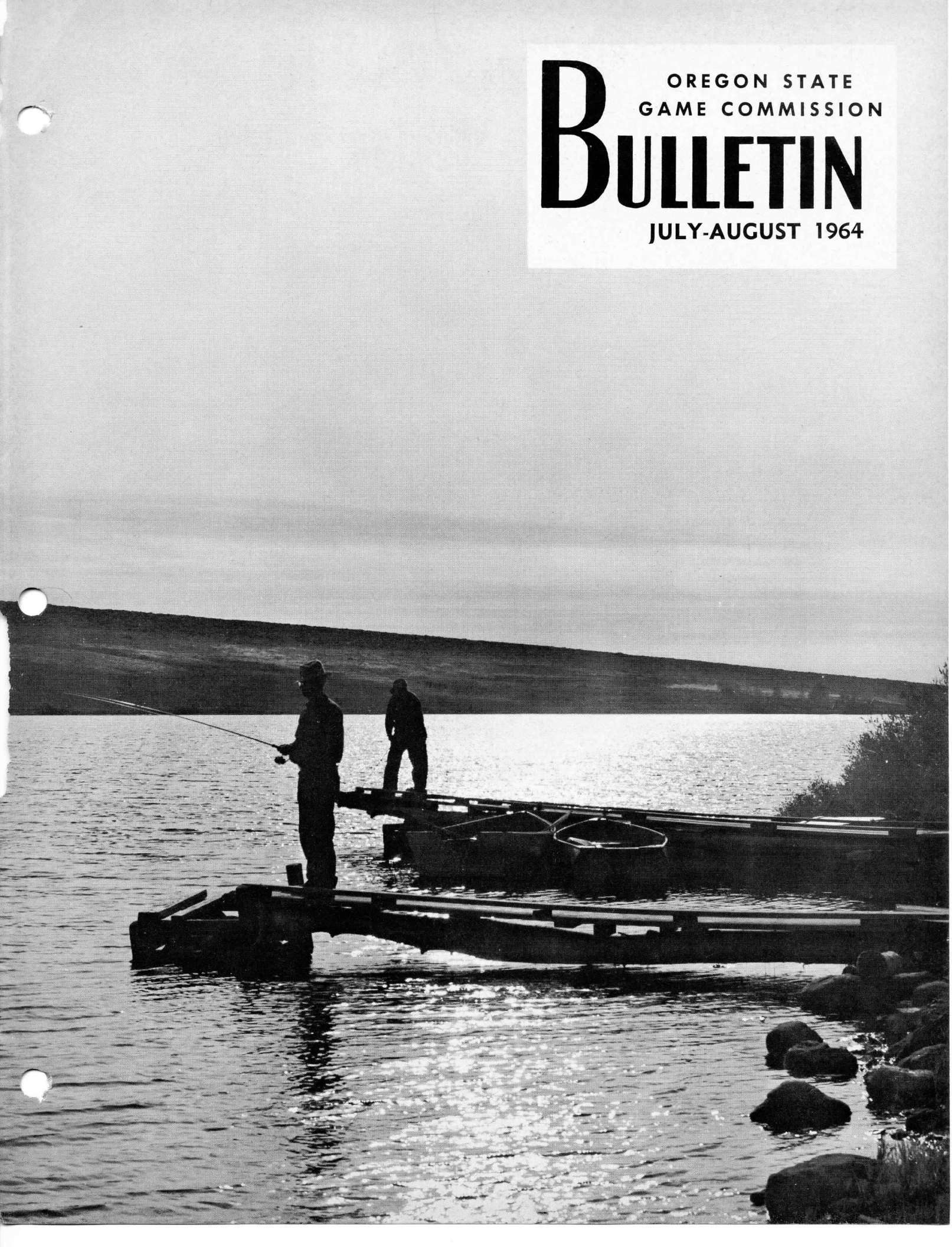
OREGON STATE
GAME COMMISSION

BULLETIN

JULY-AUGUST 1964



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July-August 1964
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The Cover

Fish Lake in the Steens Mountains. The Fish Lake Management Area was established by the Game Commission some years ago upon acquisition of most of the land adjacent to the lake. Camping facilities, maintained by a private concession, are available for a nominal charge. (Photo by Larry Bisbee)

BULLETIN HUNTER SAFETY TRAINING PROGRAM

Instructors Approved

Month of April	21
Month of May	12
Total to Date	3,168

Students Trained

Month of April	929
Month of May	1,371
Total to Date	67,620

Firearms Accidents Reported 1964

Fatal	0
Nonfatal	8

WARM-WATER FISH PONDS DEDICATED

Dedication of the St. Paul warm-water fish rearing ponds on June 6 attracted a big turn-out of anglers. This is the Commission's first warm-water fish production facility and the 10 one-acre ponds will be used to raise bass, crappies, perch, catfish, and bluegills for stocking suitable water throughout the State. The brief dedication ceremony was followed by a tour of the installation and demonstration of angling techniques.

