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ANNUAL REPORT
GAME DIVISION



Oregon State Game Commission

1950

A N N U A L R E P O R T

GAME DIVISION

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Oregon State Game Commission

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INTRODUCTION

The primary functions of the Game Division are to ascertain facts pertinent to the management of Oregon's game and fur resources, and execute management, public services, and development projects as authorized by the Game Commission.

At present, 63 permanent employees devote a major part of their time to game activities, and in addition, a large number of seasonal employees are used during peak periods of activity in trapping, game propagation, and habitat improvement.

The Game Commission's goal of producing and maintaining the maximum compatible number of game and fur species on all suitable habitat demands a current, accurate knowledge of the status of all species throughout the state and factors influencing their productivity. This information is obtained by permanently assigning trained men by geographical areas so that the various game resources can be observed throughout the year and measurements taken in a systematic manner. Such a program was initiated in 1944 in four problem areas and, at the close of World War II, agents were assigned to nine additional districts to provide full coverage of the state.

In a desire to coordinate fish and game activities and provide local supervision of rapidly expanding field programs, a district supervisory plan is being initiated. The state will be divided into five districts by watersheds and an assigned supervisor will be responsible for all game and fishery activities in each respective district. This change in organization will necessarily alter the boundaries of some of the original game management districts that have been in effect since 1946, and because only two of the five districts have been activated, most of the information herein will be reported by the original 13 game districts.

Most measurements and studies of Oregon's wildlife resources indicate that the major problems are with people rather than with wildlife. Oregon's rapid economic expansion has nearly doubled hunting and fishing pressures during the past ten years and substantially changed land uses so that the quantity and quality of habitat available for the production of wildlife is progressively less. These are the conditions which demand a more intensive field management program based upon facts.

The present program provides for annual measurements of population trends, productivity and related factors for all game species throughout the state; propagation and release of approximately 60,000 game birds per annum; improvement of game habitat through acquisition or cooperative development; control of damage by game to private property, and maintenance of high recreational standards.

The Oregon Cooperative Wildlife Research Station administers all long-range, basic game research studies. Activities of this type undertaken by the Game Division are mostly routine inventories of game populations, food supplies, and factors influencing productivity and survival. Those projects of a research nature now active are the "Summer Lake Pheasant Study" which is a Federal Aid Project; the "Cooperative Interstate Deer Herd Study" which was initiated in 1945 by the Oregon and California Game Departments and the U. S. Forest Service,

and the "Interstate Antelope Study" with the States of California, Nevada, Idaho, Oregon, and the U. S. Fish and Wildlife Service cooperating. Another cooperative project of this nature is the "Pacific Waterfowl Flyway Investigation" in which British Columbia, Washington, Montana, Idaho, Nevada, Utah, California, and Oregon, and the U. S. Fish and Wildlife Service are cooperating.

Oregon's game management programs have enjoyed the support and cooperation of most allied state and federal agencies during the past year and continued efforts are being made to secure a better understanding of mutual problems and a greater recognition of wildlife values.

Negotiations with the General Services Administration for over 6,000 acres of surplus military lands in the vicinity of Camp Adair, Camp White, and Fort Stevens have been continued during the past year and successful acquisition of these areas is at present assured.

Federal Aid Funds have been used for the acquisition and development of important waterfowl areas and an aggressive program for protection of indispensable marsh areas throughout the state has been pursued. In addition, four important big game winter ranges have been appraised during the year to determine the practicability of acquisition as a solution to current winter range problems.

Analyses of measurements of game population trends and annual harvests refute the popular quotation, "Oregon's wildlife resources have been decimated." On the contrary, much of Oregon's game habitat is found to be stocked to or beyond its carrying capacity in spite of increasing pressures. The 1949 deer season is an exceptional example, however, weather conditions and other factors contributed to the high success of hunters and it is entirely possible that the kill of over 57,000 buck deer is higher than can be normally expected.

In maintaining wildlife species at high levels of abundance, conflicts with other land uses are inevitable. Big game animals are the most frequent offenders and demand an aggressive control program. Much progress has been made in the field of damage control during the past year; however, a majority of the damage problems involve small acreages within or immediately adjacent to big game habitat and some damage can be expected in such locations regardless of population levels and control measures applied. The incompatibility of big game animals on cultivated agricultural lands is obvious, however, recent attempts of some live-stockmen to place open range lands in the same category gives cause for concern.

An aggressive beaver control program on agricultural lands during the past winter resulted in the harvest of 5,749 beaver which is a substantially greater number than has been taken in previous years.

Deep snows and extreme low temperatures during the months January and February created emergency conditions for game species in several sections of the state and emergency feeding programs were activated. Heaviest losses occurred in deer and quail but breeding populations were not seriously affected.

An analysis of the activities of field personnel of the Game Division reveals that as they gain in experience and knowledge of problems occurring in their respective districts, their operations are becoming more efficient and the quantity and quality of work performed consistently increases. They have been active in civic affairs and are respected in the communities in which they live. These

conditions invariably incur a greater respect for the organization and local wildlife resources. The Commission has reason to point with pride to the loyalty and unselfish efforts of these employees who execute the authorized programs and provide unbiased information on game problems throughout the state.

The following report provides an assembly of information gathered by the Game Division during the past year and a summary of progress made in the many fields of endeavor. The report is designed for reference by the Commission and its staff and, in order to present the available information in sufficient detail for reference purposes, it becomes too voluminous to be of value to the general public. Only a limited number of copies are printed and, with the exception of a few copies that may be sent to other State and Federal agencies, the report will not be distributed outside of the department.

Although obvious problems indicated by the data compiled may be emphasized, interpretations and recommendations for future management are not included in this report. There are so many alternatives in management that it is believed best to provide unbiased information and allow each management measure to be carefully weighed individually in the light of facts available.

OREGON STATE GAME COMMISSION
FIELD SUPERVISORY DISTRICTS

★ DISTRICT HEADQUARTERS



SCALE 0 10 20 30 40 MILES

— PRINCIPAL HIGHWAYS

..... BOUNDARY OF FIELD SUPERVISORY DISTRICTS

— BOUNDARY OF ORIGINAL GAME MANAGEMENT DISTRICTS

BIG GAME

During the past year, Field Agents continued the program of systematically recording year-around information on all big game species in the state. Management requires a continuous supply of facts concerning each big game species.

Although many factors affecting game cannot be measured and remain intangible, techniques have been developed for determining the status of our herds. Emphasis is placed upon standardizing field procedures so that comparisons are possible. Indices or trends of conditions are relied upon to measure the effects of present and proposed management policies. A search is constantly being made for ways of improving measurement procedures. When new methods are proved, they are incorporated into the existing field program.

The method of recording trends in big game populations has been standardized on the basis of animals observed per mile of permanent sample route.

Use of the separate deer tag has enabled the compilation of accurate kill figures. A successful percentage of return cards has been submitted during the past two years to provide a reliable picture of number of hunters, total kill, hunting pressure by days and areas, general age classes of kill, and trend of harvest.

After two years of unsuccessful attempts, mountain goats have been trapped and released in Oregon. The animals were secured from the Chopaka Mountain area of northern Washington and liberated in the Wallowa Mountains which offer similar habitat features. Although six goats were released, one over-age female died after liberation. Plans are being made to secure an additional nineteen which have been offered the state by the Washington Department of Game and it is hoped that a successful transplant can be established.

Two cooperative projects of an interstate nature are underway for the purpose of coordinating management activities of big game herds migrating across state boundaries. The first of these has been in progress five years and involves the Interstate Deer Herd which summers on the Fremont Forest in Oregon and winters in California. The California Division of Fish and Game, U. S. Forest Service, and Oregon Game Commission are involved in the study. The second project concerns antelope and representatives of California, Nevada, Idaho, Oregon, and the U. S. Fish and Wildlife Service have been cooperatively engaged in the study for the past two years.

In addition to big game herd studies, Oregon meets annually with representatives of Washington and the U. S. Forest Service to summarize and exchange information on current browse studies. Such information is vital for the improvement of browse supplies so essential to the winter maintenance of eastern Oregon deer herds.

By continuing the systematic measurements of conditions affecting big game, improving techniques, and exchanging ideas with other workers in the game management field, continued progress is anticipated in Oregon's big game program.

BLACK-TAILED DEER:

Black-tailed deer are widely distributed throughout western Oregon, ranging from the valley edges to the summits of the Coast and Cascade Ranges. Some intermingling between black-tailed and mule deer occurs at the crest of the Cascades. Black-tails in the Cascades generally winter on the west slope, although localized wintering occurs in the Mt. Hood, Metolius, Klamath, and other areas on the east side.

Open burned and logged-off areas provide the most productive habitat and it is here that maximum numbers and size are achieved. Dense timber stands and second-growth ranges do not offer favorable conditions for the production of black-tailed deer since the lack of sunlight inhibits the nutritional values and growth of forage.

Extensive logging in western Oregon is opening up suitable habitat for black-tails. The lack of escape cover immediately following logging necessitates protection from hunting for a few years in order to encourage deer production. By rotating closures as large sections of logged-off lands become available, it is possible to realize maximum production of the species. Hunting must be continued after re-opening to assure maximum returns from such ranges since rapid vegetative re-growth soon shades out preferred forage plants and restricts visibility to the extent that hunter success is curtailed.

Abundant forage supplies in western Oregon favor an increase of black-tailed deer where damage to agricultural crops is not a problem. Such increases can be encouraged by means of buck seasons and temporary closures of large logged-off and burned-over sections.

Population Trends:

Black-tailed deer population trend data is secured during the late summer months when the animals are distributed over all suitable ranges. Inaccessible roads and lack of winter concentrations necessitate summer observations to determine population trends.

During the past six years trend samples have been established on representative ranges of the dense timber, second-growth, and open types. Refinements in sampling procedures continue to be made as information reveals the need.

Dense cover limits visibility and the secretive nature of black-tailed deer makes it difficult to observe large numbers. Consistent observations over a period of years appear to be providing a reliable picture of the trend in population.

A summary of population trend data for black-tailed deer by counties is tabulated below. The absence of any definite divisions between herds renders it impossible to summarize information on the basis of herd ranges as is the case with mule deer.

Black-Tailed Deer Population Trends

Counties by Districts	Miles Travelled	Deer Observed	Deer Density Per Mile					
			1949- 1950	1948- 1949	1947- 1948	1946- 1947	1945- 1946	1944- 1945
Clatsop	116	284	2.4	2.1	1.0	0.6	0.4	0.4
Tillamook	192	667	3.4	3.5	2.5	2.3	1.9	1.1
Non-Burn	65	125	1.9	1.9	1.2	-	-	-
1939 Burn	46	205	4.4	5.1	4.1	-	-	-
1945 Burn	81	337	4.1	3.6	2.3	-	-	-
Lincoln	61	142	2.3	2.1	1.5	0.7	0.1	-
NORTH COASTAL:	369	1,093	3.0	2.8	1.8	1.5	1.0	-
Yamhill	11	28	2.5	6.1	5.2	-	-	-
Washington	4	12	3.0	1.7	2.3	-	-	-
Polk	16	22	1.4	0.9	2.6	-	-	-
Marion	6	3	0.5	-	1.7	-	-	-
Benton	14	23	1.6	3.1	2.1	-	-	-
Linn	9	1	0.1	-	-	-	-	-
Lane	8	15	1.9	-	-	-	-	-
WILLAMETTE:	68	104	1.5	3.1	3.0	3.6	-	-
West Lane	23	12	0.5	0.4	0.3	0.3	0.2	1.0
West Douglas	21	16	0.8	0.4	0.3	0.2	0.4	0.5
Coos	169	407	2.4	1.2	1.4	0.2	-	0.8
Curry	87	96	1.1	0.7	1.0	0.2	0.3	0.9
SOUTH COASTAL:	300	531	1.8	0.9	1.0	0.2	0.3	0.6
Douglas	21	47	2.3	0.3	0.3	0.4	0.4	0.5
Josephine	134	30	0.2	0.5	0.3	0.2	0.5	-
Jackson	60	103	1.7	0.3	0.4	0.4	-	-
SOUTHWEST:	215	180	0.8	0.4	0.3	0.3	0.4	-
TOTALS AND AVERAGES:	952	1,908	2.0	1.9	1.1	0.7	0.9	0.8

Information is presented for each county and summarized by game districts. In the grand total of 952 miles sampled on foot, 1,908 deer were observed for an average of 2.0 deer per mile. This figure shows a consistent upward trend of deer numbers during the past six years, increasing from an average of only 0.8 deer per mile in 1944-1945. When compared to the western Oregon average, the North Coastal District has the highest deer density, 3.0 deer per mile, while the Southwest District shows the lowest, 0.8 deer per mile.

Response of black-tailed deer to habitat is illustrated in the case of Tillamook County which contains a large area of burned-over range. The Tillamook

average of 3.4 deer per mile exceeds the density of any other western Oregon county. In order to compare the value of various types of habitat, information for Tillamook County has been recorded on the basis of range types; namely, non-burn, 1939 burn, and 1945 burn. The non-burn area includes old and second-growth timber stands adjacent to the burns. When comparing deer densities by habitat types, the non-burn area averages only 1.9 deer per mile while the two burns show a density of over 4 deer per mile. The 1949-1950 figure of 4.4 deer per mile on the 1939 burn area has decreased from the density of 5.1 recorded the preceding year. It is possible that this area has passed its peak from the standpoint of deer production, although future observations will be required before a trend can be determined. The 1945 burn continues to improve, indicated by the density figure of 4.1 deer per mile, an increase over the 3.6 deer recorded the preceding year.

Herd Composition:

A determination of the buck, doe and fawn percentages on the various ranges is made subsequent to the hunting season and prior to the shedding of antlers in January. From such percentages, the ratio of bucks to does and fawns to does is determined.

The buck-doe ratio is important as an indicator of the effects of hunting and the adequacy of males for breeding purposes. Fawn-doe ratios provide information on the rate of annual production and the survival of young up to the critical winter period.

