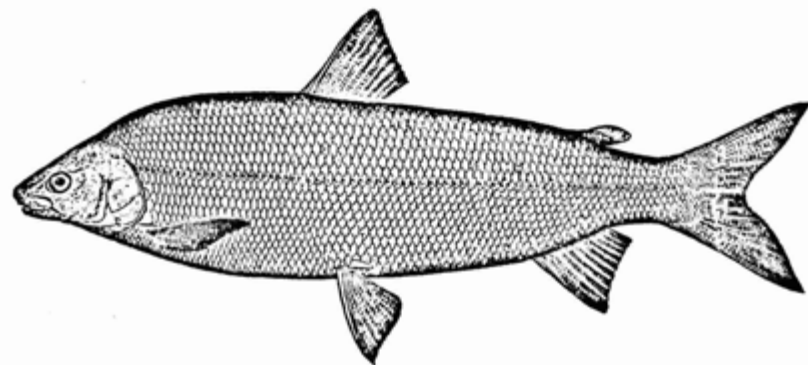
This is the common whitefish of the Pacific drainage, and while there are several sub-specific forms recognized, there is not sufficient structural differences to deserve separating them into distinct species. Two variable forms occur in Bear Lake over which there is still some doubt as to exact classification. This species is one of the most valuable na-

tive food fishes of the Rocky Mountain region, and holds an important position in the ecologic fish life balance. Contrary to general belief, the presence of whitefish in trout waters is beneficial rather than detrimental. In the deep, clear



ROCKY MOUNTAIN WHITEFISH

lakes and cold, mountain streams the flesh is delicious and by many preferred to trout. Its average weight is about a pound, but specimens have been recorded as heavy as four pounds. In many sections of Idaho it is called "mountain herring" and by some is confused with the grayling. In Lake Pend d'Oreille tons of these fish are taken each season by deep still fishing through the ice with hand lines. It strikes a fly or bait readily in streams and fights for a short time quite vigorously.

GREAT LAKES WHITEFISH—(*Coregonus clupeaformis*)

One of the most delicious of all American food dishes, and of the greatest commercial importance in the fish markets of the Great Lakes cities. In 1920 one million fry hatched from eggs secured from Lake Superior were planted in Lake Pend d'Oreille and since that time numerous speci-

mens have been taken by anglers from this water. This fish spawns on rocky reefs or shoals of the lake during the late fall which prevents its being readily seen by observers, as with the native whitefish. It feeds on the free floating micro organisms in the water and does not take the lure with any degree of certainty. On account of its extremely small and delicate mouth, tiny hooks and the smallest baits must be utilized in fishing. Ordinarily it will be found in much deeper water than the native variety, and is easily distinguished from the other by its very much smaller head, more robust body and silvery-olive coloration. The waters of Lake Pend d'Oreille are ideal for this species, and there would be little difficulty in establishing this fish in large numbers were it not for the tremendous quantities of yellow perch infesting the whitefish grounds.

### SUB-GENUS—LEUCICHTHYS

BONNEVILLE CISCO OR PEAK NOSE—(*Leucichthys gemmifer*)

This slender little fish is a native of Great Bear Lake and is closely allied to the smelts. In appearance it greatly resembles the *Leucichthys osmeriformis* of the Finger Lakes in New York. It is difficult to catch except with small mesh gill nets set in very deep water. Could eggs of this species be collected, hatched, and the resulting fry planted in some of our deep, clear lakes, it would help solve the problem of providing a suitable food for the trout and landlocked salmon in such waters. This fish must not be confused with the "pea nose" or Columbia chub of the northern lakes and rivers and waters of the lower Snake River.

### Family—Thymallidae

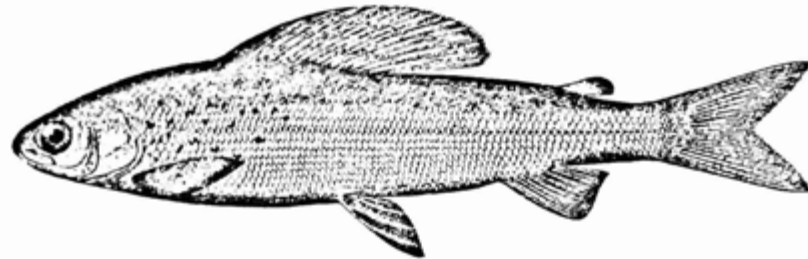
Genus—*Thymallus*

This family of salmonoid fishes is closely related to the trouts, salmons and whitefishes, differing chiefly in the structure of the skull and the coarser scales. Two species are indigenous to the United States proper and one to Alaska. Its natural habitat was confined to a comparatively restricted area—that of Michigan and Montana. In Michigan the species is all but extinct, and the numbers greatly reduced in Montana.