COMMISSIONER AMACHER REAPPOINTED

Commissioner John P. Amacher of Winchester was reappointed by Governor Mark Hatfield to serve his second five-year term as a member of the Oregon State Game Commission. The new appointment is effective July 19.

Mr. Amacher for many years has been actively engaged in promoting the interest of the fish and wildlife resources of the State. He is also a member of the Douglas County Park Board, the Oregon State Sanitary Authority, and the Multiple Use Advisory Board to the Bureau of Land Management, and is a former legislator. He operates a trailer sales business at Winchester.

BIG GAME REGULATIONS

The synopsis of big game hunting regulations for 1964 may be obtained from license agencies throughout the State or from any of the Game Commission offices.

Attention of hunters is called to the following schedule of application deadlines and drawing dates for controlled season tags and permit elk and deer hunts:

ANTELOPE TAGS
Closing date, 5 p.m., July 22
Public drawing, 10 a.m., July 30

CONTROLLED DEER SEASON TAGS
Closing date, 5 p.m., August 5
Drawing date, 10 a.m., August 12

DEER PERMITS (free unit permit)
Closing date, 5 p.m., August 5
Drawing date, 10 a.m., August 14*
*Not August 22 as erroneously published in advance flyer on regulations.

ELK PERMITS (free unit permit)
Closing date, 5 p.m., September 3
Drawing date, 10 a.m., September 10

Application for antelope and controlled deer season tags must be made upon controlled season application form available at license agencies.

Application for free deer and elk permits must be made upon application forms furnished with the general deer and elk tags.

LOG JAMS IN COAST STREAMS REMOVED

An extensive stream clearance program is again under way this summer in the coastal area. Several contracts have been let for removal of huge log jams and other debris in several watersheds, including the Siuslaw drainage in Lane County, Kilchis River in Tillamook County, and the Umpqua and Smith River drainages in Douglas County. One contract calls for work on 32 tributary streams of the Umpqua and Smith Rivers. In some areas salmon and steelhead are faced with total blocks to their migration.

AUGUST HEARING ON TRAPPING AND BIRD HUNTING REGULATIONS

The Oregon State Game Commission will hold a public hearing at 10 a.m. Friday, August 21, at its offices in Portland, 1634 S.W. Alder Street, to set hunting regulations for upland game birds and waterfowl, and trapping regulations for fur-bearing animals, including beaver, mink, muskrat, otter, raccoon and others.

Methods of hunting, seasons, and bag limits for upland species — pheasants, quail, chukars, Hungarian partridge, and grouse—will be considered.

The framework for waterfowl regulations is established by the Secretary of the Interior. The Game Commission must select season dates and bag limits for Oregon that come within the federal framework.

MAY-JUNE MEETING OF THE GAME COMMISSION

At its meetings on May 22 and June 5 the Commission considered the following matters in addition to setting the 1964 big game regulations:

BIDS. Accepted low bids as follows: $11,150 for construction of fish counting station at Winchester Dam, $13,096 for removal of log jams on Umpqua River, and $11,226 for removal of log jams on Smith River. Authorized call for bids for improvements at Cedar Creek Hatchery, Fall River Hatchery, Oak Springs Hatchery, and Butte Falls Hatchery.

ACCESS. Exercised option for acquisition of part of Knapp tract near the forks of the Umpqua; Kinzey tract and Kennedy tract in White River area.

LICENSE REFUND POLICY. Pursuant to opinion of Attorney General, adopted policy granting license fee refunds under the following circumstances only: (1) When a license is received as gift and licensee had previously purchased a license; (2) If a duplicate license for prior year is issued in error by agent when application is made for current year's license; (3) If duplicate license is purchased when licensee had either lost, misplaced, or forgotten that he had previously purchased a license (upon showing he was ignorant of provision for issuance of a certificate of lost license).

CAPITAL OUTLAY. Authorized purchase of a set of four portable plastic ponds for experimental use in raising fish, a power boat for use on Owyhee and upper Snake Rivers, two jet boats for use on lower Snake and Deschutes Rivers, and other miscellaneous equipment.

CODY PONDS. Approved renovation of Cody Ponds (White River Management Area) for fishery use.

Management of Nonmigratory Game Fish

C. J. Campbell,
Chief of Operations,
Fishery Division

IN THESE DAYS OF INCREASING POPULATION and increasing leisure time, good fishing seldom just happens —it must be made.

A number of statutes make it the responsibility and the duty of the Oregon Game Commission to manage the game fish resource. Others provide the authority to do what is necessary to accomplish this mission.

The objective of game fish management is to keep all suitable waters providing fish and fishing for Oregon anglers and their visitors. It also includes, where feasible, making waters suitable for this purpose that for some reason may not be so. To meet this objective in all of Oregon's widely varied aquatic habitat requires the use of all fish management tools and constant year-around effort.

