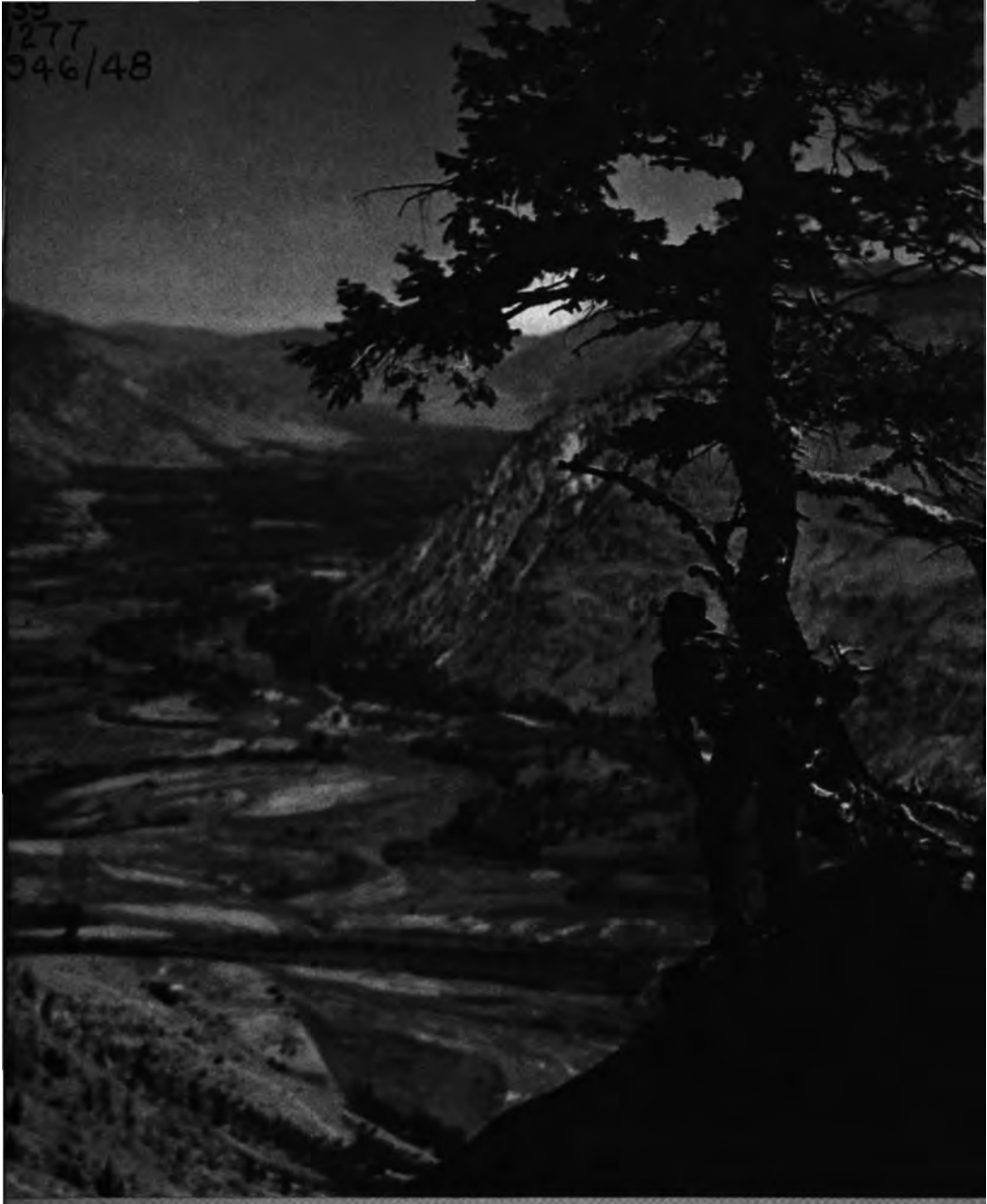


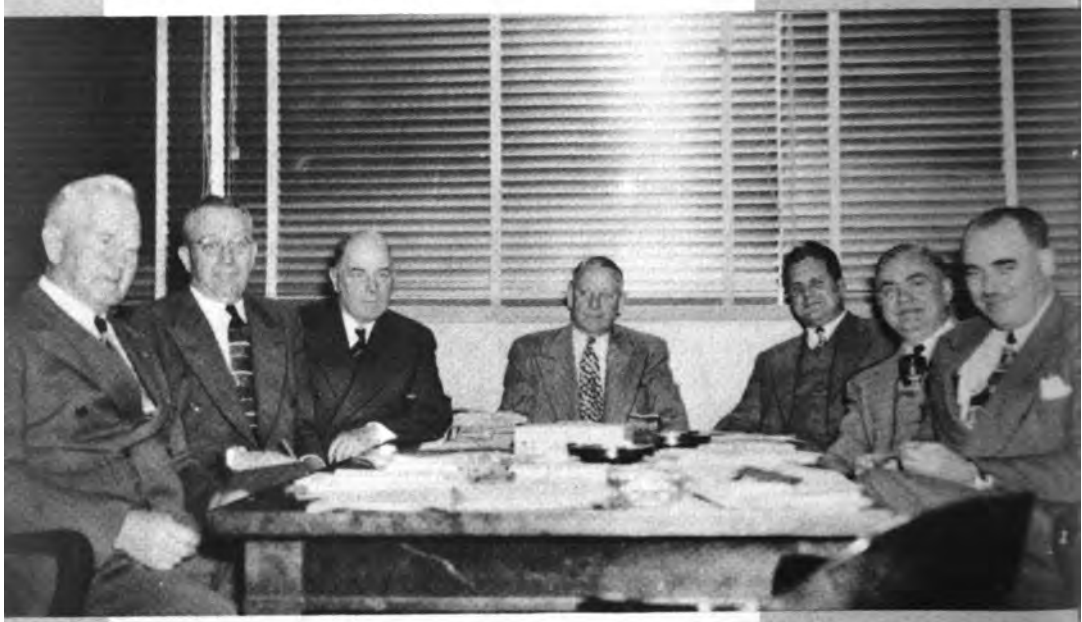
DEPARTMENT OF GAME

State of Washington

8th BIENNIAL REPORT OF THE
WASHINGTON STATE GAME COMMISSION

1946 1948

THE GAME COMMISSION
FOR THE
State of Washington,
MARCH, 1948



L. to R: Samuel B. Gjerde of Oroville, Washington
Virgil B. Bennington of Walla Walla
J. A. Loudon of Yakima
Don W. Clarke, DIRECTOR
Harold A. Pebbles, Chairman
Marcus Nalley of Tacoma
Stephen J. Morrissey of Seattle

8th Biennial Report . . .

OF THE
WASHINGTON STATE
GAME COMMISSION

THE FRONT COVER The wandering Similikameen River scouts the base of lava scarred slopes.

On the right, these slopes point toward the neighboring Canadian border; on the left, they reach toward the summit of Mt. Chopaka.

This lofty pinnacle is home to one of the largest herds of mountain goats in the State of Washington.

In summer these sure footed animals find grass, moss and lichen on the loftiest pinnacles of the age-old ridges; but, come the winter snows, the goats retreat to the stream valley.

Game Department protectors and biologists make frequent surveys to check conditions of the shaggy herd.

The State of Washington has some five thousand mountain goats scattered along its highest regions.

THE BACK COVER Lowland lakes in the State of Washington are easily accessible to an army of sportsmen who descend upon them with all manner of boats and rafts.

Here, at Lake Desire near Renton, a fisherman may take a fine limit of trout if he knows his business and enjoys his share of that special kind of patience possessed by all successful anglers.

LETTER OF TRANSMITTAL

To his Excellency
Arthur B. Langlie
Governor of the
State of Washington
Olympia, Washington

Dear Sir:

Herewith is submitted, in accordance with the law, the eighth report of the Washington State Game Commission for the biennial period beginning April 1, 1946, and ending March 31, 1948, inclusive.

Respectfully submitted,

WASHINGTON STATE GAME COMMISSION
Harold A. Pebbles, (Chairman)
Virgil B. Bennington
Samuel B. Gjerde
J. A. Loudon
Stephen J. Morrissey
Marcus Nalley
Don W. Clarke, Director

FISHERIES MANAGEMENT

The present day fisheries management program is designed to increase our game fish resources, and harvest it to a maximum that still does not jeopardize the supply for the future.

To achieve this end, the hatchery, multiple water use, and biological research divisions have been closely integrated during the past two years. An isolation of any one of the divisions would seriously effect the efficiency of the others.

This coordination was made possible largely through the establishment of the field biological force. The state was divided into eight biological divisions and all matters pertaining to fisheries problems were channeled through the district biologist in charge.

It is possible to show that greater gains have been made during this last biennium than in any previous period since the Department was placed under state control. This gain was made in the face of an ever-increasing fishing intensity.

LAKE REHABILITATION

Of all the programs inaugurated this biennium, none promises to do more for game fish propagation than lake rehabilitation, commonly called lake poisoning.

Data supplied by department catch records were showing that many of Washington's lowland lakes were producing only a low percentage of game fish in comparison to the same waters' potential production. In many lakes, large numbers of rough fish, such as carp, suckers and tench were found.

Thirty years ago most of these same lakes contained cutthroat, rainbow and silver trout, providing excellent fishing. No doubt anglers themselves were responsible for introduction of the unwanted new species. Using minnows for bait, they emptied their unused surplus back into the water or permitted live ones to escape; thus the rough varieties gained a foothold.

Through the years, fishing intensity on game fish increased, while the rough species were left comparatively undisturbed. These undesirables propagated rapidly while the game fish were reduced in number by fishermen and eventually could not hold their own in competition for food.

Sometimes it was found that game fish were stunted; in certain cases lakes were overpopulated so that 'frying pan' sized fish were non-existent. At Echo Lake in King County it was estimated that there were 50,000 large-mouth black bass, all running between only 4 and 6 inches long. In this lake of some 12.58 acres, there were less than 25 bass weighing as much as a pound. These game fish were stunted by over-population and insufficient food.

As such lakes were brought to our attention, biologists were assigned to study intensively the past catch records of the water, to conduct population

surveys, and to determine fish growth rates before any lake was selected as one for rehabilation. The thought was constantly in mind that a desirable fish population was not to be eradicated.

There is more to a successful rehabilitation project than just the distribution of rotenone in the water. To insure the kill of all, or nearly all, of the fish in the lakes, weeks must be spent in preliminary work. The body of water must be surveyed with engineering equipment and accurately mapped. Soundings are necessary to compute the volume so that the proper amount of rotenone to be used may be determined. All of this takes many man hours before the actual clean-up work may begin.

The rotenone product is distributed through the surface layers of the lakes by placing the powder in burlap sacks, attaching the sacks to the sides of a boat, and circling the lake, using an outboard motor. As the boat is propelled forward, the men intermittently shove the burlap bags containing poison under the surface, then allow them to rise. The combination of forward motion, plus the agitation caused by submerging the sacks, causes the chemical to leach out at a fairly uniform rate.

Shallow areas and weed beds are sprayed with a concentrated rotenone solution by means of a stirrup pump; great care is exercised to insure that a uniform distribution is effected in these areas.

In deep lakes burlap bags of chemical are lowered with explosive charges which are detonated at the proper level. Large lakes are subdivided into areas which are marked by buoys. A crew is assigned to each area with the calculated amount of material necessary to treat that particular area; all crews work simultaneously, thus insuring a rapid uniform rate of dispersal.

Following is a list of lakes treated in 1946 and 1947. Through the medium of this rehabilitation program, we have been able to put many of our non-productive waters back to work.

LAKES REHABILITATED IN 1946

LAKE	COUNTY	Surface Acreage	Max. Depth In Feet	Date Poisoned
Lost	Adams	5.0	21	Sept. 1946
Ludlow	Jefferson	16.0	34	----------
Horseshoe	Jefferson	16.0	24	----------
Peterson	Jefferson	25.0	55	Sept. 1946
Echo	King	12.5	30	Oct. 1946
Alice	King	32.8	30	Sept. 1946
Five Mile	King	38.5	32	Sept. 1946
Geneva	King	26.5	45	Sept. 1946
Boren	King	17.4	34	Oct. 1946
Mission	Kitsap	84.3	21	Aug. 1946
Aldridge	Mason	15.0	--	Sept. 1946
Duck	Okanogan	39.2	65	----------
Dibble	Okanogan	5.0	19	Sept. 1946
*Buffalo	Okanogan	---	--	July 1946
Leadbetter	Pend Oreille	23.9	20	Aug. 1946
Bonney	Pierce	20.0	--	May 1946

LAKES REHABILITATED IN 1946—Continued

LAKE	COUNTY	Surface Acreage	Max. Depth In Feet	Date Poisoned
Wapato	Pierce	28.0	13	Oct. 1946
Pass	Skagit	95.8	20	Sept. 1946
Hart	Skagit	67.0	20	Sept. 1946
Kidney	Skamania	11.2	54	Sept. 1946
Conner	Snohomish	10.0	18	Oct. 1946
Little Twin	Stevens	40.0	27	Aug. 1946
Perkins	Stevens	22.9	--	Aug. 1946
Dilly	Stevens	19.7	--	Aug. 1946
Ryan	Stevens	26.1	--	Aug. 1946
Bailey's	Spokane	15.5	32	Sept. 1946
Mirror	Whatcom	13.5	34	Sept. 1946

LAKES REHABILITATED IN 1947

LAKE	COUNTY	Surface Acreage	Max. Depth In Feet	Date Poisoned
Hidden	Chelan	10.3	31	Sept. 1947
Ellen	Ferry	82.4	34	Aug. 1947
Goss	Island	40.7	60	Sept. 1947
Fenwick	King	18.1	28	Sept. 1947
Langlois	King	40.2	98	Sept. 1947
Leota	King	10.7	32	Oct. 1947
Marie	King	9.4	33	Sept. 1947
Shady	King	28.5	40	Sept. 1947
Steel	King	46.0	24	Sept. 1947
Alexander	Kitsap	6.1	19	Sept. 1947
Heins	Kitsap	3.3	8	Sept. 1947
Wildcat	Kitsap	108.7	33	Sept. 1947
Spencer	Mason	230.0	35.5	Sept. 1947
Aeneas	Okanogan	53.4	60	Sept. 1947
Beaver	Okanogan	30.3	59	Aug. 1947
Beth	Okanogan	10.3	44	Aug. 1947
Copper (Silver Nail)	Okanogan	5.7	15	June 1947
Crawfish	Okanogan	81.5	36	Aug. 1947
Little Beaver	Okanogan	5.5	11	Aug. 1947
Little Twin	Okanogan	23.0	39	Sept. 1947
Crescent	Pierce	48.5	29	Sept. 1947
Orting	Pierce	6.3	34	Sept. 1947
Everett	Skagit	8.7	35	Sept. 1947
Vogler	Skagit	13.7	10	Sept. 1947
Bass	Skamania	10.0	10	Sept. 1947
Greenleaf	Skamania	50.9	40	Sept. 1947
Howard	Snohomish	27.7	51	Sept. 1947
Riley	Snohomish	29.9	40	Sept. 1947
Silver	Snohomish	106.0	51.5	Sept. 1947
Pierre	Stevens	105.0	75	Aug. 1947
Starvation	Stevens	29.9	12	Aug. 1947
Deep	Thurston	66.2	17	Sept. 1947

*Selective poisoning of undesirable fish in shallow areas.

RESIDENT SPECIES

CUTTHROAT TROUT: In eastern Washington, the cutthroat of the Pend Oreille drainage have made a remarkable recovery from a depleted condition in 1941; an improvement directly attributable to Kings Lake spawning station near Spokane. This lake of 46 acres was rehabilitated in 1940 and re-

stocked with several thousand true Pend Oreille cutthroat which now produce annually between one and one and a half million eggs. Fish hatched from these eggs are planted back into the Pend Oreille drainage; the plants being most successful in lakes and in streams where beaver have built ponds.

Another important spawning station is operated at Twin Lakes, Chelan County. Fry from this source are planted in the highland waters of the Cascade region principally in eastern Washington. Many diversified planting methods are used for the distribution of these fish. The Department plane is used to an advantage in planting otherwise inaccessible waters, and the balance of these trout are planted by pack string, truck and back packing. The excellent catches and the enthusiasm of the persons fishing these high lakes is ample testimony of the program's success.

Cutthroat in western Washington has been given special attention. The Game Department maintains a continuous search to find additional sites for spawn-taking stations, and is steadily improving the existing sources. Lake Whatcom is one example where the production of eggs has increased through our management practices. This lake produces the largest cutthroats in the state. The females taken for spawning often weigh ten pounds or more.

Over half of the western Washington rehabilitated lakes have been restocked with cutthroat. Streams and lakes from which these fine game fish appeared to be vanishing are rapidly coming back into production.

RAINBOW TROUT: The rainbow continues to be the most important of our fish as far as the rearing program is concerned. Its adaptability favors good returns to the fisherman's creel and its popularity encouraged the Department to increase the scope of this program.

During the last biennium more rainbow of legal size were planted in lakes and streams of the state than in any previous similar period. This increase in poundage is directly attributable to our policy of fall plantings.

In late September and October the larger young fish are taken from hatchery outdoor rearing ponds and released into lakes suitable for their further development. The balance of these rainbow are left in the ponds to attain more growth before spring release. By turning a portion of our output over to nature, we are able to maintain a larger production than would be possible otherwise.

EASTERN BROOK TROUT: This fish has increased in popularity with the fishermen during the past two years. As a result of biological research, favorable habitat areas have been located, and successful plantings made. One of eastern brook's outstanding characteristics is that, under favorable environmental conditions, it will stand up well under intensified fishing. In many instances, this trout will reproduce in sufficient number to eliminate the need for further plantings after the initial introduction.

SILVER TROUT: More of this resident sockeye are produced by the Department than any other species; however, since the silver trout can be planted successfully as fry, very little expense is involved.

Silver trout eggs are available in large numbers each fall. These eggs are incubated and the young fish raised to release age before the rainbow and cutthroat hatchery programs begin. The utilization of otherwise unused troughs during the winter months allows the Department to carry on this extensive program.

WHITEFISH: Until recent years, this fisheries was known to a comparatively few hardy individuals who go out for winter fishing; however, in 1947 the fishing evaluations show that over 22 tons of these fish were taken from the Yakima River alone.

Areas not formerly fished and now being utilized are the main Columbia River from Vantage to Beverly, the Pend Oreille River, and the upper portion of the south fork of the Skykomish.

A question is often asked, "What protection is this species given?" The whitefish, in a river system, spawn on a decreasing temperature; thus, in the late fall or in the winter, they school and complete their spawning period. This period is approximately six weeks in duration. In studying the life history of whitefish, it is found that they do not spawn until two years old or older. Thus, if they are protected until after their spawning period, and the fisheries are on spawned out fish, there is little reason why a high degree of production cannot be maintained. These first protection principles were put in effect in 1941. Since that time, the fishing for whitefish has steadily increased.

SPINEY-RAYED FISH: A special study of the bass of Silver Lake, Cowlitz County, was carried on. This lake was chosen as it has been the most successful producer of spiney-rayed fish in the State of Washington. Information obtained from this study is being put into practice relative to management of the specie in other waters of the state.

A comparison of the fishing returns from 1937-1940 with those of 1946 indicates the following:

	1937-1940	1946
Average number of fish per fisherman	6.3	8.2
Average number of bass per fisherman	.44	.1
Average number of perch	4.1	5.2
Average number of crappie	.4	.05
Average number of catfish	1.1	2.5

An analysis of these comparisons shows that more fish per fisherman were actually caught out of Silver Lake during the 1946 period than during the 1937-40 period; however, there is a marked decline in the number of bass and crappie caught during the 1946 period. The fact that more fish per man have been caught during 1946 does not necessarily indicate better

A far reaching program is under way to eliminate scrap fish from waters which may be planted back with trout or bass. Here is a lake that has been treated with rotenone and from which approximately 250 tons of scrap fish were removed to make way for game species.

TOP — This screen, on Green Lake Slough in Skamania County, was built to prevent migration of scrap fish back into the lake proper after rehabilitation.

BOTTOM — At Kahlotus Lake near Pasco, Washington, a young sportsman salvages two typical carp. Once this lake was host to fine bass and crappie until it became over-ridden with carp. Following its rotenone treatment, the lake was replanted with spiney-ray game fish.

TOP — Camp 8 Dam on the Wind River which for 29 years formed an obstruction to valuable upstream steelhead territory. Easement rights were purchased in 1948 by the Departments of Fisheries and Game so they might destroy the entire installation.

BOTTOM — Camp 8 Dam after dynamiting. Subsequently the debris was cleared away. The elimination of this obstruction was the first step towards increasing the steelhead runs in the river.

TOP — R. to L: Mr. Ed Clifford, public spirited real estate dealer, presents to Director Don W. Clarke the deed to a permanent right of way for sportsmen's use on Martha Lake near Seattle.

BOTTOM — A group of sportsmen help Department personnel plant steelhead fingerling raised at the Arlington trout hatchery.

fishing, since the fish may be smaller in size than those taken during the previous years. Silver Lake is heavily fished. An actual count of boats on the lake, Sunday, August 11th, showed 83 boats containing 291 fishermen. Assuming each fisherman caught the average 8.2 fish (average catch in 1946) a total of 2,386 legal sized fish were taken from the lake in one day.

STEELHEAD FISHERY

Number of Days in Season		Average Number of of Fishermen	Number of Man Days of Fishing
Sundays	9	100	900
Saturdays	9	50	450
Weekdays	43	30	1,290
Totals	61		2,640

Catch per unit of effort ..... 1.8 steelhead per man day of fishing
Average weight of fish ..... 6.0 pounds
Total number of steelhead caught 4,798
Total weight of steelhead caught ..... 28,788 pounds

TROUT FISHERY

Number of Days in Season		Average Number of of Fishermen	Number of Man Days of Fishing
Sundays	22	300	6,600
Saturdays	22	175	3,850
Weekdays	109	100	10,900
Totals	153		21,350

Catch per unit of effort ..... 1.5 trout per man day of fishing
Average weight of trout ..... 0.5 pounds
Total number of trout caught 32,025
Total weight of trout caught ..... 16,012.5 pounds

WHITEFISH FISHERY

Number of Days in Season		Average Number of of Fishermen	Number of Man Days of Fishing
Sundays	12	20	240
Saturdays	11	15	165
Weekdays	60	10	600
Totals	83		1,005

Catch per unit of effort ..... 8 whitefish per man day of fishing

FISHERIES EVALUATIONS

During the past biennium, the Department conducted a fishery evaluation on four rivers; the Chehalis, Cowlitz, Klickitat, and Yakima.

Evaluations are good indications of the success or failure of the Game Department's policies concerning planting or regulations on any one river system. By comparing evaluations from one year with those of the past or future, an indication of the increase or decrease in a fishery is obtained. From these comparisons, a program will either be continued or changed to meet a new set of conditions.

Information for evaluations is obtained by personal checks of a river by Department personnel. From these checks an indication of the fishing success and an estimate of the total fishery is determined.

Further checks on the fishery are obtained from post-season survey cards sent out to fishermen contacted on the stream during the fishing season. Data received in this manner is checked with other material on hand for an indication of accuracy. Summarizing the evaluations carried on in the past year:

1. THE EVALUATION OF STEELHEAD FISHERY ON THE CHEHALIS RIVER.

The section of the river selected for the survey, during the 1947-8 steelhead season was an area from the mouth of the river to the town of Oakville. The majority of checks were from the section of the river between the towns of Montesano and Satsop where fishing intensity is greatest.

The season lasted 106 days and during this time forty personal checks were made. On days not checked estimates of the number of fishermen out and the total number of fish caught were made based on river conditions and the time of the week as affecting the number of fishermen out.

The hours of fishing effort per steelhead was obtained from the following data taken from personal checks on the river:

Month	Fishermen	Total Hours Fished	Fish Caught	Hours of Fishing Effort per Fish
December	743	3,303.0	186	17.76
January	626	3,097.0	141	21.97
February	480	2,455.0	146	16.82
March	153	729.5	26	28.06
TOTALS	2,002	9,584.5	499	19.21

From estimates, based on personal checks, the following information was obtained:

1. Estimated total pounds of fish caught	22,384.3
2. Estimated total number of fish caught	3,087.0
3. Estimated total number of fishermen	9,981.0
4. Hours of fishing effort per fish	19.2
5. Average weight of fish caught in pounds	7.3
6. Average length of fish caught in inches	27.0
7. Buck to female ratio in December	2:1
8. Buck to female ratio in February	1.2:1

2. THE EVALUATION OF THE STEELHEAD FISHERY ON THE COWLITZ RIVER.

In continuance with the evaluation work on the Cowlitz River, another survey was conducted on the steelhead sport fishery during the 1947-48 season. The purpose of this check was to get further information on the fishing intensity and the size of the sport fishery catch.

During the 153 day season, 45 personal checks were made, 25 of which were on week-ends. From personal checks it was found that on weekends the average number of fishermen checked was 195.6, while weekdays the average was 104.6. This gave a total of 19,196.8 man fishing days for the season.

490 fish were checked in 45 days for an average of 10.9 fish per day; however, a check of 101 fishermen on April 15, 1948 showed 590 fish caught by these fishermen in the area checked up until this date, of which the biologist had checked only 79. The biologist's check then was only 13.4% of the total number of fish caught. Since the biologist checked 490 fish for the entire season and his checks saw only 13.4% of the fish caught, the total catch for the season would then be 3,657. This figure is 368 fish less than in the 1946-47 catch.

Random samples of 270 steelhead gave an average weight of 8.8 pounds or a total poundage for the season of 32,181.6.

Aerial checks of the river revealed the fishing intensity of the section of river above that surveyed was three times that of the lower or surveyed area. In fourteen checks of the area between the mouth of the Toutle River and Toledo, it was found that 10.3% of the fishermen had fish, while in the lower or surveyed area, only 7.2% had fish. Since the section surveyed was the lower part of the river, it would be safe to assume that the upper river had at least the same fishing success as the lower river. Then the total catch of the Cowlitz River, Exclusive of the Toutle and Coweeman Rivers, would be assessed as three times that of the surveyed area, or 10,971 fish with a total poundage of 96,544.8. The Cowlitz River would then provide 59,750 man fishing days during the season.

3. The Evaluation of the Sports Fishery on the Klickitat River.

The Klickitat River is one of the most popular summer run steelhead streams in the State of Washington as well as being a good trout stream and supporting a small whitefish fishery in the winter months.

The 1947 seasons on the Klickitat River were as follows:

1. General season (trout and steelhead)—May 1 to September 30.
2. Lower River (1½ miles)—Open the year around.
3. Whitefish season—December 14, 1946 to February 28, 1947.

