

OREGON STATE
GAME COMMISSION

BULLETIN

APRIL 1968



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Number 4, Volume 23
April 1968

Published Monthly by the
OREGON STATE GAME COMMISSION
1634 S. W. Alder Street — P. O. Box 3503
Portland, Oregon 97208

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The Cover

This happy angler caught his steelhead in the Sandy River. The Sandy, along with the Wilson and Alsea Rivers, has been the subject of an intensive study by the research division to determine the contribution of hatchery fish to the winter steelhead fishery.

(Photo by Milt Guymon)

BULLETIN HUNTER SAFETY TRAINING PROGRAM

Instructors Approved

Month of February 30
Total to Date 3,431

Students Trained

Month of February 541
Total to Date 120,636

Firearms Casualties Reported in 1968

Fatal 2
Nonfatal 3

TV SERIES SCHEDULED

"OREGON COUNTRY," a series of half hour programs showing outdoor recreation in the state, starts on educational TV channels 10 and 7 (KOAP and KOAC-TV) at 7:30 p.m. on April 22. Ron Shay of the Game Commission staff will host the shows and have various guests to discuss fishing, hiking, and other outdoor pursuits.

Game Commission Schedules Hearings

The annual hearing on big game regulations will be divided into three sessions this year. All will convene at 10 a.m. at the Portland headquarters of the Commission at 1634 S. W. Alder Street.

On Friday, April 5, the Commission will start its hearing with consideration of the opening dates for the 1968 deer and elk seasons. The hearing then will be adjourned to Friday, May 24, when all the general hunting regulations for big game mammals will be considered. At the end of the session, the Commission will issue a tentative list of regulations for the public to review and submit recommendations.

The 1968 hunting regulations for big game will be formally adopted at the final session on Friday, June 7.

Trout Season Opening Near

To those anglers who still consider opening of the general trout season the highlight of the year, the waiting is almost over.

Oregon's general trout season opens on Saturday, April 20, in all waters except the opening is delayed until May 25 for streams in Zones 1, 3 and 4 and national forest lakes. Individual exceptions to both opening dates are listed in the angling synopsis, copies of which are available at all license agencies. Closing date of the general season is October 31.

Bag limit for trout (including steelhead and salmon under 20 inches) is 10 fish a day (not more than 5 fish 12 inches or over); and 20 fish in possession or in 7 consecutive days (not more than 10 fish 12 inches or over).

Coast Recreation Potential

IN recent issues of the Bulletin we have brought to our readers a brief outline and description of the State-wide Comprehensive Outdoor Recreation Plan (SCORP), a section of which is presently being compiled by the Game Commission. The Alsea and Umpqua Rivers have been covered in previous issues. Since the Oregon coast is included in the SCORP plan, we will explain how the plan works in a coastal situation.

The Oregon coast has been broken into four nearly equal segments. This article deals with the Lower South Coast which is limited to Curry County. Since this seashore area is removed from centers of population, much of its recreational resources are not utilized as extensively as those to the north. However, a fantastic potential exists with miles of virgin beach and numerous coastal streams.

The Lower South Coast has been divided into eight atypical areas, each with its individual recreational potential and access problems. A few of these areas are grouped together to more easily illustrate the existing recreational facility or access need.

Winchuck River Area

The Winchuck River joins the Pacific within a half mile of the Oregon-California line. It is a small coastal stream with a short tidal area that has substantial runs of anadromous fish. At present, boat access to the estuary is the main problem. Therefore, a boat ramp is recommended in the vicinity of the Highway 101 bridge.

Brookings Area and Samuel Boardman State Park

Brookings is situated at the mouth of the Chetco River. Since the river entrance is semi-sheltered and the bar is navigable except during storms, an extensive offshore salmon fishery occurs during late summer and fall. The Port of Brookings maintains a large boat basin with a four-lane boat ramp. This facility is adequate for boat access.