Oregon is justly famous for its salmon and steelhead, among the best of game fish when taken on hook and line, but nonmigrating or resident game fish also provide many angling days and much recreation to many fishermen. These resident fish fall into the two major groups of cold-water and warm-water fish. Representatives of both groups can be found in the two general types of water habitat which are quiet water or lakes, and flowing water or streams.

Let's first consider the cold-water species. To some extent this is a misnomer as some of them can tolerate quite high temperatures, at least for short periods. They are the fish that are considered game species by even the pioneer Oregonians. They are the most widely distributed and most popular fish in the State.

They are all of the trout family and include the native and introduced species of trout, char, and salmon. Among them are the native rainbow, as well as introduced golden, Kamloop, and other strains, the native Dolly Varden and the introduced brook and lake (Mackinaw) trout, native and introduced strains of cutthroat trout, the brown trout, the kokanee which is a landlocked sockeye salmon, and the Atlantic salmon. The whitefish, inaccurately called grayling, is also included with the cold-water game fish.

While there is a considerable range of tolerance among these various species and races, they all require certain general characteristics in their environment. They need cool, preferably clear, water with a good supply of dissolved oxygen. With a few exceptions they need very well oxygenated cold water running over and through clean gravel of suitable size in order to reproduce successfully. Their eggs are buried in the gravel in the fall, winter, or spring, depending on species. Here they incubate for from a few weeks to several months, depending primarily upon temperature.

After hatching, the young fish subsist for some time upon the remainder of the egg, the yolk sac, to which they are attached. As the yolk sac is absorbed the young fish, now known as fry, work their way up through the gravel into the free-running stream. Here they feed on minute forms of life found in the water. If food and temperature conditions are good, they grow rapidly; if not, more slowly.

The most all-around satisfactory way to manage fish is to maintain proper conditions for nature to produce and raise the fish. Most anglers prefer to catch "wild" fish, and since it is not necessary to feed, protect from disease, and take all sorts of care of them, it is much more economical to let Mother Nature do the job.

We said earlier that there were two major types of aquatic environment: streams and lakes. Let us see what we can expect from nature concerning trout and streams.

Among the most obvious things we can see is the fact that some streams are rich and productive and others poor and much less productive. Nature can, of course, make a much better showing in the former. Good examples of productive streams are the Deschutes and the Klamath in central Oregon. Their waters are rich in nutrients and minerals. Large numbers of fish can grow rapidly, just as a given area of good pasture will support more cows than will the same area of semi-desert.

The waters of some of the streams draining the west side of the Cascades are very pure, so much so that they do not provide a rich aquatic pasture. In them, resident trout do not grow rapidly nor in large numbers. Nature here cannot produce either the number of individuals or the aggregate weight of fish flesh that she can in the rich streams.

Generally, if a stream has reasonably satisfactory spawning characteristics, nature will see to it that sufficient fry are produced to provide for natural mortality

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MANAGEMENT OF NONMIGRATORY GAME FISH

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and still have enough left to utilize the available food and living room.

Lakes present a different picture. The native rainbows and cutthroats cannot reproduce adequately in them, although they, of course, can and do use inlets and outlets when they are suitable. The lake trout do spawn naturally on rocky lake bottoms, and brook trout and kokanee reproduce successfully under conditions found in some of Oregon's lakes. However, many of our lakes, including most of the high mountain ones, had no fish originally and cannot produce and maintain them naturally.

The number of lakes and streams is limited, and those well suited for trout are becoming less in some areas because of competing water uses. However, the number of anglers and the demand for fish do not decrease—they increase every year. This increasing demand for fish, coupled with the fact that many waters are incapable of producing them naturally but can support them once they are produced, makes necessary a program of artificial propagation.

The Game Commission operates 16 hatcheries, of which 15 produce trout. (Several raise salmon and steelhead as well, and one produces only these species.) In a recent year their output of trout alone was 22,700,000 fish weighing 940,000 pounds.

Raising fish in these numbers is an exacting and complicated process. It alone is the subject of a number of books and innumerable scientific articles. Constant research and continued application and refinement of new methods are increasing the fish culturists' ability to raise more and better fish for less money per unit of production in the same amount of physical plant. This is why the production of our hatcheries has continued to rise, but the number of hatcheries and hatchery employees has not. They are an essential tool of resident fish management as we shall see.

The production of the hatcheries would serve no useful purpose if it did not reach the lakes and streams in good condition. To assure the accomplishment of this, liberation equipment has been refined until losses from this source are the exception rather than the rule. At the same time it has become possible to carry a much greater number or weight of fish in a given unit of equipment.

Our hatcheries produce trout of catchable size, generally 3 to 5 fish per pound, or fingerlings of various sizes as required by different waters. Where and how are they utilized? Let us again look first at the streams.

