



## Clackamas River Experimental Area

By C. J. CAMPBELL, Field Agent

A common topic of conversation among sportsmen in recent years is the increasing difficulty of catching trout as civilization encroaches more and more on the back country. However, in 1947 a section of stream within 60 miles of Portland furnished anglers with 80 per cent more trout than it did in 1946. As this was the culmination of a series of events, let us see what led up to it.

By 1940 various conservation agencies realized that, if good angling was to be maintained in the face of increasing angling pressure and other results of industrialization and population gains, the best management techniques would have to be developed and applied to Oregon's waters. One of the many questions in need of answers was what happened to hatchery trout after their release in the streams. Other questions were the best species to plant, the best time of year to plant them, and most efficient size to plant. In view of this the Oregon State Game Commission, the U. S. Forest Service, and the U. S. Fish and Wildlife Service decided to set up a test stream in Oregon on which the answers to all these questions might be sought.

### Study Area Selected

The Clackamas River was chosen for the study as it is a heavily fished stream close to a metropolitan area, is somewhat typical of the streams of the west slopes of the Cascades, and was not producing the fishing expected of it. After a preliminary survey it was decided to limit the study to a relatively small section of the stream to obtain satisfactory control. An area that included about seven miles of the Clackamas and one mile of the Collawash was readily available to the angler by a dead end road which made it necessary for anyone entering the area to return by the same route, so this portion was selected. This section is about 30 miles upstream from Estacada and just south of the Oak Grove Ranger Station. A checking station was set up on the dead end road where all anglers had to pass.

A stream survey showed the river in the area has a "B" rating on size, type, and frequency of pools. The water is practically neutral and contains little dissolved minerals. The dissolved oxygen content, as would be expected in such a stream, is very satisfactory for salmon-

oid fishes. In production of trout foods this stream is a poor average. A comprehensive examination showed less than one and one half cubic centimeters of trout foods per square foot.

The comparatively ideal conditions for the study that existed in 1941 when anglers made up practically all traffic into the area did not remain unchanged. During the war logging operations were started in this vicinity with more roads and road construction and a widely varied and much increased traffic. Also the checking station had to be moved to a less advantageous position and the lower mile dropped from the study. During the last season of the study a road construction camp was located within the area and further complicated the checking.

(Continued on Page 7)

## Trout Season Opens May 1

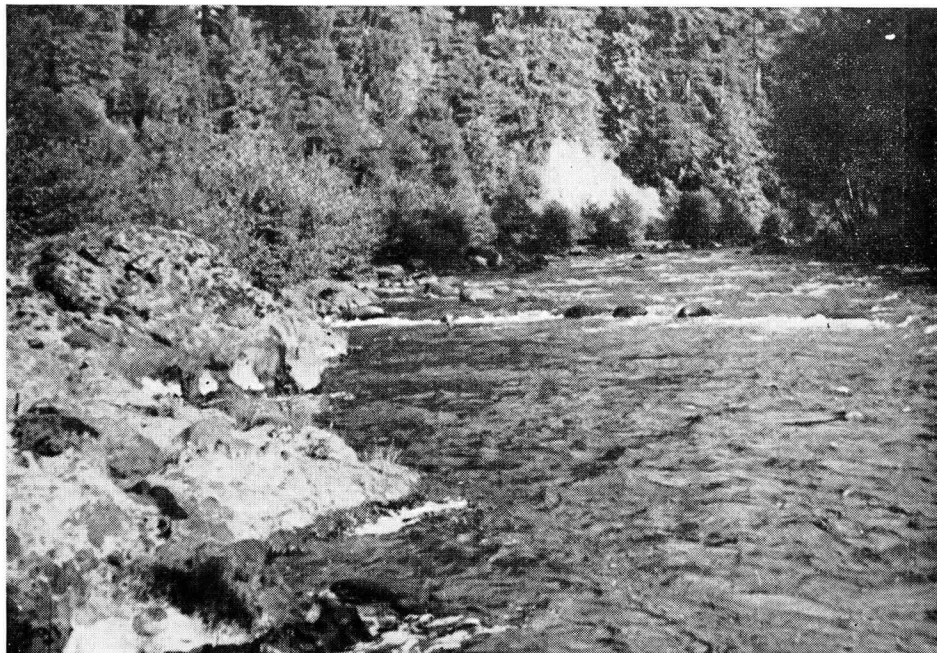
This month finds the trout fishermen busily making final preparations for the annual opening of the season, which this year occurs on the first of May except that the opening for tidewater areas is delayed until June 15.

With the general closing date on September 30, this provides the angler with a five-month season. Coastal waters however have their season extended until October 31 in order to permit some fishing of the fall run of cutthroat (harvest) trout. Included in this latter category are those waters that are tributary directly or indirectly to that part of the Columbia River below the northern city limits of St. Helens, and those waters south of the Columbia River that are directly or indirectly tributary to the Pacific Ocean.

Bag limit is the same as last year, 10 fish but not to exceed 15 pounds and 1 fish in any one day, and 20 fish but not to exceed 30 pounds and 2 fish in any 7 consecutive days or in possession at any one time. There is no limit, however, for whitefish or Dolly Varden.

Minimum length limit for trout is six inches except that a limit of eight inches

(Continued on Page 3)



Above the Oak Grove Fork on the Clackamas River.

## ☆ THIS AND THAT ☆

With this issue, the BULLETIN starts off on its third year. Five thousand copies were printed of the first issue while the current number of copies being printed is 34,000.

\* \* \*

Preparations have been made to conduct a limited big game salting program on a statewide basis. Salting will be done in close cooperation with all land administration agencies concerned. Experimental work in the Northeast District as well as in other states has shown the advisability of strategic salting in big game management, not only to provide salt where it is lacking but also to help distribute herds.