A recapitulation of herd composition data for black-tailed deer is included below:

Black-Tailed Deer Herd Composition

Counties by Districts	DEER OBSERVED				BUCK-DOE RATIO					FAWN-DOE RATIO				
	Bucks	Does	Fawns	Total	1949 1950	1948 1949	1947 1948	1946 1947	1945 1946	1949 1950	1948 1949	1947 1948	1946 1947	1945 1946
Clatsop	47	88	59	194	1-1.9	1-2.2	1-2.2	1-2.0	1-2.6	1-1.5	1-1.6	1-2.0	1-2.3	1-3.5
Tillamook	91	229	141	461	1-2.5	1-1.6	1-2.0	1-2.0	1-1.8	1-1.6	1-1.5	1-2.0	1-2.0	1-3.3
Lincoln	16	37	26	79	1-2.3	1-2.1	1-2.0	1-2.0	1-3.0	1-1.4	1-1.9	1-2.0	1-2.5	1-4.5
NORTH COASTAL	154	354	226	734	1-2.3	1-1.9	1-2.1	1-2.0	1-2.5	1-1.6	1-1.5	1-1.9	1-2.4	1-3.3
Yamhill	4	21	18	43	1-5.2	1-1.2	1-2.9			1-1.2	1-1.4	1-1.1		
Washington	5	13	14	32	1-2.6	1-1.0	1-3.0			1-0.9	1-2.0	1-1.5		
Polk	4	11	10	25	1-2.7	1-1.0	1-2.0			1-1.1	1-0.5	1-4.0		
Marion	-	-	-	-	-	-	-			-	-	-		
Benton	4	8	14	26	1-2.0	1-1.0	1-3.1			1-0.6	-	1-2.0		
WILLAMETTE	17	53	56	126	1-3.1	1-1.1	1-2.9			1-0.9	1-1.8	1-1.5		
West Lane	1	4	5	10	1-4.0	-	1-3.5	1-2.0	1-2.2	1-0.8	1-2.0	1-2.0	1-2.8	1-1.9
West Douglas	5	19	19	43	1-3.8	1-4.0	1-2.5	-	1-2.5	1-1.0	1-1.6	1-0.5	-	1-2.0
Coos	19	65	53	137	1-3.4	1-3.3	1-1.4	1-2.0	1-2.0	1-1.2	1-1.0	1-3.0	1-3.0	1-2.0
Curry	10	43	35	88	1-4.3	1-3.9	1-1.2	-	-	1-1.2	1-1.1	1-1.8	-	-
SOUTH COASTAL	35	131	112	278	1-3.7	1-3.5	1-1.3	1-2.0	1-2.2	1-1.2	1-1.4	1-1.9	1-3.0	1-2.0
Douglas	-	-	-	47	1-2.7	1-3.0	1-3.1	1-3.0	1-2.5	1-0.6	1-0.9	1-0.9	1-1.4	1-2.0
Josephine	-	-	-	30	1-1.5	1-2.0	1-3.3	1-2.5	1-4.5	1-1.5	1-0.7	1-0.9	1-1.1	1-2.2
Jackson	-	-	-	103	1-1.1	1-2.0	1-3.1	1-2.0	1-7.0	1-0.8	1-0.9	1-0.9	1-1.4	1-1.5
SOUTHWEST	-	-	-	180	1-1.7	1-2.3	1-3.2	1-2.5	1-4.5	1-1.0	1-0.9	1-0.9	1-1.2	1-2.0
TOTALS and AVERAGES	206	538	394	1318	1-2.6	1-2.2	1-2.4	1-2.0	1-3.0	1-1.4	1-1.3	1-1.5	1-2.0	1-2.4

A total of 1,318 deer were observed during the sampling period to secure a cross-section of herd composition. An average of 1 buck was recorded for every 2.6 does. This ratio is excellent and shows little variance during the past five years, the extremes being 1 buck to 2.0 does and 1 buck to 3.0 does.

That adequate males remain after the hunting season for breeding purposes is indicated by the ratio of 1 fawn to 1.4 does. Since yearling does are difficult to distinguish and are classified with mature females, the ratio of fawns to producing does is even greater than shown. A consistent increase in fawn crops is indicated by the fawn-doe ratios over the past five years. The Western Oregon average has improved from 1 fawn to 2.4 does in 1945-1946 to 1 fawn to 1.4 does in 1949-1950.

Range Conditions:

Forage conditions in Western Oregon are generally favorable and increases of black-tailed deer can be supported.

Logging is continuing to open up large areas of dense timber which will encourage deer production. Second growth is tending to shade out ground forage species on much of the lands logged at the turn of the century. This is particularly evident in Clatsop County where re-growth is reducing suitability of the habitat.

The greatest deer potential exists on the west slope of the Cascades. Expanded logging operations are expected to improve conditions by opening up much range at present lightly inhabited by deer.

The hardwood browse areas of Douglas County suffer periodic fluctuations in deer numbers. Although forage is ample, heavy grazing by sheep imposes a parasite problem which may be an important factor. Sheep production on the open prairies of Coos and Curry Counties also appears to be accompanied by fluctuating deer densities.

Winter Losses:

A consistent record is kept each winter of black-tailed deer losses observed while sampling. The data is presented on the basis of carcass per miles of travel. Reproduced below is a two-year comparison of winter deer losses in Western Oregon.

Counties by Districts	Black-Tailed Deer Winter Losses						Trend Index	
	Winter Losses				Total Carcasses	Miles Travelled	Carcass/Miles of Travel	
	Sex		Age				1950	1949
	Males	Females	Young	Adult				
Clatsop	4	7	10	3	13	28	1-2.0	1-9.3
Tillamook	42	47	90	22	112	68	1-0.6	1-4.4
Lincoln	2	1	2	1	3	11	1-3.7	1-7.0
NORTH COASTAL:	48	55	102	26	128	107	1-0.8	1-5.5

Black-Tailed Deer Winter Losses (Cont'd)

Counties By Districts	Winter Losses				Total Carcasses	Miles Travelled	Trend Index		
	Sex		Age				Carcass/Miles of Travel	1950	1949
	Males	Females	Young	Adults					
Yamhill	2	5	7	0	7	23	1-3.3	1-9.0	
Washington	3	10	14	1	15	33	1-2.2	1-2.0	
Polk	1	0	0	1	2	17	1-8.5	1-7.0	
Marion	1	0	1	1	2	2	1-1.0	-	
Benton	2	1	0	3	3	14	1-4.7	1-8.0	
Lane	0	0	0	0	0	5	0.5.0	-	
WILLAMETTE:	9	16	22	6	29	94	1-3.2	1-8.5	
West Lane	0	1	0	1	1	10	1-10.0	-	
West Douglas	1	0	1	0	1	12	1-12.0	1-9.0	
Coos	3	6	12	2	14	64	-	1-16.7	
Curry	3	3	6	1	7	32	-	1-16.0	
SOUTH COASTAL:	7	10	19	4	23	118	1-5.1	1-15.1	
Douglas	1	0	0	1	1	20	1-20.0	0-16.0	
Josephine	1	0	1	1	2	60	1-30.0	0-24.0	
Jackson	1	0	1	0	1	64	1-64.0	1-35.0	
SOUTHWEST:	3	0	2	2	4	144	1-36.0	1-75.0	
TOTALS AND AVERAGES	67	81	145	38	184	463	1-2.5	1-8.6	

Although all carcasses were not identified as to sex and age due to decomposition, those which were classified indicated a ratio of mortality among the fawns exceeding by approximately four times the losses among adults. This differential is expected since fawns lack the vigor and fat storage of mature deer.

Losses during 1950 were much higher in all districts than was the case in 1949. One carcass was observed for every 2.5 miles travelled while it was necessary to walk an average of 8.6 miles in 1949 to observe a carcass.

The heaviest known mortality occurred in the Tillamook Burn which lacks quantities of dense cover required for protection during storms. Extreme snowfall and below-zero temperatures during January resulted in concentrating the deer along the canyon bottoms. Since roads follow the stream courses, deer concentrations were very evident to the public and concern was expressed.

Although natural foods remained available in most cases, some groups of deer became pocketed by the snow and succumbed to starvation. Losses among the fawns were mainly attributed to exhaustion caused by fighting deep snow drifts and exposure to extremely low temperatures.

Attempts were made to provide artificial supplements in the form of hay and

protein concentrates but it appears that black-tailed deer forced to utilize such feeds are usually past any hope of recovery. Effects of feeding in alleviating losses could not be considered satisfactory.

Observations in the Burn after the winter concentration period were continued and have revealed a considerable survival of fawns, indicating the winter losses were not disastrous.

Similar weather conditions existed in other parts of Western Oregon but mortality was lighter due to the availability of more protective cover and lower deer densities.

MULE DEER:

Mule deer are widely scattered in varying densities throughout Oregon east of the Cascade summit. All areas providing suitable food, water, and cover support some deer. Black-tailed and mule deer summer together in the Cascades and hybrids are produced as a result of inter-breeding. During the fall, however, mule deer generally migrate to lower elevations on the east slope.

At the turn of the present century mule deer were relatively scarce. Initiation of the buck law in 1923 and the subsequent creation of large legislative refuges were employed to foster increases of deer. That such means were effective was attested by the increase of animals to the degree that winter over-utilization of key browse species became evident by 1934. Mule deer numbers in excess of winter range carrying capacities have remained a problem since this date and must receive continuous attention in planning management. Hunting seasons limited to the taking of bucks do not balance mule deer numbers with winter forage supplies where over-populations exist.

Mule deer occupy three major types of habitat in Eastern Oregon. The open sagebrush areas of Southeastern Oregon support light densities of year-around residents where water and cover are available. The most productive mule deer sections exist in the central eastern portion of the state. Here the deer summer in the timbered areas at higher elevations and migrate to the browse covered foothills to spend the winter months. The northeastern portion of the state supports some deer but the dominance of bunchgrass and comparative shortage of browse species do not encourage large numbers.

Population Trends:

Prior to this year, population trends have been recorded on the basis of deer per section. The difficulty of estimating sections sampled has introduced a personal error which cannot be corrected. In order to eliminate this source of error and standardize information with that collected for other big game species, population trends have been presented as deer per mile. Past data has been converted to this basis for comparative purposes.

Winter concentrations on open ranges render the observation of mule deer relatively easy. Population trends are determined during the months of January, February, and March. Permanent sample routes have been established on all major winter ranges and these are recorded on base maps. Airplane reconnaissance

flights are planned on many ranges in order to determine the pattern of winter deer distribution and assist in the location of samples.

In establishing the sample routes, an effort has been made to cross-section the range in order to cover the distribution of deer during mild as well as severe winters. The routes contour the range, extending from the lowest elevation occupied during severe winters to the highest elevation occupied during years of mild weather conditions. The same basis of sample miles is used to convert for the index each year. This assures a consistent result since heavy concentrations on a few miles of sample will be correlated with light concentrations over a much larger area during mild winters when deer distribution is widespread.

A five-year summary of population trends on the basis of deer per mile is presented below.

Mule Deer Population Trends

Herd Ranges By Districts	Miles Travelled	Deer Observed	Deer Density Per Mile					#Forage Trends
			1949- 1950	1948- 1949	1947- 1948	1946- 1947	1945- 1946	
Metolius	50	134	2.7	2.6	2.6	1.5	2.1	/
Tumalo	50	38	1.5	1.5	1.2	1.3	1.7	/
Deschutes R.	25	-	-	0.1	0.2	0.3	0.4	/
North Paulina	120	418	3.5	3.2	2.7	2.5	2.7	/
Devils Garden	80	595	7.4	7.5	7.4	5.6	11.4	-
Hole-In-Ground	55	148	6.6	6.7	7.5	5.1	8.8	-
McKay-Ochoco	35	164	9.4	9.4	9.4	4.0	5.6	-
North Fork	25	140	11.2	11.0	9.5	12.3	11.0	-
Maury Mt.	35	18	2.1	1.8	1.9	1.6	-	-
CENTRAL DIST.	338	1,655	4.9	4.9	4.7	3.8	4.8	
No. Silver Lake	161	2,121	13.1	8.7	6.3	5.4	-	-
So. Silver Lake	130	1,147	9.0	8.4	10.0	6.4	-	-
Crooked Creek	80	1,074	13.4	11.0	7.7	6.0	10.2	-
Deep Creek	93	1,169	12.4	5.6	6.2	2.7	3.5	-
East Goose L.	16	232	14.5	23.0	10.5	7.4	22.4	-
LAKE-KLAMATH DIST.	480	5,743	12.0	9.0	7.0	5.3	8.0	
Frenchglen	44	1,040	23.6	20.7	16.3	27.4	-	-
Alvord	18	742	41.2	31.8	46.8	32.9	-	-
Silvies River	29	468	16.1	-	4.0	13.2	-	-
Crane Mtn.	30	270	9.0	9.5	6.8	13.6	-	-
Dry Mtn.	30	590	19.7	23.5	11.4	9.6	-	-
HARNEY DISTRICT	151	3,110	20.6	20.3	15.4	19.0	-	

Mule Deer Population Trends (Cont'd)

Herd Ranges By Districts	Miles Travelled	Deer Observed	Deer Density Per Mile					#Forage Trends
			1949- 1950	1948- 1949	1947- 1948	1946- 1947	1945- 1946	
Izee	7	225	32.1	-	55.1	37.8	56.2	-
Canyon Creek	24	200	8.3	8.3	-	-	-	-
Murderers Cr.	124	2,200	17.7	14.5	10.4	9.5	10.5	-
Northside	123	4,021	32.7	30.5	25.8	23.6	30.9	-
Middle Fork	120	663	5.5	9.7	-	4.1	-	-
GRANT DISTRICT	398	7,309	18.4	16.7	20.7	11.7	19.8	
Walla Walla	19	140	7.3	3.1	4.3	1.7	-	-
Umatilla	14	74	5.3	4.8	6.4	4.9	-	-
Meacham	51	370	7.2	-	13.4	8.7	-	-
Birch Creek	21	328	15.6	-	10.2	2.5	-	-
North Fork	51	574	11.2	2.0	7.1	4.9	-	-
Butter Cr.	6	53	8.8	-	11.2	-	-	-
UMATILLA DIST.	162	1,539	9.5	3.3	8.4	5.0	-	
Burnt River	36	682	18.9	-	10.4	9.9	7.2	-
Catherine Cr.	16	67	4.2	-	-	-	-	-
Grand Ronde	26	110	4.2	-	-	-	-	-
Keating	121	1,670	13.8	-	10.6	14.1	9.5	-
Shaw Mtn.	-	-	-	-	1.0	3.5	1.0	-
NORTHEAST DIST.	199	2,529	12.7	-	7.2	7.7	5.5	
No. Fk. Malheur	128	644	5.0	-	-	-	-	-
MALHEUR DIST.	128	644	5.0	-	-	-	-	
Kahler Basin	5	61	12.2	-	-	-	-	-
*White River	6	296	49.3	-	-	-	-	/
*Badger Creek	5	46	9.2	-	-	-	-	/
*Six Fingers	3	35	11.7	-	-	-	-	/
COLUMBIA DIST.	19	438	23.1	-	-	-	-	
TOTALS AND AVERAGES	1,875	22,967	12.2	11.2	11.6	9.9	12.3	

*Black-Tailed Deer

#Trend in key forage species

/ Range Conditions improving

- Range conditions declining

0 Range conditions static

Observations during the past year were more complete than 1948-1949 when severe weather conditions curtailed field work. A total of 22,967 deer were observed in 1,875 miles of travel on 39 major mule deer winter ranges during January, February, and March of 1950. The average deer density per mile was 12.2 as compared to 11.2 the preceding year, 11.6 in 1947-1948, 9.9 in 1946-1947, and 12.3 in 1945-1946.