We said earlier that if much suitable spawning area was present, nature would see that enough fry were produced to populate the stream. Since this is true, as supported by many studies and experiments described in fishery books and papers, it is only logical to assume that planting more fry or fingerlings would accomplish no results. Only when the population of a stream has been lost through some disaster or elimination for management purposes is the planting of such small fish justified. It is possible to remove enough adult trout from a stream to make the fishing poor, but it is almost impossible to remove them to the point that they cannot re-seed that stream.

Here, then, is a situation where the catchable-size hatchery trout may be useful. They are much more expensive per fish, costing up to 25 cents each by the time they are planted. Obviously, as high a percentage as possible must be recovered by the angler to justify their use. Therefore, we use them in larger streams where access is good and fishing pressure is heavy. Where possible, we also try to spread the allocation for a given water over several different plantings just prior to and during the open season.

Fishery biologist Jim Hewkin examines fish population of Bull Prairie Reservoir with gill net. Located in northern Grant County, the impoundment was constructed by the Game Commission to provide fishing in an area where fishing opportunities are not plentiful.

Why do we do this instead of giving them time to become acclimated and wild? It is because many studies have shown that in most such circumstances the major part of these fish that are going to be caught are caught in the first few weeks, if not days, of availability. If they are not caught then, they never are, and all the time and money that has gone into them is sacrificed. There are occasional stream situations where this is not entirely true, but in most it is. The reasons for this are not entirely clear. One theory is that native fish occupy the preferred living and resting spots in the stream, thus forcing the newcomers to stay in less desirable places until it becomes impossible for them to remain. In any event, they gradually disappear and in only a few streams do any appreciable numbers remain till the next year.

These fish are good, even if they haven't been in the stream six months or a year. They fight well, and they are good table fare. They have been raised and fed in the same way as the trout providing gourmet meals in fancy restaurants.

So much for streams — how about lakes? For our purposes, we can include reservoirs with the lakes. We saw above that many of these waters do not have sufficient suitable inlets or outlets or other characteristics to provide for natural propagation of trout. However, they may produce food and have the right physical and chemical characteristics to raise them in large numbers. The fingerlings that can be raised economically in hatcheries will survive in adequate numbers in such situations.

Every lake is different, and may produce best and most economically with fish of a certain size or species planted at a certain time. It is part of the job of the fish manager to find these requirements for a given lake. The hatchery is then used to provide the right fish, at the right size, at the right time.

There are lakes for which we have not been able to find a combination that will produce good fishing from fingerling plants. Sometimes it may be primarily poor productivity and the lake can't raise the fingerlings to a catchable size in adequate numbers, or some other factors may be wrong. In such situations if access and fishing pressure warrant, catchable-size fish may be used. Such lakes become in effect public "catch out" ponds. In such a situation, fish management becomes a matter of weigh-

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Some prefer lake fishing, others stream fishing. This year Fall River was added to the very limited list of areas set aside for fly fishing. Picture was taken before new regulation went into effect.

MANAGEMENT OF NONMIGRATORY GAME FISH

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ing social and economic rather than biological factors. Particularly with a small easily reached lake, almost any given number of fish could be put in and taken out.

The high mountain lakes are an interesting segment of the resident fish management picture. These are lakes, generally of small size and in the Cascades and other mountains, accessible only by trail. Most were originally barren of fish and have no or very limited spawning possibilities. Most of them can produce angling if periodically planted with fry or fingerling trout. Formerly several men and one or two pack strings were kept busy all summer packing fish to the lakes. Now techniques have been developed to the point that more lakes are planted in about two weeks at less expense by using an airplane than were reached in the whole summer by pack horse. Many creelfuls of trout have attested to the success of the method in all the Western States.

Many times either natural or artificial reproduction can do a better job if the habitat can be improved. Like all forms of life, fish need food and shelter in order to survive. If the environment can be changed so that it can produce more food for the desired species, or provide more shelter where it is lacking, then more fish can be raised in it.

Streams can be so silted that trout cannot use the gravel successfully for spawning, and aquatic fish food or organisms cannot be produced in large enough quantity. In such a situation the removal of the cause of siltation would improve the habitat and increase production. Siltation is usually the result of poor land management practices, and so can be reduced if enough of the right people want to reduce it.

When streams, either naturally or because of alteration by man, consist of long, straight riffles with few or no pool areas, their productivity is reduced. A good pool-riffle ratio, preferably about 50-50, is necessary for top production in a stream. Careful placement of boulders can break up these long riffle areas and provide shelter and resting areas for trout.

In streams of fairly stable flow, a type of which Oregon has very few, various kinds of sills, dams, wing dams, and current diverters can be installed to make pools for shelter, to clean gravel for food production and spawning, and in general, increase productivity. This type of stream improvement must be approached with caution, however, in most of our western streams. Many more such devices have washed out or been bypassed than have been successful, or have demonstrably improved a fish population.

The protection of stream banks can be an important habitat improvement method, particularly in areas of heavy grazing. If the stream can be fenced, except for watering access, cover will return or can be replaced. This will help stabilize the banks, reduce siltation, help maintain temperatures and spawning and rearing conditions. Protection of the natural stream conditions, or restoring them where they have been lost, is the most effective and satisfactory method of physical habitat improvement.