\* \* \*

Two canvas water tanks have been purchased and will be installed this spring on the Deschutes Forest in an endeavor to effect a more desirable distribution of deer in this area. These tanks are intended to provide a summer source of water for deer on an area supplying an abundance of food. If deer can be maintained in the area during the summer months by this procedure, it will relieve a serious concentration on Paulina Creek in the Deschutes Refuge.

\* \* \*

The annual statewide upland game census has been completed and a very satisfactory carry-over of breeding stock has been noted. Weather conditions have remained favorable for upland birds in most areas of the state and no reports of losses of birds have been received. However, hunting conditions and regulations for the 1948 upland game seasons will be largely dependent upon the success of the spring brood survival.

\* \* \*

A spawning crew has gone into Crane Prairie on the Deschutes River and eggs will be taken again there this year as in past seasons.

\* \* \*

Two field agents are beginning intensive work on spiny-rayed fish (bass, crappie, etc.) waters in the Portland area. There are many excellent areas for fishing warm water varieties in the lower Columbia and Willamette valley and the Game Commission is hoping to develop angling for this type of fishes and so relieve pressure on the trout streams.

\* \* \*

Critical shortages of fresh meat products for fish food still exist and all possible sources are being tapped by the purchasing department, one order for 50,000 pounds being placed as far away as Georgia which was the nearest source available within the price range. The fisheries department is studying the possibility of extending the use of meal type of fish food when fresh meat products are not available.

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## March Meeting of the Game Commission

The Oregon State Game Commission held its regular monthly meeting on March 12 and 13 at its offices in Portland. The following business was transacted:

With reference to a request from the Enterprise Chamber of Commerce to have mountain sheep or goats stocked in primitive areas of the Willowa forest, the department was instructed to investigate the cost and feasibility of the proposal.

A letter was read from the Jefferson County Rod and Gun Club urging the Game Commission to prohibit fishing in all waters not accessible to the general public pursuant to resolution passed by the Oregon Wildlife Federation. As the law does not empower the Commission to make any angling regulations except at the statutory hearing in January, the matter was deferred for future consideration.

(Continued on Page 6)

## Commission's Expansion Program Underway

The following projects are receiving first consideration in the Game Commission's expansion program to meet the increasing demand for fish and game.

### Hatcheries

A new hatchery for the coast area has been authorized and engineering investigations of several prospective sites are being made at the present time. It is hoped to have the site selected in time to have the new hatchery in production for the 1949 season. At the present time there are four hatcheries on the coast, Brush Creek in Curry county; Bandon in Coos county; Alsea in Benton county and Cedar Creek in Tillamook county.

The new Wizard Falls hatchery on the Metolius river is nearing completion and will be in operation this coming season. It will have an approximate capacity of 2,000,000, and has the possibility of future expansion if it is decided to augment the present spring water supply with water from the river.

Improvements have been started at the Bandon hatchery, where the recent high water washed out the dam. Work includes rebuilding of the water supply dam; repairs to hatchery building; putting concrete bottoms in two ponds; construction of new rearing pond; repair of assistant foreman's residence; and installation of flood protection wall.

The Roaring River hatchery in Linn county is being revamped and production will be doubled. Former capacity was 2,000,000 (2" fish) and increased capacity will be about 4,000,000. Improvements include new dam, pipe line, utility building, two residences, and a number of new ponds.

At the Rock Creek hatchery on the Umpqua river, the capacity is being increased from 1,000,000 (2" fish) to 2,000,000. Work includes new dam and water supply line; relocation and rebuilding of all brood and rearing ponds; and installation of new cold storage plant in the former hatchery building.

Leasing of the Fish Commission holding ponds at Gate Creek will increase the production of the McKenzie hatchery by nearly 1,000,000 fish. These ponds can be placed in production this season at a nominal cost as the only work required is placing of new screen frames and cleaning out debris and the intake to the water supply system.

Completed improvements at the Butte Falls hatchery on the Rogue river increased the capacity of that station by approximately 800,000 fish, and production capacity at the Willowa hatchery has been doubled.

### Stream Improvements

Continued attention is being given to improving conditions and providing protection to the fish already in the streams. Stream improvement crews have been re-

(Continued on Page 5)

## Trout Season Opens May 1

(Continued from Page 1)

has been established in the following coastal waters to provide protection to the fingerling steelhead, trout and salmon on their downstream migrations:

Main Umpqua River below the forks and the stream systems tributary to its tidewater portion.

Rogue River and its tributaries in Curry county below and including Mule Creek on Rogue River and below and excluding Indigo Creek on the Illinois River.

All waters (including lakes) tributary to or in drainage basins tributary to the Columbia River below the north city limits of St. Helens.

All waters south of the Columbia River (including lakes) tributary to or in drainage basins tributary to the Pacific Ocean.

A minimum length limit of 10 inches will prevail in Diamond Lake and Owyhee Reservoir. Except in Duck, Twin and Fish Lakes, no length limit for eastern brook will prevail in those lakes in the Wallowa mountains above 5,000 feet in elevation, because these lakes are overstocked with small fish.

Numerous lakes and streams have special seasons and limits and anglers will find exceptions to the foregoing general regulations listed by county in the 1948 Angling Synopsis.

## Spring Trout Liberations

Releases of near legal-size hold-over trout from the Game Commission's hatcheries are under full swing. At this writing, 476,000 rainbow trout have already been liberated from the Klamath, Rock Creek, Butte Falls and Roaring River stations. Legal-sized cutthroat trout numbering 100,000 have been released in Coos and Douglas counties from Bandon Hatchery. These fish were distributed into coastal streams and lakes.

The four tank trucks of the liberation department also distributed legal rainbow from Roaring River and Oak Springs Hatcheries. Oak Springs Hatchery held over 300,000 legal rainbow which were allocated to the Deschutes River and other waters of central Oregon. The 100,000 rainbow at Roaring River were placed mainly in the Santiam and Clackamas River systems, and other tributaries of the Lower Willamette.