Although the lower river was open the year around, the steelhead did not commence to run until about March 1, 1947, so this season will be considered as extending from March 1 through May 1. During the early part of the season the fishery is entirely for steelhead.

The results of this survey are as follows:

Average weight of whitefish	0.5 pounds
Total number of whitefish caught	8,040
Total weight of whitefish caught	4,020 pounds

4. Evaluation of Whitefish on the Yakima River.

Pursuit of whitefish during recent years has been growing in importance as a sport fishery. These fish, once taken commercially in the Yakima River, were drastically reduced since there were few laws restricting the catch. However, with setting of seasons and enforcement of laws governing the bag and possession limits, the population has increased to a point where whitefish now provide an intensive sport fishery.

The species of whitefish in the Yakima River matures and spawns at two years of age. They spawn during the month of November. A whitefish does not enter a fisherman's catch to any extent until it is two years old. Approximately 70% of whitefish caught are in this age group. Some 20% were three years old and 10% were four years or older. This figure varies in different sections of the river. In the lower Yakima the catches have a higher percentage of older age groups.

The following are some average weights for various size groups:

Age	Length in Inches	Weight in Pounds
2 years	11	0.45
3 years	12¾	0.61
4 years	13½	0.73
5 years	15	1.08

Whitefish from the entire Yakima River averaged 0.5 of a pound each. A limit catch of 20 fish averaged ten pounds. This again varied on separate sections of the river. Fish in the lower river averaged 0.7 pounds each, while those from the upper Yakima averaged slightly more than 0.5 pounds each.

To make this evaluation in the Yakima River, cooperation was enlisted from Game Protectors whose districts are adjacent to the river. The fishery was carried on from a point above the town of Easton to the mouth of the river, a distance of more than 150 miles. The District Biologists' checks combined with those of the Protectors', made it possible to obtain sufficient information to arrive at a 'catch per unit' of effort, and to make estimates of the number of sportsmen participating in the fishery.

TOTAL NUMBER OF DAYS IN THE 1946-47
WHITEFISH FISHING SEASON

Sundays	12
Saturdays	11
Week Days	60

NUMBER OF DAYS ON WHICH WATER CONDITIONS WERE SUITABLE FOR FISHING

Sundays	8
Saturdays	8
Week Days	44

Average Number of Fishermen	Number of Man Days of Fishing	Number of Man Hours of Fishing*
Sundays 520	4,160	16,640
Saturdays 270	2,160	8,640
Week Days 155	6,820	27,280
TOTALS	13,160	52,560

*Man hours of fishing are based on an average of 4 hours per trip.

Catch per unit of effort	1.71 whitefish per hour
Average catch per trip	6.84 whitefish
Total catch of whitefish	89,877.00
Average weight of whitefish	0.50 pounds
Weight of whitefish caught per trip	3.42 pounds
Total weight of whitefish caught	44,938.80 pounds

GAME FISH LIBERATED

April 1, 1946 to March 31, 1947

County	*Cutthroat*	*Eastern Brook*	*Rainbow*	*Silvers*	*Steelhead*	*TOTAL TROUT*
Adams	------	------	18,881	------	------	18,881
Asotin	------	------	40,380	------	------	40,380
Chelan	635,248	------	2,489,743	4,583,268	------	7,708,259
Clallam	------	------	9,955	------	199,666	209,621
Clark	83,317	------	92,848	------	34,740	210,905
Columbia	------	------	171,561	------	------	171,561
Cowlitz	60,001	------	218,995	------	76,886	355,882
Douglas	------	------	22,750	------	------	22,750
Ferry	42,950	5,090	433,085	848,369	------	1,329,494
Garfield	------	------	31,140	------	------	31,140
Grant	------	------	136,610	1,745,500	------	1,882,110
Grays Harbor	------	------	48,994	------	6,352	55,346
Island	------	------	19,350	50,000	------	69,350
Jefferson	------	------	136,061	------	------	136,061
King	192,097	201,080	1,190,232	6,485,875	164,347	8,233,631
Kitsap	------	------	12,250	------	------	12,250
Kittitas	------	------	541,046	750,000	------	1,291,046
Klickitat	------	------	221,313	------	------	221,313
Lewis	67,087	------	1,226,784	------	37,290	1,331,161
Lincoln	------	------	35,496	------	------	35,496
Mason	------	42,355	131,700	196,800	20,466	391,321
Okanogan	------	103,950	798,342	525,000	------	1,427,292
Pacific	16,024	------	10,562	------	65,761	92,347
Pend Oreille	435,520	133,990	1,092,976	769,351	------	2,431,837
Pierce	57,798	15,000	315,669	975,000	164,021	1,527,488
San Juan	6,760	------	41,574	349,970	------	398,304
Skagit	79,597	30,334	236,920	------	29,361	376,212
Skamania	------	------	174,637	------	39,014	213,651
Snohomish	114,487	17,156	579,834	1,185,000	578,267	2,474,744
Spokane	------	14,998	289,879	696,240	------	1,001,117
Stevens	47,075	88,258	602,055	2,924,112	------	3,661,500
Thurston	33,981	------	180,100	------	------	214,081
Wahkiakum	14,060	------	14,440	------	------	28,500
Walla Walla	------	------	100,081	------	------	100,081
Whatcom	42,762	------	326,322	6,043,244	26,360	6,438,688
Whitman	------	------	23,102	------	------	23,102
Yakima	93,750	------	858,217	562,600	------	1,514,567
TOTALS	2,022,514	652,211	12,873,884	28,690,329	1,442,531	45,681,469

GAME FISH LIBERATED

April 1, 1947 to March 31, 1948

County Where Planted	Cutthroat	Eastern Brook	Rainbow	Silvers	Steelhead	TOTAL TROUT
Adams	------	------	35,380	------	------	35,380
Asotin	------	------	50,519	------	------	50,519
Chelan	353,863	------	1,412,289	2,561,499	------	4,327,651
Clallam	------	------	112,541	493,372	------	605,913
Clark	24,967	------	203,350	967,836	20,766*	1,216,919
Columbia	------	------	139,413	------	------	139,413
Cowlitz	8,537	15,194	455,760	------	------	479,491
Douglas	------	------	57,150	------	------	57,150
Ferry	27,120	------	536,253	1,128,289	------	1,691,662
Garfield	------	------	44,182	------	------	44,182
Grant	------	------	258,621	807,760	------	1,173,323
Silver Salmon	106,942					
Grays Harbor	------	------	29,969	------	20,000	49,969
Island	------	------	15,018	100,000	------	115,018
Jefferson	37,236	------	111,907	------	------	149,143
King	226,987	------	1,312,323	8,266,210	247,491	10,147,395
Grayling	94,384					
Kitsap	53,500	------	47,167	------	500	101,167
Kittitas	120,220	------	995,409	2,003,180	------	3,118,809
Klickitat	------	------	214,087	------	------	214,087
Lewis	2,268	------	764,787	------	55,414	822,469
Lincoln	------	------	64,152	------	------	64,152
Mason	------	87,508	322,319	2,141,472	6,364	2,557,663
Okanogan	20,280	145,217	1,266,794	1,536,148	------	2,968,439
Pacific	17,500	------	20,161	------	------	37,661
Pend Oreille	447,402	137,925	932,081	1,521,550	------	3,156,570
Silver Salmon	117,612					
Pierce	15,000	------	565,392	2,041,140	189,496	2,811,028
San Juan	------	15,887	61,651	325,470	------	403,008
Skagit	160,755	135,784	200,212	250,000	81,448	828,199
Skamania	24,564	139,919	669,865	------	------	834,348
Snohomish	146,160	52,658	655,161	3,245,202	108,995	4,208,176
Spokane	------	------	313,831	1,800,000	------	2,113,831
Stevens	139,125	115,540	647,882	1,562,192	------	2,464,739
Thurston	15,655	------	186,140	1,334,636	------	1,536,431
Wahkiakum	9,672	------	33,556	------	------	43,228
Walla Walla	------	------	73,681	------	------	73,681
Whatcom	102,036	52,261	361,528	7,700,928	18,862	8,235,615
Whitman	------	------	36,142	------	------	36,142
Yakima	78,500	------	1,026,360	2,256,314	------	3,361,174
GRAND TOTAL	2,031,347	897,893	14,233,033	42,043,198	749,336	60,273,745

Grayling: 94,384
Silver Salmon: 224,554
*Note: Steelhead planted by Fisheries Department.

EYEING STATIONS

Of major importance in fish propagation is the adequate supply of trout eggs. In early days all species of trout eggs were secured from wild stock. As we increased our production it was desirable to develop a more dependable source of egg supply.

Now rainbow broodstock, adult trout from which eggs are secured, has

been established at all hatcheries. This broodstock was carefully selected for many years to develop a faster growing and more prolific strain of fish.

Cutthroat and silver trout presented a different problem. Although we have cutthroat broodstock at our hatcheries, we have to depend upon wild stock to furnish the majority of our eggs. We do not maintain the large number of broodstock cutthroat necessary to meet the annual egg demand.

The number of silver trout eggs handled exceeds all others combined, between 30 and 40 million annually, and for this vast amount we turn to natural spawning areas. When the Department finds that it is economically wise to utilize such areas, installations (eyeing stations) are provided in the immediate vicinity to tend the eggs after spawning operations.

Trout eggs are delicate and extreme care is required in their handling during the first 30 days. The new eggs are incubated at the eyeing stations for a period of 25 to 50 days; at that time they have reached a development stage known as "eyed". Trout eggs in the "eyed" condition are hardy and will withstand shipment to hatcheries throughout the state where further incubation and the actual raising of the young fish takes place.

In order that this egg supply may be harvested, fish traps are constructed and maintained at spawning areas. Since the war all the fish traps have either been repaired or replaced.

Parts of fish traps have been standardized and as much pre-fabrication as possible is done in construction. A stock pile of lumber is maintained of various standard dimensions. A truck loaded with lumber, tools and supplies can ordinarily take care of several traps in the same area on one trip. Heavy duty equipment is often used in accessible places to widen and level stream beds, providing better installations at lower costs.

EYEING STATIONS

April 1, 1946 to March 31, 1947 — April 1, 1947 to March 31, 1948

	April 1, 1946 to March 31, 1947	April 1, 1947 to March 31, 1948
Salaries	$4,528.49	$7,074.74
State Vehicle Expense	63.93	223.46
Private Mileage	-----	640.40
Fares	-----	12.49
Meals and Rooms	887.63	1,124.94
Light, Heat and Water	5.98	5.13
Slickers, Coats, Gloves	73.87	46.40
Small Tools and Equipment	63.89	81.56
Repairs—Buildings and Structures	-----	204.81
Boat Expense	72.27	28.84
Repairs to Traps	85.18	458.22
Pack String	72.50	167.50
New Equipment	-----	37.96
Miscellaneous	78.00	-----
TOTAL	5,931.74	10,106.45
Salaries	4,528.49	7,074.74
Operations	1,403.25	3,031.71

FISH HATCHERIES

To further the fisheries program, the Game Department's fish hatcheries were called upon to produce trout in greater numbers and larger sizes for liberation into lakes and streams of the state. This involved major changes in the hatchery program, and required modernization and expansion of rearing facilities.

The establishment of a biological force in the field to direct a long range program for the first time placed the fish hatchery in its proper place as a "tool" of fisheries management, rather than as a single separate agency capable of maintaining fishing in any and all waters simply by planting fish.

Along with an extensive repair and modernization program, two new hatcheries were completed during the biennium. A building with 48 troughs replaced a deteriorated structure near Republic and a large hatchery and rearing pond unit was built in the Skokomish Valley near Shelton. The Shelton hatchery, with 112 troughs, twelve forty-foot circular rearing ponds and eight 10′ by 90′ raceways, is one of the larger stations operated by the Department. Fingerlings and fry reared at Shelton will be liberated in waters throughout the Olympic Peninsula. This vast area formerly received trout only from the ten pond rearing unit at Aberdeen.

A major change in the hatchery program, which became necessary during the biennium, was the establishment of a rainbow broodstock sufficient in size to insure a full rainbow program for all hatcheries.

In previous years, high quality eggs were available at reasonable prices from commercial breeders, and the Department had purchased up to 24 million eggs primarily from trout farms in Idaho.

Due to unfortunate circumstances, these sources lost most of their spawning stock during the 1945-46 season and could not guarantee large deliveries. For such an emergency the Department had maintained small groups of young rainbow broodstock at four hatcheries. These were rapidly enlarged and rainbow egg production was increased from 8,500,000 in 1945 to 13,700,000 in 1946, and to 19,500,000 in 1947. This would have been impossible had not earlier planning provided for the maintenance of broodstock, as trout usually do not reach maturity until they are three or four years old.

The development of earthen ponds for holding these brood fish at several hatcheries also made this expansion possible without reducing the fingerling production in any way.

Records show that eggs produced by departmental brood stock cost approximately $0.71 per thousand on a cost of food fed basis. Unquestionably there are other costs involved in producing these eggs but it is felt that they are nominal since regular hatchery personnel spawn the brood fish as part of their

Summer-run steelhead taken on the Wind River.

TOP — A section of the Sunnyside Waterfowl Project, typical of the public hunting areas being established all over the state.

BOTTOM — Acquisition of right-of-ways provide for the undisputed and eternal entrance by license holders to lakes in which the Game Department is maintaining a good supply of game fish.

duties, and no added labor is required to complete this work. High quality rainbow eggs during the biennium cost $2.50 per thousand, and indications are that the price will remain high for some time.

Other advantages, such as improvement of stock, positive supply of eggs (at a time most suited to rearing program) and adaptation of brood fish to a given water supply, all point to a continuance of the rainbow broodstock program.

The pack string and other established planting equipment was bolstered in the summer of 1947 by the addition of an airplane, a four passenger Stinson. The plane was fitted with two tanks having a total capacity of 34 gallons of water. With this equipment, 755,000 fry were planted in mountain lakes. Up to 17 pounds (or some 20,000 trout) were handled on each trip, and releases were completed at altitudes of approximately 400 feet above the surface of water being planted. Almost no mortality occurred by this method of liberation.

The number of fry planted in mountain lakes and streams by Department pack strings was markedly increased during the biennium. In 1946, 351,716 rainbow and 584,748 cutthroat were liberated. During the following fiscal year these plantings were increased to 1,845,108 rainbow and 276,095 cutthroat trout. The U. S. Forest Service has been generous in supplying pack horses in several scattered remote areas; a gesture which has materially increased the coverage of National Forest and alpine waters.

Correlated with information obtained from marked fish plants, planting allotments for certain streams and heavily fished waters called for a decided increase in the size of trout to be liberated. Close observation on the returns from liberations of trout of several sizes have demonstrated a much higher return from trout of legal size and over. Hatchery men have done their best to rear fish of the desired size by planting time each spring. That they have succeeded rather well is shown by the records; some 290,000 pounds of trout were planted in 1946, and 304,000 pounds in 1947. For comparison, the total production for 1943 was 179,000 pounds. This large increase in poundage is further emphasized by the fact that the number of fingerlings produced has been relatively constant for several years.

Several factors are responsible for the production of larger fingerlings. The utilization of larger quantities of feeds in greater variety is no doubt the most important factor. Others include improvement of strains of trout used as broodstock, improvement in the control of fish diseases, improvement of rearing technique and modernization and improvement of hatchery rearing facilities.

The total feed now required for the hatchery division, exceeds two million pounds annually — four times the amount fed in 1940. Rising costs on certain types of feed have necessitated the increased utilization of other low cost items

such as salmon viscera and sole carcasses. Carp, abundant in many waters of eastern Washington, have become an important food item. During the spawning season they are easily seined in shallow water and they serve as excellent feed for trout.

STATE TROUT HATCHERIES

ADMINISTRATION AND GENERAL EXPENDITURES

April 1, 1946 to March 31, 1947 — April 1, 1947 to March 31, 1948

	April 1, 1946 to March 31, 1947	April 1, 1947 to March 31, 1948
Salaries	$128,283.46	$151,970.21
State Vehicle Expense	14,359.69	13,933.84
Private Mileage	2,083.39	2,677.50
Fares	108.71	101.43
Meals and Rooms	3,373.26	5,066.34
Telephone and Telegraph	1,281.26	1,467.92
Postage and Freight	973.80	979.76
Light, Heat and Water	11,655.73	14,448.20
Slicker Coats, Pants and Boots	541.39	614.40
Small Tools and Equipment	2,651.34	4,152.50
Repairs—Buildings and Structures	2,749.13	4,586.75
Horses and Mules—Feed	338.64	1,031.42
Misc. Expense	501.98	495.36
*Feed	122,322.21	119,536.42
Feed on Hand in Cold Storage	6,626.53	9,836.21
Purchase Eggs	9,935.06	10,096.58
Lawns and Ground Expense	317.06	619.97
Medical Aid	1,892.71	1,405.26
Drugs and Chemicals	-------	1,011.38
New Equipment	9,770.92	7,362.46
Miscellaneous	760.42	797.19
TOTAL	$320,526.69	$352,191.10
Salaries	128,283.46	151,970.21
Operations	192,243.23	200,220.89

*Including feed on hand in hatcheries, and storage costs.

EGGS HANDLED AT STATE TROUT HATCHERIES

FISCAL YEAR	*Rainbow*	*Silver Trout*	*Cutthroat*	*Steelhead**	*Eastern Brook*	*Grayling*	*Silver Salmon*	*Kamloops*	*Loch Leven*	*GRAND TOTAL*
1944	9,361,243	46,413,791	4,183,751	1,200,993	747,462	.....	.....	.....	.....	61,907,240
1945	8,921,715	41,495,499	2,323,308	1,387,045	736,967	52,185	.....	.....	.....	54,864,534
1946	19,648,675	47,932,585	3,588,124	1,862,383	1,771,026	100,768	306,000	.....	.....	75,209,561
1947	25,626,866	36,766,803	3,796,745	1,267,675	2,845,495	100,768	394,820	100,000	167,584	71,066,756

*Includes eggs taken by State Department of Fisheries for Game Department.

STATE TROUT HATCHERIES
FISH FEED DATA

YEAR	Poundage fed	Cost of feed	Cost per Pound
1933	100,000	$ 9,330.00	9.3c
1934	119,467	10,700.00	10.5c
1935	206,172	14,200.00	7.0c
1936	417,741	20,000.00	5.0c
1937	297,299	13,800.00	4.5c
1938	422,083	15,600.00	3.8c
1939	328,000	12,200.00	4.0c
1940	525,505	19,815.00	3.8c
1941	585,427	22,723.00	3.9c
1942	811,882	39,014.41	4.8c
1943	952,487	59,704.96	6.3c
1944	1,139,201	64,141.82	5.63c
1945	1,398,986	67,220.22	4.83c
1946	1,594,483	128,948.74	8.0c
1947	2,298,877	129,372.63	5.6c

MIGRATORY FISH

The research concerning these species of fish can be divided into three major phases:

A — Artificial propagation
B — Life history studies
C — Fishing evaluations

All three factors help to formulate management plans regarding migratory fish.

A — The artificial propagation program of steelhead during this biennium continued to expand. The goal was to make each river system self-supporting. A policy of taking spawn from one river system to bolster a sagging steelhead population in another ends with depletion of fish in both streams.

The numbers of steelhead planted in the past two years will not reach those of former years; however, the actual poundage has been increased. Through biological experimentation it has been proven that the size of the steelhead planted is the most important factor in its survival; yet, we also recognize the fact that to improve this fisheries it would be necessary to increase the number of desirable sized fish in stream systems capable of supporting larger populations.

A limiting factor in the rearing of young steelhead is its conflict with the rainbow rearing program which supports our summer lake and stream fishing activity.

There is also much variation in steelhead production ability among the different hatcheries. At present, the South Tacoma and Mossyrock hatcheries

have water conditions best suited to this program. Construction of the two new hatcheries has increased the production of resident species of trout to such an extent that it is anticipated that the Department may be able to devote its entire South Tacoma facilities to propagation of steelhead.

The possibility of using lakes directly connected with the stream systems as rearing areas is being explored at the present time.

B — The life history studies conducted during the last two years were a continuation of those carried on by Pautzke and Meigs in 1939-40 and 41; the object being to ascertain whether winter steelhead ascending other coastal streams exhibited the same characteristics of fresh and salt water residence as the Puget Sound races displayed.

Summarizing the work on the Cowlitz River: 240 scale samples were examined; 11 showed previous spawning checks. This would indicate that only 4.4% of the fish sampled were returning to spawn for the second time. One fish showed two spawning checks. This one had spawned for the first time as a 'jack'. Further information obtained shows that 5% of the fish returned to spawn first as three-year-olds; 73% returned as four-year-olds; 21% returned as five-year-olds, and 1% returned as six-year-olds. Sixty four percent of the sport fisheries was being supplied with fish that had spent two years in fresh water and two years in the ocean. This compares with the data compiled from the study of the steelhead of the Green River drainage. Thus, regulatory measures enacted in 1940 by the Commission to protect the immature steelhead of Puget Sound are applicable to the Cowlitz River winter run.

With the retarded spring opening on streams, a needed protection has been provided for the migratory cutthroat of our costal waters. Data is being accumulated for a future report on this specie. The catch of cutthroat in tidal areas is found to be much greater than was formerly believed.

C — Fishing evaluations: Paralleling our work of increasing the resources of game fish is a series of studies to evaluate and maintain stocks of fish we already have.

WATER RESOURCE WORK

Water Rights:

During the past two years, 1,586 water right applications were handled by the Game Department. The bulk of these were for irrigation purposes and filed in Western Washington. While this region is generally thought to be abundant in rainfall, records show that there is a water deficiency during the summer and early fall — the very times when crops are maturing and water is needed most. Pasture production has been especially increased by sprinkler irrigation.

Stream production of steelhead and cutthroat trout and silver salmon is governed by the amount of water available during low flow periods. Since this is the time that irrigation is urgently needed, the conflict between agricultural uses and fisheries needs is apparent.

The Department of Game, acting with the Department of Fisheries, has investigated all water-right applications in order to save duplicating costs and effort. Recommendations have been made with a view of giving maximum protection to fish and related forms without working undue hardship on the applicants. By establishment of minimum flow requirements and irrigation rotation, water can be made available on critical streams during at least a part of the irrigation season, thus obliviating the necessity of denying applications.

In line with the investigation of water-right applications, dams have been held to a minimum by showing the applicants how their needs may be served in many cases by sumps, head boxes and partial wing dams.

In the few cases where dams have been necessary, fishways have been required. Standard fishways have one foot steps, and pools seven feet long, six feet wide, with a minimum depth of 30 inches.

Standard screening requirements for diversion intakes call for screen having a mesh opening no larger than 0.125 inches. When mechanical screens are necessary, bypasses must be provided ahead of the screens in order to insure the safe return of the fish to the stream.

In extreme cases it has been necessary to protest some applications for consumptive uses which would jeopardize fish populations. Such protests have not exceeded 5% of all applications handled.

At the present time many water-right applications are being received from people who wish to raise trout for personal use, or on a commercial basis. Our investigations show that in many instances the applicant plans to put a series of check dams in an established stream channel in order to use them as rearing ponds. If these were not prevented many miles of good spawning and rearing areas would be lost annually.

COOPERATIVE PROGRAM WITH UNITED STATES GEOLOGICAL SURVEY:

For a number of years the Department of Game has cooperated with the U. S. Geological Survey in securing stream flow measurements. The purpose is to secure flow data, with particular emphasis placed on measurements during critical low-flow periods. This data has proven valuable in connection with water-right investigations, screening projects, and other hydraulic problems. This Department's part of the program calls for funds which are matched by the Geological Survey; all actual measurements are made by the Survey personnel. The size of the program will vary each biennium according to the amounts appropriated. Currently the Department of Game is contributing $1,500 quarterly.

During 1947 the Kitsap Peninsula, a critical water area, was surveyed and some special work was handled in Clark County. In 1948 work was

done in parts of Mason County and on the west side of Hoods Canal. Some special measurements are scheduled on critical streams of Spokane and Stevens Counties. In 1946 work was carried out in King and Pierce Counties.

In addition to the above, the U. S. G. S. has been very cooperative at all times in securing and compiling data specially requested when specific problems have arisen.

WATER USE PROJECTS AS AFFECTING FISH:

Every construction project that necessitates a change of a natural stream channel constitutes a potential, if not current, fish problem. A culvert improperly placed, or a dam without adequate fishways will result in the blocking and the destruction of the fish which normally would use the area above the obstruction. Thus, on a single stream system many miles of spawning areas can be rendered useless by one careless installation. These problems are acute at present because of the tremendous amount of replacement work and new installations which were held up by war years. In addition, today's construction methods have changed considerable; such as use of culverts instead of bridges, thus furthering the complications.

The Department has kept in contact with County Engineers, the State Highway Department, and private contractors in order to outline such work in a manner designed to cause the least loss of fish.

Everyone concerned with the management of our fisheries resources realizes there are conflicts between fisheries interests and the sponsors of hydro-electric projects. The average fish conservationist is not aware of the extent and the large number of projects being considered by many separate agencies. Nearly every major stream in Western Washington, as well as the entire Columbia River watershed, have suitable damsites being considered by groups interested in power. Without the vigorous defense of our natural resources, and the demand for orderly power development by fishery conservation agencies and sportsmen, our streams would have been in far poorer shape than they are today.

Flood control projects are recognized as a necessary part of any overall program of benefit to humanity. The work results in the saving of human lives, not to mention real and personal property. It also prevents loss of valuable food-producing areas. Sometimes flood control work is actually very beneficial to the production of fish; however, engineers, special interest groups, and individuals often disagree as to the best methods of achieving flood control. Fisheries interests have no quarrel with flood control agencies, providing the latter group takes into consideration all economic factors, and base their final decisions upon maximum benefits for all parties concerned. Generally, flood control can be achieved with little damage to fish life. Where damage does occur, adequate compensation should be given to fisheries authorities so production may be increased in other areas with a view to minimizing the overall loss.

Drainage and channel improvement work has caused a number of fish problems. This work is done by agricultural interests in order to provide the better drainage that allows earlier plantings of farm crops. Often the areas thus affected were previously excellent feeding areas for young salmonoids and such drainage curtails their productiveness. The use of dynamite to widen channels is particularly destructive.

The Department has contacted all of the offices of Soil Conservation Services and County Agents advising them of these problems, and stressing the necessity of getting permits before undertaking such work.

Any change of the natural character of a stream means a fish problem. The removal of gravel from stream beds is one example. Sometimes the work will cause a roiling which may be detrimental to spawn as well as to aquatic insect life, and always results in unsatisfactory fishing conditions. Gravel permits are issued with restrictive clauses to keep damage at a minimum. Among the restrictions are those which require pit sites to be left in such shape as to prevent stranding of fish. Restrictions are also made as to time of operations in order to disturb spawn as little as possible.