Occasionally a stream becomes so heavily populated with undesirable species of fish that the preferred game species cannot exist in adequate numbers. Undesirable, as used here, means fish that are poor eating, don't have good fighting qualities, or for some other reason are not sought by the angler. In this situation chemicals can sometimes be used to remove the unwanted population, and game species be replaced. Chemical treatment of streams is a more difficult operation than chemical treatment of lakes and complete removal of the fish population is seldom achieved.

Habitat improvement for lakes can sometimes be accomplished. In some situations water control structures can be built to stabilize water levels at a desirable point or to increase the size of the lake, and thus the available area to raise fish. At present, a cooperative program with the U. S. Forest Service at Sparks Lake in central Oregon is attempting to accomplish this purpose. Fissures in the lava formation are being sealed and dams built to prevent the lake water from being lost underground. This popular lake which now reaches very low levels each year will be maintained at a higher level and its productivity will be much improved.

The construction from scratch of a lake for fishing certainly is habitat improvement for the fish. Where physical conditions permit an economical project, new fishing water can be provided. These projects are seldom simple as landownership, water rights, geological conditions at the site, engineering feasibility, as well as biological factors must all be considered. Nevertheless, the trouble and difficulties are well worth overcoming when we can actually add to the aquatic environment of the State and assure that it will always be available to the fisherman.

Frequently our lakes become contaminated, either from natural or human

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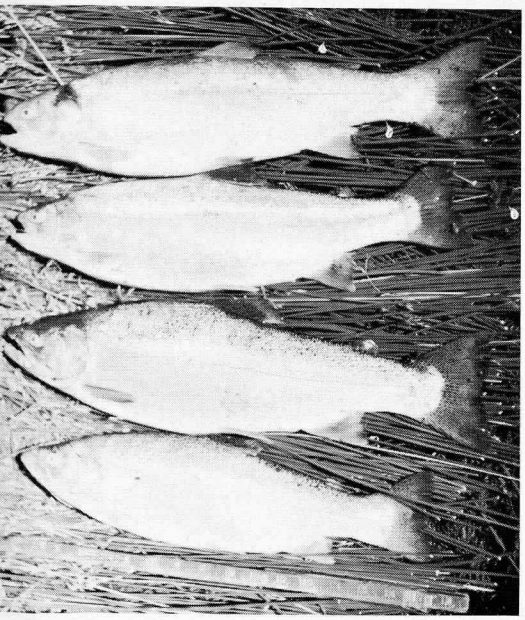

These fine specimens of rainbow trout are from Thompson Valley Reservoir. The reservoir was chemically treated in 1959 and then restocked with trout.

MANAGEMENT OF NONMIGRATORY GAME FISH

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sources, with undesirable species. These may sometimes reproduce very successfully in situations where the game fish cannot. They may become so abundant that practically all available fish food is used by them and other forms cannot survive. Their numbers must be controlled if angling is to be maintained. In a few situations, control can be accomplished on a partial basis by netting, spot use of chemicals, or similar means, but in most this approach has not been satisfactory. Complete removal of the fish population becomes necessary if it can be economically done. Chance of complete removal is better in lakes than in streams, but the odds against it are still great. Nevertheless, even if re-treatment is necessary every few years, such management will pay off in fish produced and angler-days made available. The well known story of Diamond Lake, where a 3,000-acre body of water was returned from practically no production to one of the best in the State, is a classic example of this phase of management.

Fertilization, particularly of cold-water lakes, has not been successful in general as yet. There have been indications, however, that it may become a more important management tool in the future. Perhaps the lack of certain elements, whose presence as mere traces can make a lake productive, may be the key in some instances. A method of supplying such a trace element would then spell the difference between fair or good and excellent production. Perhaps we will yet find practical methods of accomplishing this.

Another major tool of the fish manager is regulation. A number of things, both biological and social, can be accomplished through regulation. Few things fish managers and game commissions do arouse so much interest and controversy as do their rules under which angling may be carried on. Of course, to be effective the regulations must be enforced. In Oregon this is the job of the Game Division of the Oregon State Police.

The objective of the majority of regulations is to provide an orderly harvest by as many anglers as possible. The ideal would be for all harvestable fish to be caught in equal numbers by all those people participating in the fishing. Such a Utopia can never be attained if only because people vary in the skill and diligence they bring to the sport. It has been demonstrated time and time again that no matter how good the fishing, there will always be some who get skunked, some who get their limit easily, and some in between. For this purpose bag limits should be high enough to interest the average fisherman, low enough to enable him to reach that goal at least part of the time, and, of course, be related to the supply. Oregon's general trout limit of 10 fish of which 5 can be over twelve inches accomplishes this in many areas.

Some quirk of human nature makes us much happier with 10 fish when the limit is 10 than we are with 15 if the limit is 20. A limit of 10 then results in more satisfied anglers and at the same time spreads the supply further.