A moderate over-all increase is noted over the past four years. While the average upward trend in population is moderate, some major herds in those counties supporting the greatest numbers of mule deer appear to be substantially increased. This is particularly true in parts of Lake, Harney, Grant, and Baker Counties.

In Lake County a comparison of increased population trends and declining forage trends, indicate surplus deer populations. The same situation holds true on the north side of the John Day River in Grant County and the Burnt River range of Baker County.

Herd Composition:

Percentages of bucks, does, and fawns in the major mule deer herds are determined in November and December. At this time, the animals are concentrated on winter ranges and undisturbed by hunting. In addition, identification of the bucks is possible since the antlers have not been shed.

An attempt is made to classify at least 10 per cent of each herd which is considered a satisfactory sample.

A recapitulation of mule deer herd composition data for the past four years is tabulated below.

Mule Deer Herd Composition												
Herd Ranges By Districts	Bucks	Does	Fawns	Total	Buck-Doe Ratio				Fawn-Doe Ratio			
					1949-	1948-	1947-	1946-	1949-	1948-	1947-	1946-
					1950	1949	1948	1947	1950	1949	1948	1947
Metolius	15	54	44	113	1-3.6	1-5.0	-	1-0.4	1-1.2	1-2.0	-	-
Tumalo	20	51	46	117	1-2.5	-	1-3.0	-	1-1.1	-	1-1.6	-
N. Paulina	38	140	134	312	1-3.7	1-3.0	1-2.0	1-5.1	1-1.1	1-1.6	1-1.0	1-1.9
Devils Gar.	18	122	97	237	1-6.8	1-4.0	1-3.8	1-4.0	1-1.2	1-1.2	1-1.6	1-2.5
Hole-In-Gr.	19	72	64	155	1-3.8	1-5.8	1-9.8	1-3.6	1-1.1	1-1.2	1-1.9	1-1.7
McKay-Ochoco	4	21	9	34	1-5.2	1-4.2	-	-	1-2.3	1-2.0	-	-
CENTRAL DIST.	114	460	394	968	1-4.0	1-4.4	1-5.0	1-3.1	1-1.2	1-1.5	1-1.5	1-2.0
N. Silver L.	21	90	87	198	1-4.3	-	1-2.9	1-4.0	1-1.0	1-1.6	1-0.9	1-1.4
S. Silver L.	15	45	44	104	1-3.0	-	1-8.0	1-4.4	1-1.0	1-1.6	1-1.2	1-1.2
Chewaucan	11	23	18	52	1-2.0	-	1-4.0	1-3.8	1-1.3	-	1-2.0	1-1.2
Crooked Cr.	12	79	66	157	1-6.6	-	1-11.0	1-7.2	1-1.2	1-1.6	1-1.4	1-1.2
Deep Creek	15	118	106	239	1-7.9	-	1-8.0	1-2.4	1-1.1	1-1.4	1-1.1	1-1.3
LAKE-KLAMATH	74	355	321	750	1-4.8	-	1-6.4	1-4.3	1-1.1	1-1.6	1-1.3	1-1.3

Mule Deer Herd Composition (Cont'd)

Herd Ranges By Districts	Deer Observed				Buck-Doe Ratio				Fawn-Doe Ratio			
	Bucks	Does	Fawns	Total	1949-	1948-	1947-	1946-	1949-	1948-	1947-	1946-
	1950	1949	1948	1947	1950	1949	1948	1947	1950	1949	1948	1947
Frenchglen	29	130	108	267	1-4.5	1-4.3	1-3.2	1-3.6	1-1.2	1-1.0	1-1.3	1-1.3
Alvord	40	146	121	307	1-3.6	1-19.4	1-11.9	1-4.6	1-1.2	1-2.3	1-1.8	1-4.3
Silvies R.	14	99	83	196	1-7.1	1-3.5	1-6.9	1-11.0	1-1.2	1-1.7	1-1.5	1-2.3
Crane Mtn.	11	87	76	174	1-7.9	1-2.9	1-3.4	1-4.5	1-1.1	1-1.0	1-1.7	1-1.6
Dry Mtn.	19	120	108	247	1-6.3	1-16.0	1-3.8	1-2.9	1-1.1	1-1.6	1-1.7	1-1.9
HARNEY DIST.	113	582	496	1,191	1-5.3	1-7.2	1-4.5	1-5.3	1-1.2	1-1.4	1-1.6	1-2.3
Izee	-	-	-	-	-	1-15.0	-	1-14.0	-	-	1-1.3	1-2.0
Canyon Cr.	-	-	-	-	-	-	-	1-1.7	-	-	1-1.5	1-2.8
Murderers Cr.	-	-	-	-	-	1-10.0	-	1-2.3	-	-	1-1.3	1-2.8
Northside	-	-	-	-	-	1-3.3	1-9.3	1-3.8	-	-	1-1.6	1-2.0
Middle Fork	-	-	-	-	-	-	-	-	-	-	-	-
GRANT DIST.	-	-	-	-	-	1-9.4	1-9.3	1-9.3	-	-	1-1.4	1-2.7
Walla Walla	3	14	9	26	1-4.6	-	-	-	1-1.5	-	1-2.2	1-2.7
Umatilla	5	31	20	56	1-6.2	1-4.7	-	-	1-1.4	1-2.1	1-1.6	-
Meacham	-	-	-	-	-	-	-	-	-	-	1-1.9	1-2.0
Birch Cr.	6	32	19	57	1-5.3	-	-	-	1-1.8	-	1-1.7	-
North Fork	10	41	37	88	1-4.1	1-3.8	-	1-4.0	1-1.1	1-1.6	1-2.1	1-2.2
Butter Cr.	-	-	-	-	-	-	-	-	-	-	1-2.3	-
UMATILLA:	24	118	85	227	1-4.9	1-4.5	1-6.0	1-6.0	1-1.4	1-1.7	1-1.9	1-2.0
Burnt R.	-	-	-	-	-	-	1-9.0	1-7.0	-	-	1-1.2	1-1.5
Keating	-	-	-	759	1-6.8	-	1-4.0	1-3.0	1-1.0	-	1-1.8	1-1.8
Shaw Mtn.	-	-	-	-	-	-	1-2.0	-	-	-	1-2.0	1-2.0
NORTHEAST DIST.	-	-	-	759	1-6.8	-	1-4.7	1-4.0	1-1.0	-	1-1.3	1-1.6
N. Fk. Malheur	27	172	173	372	1-6.4	-	-	-	1-1.0	-	-	-
MALHEUR DIST.	27	172	173	372	1-6.4	-	-	-	1-1.0	-	-	-
TOTALS AND AVERAGES	352	1,687	1,469	3,508	1-4.8	1-6.4	1-5.5	1-5.0	1-1.1	1-1.6	1-1.8	1-2.0

A total of 3,508 animals were classified during November and December, 1949. Of this number, 352 (10%) were bucks, 1,687 (48%) were does, and 1,469 (42%) were fawns.

Expressed as ratios, 1 buck existed for every 4.8 does while 1 fawn was present for every 1.1 does.

The buck-doe ratio has remained fairly constant, varying from 1 buck to 4.8 does in 1949 to 1 buck to 6.4 does in 1948. Although no 1949 classifications were made in Grant County, observations reveal that the Izee herd still maintains the lowest percentage of bucks.

Fawn crops continue to be high, indicating the maintenance of adequate bucks for breeding purposes and favorable conditions for fawn survival. The average 1949 ratio of 1 fawn to 1.1 does shows an improvement in production and survival to December over the preceding three years. Little variation in the excellent 1949 fawn crop is evident on any of the herd ranges.

Range Conditions:

Probably the most important factor in maintaining mule deer is the adequacy of food supplies. Generally, summer forage is more than ample for the numbers of deer now being carried. Many winter ranges are in critical condition, however.

Poor soil, severe climate, and low moisture supplies limit forage production on winter ranges. Browse supplied by shrubs forms an important part of a deer's diet during the winter months in supplying protein and remaining available when crusted snow covers the ground. Growth and recovery of shrubs is limited. Continued over-utilization of shrubs will eventually destroy them and reproduction will not occur as long as a sizeable deer herd remains on the range. Hence, it is essential to manage winter forage supplies, particularly important shrub species preferred by deer, by preventing over-utilization. Maintaining balances between deer numbers and winter forage supplies can best be realized by harvesting surplus deer.

In order to determine forage trends on winter ranges, studies are conducted by the Field Agents. On ranges where shrub species preferred by deer are sufficiently abundant to supply a substantial portion of the winter diet, such species are selected for study. Utilization measurements of the key shrub species will serve as an indicator of forage trends since abuse will first become evident on preferred plants.

Bitterbrush is the primary key species on the better browse ranges. A total of 125 bitterbrush utilization transects have been established on the major deer ranges in Deschutes, Crook, Lake, Klamath, Harney, Grant, and Baker Counties. Each transect consists of 20 staked plants which are measured semi-annually during May and October. Measurements are designed to provide information on utilization by deer and by livestock, annual forage production, and the vigor and trend of bitterbrush stands.

On many mule deer ranges, no single plant species is sufficiently abundant or important enough to serve as a key in management. In order to determine the relative importance of forage species during the winter months and possible indicators of range trends on areas where key species are not known, semi-annual utilization measurements of all forage species are made.

A total of 31 transects have been established on deer ranges lacking key browse species in Wheeler, Deschutes, Lake, Harney, Grant, Umatilla, Baker, Wallowa, and Malheur Counties. A transect consists of 20 staked plots including 100 square

feet each. A record is maintained of plant species and densities on each plot for future use in determining forage trends. The utilization of shrubs, grasses, and weeds is measured in May to determine deer use the preceding winter and again in October to determine livestock use.

Systematic forage measurements are compared with population trends to serve as a basis for management. An index of range conditions as determined by forage studies is included in the Population Trend Summary. To simplify the presentation, a symbol is utilized to indicate improving, declining, or static conditions.

Four ranges within the excellent bitterbrush section of Deschutes County where deer densities are low have shown improvement. With the exception of three black-tail wintering areas on the east slopes of Mt. Hood, the remaining winter ranges being studied in eastern Oregon show downward forage trends. Such downward trends are accompanied by increasing deer numbers.

To prevent further destruction of important browse resources, it appears that mule deer numbers must be balanced with winter food supplies, particularly in parts of Lake, Grant, and Baker Counties.

Winter Losses:

A measurement of mortality, particularly by malnutrition is conducted at the time observations are made to determine mule deer population trends. In order to provide a basis for comparison and establish a trend, winter losses are expressed as carcass per miles of travel.

A summary of 1949-1950 winter losses and a two-year comparison is included below:

Mule Deer Winter Losses								
Herd Ranges By Districts	Winter Losses			Total Carcasses	Miles Travelled	Trend Index		
	Sex		Age			Carcass/Miles Trav.	1950	1949
	Males	Females	Young Adults					
N. Silver L.		3	5	2	7	47	1-6.7	1-4.0
S. Silver L.	3	2	21	10	31	53	1-1.7	1-3.5
Crooked Creek				1	1	61	1-61.0	1-3.9
Deep Creek		1	1		1	55	1-55.0	1-6.0
East Goose L.	1		1		1	16	1-16.0	1-2.6
LAKE-KLAMATH	4	6	28	13	41	232	1-5.7	1-3.8
Frenchglen	1	1	4		9	44	1-4.9	1-9.0
Alvord					0	18	-	1-3.6
Silvies R.					2	29	1-14.5	
Crane Mtn.	3	2	4	1	8	30	1-3.7	1-24.0
Dry Mtn.	2	3	34	8	48	38	1-0.8	1-3.0
HARNEY	6	6	42	9	67	159	1-2.4	1-5.5

Mule Deer Winter Losses (Cont'd)

Herd Ranges By Districts	Winter Losses				Total Carcasses	Miles Travelled	Trend Index		
	Sex		Age				Carcass/Miles Trav.	1950	1949
	Males	Females	Young	Adults					
Northside Murderers Cr. Izee			45	10	55	55	1-1.0	1-2.1 1-1.4	
			21	6	27	7	1-0.3	1-0.5	
GRANT DIST.			66	16	82	62	1-0.8	1-1.6	
Walla Walla					2	19	1-9.5	1-16.0	
Umatilla		1		1	5	12	1-2.4	1-1.6	
Meacham		1		1	10	51	1-5.1		
Birch Cr.		1	1		1	21	1-21.0	0	
North Fork	8	8	12	4	25	51	1-2.0	1-1.1	
Butter Cr.		1	1		1	8	1-8.0		
UMATILLA DIST.	8	12	14	6	44	162	1-3.7	1-1.7	
No. Fk. Malheur	9	13	19	3	22	46	1-2.1	1-1.6	
MALHEUR DIST.	9	13	19	3	22	46	1-2.1	1-1.6	
Metolius					0	31	0-31.0	-	
Tumalo					0	18	0-18.0	-	
North Paulina	1			1	1	95	1-95.0	-	
Devils Garden	1	2	4	1	5	44	1-8.8	-	
Hole-In-Gr.		2	2		2	13	1-6.5	-	
McKay-Ochoco		2	1	2	3	14	1-4.7	-	
North Fork					0	8	0-8.0	-	
Maury Mountain					0	8	0-8.0	-	
CENTRAL DIST.	2	6	7	4	11	231	1-21.0	-	
TOTALS AND AVERAGES:	29	43	176	51	267	892	1-3.3	1-1.8	

A total of 267 carcasses were observed in 892 miles of travel, an average of 1 carcass per 3.3 miles. Since many carcasses were badly decomposed at the time of observation, sex and age not being identifiable, all losses were not classified. As in past years, heaviest mortality occurred among the fawns.

The 1948-1949 winter, which was very severe, resulted in an average mule deer loss much higher than occurred last winter. One carcass was found for every 1.8 miles travelled in 1948-1949 as compared to 1 carcass per 3.3 miles in 1949-1950.

Those ranges suffering the highest winter loss rate were South Silver Lake in Lake County (1 per 1.7 miles of travel), Dry Mountain in Harney County (1 per 0.8 miles), Northside in Grant County (1 per 1.0 miles), and Izee in Grant County (1 per 0.3 miles). Observations on these ranges indicate considerable reductions of fawns from those present last December.

Winter losses can be used as an indicator of range conditions. A high index generally can be correlated with over-used forage supplies. Losses among those herds on ranges supplying adequate winter browse are usually light.