Both jetties provide public access to the river mouth and adjoining beach. During the spring and summer they are used by saltwater anglers who catch a variety of bottom fish. In the fall jetty anglers take salmon with herring and anchovies.

Samuel Boardman State Park, with its six miles of beach, lies just to the north of Brookings. The area is rugged and development is at a minimum. Two waysides have been provided which give adequate access to the few level beaches. Also, many points on Highway 101 give panoramic views of some of Oregon's most beautiful coastline.

Hunter Creek and Pistol River

These two coastal streams join the Pacific a short distance to the south of Gold Beach. Both streams have good runs of anadromous fish. Stream and beach access to the Hunter Creek area is adequate from Highway 101. A short access road and

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STEELHEAD INVESTIGATIONS

By Harry Wagner, Fishery Biologist, Research Division

WITH THE FIRST FALL rains and a rise in coastal rivers of the Pacific Northwest, winter steelhead come in from the sea and begin their spawning migration upstream, as their ancestors have done for thousands of years. Through the centuries, populations were kept in balance by natural, or biological, factors operating within the framework of the physical environment. Only recently has man been a significant factor in the fishes' existence, but during this brief moment in evolutionary time, man's industrial and agricultural activities and recreational use have made and are making great demands on the resource.

The future abundance of this species depends in part on the development and use of the proper management techniques. The goals of research are to provide the facts required to formulate and update management practices to meet the challenging problems of today and tomorrow.

Steelhead Life History

The steelhead is the sea-run form of rainbow trout. In some streams the resident and migratory forms exist together. The migratory form is characterized by

the occurrence of a transformation or metamorphosis in the spring which results in a migration to the sea of the juvenile fish which are about six to seven inches in length. The steelhead remains in the ocean until it reaches sexual maturity, usually two years later. The adult steelhead trout returning from the sea is often confused with the salmon, but while similar in many respects, is quite different. The most striking difference is that salmon always die after spawning but steelhead do not necessarily, although the numbers that survive to make a second or third spawning migration are quite low. Age studies conducted on winter steelhead from the Alsea, Wilson, and Sandy rivers indicate that only 5 to 7 percent of the fish survived to return for a second spawning migration the following winter. Those fish which do survive to spawn again are primarily females. The higher incidence of females as repeat spawners is thought to result from the fact that males usually arrive first on the spawning grounds and generally stay longer. Thus, male fish are subjected for a longer period of time to

mortality factors which exist in fresh water, as well as physiological stresses associated with reproduction.

Aging

This might be a good place to stop and mention briefly how fishery biologists go about aging a fish since we will be referring frequently to the subject of fish age. Aging is accomplished through microscopic examination of scales taken from the fish. Fortunately for biologists, the scales of the fish have growth rings somewhat like those laid down by a tree. For approximately each year of growth an annulus or year mark is present. Fresh and saltwater growth can also be distinguished. The number of times that a fish has spawned can also be observed on the scale. The edges of the scales are absorbed while the adult fish remains in fresh water, resulting in a definite check or scarred area on the scale. The scale is also useful for calculating the length of the fish to some specific time period in the past. Thus, the scale contains much of the history of the individual fish with respect to the amount of time spent in

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BEAVER

ENDANGER

Past and

IT is not our purpose here to discuss endangered species in detail but to portray some of the efforts we employ to preserve them.