Size limits are of debatable value. The original reasoning was that the fish would be permitted to grow to the point where it would reproduce at least once before it was caught. It has been shown that common size limits in many waters do not accomplish this purpose. Some states, hoping to reduce loss of fish, require that all fish, regardless of size, up to the bag limit be kept. Thus there should be no fish lost from hooking injuries. Enforcement of such a rule is difficult and some "sorting" goes on anyway. Oregon has maintained the position that the angler, at least if he is conscientious at all, can safely release most small fish, and that a trout under six inches is too small to be very interesting. Therefore, the 6-inch minimum size has been retained for the trout fishery. (This is modified where migratory fish are a major concern.)

Special situations call for special regulations. There are instances, notably in the high lakes in the Wallowas, where brook trout reproduce successfully and where angling pressure is relatively light. The result is too many trout for the food supply and none can reach large size. Here the bag limit is doubled to encourage anglers to visit these waters and to increase the number of fish removed.

Another special situation at the other extreme is Hosmer (Mud) Lake where Atlantic salmon have not reproduced where the supply is limited, and the demand is great. Here there is a unique, for Oregon, limit of no fish. All salmon caught must be released. It is a very popular fishery, but the supply of these exotic fish is maintained—thanks to the regulation and some dedicated fish-culturists at the Wizard Falls Hatchery.

Oregon is blessed with many lakes and many miles of streams. Because of the extent of this resource, we can afford to indulge our angling citizens in ways that would be impossible if waters were very limited. We can set aside at least a few areas in which only specialized forms of angling can be employed. In a sense this may be discrimination, but with so many waters we can afford the luxury of a little discrimination. Actually the percentage of water so regulated is insignificant, and it makes possible increased pleasure and recreation for a sizable segment of the anglers. In the case of Hosmer Lake, the requirement of barbless flies only enables the no-fish bag limit to work much more successfully.

We have learned in recent years that in many waters, closed seasons may not be necessary. The fish populations can support angling the year around and thus supply more days of recreation. On the other hand, we no longer fish for food for survival—our fishing is now primarily a sport. A sport without rules quickly becomes a poor sport. What would baseball be like if all the players could do things any way they chose with no rules to follow? Enjoyment of the game would be lost by the player—as well as the spectator. Therefore, while angling can be increased in some places by eliminating closed seasons, the time has not yet come in Oregon when we must eliminate the time-honored thrill and anticipation of "opening day." When we do, angling will have lost a valuable and irreplaceable part of its color and appeal.

However, by permitting year-around fishing on some waters, off-season angling is provided for those who desire it. Even ice fishing becomes available for those hardy souls who find that the most satisfying type of fishing. Oregon is fortunate to be able to provide such a balanced program.

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In order to employ these various management tools and methods properly, a great deal must be known about the environment of the fish and the populations in the environment. Without such knowledge it is impossible to regulate correctly, to plan good habitat improvement, or to make wise use of the output of the hatcheries. To obtain such knowledge and to keep it up to date, good management requires constant surveillance and inventory of the habitat and the resource.

The major share of the time of the district fishery biologist, the key man in the program, is spent on inventory and surveillance activities. Of basic importance is the physical inventory of the waters. All the lakes and streams and their characteristics must be known. Such information should be recorded in permanent records for all waters. Routine surveillance can then keep up with changes as they occur through man's or nature's activities.

Random creel checks can tell if a problem may be developing in the water in question or if the fish population is essentially satisfactory. More intensive creel census is necessary on some major waters where more detailed knowledge of harvests is desirable or essential to proper management. Such intensive surveys have been maintained for a number of years at some waters, such as East, Paulina, and Diamond Lakes. While time-consuming and expensive, they have had a great deal to do with the much increased production of these waters over the years.

Inventory of the fish populations is carried out by obtaining and studying samples of the fish themselves. To be as unselective as possible, this is accomplished by the use of various kinds of nets and electric shocking devices. Much can be learned about the conditions in a body of water from the number, size, and condition of the fish collected. This is the basic information upon which habitat improvement, changes in stocking rates or time or species, and regulations are based.

We have now discussed at least briefly most of the broad aspects of fishery management as related to cold-water game fish. We must not forget the second group, the warm-water game fish. These fish are also known as the spiny rays because, unlike trout, they have hard, sharp-pointed rays as well as soft ones in some of their fins. These spines can cause painful wounds if the fish are handled carelessly. The most common and most frequently sought ones are the largemouth and smallmouth black bass, bluegill, black and white crappie, the various catfish, and the yellow perch.

The warm-water species are native to the Middle West and the South. Most species were introduced into Oregon in the late 1800's by people who missed the sort of fish they had been used to back home. Introductions on their behalf were also made by the United States Fish Commission. An interesting and pleasantly readable account of their arrival is provided by Ben Hur Lampman's "The Coming of the Pond Fishes."