SCREENING PROGRAM:

The screening program may be broken down into two different classifications.

The most important phase is the one dealing with mechanical screens used to prevent loss of fish in irrigation and power diversions. Such screening units vary from small screens designed for ditches carrying only 3 or 4 c.f.s. to major installations, screening 1100 c.f.s. or more.

Bypass counts have shown the great saving many times over that this program provides to game fish in the state. Such savings have equalled the combined outputs of several hatcheries in a single season. The budget for screening during the current biennium amounts to $45,000.

The crew for this work consists of a field supervisor, five men who work on installation of new screens, and inspect and maintain present installations, and two shop men who fabricate screens. The Screening Division maintains a well-equipped shop in Yakima, the center of screening activities. Besides pick-up trucks, this division has a service truck equipped to handle all field repair work.

Today more than 200 units are being operated in the state. These are principally located in the Methow, the Entait, the Wenatchee, the Yakima, the Naches, the Tucannon and the Walla Walla river systems. In addition, a number of units are operated in Western Washington, the greatest number being near Sequim.

The newest screen, and one using the smallest mesh yet tried, is located on the Yelm irrigation district diversion. It has mesh openings of 1/8" and is built to screen up to 180 c.f.s.

The second type of screening is primarily for the purpose of keeping planted fish from escaping down lake outlets, and to prevent undesirable species from entering the lakes via the outlets. Some of this type of screen was installed during the past year at:

Park Lake Outlet, Grant County — revolving screen
Spanaway Lake Outlet, Pierce County — mechanical flatplate screen
Silver Lake Outlet, Snohomish County — flat plate screen
Howard Lake Outlet, Snohomish County — flat plate screen
Meridian Lake Outlet, King County — V-Type flat plate screen
Five Mile Lake, King County — flat plate screen
Spencer Lake, Mason County — V-Type flat plate screen and downstream trap

In addition to the above, a number of screens were installed by sportsmen's groups and resort owners under Game Department supervision.

During the past year, the Departments of Fisheries and Game have cooperated on a number of stream improvement projects with a view to maintaining all possible natural habitat for migratory fish. These included:

DAMS AND LOG JAMS REMOVED:

Naselle River — 2 log jams, 2 splash dams removed
Willipa River — 2 dams, 1 log jam removed
Hoquiam River — 2 log jams, 1 water supply dam removed
Skookumchuck River — 1 dam removed
Wildcat Creek (tributary to Cloquallam Creek) — 1 dam, 1 log jam
Ayell Creek (tributary to Cowlitz River) — 1 dam removed
Raging River — Preliminary work completed for removal of dam during low flow period of 1948
Elworth Creek (Willipa River) — 2 log jams removed
Purdy Creek, Snohomish County — 1 dam removed
Yellowhawk Creek, Walla Walla County — 1 dam removed
Touchet River — 1 dam out
French Creek, Snohomish County — 1 dam out
Issaquah Creek — 2 log jams removed
Cedar Creek, Clark County — 1 dam out, 1 log jam removed
Vance Creek, Mason County — 1 dam out
Wind River — 1 dam out
Washougal River — 1 dam out
Bear Creek, Kitsap County — 1 dam out
Ruby Creek, Whatcom County — 1 dam out

FISHWAYS INSTALLED OR IMPROVED:

Wildcat Creek (tributary to Cloquallam Creek)
Olequa Creek — Partially completed during the fiscal year

FISHWAYS INSTALLED OR IMPROVED — Continued:

Touchet River
Purdy Creek, Snohomish County
Issaquah Creek
White River — Design approved for new collection system. Actual work started after April 1st
Coal Creek (tributary to Lake Washington)
Des Moines Creek, King County
Tulalip Creek, Snohomish County
Skookumchuck River
Soos Creek

During the biennium, a very interesting and worthwhile project was carried out in Southeastern Washington with the assistance of local sportsmen. The Tucannon River supports a run of steelhead trout and Chinook salmon. This rapid stream has few pools for feeding and resting areas. To improve the situation, a series of low check dams were installed during the biennium. Over thirty of these installations were made; constructed low enough to avoid obstructing upstream migrants, yet sufficient to provide good habitat area both on the upstream and downstream sides. A low earthen dam was built adjacent to the Tucannon River and a small lake was formed. This was planted with rainbow fingerlings toward the end of the biennium.

BIOLOGICAL RESEARCH & LAKE & STREAM IMPROVEMENT

	April 1, 1946 to March 31, 1947	April 1, 1947 to March 31, 1948
Salaries & Wages	$ 1,718.53	$12,006.31
Private Mileage	500.60	2,252.25
State Vehicles		65.93
Fares	2.90	9.68
Meals & Rooms	411.69	1,831.96
Telephone & Telegraph	6.85	31.85
Postage & Freight	193.34	2.05
Light, Heat & Water		22.45
Small Tools & Equipment	225.67	110.75
Tags	365.14	112.53
State Printing	1,954.80	
Signs	2,250.00	
Scientific Supplies	1,526.86	
Plane & Boat Expense	105.07	97.44
Poison & Chemicals	13,058.21	20,309.76
Lab. & Office Supplies		409.65
Purchase of Eggs	2,127.18	
Construction & Rep. Fish Traps		3,371.10
Geological Survey		4,362.03
New Equipment	4,297.19	498.40
Medical Aid	17.30	44.12
Miscellaneous	1,587.11	162.11
TOTALS	$30,348.44	$45,700.37
Salaries & Wages	$ 1,718.53	$12,006.31
Operations	28,629.91	33,694.06

LICENSE DIVISION

The most concrete information available on the number of hunters and fishermen in the state may be drawn from a comparison of the license sales, beginning in the year 1933. These figures are as follows:

Year	Number of Licenses	Number of Big Game Seals	Amounts
1933	129,622	None	$ 312,544.50
1934	158,313	None	381,126.00
1935	164,477	47,253	417,304.28
1936	187,881	57,818	483,166.03
1937	207,875	70,407	553,133.50
1938	212,770	71,061	558,991.50
1939	219,278	80,270	589,895.00
1940	231,060	88,021	626,577.00
1941	257,253	108,127	727,025.00
1942	261,640	104,430	727,318.50
1943	310,347	136,656	913,157.50
1944	310,516	125,001	906,090.00
1945	353,263	142,149	1,054,108.00
1946	445,166	179,536	1,363,162.00
1947	463,047	191,787	1,417,223.00

This steady climb from year to year clearly indicates, too, the increasing demand on our fish and game resources. In 1947, the Department found itself in the position of trying to work with an operations budget based on pre-war prices. As in all businesses and industries, it was costing us more to produce less, yet the ranks of sportsmen entering the field were growing.

To remedy this situation, and to make available sufficient money for the necessary expansion program, the State Legislature at its 1947 session was requested to increase state resident hunting and fishing licenses from $3.00 to $5.00; county resident hunting and fishing licenses from $1.50 to $2.50. This legislation included the specific allocation of 50% of the increase to the Lands Division for the acquisition, development and management of public shooting grounds, public fishing areas, upland bird habitat, and operation and maintenance of big game areas. The progress of this Lands program is discussed in detail in another section. The increase was voted to go into effect for the calendar year of 1948.

It might be explained here that although the Department runs on a fiscal year, the License Division is of necessity on a calendar year. For this reason, the figures quoted for the last biennium are for 1946 and 1947. It appears that the peak of license sales may have been reached, and, on the basis of incomplete returns for 1948, it is believed that the total of licenses sold for that year will be no greater, and possibly less, than in 1947.

GAME MANAGEMENT

The success of a game management program can best be measured by the amount of game in the hunter's bag. This does not minimize the esthetic value of wildlife, nor overlook the fact that any program that provides a maximum supply of game for sportsmen is bound to produce animals for the general public to see and to enjoy.

The two principal phases of game management might be listed as increase in production and wise use of what we have.

Increased production is accomplished through habitat improvement, predator control, and artificial propagation.

Law enforcement is the fundamental factor which guards all phases of a game program since, without law enforcement, all other types of management would be useless.

To get the maximum harvest from stock raised, and still not impair the production of the future, much can be accomplished through the wise use of open and closed seasons and, when the occasion demands it, closed areas.

Too much emphasis on conservation can be just as wasteful as over-hunting. Balance must be maintained. Game management is just the same as farming or animal husbandry. Excess males can be harvested each year and, when the pasture is crowded, the additional females produced must also be harvested.

DEER:

In the state of Washington, deer are the 'bread and butter' of big game hunting; a fact generally true throughout the U. S.

Although the deer in this state are classified scientifically as belonging to only two species, there are actually four distinct varieties of which mule deer are the largest. Found in nearly all forested areas of eastern Washington, they are most plentiful on the east slope of the Cascade Mountains, and they thrive on the semi-arid forest or sagebrush ranges.

Black-tailed deer are closely related to the mule deer and are classified as a sub-specie of their group. They readily interbreed with mule deer where the ranges overlap, and animals found in parts of Yakima and Kittitas Counties are a mixture of mule deer and black-tailed groups. Generally, black-tailed deer are found in the humid slopes of western Washington, but their range extends through the Columbia River gorge, to the east side of Skamania and Klickitat Counties and a little into Yakima County.

Eastern, or Pend Oreille white-tailed deer, are found in the three northeast counties of the state, generally in the region north of Spokane. Their large populations are east of the Columbia River, although a few of their numbers range as far west as the Okanogan River. Rarely found in the Cascade Mountains, the white-tail is the most cunning of all deer species, and the most difficult to hunt.

Another variety, the Columbia River white-tailed deer, was common in the area from Vancouver to the mouth of the Columbia River when the earliest

settlers came to this region; however, the clearing of the lowlands took away most of the range of this group and they are now confined largely to a small region in Wahkiakum County.

Roughly speaking, 52% of the total area of the state is utilized by deer, and the large desert and farming area in central and eastern Washington is the principal non-producing region.

DEER POPULATIONS:

Studies indicate that there are approximately 255,000 deer in the state of Washington. Some 140,000 of these are black-tails, 85,000 are mule deer, and 30,000 white-tailed deer. These figures are conservative and the actual population probably exceeds these numbers in all species.

DEER HUNTING:

Deer hunting has increased tremendously in recent years. In 1938 there were 70,000 deer hunters in the state, while in 1948 there were approximately 180,000. The 1938 kill was in the neighborhood of 6,000 animals, while the 1948 harvest exceeded 25,000. Studies indicate that the present population of 250,000 deer will support a yearly buck kill of approximately 25,000. If a greater number are killed on any certain season, there will inevitably be a smaller kill the following year.

From this heavy hunting pressure, it can be seen that the Game Commission must consider, first, the needs of the deer rather than the wishes of the hunters in setting the seasons. If seasons were set so that all hunters could bag a deer, the 200,000 sportsmen would take most of them in one season. Different varieties of deer need various types of protection and management.

Mule deer are most easily hunted and are the choice of the bulk of hunters in this state. They range over a large area of the Cascade Mountains during the summer, but concentrate on limited lowland winter ranges along the valley farms during the winter months. The migration to the winter range usually starts about the 20th of October — a time which coincides with the start of the breeding season. From experience it has been determined that any mule deer hunting season starting after the 20th of October or extending past the first of November results in an extremely heavy kill. One week of season in November kills far more deer than are usually taken in a three-week season starting in early October. Considering the sport of hunting rather than the harvesting of animals, an early season is best. For these reasons, the Game Commission has continued to establish October seasons even in the face of strong criticism from those who want mule-deer hunting in November.

Black-tailed deer are better protected by the dense cover found over a great part of western Washington; however, most hunters prefer an October season before the heavy rain and fog period, and before the start of the breeding season.

White-tailed deer are the most difficult to hunt and, while their season usually coincides with the general state season, the hunters take a far lower

percentage of bucks. To step up the kill of white-tails the Game Commission has extended the season or established an extra week of later season to increase hunters' advantage. These extended seasons help to harvest white-tailed deer in better proportion to the harvest of other deer herds in the state.

DEER PROBLEMS:

The main headaches, from the standpoint of those charged with game management, are damage to agricultural crops, depletion of winter range, and natural losses. Deer damage to crops, fruit trees, gardens and ornamental plants is a serious problem in nearly all ranges of the state. Methods used in combatting these problems are discussed in another section of this report but a pertinent fact stands out: IN MANY AREAS THE LIMIT TO WHICH DEER HERDS MAY BE BUILT UP IS DETERMINED BY THE AMOUNT OF DAMAGE THEY CAUSE TO AGRICULTURAL CROPS.

Mule deer herds generally are limited by the carrying capacity of the range on which they winter. On much of the eastern slope of the Cascade Mountains there is less than one square mile of winter range for every ten square miles of summer deer range. The forage available on these winter ranges determines the number of mule deer that the entire area can support. When deer are allowed to over-utilize and kill the present forage plants, the entire herd is set back for many years. It is a slow process to revegetate and build back a damaged range.

Deer are browse and brush-eating animals, and while they do eat some grass at certain seasons of the year, they will not thrive on a grass diet.

Along with the over-utilization of ranges is the problem of winter loss. The heavier a winter range is utilized, the greater the loss of animals. This loss usually occurs in the young crop or fawns of the year, as they are unable to compete for food with the larger animals.

Snow depth determines the size of the winter range, and the deeper the snow, the smaller the area in which deer must compete for forage. During the severe winter of 1942-43 winter losses in Chelan County and Okanogan County equalled the legal hunting season kill for the entire state for the same year. This loss, accompanied by severe damage to forage plants, clearly indicated that the area could not continue to support the number of deer then present on the ranges. Pittman-Robertson projects, discussed in the LANDS DIVISION report, will do much to better this situation.

Over-populations are occurring on both white-tailed and black-tailed deer ranges but they are not so spectacular nor so obvious.

Deer population in many regions built up rapidly for about ten years, and now have started to level off with no further apparent increase.

Losses of female animals directly traceable to the poor quality and quantity of forage available have mounted to a point where, in certain cases, these losses are equal to the annual increase.

There were relatively few deer in western Washington before the virgin forests were logged. Those present were generally confined to river bottoms and natural open areas. When the forests were cut and replaced with lush growth of good quality deer forage plants the populations climbed rapidly. Usually this period of build-up lasts for twenty years after an area has been logged. Then the second growth timber reaches the pole stage, shading out the ground plants, and although some plants will continue to grow in the shade, they are practically valueless to game because of their low food value. Without sunshine a plant cannot manufacture starch which is the basis of all food production.

Most of the deer ranges in western Washington are now in the process of having the deer foods eliminated by this reforestration. This forces deer to seek the edge of the forest for food, and crowds them directly into farming areas where the damage problem has increased tremendously. It also brings about increased losses in many regions.

In the past, as damage and range problems have come up, the Game Commission has established special doe areas to solve the difficulty. Such areas were selected where deer of either sex could be taken during the legal hunting season. Increased kill of bucks alone has no effect on the population increase as long as enough males are left for breeding purposes. The increase can only be held by taking of does—the producing animals. Some of these special doe seasons were open to all licensed hunters, while others were limited to designated numbers by controlled hunt lot drawings. It was found that the controlled hunts were most satisfactory, as the general open areas attracted at least five times as many hunters as could reasonably be expected to hunt in the area.

Whidby Island is an example of one of the first doe areas established by the Game Commission. This area was opened to the killing of deer of either sex in 1937 and has been continued open each year since that time. Prior to 1937, the area produced less than 100 buck deer per year, whereas since that date it has produced an average of over 300 deer a year. The 1948 kill was still larger than the 1937 kill when the area was first opened. This proves that the harvesting of does can be decidedly beneficial from the standpoint of management and that the killing of does is not immediately followed by loss of the deer herd. In the past eleven years the Game Commission, as the necessity arose, established over sixty special deer seasons or doe areas in 17 different counties to relieve game problems. In these seasons approximately 15,000 antlerless deer were taken.

The need for such special seasons increased each year until it was concluded that some orderly system of doe harvest must be established to replace this past patchwork method. With this in mind the Commission inaugurated a system of regular yearly controlled hunts to issue doe permits that are valid during the general deer season.

As a start, in 1948, such controlled hunts were established for twenty counties, with a total of 6,835 permits issued; these in counties where deer herds were approaching range capacity. It is planned to increase the number of permits each year until they will be adequate to harvest the increase.

The number of permits to be issued in each county is based on the previous year's buck kill for that county. It can be reasonably assumed that for every buck that is produced there is also a female produced. The doe kill probably never will equal the allowed buck harvest, but it will be a substantial part of the hunter's take. If the deer herds of the state were allowed to build up and stabilize naturally, it could be assumed that the loss of does each year would be equal to the number of bucks harvested. This would amount to approximately a 50% loss of the harvestable game resources, whereas through this management program the same loss could be changed to a major item in the hunters' bag.

The entire program of game management is similar to livestock management. When a farmer's pasture is full, he must start selling heifers from his herd.

ELK:

This state has two varieties of elk. The first settlers in Washington found a few elk herds scattered over much of the western part of the state. These were the native Roosevelt elk and most of them were found on the Olympic Peninsula and in the Pacific County area. Apparently there were no native elk in eastern Washington.

Back in 1912, County Game Commissions inaugurated a program of introducing elk from the North Yellowstone herd in Montana. These were known as Rocky Mountain elk. From 1912 to 1931 some 500 elk were introduced into various counties of the state. Some of the plantings were not successful, but all of the present elk herds in eastern Washington are the result of these introductions. Fifty elk planted on the Naches River in Yakima County in 1913, are responsible for the elk herd there today — a herd of approximately 4,000 animals that range through Yakima and western Kittitas Counties. Another release by the Kittitas County Game Commisson, near Vantage Ferry, has developed into the present Colockum herd of some 1,000 animals. Three releases totaling 115 animals form the nucleus of the Blue Mountain elk herd, now made up of approximately 3,500 animals.

Western Washington herds are now found in Clallam, Jefferson, Mason and Grays Harbor Counties on the Olympic Peninsula, and in Pacific and Wahkiakum Counties in southwestern Washington. There are also elk in the Enumclaw area and in King County, as well as in the Mt. St. Helen's region in Cowlitz, Skamania and Lewis Counties.

ELK POPULATIONS:

There are about 23,000 elk in the state of Washington. Some 9,000 of these are in eastern Washington and 14,000 in the western part of the state.

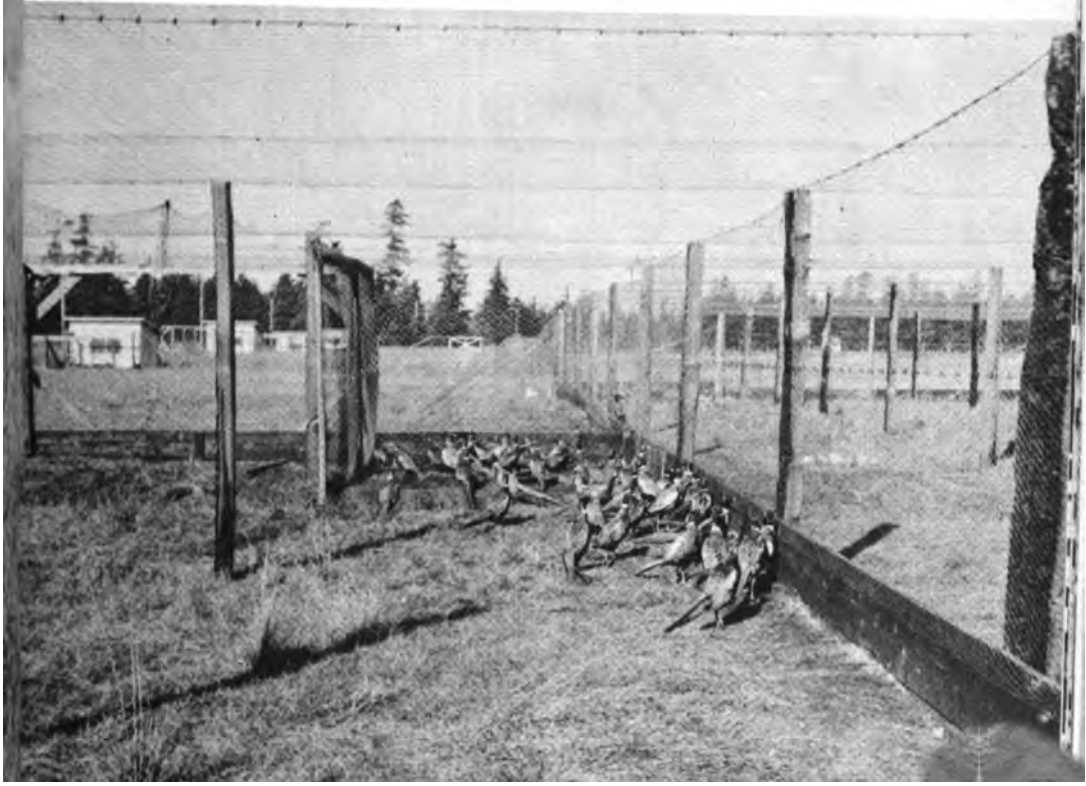
A typical doe of the black-tailed deer. Of some 225,000 deer estimated to roam the state of Washington, there are approximately 140,000 black-tails, native to the western part.

TOP — The state of Washington has a larger population of mountain goats than any other state in the nation. One-hundred fifty controlled hunt permits were issued for these animals in 1948.

BOTTOM — A two year old male antelope, part of a herd which was established in 1938 from fawns collected in southeast Oregon. The herd now roams the dry stretches of a special reserve in a sage brush area between Ellensburg and Yakima.

TOP — A Chinese pheasant hen's feathers blend well with the cover of her habitat.

BOTTOM — Chinese pheasant roosters at Whidby Island Game Farm. This flock is ready for planting.



TOP — A few Chukar partridges were brought into this state around 1930, although the real introduction of these birds, native to Asia, was not made until 1937-38. They are doing well in the dry, upland areas of eastern Washington and their increasing numbers may soon warrant an open season on these fine game birds.

BOTTOM — Ducks in flight over Lake Washington.

A few elk have been transplanted recently into the south fork of the Nooksack River area in Whatcom County, and the Silver Star area of Clark County but, generally, the Game Commission is opposed to any widescale introductions of elk. It has been proven that elk herds replace or eliminate deer herds. An elk, approximately four times as big as a deer, consumes at least four times as much food. They compete with deer in most areas and starve out the smaller animals. A range that will support 1,000 deer, will carry only 250 elk.

With the heavy hunting pressure in this state today, the Game Commission feels it inadvisable to replace good deer herds with elk; thus cutting down the number of animals available to kill in the future. The quantity of meat produced would probably be the same, but it could not be as equitably divided as it could if produced in the form of deer.

ELK HUNTING:

During the past season there were 30,000 hunters licensed to hunt elk in the state. At the same time there were about 23,000 elk in the entire state. Since there are approximately 3,000 elk available to be killed each year, the average hunter should be able to bag an elk once in every ten years.

Elk breed in September and the hunting season is usually set after the deer season in November. It is set late to give hunters a better opportunity to take bulls who are wary and difficult to bag.

It is not advisable to have the deer and elk season overlap as such a situation would increase hunting pressure in areas having both deer and elk. Such an arrangement would invite game law violations in that a $5.00 supplemental license is required to hunt elk, while only a fifty cent game seal is necessary for deer hunting.

ELK MANAGEMENT PROBLEMS:

Elk damage to crops and over-grazing of ranges are the main problems with regard to elk management. These animals, ranging in large herds of from 20 to 100 animals, can do tremendous damage to agricultural crops in a short time.

Over-grazing, also a critical problem on most of the ranges, is being solved by the combined efforts of the Game Commission, private landowners, sportsmen and the U. S. Forest Service officials. Tentatively agreeing to stabilize several ranges they hope to find the answer to a few of the most pressing questions. Such programs cover the management of elk in Yakima and Kittitas Counties and in the Blue Mountains of southeastern Washington. The idea is carried out on the Pittman-Robertson winter ranges on the Oak Creek and Tucannon River regions; also, for deer, on the Methow and Sinlahekin ranges in Okanogan County.

Special seasons or controlled hunts are set each year designed to harvest the annual increase of female animals. Under this program it is possible to main-

tain a kill of approximately 3,000 elk a year in the state of Washington. It is recognized that this does not satisfy the present hunter demand, but the fact remains that the ranges of the state are not adequate to begin to keep up with the ever-increasing hunting pressure.

BEAR:

Black bear are found in all parts of the state, but are far more abundant west of the summit of the Cascade Mountains. A few grizzly bear were killed in this state some years ago, but it is doubtful that there are any grizzlies present today.

There are no estimates available on black bear populations in the state; however, Washington is one of the leading bear-producing states in the country.

Bear seasons in eastern Washington coincide with regular deer hunting season. In western Washington the bear season is open the year around. This generous season was established to encourage the taking of these animals since they are not highly prized by sportsmen because the value of their meat for human consumption depends largely on the type of food they have utilized. In this respect western Washington bear are far less desirable than those taken in the eastern part of the state.

BEAR PROBLEMS:

Bear do considerable damage to domestic stock, fruit trees, bee hives and forest trees. In some regions they kill young deer and elk.

MOUNTAIN GOAT:

These lofty mountaineers are found through the high peaks of the Cascades from the vicinity of Mt. Adams to the Canadian border. Eight mountain goat were introduced into the Olympic Mts. in 1924 and have increased to a fair herd in that area. The state of Washington with approximately 6,000 goats, has the largest population of these animals of any state in the country.

Studies indicate that they are adapted to a specific type of mountain habitat, requiring steep crags for protection and ample food and water close at hand. All of the areas adapted for their survival have been occupied for many years but their numbers have remained practically constant. From these studies it was concluded that a small number of goats could be harvested each year without in any way harming the population now existing. Consequently the Game Commission established a controlled hunt to issue 150 goat hunting permits during the 1948 season. This was the first legal open season in the state since 1920.

ANTELOPE:

Apparently antelope never have been found native to the state of Washington; however, they were introduced into Kittitas County by this department in 1938. Approximately 25 fawns a year were secured from Oregon and

Nevada during the 1938-39-40 seasons. Of this number some 40 animals reached successful maturity. They were released on the Squaw Creek Refuge in Kittitas County. In 1942 when the war started, there were approximately 60 animals present in the area. During the war most of the antelope range was taken over by the military authorities for artillery range, anti-aircraft range and other purposes not conducive to expansion of the herd. At the close of the war there were about fifty antelope remaining. Today they seem to be increasing, but it is doubtful that Washington will be able to support any great herds of these animals. They are already causing farm damage in the Badger Pocket area of Kittitas County.