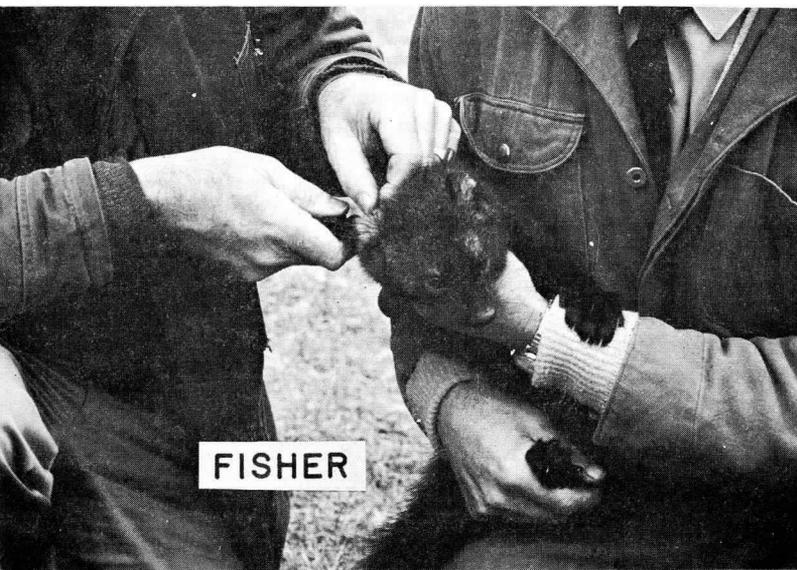
The enactment of the Endangered Species Preservation Act of 1966 by Congress represented a recent example of a host of state, federal and international legislative efforts directed at preserving the wild creatures of our environment.

Throughout modern history periodic concern has been expressed that various species of wildlife would, primarily as a result of man's activities, be exterminated. Such concern has not been without validity. The passenger pigeon and the heath hen in the eastern United States are classic tragic examples of irrevocable disappearance of these forms of life from this earth. A local example is the temporary extermination of the magnificent form of bighorn sheep indigenous to Oregon. After years of total absence, it is only now being restored. In this instance stocks for re-introduction were available. This was not the case for the passenger pigeon and the heath hen.

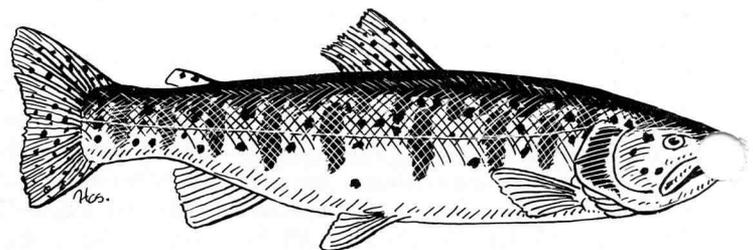
Although the wise enactment of the Endangered Species Act currently has been receiving wide attention, Oregon long has been conscious of the need for such efforts. Historical records of the Oregon Game Commission, of the Legislature, and of scientific and citizen groups reveal strong interest in the permanent security of Oregon's wild fauna. Before the turn of the century Oregonians were expressing concern about several wildlife forms, including the beaver. This species, then almost gone, was restored through an intensive management program, including live-trapping for transplantations.

As our state entered the era of increased land use for domestic purposes, positive efforts were under-