Since these species have survived and in places thrived in northern Oregon waters, it is obvious that in spite of being called warm-water fish they can tolerate very cold water part of the year. However to reproduce successfully, they require water much warmer than do trout. The various species spawn when temperatuers reach 65 to 85° F. Their spawning habits vary, but none bury their eggs as do trout. Most of them make a bed or nest and even care for the resultant fry for a short time.

The smaller ones, like the bluegill and the sunfish, feed on algae and small animal life. While small, they in turn provide food for the larger carnivorous forms, such as bass. Large bass will eat most anything alive that they can swallow, up to and including young ducks.

Fishery managers ordinarily feel that a better job can be done with either trout or warm-water species if they are not both present in the same water. There are instances of waters that are capable of producing both types in satisfactory numbers and sizes, but these are exceptions rather than the rule. The spiny-rayed species grow more slowly than trout and therefore require longer to make a fishable population.

Until this summer, management of these fish in Oregon has depended upon natural production. The physiology of these fish and the type of eggs they produce do not suit them for the type of artificial propagation that can be applied to trout. Sources of supply for planting new waters or replanting old ones are salvage from flood plain pools of the Columbia or Willamette, or from cooperating private ponds. Importations from State or Fish and Wildlife Service warm-water production stations in other areas could also occasionally be arranged. Strict control of species was almost impossible to maintain in such operations. Undesirable forms were frequently included, and the spread of these was undoubtedly aided in this way. Also little control was possible over numbers or time of availability.

Because of this unsatisfactory method of obtaining stock and the continuing need for a source of supply, the St. Paul warm-water rearing ponds were built.

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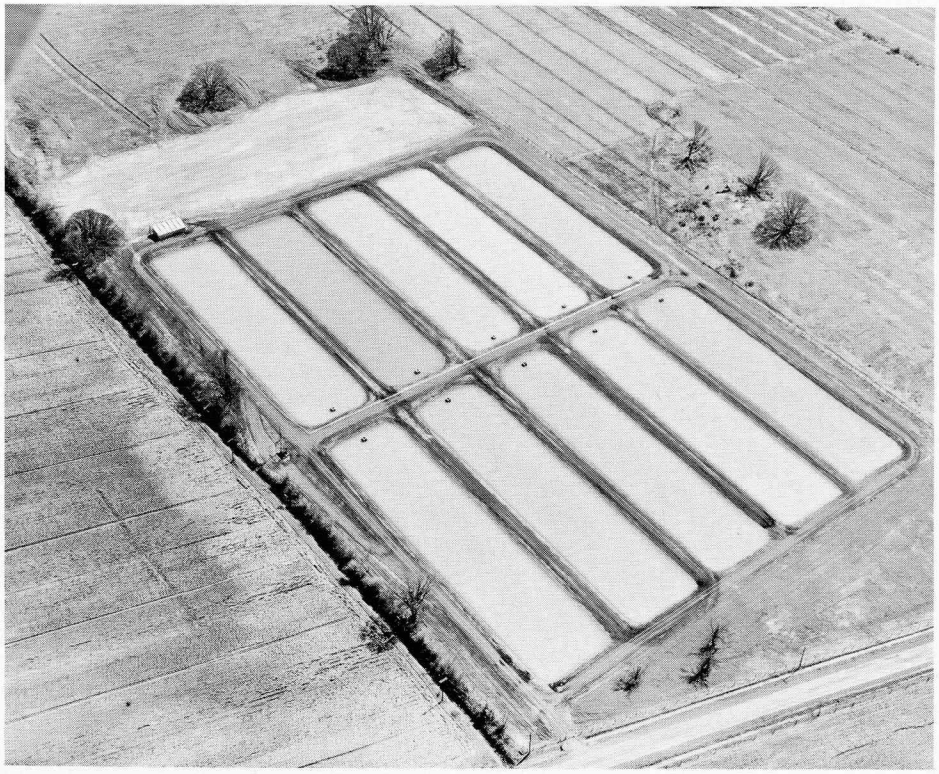
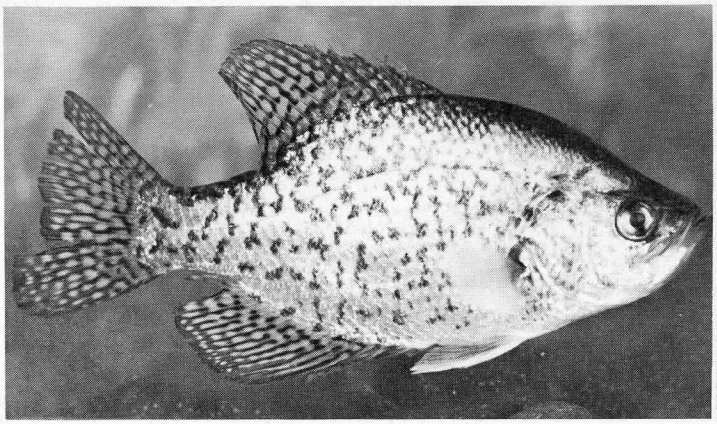
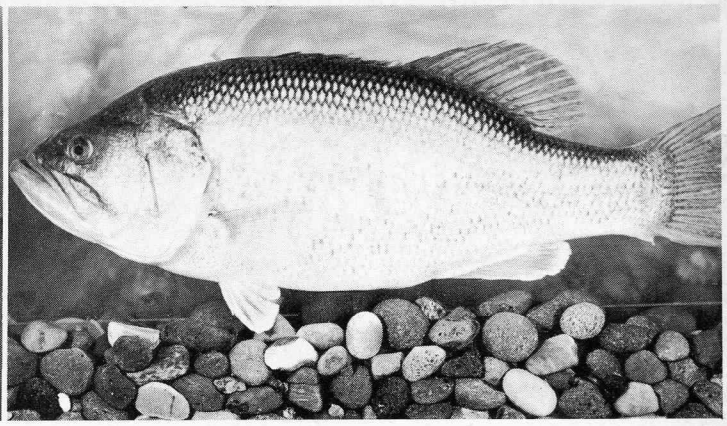