ROOSEVELT ELK:

Roosevelt elk are confined to the Coast and Cascade Ranges. Some transplants of Rocky Mountain elk have been made along the Cascades but the Roosevelt sub-species continues to be dominant in this area.

Although elk summer in the vicinity of the high Cascade lakes, a general migration to the western slope takes place each fall. The herds winter as individual units along the west slope drainages at lower elevations. Exceptions to this rule do occur and some wintering takes place on the east side.

Roosevelt elk in the Coast Range generally follow a pattern of existence similar to that of black-tailed deer. They prefer open burns and logged-off areas but scattered herds reside in timbered sections.

One characteristic of this sub-species is its tendency to occupy a limited home range, not spreading to adjacent areas. Because of this tendency, hunting may remove all breeding bulls if spikes are not protected. Annual hunting is desirable as a means of keeping the animals alert and forcing them to disperse away from concentrated ranges. Hence, hunting is continued on bulls with three or more points per antler to preserve adequate breeding males and realize an annual harvest of the animals, at the same time encouraging increases on suitable ranges.

Population Trends:

Since Roosevelt elk occupy ranges jointly with black-tailed deer, observations to determine population trends are conducted simultaneously during the summer months. The index of trend is presented as elk per mile of sample in order to secure a consistent basis for comparison.

Population trend data in western Oregon is presented in the following table.

Roosevelt Elk Population Trends								
Counties By Districts	Miles Travelled	Elk Observed	Elk Density Per Mile					
			1949- 1950	1948- 1949	1947- 1948	1946- 1947	1945 1946	
Clatsop	116	1,005	8.7	7.2	4.3	3.7	3.0	
Tillamook	196	415	2.1	1.1	1.1	0.5	1.0	
Lincoln	61	52	0.9	1.1	0.7	0.8	0.1	
NORTH COASTAL	373	1,472	3.9	3.1	2.3	1.7	1.4	
West Lane	23	0	0.0	0.0	0.0	0.2	0.3	
Coos-Douglas	190	384	2.0	1.7	1.1	0.6	1.0	
Curry	87	35	0.4	0.7	0.2	0.1	0.0	
SOUTH COASTAL	300	419	1.4	1.2	0.6	0.3	0.8	
TOTALS AND AVERAGES	673	1,891	2.8	2.6	1.8	1.3	1.2	

A total of 673 sample miles are established on Western Oregon elk ranges. During 1949-1950, 1,891 elk were observed, an average of 2.8 per mile. Compared to averages for preceding years, densities have shown a consistent increase from the figure of 1.2 elk per mile tabulated in 1945-1946.

Heaviest elk concentrations exist in Clatsop, Tillamook, and Coos Counties. Tillamook County shows the highest rate of increase, particularly on the open burn.

Little information is available on the Cascade herds. Dense timber and inaccessibility of winter ranges renders it difficult to make consistent observations. Static conditions are indicated in most areas. One herd has taken up winter residence on the east slopes of Mt. Hood. The Breitenbush herd winters in a very restricted area under hazardous conditions and does not appear to be increasing appreciably. Some of those elk native to the Upper Klamath Lake section have wintered on the South Fork of Rogue River and may establish a new herd if this practice continues.

Herd Composition:

Herd composition data is secured subsequent to the hunting season in order to determine the survival of breeding bulls and productive rate of the herds.

Information on the percentages of bulls, cows, and calves is included below:

Roosevelt Elk Herd Composition

Counties By Districts	Elk Observed				Bull-Cow Ratio				Calf-Cow Ratio			
	Bulls	Cows	Calves	Total	1949- 1950	1948- 1949	1947- 1948	1946- 1947	1949- 1950	1948- 1949	1947- 1948	1946- 1947
Clatsop	95	364	130	589	1-3.8	1-3.6	1-3.4	1-4.0	1-2.8	1-2.5	1-2.8	1-2.5
Tillamook	49	142	47	238	1-2.9	1-2.6	1-2.4	1-2.0	1-3.0	1-2.2	1-2.5	1-2.6
Lincoln	2	11	5	18	1-5.5	1-3.3	1-2.8	1-2.0	1-2.2	1-2.5	1-2.0	1-2.0
N. COASTAL	146	517	182	845	1-3.5	1-3.4	1-3.1	1-2.7	1-2.8	1-2.4	1-2.7	1-2.4
West Lane	1	7	2	10	1-7.0	0	0	1-3.0	1-3.5	0	0	1-2.2
Coos-Douglas	106	390	166	662	1-3.7	1-4.2	1-7.8	1-5.6	1-2.3	1-3.0	1-2.4	1-5.4
Curry	7	35	10	52	1-5.0	1-1.9	1-2.1	1-2.4	1-3.5	1-3.0	1-2.4	1-1.9
S. COASTAL	114	432	178	724	1-3.8	1-3.5	1-5.3	1-4.2	1-2.4	1-3.0	1-2.4	1-3.7
TOTALS AND AVERAGES	260	949	360	1,569	1-3.6	1-3.4	1-3.4	1-2.9	1-2.6	1-2.5	1-2.6	1-2.6

Of the 1,569 elk observed in Western Oregon, 260 or 17 per cent were bulls, 949 or 60 per cent were cows, and 360 or 23 per cent were calves. Expressed as ratios, 1 bull existed for every 3.6 cows and 1 calf for every 2.6 cows in 1949-1950.

No widespread bull-cow ratios are in evidence. It appears that the three-point regulation is proving effective in maintaining supplies of breeding males. The percentage of bulls in the various herds has remained stable during the past four years.

Calf crops continue to be constant. Since yearlings are classified with adult females, the calf-cow ratio is actually better than the 1 to 2.6 indicated.

Range Conditions:

As with black-tailed deer, open burns and logged-off areas provide the most suitable habitat for Roosevelt elk. Logging continues to improve conditions by removing dense timber and opening up the range.

Many of the older cut-over areas are growing back to the extent that their desirability as elk range is rapidly declining. This is particularly true in Clatsop County where various herds are being crowded onto adjacent valley edges as a result of dense second-growth reproduction. The increasing incidence of damage complaints along shoestring valleys verifies the declining condition of the range.

Summer forage remains more than ample for Roosevelt elk. Browse conditions on some winter ranges in Clatsop County are expected to become critical as shrubs continue to be shaded out by the rapid development of timber species. In most areas, with the exception of Clatsop County, winter browse supplies are adequate. This was particularly evident in Tillamook County last winter when the elk were forced to concentrate along the stream bottoms as a result of deep snow. Even during the most critical weather, elk were able to secure an abundance of willow along the streams and thrived in excellent condition.

The major problem involved is to encourage a wider distribution of elk over unoccupied habitat. Local range over-utilization is limited in extent and does not affect the over-all picture of insufficient elk numbers throughout Western Oregon as a whole.

ROCKY MOUNTAIN ELK:

As with other big game animals in Oregon, Rocky Mountain elk have been subject to periodic fluctuations in numbers. Records of explorers and early settlers reveal that the original distribution was similar to the one which exists today. Shortly after the turn of the century, however, the species was in danger of extinction.

To foster increases of elk, hunting was prohibited shortly after 1900. In 1912 and 1913, thirty head were transplanted from Jackson Hole, Wyoming to a 2,560-acre pasture at Billy Meadows north of Enterprise. Transplants were subsequently made in other sections of northeastern Oregon and at scattered intervals along the Cascades.

As a result of the transplants and protection afforded to remnant native herds, elk increased to the extent that a hunting season on bulls was allowed in 1933. Annual seasons have been possible since that date.

At the time of the first hunting season, elk were concentrated in a few large herds. One effect of hunting has been to break up and scatter elk into small herds over a wide area. Today the animals are spread throughout the Blue and Wallowa Mountains as far south as the North Fork of the Malheur River and

westward into eastern Crook County.

From a management standpoint, elk habitat can be classified into three major types, including northeastern Oregon bunchgrass ranges, southeastern Oregon browse ranges, and agricultural lands.

The open bunchgrass slopes of northern Wallowa, Union, and Umatilla Counties offer an abundance of winter forage suitable for the maintenance of elk. Localized summer and winter concentration problems are in evidence but cannot be applied to the entire range type. Although natural limits are imposed on total numbers throughout this area, it can be regarded as primarily suited to the production of elk.

The southeastern Oregon browse ranges are essential to the winter maintenance of deer. Since demand is much greater for deer hunting and evidence indicates that elk compete with deer for browse, management necessitates the control of elk numbers on such ranges.

Elk are not compatible with agricultural enterprises. On those ranges classified as agricultural land, elk populations must be controlled.

Population Trends:

Many elk herds winter on inaccessible ranges, making sampling from the ground difficult. In order to adequately cover all major winter ranges, airplanes are used.

Experience has shown that elk can be readily observed during the early morning hours of March and April as they feed on green grass growing along south slopes. By flying at a safe elevation in a direction parallel to the southern exposures, a winter range can be quickly and adequately sampled to determine the population trend.

Considerable variation exists in the winter locations of elk herds. Refinements in sampling procedures continue to be necessary and the more extensive use of airplanes is needed before satisfactory information on population trends will be secured.

Available data is summarized on the following page:

Rocky Mountain Elk Population Trends						
Herd Ranges by Districts	Miles Travelled	Elk Observed	Elk Density Per Mile			
			1949- 1950	1948- 1949	1947- 1948	1946- 1947
Middle Fork	120	405	3.4	2.0	5.3	3.6
Camp Creek	20	78	3.6	2.6	-	1.5
Grub Creek	40	100	2.5	4.2	-	2.9
Beech Creek	8	14	1.7	-	0.7	-
Canyon Creek	40	55	1.3	0.6	0.8	0.8
GRANT DISTRICT:	228	652	2.8	1.9	3.9	2.9
Calamity	15	18	1.2	1.0	0.0	0.5
Black Rock	3	0	0.0	2.7	0.0	7.3
Otis Mountain	10	5	0.5	3.3	1.6	1.8
HARNEY DISTRICT:	28	23	0.8	2.0	0.6	1.7
Walla Walla	19	195	10.2	6.5	4.4	-
Umatilla	14	27	2.0	1.7	0.3	-
Meacham	51	145	2.8	-	3.0	-
Birch Creek	21	89	4.2	-	9.3	-
North Fork	51	16	0.3	1.6	4.0	-
Butter Creek	6	3	0.5	-	0.7	-
UMATILLA DISTRICT:	162	475	2.9	3.2	3.7	-
Grand Ronde	106	348	3.3	-	-	-
Lookingglass	80	87	1.1	-	-	-
Mt. Emily	70	20	0.3	-	-	-
Shaw Mountain	60	80	1.3	-	3.6	2.6
NORTHEAST DISTRICT:	316	535	1.7	-	2.9	2.2
Wenaha	-	-	-	-	-	-
Minam	-	-	-	-	-	-
Chesnimnus	140	505	3.6	-	-	-
WALLOWA DISTRICT:	140	505	3.6	-	-	-
TOTALS AND AVERAGES:	734	1,685	2.3	2.8	3.3	2.8

Although incomplete information reveals a decided decrease of elk, this trend is to be expected after the very liberal 1949 season in which both sexes were harvested over most of northeastern Oregon.

A total of 734 animals were observed in 1,685 miles of travel while sampling elk ranges. The average density of 2.3 elk per mile is appreciably lower than the 1948-1949 figure of 2.8. Since figures on the Chesnimnus range were not available for past years, the information is not included in the final summary. The totals for the Umatilla and Northeast Districts which include our heaviest

populated ranges, show substantial decreases. Effects of hunting pressure are particularly evident on the Birch Creek and North Fork ranges of Umatilla County which were heavily hunted. Here elk densities declined noticeably from those recorded in preceding years.

Herd Composition:

Bull elk retain their antlers until mid-winter and observations to determine herd composition can be taken later than is the case with deer.

A comparison of bull, cow, and calf percentages in the various herds for the past four years is provided below:

ROCKY MOUNTAIN ELK HERD COMPOSITION

Herd Ranges by Districts	ELK OBSERVED				BULL-COW RATIO				CALF-COW RATIO			
	Bulls	Cows	Calves	Total	1949	1948	1947	1946	1949	1948	1947	1946
					1950	1949	1948	1947	1950	1949	1948	1947
GRANT	-	-	-	-	-	-	1-7.0	1-4.0	-	-	1-3.0	1-2.6
Walla Walla	5	23	7	35	1-4.6	1-2.6	-	-	1-3.2	1-3.2	-	-
Meacham	9	27	21	57	1-3.0	-	-	-	1-1.3	-	-	-
Birch Creek	2	10	10	22	1-5.0	1-5.1	-	-	1-1.0	1-2.9	-	-
Umatilla	-	-	-	-	-	1-3.6	-	-	-	1-2.4	-	-
UMATILLA	16	60	38	114	1-3.7	1-4.0	1-4.4	1-2.4	1-1.6	1-2.6	1-1.9	1-2.0
Grand Ronde	-	-	-	74	1-20.0	-	-	-	1-1.2	-	-	-
NORTHEAST	-	-	-	74	1-20.0	-	1-4.2	1-9.0	1-1.2	-	1-3.0	1-1.9
Wenaha	17	114	26	157	1-6.7	1-3.7	-	-	1-4.4	1-2.8	-	-
Minam	-	-	-	-	-	1-2.3	-	-	-	1-3.6	-	-
Chesnimnus	14	147	120	281	1-10.5	1-7.7	-	-	1-1.2	1-1.7	-	-
WALLOWA	31	261	146	438	1-8.4	1-4.6	-	-	1-1.8	1-2.7	-	-
Totals and Averages	47	321	184	552	1-6.8	1-4.3	1-5.2	1-5.0	1-1.7	1-2.6	1-2.6	1-2.0

Out of 552 elk classified, 47 or 9 per cent were bulls, 321 or 58 per cent cows, 184 or 33 per cent calves. The bull-cow ratio was 1 to 6.8 which represents a downward trend in the percentage of males during the past four years.

The effects of bull seasons on sex ratios are evident on the Grand Ronde and Chesnimmus ranges where hunting has been restricted to males. The Grand Ronde ratio of 1 bull to 20 cows and the Chesnimmus ratio of 1 to 10.5 are much more widespread than the over-all average of 1 to 6.8.

Calf crops appear to be excellent. The 1949-1950 average of 1 calf to 1.7 cows is improved over the ratios of the preceding three years. The poorest crop was produced by the Wenaha herd where only 1 calf existed for every 4.4 cows. The results of malnutrition during the very severe winter of 1948-1949 may bear some relationship to this poor production.

Information on the antler point classes of bulls observed in the Umatilla District has been recorded for the past three years. This is summarized in the following table.