WHITETAILED DEER



FISHER



LAHONTAN CUTTHROAT TROUT

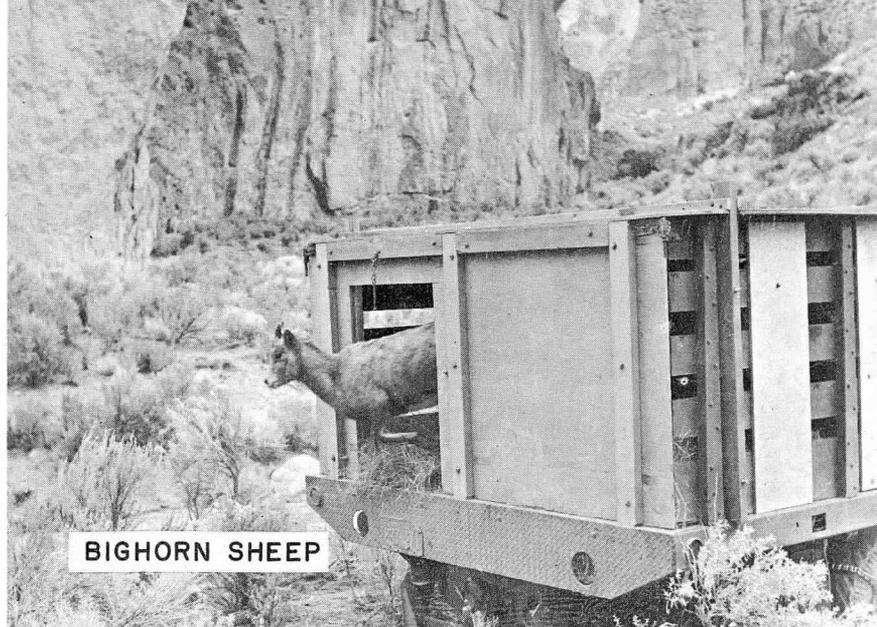
ED SPECIES

Present

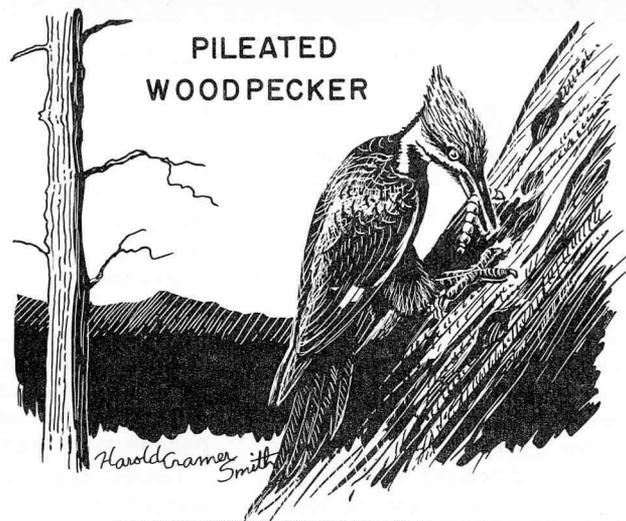
taken to assure the integrity of wildlife values in our environment. Some species were not afforded the attention desirable because of their location, economic conflict with other interests, or simply lack of understanding of their needs.

The Game Commission is deeply mindful of its solemn obligation of stewardship. It embraces not only the maintenance of those forms directly utilized by the hunter, the angler and the nature lover; it includes as well the major life forms which bear a relationship to the biological community and without which many of our important species would not thrive. Numerous scientific inquiries, management tools and collaborative efforts have long been used to meet this obligation. Whether it be regulations or refuges, population controls or propagation, transplantations or environmental manipulations, the composite efforts are designed to assure the welfare of the species. There is nothing new about the problem of endangered species. However, an incredibly faster tempo of land and water development creates a more compelling need for such efforts.

Accordingly, the recent Endangered Species Preservation Act is in keeping with the needs of our time. It will assure a more orderly and systematic treatment of this problem on a national basis. In Oregon many legislative acts have been passed consistent with this objective. The most recent granted protective status to the cougar and wolverine. Among other endangered species in Oregon are: Columbian whitetail deer, fisher, Canada lynx, kit fox, greater sandhill crane, bald eagle, pileated woodpecker, burrowing owl, osprey, sharp-tailed grouse, Lahontan cutthroat trout, white sturgeon of the Snake River canyon, and the upper Snake River races of salmon and steelhead.