These ten one-acre ponds near St. Paul form the Game Commission's first production facility for warm-water game fish.



White crappie



Largemouth bass

MANAGEMENT OF NONMIGRATORY GAME FISH

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Brood fish of various species can be maintained here and pure cultures of desired species raised in the ten separate ponds, each an acre in extent. Because of their relatively slow growth even in good situations, it is usually prohibitively expensive to raise them to large size, and they are stocked as fingerlings.

In lakes or reservoirs particularly, these fish are prone to overpopulate and become stunted. If conditions for reproduction are adequate, many young are produced, and if fishing pressure is not too heavy (it frequently isn't in trout-loving Oregon), and if large carnivorous fish are not present in sufficient numbers, too many of them survive. The food supply becomes inadequate for the large number of fish, and growth slows or stops. Reproduction also may stop under such conditions, but too late. Already there is a tremendous number of short, thin, stunted fish that are of no interest to the anglers.

The only cure for such a situation is removal of most or all of the fish and a new start. Chemical treatment is the most successful means yet found, but some species, notably the catfish, are most difficult to eliminate completely. Species that have shown the most potential for overpopulation and stunting in Oregon lakes are yellow perch, crappie, bluegill, and bullhead catfish. A great deal of work is being done, particularly by Oregon State University and its Extension Service, in determining the most successful combinations and numbers to use in Oregon waters to obtain balanced populations.

Since underfishing is a common source of trouble with warm-water game fish, means to increase the catch are frequently desirable. If lakes have little cover, sometimes brush shelters can be installed. These tend to attract the small fry which in turn attract the larger fish. Since fishermen know this, they can seek the brush shelters as a more concentrated source of supply. On the other hand, too much cover must be avoided or too many young fish escape their enemies and survive to overpopulate the lake.

If warm-water species are present in a stream and find conditions to their liking, they will thrive; and if they don't, there is not much we can do about it. In general they prefer slower moving and warmer streams than trout, but some, like the smallmouth bass and channel catfish, thrive in such big fast streams as the Snake River.

Enough Oregon anglers enjoy fishing for these fish that we can utilize them for new or reclaimed waters not well suited for trout. Generally all that is needed is an initial stocking and patience while a fishable population develops. Then if fishing pressure is heavy enough, a valuable self-perpetuating population is available for many years. If the population gets out of balance, it may be necessary to eliminate it by chemical treatment, or drainage if feasible, and start over.

The availability of these fish in lakes, streams, and private ponds not only provides many man-hours of pleasant recreation but diverts some pressure from the trout and spreads the angling effort. The new rearing facility for them will be of great help in accomplishing these purposes.

Since underfishing rather than overfishing is most apt to be a problem, a minimum of regulation is necessary for these fish. It has been demonstrated that size and bag limits, except under unusual conditions, will do more harm than good with warm-water fish. A bag limit, quite high, is maintained on catfish, but its main purpose is to discourage waste rather than to conserve the fish. Also in some situations large bass can be removed under heavy fishing in too-great numbers and protective regulation is necessary. Generally, though, no regulation is necessary for hook and line fishing.

To sum up, we have seen that a major responsibility of the Oregon Game Commission is the management of the nonmigratory or resident game fish. There are two main groups, the cold-water and the warm-water species. The responsibility is discharged by encouraging natural production, providing fish by artificial propagation where natural propagation is inadequate or impossible, improving habitat or providing new habitat, promulgating and enforcing regulations for the benefit of the fish, and maintaining constant inventory and surveillance. It is a difficult and complicated but fascinating and ever-changing job.

If the Oregon Game Commission had not been managing resident fish populations over the past 30 years, many important bodies of water within the State would be worthless as fishing areas today.

Whatever your preference—good fishing!

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