The trucks were scheduled next for Cedar Creek, Willamette and Wallowa Hatcheries. Cedar Creek held over 200,000 legal cutthroat and 100,000 steelhead yearlings. Willamette station had 100,000 hold-over rainbow trout, and Wallowa Hatchery 200,000 rainbow of near-legal size. Other hatcheries still holding fish of this size are as follows: Butte Falls, 124,000 rainbow; Alsea, 100,000 cutthroat and 50,000 steelhead; Hood River, 150,000 rainbow; Klamath, 100,000 rainbow and 200,000 eastern brook trout;

Brush Creek, 100,000 cutthroats; and McKenzie, 300,000 spring rainbow.

Earlier releases of smaller sized fish are as follows: Wallowa, 218,250 yanks; Cedar Creek, 538,000 silver salmon and 37,000 chum salmon; and Alsea, 20,000 steelhead. Butte Falls first released 50,000 yearling silver salmon, and later distributed approximately 1,000,000 silver salmon fry and 494,000 chinook salmon.

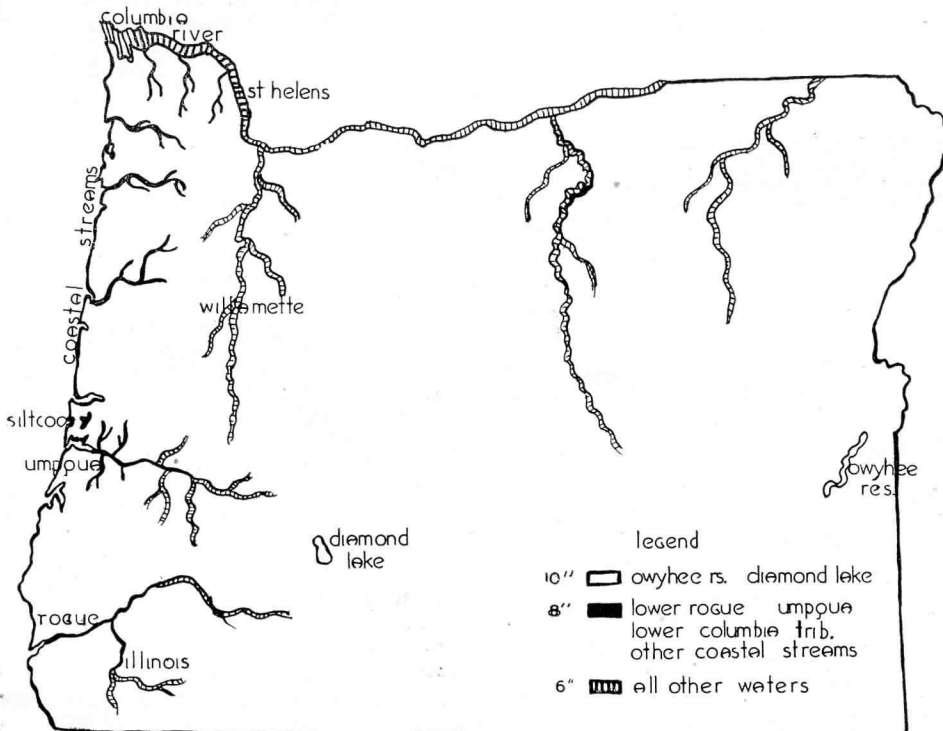
## In the Light of The Moon

Of the many alibis so profusely used by the angler, the one most commonly heard is that the full moon has an adverse effect on fishing. Who has not heard the crestfallen angler, returning with an empty creel, make a feeble attempt to explain his unfortunate situation by condemning the wind, the weather or barometer. Should the day include a broken fly rod and snagged waders the fevered comment would undoubtedly incorporate the "blankety blank" Game Commission. Had an unproductive day fallen within a certain period of the lunar month most surely the blame would have been emphatically placed on the full moon.

The angler's belief in moon phases and their effect on fishing has stimulated investigations by certain fishery managers to determine whether or not this connection could be proven valid by comparing catch records. The fishery worker usually determines whether a stream or lake produces good or poor fishing by recording the time it takes the angler to catch fish. Thus a stream or lake in which the average angler caught four fish in an hour's time would be considered better than another body of water in which the average was only one fish per hour. If the full moon does affect fishing, then one would assume that the average angler would catch fewer fish during the full moon periods.

A Canadian worker, Dr. Charles M. Mottley, in his report on Paul Lake, British Columbia tested the significance of this belief by using five years of creel census data. By comparing the average monthly and yearly catches with catches made during the full moon, it was possible to arrive at certain conclusions. Although smaller catches were made during a number of full moon periods they were thought to be due to chance variation. Thus Mottley makes the following statement, "The moon may have an effect on fishing but, if so, it does not seem to be great enough to be of practical importance. If one were prepared to act in this belief, and if he had a choice of several days on which to go fishing in this particular lake, he should not let the phase of the moon influence his choice;

(Continued on Page 6)



Trout minimum length limit regulations as applied to waters in different sections of the state. A few typical streams and lakes for each area are indicated. Angling Synopsis should be consulted for detailed information.



## Game Code Arrests Increase

The recently released annual report of the Department of State Police shows a 30 per cent increase in the number of arrests for game law violations over the previous year. In 1946, the arrests totalled 1,832 compared to 2,431 for 1947. Part of this undoubtedly may be accounted for by the increased number of hunters and anglers and also to additional law enforcement officers in the field.

Hunting or angling in closed areas, during prohibited hours or with prohibited methods, were the chief causes of arrest. Failure to buy a license and failure to tag big game also resulted in a high number of apprehensions.