THE MONTANA GRAYLING—(*Thymallus montanus*)

Any angler who has the pleasure of catching a grayling will never again have any difficulty in identifying the fish. The gaily colored, excessively developed dorsal fin is dis-

tinctive. This fin is marked with purplish, greenish bands and rose colored or reddish spots. The general color tone of the body is a purplish gray with a few black irregular shaped spots present on the anterior part of body or shoulder. Although formerly abundant in all tributaries of the Madison River just over the Idaho line or Continental Divide in Montana, there are no records of its presence in our waters previous to their being planted. A few have recently been reported as taken in Henry's Lake and the upper Snake. In 1927 the Fish & Game Department planted 25,000 at the ex-



MONTANA GRAYLING

treme head of the Salmon River in the Sawtooth Basin. It is one of the finest of game fishes and the flesh is considered the equal if not the superior of trout although of a peculiar flavor. It spawns in the spring and the eggs are exceedingly adhesive making artificial propagation difficult.

### Family—Centrarchidae

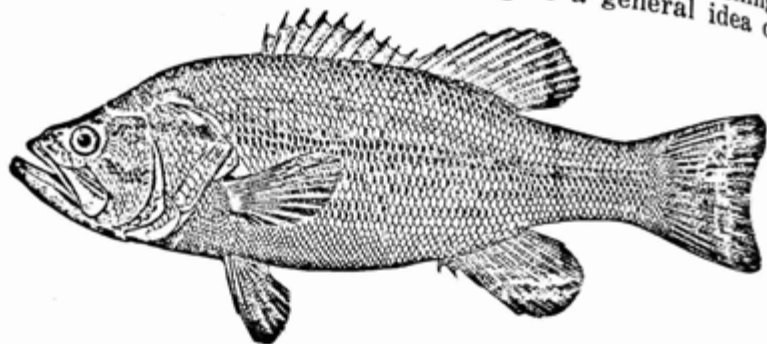
This family includes the sunfishes and basses, and with the exception of the Sacramento perch was not originally represented west of the Rocky Mountains.

### GENUS—MICROPTERUS

LARGE-MOUTH BLACK BASS; OSWEGO BASS—(*Micropterus salmoides*)

Of the two species of black bass, the large-mouth (unwisely introduced into Idaho trout waters) is considered by anglers as the least gamy. However, a good sized "big mouth" on the end of a light outfit can make things interesting for a few minutes at least. It has become firmly established in almost all of the larger streams and large and small lakes of northern Idaho, and is rapidly increasing in the lower Weiser, Payette and Boise Rivers and that part of Snake River adjacent to these streams. It prefers sluggish waters to those of swift current, frequenting adjoining

sloughs, quiet bays and the shallower parts of the deep lakes. The smaller examples rise readily to a large gaudy fly, but angling for them is usually practiced by casting with artificial minnow or "plugs" and spinners. Still fishing with live frogs or minnows or bait casting with these natural lures is also productive of good results. The best fishing may be had in the fall after a few sharp frosts and the most successful time of day is just after sun rise or late evening. The accompanying illustration will give a general idea of



LARGE-MOUTH BLACK BASS

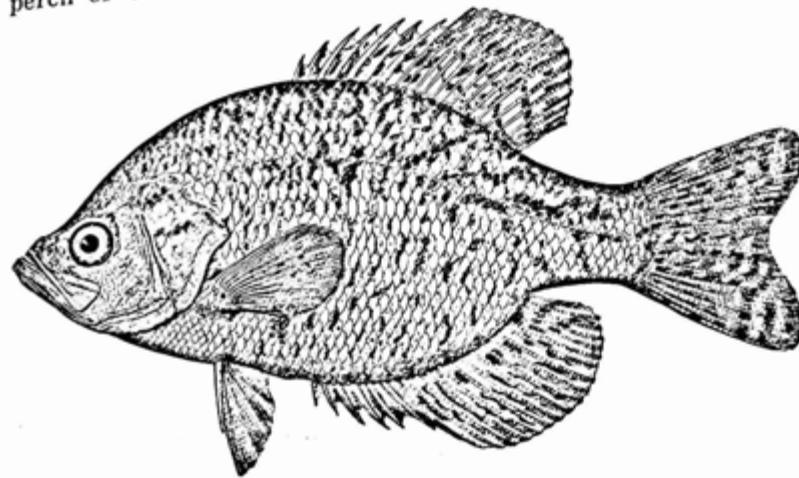
the appearances of this bass, and as there are no small-mouth black bass in the State no difficulty should be experienced in identification. The color is an olive green, darker on the back with lighter sides and almost white belly. A wide dusky band follows the lateral line along the side.