Number of Points	Antler Point Classes Umatilla District					
	Number of Bulls in Class			Per Cent in Class		
	1950	1949	1948	1950	1949	1948
1 and 2	9	15	16	53	37	56
3	2	1	1	12	2	3
4	1	10	3	6	24	9
5	3	9	5	17	22	16
6	2	6	5	12	15	16

This information emphasizes the dependence upon yearling animals to support hunting and the hazards limiting survival of elk.

Range Conditions:

Reduced numbers of elk and milder weather conditions limited concentrations on winter ranges this year. Complaints of range damage were few compared to those received in 1948-1949.

Elk are hardy animals and can exist throughout the winter on dry bunchgrass. Where an abundance of this forage remains available, no concern is felt over the question of maintaining an elk herd. Some opposition is expressed to continued elk grazing on privately owned ranges throughout the winter and early spring months. Concentrations of the animals do create problems. Since much of the winter range is privately owned, elk populations must be maintained at compatible levels.

A concentration of approximately 500 elk on the Wenaha River above Troy this past winter presented a serious problem. This herd summers in Washington and the available winter range is limited. Deep snow rendered much of the bunchgrass unavailable and the limited supply of browse was soon exhausted. The calf loss was high compared to other ranges.

On deer ranges supporting stands of shrubs and lacking suitable amounts of bunchgrass, browsing by elk continues to create a problem. The heights to which elk can feed and their destructive browsing habits render it difficult for deer to compete with them. Continued control of elk numbers on the southeastern Oregon deer ranges appears to be a sound management objective.

ANTELOPE:

Antelope occupy the open, preferably short sagebrush, sections of southeastern Oregon. At present, the species is confined to Malheur, Harney, Lake, Klamath, Deschutes, and Crook Counties with the largest herds in Harney County.

During the early 1940's, antelope numbers decreased at an alarming rate. Observations indicated coyote predation at the time of fawning to be an important limiting factor. Coyote poisoning programs initiated in 1946 and continued to date have been effective in insuring fawn survival during the past four years. Increased production enabled the holding of a limited season on bucks in 1949, the first hunting permissible since 1945.

Much suitable antelope range remains unoccupied. The major management practice required is to encourage further increases of the species. Available sources of water during the late summer months appear to be inadequate. Improvement of the habitat by supplying water and restricting the kill to bucks are felt to be the most practical procedures to follow in fostering antelope increases and wider distribution.

Population Trends:

The open-type of terrain occupied by antelope renders it possible to easily observe the animals. Since the herds are very widespread, often in inaccessible areas, airplanes are used to secure data on population trends.

Experience has indicated February to be the best month for securing information on the trend in population. At this time, the herds are concentrated on winter ranges and it is possible to sample an adequate cross-section. Permanent sample areas have been established on all major antelope ranges and these are flown consistently each year. Numbers observed along the sample routes are recorded on the basis of antelope per mile to compare with past measurements and establish a trend in population.

By flying at an elevation of approximately 500 feet and observing in a direction away from the sun, a herd of antelope is readily identified when the animals become disturbed and flash their white rump patches as a warning signal. Patches of snow make it difficult to see the white portions of antelope and flying is planned when snow is not present.

A summary of antelope population trend data for the past four years is recorded on the following page.

ANTELOPE POPULATION TRENDS

District	Sample No.	Location	Miles Travelled				Antelope Observed				Antelope Per Mile			
			1950	1949	1948	1947	1950	1949	1948	1947	1950	1949	1948	1947
	1	Catlow Valley	270	270	270	270	445	310	251	236	1.7	1.2	0.9	0.9
	2	Foster Flat	80	80	80	80	325	348	127	154	4.1	4.4	1.6	1.9
	3	Bridge Creek	40	-	-	-	48	-	-	-	1.2	-	-	-
	4	Red "S" Field	60	60	60	60	105	87	90	100	1.8	1.5	1.5	1.7
	5	Harney Valley	90	90	90	90	45	-	150	-	0.5	-	1.7	-
	6	Blitzen Valley	80	80	80	80	13	10	8	4	0.1	0.1	0.1	0.1
	7	Coleman Mountain	90	90	90	90	409	252	181	140	4.5	2.8	2.0	1.6
	8	Chain Lakes	160	160	160	160	273	271	297	211	1.7	1.7	1.9	1.3
	9	Sagehen Flat	240	240	150	240	1083	-	1155	1105	4.5	-	7.7	4.6
	10	Big Spring Table	240	240	40	240	2282	3114	38	1416	9.5	12.9	1.0	5.9
	11	Hart Mountain	160	160	160	260	197	-	544	65	1.2	-	3.4	0.3
	12	Squaw Butte	120	120	50	120	21	-	40	35	0.2	-	0.8	0.3
	13	Dry Valley	100	100	-	100	2	-	-	100	-	-	-	1.0
HARNEY			1730	1690	1330	1790	5248	4392	2881	3566	3.0	2.7	2.2	2.0
	1	Bear Creek	181	181	181	-	110	259	137	-	0.6	1.4	0.8	-
	2	Glass Butte	186	186	186	-	44	31	75	-	0.2	0.2	0.4	-
	3	Pine Mountain	181	181	181	-	306	223	321	-	1.7	1.2	1.8	-
CENTRAL			548	548	548	-	460	513	533	-	0.8	0.9	1.0	-
	1	Freezeout Mountain	70	158	-	-	61	30	-	-	0.9	0.2	-	-
	2	Juntura	70	88	-	-	113	119	-	-	1.6	1.4	-	-
	3	Saddle Butte	88	158	-	-	241	203	-	-	2.7	1.3	-	-
	4	Crooked Creek	88	35	-	-	139	15	-	-	1.5	0.5	-	-
	5	Mahogany Mountain	70	158	-	-	230	53	-	-	3.2	0.3	-	-
	6	Antelope Reservoir	88	105	-	-	18	6	-	-	0.2	0.1	-	-
	7	Rattlesnake Creek	105	175	-	-	312	159	-	-	2.9	0.9	-	-
	8	Antelope Creek	245	280	-	-	281	365	-	-	1.1	1.3	-	-
	9	Whitehorse	140	158	-	-	15	148	-	-	0.1	0.8	-	-
MALHEUR			964	1315	-	-	1410	1098	-	-	1.5	0.8	-	-
	1	Drakes Flat	185	185	185	-	653	888	502	-	3.5	4.8	2.7	-
	2	Silver Lake	128	128	128	-	375	492	386	-	2.9	3.8	3.0	-
	3	Clover Flat	40	40	-	-	47	52	-	-	1.2	1.3	-	-
LAKE			353	353	313		1075	1432	888		3.0	4.1	2.8	
Totals and Averages			3595	3906	2191	1790	8193	7435	4302	3566	2.3	1.9	2.0	2.0

Since 1947, an increased number of antelope have been observed each winter. The figure has expanded from 3,566 head in 1947 to 8,193 head in 1950. No attempt has been made to count total numbers on all ranges but the trend on the sample areas is encouraging. A total of 3,595 sample miles were flown in 1950, an average of 2.3 antelope per mile. This index is higher than during the preceding years.

Antelope densities are much higher in Harney County than the average for the state. Very consistent observations have been made in this county for the past four years and the trend is summarized in the following table.

Population Trend in Harney County			
Year	Antelope Observed	Miles Travelled	Antelope Per Mile
1947	3,654	1,790	2.0
1948	2,890	1,330	2.2
1949	4,392	1,690	2.7
1950	5,248	1,730	3.0

Herd Composition:

The determination of the percentages of bucks, does, and fawns, in the various antelope herds is done in August. At this season of the year, the animals are concentrated near the late summer water sources and large numbers can be easily observed.

A recapitulation of herd composition data for the past five years is tabulated below:

County	Antelope Classified				Buck-Doe Ratio					Fawn-Doe Ratio				
	1949	1948	1947	1946	1949	1948	1947	1946	1945	1949	1948	1947	1946	1945
Harney	416	648	675	494	1-1.0	1-1.1	1-1.7	1-1.5	1-1.1	1-1.2	1-1.1	1-0.9	1-4.3	1-4.7
Lake	183	589	181	234	1-2.7	1-2.0	1-1.2	1-3.0	-	1-1.7	1-1.6	1-0.8	1-2.2	-
Crook-Deschutes	51	264	77	189	1-1.2	1-2.1	1-1.7	1-4.0	1-2.4	1-1.0	1-3.9	1-5.4	1-1.0	1-1.0
Malheur	225	317	-	-	1-1.4	1-3.0	-	-	-	1-1.0	1-1.5	-	-	-
Totals and Averages	875	1818	933	917	1-1.3	1-2.0	1-1.5	1-2.8	1-1.5	1-1.2	1-2.0	1-2.4	1-5.8	1-7.5

A consistent improvement in the percentage of bucks is noted. In early August, 1949, an over-all average of one buck existed for every 1.3 does. During the past five years, the buck-doe ratio has varied from the extremes of 1 to 1.3 in 1949 to 1 to 2.8 in 1946. At the present time, a surplus of males in excess of breeding requirements is available.

Fawn survivals have increased materially since 1946, a fact substantiated by the improved population trend index. In 1949, the average fawn-doe ratio was 1 to 1.2, a decided increase over the fawn survival of 1 to 7.5 does in 1945.

To determine the effect of hunting on buck numbers, information was secured prior to and immediately following the 1949 antelope season on Drakes Flat in Lake County, our heaviest hunted range. The pre-and post-season herd composition data is included in the following table:

Pre-Season and Post-Season Herd Composition On Drakes Flat

	Bucks	Does	Fawns	Total	Buck-Doe Ratio	Fawn-Doe Ratio
Pre-Season	24	60	26	110	1-2.5	1-2.3
Post-Season	12	68	53	133	1-5.7	1-1.3

As indicated above, the percentage of males was reduced by hunting from 1 buck to 2.5 does before the season to 1 buck to 5.7 does after the season. The effect of concentrated hunting does not appear to have reduced the number of bucks below the ratio required for breeding. A follow-up of fawn production on this range will be conducted to verify the assumption.

Range Conditions:

The abundance of short sage species in southeastern Oregon and the reliance of antelope on this type of vegetation renders it improbable that over-utilization of forage supplies will occur in the immediate future. At present, the relatively low population densities of antelope insure light use of preferred food plants.

Green grasses and weeds are eaten with relish during the early spring months and throughout the summer when available on dry lake beds. However, the period of use is short and competition with domestic livestock for these classes of forage is minor.

Water sources during the late summer months are limited and this results in heavy concentrations of antelope. It is possible that the development of additional water supplies would induce a more widespread distribution of antelope. Developments in cooperation with the U. S. Bureau of Land Management have been completed with a view toward testing the value of such practices.

Four-State Antelope Survey:

Representatives from the States of California, Nevada, Idaho, and Oregon, and the U. S. Fish and Wildlife Service have met annually during the past two years in order to coordinate collection of information and management of antelope herds migrating across state boundaries.

Information gathering techniques have been standardized and those herds interstate in nature have been assigned to individual states for study. An annual report is prepared summarizing all information collected by the four states. Harvesting methods have been discussed and the value of buck seasons recognized as a means of increasing antelope numbers.

A food habits study is currently underway in order to determine monthly food preferences throughout the year and the percentages of various forage species eaten. Oregon is collecting between two and three antelope per month, starting the work in May of 1950. Analysis of stomach contents is being conducted by the Foods Habits Laboratory of the California Division of Fish and Game.

MOUNTAIN GOATS:

After unsuccessful trapping attempts in 1948 and 1949, an initial transplant of mountain goats has been established in Oregon.

During March, 1950, a man was detailed to the Chopaka Mountain area in northern Washington in order to secure goats. Several of the local ranchers were contacted and offered \$100.00 per mountain goat trapped and delivered. Two local men were hired for a short period to assist in the construction of a trap. Rope netting was used for the trap and chicken wire severed for wings.

During the last week of March approximately 14 local ranchers conducted several drives of goats in an attempt to force them into the trap. Seven animals were secured in this manner but one mature male was killed in the process. A total of six goats were loaded and transported to Enterprise on March 27, arriving at 6:00 A. M. on March 28. These animals included three mature males, one old female, one mature female, and one yearling female. Shortly after arrival at Enterprise, the goats were transported to the head of Wallowa Lake and released on the east slope of Chief Joseph Mountain. The President of the Wallowa County Sportsmen's Association, several members of the Wallowa National Forest, and the local game officer were present at the time of liberation. Pictures were secured and the release was publicized. Response to Commission efforts in establishing mountain goats in Wallowa County was extensive and all persons contacted appeared to be well pleased.

At the time of release, the old female appeared to be quite stiff as a result of the long trip. She proceeded with the other animals but was found dead the following morning. The remainder of the group appeared to be quite healthy and it is hoped that they will find the area attractive.

Experience with other species of big game indicates that successful establishment on a new range necessitates a larger transplant than was made in Wallowa County. The Washington Department of Game has authorized the removal of twenty-five animals. Since six have been transplanted, attempts will be made to secure the remaining nineteen next spring. We have increased confidence in our ability to secure mountain goats and are hopeful of success.

BIG GAME RANGE MANAGEMENT:

Winter forage is recognized to be the principal limiting factor of most big game herds in eastern Oregon for the following reasons:

1. Deep snow forces most big game animals from the timbered areas onto a narrow belt of marginal, open foothill lands from November through February.
2. Approximately 80 per cent of these foothill lands are in private ownership and are a connecting link between home ranches and forest grazing lands for range livestock producers. The history of these ranges is generally one of abuse. The few scattered tracts of public land within these winter range areas have received similar abuse because grazing could not be effectively controlled.

3. Big game animals have a habit of concentrating on favored portions of the winter range area available and do not utilize the available range equitably.
4. Natural phenomena such as drought, and invasions of grasshoppers and mice, have caused a high mortality of preferred game foods on many ranges during past years.

In some instances it appears that early abuse of ranges by domestic livestock improved winter forage conditions for game. Depletion of the original dense stands of perennial grasses on these low ranges was followed by an invasion of juniper, sage, bitterbrush and other secondary shrub species that are now recognized as essential for the maintenance of wintering deer herds. However, with the loss of preferred perennial grasses, livestock have become more dependent upon these shrub species for forage and heavy dual use combined with other factors has resulted in a substantial reduction in quantity of forage. The above conditions apply on browse-type winter ranges in Baker, Grant, Harney, Crook, Deschutes, Lake and Klamath counties.

Winter ranges in Union, Wallowa, Umatilla, and Morrow counties are of a different type. In this area the timbered Blue Mountain and Wallowa Mountain ranges are surrounded by open grassland breaks, many of which are too steep for use by domestic animals. The more accessible portions of these grasslands have been over-grazed until preferred perennial grasses have been substantially reduced. Annual grasses and weeds have replaced these perennials instead of shrub species, as occurred on the more arid central Oregon ranges. The few shrub species that occur, (Ninebark, cherry, Ocean spray, willow, etc.) are not very palatable but contribute as emergency winter food for game. These ranges are excellent for the winter maintenance of elk since these animals are primarily grass feeders. However, they are not good deer winter ranges because of the small quantity of browse available.