### ANNUAL REPORT Department of State Police 1947 Game Code

	Warn.	Arrests	Acq.	Sent.	Fines
Angling:					
Closed Season .....	8	46	..	....	\$ 820.65
Prohibited areas, hours, or methods....	44	435	5	.33	11,458.25
Disguising:					
Sex of Deer.....	2	5	..	....	125.00
Species or Kind of Bird.....	..	1	..	....	25.00
Exceeding Bag Limit.....	1	72	4	.15	2,151.68
Failure to Heed Citation for Violation					
of Game Laws.....	..	1	..	....	19.00
Failure to Tag Properly or At All.....	15	135	5	1.38	6,442.00
False Application for License.....	..	3	..	....	60.50
Hold Game Animal, No Permit.....	..	4	..	....	95.00
Hunting:					
Closed Season .....	8	161	12	4.71	6,779.20
Prohibited Areas, Hours, or Methods....	115	484	27	3.65	15,282.19
Illegal Sale of Hunting License.....	..	1	..	....	25.00
Lending Hunting License.....	..	2	1	....	25.00
Molesting Game Animals, Birds.....	..	6	..	.08	332.00
No Fish Ladder.....	..	1	..	....	150.00
No License:					
Angling .....	122	280	6	.35	5,914.40
Fur Dealer .....	..	2	..	....	50.00
Game Breeder .....	..	4	..	....	100.00
Guide .....	..	3	..	....	175.00
Hunting .....	106	121	5	.54	2,959.88
Non-Resident .....	..	59	6	.12	1,363.30
Trapping .....	7	12	1	.24	183.00
Other .....	1	....	..	....	....
Permitting Dog to Run Deer.....	..	1	1	....	....
Possession:					
Game Animal .....	..	238	5	7.87	15,426.80
Game Bird .....	..	100	3	.32	3,082.00
Game Fish .....	..	163	3	.32	4,006.10
Sale Game Animal, Bird, Fish.....	..	3	1	....	100.00
Trapping:					
Closed Season .....	..	5	..	....	545.50
Prohibited Areas or Methods.....	..	2	..	....	75.00
With Unbranded Traps.....	1	5	..	....	100.00
Trespassing .....	..	11	1	....	196.00
Unlawfully Disturbing Traps.....	..	1	..	.06	25.00
Using License of Another.....	..	5	..	....	112.50
Wanton Waste of Game.....	..	20	2	.16	862.00
<b>TOTALS.....</b>	<b>436</b>	<b>2,431</b>	<b>91</b>	<b>20.51</b>	<b>\$81,948.45</b>

13.27 years suspended — \$7,871.05 remitted.

Licenses and Bag Limits Checked O. K.:

Angling .....	26,550
Fur Dealer .....	1
Guide .....	3
Hunting .....	30,331
Trapping .....	240
Other .....	8
Predatory Animals Killed.....	31

## Deer Spotlighting Expensive

That the price of deer meat can come rather high even when compared with current market prices is being impressed upon deer spotlighters appearing before some courts of the state.

Recently Justice of the Peace Frank Shelton of Estacada fined two local residents, Robert J. Moore and Forrest W. Carpenter, a total of \$459 and set a precedent by confiscating their automobile as well as their guns and spotlight.

Four Lane county residents, Robert R. Durham, Don V. Stickles, Milton E. Worley of Cottage Grove and Ralph V. Conklin of Dorena, were fined a total of \$705 by District Judge Chester Anderson. Their rifles and spotlighting equipment also were confiscated.

When Merrill Jack LaMar and Clark Keister were convicted of spotlighting in the court of Justice of Peace A. E. Haaglund of Tillamook, they were assessed a fine of \$400 each, plus court costs, and their hunting equipment was confiscated.

The last legislative session amended the existing law to provide that convicted spotlighters shall be punished by a fine of not less than \$150 or by imprisonment in the county jail not less than 30 days. The fine may be as high as \$1,000.

## Rogue River Hearing Set for June

The U. S. Reclamation Service has announced it will hold a hearing on the Rogue River Basin Project on June 8 at the Armory Building at Medford. At that time a complete discussion will be held on all phases of the project, including recreation and fisheries. This will be an important meeting for sports fishing interests will be materially affected if dams are constructed on the main Rogue River as tentatively planned.