#### GENUS—POMOXIS

CALICO BASS; CROPPIE—(*Pomoxis sparoides*)

One of the most desirable pond fishes of the United States. Two species occur, one of which has been introduced into Idaho waters. The true croppie (*Pomoxis annularis*) is more southern in its distribution, while the calico bass is more numerous in the upper Mississippi Valley and well into Canada. It is a beautiful fish, the body deeply compressed or flat but with a depth equal to half its length. The color is a silvery olive with irregular darker mottlings over the sides. The fins have dark green reticulations and there are several dusky spots on the gill cover. The dorsal and anal fins are almost of the same size which is rather unusual in American fresh water fishes. The calico bass has 7 or 8 spines in the dorsal fin while the true croppie has never more than 6. This bass is an excellent game fish for one of

its size which seldom exceeds a pound in weight, and for the table is surpassed by few of our fresh water species. While this fish should not be encouraged in trout waters, it is much more desirable for shallow lakes and ponds than the yellow perch or catfish. It will take almost any kind of a bait,



CALICO BASS OR CROPPIE

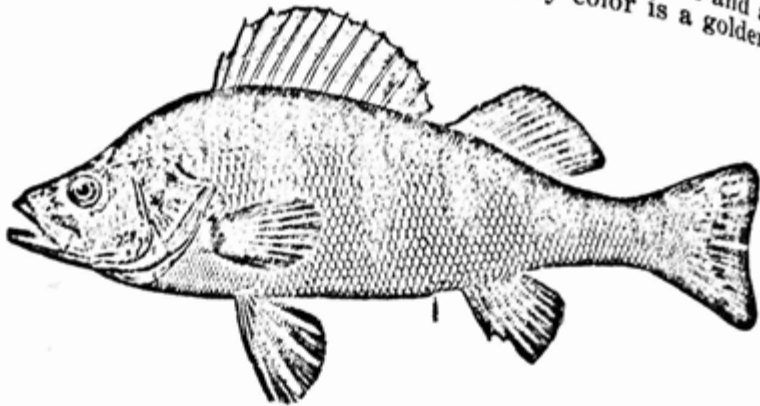
natural or artificial, and on light tackle is not to be despised by any angler. At a recent meeting of angling writers and naturalists it was decided to change the spelling of the name from crappie to croppie.

#### Family—Percidae

THE YELLOW PERCH; RINGED PERCH—(*Perca flavescens*)

The yellow perch has a wide eastern distribution. It is common on the Atlantic coast from Canada to the Carolinas, and in the Great Lakes and Upper Mississippi valley. Through fish cultural distribution it has been widely introduced into the Pacific coast states to the detriment of many of the most famous trout waters. As a game fish the perch holds a certain degree of popularity on account of the fact that anybody can catch it. It is one of the most predatory fishes of the North American continent. It devours almost anything of suitable size and is itself largely protected from being eaten by the formidable array of sharp spines in the fins. This species is exceedingly prolific, the eggs being deposited in long strings over sticks, stones and water plants, and little loss occurs in hatching even under the most un-

favorable weather or water conditions. The mature fish do not usually exceed a half pound in weight, but in certain waters many reach a length of from 15 to 18 inches and a weight of three pounds. The general body color is a golden



YELLOW PERCH

yellow; the back dark greenish and the sides covered with from six to eight dusky bands running crosswise. The lower fins are bright red or orange.