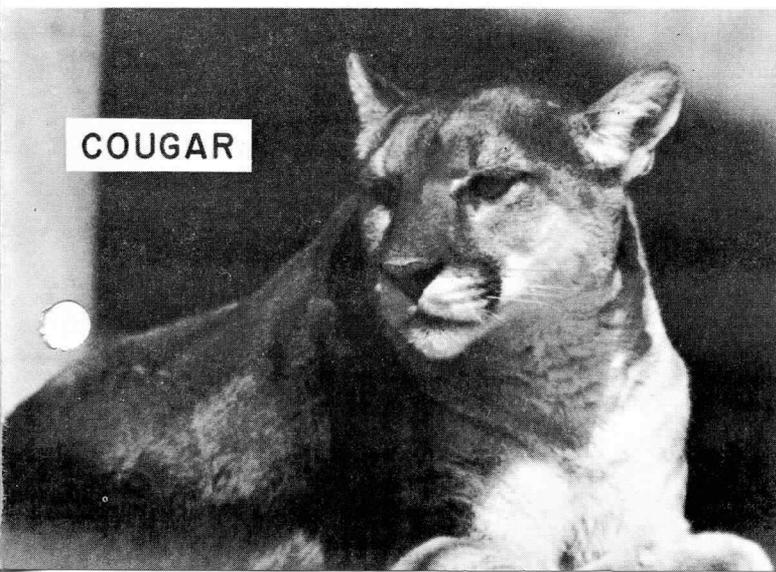
BIGHORN SHEEP



PILEATED
WOODPECKER



SHARP-TAILED GROUSE



COUGAR



WOLVERINE



Game Commission's research laboratory at Corvallis.

STEELHEAD INVESTIGATIONS

(Continued from Page 3)

fresh water and sea water as well as the number of spawning migrations and the size at which the events occurred.

The adult fish ascend in winter to the spawning grounds which are usually in the upper tributaries of the river system. There the female selects a site in the gravel for the nest or redd into which the eggs will be deposited. With her tail, a large hole is excavated and the female deposits her eggs which are immediately

fertilized by the male at her side. Again using her tail, she covers the nest with gravel. After two to six months, depending primarily on water temperature, the young fish will emerge from the gravel and begin what is probably the most hazardous phase of their lives. They remain in fresh water from one to four years before migrating to the sea, dependent on how fast the fish grows. If the fish grows rapidly, it might migrate to the sea at one year of age. Slower growth requires more years to reach migrant size.

Growth rate is controlled by the abundance of food, water temperature and, in part, by inheritance. Migrants leaving the

Alsea and Wilson rivers are predominantly two years of age (80 percent) with the remainder being one (5 percent) and three years (15 percent) of age. On the Sandy River, two-year-old fish predominate but three-year-olds are abundant and four-year-old fish are not uncommon.

Migration takes place in the spring of the year, usually with peak movements occurring in most Oregon coastal streams from mid-April to mid-May. Much of the early effort by fishery biologists was aimed at determining the size and age of downstream migrants as well as the time of year movement took place. As a result of their findings, regulations for a late spring opening of the trout fishery were established to protect young fish prior to and during the downstream migration.

Parr-smolt Transformation

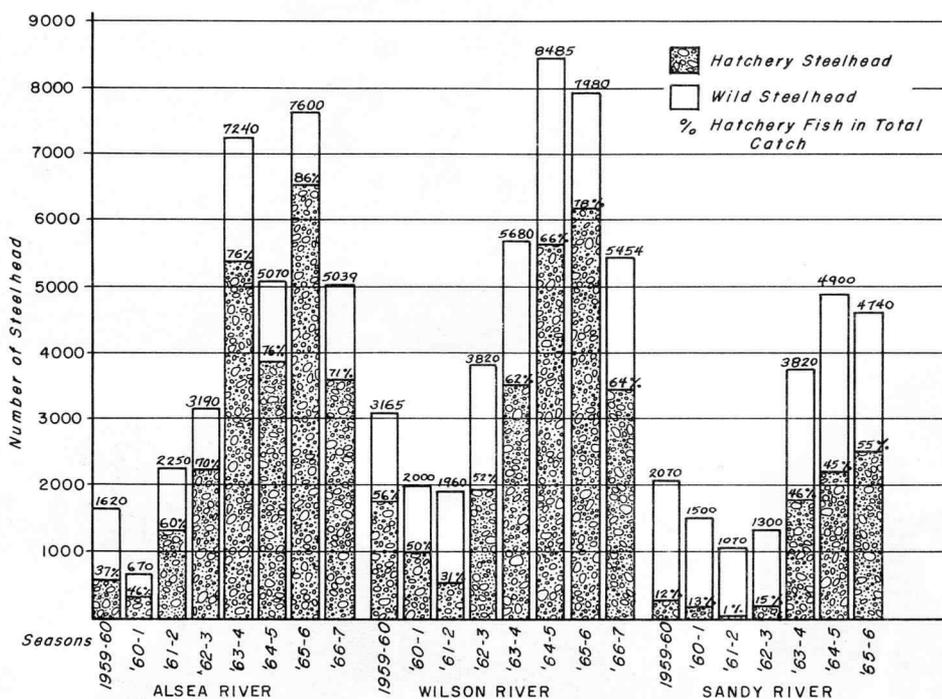
Prior to the downstream migration, a curious biological change takes place in the young fish. The change has been called the "parr-smolt" transformation or metamorphosis. The transformation, which in winter steelhead is apparently size dependent, involves profound changes in the physiological and biochemical function as well as behavior which together prepare the animal for downstream migration and survival in the marine environment. The transformation from resident to a migratory form is a critical step in the life of the steelhead. Knowledge of factors that control or influence this transformation are of considerable importance to the fishery biologist. Present studies at the Game Commission's research laboratory in Corvallis are designed to provide new facts concerning the transformation.