PHEASANT, DEER, AND ELK KILLS FOR 1947 SEASON

County	Total Pheasant Killed	Total Deer Kill	Total Elk Kill
Adams	2,677		
Asotin	1,315	205	167
Benton	8,031		
Chelan	4,170	2,990	35
Clallam	1,501	701	71
Columbia	4,252	225	149
Clark	3,438	351	2
Cowlitz	3,254	787	55
Douglas	1,360	192	
Ferry	620	891	
Franklin	910		
Garfield	3,323	200	180
Grant	1,555		
Grays Harbor	3,095	1,362	314
Island	3,516	502	
Jefferson	751	431	113
King	4,935	756	7
Kitsap	1,524	198	
Kittitas	17,791	1,250	368
Klickitat	854	752	4
Lewis	5,112	1,215	15
Lincoln	4,520	162	
Mason	1,496	807	30
Okanogan	5,044	2,932	
Pacific	1,303	1,033	182
Pend Oreille	747	621	
Pierce	8,252	1,163	6
San Juan	3,266	91	
Skagit	4,947	318	
Skamania	342	500	20
Snohomish	4,411	391	
Spokane	9,227	523	
Stevens	4,756	1,477	
Thurston	2,768	856	
Wahkiakum	1,144	314	79
Walla Walla	15,009	98	11
Whatcom	8,361	397	
Whitman	30,974		
Yakima	51,000	490	469
No County Listed		892	93
STATE TOTALS	231,551	26,128	2,370
Total Hunters	150,000	170,000	27,670

DEER AND ELK KILLS

	ELK	DEER
1936	605	6,000
1937	1,069	8,700
1938	1,449	8,780
1939	1,435	12,290
1940	1,501	18,000
1941	1,250	22,000
1942	1,141	30,000
1943	3,590	24,000
1944	2,193	23,000
1945	3,212	22,000
1946	3,340	24,000
1947	2,370	26,000

CHINESE PHEASANTS:

First choice of upland bird hunters in the state of Washington is the Chinese pheasant. This bird, a native of eastern Asia, was first brought into the country by Judge Denny who planted their species in the Williamette Valley in 1882. They increased and spread rapidly and were transplanted into the state of Washington before 1900. Today Chinese pheasants are found in every county of the state where they occupy all areas adapted for their survival. A general survey indicates that approximately 11% of our land area can support some of these birds.

The initial introduction built up rapidly to a peak population in the 1920's. Since that time they have fluctuated up and down, but never have they equalled the numbers of the first peak population. Apparently diseases have been introduced, and predators have adapted themselves to preying upon the new specie.

In recent years reductions can be attributed to deterioration of habitat and climatic conditions or weather cycles. 'Habitat' means the food, water and shelter, or the living conditions available for any species. To exist pheasants must have food and water adjacent to good protective cover. They must have proper nesting sites where they will not be killed by the mower nor disturbed by the plow. With more scientific farming, waste areas have been eliminated, weeds cut or burned, and brush removed to make way for pasture or cropland. All of these enterprising improvements for the affairs of mankind have been detrimental to the game bird population. Heavy rains during the hatching season have also had their damaging effect. June rainfall during the past ten years has been much heavier than it was during the ten year period when pheasants in Washington were at peak numbers.

Today it is estimated that there are somewhat more than a million pheasants in this state. Approximately 150,000 hunters are out after these birds each fall and, roughly, 300,000 cock birds are bagged annually.

Management of pheasants to increase their numbers is accomplished through the regulation of seasons and bag limits, improvement of habitat, and

artificial stocking. Seasons and bag limits are set yearly by the State Game Commission, who give careful consideration to the best available information regarding birds that can be harvested.

Since 1941 hunters have been limited to taking cock pheasants only, as it is known that natural losses are extremely heavy and females must be saved for breeding purposes. The life span of a pheasant averages less than a year. Hunting seasons have varied in length from ten to 23 days, with eighteen days being about average. Since pheasants are polygamous and one cock is sufficient to breed ten or more hens, the season can be opened in all areas where some pheasants are found. Even though the population is low, removal of surplus cocks does not reduce their reproduction.

Improvement of habitat is the most fundamental and far-reaching method of attacking the problem of the present scarcity. It is fundamental in that it supplies the living conditions necessary for the survival and reproduction of wild birds, as well as birds produced artificially and released into the wilds; however, habitat improvement is a long, slow, expensive program which will take many years to develop.

In eastern Washington, habitat improvement is being accomplished through a farmer-cooperative program, whereby the farmer grants the Game Department use of certain parcels of waste land for a period of at least ten years. The Department fences and develops these lands for the benefit of game birds.

In western Washington, the program is carried on through the direct acquisition and development of small habitat areas, and through a farmer-cooperative program which sets up feed hoppers in regions where food scarcity is the limiting factor. Further discussion of the habitat improvement program is found under the section dealing with lands management.

The third phase of pheasant management is artificial propagation and planting of birds. This too is an expensive method which does not have the long-range values of habitat improvement.

At the present time the Game Department operates eleven game farms which produce in the neighborhood of 100,000 pheasants each year. The birds cost the state approximately $2.00 each to raise, and banding experiments have proven that the direct return of cocks to the hunters' bag averages quite low. A kill of 25 to 30% of the cocks planted is well above average.

Thinking in terms of cocks alone, this indicates a cost of $8.00 for every bagged pheasant and makes it apparent that game farms alone cannot produce good hunting. Their principal value is to guarantee a supply of good broodstock of birds kept available to nest in the wild and to reproduce their young under wild conditions. The game farm plant can ONLY be a minor supplement to this stock of wild-raised birds.

Actually the management of Chinese pheasants is one of the most difficult problems confronting the Game Commission today. Figuring on a dollar and cents basis, it is not economically sound to try to do much for pheasants in

this state. The amount secured from the sale of a license is far less than the cost of putting another bird in a hunters bag — either through habitat improvement or through artificial stocking; however, the Game Commission feels that we must do the best we can to maintain a balanced program giving the most benefits to the hunters in the state.

All phases of management are being studied by biologists in an effort to better the present program. This study includes everything from production of better game birds to the introduction of new food-producing plants, destined to improve the wild habitat.

One of the most encouraging features of this battle is the anticipated development of the Columbia Basin project in central Washington. This project will bring into production a tremendous section of new pheasant range which should be better than most of the habitat now extending across the rest of the state. The Department is making plans to take full advantage of this potential production area from which they expect to secure the greatest return to the hunters of Washington.

QUAIL:

There are four species of quail found in the state of Washington, all of which have been introduced.

The most common is the valley or California quail found in nearly all sections of the state where there is cleared farmland. These birds reached a peak population in 1942 when they were hit by a severe winter blizzard and tremendous numbers of them were killed in eastern Washington. Today their numbers have built up again to a good hunting population.

Bobwhite quail were also introduced into the state and, at first, increased in some areas; however, their population wavered and has gone to a low level at the present time. Their largest numbers are found in the lower Yakima Valley, along the Snake River and in parts of Whitman County.

Mountain Quail were introduced into this state at a very early date from Oregon and California. They are found in limited numbers on logged-off regions in western Washington and in the Blue Mountains of southeast Washington.

Scaled quail were introduced into the lower Yakima Valley by the Yakima County Game Commission some years ago, and are still found on the sagebrush ranges of Yakima and Benton Counties.

Generally speaking, the quail population is good over most of eastern Washington today, and the Game Commission has extended the season on these birds beyond the period allowed for hunting Chinese pheasants. The quail population is adequate to support more hunting than it receives at the present time, and it furnishes a good release of hunting pressure from other game birds.

GROUSE:

There are six varieties of grouse in the state of Washington; but only three of these are found in numbers sufficient to support an open season.

Blue grouse, including both the dusky and sooty varieties, are found in the mountain regions. Ruffed grouse are distributed thinly through many of the lowland and foothill valleys, and the Franklin grouse or 'Fools hen' is found in limited numbers in the Cascade Mountains.

None of the grouse are plentiful, but it has been found that a limited hunting kill does not materially affect their numbers. They are subject to cycle diseases which are common through all grouse ranges, and many of their numbers are lost naturally if not taken in an open season.

The usual practice of the Game Commission is to allow two days of grouse hunting coincident with the opening of deer season.

Sage grouse, or sage hens, are found in limited numbers in some parts of eastern Washington, and Sharp-tailed grouse or Western prairie chickens inhabit some of the foothills of rangeland in north central Washington.

A few ptarmigan are still found in the high Cascade Mountains, above timber line.

Although all these varieties of grouse are native to the state, there seems scant possibility of ever bringing them back to major importance again. Settlement of the state has changed their natural habitat and caused them to be replaced by introduced species better adapted to survival in farming communities.

PARTRIDGE:

Two species of partridges are found in the state, the Hungarian partridge and the recently introduced Chukar partridge.

Hungarians were introduced in 1910 and built up to tremendous numbers between 1920 and 1928. They suffered crash declines which did not coincide in all sections of the state. Generally the big losses occurred between 1920 and 1930. Since that time their numbers have fluctuated considerably, but apparently hunting kill had little effect on their populations. Reproductive success determined by weather conditions during the hatching season is primarily responsible for the fluctuations.

From 1938 to 1941, Chukar partridge game birds, native to southeast Europe and southern Asia, were raised on game farms and released in the state. Approximately 3,000 chukars were released in nearly all sections of the state during this period. For several years following their release, little was seen of the birds; but commencing with 1946, they began to show in good numbers in the semi-arid, steep canyon ranges of eastern Washington. Since that time they have increased steadily, until there is now a very good population of these newcomers in Yakima, Kittitas, Chelan, Douglas, Grant and Okanogan Counties. If this increase continues, it is highly probable that it will be possible to hunt them in the near future.

WATERFOWL:

Although waterfowl hunting seasons and bag limits are established by the Federal Government, the Game Commission has some responsibility in regard to their management. In recent years the matter of waterfowl research has been handled by the state as a major undertaking.

Because these birds cover such great distances on their annual migratory flights, it is almost impossible for any one state, or even one country, to get a complete picture of the waterfowl problem. To overcome this difficulty, the western states and the province of British Columbia have organized a Pacific Flyway Waterfowl Committee. This group is composed of research representatives from all over the states and from interested provinces. They coordinate their studies and compare and exchange information to get an overall picture for waterfowl management. This program is making definite headway and should do much to supply needed information for intelligent regulation of waterfowl hunting.

STATE GAME FARMS
ADMINISTRATION AND GENERAL EXPENDITURES
April 1, 1946 to March 31, 1947 — April 1, 1947 to March 31, 1948

	April 1, 1946 to March 31,1947	April 1, 1947 to March 31, 1948
Salaries	69,991.37	84,890.91
State Vehicle Expense	6,349.95	7,143.09
Private Mileage	1,376.70	1,489.45
Fares	93.36	100.97
Meals and Rooms	6,949.85	11,919.93
Telephone and Telegraph	813.54	875.37
Postage & Freight	226.34	155.77
Light, Heat & Water	5,577.12	7,525.83
Small Tools & Equipment	1,322.19	961.36
Repairs to Pens and Structures	575.34	1,740.83
Feed for Birds & Animals	46,715.79	52,444.86
Purchase Hens	24,269.72	15,491.75
Seeds & Plowing	1,485.31	1,516.16
Drugs and Chemicals	880.10	866.86
Medical Aid	865.49	940.36
Miscellaneous	981.22	1,761.75
Rent of Land	1,600.00	840.00
Purchase of 4-H Birds	908.00	2,318.00
New Equipment	47.94	5,761.71
TOTAL	$171,029.33	$198,744.96
Salaries	$ 69,991.37	$ 84,890.91
Operations	101,037.96	113,854.05
GAME FARM RECEIPTS:		
Sale of Hens	8,655.12	9,831.69
Sale of Incubator	200.00	
Sale of Hay	50.00	
Sale of Tractor	15.00	
Sale of Sacks		263.23
Sale of Farm Machinery		305.00
Sale of Plumbing Fixtures		235.00

GAME BIRDS PLANTED IN STATE OF WASHINGTON

April 1, 1946 to March 31, 1948

	April 1, 1946 to March 31, 1947	April 1, 1947 to March 31, 1948
Pheasants planted from game farms	83,033	98,474
Pheasants planted from 4-H	908	1,475
Pheasants from other sources	209	894
TOTAL CHINESE PHEASANTS PLANTED	84,150	100,843
Quail transplanted	55	
Other game birds liberated	81	
TOTAL BIRDS PLANTED IN STATE	84,286	100,843

ENFORCEMENT DIVISION

The problem of game law enforcement rests in the hands of 65 uniformed and well-trained protectors, who work under the ten district supervisors of the State Game Department.

Although patrol, with its integral parts of investigation and prosecution, remains the principal duty of these officers, other duties include all of the many and varied phases of the field of game management.

Because the average license-holder's only contact with the State Game Department is through the game protector that he meets in the field, a continuing effort is being made to insure that the field force is composed of the best qualified men available in the United States. The heart of this protection force is composed of men who have chosen game law enforcement and game management work in general, as their life's career. Some twenty-two members of the present force of protectors are officers who have followed that line of duty since the inception of state game control in 1933, and numbered among them are several who were county game wardens at that time. The balance of the force is made up of young men, many of whom have college degrees in game management, and others who are graduates of various schools of police science or men who have had law enforcement experience in this or other states, or in the armed services.

The force as a whole keeps up to date and receives formal training at annual schools and quarterly district meetings held for the purpose of instruction. To augment this training, individual members are assigned to specialized courses at schools and universities. Two members of the protection force are now receiving specialized training at the Ross L. Leffler Game Protectors' School which is the official training school for the State of Pennsylvania. During the past biennium, other officers have attended summer schools on police science offered by the University of Washington and Washington State College.

No man is assigned to a game protection district until he has completed at least six months, and more often a full year, of probationary training duty with experienced officers of the Department. During this period, the novice protector is made familiar with game law enforcement, manner of approach, elements of predator control work, fish and bird planting, beaver control and pelting, lake poisoning techniques and other of the varied phases of game management work. After completion of such training, coupled with whatever formal schooling is available, a man may be permanently assigned to a district.

During hunting seasons each year, a considerable number of deputy game protectors are added to the regular force. These men, insofar as possible, are chosen from applicants for game protection positions. By particular observ-

ance of the activities of these men during the hunting season, it is often possible to select qualified replacements from these ranks when game-protector position vacancies exist.

In addition to the regularly employed protectors and these deputies, there is an auxiliary force of special deputy game protectors, made up from representatives of sportsmen's organizations; men who serve as ex-officio protectors without pay, but who take action when a game law violation is observed by them. These men, chosen by the sportsmen's organizations, are commissioned by the Department. It has been proven that the establishment of such an auxiliary force has helped materially in the suppression of game law violations.

During the past biennium, with increasing popularity of winter steelhead fishing, it has been impossible to maintain adequate patrol of winter trout streams with the regularly-assigned force. Therefore, the Department has adopted a policy of employing deputy protectors whose sole duty is to patrol major steelhead streams during that season. This force of deputy protectors works with certain of the regularly-appointed force who have been transferred from less active districts to steelhead rivers for the winter months.

ENFORCEMENT DIVISION
ADMINISTRATION AND GENERAL EXPENDITURES
April 1, 1946 to March 31, 1947 — April 1, 1947 to March 31, 1948

	April 1, 1946 to March 31, 1947	April 1, 1947 to March 31, 1948
Salaries	$180,222.69	$217,639.07
Private Mileage	39,373.42	48,046.34
State Car Expense	13,163.46	10,884.87
Fares	668.99	952.15
Meals and Rooms	19,737.71	21,622.69
Telephone and Telegraph	1,189.14	1,380.18
Postage, Freight and Express	276.94	409.73
Small Tools and Equipment	308.55	248.60
Ammunition	214.92	124.95
Boat Expense	1,129.22	1,732.63
Medical Aid	4,497.80	3,344.08
Miscellaneous	585.50	420.35
New Equipment	200.65	10,496.84
Light, Heat & Water-Checking Stations	54.31	99.28
Cold Storage	68.75	226.62
State Printing	93.75	67.68
Uniforms	350.88	1,044.56
Traps and Trapping Supplies	792.97	146.35
Plane Expense		2,234.99
Signs and Tags		3,432.79
TOTAL	$262,929.65	$324,554.75
Deputy Protectors' Salaries	$ 7,503.80	$ 10,640.50
GRAND TOTAL	$270,433.45	$335,195.25

REPORT OF THE ENFORCEMENT DIVISION
FINES, ARRESTS, CONVICTIONS

	April 1, 1946 to March 31, 1947	April 1, 1947 to March 31, 1948
Total Number of Arrests	1,948	2,189
Total Number of Acquittals	23	25
Total Number of Convictions	1,922	2,161
Total Number of Appeals	0	3
Total Number of Juveniles	19	36
Dismissals (not included)	3	14
Food Fish Cases Included	20	18
Big Game Cases Included	345	322
Other Trapping, etc. included	85	53
Jail Sentences Imposed	3,995 days	3,432 days
Jail Sentences Suspended	2,698 days	2,392 days
Jail Sentences Served	1,297 days	875 days
Fines Assessed	$ 96,969.80	$ 99,175.91
Fines Suspended	22,054.50	28,448.92
Fines Collected	55,037.30	56,181.24
Fines Served in Jail	3,958.50	2,038.50
Case Appeal Fines	----------	----------
Bail Forfeited	4,161.50	5,066.50
Fines Unpaid	11,758.00	7,440.75

*Note—One-half of the fines collected goes to the State Game Fund and one-half to the County in which the arrest is made.

FUR MANAGEMENT PROGRAM

Throughout the period of settlement and in modern times, very little was known of the annual fur take by trappers in the State of Washington until the 1938-39 trapping season when the first successful effort was made to tabulate the annual raw fur take.

Since 1938 trapping licenses have been issued from the Department of Game office, and it is now possible through contact with the trappers to check their activities. This was accomplished by issuance of a postcard with each trapper's license requesting a list of species of fur-bearers taken. For a number of years the Department was dependent upon the quarterly reports of licensed fur dealers to reveal the source of pelts handled. However, not all the raw pelts were disposed of through Washington dealers and therefore the information gathered would not provide a complete picture of the industry. Now, with the present trapper's report card and the quarterly fur dealer's report, a comprehensive picture of the fur take in the state is available.

A good demand for fur of all kinds has brought upon the Game Department the problem of trying to keep enough broodstock in reserve to insure the licensed trappers a fair supply of animals each season. Trappers have increased yearly from 1,996 in 1944 to 2,450 in 1947. The take of fur-bearing animals has increased in proportion to the trapping licenses issued.

The high prices paid last season on mink, muskrat and otter have made a heavy drain on our broodstock. We have found it necessary to put in small closure areas, closed to all trapping, in various places throughout the state with the thought in mind that by having such closures where no trapping is permitted, animals would have a chance to filter out of the closed areas to re-stock the overtrapped outside areas. A live-trapping, tagging and transplanting of muskrat program has been carried out this past season. Rats have been live-trapped and planted in virgin territory where no rats have been in existence for a good number of years. Some live-trapping and tagging of marten to determine migration has been tried in the Cascade area.

The following tabulation shows yearly take of fur-bearing animals and revenues received by the trappers for the seasons from 1944-45 to 1947-48:

	Muskrat	Mink	Marten	Raccoon	Otter	Total Revenue
1944-45 Season	61,650	9,235	1,468	4,813	477	$ 333,904.00
1945-46 Season	51,533	10,688	1,443	5,394	512	512,456.44
1946-47 Season	54,996	7,433	1,714	4,102	655	280,138.50
1947-48 Season	66,087	8,895	752	3,827	629	518,281.30

A brief resume of the present status of eleven principal Washington fur-bearing animals follows:

MUSKRAT: Regarded as one of the most staple of all fur-bearing animals and the main-stay of the trappers' take. More than 121,000 were taken by trappers during the last biennium. This little animal may be found in streams, lakes and marshes, living in burrows in banks of streams, and normally when found in lakes and marshes their habit is to build houses of reeds, sticks and mud. The muskrat has a rapid rate of reproduction, usually from two to four litters per year and from four to eight animals per litter. This factor is the reason that the animal has been able to maintain its number in the face of heavy trapping activities. The average price per pelt on muskrat for the season of 1946-47 was $1.50 per pelt; in the 1947-48 season the average increased to $2.75 per pelt.

MINK: Principally a stream-dwelling animal, having one litter per season, from three to eight per litter. The mink take has increased in this biennium to 16,328. The very heavy trapping in the 1947-48 season was due to the extraordinary high price paid for mink pelts. In the 1946-47 season fur dealers paid an average pelt price of $17.50. In the 1947-48 season mink prices skyrocketed to an average of $33.50 per pelt.

MARTEN: This little animal with the rich brown fur and orange throat is principally found in the high reaches of the Cascade Mountains. Marten are very rarely found below an elevation of four thousand feet. Its range is usually dense timbered areas and its principal foods are squirrel, rabbit and mountain ash berries. A thirty day season on marten with a thirty-six trap limit per trapper is proving very successful. 2,466 marten were taken in this biennium, with an average pelt price in the 1946-47 season of $21.50 and in the 1947-48 season, an average of $21.00 was paid by fur dealers.

OTTER: Otter are found principally on the West Coast, and the majority of these animals are taken in Clallam and Grays Harbor Counties. The otter is a difficult animal to trap and for this reason is holding its numbers fairly well. It ranges over a large area and its habit is to revisit familiar haunts on an average of once a month. This animal has one litter per year and one to three per litter. 1,284 animals were taken in this biennium with an average pelt price received of $27.00 for the 1946-47 season and $23.50 for the 1947-48 season.

RACCOON: This animal has increased in the State of Washington and has extended its range from the Pacific Coast to Eastern Washington. It has increased in some of the coastal areas to the extent to where it is becoming a nuisance. With the lower prices paid for raccoon pelts, trapping pressure has been very light. Hunting of raccoon with dogs at night has been per-

mitted. In some of the coastal districts this has become a very popular sport. 7,929 raccoon were taken in this biennium with the very low average pelt price of $1.55.

LYNX: This fur-bearer is not too plentiful and is normally found in the more remote timbered areas. Less than 50 of these animals are taken per year, bringing an average pelt price of $37.00.

FOX: Whatcom County is the best fox producing area in the state. Although this animal is not classified as a fur-bearer any more, the trapping of the fox throughout the year has had a tendency to cut down on the population. It has become necessary to classify this animal as a predator because of his marauding expeditions on poultry farms and game birds. Most of the animals taken were red fox with a few silver and cross fox mixed into the take. The Cascade red fox is known to be a native of the state. It ranges over most of the Cascade Mountain region from the Canadian Border down to the Columbia River in Washington.

SKUNK: This animal has also been reclassified and is now a predator. The low prevailing price has discouraged many trappers from taking more of these animals, and they have increased particularly on the West Coast and in Southwestern Washington to such an extent that they actually have become a nuisance.

CIVIT CAT: The extremely low pelt quotation on this animal has brought about a heavy rate of increase especially in the Olympic Peninsula. In many districts the rate of increase has reached a point where the animal has become a pest.

WEASEL: Weasel are trapped throughout the state but in most cases only a few are taken. Weasel in the mountainous and eastern part of the state turn white in the winter, but west of the Cascades they retain their brown coat throughout the year.

FISHER: The season has been closed on this animal for quite a number of years and the population has shown a slight increase in the Olympic Peninsula area. Trappers report seeing an occasional fisher.

BEAVER PROGRAM

Beaver trapping is one of the West Coast's oldest industries. Beaver were taken indiscriminately in the early days, with no thought of conservation or any fear of their numbers ever being depleted. Shortly after the turn of the century, the beaver was a scarce and rare animal in the State of Washington, and game-minded men began looking toward giving the few remaining animals all the protection possible.

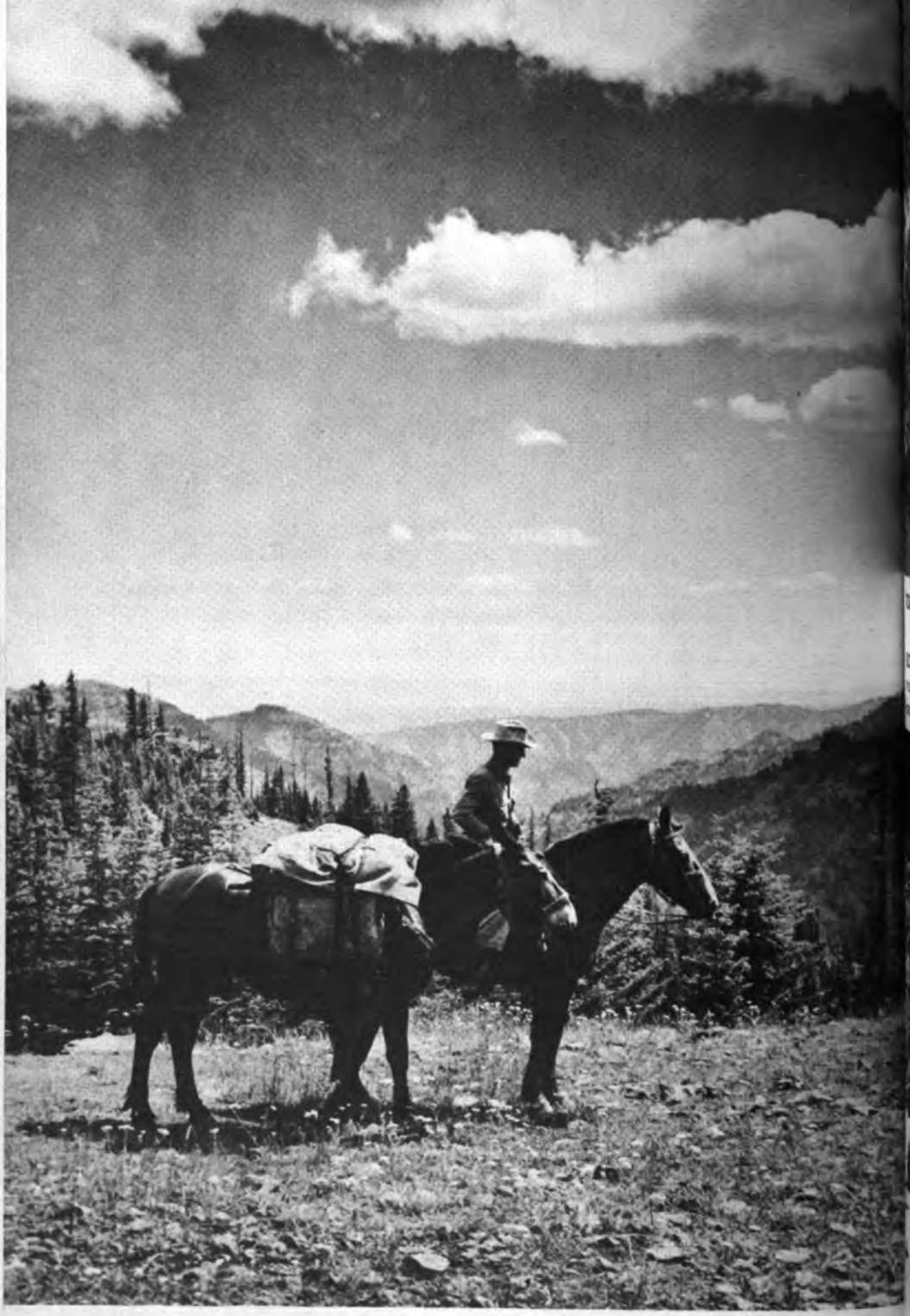
In 1934 a few animals were being live-trapped and transplanted, and this program has carried on and enlarged up to the present time, when a staff of five men spends its entire summer months live-trapping beaver out of the lowland and agricultural areas where they have become a nuisance, and transplanting them into the lakes and streams in higher elevations where their dam-building and propagating can go on unmolested.