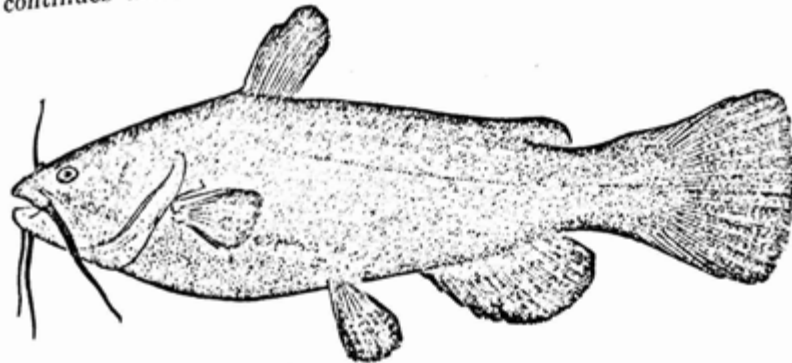
### Family—Siluridae

All marine and most of the fresh water catfishes belong to this group of fishes which number over 700 species throughout the world. In all of the rivers and lakes of North America east of the Rocky Mountains, catfishes in a great number of varieties abound. They can be roughly grouped into four general classes—the channel cats, mud cats, yellow cats and stone cats. The largest of the species is the "forked tail cat" of the Mississippi which has been taken weighing 150 pounds. The Great Lakes cat also grows to an immense size

COMMON BULLHEAD; HORNED POUT—(*Ameiurus nebulosus*)

This is the familiar little catfish common to almost all of the streams and lakes of the middle and eastern United States. It was introduced in the late 1870's into California and from there has been widely distributed into several other coast states. While the common bullhead can scarcely be classed as a game fish, many persons enjoy still-fishing for them at night, at which time owing to their nocturnal feeding habits they bite more freely than during the day. It is one of the hardiest of fishes and will thrive in muddy,

stagnate waters where temperatures range from freezing to above 90 degrees. Its spawning habits are interesting. To prevent the eggs and newly hatched fry from smothering in the muddy bottom, the parent fish sucks the entire mass into its mouth and blows them out at frequent intervals. This continues until the fry raise in a school from the nest and



COMMON BULLHEAD

are free from danger of suffocation. For a considerable period afterward the school of young fish follow the parent (usually the male) in the manner of young chicks with an old hen.

### Family—Cyprinidae

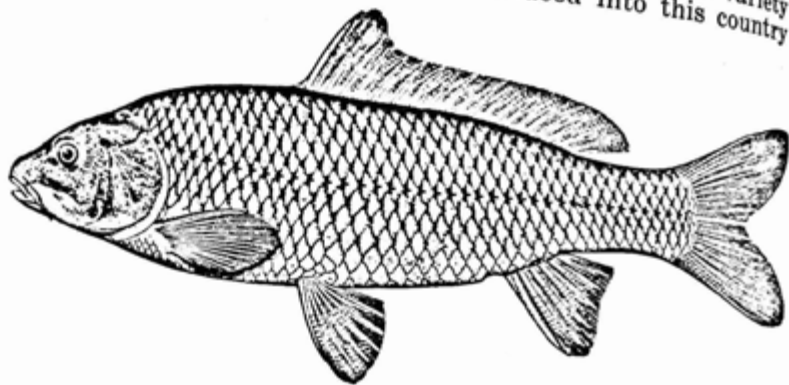
This family comprises a greater number of genera and species than any other class of fishes. To it belong the carp, dace, bream, roach, shiner and numerous varieties of minnow. There are about 230 recognized species of this family in North America, the greater number of which are native to the eastern and southern parts of the United States. With few exceptions the Cyprinidae are small fishes, whose chief value in the finny world is to convert the microscopic organisms of the water into a food more acceptable to the higher and more desirable forms.

### GENUS—CYPRINUS

THE GERMAN CARP—(*Cyprinus carpio*)

This carp is a native of Asia where it has been domesticated in ponds for many centuries. It is believed to have been introduced into eastern Europe about 1227. There are reports that the carp was first brought to this country in a shipment of goldfish from Holland in 1830, but later

investigation disclosed that these were "golden ide" a large variety of goldfish. The first authentic record of a successful shipment of carp to the United States was in 1877. These were transported from Bremen, Germany, under direction of the U. S. Fish Commission and placed in ponds in Druid Hill Park, Baltimore. They reproduced the following year and the young were distributed to various parts of the country. Their importation was one of the most bitter mistakes ever made by any country in the world. No variety of plant, animal, bird or fish introduced into this country