Hatchery Studies

The number of steelhead migrants that can be produced in a given stream is limited. The artificial rearing and subsequent releases of migrant winter steelhead to supplement natural reproduction is an important management technique. Most young steelhead reared in the hatchery where an unlimited food supply is available will reach migrant size in one year. The hatchery fish, if released at the right size and time, will migrate seaward almost immediately.

Although steelhead trout and Pacific salmon have been artificially propagated since the latter part of the 19th century in hatcheries along the Pacific coast, information on the efficiency and justification for such practice was absent or inconclusive until recently.

In the winter of 1959-60, the Research Division of the Oregon State Game Com-



CONTRIBUTION OF HATCHERY PRODUCED STEELHEAD TO SPORT CATCH IN THREE KEY STREAMS, 1959 - '67

STEELHEAD INVESTIGATIONS

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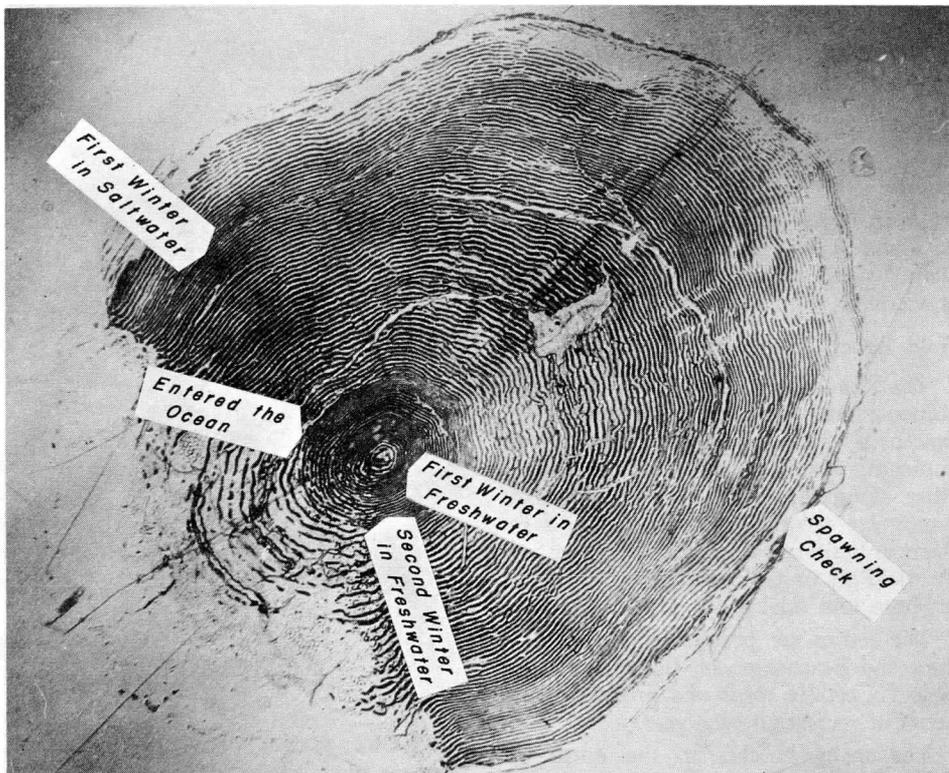
mission was given the job of assessing the role of artificial propagation of winter steelhead as a means of supplementing natural reproduction. The research program was undertaken to provide the knowledge necessary for obtaining a high survival of juveniles and a subsequent large return of adults from the fish stocked from the hatchery. Building on the work of fishery biologists in Washington, such things as the sizes of fish to be released, time of year that stocking should be done, the best method of release, and the best release location in the stream were examples of the factors investigated. Of equal importance to survival was the contribution which hatchery fish made to the sport fishery and the cost involved in making a fish available to the creel.