In 1945 a Bill was introduced and passed by the Legislature authorizing the State Game Department to enter into co-operative agreements with landholders on whose land beaver existed, in order that they might receive a share of the proceeds from the animals trapped on their lands. The Department of Game traps, pelts and markets all the beaver taken under agreement and the landholder receives forty per cent of the net proceeds from such animals taken. The first year of this cropping program the State Game Department entered into 366 agreements, reimbursing the landholders in the amount of $33,049.28. In the 1947-48 trapping season 1,109 such agreements had been entered into and the landholders were reimbursed $41,957.25. Beaver pelt prices have a tendency to fluctuate, due to public demand. In the season of 1945-46 a $45.62 average was received. In the 1947-48 season, prices had declined to an average of $32.62 per pelt.

This program has been accepted by most of the landholders as one of the fairest and most profitable enterprises one could ever hope for, although some criticism has been received from a few individuals who feel that they should have all of the revenue received from the beaver, not realizing the cost of live-trapping, transplanting and the dead-trapping, pelting and marketing of the pelts. Beaver, differing from most other fur bearers, require a high degree of pelting skill and proper handling is necessary in order to realize the best prices. We point with pride to the high prices received for Washington beaver, which top all other states in the Union and run second only to that which is received for the heavier-furred Alaskan pelts.

TOP — A satisfying and comprehensive project in recent years has been the rebuilding of the once almost devastated beaver populations. This beaver is shown among the tall grasses which adjoin his home.

BOTTOM — A game protector collects a beaver from a live-trap. The animal will be removed from this location where he has been causing trouble to a land owner, and be placed in a remote upper stream where he could do considerable good.



A state predator hunter on a coyote trapping expedition in the Blue Mountains.

TOP – Cougar on the Olympic Peninsula.

BOTTOM – Cougar take a heavy toll of deer each season. The Game Department maintains cougar hunters who, with their dogs, pick up the trail of these killers and track them down.

TOP — A section of an elk drift fence in the Blue Mountains near the Gail Wetherly ranch. 104 miles of fencing, mostly of this type, have been constructed throughout the state to control damage to agricultural areas. Building of such fences is done cooperatively; the Game Department furnishes the materials and the land owners do the actual building.

BOTTOM — Controlled hunts are arranged similar to a lottery. Each application is sealed in an envelope and a disinterested party from the local areas does the drawing. The room is usually filled with hopeful sportsmen as is this one at an elk drawing held at Naches, Washington.

CONTROL OF BEAVER

	April 1, 1946 to March 31, 1947	April 1, 1947 to March 31, 1948
Salaries & Wages	$ 546.32	$13,889.69
State Vehicle	------	1,341.78
Private Mileage	308.25	1,440.65
Meals and Room	212.84	1,916.12
Fares	------	.50
Telephone and Telegraph	------	6.15
Postage and Freight	------	3.96
Light, Heat & Water	4.26	85.57
Small Tools and Equipment	------	22.02
Beaver by the Pelt	19,277.03	19,485.00
Live Trap Beaver	------	157.50
Contract Beaver (Landowners Share 40%)	33,049.28	26,959.65
Beaver Purchased	------	1,800.00
Beaver Supplies	645.46	818.09
Medical Aid	28.32	120.17
Miscellaneous	------	6.81
TOTAL	$54,071.76	$68,053.60
Salaries & Wages	$ 546.32	$13,889.69
Operations	53,525.44	54,163.97

TRAPPERS' CARD REPORT

Year	Trapper	Animals Taken	Value Received
1944-45	1,996	69,829	$218,837.50
1945-46	2,516	65,440	512,456.44
1946-47	2,828	73,886	280,138.50
1947-48	2,450	82,182	518,281.30

GAME DAMAGE

Game damage in the State of Washington has developed to a point where it is no longer a matter to be pushed aside or go unrecognized by sportsmen and license holders. It could probably be construed in some instances that agriculture has infringed on the wildlife habitat; therefore, preventive measures are extremely necessary.

The Twenty-eighth Regular Session of the State Legislature passed a bill authorizing the State Game Commission to enter into cooperative agreements with landholders for the fencing of agricultural and horticultural lands where deer and elk could not be controlled by seasons. The Thirtieth Session of the Legislature appropriated $70,000.00 for the prevention of deer and elk damage.

A special type of fence which is eight feet high and of the best quality of woven wire obtainable has proved one hundred per cent effective in keeping both deer and elk from agricultural and horticultural lands. The approximate cost of such a fence has been about $1,000.00 per mile, up to the spring of 1948 when material prices continued to increase. This type of fence now

runs approximately $1,175.00 per mile compared to $1,000.00 a year ago. We have at the present time approximately 104 miles of preventive deer and elk damage fences.

The number of fences, panels and deer cages in the respective counties is as follows:

County	Agreements	Footage	Cages (12')	Total Footage
Chelan	35	*122,478'	258 (3,096')	125,574
Clallam	2	7,825	----------	7,825
Cowlitz	2	1,650	----------	1,650
Douglas	3	23,420	----------	23,420
Ferry	12	11,623	----------	11,623
Garfield		**44,880	----------	44,880
Grays Harbor	5	6,515	----------	6,515
Island	8	21,481	----------	21,481
Jefferson	3	5,740	----------	5,740
King	6	8,230	----------	8,230
Kitsap	3	7,560	----------	7,560
Kittitas	11	13,154	----------	13,154
Klickitat	4	730	1,480 (17,760')	18,490
Lewis	5	8,990	----------	8,990
Mason	8	10,453	----------	10,453
Okanogan	40	95,285	----------	95,285
Pacific	3	2,404	----------	2,404
Pend Oreille	2	1,036	----------	1,036
Pierce	9	18,470	----------	18,470
San Juan	2	7,675	----------	7,675
Skamania	3	7,003	900 (10,800')	17,803
Spokane	1	2,066	----------	2,066
Stevens	3	6,055	----------	6,055
Thurston	1	7,200	----------	7,200
Wahkiakum	1	300	----------	300
Walla Walla	1	6,425	----------	6,425
Yakima	10	***69,125	----------	69,125
TOTALS	183	517,773'	2,638 (31,656')	549,429

(Approx. 104 Mi.)

* Includes: 25-Mile Creek Fence 3.3 Mi.
Wenatchee No. 1 Canyon Fence 2 "
Manson Drift Fence 2.5 "
** Includes: Garfield Drift Fence 8.5 "
*** Includes: Yakima Drift Fence 8.5 "

The past year we have had a chemist working on various types of repellents. A repellent has been developed which has proven very satisfactory in a number of areas. It consists of a spray emulsion, one gallon making two hundred gallons of spray. This is applied in orchard areas with a power sprayer and in small berry patches with a hand sprayer. We have high hopes that through the winter months we will be able to keep deer from browsing on young trees and, in Western Washington, on berries.

In Garfield County where elk have been in the habit of moving down into the grain fields, an 8½ mile drift fence has been constructed, starting at approximately the Asotin County line and continuing west. This fence was completed in the fall of 1948 and has eliminated considerable elk damage to wheat crops this fall.

APPROPRIATIONS—PREVENTION OF DEER AND ELK DAMAGE—DAMAGE CLAIMS

April 1, 1943 to December 1, 1948

		Prevention		Claims	Total
1943-1945					
April 1, 1943 to	Appr. 49-7	$100,000.00	Appr. 49-6	$60,000.00	$160,000.00
March 31, 1945	*Spent*	*42,258.24*		*30,087.40*	*72,345.64*
	Unused Portion	$ 57,741.76		$29,912.60	$ 87,654.36
1945-1947					
April 1, 1945 to	Appr. 49-7	$ 67,500.00	Appr. 49-8	$60,000.00	$127,500.00
March 31, 1947	*Spent*	*35,375.28*		*5,823.92*	*41,199.20*
	Unused Portion	$ 32,124.82		$54,176.08	$ 86,300.80
1947-1949					
	Appr. 49-3	$ 70,000.00	Chap. 285 Laws of '47	$20,000.00	$ 90,000.00
April 1, 1947 to December 1, 1948	*Spent up to December 1, 1948*	*67,967.81*		*8,299.31*	*76,267.12*
	Balance	$ 2,032.19		11,700.69	13,732.88
TOTAL SPENT TO DECEMBER 1, 1948		*$145,601.33*		$44,210.63	$189,811.96

PREVENTION & RELIEF OF DEER & ELK DAMAGE

	April 1, 1946 to March 31, 1947	April 1, 1947 to March 31,1948
Salaries & Wages	$ 771.91	$ 1,886.40
Private Mileage	140.70	372.00
Meals & Rooms	90.30	176.75
Postage and Freight	51.64	------
Fencing Agreements	15,940.15	16,352.13
Feed in the Open	1,217.08	6,291.82
Materials for Deer and Elk Control	6,350.88	16,829.79
Medical Aid	12.18	39.72
Small Tools and Equipment	------	14.65
Miscellaneous	1.33	18.90
TOTAL	$24,576.17	$41,982.16
Salaries & Wages	$ 771.91	$ 1,886.40
Operations	23,804.26	40,095.76

PREDATOR CONTROL

The present predator control program has been in operation for nearly four years.

Much value has been derived from its provision for regular salaried hunters; accredited men who are paid by the Game Department and available to give their immediate attention to any report of predation.

Payment of bounties has been an incentive for others to seek out the marauders; however, these bounty hunters frequently do not take the animals in regions which support the largest herds of game, and in which the greatest predations occur. Men who are specially trained for this work can give the best attention to areas where the important game concentrations exist. No region is inaccessible to the staff of predator hunters, a fact which means much especially during the critical winter months. Each game protector also considers it a part of his duty to lend continued effort in holding down predator populations. Hunters and sportsmen's groups have done much toward keeping predators in game areas well under control.

Especially is this true of the cougar population. Cougar hunting has become a sport in itself, spurred on by the encouragement of a fifty dollar bounty.

Sports clubs throughout the state must be given much credit for sponsoring and conducting predator hunts which were particularly helpful in controlling magpies and crows.

An at-a-glance notation of some of the more damaging predators is listed below:

BOBCAT: Generally 15 to 30 pounds in size. Color—greyish brown with dark spots. Breeding habits—February and March, gestation period—approximately 70 days, size of litter—2 to 4. The bobcat population has been fairly stable since 1936 when 2,315 were taken. Since that time the usual annual take averages 1,100.

RED FOX: Found primarily in the lower reaches of Skagit, Whatcom, and Snohomish Counties, with a few in Thurston County. Also found in small numbers throughout the mountain summit areas. Size—usually 10 to 15 pounds. Color—pale red. Breeding habits—February and March, litter of from five to seven, gestation period—51 days. The red fox found in the lower reaches of this state were introduced during the 1920's, an introduction which has increased to a point where it became necessary for the Game Commission to classify the red fox as a predator in 1944. During the past three years, in the lower regions of the state, more than 1,000 of these animals have been destroyed; however, the fox that range in the Cascade Mountains are considered a natural resource and no attempts have been made to control them.

COUGAR: Range in the mountain areas throughout the entire state. Size—generally between 100 pounds and 185 pounds. Females are smaller than males. Color—tan and brown; ears and tip of tail darker than belly and rump.

Breeding habits—any time of year; gestation period—96 days, size of litter—one to six, but generally two or three. The cougar population which built up during the war years has been greatly reduced by the consistant average of 200 cougars per year taken during the past three years. Although cougar are found in all mountain regions, the Olympic Peninsula leads the state in numbers taken. Clallam County ranks first, then Jefferson, and third, Okanogan County.

COYOTES: Range throughout the State. Size—an average 26 pounds with an extremely large 44 pounds on record. Color—pale yellowish to grey. Breeding habits—February generally, gestation period—63 days, size of litter—one to twelve, generally six to eight. The coyote population, like that of other predators, grew during the war years. In an effort to reduce this population, 16,668 coyotes were destroyed within the state. This sum is composed of animals taken by department personnel, Fish and Wildlife Service, and those taken for bounty. This figure was the largest in the state's history, and since it was accumulated the coyote population has been greatly reduced, especially in game areas .

OTHER PREDATORS: Magpies and crows along with a few species of hawks and the great horned owl, have had to have some attention during the past biennium. Various smaller predators such as skunks, weasels, etc., must be checked continually as they can become extremely detrimental to game if permitted to increase in numbers.

PAYMENT OF BOUNTIES AND FOR PREDATORY CONTROL
April 1, 1946 to March 31, 1947—April 1, 1947 to March 31, 1948

	April 1, 1946 to March 31, 1947	April 1, 1947 to March 31, 1948
Salaries	$ 60,436.13	$ 49,134.29
State Vehicle	1,076.21	2,014.67
Private Mileage	18,358.05	12,425.10
Fares	63.42	61.73
Meals and Rooms	5,950.41	4,523.92
Telephone and Telegraph	57.80	17.09
Postage and Freight	6.17	4.00
Light, Heat and Water	5.10	.77
Small Tools and Equipment	152.79	11.56
Bounties	56,613.70	43,627.70
Bounties	25.00	———
Shells	846.48	262.52
Traps	3,804.03	50.72
Poison and Bait	7,494.52	1,705.75
New Equipment	16,793.46	———
Plane Expense	635.94	———
State Printing	1,316.53	———
Medical Aid	200.19	718.08
Miscellaneous	94.89	243.53
TOTAL	$173,930.82	$114,801.43
Salaries	$ 60,436.13	$ 49,134.29
Bounties	$ 56,638.70	$ 43,627.70
Operations	$ 56,855.99	$ 22,039.44

PREDATORS BOUNTIED IN STATE
1935 to 1947 Incl.

	Adult Coyotes	Coyote Pups	Bobcats	Cougars
1935	4,006	---	1,760	94
1936	6,067	---	2,315	151
1937	6,033	---	1,430	139
1938	6,816	934	1,840	162
1939	*7,697	954	1,175	55
1940	4,325	780	590	43
1941	8,234	931	1,699	92
1942	5,194	833	949	65
1943	6,584	714	903	72
1944	8,576	503	1,650	125
1945	5,355	656	1,151	213
1946	6,781	539	1,413	275
1947	5,377	474	880	207

* During 1939 Bounty on adult coyotes was raised from $2.50 to $5.00. This number includes 225 adults on which $2.50 was paid.
Bounty law became effective in 1935. Coyotes $1.00, Bobcats $5.00, Cougar $25.00.
Bounty law amended in June, 1937. Coyotes (adults) $2.50, Pups $1.00, Cougar $50.00
Bounty law amended in June, 1939. Coyotes (adult) $5.00.
Bounty law changed effective in 1945, giving State Game Commission authority to regulate bounties and to employ predator hunters.

BOUNTY PAID ON PREDATORY BIRDS

County	April 1, 1946 to March 31, 1947			April 1, 1947 to March 31, 1948		
	Magpies	Crows	Raven	Magpies	Crows	Raven
Adams	150	5	1	106	---	---
Asotin	39	---	---	---	---	---
Benton	428	61	---	630	---	---
Chelan	204	---	1	102	---	---
Callam	---	---	---	---	146	---
Columbia	87	---	---	---	---	---
Cowlitz	---	30	---	---	---	---
Douglas	101	14	---	---	---	---
Garfield	166	12	---	533	4	---
Grant	723	4	---	1,975	344	---
Grays Harbor	---	73	---	---	625	11
Island	---	68	---	---	---	---
King	---	63	---	---	46	---
Kittitas	1,726	24	---	2,247	6	---
Klickitat	175	161	7	133	49	5
Lincoln	1,074	30	1	1,010	11	---
Okanogan	1,868	199	---	1,376	136	---
Pacific	---	---	---	---	50	---
Pierce	---	157	---	---	395	---
San Jaun	---	---	---	---	112	---
Skamania	---	---	---	---	34	---
Spokane	96	70	---	270	---	---
Walla Walla	381	55	7	329	23	---
Whatcom	---	59	---	---	158	---
Whitman	2,943	55	7	2,077	1	2
Yakima	2,964	207	1	2,077	164	---
TOTALS	13,125	1,347	25	12,865	2,304	18

PREDATORS TAKEN IN STATE BY COUNTIES

April 1, 1946 to April 1, 1947

County	COYOTES		BOBCATS		COUGARS		FOX	SKUNK	MAGPIES		CROWS-RAVENS	OWLS	HAWKS
	Bounty	Dept. Men	Bounty	Dept. Men	Bounty	Dept. Men	Dept. Men	Dept. Men	Bounty	Dept. Men	Bounty	Dept. Men	Dept. Men
Adams	205	235	--	1	--	--	--	3	150	836	6	22	42	5
Asotin	274	55	5	--	1	--	--	4	39	420	--	--	4	8
Benton	359	62	1	--	1	--	--	26	428	1588	61	134	9	80
Chelan	201	245	22	6	42	3	--	12	204	229	1	4	5	25
Clallam	64	64	136	29	22	--	--	7	--	--	--	119	--	17
Clark	85	11	20	--	5	--	--	863	--	--	--	38	10	2
Columbia	103	130	--	4	1	--	--	--	87	801	--	33	1	2
Cowlitz	69	39	58	10	3	--	3	44	--	--	30	12	2	8
Douglas	294	289	4	--	--	--	--	2	101	198	14	--	--	22
Ferry	336	337	11	1	9	--	--	16	--	370	--	203	6	20
Franklin	137	1	--	--	--	--	--	--	--	--	--	--	--	--
Garfield	215	308	1	9	--	--	--	13	166	913	12	14	83	20
Grant	377	161	10	--	--	--	--	7	723	219	4	10	4	11
Grays Harbor	91	3	156	1	9	--	--	2	--	--	73	154	4	28
Island	--	--	--	--	--	--	--	--	--	--	68	1	--	13
Jefferson	35	22	34	6	24	--	--	4	--	--	--	9	--	16
King	114	97	84	15	7	--	--	42	--	--	63	12	6	8
Kitsap	1	14	2	1	--	--	--	--	--	--	--	--	--	4
Kittitas	166	255	16	6	11	--	--	28	1726	1997	24	237	54	90

County	COYOTES		BOBCATS		COUGARS		FOX	SKUNK	MAGPIES		CROWS-RAVENS	OWLS	HAWKS
	Bounty	Dept. Men	Bounty	Dept. Men	Bounty	Dept. Men	Dept. Men	Dept. Men	Bounty	Dept. Men	Bounty	Dept. Men	Dept. Men	Dept. Men
Klickitat	352	163	47	2	7	--	6	1	175	116	168	37	13	18
Lewis	146	7	147	3	11	--	--	--	--	--	--	14	--	1
Lincoln	500	194	9	--	1	--	--	5	1074	1601	31	147	66	138
Mason	36	--	31	--	5	--	--	1	--	--	--	10	--	3
Okanogan	780	649	39	2	55	1	--	35	1868	1322	199	10	7	15
Pacific	71	1	95	1	--	--	--	3	--	--	--	22	--	--
Pend Oreille	127	287	27	8	--	--	--	32	--	28	--	190	--	--
Pierce	163	37	72	5	15	--	--	--	--	--	157	19	--	5
San Juan	--	--	--	--	--	--	--	--	--	27	--	21	1	13
Skagit	20	43	76	58	2	--	220	72	--	--	--	22	4	9
Skamania	44	74	19	1	5	1	9	--	--	3	--	4	--	--
Snohomish	111	14	72	3	2	--	--	6	--	--	--	167	1	7
Spokane	380	104	13	--	--	--	--	13	96	302	70	--	5	8
Stevens	605	374	64	20	2	1	--	4	--	321	--	27	40	51
Thurston	135	--	60	--	--	--	--	--	--	57	--	15	3	5
Wahkiakum	9	14	12	8	--	--	--	2	--	--	--	13	--	1
Walla Walla	158	161	1	--	--	--	--	4	381	627	62	99	3	9
Whatcom	8	7	30	4	25	--	222	44	--	--	59	97	--	18
Whitman	247	239	3	--	--	--	--	11	2943	1747	62	61	19	49
Yakima	302	629	36	7	10	--	2	9	2964	4492	208	235	92	23
TOTALS	7320	5325	1413	211	275	6	462	1315	13125	18214	1372	2212	484	752

PREDATORS TAKEN IN STATE BY COUNTIES

April 1, 1947 to March 31, 1948

County	COYOTES		BOBCATS		COUGARS		FOX	SKUNK	MAGPIES		CROWS-RAVENS	HAWKS	OWLS
	Bounty	Dept. Men	Bounty	Dept. Men	Bounty	Dept. Men	Dept. Men	Dept. Men	Bounty	Dept. Men	Bounty	Dept. Men	Dept. Men	Dept. Men
Adams	197	208	--	--	--	--	--	1	106	390	--	5	2	47
Asotin	330	4	10	--	--	--	--	9	--	292	--	146	3	8
Benton	89	17	--	--	--	--	--	15	630	890	--	90	53	3
Chelan	118	107	6	7	27	9	--	6	102	167	--	7	9	10
Clallam	41	11	65	5	29	--	--	17	--	--	146	66	13	5
Clark	42	12	14	--	--	--	--	158	--	--	--	207	3	1
Columbia	117	--	4	--	--	--	--	1	--	316	--	23	--	1
Cowlitz	67	82	34	4	--	--	--	237	--	--	--	20	3	1
Douglas	330	64	2	--	--	--	--	--	--	97	--	2	16	5
Ferry	110	407	28	7	10	--	--	4	--	244	--	36	23	14
Franklin	84	--	--	--	--	--	--	--	--	--	--	--	--	--
Garfield	164	447	--	31	--	--	--	17	533	2301	4	38	33	53
Grant	457	28	9	4	--	--	--	--	1975	414	344	42	19	10
Grays Harbor	97	7	86	1	13	--	--	--	--	--	636	46	10	--
Island	--	--	--	--	--	--	--	--	--	--	--	39	8	--
Jefferson	6	6	16	--	16	--	--	4	--	--	--	7	7	--
King	185	48	102	5	5	--	--	6	--	--	46	20	3	--
Kitsap	16	1	2	--	--	--	--	--	--	--	--	1	3	2
Kittitas	126	437	13	10	11	--	--	11	2247	3034	6	432	49	84
Klickitat	319	25	50	--	3	--	--	--	133	660	54	211	6	30

County	COYOTES		BOBCATS		COUGARS		FOX	SKUNK	MAGPIES		CROWS-RAVENS	HAWKS	OWLS
	Bounty	Dept. Men	Bounty	Dept. Men	Bounty	Dept. Men	Dept. Men	Dept. Men	Bounty	Dept. Men	Bounty	Dept. Men	Dept. Men	Dept. Men
Lewis	136	1	81	--	7	--	--	1	--	--	--	12	--	--
Lincoln	603	71	5	--	--	--	--	--	1010	554	11	30	44	33
Mason	35	4	18	--	4	--	--	--	--	--	--	--	6	--
Okanogan	517	1144	14	3	40	1	--	49	1376	1476	136	2	13	8
Pacific	58	--	50	--	--	--	--	1	--	--	50	7	1	--
Pend Oreille	124	363	16	8	--	--	--	11	--	449	--	17	9	6
Pierce	120	56	50	5	7	--	--	1	--	--	395	--	2	3
San Juan	--	--	--	--	--	--	--	--	--	--	112	--	2	--
Skagit	11	15	23	16	2	--	126	55	--	--	--	14	8	1
Skamania	21	--	14	--	11	--	--	4	--	--	34	1	1	--
Snohomish	83	75	40	17	1	--	71	240	--	--	--	179	14	--
Spokane	256	251	10	6	--	--	--	19	270	341	--	6	2	--
Stevens	375	412	19	8	4	2	--	1	--	642	--	18	15	9
Thurston	70	--	34	--	--	--	--	--	--	--	--	3	1	2
Wahkiakum	12	9	14	3	--	--	--	--	--	--	--	--	--	--
Walla Walla	122	15	6	--	--	--	--	3	329	191	23	21	--	1
Whatcom	4	1	18	3	12	--	42	10	--	--	158	39	14	1
Whitman	209	393	1	1	--	--	--	5	2077	1753	1	34	23	49
Yakima	200	815	26	13	5	--	15	10	2077	4544	164	81	16	18
TOTALS	5851	5536	880	157	207	12	254	896	12865	18755	2322	1902	434	405

RECAPITULATION OF BOUNTIES BY COUNTIES

April 1, 1946 to March 31, 1947

COUNTIES	Coyotes at $1.00	Coyotes at $5.00	Total Amount Coyotes	Bobcats at $5.00	Total Amount Bobcats	Cougars at $50.00	Total Amount Cougars	GRAND TOTAL Number Animals	GRAND TOTAL Bounty
Adams	25	180	$ 925.00	---	$ -------	---	$ --------	205	$ 925.00
Asotin	7	267	1,342.00	5	25.00	1	50.00	280	1,417.00
Benton	28	331	1,683.00	1	5.00	1	50.00	361	1,738.00
Chelan	21	180	921.00	22	110.00	42	2,100.00	265	3,131.00
Clallam	1	63	316.00	136	680.00	22	1,100.00	222	2,096.00
Clark	---	85	425.00	20	100.00	5	250.00	110	775.00
Columbia	33	70	383.00	---	-------	1	50.00	104	433.00
Cowlitz	3	66	333.00	58	290.00	3	150.00	130	773.00
Douglas	15	279	1,410.00	4	20.00	---	-------	298	1,430.00
Ferry	7	329	1,652.00	11	55.00	9	450.00	356	2,157.00
Franklin	1	136	681.00	---	-------	---	-------	137	681.00
Garfield	68	147	803.00	1	5.00	---	-------	216	808.00
Grant	10	367	1,845.00	10	50.00	---	-------	387	1,895.00
Grays Harbor	---	91	455.00	156	780.00	9	450.00	256	1,685.00
Island	---	---	-------	---	-------	---	-------	---	-------
Jefferson	5	30	155.00	34	170.00	24	1,200.00	93	1,525.00
King	1	113	566.00	84	420.00	7	350.00	205	1,336.00
Kitsap	---	1	5.00	2	10.00	---	-------	3	15.00
Kittitas	---	166	830.00	16	80.00	11	550.00	193	1,460.00
Klickitat	11	341	1,716.00	47	235.00	7	350.00	406	2,301.00