GERMAN CARP

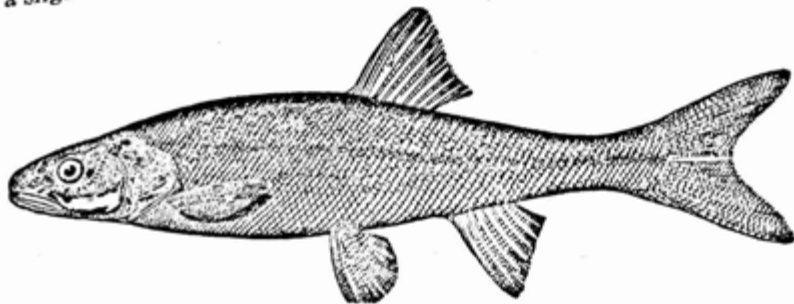
from abroad has been so destructive to our native species as has the carp. It has little or no merits either as a food or game fish, and while untold numbers are consumed in the large centers of population in the east and middle west, such utilization is largely due to their availability and cheapness and they are tolerated only in the absence of better fishes. Contrary to general belief, carp are not piscivorous or fish eating in their habits, but they subsist principally on vegetable matter and the minute life of the bottom. They root around through the aquatic plant life like hogs and indirectly destroy or drive out the more desirable fishes by depleting their food and rendering the water conditions inhabitable.

#### GENUS—PTYCHOCEILUS

THE SQUAWFISH—(*Ptychocheilus oregonensis*)

The largest of the American Cyprinidae, certain variations of this genus reaching a weight of 80 pounds. In Idaho waters the above species seldom exceeds 4 pounds. It is fairly well distributed over the entire state, with the exception of the Upper Snake River. While the adult fish is ex-

tremely predatory, the young furnish an ideal food for trout and bass. The color of the mature fish is a muddy greenish or brownish yellow, with lighter under parts. The sides are occasionally silvery. The shape is very much elongated with a slight elevation back of the head which is long and slender

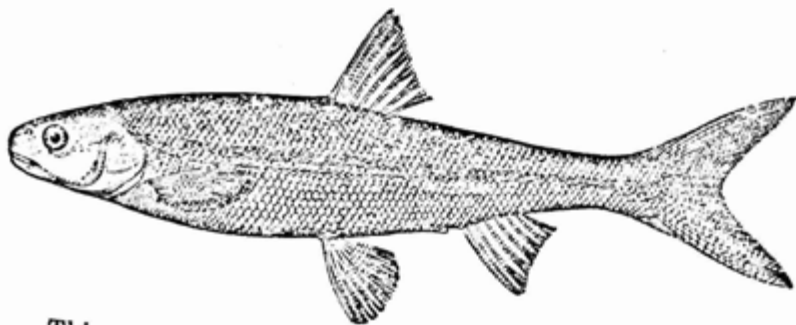


SQUAWFISH

or pike-like. The tail is deeply forked, more so in the young than in the adult. The squawfish bites readily on all sorts of baits and is regarded as a pest by most anglers in quest of game fishes. It is seldom used as food although not unpalatable from certain waters when properly prepared.

#### GENUS—MYLOCHEILUS

COLUMBIA CHUB—(*Mylocheilus caurinus*)



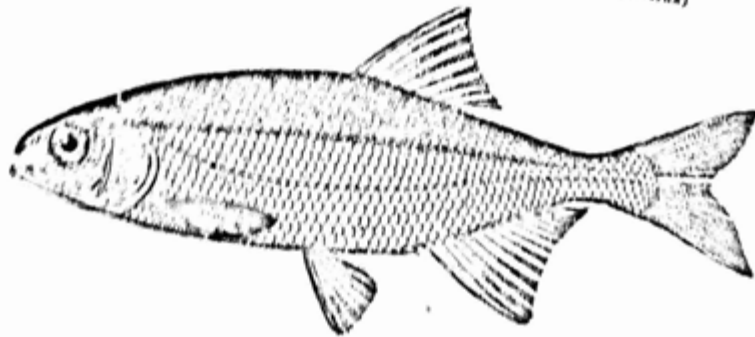
This symmetrical little fish which seldom exceeds a length of 10 inches is abundant in the lower Snake River and tributaries and rivers and lakes of north Idaho. It is valuable as a fish food although quite destructive on the spawning beds of salmon and trout. It schools in great numbers and ascends the smaller tributaries of lakes or rivers for reproduction. In northern Idaho it is commonly known



as the "pea nose" and along the Snake River as river hermit. The color above is a dark greenish or brownish, the sides and lower parts silvery. After being taken from the water for some time, a pronounced stripe makes its appearance along the lateral line with occasionally an additional stripe or band below. Little difficulty will be found in distinguishing this fish from the other minnows on account of its small head with very blunt or rounded snout.