Considering the above conditions, it has been the policy of the Game Commission to favor production of elk on the northeastern Oregon grass winter ranges and favor production of deer on browse winter ranges in central and southeastern Oregon. The control of elk numbers on southeastern Oregon browse ranges has been accomplished by the hunting of both sexes since 1943.

Present Situation:

In order to provide a general appraisal of the present winter range problem in eastern Oregon, the following statistics and estimates are submitted by game management districts:

EASTERN OREGON DEER AND ELK RANGE ESTIMATES

District	Sections of Summer Range	Sections of Potential Winter Range	Sections of Winter Range In Use	Av. Winter Density Deer Per Section	Elk Per Section	Sections of Problem Range
Columbia	1,800	800	300	5	Trace	40
Central	4,400	1,400	900	27	Trace	200
Lake-Klamath	5,700	1,600	1,050	60	Trace	800
Harney	3,400	1,800	900	25	1	180
Grant	3,600	1,050	500	42	2	350
Umatilla	2,100	1,200	700	8	6	500
Wallowa	1,850	900	600	9	3	50
Northeast	3,300	600	500	20	5	400
Malheur	3,600	2,000	1,200	2	Trace	30
Totals and Averages	29,750	11,350	6,650	23	2	2,550

The above chart provides gross estimates of the quantities of big game range available in each district and an indication of the present utilization of these ranges. It will be observed that there are approximately five acres of summer range for each acre of winter range in use and that only half of what appears to be satisfactory winter range is now being utilized. In some districts, these indicated potential winter ranges may be too distant from suitable summer ranges to ever be used but in most instances the reason for lack of use is not yet evident.

It also should be observed that of the over 4,000,000 acres of deer and elk winter range now in use approximately 1,500,000 acres are within current problem areas and that additional ranges may become problem areas in the future.

The term "problem area" as herein applied means a winter range habitually used by game animals which in its present condition will not consistently support current big game densities.

Land-Use Conflicts:

It is fortunate for Oregon's big game resources that over half of the state is publicly owned. A large part of these public lands are within National Forests where wildlife values are recognized as public assets.

Approximately 80 per cent of the lands within big game winter ranges in eastern Oregon are owned or controlled by private interests, most of whom are in the livestock business.

The history of the range livestock business in eastern Oregon reveals that the peak of livestock numbers occurred around 1890 when there was no control of grazing on public lands. A second peak occurred in 1918 and 1919 when public land management agencies permitted the grazing of livestock in excess of carrying capacities as an aid to the war effort.

Undoubtedly the present poor condition of grazing lands in eastern Oregon can be traced to these early abuses. Although livestock use on public lands has been constantly cut since 1920, many ranges have failed to recover.

Figure I indicates the trend in cattle and sheep numbers permitted on National Forests in Oregon since controls and records have been maintained.

This substantial reduction of livestock numbers on public lands has also decreased the livestock use on adjacent lowlands in spring and fall because the summer carrying capacity of these open ranges is very low and the annual grasses and weeds normally dry up and become unpalatable in May or June. Therefore, if the operator does not have irrigated summer pastures or other suitable summer range, the foothill ranges do not contribute substantially to his enterprise.

Due to the continuous decrease in numbers of livestock permitted on public lands and efforts of public conservation agencies, some range livestock producers have initiated range improvement programs in an attempt to increase the carrying capacities of their privately owned ranges. Such far-sighted operators have greatest reason to complain of use in winter and spring by big game animals because early uncontrolled use is recognized to be detrimental to perennial grass species.

PERMITTED GRAZING ON U. S. NATIONAL FORESTS IN OREGON

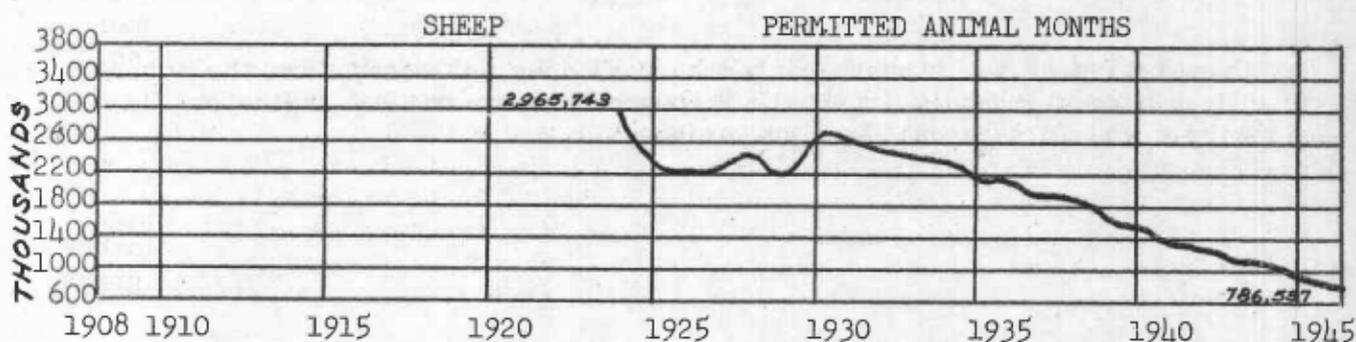
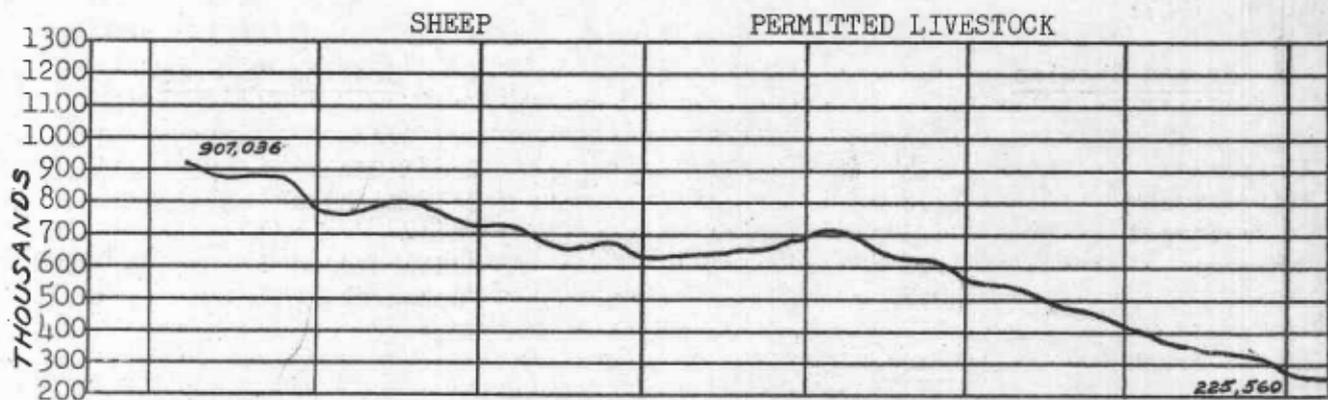
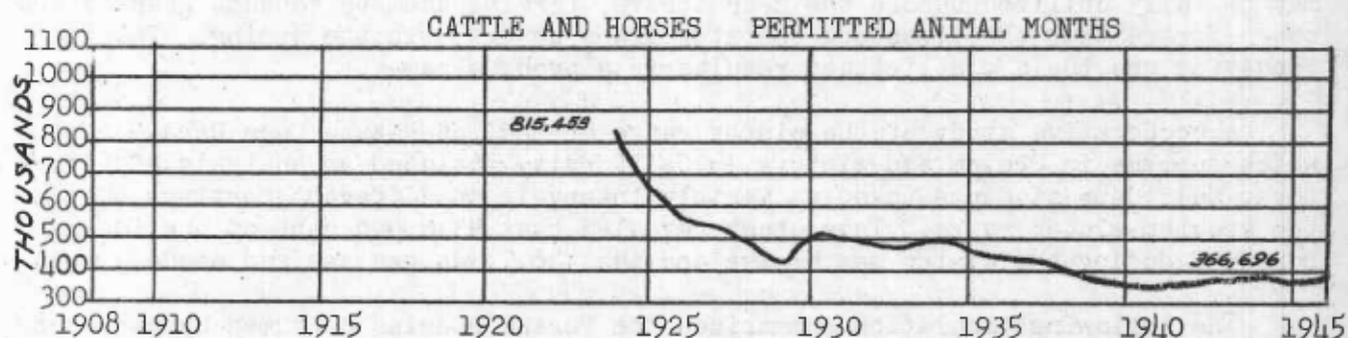
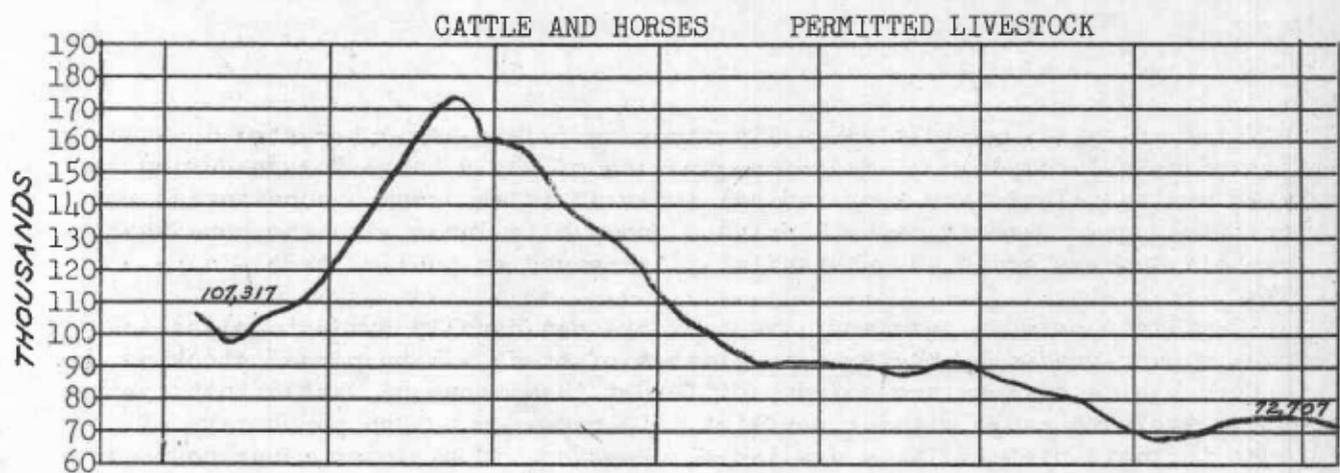


FIGURE I

U. S. FOREST SERVICE DATA

A majority of Oregon's range livestock producers are interested in wild-life and do not complain of moderate game use of their range forage during the winter months. There are some radical individuals who seek a substantial reduction of big game numbers on both private and public lands with the hope that livestock numbers could be substantially increased on public lands.

Conflicts between game and livestock are not usually evident unless a range is over-grazed by one or both classes of stock. With normal stocking, the food habits of deer are so much different than those of cattle that the two can use the same range without conflict. Deer prefer a high percentage of browse in their diet if it is available. However, if a winter range has been heavily stocked with cattle during the summer and fall months, browse forage may be fully utilized before the deer arrive, forcing them to consume grasses and other forage that the livestock operator plans to graze in the spring. This condition creates a conflict and results in a problem range.

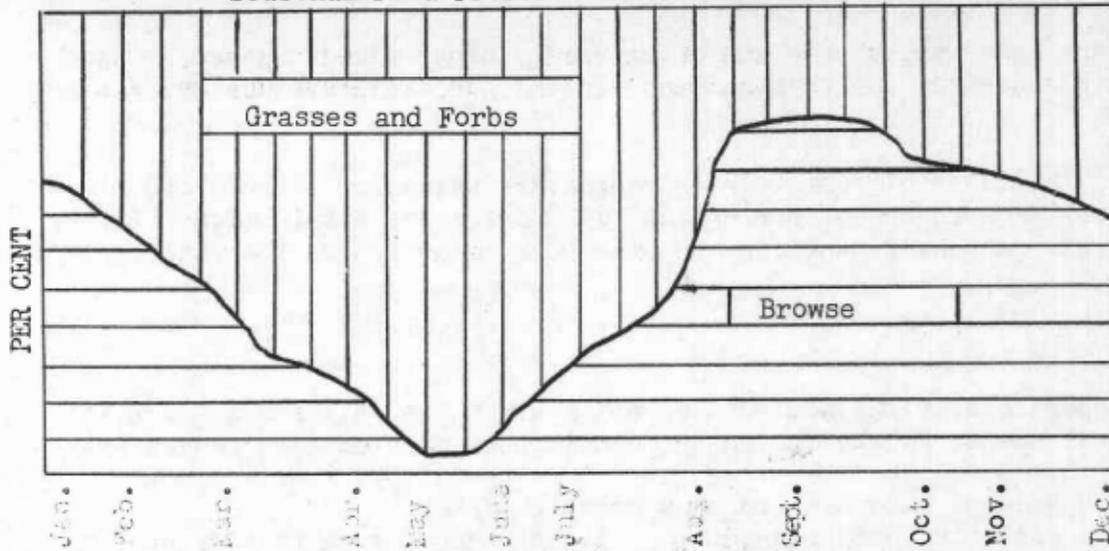
A cooperative study of the winter range of the Interstate Deer Herd, which summers in Oregon and winters in California, included an analysis of fifty-three mule deer stomachs taken at monthly intervals on different portions of the problem winter range. This study revealed that 53.4 per cent of the forage consumed during the winter was browse and that 46.7 was grasses and weeds.

The following tabulation summarizes the forage species consumed by per cent of volume in stomach contents of deer collected from November, 1946, through March, 1947:

<u>Browse Species</u>		<u>Grazing Species</u>	
Sage	19.4	Dry Grass	31.2
Juniper	9.4	Green Grass	4.5
Bitterbrush	14.8	Balsamorhiza	5.6
Squaw Carpet	5.3	Phlox	3.8
Mahogany	3.6	Mustard	1.5
Lichen	0.7	Buckwheat	0.1
Manzanita	0.2		
Rabbit Brush	<u>Trace</u>		
Total	<u>53.4%</u>		<u>46.7%</u>

Correlation of the stomach contents of 83 deer collected from the Interstate deer herd at monthly intervals throughout the year 1947 indicates the following trend in seasonal food preferences:

Seasonal Food Preferences of Deer



The following chart provides a comparison of livestock and game use on Eastern Oregon National Forests in 1949. (Forest Service Data).