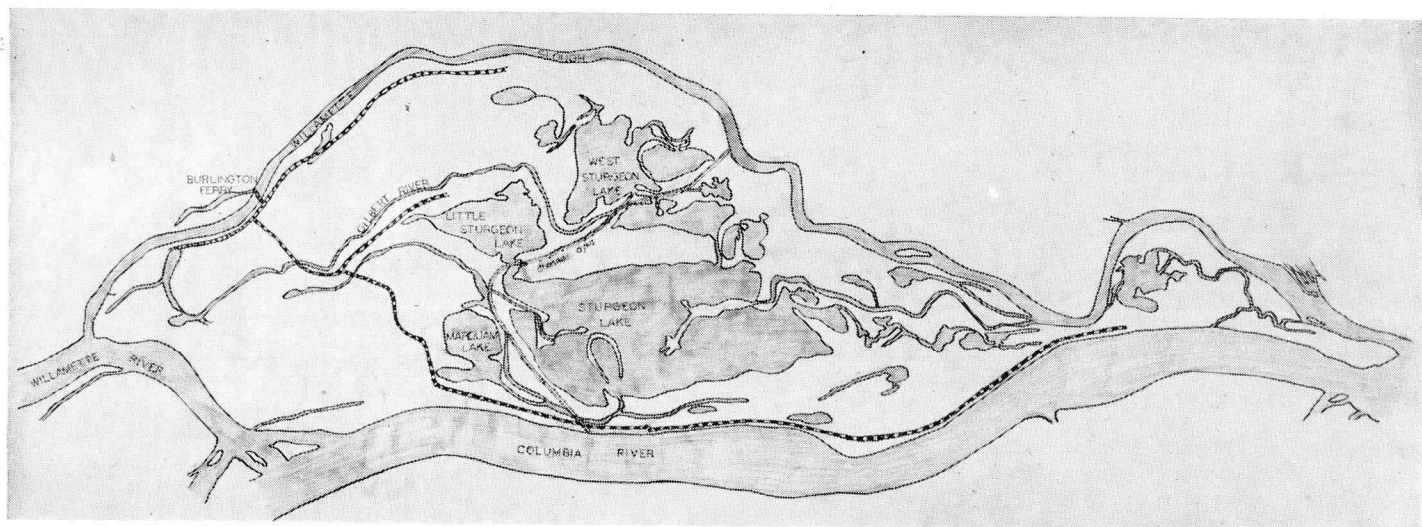
## Martin Reappointed

Commissioner Kenneth S. Martin was reappointed February 25 by Governor Hall for another five-year term on the Game Commission. He was first appointed in February, 1943 but was on a leave of absence during the war.

## APRIL-MAY CALENDAR

Species	Open
Salmon, Steelhead,	
over 20", ex-	
cept coast waters....	April-May
Trout, except tidewater. . .	May
Jack Salmon under 20" . . .	Same as salmon
Spiny-rayed fish. . . . .	April-May
Predatory animals. . . . .	April-May

NOTE: For specific exceptions, consult official synopsis of hunting or angling regulations.



Sketch of Sauvies Island showing the main lakes and road, as well as the drainage dyke that bisects the island. Land being acquired by the Game Commission for wildlife management area and public shooting ground is below, or to the right of, the dyke.

## Sauvies Island to Provide Another Shooting Ground

Sauvies Island, the waterfowl center of western Oregon, has been selected by the Oregon State Game Commission as the site of Oregon's third public shooting ground and management area.

This island extends from the mouth of the Willamette River fifteen miles down the Columbia and has been the center of waterfowl hunting in the area west of the Cascade Mountains since the Frenchman, Monsieur Sauvie, started a dairy there to supply Fort Vancouver with butter and milk in its early days.

The island is composed of about 25,000 acres of low alluvial soil originally interspersed with numerous ponds, sloughs and lakes. About half of the island has been dyked and drained by the U. S. Army Engineers, which ruined such well known hunting and fishing grounds as Little Sturgeon, Marquam, Foley, Mouse Island, Dry and Wilnot lakes and the upper part of the Gilbert River. The Oregon State Game Commission is planning to acquire approximately 10,000 acres outside the drainage district to develop a game management area and public shooting ground. This area includes in round numbers 1,400 acres of cultivated lands, 800 acres brush, 4,400 acres of pasture land and 3,400 acres of water, including Big Sturgeon Lake, Lower Gilbert River, Crane and Cunningham Sloughs.

Acquisition is now under way but it is anticipated that not enough acquisition or development will have been accomplished to permit any shooting on state-owned lands during the 1948 hunting season. Some, however, will undoubtedly be available by the time the 1949 hunting season comes around.

Development of this area will include the raising of domestic grain on the cul-

tivated lands for waterfowl and upland bird feed, stabilizing of water levels by dams and water controls followed by the planting of aquatic and semi-aquatic duck foods, management of grazing for the benefit of wildlife, predator control, strict law enforcement, and the construction of roads, trails, duck blinds and picnic grounds.

Half of the area will be closed to hunting to maintain a resting and feeding area to hold migrating waterfowl in this district. The rest will be opened to public hunting under a controlled system. The number of hunters on the shooting grounds each day will have to be limited, probably by drawings, and assignments made to definite shooting spots to give a fair and successful shoot to all.

The feeding and resting area on Sauvies Island will not only help the public shooting grounds there but will also help the waterfowl hunting along the Columbia River and the Willamette Valley.

Federal funds allocated to the State of Oregon by the Federal Aid in Wildlife Restoration Act will furnish three-fourths of the money for this land acquisition and development. The cost of administration will be a direct obligation of the State Game Fund.

Oregon's first public shooting ground (Summer Lake) was put in operation in 1944 and has proven so successful that the program is being expanded quite rapidly.

In addition, Sauvies Island will be the most outstanding spiny-ray fishing ground in the state, and the asset has not been overlooked in preparing the development and management plans.

Just before the molting period, ducks and geese fly to bodies of water where they will be safe from land enemies. The reason is the fact that they molt their primary feathers all at one time and, for a short period, cannot fly.

## Commission's Expansion Program Under Way

moving log jams and blasting out natural barriers and abandoned dams; installing fishways over existing dams; and checking on logging and mill operators in an effort to keep sawdust and other debris being dumped where it will be washed into the streams.

The screen crews have extended their operations in central and eastern Oregon and several hundred new screens will be installed in irrigation ditches before the irrigation season in time to keep fish from going down the ditches and on to the fields and orchards. Oregon is probably the only state in the Union that has its own screen factory for constructing fish screens on a mass production basis. This factory is located at Central Point in Jackson county.

### Game

Work is being rushed at the new game farm located five miles out of Hermiston in Umatilla county and it is expected to be under partial production this season. This farm will eventually replace the old Pendleton game farm.

Preliminary engineering work has been completed on the Camas Swale wildlife management area and public shooting ground in Lane county and development work will be started within the next few months.

Approval of the acquisition of a large tract of land in the northern part of Sauvies Island will eventually provide the sportsmen with possibly the finest waterfowl management area and public shooting ground on the west coast. Acquisition and development will take several years, however.

Improvement of big game and upland game habitat is receiving continuous attention by the crew of field agents stationed the year around throughout the state.