#### GENUS—LEUCISCUS

THE SILVERSIDE SHINER OR DACE—(*Leuciscus baltentus*)



Several varieties of *Leuciscus* are found in waters throughout the state. The form common to the Snake River above Shoshone Falls is known as the Utah Lake chub (*Leuciscus inermis*). This variety grows larger than the "baltentus" of the lower Snake and Columbia River. The form illustrated is the common shiner of the Boise, Payette and Boise Rivers and is also abundant in Salmon River and lakes of the Sawtooth country. The color is a bright silvery with a faint band down the lateral line. Males have crimson cheek during the spawning season. This is a valuable little fish in that it furnishes in both the adult and immature sizes an ideal food for other fishes. It is also extensively used as a bait minnow.

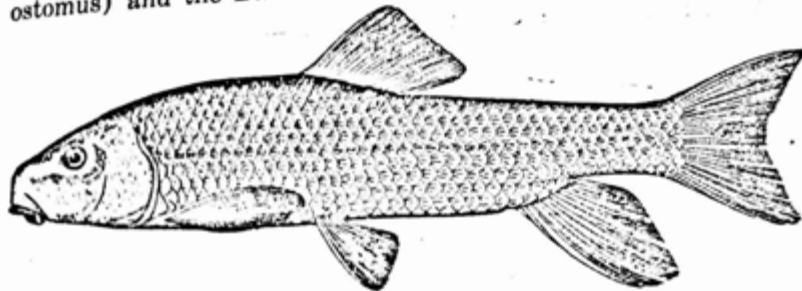
#### OTHER CYPRINOID MINNOWS

The long nosed dace (*Rhinichthys cataractae*) and the Dusky dace (*Agosia nubilosa*) with several variable forms occur in all waters tributary to the Columbia drainage. These varieties are seldom found in schools, preferring rather to flock by themselves and for this reason are less valuable from a fish food standpoint.

#### Family—Catostomidae

#### GENUS—CATOSTOMUS

About 60 species of suckers are known in North American waters of which only a small number are represented in Idaho. In the Upper Snake River and Bear Lake drainage are found the long nose sucker (*Catostomus catostomus*) and the Bannock sucker (*Catostomus pocatello*).



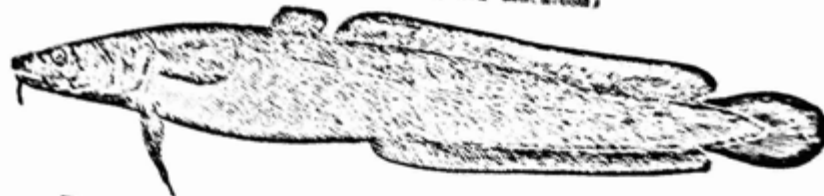
COLUMBIA SUCKER

The Rosyside sucker or Utah Lake mullet is also common in these waters. In the lower Snake, Salmon and Clearwater Rivers, the Columbia sucker (*Catostomus macrocheilus*) is more frequently encountered. Little attention has been given the family of suckers especially in the far west and doubtless a number of species have entirely escaped the notice of investigating naturalists. A collection of the suckers, chubs, sculpins, etc. are to be collected and forwarded to Dr. Carl Hubbs of the University of Michigan, who specializes in the identification of these families.

#### Family—Gadidae

#### GENUS—LOTA

LING; LAWYER; CUSK—(*Lota maculosa*)



The ling is the only fresh-water representative of the cod family. It is well distributed in large lakes and rivers of the northern United States and Canada. It is found in

Idaho only in the extreme northern part—the Kootenai drainage. This species is so unlike any other fresh-water fish that it can be easily identified. It is taken on set lines and occasionally by the still fisherman. Great numbers are speared when ascending the smaller tributaries in the spring for spawning.

### Family—Acipenseridae

WHITE STURGEON; COLUMBIA STURGEON—(*Acipenser transmontanus*)



There are about thirty species of sturgeons most of the varieties anadromous or ascending fresh water from the ocean for spawning purposes. A few species spend their lives entirely in fresh water. A few range in length from 3½ to 30 feet. The Columbia sturgeon is one of the largest of the family having been taken in the lower Snake River weighing 1,000 pounds. They are sluggish, clumsy, bottom feeding fish, living principally on small fish, lampray eels, molluscs, etc. The color is a dark grayish blue on the back with lighter olive or whitish sides and belly. The back and sides are covered with a series of bony plates. They are taken in the Snake, Clearwater and Kootenai Rivers with set lines by commercial fishermen.