COUNTIES	Coyotes at $1.00	Coyotes at $5.00	Total Amount Coyotes	Bobcats at $5.00	Total Amount Bobcats	Cougars at $50.00	Total Amount Cougars	GRAND TOTAL Number Animals	GRAND TOTAL Bounty
Lewis	---	146	730.00	147	735.00	11	550.00	304	2,015.00
Lincoln	61	439	2,256.00	9	45.00	1	50.00	510	2,351.00
Mason	---	36	180.00	31	155.00	5	250.00	72	585.00
Okanogan	15	765	3,840.00	39	195.00	55	2,750.00	874	6,785.00
Pacific	---	71	355.00	95	475.00	---	---	166	830.00
Pend Oreille	---	127	635.00	27	135.00	---	---	154	770.00
Pierce	---	163	815.00	72	360.00	15	750.00	250	1,925.00
San Juan	---	---	---	---	---	---	---	---	---
Skagit	---	20	100.00	76	380.00	2	100.00	98	580.00
Skamania	---	44	220.00	19	95.00	5	250.00	68	565.00
Snohomish	1	110	551.00	72	360.00	2	100.00	185	1,011.00
Spokane	22	358	1,812.00	13	65.00	---	---	393	1,877.00
Stevens	1	604	3,021.00	64	320.00	2	100.00	671	3,441.00
Thurston	---	135	675.00	60	300.00	---	---	195	975.00
Wahkiakum	1	8	41.00	12	60.00	---	---	21	101.00
Walla Walla	82	76	462.00	1	5.00	---	---	159	467.00
Whatcom	---	8	40.00	30	150.00	25	1,250.00	63	1,440.00
Whitman	82	165	907.00	3	15.00	---	---	250	922.00
Yakima	38	264	1,358.00	36	180.00	10	500.00	348	2,038.00
TOTALS	539	6,781	$34,444.00	1,413	$7,065.00	275	$13,750.00	9,008	$55,259.00

RECAPITULATION OF BOUNTIES BY COUNTIES

April 1, 1947 to March 31, 1948

COUNTIES	Coyotes at $1.00	Coyotes at $5.00	Total Amount Coyotes	Bobcats at $5.00	Total Amount Bobcats	Cougars at $50.00	Total Amount Cougars	GRAND TOTAL Number Animals	GRAND TOTAL Bounty
Adams	43	154	$ 813.00	---	$ -------	---	$ -------	197	$ 813.00
Asotin	12	318	1,602.00	10	50.00	---	-------	340	1,652.00
Benton	10	79	405.00	---	-------	---	-------	89	405.00
Chelan	---	118	590.00	6	30.00	27	1,350.00	151	1,970.00
Clallam	---	41	205.00	65	325.00	29	1,450.00	135	1,980.00
Clark	---	42	210.00	14	70.00	---	-------	56	280.00
Columbia	34	83	449.00	4	20.00	---	-------	121	469.00
Cowlitz	1	66	331.00	34	170.00	---	-------	101	501.00
Douglas	4	326	1,634.00	2	10.00	---	-------	332	1,644.00
Ferry	1	109	546.00	28	140.00	10	500.00	148	1,186.00
Franklin	---	84	420.00	---	-------	---	-------	84	420.00
Garfield	39	125	664.00	---	-------	---	-------	164	664.00
Grant	18	439	2,213.00	9	45.00	---	-------	466	2,258.00
Grays Harbor	---	97	485.00	86	430.00	13	650.00	196	1,565.00
Island	---	---	-------	---	-------	---	-------	---	-------
Jefferson	---	6	30.00	16	80.00	16	800.00	38	910.00
King	3	182	913.00	102	510.00	5	250.00	292	1,673.00
Kitsap	---	16	80.00	2	10.00	---	-------	18	90.00
Kittitas	2	124	622.00	13	65.00	11	550.00	150	1,237.00
Klickitat	19	300	1,519.00	50	250.00	3	150.00	372	1,919.00

COUNTIES	Coyotes at $1.00	Coyotes at $5.00	Total Amount Coyotes	Bobcats at $5.00	Total Amount Bobcats	Cougars at $50.00	Total Amount Cougars	GRAND TOTAL Number Animals	GRAND TOTAL Bounty
Lewis	---	136	680.00	81	405.00	7	350.00	224	1,435.00
Lincoln	75	528	2,715.00	5	25.00	---	---	608	2,740.00
Mason	---	35	175.00	18	90.00	4	200.00	57	465.00
Okanogan	11	506	2,541.00	14	70.00	40	2,000.00	571	4,611.00
Pacific	---	58	290.00	50	250.00	---	---	108	540.00
Pend Oreille	1	123	616.00	16	80.00	---	---	140	696.00
Pierce	---	120	600.00	50	250.00	7	350.00	177	1,200.00
San Juan	---	---	---	---	---	---	---	---	---
Skagit	1	10	51.00	23	115.00	2	100.00	36	266.00
Skamania	---	21	105.00	14	70.00	11	550.00	46	725.00
Snohomish	---	83	415.00	40	200.00	1	50.00	124	665.00
Spokane	31	225	1,156.00	10	50.00	---	---	266	1,206.00
Stevens	---	375	1,875.00	19	95.00	4	200.00	398	2,170.00
Thurston	---	70	350.00	34	170.00	---	---	104	520.00
Wahkiakum	---	12	60.00	14	70.00	---	---	26	130.00
Walla Walla	27	95	502.00	6	30.00	---	---	128	532.00
Whatcom	---	4	20.00	18	90.00	12	600.00	34	710.00
Whitman	111	98	601.00	1	5.00	---	---	210	606.00
Yakima	31	169	876.00	26	130.00	5	250.00	231	1,256.00
TOTAL	474	5,377	$27,359.00	880	$4,400.00	207	$10,350.00	6,938	$42,109.00

DIVISION OF LANDS

One of the more important tools available for use in game administration is the controlled use of land areas for wildlife production and harvest. As human populations increase, with an ever-growing number of persons demanding a larger wildlife harvest, it is obvious that steps must be taken to cope with the fact that these same growing populations result in a lessening of the amount of land left unappropriated for game use. With this in mind, the State Game Commission, the State Legislature, and the Sportsmen, have cooperated in the formulation and enactment of laws enabling the department to greatly expand its land management program. This program, as established, is a supplement to other departmental activities. It can be divided into the following phases:

1. Public Fishing Lands

The preservation of the right of the license holder to take game fish produced is essential. The Game Department is securing areas of access to the waters of the state. To date, they have secured 52 such public fishing grounds, but this is just the beginning. Primary emphasis is being placed on lakes included in the poisoning program and on water located in the more heavily populated sections of the state. Many of these areas are acquired through donations of land from sportsmen's clubs, realtors, resort owners, and interested individuals. The realization that waters to which the Game Department holds access will always be well managed for fish production has provided a stimulus for such donations. County Planning Commissions have been helpful in setting aside areas for public fishing and recreational use.

Of the areas acquired, 25 have been developed to facilitate their use; that is roads have been built to the waters' edge, parking space has been arranged and sanitary facilities installed.

2. Public Shooting Grounds And Waterfowl Habitat

In the State of Washington there is a need for more locally-produced ducks, additional feed for migratory fowl and a place for the freelance shooter to put out his decoys. Land is being purchased, food planted, and marshes constructed to answer these needs. Before the start of this work, a study was made of state and federal waterfowl refuges and shooting grounds throughout the West to determine the best means of waterfowl and waterfowl food production. The Game Commission has approved for purchase an area of 4,067.82 acres in Yakima County, south of Sunnyside; also Lake Terrell in Whatcom County which will contain 1,296.76 acres; and Downs Lake of 3,004.90 acres, situated on the boundaries of Spokane and Lincoln Counties, southeast of Spokane. Acquisition and development has been started on these areas. The entire state has been surveyed and additional areas have been selected so that a statewide program may be rounded out as funds become available.

TOP — Land owners and the Game Department join hands to establish habitat areas devoted to the increased production of game birds.

BOTTOM — A young pheasant hen grabs a snack at one of the hoppers in a habitat area.

TOP — An aerial view of the Oak Creek Game Range. This unit now contains 27,440 acres between the Tieton and Naches Rivers in Yakima County.

BOTTOM — In addition to preserving natural food for game use, browse plants and grasses are grown for harvest by game. Here on a cut-over area on the Oak Creek Game Range, a worker is shown seeding blue grass.

3—Pheasant Habitat Development

Hardy and elusive as he is, the pheasant still needs a place to live and reproduce. In irrigated eastern Washington and humid western Washington, the Game Department has acquired 43 tracts of land averaging ten acres in size. Detailed investigations are being made on these units to determine the best land management practices to be followed in producing better pheasant populations. An intensive winter-feeding program is being carried on in the Sequim-Dungeness region in Clallam County to determine the effect on over-wintering bird populations in the western part of the state. Land owners and the Game Department are joining hands in the wheat-farming belt of eastern Washington to apply proven techniques aimed at increasing the population of wild upland birds.

Department specialists and the land-owner make a detailed survey of each farm to determine what areas can be set aside for game use. These tracts are then planted to permanent grasses and to food and cover-producing shrubs. Sources of water are assured, either through the construction of specially developed catchment cisterns, or by developing natural sources. Thus, weed patches and erosion-hazard areas are turned into game production units. More than 195 land-owners have entered into agreements, setting aside a total of 327 individual plots since the inception of this program in 1947. One and one-half tons of grass seed have been planted, as have over 30,000 shrubs and trees.

4-Big Game Range

Each acre of new agricultural land in the state affects the land area available for game production. It has become necessary to select and acquire certain key concentration points to insure winter food supplies for the herds of deer and elk. This phase of the program was started in 1939. During the past biennium, additional land purchases were made within the boundaries of established units. A new area containing 7,868.53 acres, situated along Sherman Creek in Ferry County, was approved for purchase. Both mule and white-tail deer are benefitted by this project. In addition to preserving all native food for game use on these ranges, agricultural crops, browse plants and grasses are grown for harvest by game.

Oak Creek Game Range is a unit now containing 27,440 acres, situated between the Tieton and Naches Rivers in Yakima County. This was increased by leasing 5,705.12 acres from the Northern Pacific R. R. Company. Some 2,000 elk are dependent on this range for their winter livelihood, but deer, pheasants, and chukars are also served by the project.

Squaw Creek Game Range, composed of 9,453 acres, was purchased originally as a range upon which to introduce antelope into this state. The range

has also served as a base upon which to start a deer herd in southern Kittitas County, between the Columbia and the Yakima rivers. There are numerous chukar, partridges, and sage-grouse in this area.

Wm. T. Wooten Game Range, which was formerly called the Tucannon Game Range, is located along the Tucannon River in Columbia and Garfield Counties. This 12,986 acre unit serves a multiple purpose. Elk winter on the grass-covered ridge tops, while mule-deer and white-tailed deer utilize the brushy slopes and river bottom. The thirteen miles of stream within the project produce some of the best fishing in southeastern Washington. Fences have been constructed to keep domestic stock off the range. 27 miles of the 34-mile boundary is now stock tight.

The Methow Game Range, when completely acquired, will occupy 15,210 acres along the east side of the Methow Valley in Okanogan County. In addition to the value of this range as a mule-deer wintering area, developments are underway to increase the numbers of grouse and pheasants. Bitterbrush and bunch grass, both native plants, form the bulk of the big game food produced in this area; however, 449 acres of land are farmed for the production of alfalfa and grain for game food.

On the Sinlahekin Game Range near Loomis, the range of the mountain goat and the pheasant actually meet. Intensive management of the valley floor has produced one of the state's highest pheasant populations. Ponds made by man and by beaver provide fish, fur, and waterfowl. Purchased as a mule-deer winter range, this 18,812 acre unit serves hunters, fishermen and campers alike.

Funds for land acquisition and development work are available from two sources. The 1947 legislature increased the fee for hunting and fishing licenses and stipulated that 20 percent of the monies derived from the sale of resident licenses should be used for the acquisition, development, and management of game lands. The Federal Aid and Wildlife Restoration Act provides that monies gained from a tax on sporting arms and ammunition be apportioned to the states on the basis of a ratio between their land area and hunting license sales. The total fund is made up of 75% federal money, and twenty-five percent state matching money. Under the provisions of this act, the funds may be used in purchasing game range, for the development of game range, or for use in game research.

APPROPRIATIONS

	1938	1939	1940	1941
Federal Apportionment	$23,439.58	$36,871.25	$56,525.42	$63,896.62
State Contribution	7,813.19	12,290.42	18,841.81	21,298.87
TOTAL	$31,252.77	$49,161.67	$75,367.23	$85,195.49

	1942	1943	1944	1945
Federal Apportionment	$29,113.94	$22,792.83	$22,299.09	$26,114.75
State Contribution	9,704.65	7,597.61	7,433.03	8,704.92
TOTAL	$38,818.59	$30,390.44	$29,732.12	$34,819.67

	1946	1947
Federal Apportionment	$65,044.07	$246,709.55
State Contribution	21,681.36	82,236.52
TOTAL	$86,725.43	$328,946.07

ACQUISITION OF LANDS FOR PUBLIC HUNTING, FISH AND GAME HABITAT AREAS, AND OTHER PURPOSES

	April 1, 1947 to March 31, 1948
Salaries and Wages	$ 48,314.59
State Vehicles	3,300.91
Private Mileage	5,255.25
Fares	98.04
Meals and Rooms	13,180.96
Telephone and Telegraph	30.95
Postage and Freight	3.15
Light, Heat and Water	7.35
Maps, blue prints, etc.	913.75
Signs	399.13
Small Tools and Equipment	924.60
Material	11,203.80
Labor	353.56
Seeds and Plowing	718.41
Taxes	91.99
Assessments	2,350.52
Feed for Birds	1,148.40
Purchase of Property	68,267.78
New Equipment	14,057.65
Medical Aid	283.50
Miscellaneous Expense	614.55
TOTAL	$171,518.84

Salaries & Wages	$ 48,314.59
Operations	123,204.25

WILDLIFE RESTORATION AND RESEARCH

April 1, 1946 to March 31, 1947 — April 1, 1947 to March 31, 1948

	April 1, 1946 to March 31, 1947	April 1, 1947 to March 31, 1948
Salaries and Wages	$ 5,646.81	$34,280.96
State Vehicles	220.65	1,457.78
Private Mileage	415.45	2,999.99
Fares	2.00	20.64
Meals and Room	1,294.20	11,732.72
Postage and Freight	3.10	-------
Small Tools and Equipment	64.89	457.16
Material	1,551.89	5,440.85
Labor	119.02	1,612.59
Seeding and Plowing	260.59	1,003.93
Taxes	-------	2,433.34
Rental of Land	-------	100.00
Purchase of Property	10,800.00	13,500.15
Title, Insurance, Abstract Fees, etc.	255.10	-------
New Equipment	-------	14,837.53
Medical Aid	123.88	313.41
Miscellaneous	85.50	32.64
TOTAL	$20,843.08	$90,223.69
Salaries and Wages	5,646.81	34,280.96
Operations	15,196.27	55,942.73

Note: Pittman-Robertson "Federal Aid" —75% reimbursed by Federal Government and credited game fund.

WILDLIFE CONSTRUCTION APPROPRIATION

WASHINGTON STATE DEVELOPMENT BOARD GRANT 26-3-7

April 1, 1946 to March 31, 1947 — April 1, 1947 to March 31, 1948

	April 1, 1946 to March 31, 1947	April 1, 1947 to March 31, 1948
Salaries and Wages	6,666.65	----
State Vehicles	274.21	113.99
Private Mileage	902.15	----
Meals and Room	2,161.11	----
Telephone and Telegraph	.70	----
Small Tools and Equipment	58.75	22.90
Labor	16,964.73	----
Materials	3,407.29	----
Seeds and Plowing	460.35	799.28
Medical Aid	36.66	36.50
Miscellaneous	3.54	----
New Equipment	549.40	----
TOTAL	$31,485.54	$972.67
Salaries and Wages	$ 6,666.65	----
Operations	$24,818.89	$972.67

Note: Pittman-Robertson "Federal Aid"—75% reimbursed by Federal Government and credited general fund.

ENGINEERING DIVISION

During the past two years, the State Game Department, through its construction division, has completed more major projects than during any similar period in its existance.

These projects included not only additional new installations but a complete program of repairs to its already existing facilities. More than a million and a half dollars were expended on this capital expansion program.

New hatcheries were constructed in Mason County near the city of Shelton, in Pierce County near the city of Puyallup, and in Ferry County near the town of Republic.

New game farms were built in Kittitas County near Ellensburg, and on Whidby Island, Island County.

The new Administration-Warehouse building, as discussed on the back cover page, was constructed.

Major repairs were completed at Chelan Hatchery, South Tacoma Hatchery, Vancouver Hatchery, Arlington Hatchery, San Poil Hatchery, Aberdeen Hatchery, Tokul Creek Hatchery and the Naches Hatchery; also at the Walla Walla, Kennewick and Methow State Game Farms.

The state of Washington now possesses one of the finest systems of hatcheries and game farms existing in any state in the nation.

The work completed during the past biennium represents a substantial addition to these facilities. They will have a lasting and beneficial effect on the state's wildlife resouces.

CAPITAL OUTLAYS & MAJOR REPAIRS

April 1, 1946 to March 31, 1947 — April 1, 1947 to March 31, 1948

	April 1, 1946 to March 31, 1947	April 1, 1947 to March 31, 1948
Aberdeen Hatchery	$ ------	$ 6,335.14
Arlington Hatchery	4,171.89	3,620.71
Bellingham Hatchery	227.74	------
Lake Whatcom Hatchery	721.15	------
Tokul Creek Hatchery	361.08	647.27
Vancouver Hatchery	8,029.97	1,660.64
Kennewick Game Farm	53.44	------
Yakima Game Farm	128.22	------
Puyallup Hatchery	------	530.00
State Wide Equipment	------	26,305.72
State Wide Repairs	------	102,065.21
Screening	------	13,466.96
TOTAL	$13,693.49	$154,631.65
Salaries	$ 3,547.76	$ 46,838.64
Operations	$10,145.73	$107,793.01

CAPITAL OUTLAYS, MAJOR REPAIRS & BETTERMENTS
April 1, 1946 to March 31, 1947 — April 1, 1947 to March 31, 1948

	April 1, 1946 to March 31, 1947	April 1, 1947 to March 31, 1948
Ellensburg Game Farm	$ 9,212.69	$ 6,030.79
Lewis County Farm	18,798.54	------
Methow Farm	2,989.38	------
Spokane Farm	12,072.30	------
Whidby Island Farm	19,086.49	4,419.06
Yakima Farm	984.32	------
Mason Co. Hatchery	8,244.38	5,040.13
Puyallup Hatchery	27,219.56	1,902.97
Walla Walla Farm	------	811.13
Aberdeen Hatchery	------	1,750.72
Chelan Hatchery	------	892.72
Miscellaneous	134,358.10	875.29
TOTAL	$232,965.76	$21,722.81
Salaries	$ 40,996.23	1,514.80
Operations	$191,969.53	$20,208.01

CAPITAL OUTLAYS & MAJOR REPAIRS
WASHINGTON STATE DEVELOPMENT BOARD GRANT 26-3-6

	April 1, 1946 to March 31, 1947	April 1, 1947 to March 31, 1948
Preliminary Expense	$ 28,602.76	$ 4,209.43
Ellensburg Game Farm	14,958.75	118,811.79
Whidby Island Game Farm	53,463.49	92,792.86
Mason County Hatchery	27,090.96	213,336.98
Puyallup Hatchery	14,091.14	76,183.40
Administration Building	--------	47,626.78
TOTAL	$138,207.10	$552,961.24
Salaries	$ 32,151.01	$ 65,560.34
Operations	$106,056.09	$487,400.90

DIVISION OF EDUCATION AND INFORMATION

During the past biennium, tremendous and ever-increasing enthusiasm for hunting and fishing in this state has stretched the lines of production and maintenance to their ultimate limits. From this time forth, good hunting will depend upon land owners and sportsmen themselves, as well as upon the men who are actively employed in building up a game supply. People who

understand this problem are the ones best equipped to deal with this far-reaching study in co-operation; a study destined to become more complex as the years go by.

The Game Department believes that a good place to start teaching conservation of wildlife is with America's youth. With this thought in mind, personnel of the education and information division have devoted many hours to instructing in 4-H summer camps. It is recognized that 4-H clubs are made up of the cream of America's organized young people from farm groups. Their groups have summer camps each year in all 39 counties, and, since a large percentage of game is supported by farming practices, this instruction program has been designed to show the young people the value of Washington's game as well as to help them recognize their part in its propagation. Subjects available for the 1948 4-H club camp instruction throughout the state include: 1—Game birds relation to the farm. 2—Identification and discussion of game birds, animals and fish. (A general coverage to give the farm youth knowledge of local wildlife). 3—Game laws and the part each person plays in the protection program of this state. 4—Safety with firearms. 5—Fly-casting and fishing methods discussed and demonstrated. 6—Trapping in relation to farm predators; a program for youths interested in utilizing fur resources in their immediate areas.

Plans have been laid during this past biennium for an ambitious school program which is to include the aid of protectors as well as game and fish biologists in classroom instruction. The Washington State Sports Council and the Game Department outlined this program which receives guidance and advice from the College of Education of the University of Washington. Still furthering this idea, the Department sponsored and paid for the education of ten teachers who attended a conservation summer school at the University of Washington in 1948.

Of course, education is not confined to youth. The Education and Information Division has accumulated materials and animals so that they may put on an average of ten comprehensive displays each year. These have appeared at fairs, sportsmen's shows and festivals. Some are simple and others elaborate, depending on the space and facilities provided, but all have proven popular with crowds.

The value of the printed word has not been over-looked. A monthly round-up of all news and activities of the Game Department is released to newspapers, sportsmen, and interested people through the GAME BULLE-

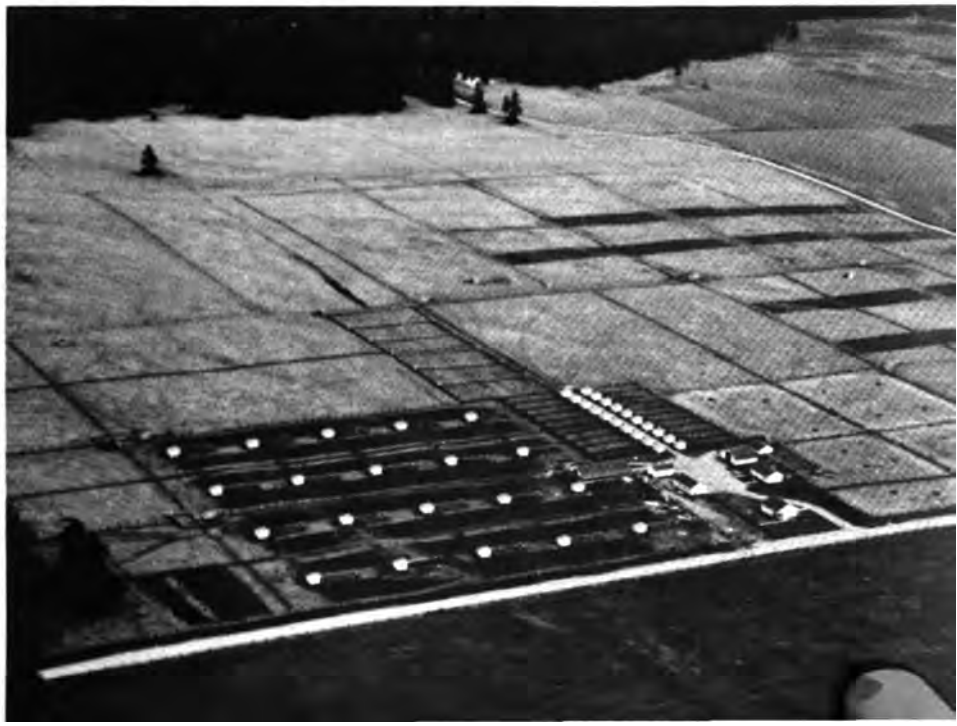
TIN. This Bulletin is supplemented by current news releases, feature articles, and rotogravure pages. Picture and magazine material is furnished to interested publishers. For the more specific researcher, miscellaneous bulletins and progress reports are kept up to date, and are available upon request. A monthly NEWSLETTER for the department personnel is published with an idea of keeping all employees acquainted with each other as well as with the department's activities throughout the state.