## Commission Adopts Willamette Valley Project Report

The 100 page report on the Willamette Valley Project prepared jointly by the staff members of the Oregon State Game Commission and Fish Commission of Oregon was presented to the Game Commission at its March meeting and adopted. The report covers in detail each of the 19 proposed dams recommended for construction under the Willamette Valley Project by the Corps of Engineers and the anticipated damage to fish and wildlife resources, including game fish, steelhead, salmon and wildlife such as ducks, furbearers and upland game. Many phases of the project will vitally affect the welfare and survival of these resources in the Willamette Basin. Every large tributary, except the McKenzie River, will be completely obstructed to upstream migrations of fish inhabiting the rivers and about 90 per cent of all migratory species will be banned from their ancestral spawning grounds.

For the amelioration of harm to game fish resources, three game fish hatcheries are recommended for construction at a cost of slightly over \$1,000,000. It is recommended that 1,543,000 legal sized fish be reared annually and planted in the Willamette River and its tributaries. Annual operation of three hatcheries is calculated to cost \$59,695 per hatchery. In addition a research and management program on game fish is proposed that will cost \$25,000 a year.

For the protection of commercial fisheries it is recommended that three new hatcheries be built on the Middle Fork Willamette, South Santiam and North Santiam rivers, and that the present Fish Commission hatcheries on the McKenzie and North Santiam rivers be expanded and used along with the new hatcheries for salvage of runs of salmon and steelhead blocked by the proposed dams. A total direct cost of these facilities is estimated at slightly over \$2,000,000 with annual operation cost of approximately \$468,000. In addition, a hatchery management study program is proposed that will cost \$25,000,000 annually.

The report includes recommendations for minimum flows to protect fishery resources, and modifications in channel improvements to protect aquatic resources.

Existing big game and upland game habitat will be completely removed to the extent of 31,957 acres, as a result of inundation of the impoundment sites. Waterfowl will be affected adversely by the project, due to the complete removal of at least 138,700 acres of winter habitat as a result of drainage. In addition, any channel closures, filling of existing sloughs, channels and ox-bow lakes, will remove the habitat involved for both resi-

dent and migrating species. The impoundments created will function as migratory waterfowl resting areas in varying degrees, but the lack of both aquatic plants and stable water levels will incur a hazard for this resource for which provisions must be made. An adverse condition will result for furbearer resources throughout the Willamette Valley, in addition to the actual impoundment site, from bank protection, cut-off channel closures, and maintenance of bank full stages over a longer period of time. It is believed that negligible effects will result for upland game.

For the alleviation of damage to game resources the following general procedures are recommended:

**Big Game and Grouse** — Supplemental law enforcement at and adjacent to impoundment and other construction sites.

**Waterfowl** — (a) The acquisition and maintenance of not less than an average of 200 acres of suitable land annually planted to suitable cereal crops for waterfowl and upland game at Fern Ridge, Cottage Grove, Dorena, Holley, and Lewisville dams. A provision for sufficient funds to carry out the above.

(b) The establishment, management and maintenance of at least 9,907 acres of permanent marsh at suitable locations throughout the Valley, as a partial replacement of habitat lost and in conformity with present Willamette Valley waterfowl development program of the department.

**Furbearers** — (a) A 5-year research program to determine means of retaining and managing fur resources in the drastically altered habitat, resulting from the Project.

(b) Provision of funds to support maintenance of a fur resources management program following the initial investigative stage.

**Upland Game** — It is requested that each right-of-way acquisition to be undertaken for dikes, canals, levees, irrigation canals, have the provision attached thereto that the appropriate administrative agency shall have the authority at any time to set up any portion or portions, either continuous or in intermittent blocks, of these right-of-ways as wildlife sanctuaries for the benefit of upland game, waterfowl and furbearing animals. Also, it is recommended that a program for the planting and maintenance of such food or cover, at any time on these right-of-ways, as will not interfere with the primary intent of the construction or the local agricultural economy, be assured to the appropriate administering agency.

During the hatching season, wild turkeys make a hissing sound in imitation of a snake as a protection against disturbers seeking their eggs.

## March Meeting of the Game Commission

(Continued from Page 2)

It was ordered that the Pendleton game farm property be offered for sale and that sealed bids be advertised for, the Commission reserving the right of possession until July 1.

It was also ordered that sealed bids be called for the pasture land at the Hermiston game farm, the Commission reserving the right to manage and control all wildlife on the property.

Easement across the Rock Creek hatchery property to the California-Oregon Power Company was approved.

The department was instructed to investigate possibility of acquiring shooting rights on tule lands southeast of LaGrande.

The game department was instructed to prepare a statewide program for establishment of developmental areas to demonstrate practicability of habitat improvement.

It was decided that 4-H Club members participating in pheasant rearing projects be paid \$1 a bird instead of 75 cents as in previous seasons.

Construction of a fence around the fishway at Savage Rapids dam was authorized.

Cancellation of a license agency at Grants Pass was ordered upon information received that a pre-dated fishing license had been sold to an angler following his arrest for fishing without a license.

It was ordered that the department negotiate again with the Chewaucan Cattle and Land Company for the use of a portion of their holdings in Lake county as a public shooting ground under arrangements similar to last year.

The department of predatory control was instructed to include plans for predatory bird control in its general control program.

## In the Light of the Moon

(Continued from Page 3)

furthermore he should not use the phase of the moon as an alibi in case he 'enjoyed' poor fishing."