COMPARISON OF LIVESTOCK AND GAME NUMBERS ON NATIONAL FORESTS - 1949

National Forest	Total Area (Acres)	Area Live-stock Permitted (Acr)	Number Cattle Permitted	Number Sheep Permitted	Estimated Number Elk	Estimated Number Deer
Mount Hood	1,107,305	235,000	1,710	500	130	4,600
Deschutes	1,644,125	693,355	2,600	25,000	300	13,500
Fremont	1,222,280	1,067,684	6,100	27,300	-	35,300
Ochoco	836,847	787,632	8,928	18,668	360	8,600
Malheur	1,180,615	1,131,582	15,988	14,600	1,200	22,000
Whitman	1,483,303	1,248,470	13,290	40,293	3,800	11,500
Wallowa	979,264	880,580	11,325	18,493	2,500	12,000
Umatilla	1,071,875	859,489	5,903	30,171	6,500	9,250
Totals	9,525,614	6,903,792	65,844	175,025	14,790	116,750

100,849 Cow Units Livestock

40,140 Cow Units Game

It will be observed that the present weighted ratio of game to livestock numbers on National Forests is approximately 1 to 2.5.

The food preferences of deer are most comparable to those of sheep. However, the manner in which deer use a range is substantially different in that they do not forage in large bands and do not achieve as close a utilization of the available forage.

The food habits and behavior of elk are similar to those of range cattle in that they are principally grazing animals, preferring to feed on open meadows and ridges during summer months and on low grasslands in winter. For this reason, competition between elk and cattle is much more direct than between deer and cattle.

Recognizing a trend toward conservation and rehabilitation of forage on private ranges through reductions of livestock use, deferred grazing, reseeding and other procedures, it may be assumed that these efforts will increase the carrying capacity for game if numbers are held at a level permitting improvement of preferred game forage species.

It is believed that multiple use of low ranges by both livestock and game is sound if both classes of stock are properly managed.

There are some ranges that are of extremely high value to game. In such cases, multiple use may not be sound and control for exclusive use by game would be desirable.

Most of the major big game winter ranges are valuable to the range livestock industry as a source of spring and fall forage and elimination of livestock use would seriously handicap the livestock industry and the economy of local communities.

Management:

1. Cooperate with the Soil Conservation Districts, Livestock Associations, and individual operators who desire to rehabilitate problem game ranges by:

- a. Holding game numbers at a compatible level.
- b. Assisting with reseeding or other range improvement practices.
- c. Encouraging early return of game to public lands in spring by salting higher ranges.

2. Continue annual measurements of forage trends on problem ranges and demonstrate practicability of multiple use to landowners through construction of exclosures that will provide visible evidence of effects of normal game use.

3. Acquire isolated private ranges if:

- a. Located within boundaries of excellent big game habitat where continuous damage can be anticipated and practical controls cannot be applied.
- b. The condition of the range and its importance to game herds renders multiple use impractical.
- c. The resultant removal of livestock use will permit increased production of game in proportion to costs.
- d. The attitude of landowners and community will not permit maintenance of a reasonable number of game animals.

Cooperative projects for maintenance and improvement of private range lands used by big game animals have been active for the past ten years. The most frequently used practice is that of holding big game herds at compatible levels by authorizing harvest of surplus animals from over-stocked ranges. During the past two years, an aggressive spring salting program has been in operation in most districts in an attempt to draw animals away from private ranges earlier in the spring.

Progress in range improvement through reseeding has been very limited because proven methods of improvement are few and the recently established habitat improvement department has not been equipped to undertake large range-reseeding projects. One small 17-acre planting was made on the Keating range in May, 1949. Fair returns can be expected from grass plantings under favorable conditions but experimental plantings of palatable shrubs that are of greatest value to big game animals have seldom been successful.

The practice of measuring forage utilization and trends has been in effect on most of the problem game ranges since 1944. However, interest in these measurements

by landowners and sportsmen is a new development.

Forage studies are summarized in a following section.

In view of the fact that current problem big game ranges in eastern Oregon include approximately 1,500,000 acres which are valued at \$2.00 to \$10.00 per acre, it does not appear practical to depend solely upon an acquisition program for maintenance of the big game resources.

During the past year, an appraisal of both economic and wildlife values has been made on three important big game ranges and three additional ranges are being thoroughly examined.

The ranges appraised are as follows:

Big Game Range Acquisition Projects					
Area	County	Acreage	Private Land	Range-Type	Estimated Value
Eden	Wallowa	5,658	5,658 Acres	Grass Breaks	\$ 75,140.00
Keating	Baker	28,160	15,722 Acres	Grass-Sage	219,500.00
N. Fk. John Day	Grant	23,610	17,750 Acres	Steep Grassland	54,310.00
Total:		57,428	39,130	Grass	\$348,950.00

In addition to the above, acquisition is a potential solution to problems on approximately 118,320 acres of game range in the vicinity of the John Day Valley and Murderers Creek in Grant County, and in the White River area in southwestern Wasco County where approximately 15,560 acres will be required to maintain the present big game herd without conflict with other land-uses.

SALTING:

The benefits derived from distribution of mineral supplements on big game ranges have not been satisfactorily measured. However, recognizing the potential benefits, the Commission has initiated an aggressive salting program designed to distribute salt on both spring and summer big game ranges and follow through with a study of the effects of the program upon survival, body weights, and distribution of big game animals. Salt will be allocated to Cattle Associations for distribution on cow ranges where definite salting patterns are used to control distribution of domestic animals; but otherwise, all salting will be done by employees of the department.

Over 50 tons of salt will be distributed on Oregon big game ranges in 1950.

FORAGE STUDIES:

Oregon is cooperating with adjacent states and Federal land management agencies to assure a free exchange of information on range research.

Since the majority of big game range problems exist on wintering areas east of the Cascade Mountains, studies are largely restricted to this section.

Range studies conducted by the Commission's Field Agents are of a practical nature since the multiple duties of administration render it impossible to follow out basic research problems. Generally, such studies are aimed at determining trends in range conditions to serve as a basis for management.

At present, Field Agents are engaged in four types of range studies. A discussion of projects, objectives, methods, results, and future plans is presented to summarize activities in connection with the study of big game range conditions.

Interstate Deer Herd Study

Cooperating Agencies:

California Division of Fish and Game
Oregon State Game Commission
U. S. Forest Service

Objectives of Study:

Semi-annual measurements of utilization of key forage species on a key area to determine the degree of livestock and deer use.

Information is to serve as a guide in establishment of a management plan for the Interstate Deer Herd. Measurements over a three-year period will be used to determine the rate of stocking for livestock and deer with reductions or increases to be based upon an equal division of available annual forage.

Methods Used In Study:

During October, 1947, and the summer of 1948 a total of 400 forage utilization check plots were established at pre-determined intervals along the many roads which traverse the Interstate Deer Herd winter range. This range is located within the Modoc National Forest of northern California and winters a large deer herd summering on the Fremont Forest in Oregon. The study area was classified into four range types; namely, pine-bitterbrush, juniper, sagebrush, and grassland, and 100 plots were established in each type.

Each plot consists of a line transect 200 feet long. Utilization is measured along 500 inches of this line, the measured segments being 25 inches long and spaced 10 feet apart.

The plots were designed to provide information on: (1) Percentage of cropping by livestock and by deer of certain species of plants; (2) the relative yield of the various plant species; and (3) the composition of the ground cover.

Prior to 1947, utilization measurements were confined to bitterbrush transects including twenty staked plants. During the fall of 1947, the spring and fall of 1948, and the spring of 1949, utilization measurements included all plant species encountered on the 200-foot long line transects mentioned above. The excessive amount of field work and office compilation involved, compared to the results obtained, indicated the need of reducing the utilization studies to practical limits.

During the fall of 1949, measurements were confined to 120 plots within a key area which included bitterbrush in sufficient abundance to justify saving. Those plots inside the key area upon which juniper was present were also measured. Work was confined to bitterbrush and juniper since past data has shown that average percentage cropping of these browse species is so much higher than for sagebrush and rabbitbrush that there is little need to be concerned about the latter species when use of bitterbrush and juniper is kept within allowable limits.

Results and Conclusions:

Table I summarizes the utilization of browse on the four range types during a two-year period in 1948 and 1949 when 400 forage check plots were measured. The heavy use of juniper and bitterbrush indicates the importance of these species and serves as a basis for the establishment of the key species - key area method of measurement.

Table I

Average Percentage Cropping by Types 1948-1949				
Species	Pine-Bitterbrush	Sagebrush	Juniper	Grassland
Sagebrush	1.6	2.7*	7.8*	3.9
Rabbitbrush	5.3*	8.6*	10.0*	10.7*
Juniper	21.8	15.7	19.5	-
Bitterbrush	41.5	35.5	62.8	-

*Exclusive of additional cropping by rodents

Table II provides a comparison of bitterbrush utilization by livestock over a three-year period. Utilization inside and outside the key deer management area is included.

Table II

Average Percentage Cropping of Bitterbrush by Livestock			
	1947	1948	1949
Inside deer management area	18.8	17.8	12.8
Outside deer management area	21.5	19.6	14.6
Over-all average	20.1	18.4	13.1

Results of utilization studies on the Interstate Deer Herd winter range are published yearly in "California Fish and Game", the official publication of the California Division of Fish and Game. The Third Progress Report, published in April, 1949, includes data on the sample plots currently being measured. A Fourth Progress Report is expected to be made available this year.

Future Plans:

It is planned to continue semi-annual utilization measurements during May and October on the Interstate Range. These measurements will be restricted to those plots within the boundaries of the key deer area. No immediate changes in the system are anticipated.

Present plans call for continuing the study as now established for the purpose of guiding the management of the Interstate Deer Herd and the winter range.

Bitterbrush Utilization Study

Cooperating Agencies:

U. S. Forest Service

Objectives of Study:

Recognizing that bitterbrush is a preferred deer browse on winter ranges and its utilization will generally indicate range conditions, measurements of selected plants will serve as a guide to the management of mule deer harvests.

Bitterbrush will be used as a key browse species on ranges where it exists in sufficient quantities to supply a substantial portion of the winter diet.

The major objectives of the study are to measure the vigor and trend of bitterbrush stands, the degree of competition for bitterbrush between domestic livestock and deer, the annual forage production of bitterbrush, and the annual utilization by grazing animals. The answers to these objectives will serve as a basis for the administration and management of forage and game resources and assist in the cooperative management of competing browsing animals.

Methods Used In Study:

A total of 125 bitterbrush utilization transects have been established on the major deer winter ranges in Deschutes, Crook, Lake, Klamath, Harney, Grant, and Baker counties. The establishment of transects was initiated in 1944 and additions, as well as changes in existing transects, have been made as increased knowledge of conditions has indicated the need.

Each transect consists of twenty plants located in a straight line from the point of origin and identified by means of a numbered stake.

The establishment and measurement of transects is based on instructions contained in the California Forest and Range Experiment Station Research Note No. 35, entitled "A Method of Estimating Grazing Use of Bitterbrush" by A. L. Hormay. The method consists of selecting a site within the mid-winter deer

concentration area and marking the transects as described above. The number of transects established varies with the size of the winter range and the extent of the bitterbrush stand. A record is made of the average crown diameter and height of each plant. The average length of ungrazed twigs is measured each fall to determine forage production. Percentage utilization of the average annual twig growth is measured in the fall to determine livestock use and again in the spring to determine deer use. Consistent records of all measurements are maintained.

Results and Conclusions:

No data of a research nature is available or contemplated. Summaries of bitterbrush production and utilization are included in annual reports of the Oregon Game Commission. This information is used as a guide by the Commission in formulating hunting regulations and future mule deer management policies.

Future Plans:

The project will be continued indefinitely. Changes in transect numbers and locations will be made as more intimate knowledge of herd ranges and deer-forage relationships becomes available.

Utilization Measurements of All Forage Species

Cooperating Agencies:

U. S. Forest Service

Objectives of Study:

On many of Oregon's big game ranges, no single plant species is sufficiently abundant or important enough to serve as a key in management. In order to determine the relative importance of forage species during the winter months and possible indicators of range trends on areas where key species are not known, semi-annual utilization measurements of all forage species are made.

In addition to determining the importance of various forage species in the winter maintenance of mule deer and elk, this study is aimed at measuring the degree of competition between livestock and game.

Methods Used In Study:

A total of 31 transects have been established on winter mule deer and elk ranges lacking recognized key browse species. Eastern Oregon counties where such transects are located include Wheeler, Deschutes, Lake, Harney, Grant, Umatilla, Baker, Wallowa, and Malheur.

During June, 1947, Elbert Reid of the U. S. Forest Service conducted a short training school for all eastern Oregon Game Commission field agents on the Starkey Experimental Range. At that time, utilization measurement techniques were explained and practiced. Subsequent to the training school, transects were established on big game ranges.

Each transect consists of twenty plots located in a straight line one chain (66') apart. The individual plot consists of a circle with a radius of 5.64' and includes an area of 100 square feet. In addition to marking the transect with a 2" wooden stake, the center of each plot is marked with a 3/8" steel peg.

At the time the transects were established, inventories of plant species and densities on all plots were recorded for future use in determining forage trends.

The utilization of shrubs, grasses, and weeds is measured in May to determine big game use during the preceding winter. Measurements in October are made to determine livestock use during the spring, summer, and fall grazing seasons. At the time of measurement, periodic weight checks of clipped plants are made to guide ocular estimates of utilization.

Results and Conclusions:

Since the project is but three years old, no conclusions are possible. No attempt is being made to secure research data. The transects were established and are being maintained to provide information useful in management of big game herds. Annual summaries are compiled and used in formulating hunting regulations.

Spring measurements provide data on all forage species with the exception of annual grasses and some weeds which mature and dry up so rapidly that consistent results are not believed possible. Fall observations are limited to perennial grasses and shrubs which remain available throughout the year for measurement.

Observations on the Keating deer range in eastern Baker County revealed winter use of big sage (Artemesia tridentata) exceeding 60 per cent. of the current year's forage. This range lacks preferred browse species and utilization measurements have indicated the importance of big sagebrush heretofore not recognized in Oregon.

Future Plans:

Revisions of existing transects and establishment of additional ones will be accomplished as the need is indicated and time permits.

Utilization measurements will be continued with a view toward determining important big game forage species on winter ranges where key browse species are lacking. Information derived from this study will be used in formulating regulations. Detailed research analyses will not be made.

A check of forage inventories and densities will be accomplished at periodic intervals in an attempt to secure information on trends in forage conditions.

Perennial Grass Utilization Measurements

Cooperating Agencies:

U. S. Forest Service
Grant County Livestock Association
Grant County Chapter of the Izaak Walton League

Objectives of Study:

Determine the extent of deer use on Sandberg bluegrass (Poa secunda) during that period in the spring between the time it greens up and the deer leave the range.