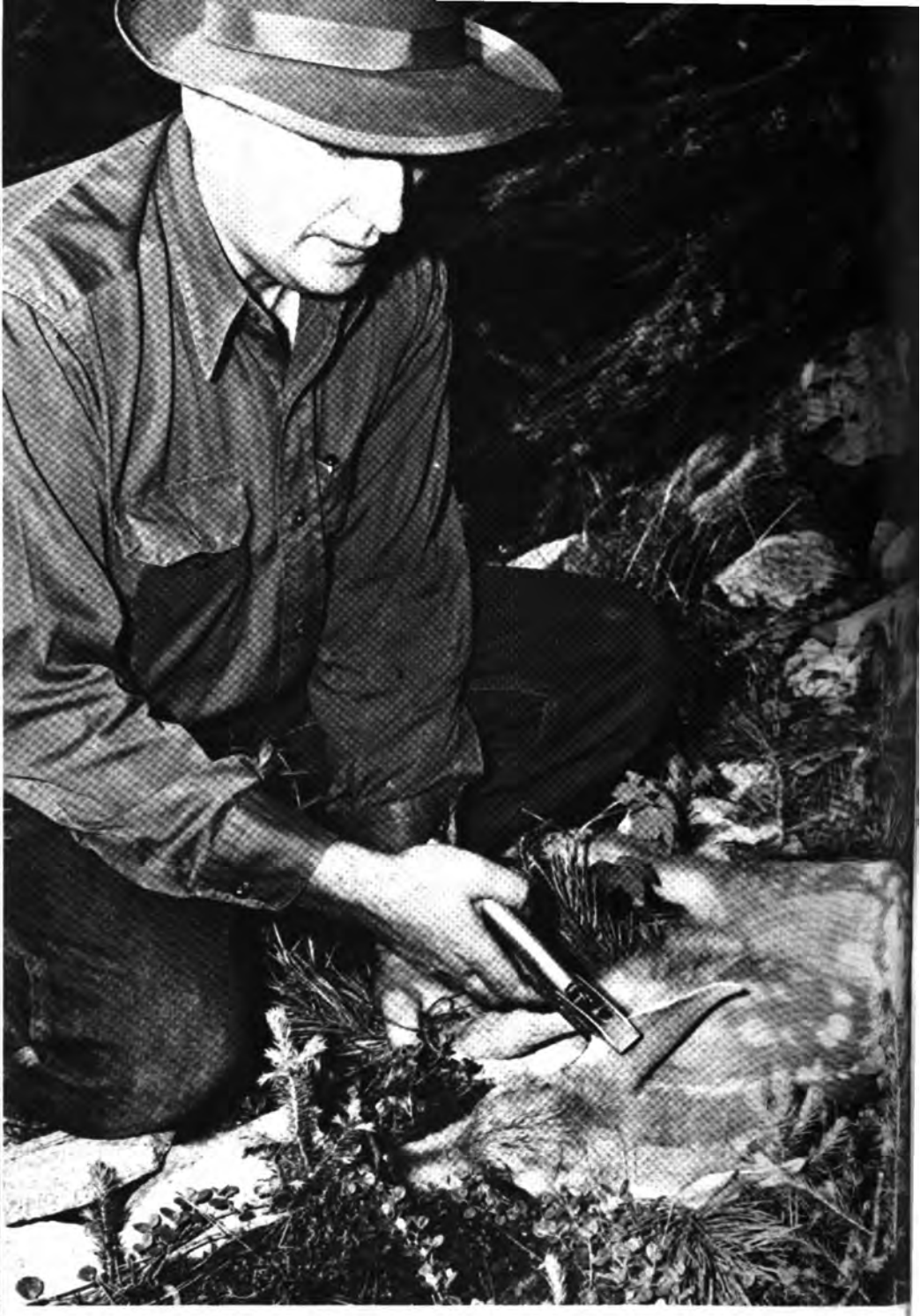
A lecture program provides speakers who are able to discuss conservation and game management with a wide variety of clubs. These speakers who come free of charge have motion pictures when desired to illustrate their spoken information.

The Game Department now has six motion pictures in natural color with full sound track of voice narration and music background. These films may be had for the asking by any interested group who have their own projectors and screens, or they will be shown upon request (allowing for reasonable time warning to arrange a place on the schedule) by department speakers. During the past two years it is estimated that some 250,000 people have viewed these pictures on Washington's wildlife.

TOP — Game biologists meet with a group of 4-H club members. A comprehensive program of wildlife identification and conservation is carried on by this Department. A part of the project involves meeting with some 4,500 farm youths each year in their summer camps.

BOTTOM — An aerial view of the Whidby Island Game Farm which was constructed during the past biennium.





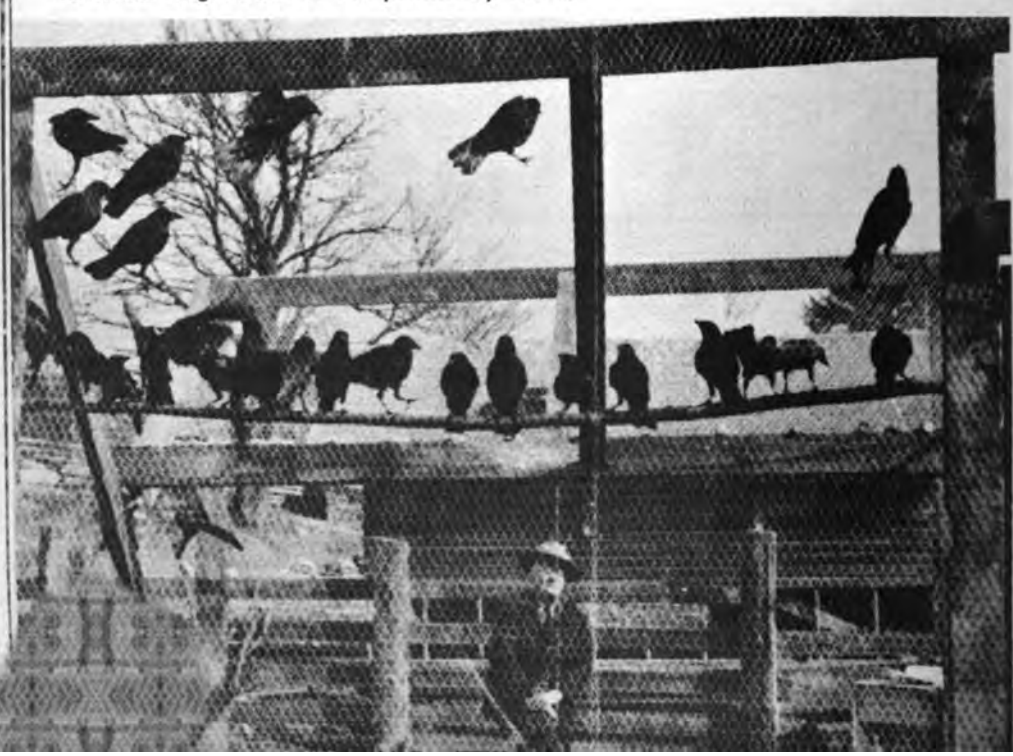
A Game Department biologist places a tag on the ear of a mule deer fawn. Such a checking device helps to assemble facts about the migrations and life histories of Washington's deer.

TOP — Each year the Game Department holds schools to bring the personnel up to date on newest ideas for protection and conservation of wildlife. Here an attentive group of men listen to M. M. Fruit, Chief of the Enforcement Division.

BOTTOM — A State Game Protector checks the Big Game Tag on the antlers of a buck deer taken in the Natapoc Bow and Arrow reserve.

TOP — The coyote, an innocent looking but dangerous marauder.

BOTTOM — Crows are trapped for banding and release. Such a procedure helps to check migrations of the predatory birds.



SUMMARY OF RECEIPTS

STATEMENT OF AMOUNT CREDITED TO STATE GAME FUND (From Report of State Treasurer)	Jan. 1, 1946 to Dec. 31, 1946	Jan. 1, 1947 to Dec. 31, 1947
Department of Game (Miscellaneous Collections)	$ 271,301.45	$ 150,668.41
Department of Game (Licenses & Big Game Seal Tags)	1,249,276.50	1,371,700.50
County Fines	28,980.63	32,658.10
Sale of State Property	11,166.86	11,985.31
Deposit Interest	29,427.62	26,657.64
Receipts from Transfers	351.75	----------
Federal Aid (Game Fund reimbursed 75% of amount expended from appropriation "Wildlife Restoration and Research" — or for Pittman-Robertson projects)	39,305.10	50,478.04
Miscellaneous	501.92	1,894.67
Cancelled Warrants	----------	128.08
	$1,630,311.83	$1,646,170.75
Treasurer's Balance on hand December 31, 1945	1,563,741.75	----------
Treasurer's Balance on hand December 31, 1946	----------	1,696,392.11
	$3,194,053.58	$3,342,562.86
Warrants Paid	1,497,636.47	1,918,652.08
Transfers	25.00	21,561.07
Treasurer's Balance on hand December 31, 1946	$1,696,392.11	----------
Treasurer's Balance on hand December 31, 1947	----------	$1,402,349.71

STATEMENT OF AMOUNT CREDITED TO STATE GAME FUND (From Report of State Treasurer)	April 1, 1946 to March 31, 1947	April 1, 1947 to March 31, 1948
Department of Game (Miscellaneous Collections)	$ 108,903.24	$ 244,342.93
Department of Game (Licenses & Big Game Seal Tags)	1,360,530.50	1,449,969.50
Sale of State Property	11,255.71	12,700.69
County Fines	32,009.49	32,093.78
Deposit Interest	26,657.64	28,936.36
Receipt from Transfers	361.75	----------
Federal Aid (Game Fund reimbursed 75% of amount expended from appropriation "Wildlife Restoration and Research" — or for Pittman-Robertson projects)	45,449.44	39,268.79
Miscellaneous	724.89	1,995.78
Cancelled Warrants	----------	128.08
	$1,585,892.66	$1,809,435.91
Treasurer's Balance on hand March 31, 1946	1,592,004.38	----------
Treasurer's Balance on hand March 31, 1947	----------	1,631,454.07
	$3,177,897.04	$3,440,889.98
Warrants Paid	1,546,417.97	2,093,151.72
Transfers	25.00	----------
Transfer - Federal Aid (Washington Development Board Funds) 75% transferred to General Fund	----------	21,561.07
Treasurer's Balance on hand March 31, 1947	$1,631,454.07	----------
Treasurer's Balance on hand March 31, 1948	----------	$1,326,177.18

SUMMARY OF REVENUE CALENDAR YEARS 1946-1947

(From Records of Department of Game Office)

		Number of Licenses Issued 1946	1947	*Total Amount Collected* 1946	1947
COLLECTIONS BY DEPARTMENT OF GAME—LICENSE DIVISION—					
State Resident Hunting & Fishing Licenses	at $ 3.00	286,811	317,545	$ 860,433.00	$ 952,635.00
State Non-resident Hunting & Fishing Licenses	at 25.00	124	223	3,100.00	5,575.00
State Alien Hunting & Fishing Licenses	at 25.00	18	23	450.00	575.00
State Non-resident Fishing Licenses	at 5.00	4,558	5,253	22,790.00	26,265.00
State 10-Day Non-resident Fishing Licenses	at 1.50	8,121	11,961	12,181.50	17,941.50
State Non-resident Hunting & Fishing Licenses (sold as Reciprocals)	at 20.00	11	12	220.00	240.00
State Non-resident Game Bird Hunting Licenses	at 15.00	210	277	3,150.00	4,155.00
State Taxidermist Licenses	at 5.00	26	31	130.00	155.00
State Fur Dealers' Licenses	at 10.00	98	70	980.00	700.00
State Private Game Farm Licenses—new	at 20.00	16	22	320.00	440.00
State Private Game Farm Licenses—renewal	at 10.00	52	58	520.00	580.00
State Game Importers Licenses—new	at 20.00	2	1	40.00	20.00
State Game Importers Licenses—renewal	at 10.00	1	1	10.00	10.00
State Resident Supplemental Elk Licenses	at 5.00	24,515	26,374	122,575.00	131,870.00
State Non-resident Supplemental Elk Licenses	at 25.00	31	53	775.00	1,325.00
County Resident Hunting & Fishing Licenses	at 1.50	81,606	86,303	122,409.00	129,454.50
County Non-resident Fishing Licenses	at 3.00	2,167	1,585	6,501.00	4,755.00
County Alien Fishing Licenses	at 5.00	71	62	355.00	310.00
County Professional Guide Licenses	at 10.00	12	12	120.00	120.00
County Resident Trapping Licenses	at 5.00	2,837	2,313	14,185.00	11,565.00
Duplicate License Fee	at .50	1,174	1,214	587.00	607.00
		412,461	453,393	$1,171,831.50	$1,289,298.00
Total receipts from sale of big game seals		154,890	164,805	$ 77,445.00	$ 82,402.50
Total Receipts from Licenses (1)		567,351	618,198	$1,249,276.50	$1,371,700.50

	Number of Licenses Issued 1946	1947	*Total Amount Collected* 1946	1947
Fines collected for violation of State Game Laws	------	------	(2)	(2)
Receipts from other sources and transfers	------	------	(2)	(2)
Reimbursement by Federal Government of 75% of money expended from appropriation "Wildlife Restoration and Research" (Pittman-Robertson Act) deposited in State Treasury and not through Department of Game Office	------	------	(3)	(3)
MISCELLANEOUS COLLECTION IN DEPARTMENT OF GAME OFFICE—				
Lease Rental	------	------	100.00	17.69
Tagging	------	------	1,059.40	1,084.15
Tagging trophy seals	------	------	1.00	-------
Sale of confiscated material	------	------	-------	7,330.75
Sale of Peat Soil	------	------	-------	1,903.50
Sale of blackberries	------	------	842.75	-------
Sale of State property	------	------	572.50	235.67
Sale of Game Fish Tags	------	------	625.25	451.95
Sale of Hay	------	------	50.00	-------
Sale of Pelts	------	------	269,534.45	141,754.22
Sale of Aluminum Bird Bands	------	------	15.75	32.35
Sale of Poultry	------	------	8,345.67	9,846.14
Sale of Feed	------	------	1,355.94	-------
Miscellaneous	------	------	467.52	1,891.97
	567,351	618,198	$1,532,246.73	$1,536,248.89

(1) Total receipts from licenses include some sale reported after January 1, 1946 and 1947, respectively, which accounts for the difference between these totals and those shown by the State Treasurer.

(2) As collection of fines is not reported to the Department of Game office, and this segregated information is not available from the State Treasurer's office, this item is left blank. It is included in the State Treasurer's reports under "county fines."

(3) Calendar year 1946—this amount was $39,305.10—Calendar year 1947—it was $50,478.04.

GENERAL EXPENSE — LICENSE DIVISION

April 1, 1946 to March 31, 1947 — April 1, 1947 to March 31, 1948

	April 1, 1946 to March 31, 1947	April 1, 1947 to March 31, 1948
Salaries	$ 9,348.58	$10,271.25
Private Mileage	55.25	150.60
Meals, Rooms and Berths	53.29	98.23
General Office Supplies	1,033.72	1,000.98
Postage and Envelopes	1,458.44	1,454.34
Freight and Express	243.51	286.35
State Printing	9,995.85	15,654.22
Surety Bonds	1,743.04	1,712.10
Repairs to Furniture and Equipment	97.32	17.45
Signs and Tags	2,921.48	1,565.84
TOTAL	$26,950.48	$32,211.36
Salaries	$ 9,348.58	$10,271.25
Operations	$17,601.90	$21,940.11

GENERAL ADMINISTRATION AND OFFICE EXPENDITURES

April 1, 1946 to March 31, 1947 — April 1, 1947 to March 31, 1948

	April 1, 1946 to March 31, 1947	April 1, 1947 to March 31, 1948
Salaries	$180,234.93	$176,404.38
State Vehicle Expense	16,300.13	14,080.99
Private Mileage	12,491.75	12,578.40
Fares	1,334.36	1,769.55
Meals, Rooms and Berths	13,144.46	16,617.59
General Office Supplies	1,843.57	3,202.84
Telephone and Telegraph	4,786.34	5,558.98
Postage and Envelopes	6,509.94	2,576.78
Freight and Express	1,428.45	850.27
State Printing	1,210.77	11,039.61
Rent	10,292.18	17,267.52
Surety Bonds	707.90	667.88
Advertising	8,248.60	1,258.18
Repairs to Furniture and Equipment	74.61	256.51
Small Tools and Equipment	293.35	213.74
Feed	2,137.29	2,542.86
Signs and Tags	20.19	266.54
Light, Heat and Water	516.18	662.01
Beaver Supplies	------	38.63
Seeds and Plowing	243.05	199.54
Warehouse Supplies	89.90	91.59
Warehouse Stock	7,108.20	7,162.24
New Equipment	10,212.94	8,518.10
Scientific Supplies	236.76	130.05
Medical Aid	40.62	285.05
Photographic Supplies	3,621.67	4,055.31
Drafting Supplies	339.40	157.93
Miscellaneous	1,189.08	1,996.25
Building and Structure	439.97	------
TOTAL	$285,096.59	$290,449.32
Salaries	$180,234.93	$176,404.38
Operations	$104,861.66	$144,044.94

STATE GAME COMMISSION
GENERAL ADMINISTRATION AND OFFICE EXPENDITURES

	April 1, 1946 to March 31, 1947	April 1, 1947 to March 31, 1948
Per Diem	$ 985.00	$1,360.00
Stenographer	612.00	356.09
Private Mileage	175.60	185.20
Fares	122.84	687.75
Meals, Room, Berths	394.47	588.20
Telephone & Telegraph	103.36	47.53
State Vehicles	13.04	-----
Misc. Badges	26.27	96.82
TOTALS	$2,432.58	$3,321.59
Salaries & Wages	$1,597.00	$1,716.09
Operations	$ 835.58	$1,605.50

RECAPITULATION OF DISBURSEMENTS

	Fiscal Year April 1, 1946 to March 31, 1947			*Fiscal Year April 1, 1947 to March 31, 1948*		
	Salaries	*Operations*	*Totals*	*Salaries*	*Operations*	*Totals*
Game Commission	$ 1,597.00	$ 835.58	$ 2,432.58	$ 1,716.09	$ 1,605.50	$ 3,321.59
General Administration	56,694.72	27,649.89	84,344.61	68,068.36	40,922.76	108,991.12
License Division	9,348.58	17,601.90	26,950.48	10,271.25	21,940.11	32,211.36
Game Survey	26,916.91	8,747.87	35,664.78	24,771.82	12,088.39	36,860.21
Lake & Stream Survey	29,673.91	10,051.20	39,725.11	27,590.36	11,639.80	39,230.16
Pittman-Robertson	14,777.67	6,770.51	21,548.18	1,674.07	844.34	2,518.41
Game Refuges	-------	-------	-------	10,764.27	6,050.23	16,814.50
Pheasant Habitat	-------	247.57	247.57	-------	223.77	223.77
Biennial Report	-------	-------	-------	-------	2,842.20	2,842.20
Stores & Warehouse	3,806.98	15,128.08	18,935.06	3,337.42	19,184.22	22,521.64
Signs & Tags	-------	20.19	20.19	-------	-------	-------
Legal Advertising	-------	8,106.09	8,106.09	-------	626.90	626.90
Feed in the Open	-------	290.77	290.77	-------	484.00	484.00
Dept. of Agriculture	-------	1,445.95	1,445.95	-------	1,927.15	1,927.15
Engineers & Draftsmen	9,584.54	2,945.72	12,530.26	22,123.87	5,151.07	27,274.94
Publicity	6,346.86	7,288.00	13,634.86	11,555.40	10,055.49	21,610.89
Special Fur-Bearing & Beaver	21,804.95	921.15	22,726.10	1,489.63	368.82	2,272.63
Predatory Animal Hunters	-------	-------	-------	-------	-------	-------
Screening Operations	3,908,68	934.69	4,843.37	239.82	157.04	396.86
Game Protectors—						
Regular $180,220.69				217,639.07		
Temporary 7,503.80	187,726.49	82,706.96	270,433.45	10,640.50	228,279.57	107,329.86	335,195.25
State Game Farms	69,991.37	101,037.96	171,029.33	84,890.91	113,854.05	198,744.96
State Trout Hatcheries	128,283.46	192,243.23	320,526.69	151,970.21	200,220.89	352,191.10
Construction	2,887.01	2,513.51	5,400.52	15,553.63	6,039.41	21,593.04

	Fiscal Year April 1, 1946 to March 31, 1947			*Fiscal Year April 1, 1947 to March 31, 1948*		
	Salaries	*Operations*	*Totals*	*Salaries*	*Operations*	*Totals*
Eyeing Stations	4,528.49	1,403.25	5,931.74	7,074.74	3,031.71	10,106.45
Lands Division	3,832.70	1,625.30	5,458.00	-------	1,075.40	1,075.40
New Equipment	-------	10,175.17	10,175.17	-------	-------	-------
Stores Issues	-------	6,687.50	6,687.50	-------	4,341.38	4,341.38
Total—Salaries & Wages & Opr.	$581,710.32	$494,033.04	$1,075,713.36	$671,371.42	$563,321.73	$1,234,693.15
Biological Research	1,718.53	28,629.91	30,348.44	-------	-------	-------
Lake & Stream Improvement	-------	-------	-------	12,006.31	33,694.06	45,700.37
*Wildlife Restoration & Research	5,646.81	15,196.27	20,843.08	34,280.96	55,942.73	90,223.69
Prevention of Deer & Elk Damage	771.91	23,804.26	24,576.17	1,886.40	40,095.76	41,982.16
Payment of Bounties & For Predator Control	60,436.13	113,494.69	173,930.82	49,134.29	65,667.14	114,801.43
Damage Claims Paid	-------	1,597.00	1,597.00	-------	-------	-------
Claims caused Pred. Cont. Program	-------	-------	-------	-------	960.00	960.00
Control of Beaver	546.32	53,525.44	54,071.76	13,889.69	54,163.97	68,053.66
Capital Outlays & Major Repairs	3,547.76	10,145.73	13,693.49	46,858.64	107,795.01	154,631.65
Capital Outlays, Maj. Rep. & Betterments	40,996.23	192,056.17	233,052.40	1,514.80	20,208.01	21,722.81
Administration Building	-------	-------	-------	-------	97,898.90	97,898.90
Acquisition of Lands for Public Hunting, Fishing and Game Habitat Areas, and Other Purposes	-------	-------	-------	48,314.59	123,204.25	171,518.84
Wildlife Const. Grant 26-3-7	6,666.65	24,818.89	31,485.54	-------	972.67	972.67
Capital Outlays Grant 26-3-6	32,151.01	106,056.09	138,207.10	-65,560.34	487,400.90	552,961.24

*75% to be refunded by Federal Government.

LIST OF EMPLOYEES OF THE STATE OF WASHINGTON
DEPARTMENT OF GAME

NAME	ADDRESS	POSITION
Don W. Clarke	2279 Viewmont Way, Seattle	*Director*
John A. Biggs	2256 Viewmont Way, Seattle	*Ass't. Director*
Hazel D. Clarke	6708-1st Ave. N.W., Seattle	*Chief Clerk-Office Mgr.*
H. T. Condon	4718-21st Ave. N.E., Seattle	*Business Manager*
Laura Arthur	6212-5th Ave. N.W., Seattle	*Secy. to Commission*
Donald D. Stahl	5103 E. 44th St., Seattle	*Chief-License Division*
Dorothy Gaines	2216 E. 75th, Seattle	*Account-Clerk*
Lyla Anderson	10426 Waters Ave., Seattle	*Account-Clerk*
Vivien J. McKinney	129 N. 59th, Seattle	*Payroll Clerk*
Lois Broten	1632-15th Ave., Seattle	*Clerk-Stenographer*
Margaret Brown	1619 Belmont Ave., Seattle	*Clerk-Stenographer*
Marjorie H. Brown	1305 E. Howell, Seattle	*Clerk-Stenographer*
Frances E. Cackette	615 Boren Ave., Seattle	*Clerk-Stenographer*
Edith Carlson	Route 3, Box 408, Bellevue, Wn.	*Clerk-Stenographer*
Bernice Collins	7336-24th Ave. N.W., Seattle	*Clerk-Stenographer*
Hazel Cooper	309 E. Harrison, Seattle	*Clerk-Stenographer*
May P. Hammond	723-35th Ave., Seattle	*Clerk-Stenographer*
Janice Mainhardt	17204-3rd Ave. N.E., Seattle	*Clerk-Stenographer*
Bertha M. Martens	2021-4th Ave., Seattle	*Clerk-Stenographer*
Dorothy Pinkerton	10612 Durland N.E., Seattle	*Clerk-Stenographer*
Pauline E. Smith	1523 E. 91st, Seattle	*Clerk-Stenographer*
Dorothy Atkins	5113 Brighton St., Seattle	*Clerk-Typist*
Lena Boitano	8559 Mary Ave. N.W., Seattle	*Clerk-Typist*
Elna Cartino	1014 E. Roy, Seattle	*Clerk-Typist*
Bernice Clark	918-30th Ave., Seattle	*Clerk-Typist*
Margaret B. Glaser	1810 N. 40th, Seattle	*Clerk-Typist*
Vera Johnson	1305 E. Howell, Seattle	*Clerk-Typist*
Cora Jones	12058-42nd Ave. S., Seattle	*Clerk-Typist*
Juanita Pilcher	400 W. Roy, Seattle	*Clerk-Typist*
Hazel Stone	6314-42nd Ave. S.W., Seattle	*Clerk-Typist*
Dorothy Strom	400 W. Roy, Seattle	*Clerk-Typist*
Dolores Strubin	1824 N. 48th, Seattle	*Clerk-Typist*
Peggy Ward	2645 W. 57th, Seattle	*Clerk-Typist*
Grace M. Cooper	2245 Yale Ave. N., Seattle	*Clerk*

GAME MANAGEMENT DIVISION

J. Burton Lauckhart	2143 N. 86th St., Seattle	*Chief*
Niilo Anderson	511 Douglas St., Wenatchee, Wn.	*Game Biologist*
Dan C. Barnett	16550-18th Ave. N.E., Seattle	*Game Biologist*
Arthur K. Crews	1916 Harding Rd., Aberdeen, Wn.	*Game Biologist*
Russell W. Hupe	1832 S. Eastside, Olympia	*Game Biologist*
Robert G. Jeffrey	Rt. 1, Box 517-A, Stanwood, Wn.	*Game Biologist*
Ralph W. Mohr	Rt. 6, Box 229-B, Yakima, Wn.	*Game Biologist*
Raleigh Moreland	5823 N. Calispel, Spokane	*Game Biologist*
Carl V. Swanson	Box 296, Starbuck, Wn.	*Game Biologist*
Henry A. Hansen	217 New Science Hall, Pullman, Wn.	*Waterfowl Biologist*
Wendell H. Oliver	Box 224, Buena, Wn.	*Waterfowl Biologist*

GAME MANAGEMENT	ADDRESS	POSITION
Chas. F. Yocom	217 New Science Hall, Pullman, Wn.	*Waterfowl Biologist*
Donald Galbraeth	214 Vancouver Ave., Tacoma	*Research Asst.*
Morris A. Clyde	2106-2nd Ave. W., Seattle	*Statistician*
Harold Witham	8730-19th Ave. N.W., Seattle	*General Game Farm Supt.*
L. R. Carlton	36001-100th Ave. S.E., Auburn, Wn.	*Auburn Supt.*
Edw. W. Osterberg	36001-100th Ave. S.E., Auburn	*Auburn Asst.*
Fred Potter	Colville, Wn.	*Colville Asst.*
Wm. G. Ford	RFD #3, Ellensburg, Wn.	*Ellensburg Supt.*
Dale Hamblen	RFD #3, Ellensburg, Wn.	*Ellensburg Asst.*
Ernest Johnson	RFD #1, Kennewick, Wn.	*Kennewick Supt.*
Roy Davis	RFD #1, Kennewick, Wn.	*Kennewick Asst.*
R. D. Leslie	Rt. 1, Box 70, Centralia, Wn.	*Lewis County Supt.*
Geo. McDaniel	Winthrop, Wn.	*Methow Supt.*
Ross Harper	7801 Phillips Rd. S.W., South Tacoma	*So. Tacoma Supt.*
Cyril Bean	7801 Phillips Rd. S.W., So. Tacoma	*So. Tacoma Asst.*
Arthur D. Simons	7801 Phillips Rd. S.W., So. Tacoma	*So. Tacoma Asst.*
Wm. Wadkins	Deer Park, Wn.	*Spokane Supt.*
Chester A. Grant	Deer Park, Wn.	*Spokane Asst.*
Dave Ford	Route #1, Walla Walla, Wn.	*Walla Walla Supt.*
E. Hedstrom	Rt. 1, Box 1000, Coupeville, Wn.	*Whidby Island Supt.*
Harvey Chesteen	Rt. 1, Box 1000, Coupeville, Wn.	*Whidby Island Asst.*
Dale Chinn	Star Rt., Box 165, Wapato, Wn.	*Yakima Supt.*
Lloyd Cline	Star Rt. Box 165, Wapato, Wn.	*Yakima Asst.*