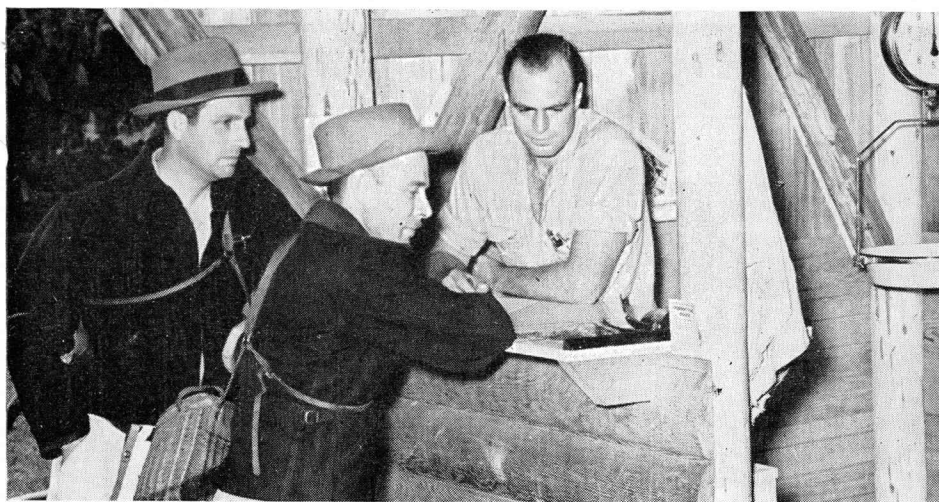
Dr. Stillan Wright of the U. S. Fish and Wildlife Service, has made a similar study of Fish Lake, Utah. In checking the records of anglers trolling and fly fishing he found that there were no significant differences in the catches made at the time of the new and full moon over a three year period.

The above investigators clearly state that their findings apply only to the waters studied. Thus the belief of the full moon and its effect on fishing may be proven valid on other lakes or streams.

Many anglers fishing Diamond Lake,

(Continued on Page 8)





Anglers being checked out of study area by Game Commission personnel.

## Clackamas River Experimental Area

(Continued from Page 1)

### Methods Used

Two primary tools were used in the study. One was plantings of marked trout and the second was a 100 per cent creel census of the area. Trout to be planted in the area were marked at the hatchery for future identification by the removal of one or more fins. It had been demonstrated that this has no detrimental effect on the fish, and if the fins are removed properly, regeneration is insufficient to invalidate data obtained. As the only way into the area was a dead end road, all anglers passed the checking station entering and leaving the area, and an attendant was on duty at all times. When a fisherman entered the area he was informed of the study and his cooperation requested. On his return his catch was segregated into two inch size groups and weighed, and this data plus other pertinent information was used to fill out a census form. A form was completed for each angler regardless of his success, and these data compiled for each day, week, and month.

The first season of operation was 1941. Before the season opened that year, 40,000 marked rainbow averaging about 3 inches were planted in the area, and after the close of the season 40,000 more of approximately the same size were liberated. The spring planted fish were of spring spawning stock, and the fall planting of fall spawners. Both were from the Oak Springs Hatchery.

During this season, which was six months long, 2,093 anglers fished in the study area. They caught 8,673 trout at an average rate of one fish in 0.92 hours. However 75.9 per cent of these fish were under 8 inches in length.

Because of the small size of the fish planted in the spring no returns of the marked trout were expected during the

1941 season. However a few of the larger individuals did reach legal size and 156 were removed in the catch. Over 700 were reported caught and released. The advent of war caused this area to be closed to the public, and the study had to be discontinued for the duration. It was possible to make one day's test fishing in the area in 1942, when 78 legal fish were caught of which 18.6 per cent were marked. As was to be expected most of these were from the spring plant. This indicated a fair survival and that the fish were not leaving the area. There was a further and unforeseen development in 1944 and 1945. During each of these years, four adult steelhead were found in catches in the Columbia River, carrying the marks of the fish planted in the Clackamas in 1941. Considering the gauntlet of dams and pollution between the upper Clackamas and the sea a large number of the trout must have attempted the journey for 8 to have completed it. Five of these fish were spring spawners and three, fall spawners. This circumstance is a strong indication that trout in the Clackamas tend to leave the stream and try to go to sea as they become older and larger.

### Study Resumed After War

After the war was over and personnel again available the study was resumed under an agreement between the Oregon Game Commission and the U. S. Forest Service. Conditions had changed since 1941; the road into the area had been improved to handle log trucks, and its new location made it necessary to move the checking station and to drop a mile from the study area. This mile included a forest camp and some very popular fishing water.

Since it was thought that a complete closure had been in effect all during the war, no planting was made prior to the opening of the angling season. It seemed like a good opportunity to learn the results of such a closure. A planting was

planned for later in the year, and about 30,000 marked fish averaging three and one quarter inches were put into the stream in the study area near the close of the season.

It became apparent that the closure had not been effective, particularly during 1944 and 1945. This coupled with no stocking during the war resulted in a reduced angler success. The season had been cut to five months and the lower mile of popular water dropped from the area, yet more anglers, 2,298, were checked than in 1941. These fishermen caught 5,006 trout at an average rate of 1.54 hours per fish. However 81.5 per cent were under 8 inches.

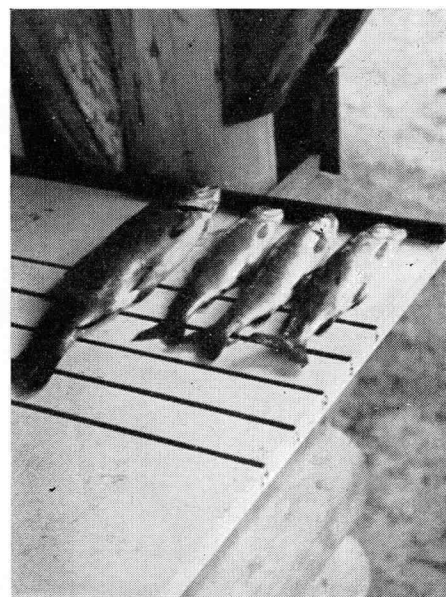
Since scale studies had indicated that few fish were found in the stream over 5 years old, none of the marked 1941 plants were expected in the catch, and none were found. The examination and measurements made on scales collected during this season from fish undoubtedly hatched in the river, showed a slow growth rate. At the end of two years a trout in this stream is still just under legal size of six inches. This is due in part to a rather low food supply, and in part to low water temperatures during a large part of the year.