The Alsea, Sandy, and Wilson rivers were used as study streams because considerable background information was available for them from previous studies and because of their close proximity to high population centers. Large numbers of experimental hatchery fish were released to study the various factors influencing survival and catch. Before release from the hatchery, the fish were marked by removing a fin or combination of fins for the purpose of future identification. In addition, the fish were examined for disease and parasites and general condition as well as smolt characteristics.

During the winter months of the past seven years, personnel of the Research Division have made intensive creel censuses to obtain catch data from fishermen so that estimates of total catch of marked and wild steelhead could be made. The number of fishermen and time spent fishing were also determined because of their importance in evaluating the contribution of hatchery fish to the catch. The steelhead angler has been extremely helpful in this aspect of the study in supplying catch information. The success of the study is in large part due to that cooperation and interest.

The contribution of hatchery-reared steelhead to the sport fishery has been increasingly significant on the three streams during the 1957-67 period. The numbers of wild steelhead being caught have remained relatively constant in comparison to the increased harvest of hatchery-reared steelhead.

Determinations of the best time, size and condition of fish to release have



Scale from an adult winter steelhead captured on its second spawning migration. The juvenile fish migrated downstream after two winters in fresh water. It returned on its first spawning migration after two summers of ocean growth.

materially aided the Commission's steelhead production program.

Costs

What about the cost involved in using hatchery-reared steelhead to supplement natural reproduction? It costs about 90 cents per pound to rear and release steelhead migrants. The minimum size for migrants is approximately nine fish per pound. Thus, each migrant released from the hatchery costs about 10 cents. The Alsea and Wilson rivers are stocked annually with about 100,000 migrants. The total cost of releasing that many fish from the hatchery into each stream is about \$10,000. It is apparent then why the Commission is concerned with survival and contribution of the hatchery product and why so much time and effort have gone into the steelhead study. As a result of the success on the Alsea, Wilson, and Sandy rivers, large numbers of hatchery fish have now been stocked in other coastal streams.

Laboratory Studies

Not all the studies undertaken by the Research Division are conducted in the field, for laboratory research is an important part of the program, complementing field studies.

Much of the effort in the laboratory as well as in the field has gone into the identification of the potential migrant

and understanding the factors which control the transformation of steelhead from freshwater to marine forms.

The laboratory research has been centered at Oregon State University since 1965. A laboratory provides aquaria and fish-culturing facilities for the experimental rearing and testing of small numbers of fish, and chemical and histological facilities.

Studies presently under way are aimed at determining the role of day length and temperature in the parr-smolt transformation to the end of defining more closely the changes associated with the transformation for purpose of identifying the potential migrant. The results from such studies are pertinent to the hatchery program and provide a better understanding of the fish from the standpoint of predicting how steelhead juveniles will respond in downstream migration tendencies to changes in the environment arising out of the effect of dams and thermal pollution, for example.