FISHERY MANAGEMENT DIVISION

Clarence F. Pautzke	2124 W. 99th St., Seattle	*Chief*
Robert C. Meigs	7550-22nd Ave. N.E., Seattle	*Asst. Chief*
D. Earnest	N. 520 Walnut Rd., Rt. 3, Opportunity, Wn.	*Fish Biologist*
Ralph Larson	1601 Simpson Ave., Aberdeen, Wn.	*Fish Biologist*
Edw. S. Marvich	6535-6th Ave. N.W., Seattle	*Fish Biologist*
Alex Mc Rea	2715 Jefferson, Bellingham, Wn.	*Fish Biologist*
Robert J. Rennie	211 N. Crescent Dr., Yakima, Wn.	*Fish Biologist*
Marvin Smith	530-25th St., Longview, Wn.	*Fish Biologist*
Roy R. Strickland	Route 1, Chelan, Wn.	*Fish Biologist*
Franz H. Dettmer	6711-35th Ave. So., Seattle	*Aquatic Chemist*
Atley O. Nelson	3358 Beach Drive, Seattle	*Statistician*
Cliff Millenbach	9728 Phinney Ave., Seattle	*General Hatchery Supt.*
John M. Johansen	8513 S. 117th Place, Seattle	*Supt.-Eyeing Stations*
Robt. L. Meyer	RFD 1, Box 270-A, Aberdeen, Wn.	*Aberdeen Supt.*
M. D. McCollough	RFD 1, Box 270-A, Aberdeen, Wn.	*Aberdeen Asst.*
K. D. Hodgeboom	Route #3, Arlington, Wn.	*Arlington Supt.*
Ralph V. Planque	Route #3, Arlington, Wn.	*Arlington Asst.*
Lloyd Warrick	Route #3, Arlington, Wn.	*Arlington Asst.*
Earl V. Pownall	Route #3, Arlington, Wn.	*Arlington Asst.*
Fred E. Keffel	Whatcom Falls Pk., Bellingham, Wn.	*Bellingham Supt.*
Edw. McMurchie	Whatcom Falls Pk., Bellingham, Wn.	*Bellingham Asst.*
W. H. Ashby	Chelan, Wn.	*Chelan Supt.*
John Wade	Chelan, Wn.	*Chelan Supt.*

FISHERY MANAGEMENT	ADDRESS	POSITION
Robert T. Baade,	Chelan, Wn.	*Chelan Asst.*
Bud Ault,	Box 926, Chelan, Wn.	*Chelan Asst.*
Tom Inions,	Star Route, Leavenworth, Wn.	*Chiwaukum Supt.*
Paul Lovejoy,	Colville, Wn.	*Colville Supt.*
Marvin Hull,	Box 7, Ford, Wn.	*Ford Supt.*
Frank E. Peterson,	Box 7, Ford, Wn.	*Ford Asst.*
Harry K. Knowlton,	Box 7, Ford, Wn.	*Ford Asst.*
Jack McCoy,	Box 7, Ford, Wn.	*Ford Asst.*
R. H. Yorke,	Goldendale, Wn.	*Goldendale Supt.*
Floyd E. Clarence,	Goldendale, Wn.	*Goldendale Asst.*
Gerald Sherry,	Goldendale, Wn.	*Goldendale Asst.*
C. A. Jones,	RFD #2, Sedro Woolley, Wn.	*Lake Whatcom Supt.*
John D. Richmond,	RFD #2, Sedro Woolley, Wn.	*Lake Whatcom Asst.*
Wayne Tidyman,	RFD #2, Sedro Woolley, Wn.	*Lake Whatcom Asst.*
Geo. Lytle,	Star Rt. 1, Box 110, Shelton, Wn.	*Mason County Supt.*
Kenneth McGee,	Star Rt. 1, Box 110, Shelton, Wn.	*Mason County Asst.*
Wm. Soden,	Star Rt. 1, Box 110, Shelton, Wn.	*Mason County Asst.*
Lloyd J. Neil, Jr.,	Star Rt. 1, Box 110, Shelton, Wn.	*Mason County Asst.*
C. A. Welshons,	Mossyrock, Wn.	*Mossyrock Supt.*
Virgil Johnston,	Mossyrock, Wn.	*Mossyrock Asst.*
Claude Walk,	RFD #1, Naches, Wn.	*Naches Supt.*
Lloyd J. Beall,	RFD #1, Naches, Wn.	*Naches Asst.*
Martin L. Squires,	Usk, Wn.	*Pend Oreille Supt.*
L. W. Walter,	Seward Park, Seattle	*Seward Park Ponds Supt.*
A. F. Immenroth,	Seward Park, Seattle	*Seward Park Ponds Asst.*
John Dillard,	Seward Park, Seattle	*Seward Park Ponds Asst.*
John M. Ward,	Seward Park, Seattle	*Seward Park Ponds Asst.*
C. R. Foster,	So. Tacoma	*So. Tacoma Supt.*
Arthur E. Westrope, Jr.,	Rt. 8, Box 344, So. Tacoma	*So. Tacoma Asst.*
Arthur J. King,	Rt. 8, Box 344, So. Tacoma	*So. Tacoma Asst.*
Philip Yant,	Rt. 8, Box 344, So. Tacoma	*So. Tacoma Asst.*
John King,	Rt. 8, Box 344, So. Tacoma	*So. Tacoma Asst.*
J. M Hyner,	4116 N. 24th, Tacoma	*So. Tacoma Asst.*
G. W. Loveridge,	RFD #7, Spokane	*Spokane Supt.*
James F. Morrow,	RFD #7, Spokane	*Spokane Asst.*
Bert R. Jensen,	RFD #7, Spokane	*Spokane Asst.*
Ernest R. Jeffries,	RFD #7, Spokane	*Spokane Asst.*
James R. Fisher,	RFD #7, Spokane	*Spokane Asst.*
C. J. Nixon,	RFD #1, Fall City, Wn.	*Tokul Creek Supt.*
Fred Shortreed,	RFD #1, Fall City, Wn.	*Tokul Creek Asst.*
Hugh McSweyn,	RFD #1, Fall City ,Wn.	*Tokul Creek Asst.*
Clinton Ericksen,	RFD #1, Fall City, Wn.	*Tokul Creek Asst.*
Thos. E. Ryan,	RFD #1, Box 217-A, Vancouver, Wn.	*Vancouver Supt.*
Kenneth C. Bennett,	Rt. 1, Box 217-A, Vancouver, Wn.	*Vancouver Asst.*
Herbert A. Berg,	Rt. 1, Box 217-A, Vancouver, Wn.	*Vancouver Asst.*
Bjarne Jones,	RFD #4, Walla Walla, Wn.	*Walla Walla Supt.*
J. J. Henrichsen,	RFD #7, Yakima, Wn.	*Yakima Supt.*
H. F. Mayhew,	RFD #7, Yakima, Wn.	*Yakima Asst.*

FISHERY MANAGEMENT	ADDRESS	POSITION
ARTHUR E. WINDSOR,	RFD #7, Yakima, Wn.	*Yakima Asst.*
CLARENCE L. GARRISON,	RFD #7, Yakima, Wn.	*Yakima Asst.*
JOSEPH F. STEELE,	RFD #7, Yakima, Wn.	*Yakima Asst.*
CARROLL HOLBERT,	2639-10th Pl., Renton, Wn.	*Eyeing Station Asst.*
ROY STEVENSON,	Cheney, Wn.	*Eyeing Station Asst.*
D. H. PUCKETT,	509 Fairview Ave. N., Seattle	*Eyeing Station Asst.*
WALTER R. HANSON,	546 N. 77th, Seattle	*Eyeing Station Asst.*
J. L. BURGE,	Winthrop, Wn.	*Packer*
HARRY L. BROWN,	Yakima, Wn.	*Field Super.-Screening*
JOHN O. KRAKENBERG,	1523 Roosevelt Ave., Yakima	*Mechanic*
THEO. C. PRICE,	Rt. 1, Box 843, Yakima, Wn.	*Mechanic*
DUDLEY RAKE,	Rt. 6, Yakima, Wn.	*Mechanic*
VERNON O. SMITH,	Rt. 1, Box 813, Yakima, Wn.	*Mechanic*

PREDATOR CONTROL DIVISION

WALTER NEUBRECH,	8825 Densmore Ave., Seattle	*Chief*
L. A. KRAMER,	RFD #2, Toppenish, Wn.	*Field Supervisor*
MELVIN WILLIAMS,	Box 206, Omak, Wn.	*Field Supervisor*
J. J. ALLEN,	316 Division, Arlington, Wn.	*Predator Hunter*
KERMIT BERGEVIN,	1105 E. 14th St., Ellensburg, Wn.	*Predator Hunter*
DOUGLAS BUCHANAN,	Box 223, Cusik, Wn.	*Predator Hunter*
CHAS. E. DINWIDDIE,	Box 155, Endicott, Wn.	*Predator Hunter*
E. D. GOODNER,	Gen Del., Deer Park, Wn.	*Predator Hunter*
MERLE HOOSHAGEN,	Rt. #1, Pomeroy ,Wn.	*Predator Hunter*
MARVIN A. JEMTEGAARD,	Box 186, Monitor, Wn.	*Predator Hunter*
LORRAINE L. KEATTS,	Rt. #1, Sedro Woolley, Wn.	*Predator Hunter*
EARL W. WILLIAMS,	RFD #1, Republic, Wn.	*Predator Hunter*
MERLE WILLIAMS,	Gen Del., Methow, Wn.	*Predator Hunter*

FURS & DAMAGE CONTROL DIVISION

O. L. RESNER,	12004-23rd Ave. N.E., Seattle	*Chief*
STANLEY E. GUENTHER,	715 E. St., Renton, Wn.	*Game Biologist*
R. M. ATHEARN,	Wickersham, Wn.	*Beaver Trapper*
MARTIN CARDER,	P.O. Box 733, Montesano, Wn.	*Beaver Trapper*
H. L. MONTGOMERY,	Monitor, Wn.	*Beaver Trapper*
LLOYD M. RIEMER,	Route 1, Castle Rock, Wn.	*Beaver Trapper*
DWIGHT W. WALLACE,	E. 917 Princeton Ave., Spokane	*Beaver Trapper*
THOS. G. SCOTT,	Rt. #1, Naches, Wn.	*Beaver Trapper*
GARDINER F. JONES,	1812 D. St., Pullman, Wn.	*Beaver Trapper*
WARREN HARTUNG,	Pomeroy, Wn.	*Elk Herder*

ENFORCEMENT DIVISION

MELVILLE M. FRUIT,	8011 Ashworth, Seattle	*Chief*
DALE K. ALLEN,	Leavenworth, Wn.	*Dist. Supervisor*
E. A. CHITWOOD,	6716 Phinney Ave., Seattle	*Dist. Supervisor*
JOS. DROLET,	810 N. Clay St., Colfax, Wn.	*Dist. Supervisor*
OLE EIDE,	Box 102, Stanwood, Wn.	*Dist. Supervisor*

ENFORCEMENT	ADDRESS	POSITION
Gene Fennimore	516 E. Main, Walla Walla, Wn.	*Dist. Supervisor*
Wm. O. Hall	567-25th Ave., Longview, Wn.	*Dist. Supervisor*
Lloyd J. Neil	619 N. Proctor, Tacoma	*Dist. Supervisor*
Clyde Norton	P.O. Box 53, Aberdeen, Wn.	*Dist. Supervisor*
Fred L. Roundy	8923 E. Mission, Rt. 9, Spokane	*Dist. Supervisor*
Fred Van Arsdol	120 Park Ave., Yakima, Wn.	*Dist. Supervisor*
Clayton Barnes	1813 S. 16th Ave., Yakima, Wn.	*Protector Pilot*
Elwin E. Beaughan	Rt. 1, Box 270-A, Montesano, Wn.	*Game Protector*
V. C. Beedle	Box 14, Skykomish, Wn.	*Game Protector*
H. F. Bercot	Freeland, Wn.	*Game Protector*
R. E. Beringer	811 E. Wellesley, Spokane	*Game Protector*
Carl E. Bland	Dryden, Wn.	*Game Ptroector*
Allan E. Bonner	2912 W. Boston St., Seattle	*Game Protector*
Walter C. Bush	Rt. 6, Box 2988, Bremerton, Wn.	*Game Protector*
Richard Chandler	Ione, Wn.	*Game Protector*
Roy Clark	Pomeroy, Wn.	*Game Protector*
Arthur Courtney	1116 Poplar, Clarkston, Wn.	*Game Protector*
Richard Crocker	Box 5512, Friday Harbor, Wn.	*Game Protector*
James S. Cromwell	Rt. 5, Box 58, Vancouver, Wn.	*Game Protector*
B. E. Ditlevsen	Box 38, Seaview, Wn.	*Game Protector*
John W. Douglas	204 Garfield St., Seattle	*Game Protector*
H. D. Drain	1634-2nd St., Kirkland, Wn.	*Game Protector*
Norman Ellsworth	Rt. 1, Box 70, Centralia, Wn.	*Game Protector*
A. R. Erickson	723 Grand Blvd., Olympia, Wn.	*Game Protector*
Geo. R. Farquhar	711 Turner St., Shelton, Wn.	*Game Protector*
Wm. A. Farquhar	812 Park St., Colfax, Wn.	*Game Protector*
V. R. Fiebig	Route #1, East Stanwood, Wn.	*Game Protector*
Cecil Fisher	Davenport, Wn.	*Game Protector*
John M. Gladney	Box 193, Waterville, Wn.	*Game Protector*
H. O. Goodman	Box 545, Blaine, Wn.	*Game Protector*
C. H. Haley	Box 311, Quilcene, Wn.	*Game Protector*
Donald Hayden	274-19th Ave., Longview, Wn.	*Game Protector*
Elwin D, Hemstreet	Box 63, Oroville, Wn.	*Game Protector*
T. R. Henderson	Box 359, Sumner, Wn.	*Game Protector*
Gene Insel	Box 294, Elma, Wn.	*Game Protector*
Ralph Johnson	Box 238, Newport, Wn.	*Game Protector*
Howard R. Jones	Rt. 2, Box 309, Enumclaw, Wn.	*Game Protector*
John Kanz	Okanogan, Wn.	*Game Protector*
Mitchell Kershaw	403 N. Dayton, Kennewick, Wn.	*Game Protector*
Boyd King	Federal Housing #27, Port Angeles, Wn.	*Game Protector*
J. E. Kirkendall	3302 Summit View, Yakima, Wn.	*Game Protector*
Robert Leslie	c/o Colville Game Farm, Colville, Wn.	*Game Protector*
Wm. Little	Morton, Wn.	*Game Protector*
Charles Long	2900 Lakeway Dr., Bellingham, Wn.	*Game Protector*
John R. Lund	P.O. Box 837, South Bend, Wn.	*Game Protector*
Clark Martin	Ritzville, Wn.	*Game Protector*
Norman E. Mattson	1619 Hoyt Ave., Everett, Wn.	*Game Protector*
Eugene D. Maxwell	Goldendale, Wn.	*Game Protector*

ENFORCEMENT	ADDRESS	POSITION
Geo. E. Mitchell	Box 456, Soap Lake, Wn.	*Game Protector*
Boyd McCracken	P.O. Box 336, Forks, Wn.	*Game Protector*
J. Henry Moore	Box 153 Diablo Dam, Rockport, Wn.	*Game Protector*
Edw. L. Morris	512 "K" St., Renton, Wn.	*Game Protector*
N. E. Palmer	Prosser, Wn.	*Game Protector*
James P. Parker	Rt. #1, Box #56, Ellensburg, Wn.	*Game Protector*
Roy E. Roberson	Box 222, Easton, Wn.	*Game Protector*
Edw. J. Robins	E. 1427 Nebraska, Spokane, Wn.	*Game Protector*
Ralph Schwindel	Republic, Wn.	*Game Protector*
Lawrence Seabury	11 & Section, Mt. Vernon, Wn.	*Game Protector*
Geo. Smallwood	Box 151, Eatonville, Wn.	*Game Protector*
Maurice Splane	821 Ferry, Sedro Woolley, Wn.	*Game Protector*
Laurence Sprengel	Rt. 2, Colville, Wn.	*Game Protector*
Jack Tharp	Chelan, Wn.	*Game Protector*
Roger Lee Thomas	527 N. Chelan, Wenatchee, Wn.	*Game Protector*
Albert A. Thompson	Rt. 1, Box 221-B, Vancouver, Wn.	*Game Protector*
Wm. H. Upton	707 Park St., Walla Walla, Wn.	*Game Protector*
Arthur E. Watkins	5560 Greenwood Ave., Seattle	*Game Protector*
John Wagner	3112 N. 9th St., Tacoma	*Game Protector*
Franklin F. White	Goldendale, Wn.	*Game Protector*
Wm. A. Wooten	207 Dayton Ave., Dayton, Wn.	*Game Protector*
Earl Yribar	Box 201, Stevenson, Wn.	*Game Protector*
Paul Zollner	Cathlamet, Wn.	*Game Protector*

EDUCATION AND INFORMATION DIVISION

Wesley A. Hunter	16512-21st Ave. N.E., Seattle	*Chief*
Jack Jett	4465 Union Bay Lane, Seattle	*Representative*
Gordon M. Quarnstrom	1242-22nd Ave., Longview	*Representative*
John A. Sechrist	6341 Cycle Lane, Seattle	*Representative*
Patsie V. Sinkey	4800 Fremont Ave., Seattle	*Representative*
Peter Anders	2630 N. Beach Dr., Seattle	*Photographer*

LAND MANAGEMENT DIVISION

Norman P. Knott	11447-71st Place S., Seattle	*Chief*
Carl N. Crouse	218 Aloha, Seattle	*Federal Aid Administrator*
Ronald Andrews	5 South 7th St., Yakima, Wn.	*Acquisition Biologist*
Chester C. Ball	N. 2409 Ella, Rt. 10, Spokane	*Acquisition Biologist*
Albert V. Bertucci	218 Aloha, Seattle	*Acquisition Biologist*
Lawrence A. Wadkins	Box 261, Sprague, Wn.	*Acquisition Biologist*
Robert Braunwart	W. 1111 Cleveland St., Spokane	*Development Biologist*
Oliver T. Edwards	525 Lk. Louise Dr. S.W., Tacoma	*Development Biologist*
David B. Gray, Jr.	409 S. 34th St., Yakima, Wn.	*Range Biologist*
R. T. Hawkins	315 S. 5th St., Sunnyside, Wn.	*Development Engineer*
Francis N. Breslich	3302 E. 70th St., Seattle	*Surveyor*
Robert I. Cane	4119 West Kenyon, Seattle	*Chainman*
Weldon D. Hattenburg	16533-21st Ave. N.E., Seattle	*Draftsman*
John Mandery	Winthrop, Wn.	*Methow Range Keeper*

LAND MANAGEMENT — ADDRESS	POSITION
WALTER BELL, Star Route, Naches, Wn.	*Oak Creek Range Keeper*
RAY SILVERS, Loomis, Wn.	*Sinlahekin Range Keeper*
MILLARD F. HOWE, Pomeroy, Wn.	*Wm. T. Wooten Range Keeper*
GEO. SCHRINDEL, Route 2, Ferndale, Wn.	*Lk. Terrell Range Keeper*
ROBERT E. LEE, Route 1, Kettle Falls, Wn.	*Sherman Creek Range Asst.*
ROY E. ANDREWS, Ritzville, Wn.	*Crew Foreman*
DAVID E. COLVIN, Winthrop, Wn.	*Crew Foreman*
LLOYD E. GUNN, Pomeroy, Wn.	*Crew Foreman*
LEE C. MAXWELL, Eatonville, Wn.	*Crew Foreman*
JOE A. WARNER, Rt. 2, Box 18, Blaine, Wn.	*Crew Foreman*
J. E. WARDROP, 3116 Eldridge Ave., Bellingham, Wn.	*Crew Foreman*
RUSSELL W. WILSON, 106 Pike St. N.E., Auburn, Wn.	*Crew Foreman*
N. L. MARVIN, Ritzville, Wn.	*Crew Foreman*
WM. O. HARRIS, Ritzville, Wn.	*Maintenance Laborer*
BONNAR BLONG, Stanwood, Wn.	*Development Laborer*
ELLSWORTH R. BROWN, Stanwood, Wn.	*Development Laborer*
JAMES L. CLEMENT, Ritzville, Wn.	*Development Laborer*
JOHN M. CRICKMER, 16515 E. Sprague, Veradale, Wn.	*Development Laborer*
WALTER CURLEY, 309 N. 36th St., Seattle	*Development Laborer*
ELMER LEROY HUTCHINSON, Route 1, Outlook, Wn.	*Development Laborer*
LESTER MAGLEY, Route 1, Outlook, Wn.	*Development Laborer*
ROBERT L. MARSH, Whitestone Hotel, Tonasket, Wn.	*Development Laborer*
ROBERT W. MCNEILL, Pomeroy, Wn.	*Development Laborer*
GENE PLUID, Ritzville, Wn.	*Development Laborer*
FRANK POWERS, Winthrop, Wn.	*Development Laborer*
JESS POWERS, Winthrop, Wn.	*Development Laborer*
JACK L. RHINES, Box 714, Chelan, Wn.	*Development Laborer*
FREDERICK C. SCOGGIN, Loomis, Wn.	*Development Laborer*
MELVIN SHARP, Pomeroy, Wn.	*Development Laborer*
JOHN M. SILVERS, Loomis, Wn.	*Development Laborer*
CLAUD E. SMITH, Pomeroy, Wn.	*Development Laborer*
NELSON L. YOUNG, Ritzville, Wn.	*Development Laborer*
WILLIAM E. WILSON, Eatonville, Wn.	*Development Laborer*

ENGINEERING AND CONSTRUCTION DIVISION

JAMES H. LYON, 6236-45th Ave. N.E., Seattle	*Chief*
BERTRAM L. ULREY, 11469-69th Place S., Seattle	*Field Engineer*
J. T. DEITCH, 414 Boylston Ave., Seattle	*Office Engineer*
DONALD ARNTZEN, 1817 N. 46th, St. Seattle	*Asst. Office Engineer*
P. A. STEWART, 7050-56th Ave. N.E., Seattle	*Stream Improvement Eng.*
LOUIS E. CORTI, 312 Sam St., Monroe, Wn.	*Hoisting Engineer*
GLEN E. DAVIS, 2128 N. 117th, Seattle	*Crew Foreman*
F. H. DEDERICK, 19036 Ballinger Rd., Seattle	*Crew Foreman*
WM. F. WEEMS, Rt. 1, Box 46, Centralia, Wn.	*Crew Foreman*
JACK D. PETERS, 7326-56th Ave. N.E., Seattle	*Construction Inspector*
DANIEL W. FOSTER, 218½-6th Ave. N., Seattle	*Mechanic*
DAVID D. IRWIN, 20059 Dayton Ave., Seattle	*Mechanic*

ENGINEERING & CONSTRUCTION	ADDRESS	POSITION
JACK BRADSHAW	535 E. 155rd, Seattle	*Equipment Operator*
ROYAL W. ELLIS	1156 N. 128th, Seattle	*Equipment Operator*
ANDREW FREDRICKSON	3843-20th Ave. S.W., Seattle	*Equipment Operator*
KENNETH W. WEISER	2112 N. 36th, Seattle	*Equipment Operator*
DON W. DAVIS	Rt. 1, Box 521, Alderwood Manor, Wn.	*Carpenter*
GEO. W. DEAN	Rt. 1, Box 428, Centralia, Wn.	*Carpenter*
JOHN H. ROBY	711-22nd Ave., Seattle	*Carpenter*
KENNETH W. BELLAMY	705 S. Wapato Ave., Wapato, Wn.	*Laborer*
JOHN A. BENEDETTI	1052 N. 36th, Seattle	*Laborer*
HAROLD L. CORTI	312 Sam St., Monroe, Wn.	*Laborer*
AXEL SWENSON	R. R. #7, Yakima, Wn.	*Laborer*
GUY M. KRESS	Vashon, Wn.	*Chainman*
WAREHOUSE		
LEONARD FISKE	7217 Taft St., Seattle	*Storekeeper*
CLIFFORD ANDERSON	4428 S. 170th, Seattle	*Light Equip't. Operator*
GEORGE W. LEMONS	749 Harvard Ave. N., Seattle	*Asst. Warehouseman*
DALE KEFFEL	4743 N.E. 19th, Seattle	*Asst. Warehouseman*
FRANK E. THOMAS	1116 E. Republican, Seattle	*Custodian of Building*

A little after the close of the biennium, the Game Department moved into its new quarters, bringing the administrative personnel and two warehouses all under the same roof.

The property was selected for several reasons; its proximity to the metropolitan area, the advantages offered for ample parking facilities, and the adaptability of its contours permitting the administration offices to face the thoroughfare and the warehouse to the alley.

The building is of reinforced concrete design with extensive use of aluminum and glass throughout. Attempt was made to indicate the character and purpose of the structure by use of quarried stone floor and of planting areas in the entrance and lobby.

The two upper floors of the building provide for office space. The two lower floors provide laboratory space, assembly room and complete facilities for warehousing and shops.

A restricted budget dictated the straightforward simplicity of design to be within the cost limit of seventy-six cents per cubic foot, which is generally regarded as being a low figure.

The building was constructed at a total cost of two hundred eighty-eight thousand, seven hundred twenty-five dollars including the architects' and engineers' fees and the site.

Besides substantial economies which can be gained from a unified operation, it represents a tangible saving of approximatly two thousand dollars a month for rentals previously paid. This saving will eventually amortize the cost of the structure.

WASHINGTON STATE DEPARTMENT OF GAME Administration Warehouse Building"