### 1947 Season

Logging and road building operations continued in the area and by the 1947 season roads that had not been improved were almost impassable, and during the whole season there was seldom a time when at least one section of the road was not in a condition to make travel by conventional automobile difficult. Also a road construction camp had been placed in the study area, and this made checking much more difficult.

The poor results of the 1946 season in-

(Continued on Page 8)



Clackamas River Rainbow Trout.

## Oregon State Game Commission Bulletin

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P. O. BOX 4136  
PORTLAND 8, OREGON

licated that this would be a good time to make a plant of legal sized fish in the area, so, about three weeks before the season was to open, a heavy plant of nearly 30,000 marked rainbow of legal size were placed in the stream.

The season was further reduced to 4 months, but in spite of this and the poor road conditions almost as many anglers, 2,265, fished the area as in 1946. Most of this pressure was during the first three weeks of the season with Sunday anglers practically elbowing for room to fish. The bag limit was reduced to 10 fish but these anglers caught 9,010 trout at an average rate of 1.05 hours per fish. The percentage of fish under 8 inches dropped back to 75, an improvement over 1946 and a slight improvement over 1941. This catch is an increase of 80 per cent of fish in the creel for an identical section of stream over 1946. However during one week when 102 of 337 anglers took limit catches there were 75 who returned with empty creels. Evidently poor success is not always caused by lack of fish.

Of these 9,010 trout, 6,399 were marked fish, and all but 9 of the marks were of the spring plant of legal sized fish. The 9 were from the 1946 fall plantings, the rest of which were not in evidence. Of course, most of this fall plant could not have reached legal size by the 1947 season, but whether this is the reason they did not show up or whether they had disappeared from the area cannot be definitely stated. The spring plant, however, furnished 71 per cent of the season's catch. Other records from the lower Oak Grove Fork, from above the study area, and from the Clackamas below the study area increase the known take to 7,674 of the 1947 marked fish. This is 25.6 per cent of the plant. As many more were taken below the area on which no records were obtained it is felt that 35 per cent is a conservative estimate of the part of this plant that was harvested during the first season of availability. It is also known that at the close of the season 50 per cent of the catch was still made up of marked trout, indicating a considerable number remaining in the vicinity of planting. If they continue to remain there, they will add to the total recovery from the plant in future seasons.

### Three Season Comparison

The table presents a comparison of the

ITEM	1941	1946	1947
Miles of Stream.....	8	7	7
Months of Season.....	6	5	4
Bag Limit .....	15	15	10
Number of Anglers.....	2,093	2,298	2,265
Number of Trout Caught.....	8,673	5,006	9,010
Average Fishing Day.....	3.8 hrs.	3.36 hrs.	4.2 hrs.
Average Catch .....	4.14	2.18	3.98
Average Time Per Trout.....	0.92	1.54	1.05
Per Cent Under 8 Inches.....	75.9	81.5	75.0
Number of Limit Catches.....	152	79	382
Number of Empty Creels.....	756	1,270	643

three seasons of operating of the Clackamas Study area. The number of anglers fishing in the area shows remarkably little variation. The interaction of other changing conditions resulted in an almost static condition here. There is a considerable change in the numbers of trout caught. The fact that no plantings were made between 1941 and 1946, and that considerable fishing was done during that time resulted in a low catch in 1946. Following the planting of a large number of legal fish in 1947 the catch rose to somewhat above that of 1941.

Perhaps the reason anglers spent more time on the stream in 1947 can be explained by the fact that the road approaching the area was much improved over most of the distance, thus cutting down on travel time to and from home. The average time necessary to catch one trout shows a definite improvement in 1947 over 1946 but is not quite so good as in 1941.

The relationship between limit catches and empty creels is much better in 1947 than the previous years. The reduction in the bag limit to 10 fish undoubtedly accounts for part of this change but not all.

This program has shown that angling can be furnished quickly in heavily fished streams of low productivity by the introduction of legal size trout before or during the angling season. This and other investigations in various parts of the country have shown that by far the greatest return from any plant is during the first season of availability. Planting legal fish for immediate removal cannot provide the type of fishing our fathers knew, but at least it can provide fishing in areas where the demand is above what the streams can naturally produce. The expense of this type of planting is high, but when figured on the cost per fish in

the creel, rather than per fish in the stream, it will usually be found the cheaper method of furnishing angling. It may cost less to plant a large number of small fish in a stream of this type, but if none return to the creel there is no benefit derived from them and the cost is all loss.

In conclusion, sincere thanks are extended to the thousands of anglers whose patient cooperation and interest have made this study possible.

## In the Light of the Moon

(Continued from Page 6)

Oregon are also of the opinion that a full moon results in poor fishing. To test the validity of this belief, records of the past two season's catch were averaged as to full moon periods and compared to the average monthly catch. Here again there was no evidence to support the theory. The catch per hour, which is used as a criteria to determine good or poor fishing, was found to fluctuate from day to day with no indication of a trend toward poor fishing during the full moon periods.

It would seem that the average angler is reluctant to accept defeat as a matter of his own doing, choosing rather, any one of the numerous alibis in preference. Thus the credence anglers place upon certain physical phenomena is no doubt a defensive mechanism developed through time and innumerable fruitless angling attempts. By having a store of alibis within grasp he can return empty handed, with a reasonable excuse to take off again at the least provocation.

John Alden Knight, the father of the solunar theory, has said, "If you wish to know if the fishing is good or bad, pack your gear in your car and go fishing."