Although considerable progress has been made in the use of artificial propagation as a management technique and in increasing our knowledge of certain biological and physiological processes in the steelhead, many questions still remain to be answered. Future studies will place greater emphasis on factors limiting or controlling the abundance of summer steelhead.

Coast Recreation

(Continued from Page 2)

parking area are recommended at the mouth of Pistol River near Highway 101 bridge.

Myers Creek beach, about a mile north of Pistol River, provides the best razor clam digging on the South Coast. Access is adequate from Highway 101.

Gold Beach Area

The Rogue River, famous for its spring chinook salmon, is a major recreation center of the South Coast. Public boat launching ramps are the most needed facility along the tidal estuary. Two boat ramps are recommended in addition to the boat basin and four-lane ramp planned by the Port of Gold Beach to serve the offshore and tidal areas.

The jetties are popular among fishermen and beachcombers. Both are accessible via county roads and provide many hours of recreation each year.

The many beaches to the north of Gold Beach offer excellent recreational opportunities. Access development is recommended at five strategic locations.

Port Orford Area

Port Orford has long been a commercial salmon port but sport boat activity is nearly nonexistent due to an inadequate boat launching facility. The cove to the south of town offers an excellent location for a boat ramp since it is sheltered in summer from the prevailing northwest winds. Our plan recommends a boat ramp at this location.

North Curry County

Elk and Sixes Rivers are the recreation centers of northern Curry County. Since both streams have good runs of anadromous fish, the recreational potential is centered around fishing.

The Elk, with its shallow tidal area, is best suited to bank fishing. Adjacent land is in private ownership; therefore, over a half mile of shore access is recommended. The Sixes estuary is well suited to boat fishing. Here, too, the entire tidal area is in private ownership. A boat ramp is recommended for this section as well as two areas for bank fishing.

-- Rick Werner



Oregon's "Blue" Jays

MOST species of North American jays are predominantly blue in coloration and are wrongly referred to as blue jays. The real blue jay is a bird of the eastern half of the United States, while in the west the bird commonly called blue jay is either a scrub or Steller's jay.

The scrub jay, or California jay as it is frequently called, is a bird of the scrub oak patches and brushy areas, preferring such cover to the evergreen forests inhabited by other species. It has one of the most peculiar distributions in the state of any Oregon bird, ranging widely through the Willamette, Rogue, and Umpqua Valleys and in the brushy areas in Klamath and Lake Counties. Small isolated colonies are also located near The Dalles, Brookings, and in the Steens Mountains.

Steller's jays enjoy a wide distribution and are a common species in or near all of the coniferous forests in the state. They are absent only from the grasslands and desert regions of eastern Oregon.

The Steller's jay can easily be distinguished from the scrub jay by a conspicuous black crest which is held erect except when this bird is in flight. No other western jay wears such an adornment. The foreparts of its body are black, and the back half, including the wings, belly, and

tail, are deep blue. In the scrub jay the head, wings, and tail are blue while the underparts are gray and the back a pale brown.

Like all jays, these two species are noisy and boisterous, with screams and calls echoing through the woodlands whenever an intruder appears. The Steller's jay is a superb mimic and will reproduce the scream of a hawk or eagle, or the call of a crow. About their nests, however, jays become silent and secretive and are seldom observed.

Over 70 percent of the diet of both the scrub and Steller's jays is composed of vegetable matter such as acorns, seeds, and fruits. They are especially fond of nuts, and when a filbert or walnut orchard is located near their woodland habitat, their persistent raids often result in considerable economic loss to the farmer. What they can't eat they carry away and hide in a tree or bury in the ground.

Much of the animal matter consumed is composed of insects and other invertebrates. In the spring they acquire a somewhat tarnished reputation as devourers of the eggs and young of song birds. Despite these bad habits there is no evidence that predation by jays has caused serious damage to any bird population.

-- C. E. Kebbe

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