Determine the extent of Poa secunda recovery between the time the deer leave the spring range and maturity of the grass species.

Methods Used In Study:

A total of 14 deer-proof-fenced exclosures were established on the Northside Deer Herd Range along the north side of the John Day River generally between Bear Creek and Cummings Creek during January and February, 1950. Each plot enclosed an area twenty feet square and was located in the Sandberg bluegrass type. Snow conditions necessitated the placing of plots in accessible areas but insured an unbiased selection of sites since forage conditions were hidden from view. Five foot chicken wire netting was used to fence the exclosures.

During late March and early April measurements were taken on seven exclosures, the remaining seven being unsuitable for study.

George Garrison of the Starkey Experimental Range provided technical assistance in outlining measurement procedures. Three plots of 25 square feet were selected at random in the exclosure and all Poa secunda was clipped to ground level and weighed to the nearest gram. Three similar plots were selected outside the exclosure and measured in the same manner. Information derived from plots inside and outside the exclosures was compared to determine the degree of Poa secunda utilization by deer up to the time the measurements were taken.

Results and Conclusions:

Data from three exclosures was statistically analyzed by the staff of the Starkey Experimental Range, U. S. Forest Service.

Clipping weights converted to pounds of bluegrass herbage per acre amount to 196 pounds on protected areas as compared to 101 pounds on areas grazed by deer. The deer had removed 95 pounds of bluegrass per acre, or 48.5 per cent of the total herbage present at the time of sampling. This degree of use is based on the entire above-ground portion of bluegrass rather than that portion available to cattle.

The sample analyzed provides a reliable estimate of the bluegrass present on the range and the difference in amounts present inside and outside the exclosures. If all the bluegrass was actually harvested, the average yield per acre would fall within 11 per cent of the average yield per acre as estimated by the sample, with odds of 2 to 1.

In one area where the spring turn-out of cattle was delayed, a follow-up measurement showed a 13.5 per cent recovery of bluegrass during a two-week interval.

Future Plans:

The Pacific Northwest Forest Experiment Station, U. S. Forest Service, has offered to provide technical assistance in reorganizing the study this year.

Not less than 10 and preferably 15 20' by 20' exclosures will be located and fenced. Two locations at least 65 feet apart will be selected at each site. The location to be fenced will be selected with the flip of a coin.

A few days before cattle are turned on the range next spring, two samples selected at random, each 25 square feet in area, will be clipped in the exclosure as well as two in the outside plot. A comparison of data inside and outside the fenced exclosures will provide further information on the degree of utilization.

To determine the impact of deer use on flower stalk production and herbage production, the open plots will be protected with a temporary cattle-tight fence after the initial measurements. At the time the leafage on Sandberg bluegrass begins to dry appreciably, two more small samples, each 25 square feet in area, will be clipped in each of the 20' by 20' plots. The number of flower stalks on each sample will be counted before clipping. The data on flower stalk counts should provide some indication of the impact of early deer use on the ability of Sandberg bluegrass to reproduce itself; the data from the second set of clippings will give an idea of the effect of early deer use on total yearly herbage production.

1949 BIG GAME HUNTING SEASONS

GENERAL DEER SEASON:

The 1949 deer season extended from October 1 through October 20 in all counties except Sherman for black-tailed and mule deer bucks having not less than forked antlers. White-tailed bucks with at least forked antlers were legal in Douglas County.

Dry weather conditions prevailed during the early part of the season. An early migration of mule deer increased hunter success the last week. As in years past, most of the hunting pressure was exerted the first three days of the season.

For the second year separate return cards were attached to deer tags and hunters were required by law to file a report within thirty days after the close of the season. Success in a checking-out system of this type necessarily depends upon cooperation by individual hunters since the large number of participants renders it difficult to enforce compliance with the law.

A machine analysis was conducted on 73 per cent of the return cards submitted by January 1, 1950. To secure complete data, 1,000 tagholders were chosen at random and polled by mail. Results of the scientific poll were applied to the machine analysis in order to pro-rate the 27 per cent unreturned cards, thereby obtaining total kill figures.

Separate return cards have proved effective in supplying information in the total number of deer hunters, total deer kill, hunting pressure by areas and by dates, hunter success, general antler classes of bucks killed, and the trend in annual harvest.

A comparison of kill data for 1948 and 1949 is provided on the following pages:

The 1949 deer kill exceeded by 17,475, or 43.9 per cent, the kill in 1948. A comparison of figures shows a total kill in 1948 of 39,785 and in 1949, 57,260. The 163,628 deer tags purchased in 1949 is a decrease of 2,990, or 1.8 per cent, under the 166,618 issued in 1948.

On the basis of percentages, 1949 hunter success averaged 35 per cent compared to the 1948 figure of 23.9 per cent.

Applying the kill figures to the total hunting area of 95,430 square miles, an average of 0.6 bucks were harvested per square mile in 1949. The 1948 index showed an average of 0.4 bucks harvested per square mile.

Kill figures are summarized by supervisory districts. The greatest number of deer hunters were recorded from the Northwest District where 45,530 participated. The biggest kill was made in the Northeast District where 13,921 bucks were harvested. Highest success was experienced in the Southeast District, an average of 49.9 per cent of the hunters being successful.

Counties in order of total kill were Lake with 6,900 head, Grant 5,558, Klamath 5,443, Deschutes 4,756, Harney 4,011, Baker 2,521, and Tillamook 2,349. Hunter success by counties shows Grant highest with 57.1 per cent, followed by Wheeler 54.7, Harney 53.2 and Lake 50.5 per cent. Lowest success was experienced in Hood River County where only 12.2 per cent of the hunters were able to bag a buck.

The majority of counties showed an appreciable increase in deer kill during the 1949 season. One notable exception is Tillamook County where the kill declined from 3,268 in 1948 to 2,349 in 1949. This decline was anticipated since much of the county was opened to hunting in 1948 after a three-year closure and large numbers of surplus bucks were available. The kill is expected to stabilize after surpluses are reduced by continued hunting.

GENERAL DEER SEASON
1948-1949 Comparison

Counties By Supervisory Districts	Number of Hunters		Kill		% of Hunters Successful		% of Forked Antlers		County Area in Square Miles	Bucks Harvested Per Square Mile	
	1949	1948	1949	1948	1949	1948	1949	1948		1949	1948
Benton	2,983	2,776	630	507	21.1	18.3	51.1	52.7	647	1.0	0.8
Clackamas	2,355	2,038	458	350	19.4	17.2	50.0	48.9	1,890	0.2	0.2
Clatsop	3,768	3,450	917	790	24.3	22.9	48.8	51.0	820	1.1	1.0
Columbia	3,297	3,135	687	440	20.8	14.0	50.1	52.5	646	1.1	0.7
Lane	7,222	7,892	1,833	1,423	25.4	18.0	44.6	45.2	4,594	0.4	0.3
Lincoln	2,041	3,177	630	545	30.9	17.2	49.8	52.4	1,006	0.6	0.5
Linn	3,454	3,059	917	636	26.5	20.8	44.2	46.2	2,204	0.4	0.3
Marion	2,669	2,452	516	428	19.3	17.5	53.8	50.0	1,173	0.4	0.4
Multnomah	314	374	57	33	18.1	8.8	53.9	43.3	424	0.1	0.1
Polk	2,826	2,447	745	522	26.4	21.3	48.9	47.1	739	1.0	0.7
Tillamook	9,734	9,976	2,349	3,268	24.1	32.8	45.8	38.7	1,115	2.1	2.9
Washington	2,669	2,611	802	755	30.0	28.9	25.9	38.8	716	1.1	1.1
Yamhill	2,198	2,157	458	473	20.8	21.9	49.3	53.7	709	0.6	0.7
NORTHWEST	45,530	45,544	10,999	10,170	24.2	22.3	47.0	47.7	16,683	0.7	0.6
Coos	4,553	6,340	1,490	1,198	32.7	18.9	47.8	49.0	1,611	0.9	0.7
Curry	1,099	1,673	458	361	41.7	21.6	48.6	42.1	1,622	0.3	0.2
Douglas	6,908	8,512	2,464	1,746	35.7	20.5	44.1	44.1	5,062	0.5	0.3
Jackson	6,437	8,264	2,063	1,365	32.0	16.5	34.9	32.5	2,817	0.7	0.5
Josephine	2,355	3,096	630	394	26.7	12.7	32.5	39.7	1,625	0.4	0.2
SOUTHWEST	21,352	27,885	7,105	5,064	33.3	18.2	41.6	41.5	12,737	0.6	0.4
Crook	4,867	4,692	2,005	1,240	41.2	26.4	54.3	44.0	2,980	0.7	0.4
Deschutes	13,183	8,560	4,756	2,180	36.1	25.5	43.2	56.5	3,041	1.6	0.7
Hood River	1,413	1,669	172	168	12.2	10.1	42.9	54.5	529	0.3	0.3
Jefferson	1,256	975	344	245	27.4	25.1	38.8	43.2	1,794	0.2	0.1
Klamath	11,932	9,972	5,443	3,104	45.6	31.1	45.4	43.8	5,973	0.9	0.5
Wasco	1,884	1,878	458	311	24.3	16.6	36.6	43.2	2,367	0.2	0.1
CENTRAL	34,535	27,746	13,178	7,248	38.1	26.1	43.5	47.5	16,704	0.8	0.4
Baker	5,495	5,607	2,521	1,721	45.9	30.7	41.1	43.6	3,084	0.8	0.6
Gilliam	314	-	114	-	36.3	-	32.0	-	1,211	0.1	-
Grant	9,734	9,904	5,558	3,033	57.1	30.6	44.1	50.3	4,532	1.2	0.7
Morrow	2,041	1,742	859	392	42.1	22.5	44.2	54.0	2,059	0.4	0.2
Umatilla	4,396	4,971	1,089	896	24.8	18.0	45.8	46.2	3,231	0.3	0.3
Union	4,485	5,488	1,260	1,138	28.1	20.7	38.8	46.4	2,032	0.6	0.6
Wallowa	2,512	5,494	1,146	1,250	45.6	22.8	33.3	38.8	3,178	0.4	0.4
Wheeler	2,512	2,264	1,374	755	54.7	33.3	41.0	47.5	1,707	0.8	0.4
NORTHEAST	31,489	35,470	13,921	9,185	44.2	25.9	40.0	46.7	21,034	0.7	0.4
Harney	7,536	9,252	4,011	3,266	53.2	35.3	46.3	49.2	10,132	0.4	0.3
Lake	13,659	12,741	6,900	3,860	50.5	30.3	51.0	54.3	8,270	0.8	0.5
Malheur	2,983	3,106	1,146	886	38.4	28.5	41.1	41.7	9,870	0.1	0.1
SOUTHEAST	24,178	25,099	12,057	8,012	49.9	31.9	46.1	48.4	28,272	0.4	0.3
Tag Holders Not Hunting	6,544	4,741									
State Totals and Averages	163,628	166,618	57,260	39,785	35.0	23.9	44.1	46.7	95,430	0.6	0.4

AVERAGE WEIGHTS OF BUCK DEER

District	Two Points					Three Points					Four Points and Over				
	1949	1948	1947	1946	1945	1949	1948	1947	1946	1945	1949	1948	1947	1946	1945
North Coastal	127	128	123	125	126	166	146	148	140	155	187	168	169	163	173
South Coastal	94	80	95	-	-	103	105	111	-	-	128	125	122	-	-
Willamette	105	109	109	117	-	125	128	134	138	-	150	151	183	153	-
Southwest	80	90	82	92	83	115	105	111	119	106	144	145	138	132	142
Black-tailed Deer Averages	102#	102#	102#	111#	105#	127#	121#	126#	132#	131#	152#	147#	153#	149#	157#
Columbia	96	-	113	-	-	155	-	111	-	-	157	-	181	-	-
Central	86	91	101	101	-	116	123	138	135	-	165	180	163	166	-
Lake-Klamath	-	97	103	-	-	-	146	160	-	-	-	169	172	-	-
Malheur	95	-	-	-	-	140	-	-	-	-	177	-	-	-	-
Harney	112	110	106	120	-	137	135	133	141	-	166	174	176	173	-
Grant	-	93	-	-	-	-	145	170	-	-	-	190	175	-	-
Umatilla	90	89	-	-	-	129	123	115	-	-	178	169	182	-	-
Northeast	-	125	-	-	-	-	158	134	-	-	-	189	159	-	-
Wallowa	103	99	-	-	-	136	112	-	-	-	161	169	-	-	-
Mule Deer Averages	97#	101#	100#	110#	-	136#	135#	137#	138#	-	167#	177#	173#	170#	-

Checks by Field Agents during the deer season were made to secure information on hog-dressed weights of bucks by antler point classes. A five-year average showing weight trend is tabulated above.

Two point black-tail bucks have consistently averaged only 102 pounds the past three years. The three and four-point classes show a slight increase in average weight over the preceding year but the five-year trend is quite constant. Heaviest weights were recorded in the North Coastal District which includes a considerable amount of open range.

No noticeable variations are evident in the average weights of mule deer although the two points show a downward trend.

Average Weight and Spread of White-Tail Bucks
by Antler Point Classes

Area	%	Two Points		Three Points		Four Points & Over			
		Ave. Wt.	Ave. Spread	Ave. Wt.	Ave. Spread	Ave. Wt.	Ave. Spread		
White-Tail Refuge	8	61	6"	69	100	12"	23	116	14"

The season on white-tailed deer in Douglas County provided an opportunity to secure weights and measurements. Results are shown in the above table.

After several years of closed seasons, the dominance of mature bucks in the kill is evident. Only 8 per cent were two points while 69 per cent of those checked were three points and 23 per cent were four points or over. Average weights were much lighter than those recorded for black-tails.

SPECIAL DEER SEASONS:

One special deer season was held in 1949 on the northside of the John Day River. Dates of the season were December 15 through December 18 and the kill was restricted to antlerless animals.

Severe drought conditions and a heavy infestation of grasshoppers during the summer of 1949 created a critical situation on the winter range. The season was an emergency measure designed to harvest surplus deer and alleviate anticipated winter losses.

A total of 1,000 tags were authorized and 844 hunters participated, harvesting 750 animals including 3 antlerless bucks, 563 does, and 184 fawns. Average success of all hunters was 89 per cent.

A summary of statistics on the season follows:

Name of Season	Date	Number of Hunters	Special Deer Season K I L L				% of Hunters Successful
			Bucks	Does	Fawns	Total	
John Day	12/15/ 12/18, incl.	844	3	563	184	750	89%

ARCHERY SEASONS:

Three archery areas were in effect during the 1949 season. The Tillamook Burn and Mt. Emily areas were open from September 17 through September 28 while the Canyon Creek season extended through October 20.

Deer of either sex were included in the bag and both sexes of elk were also legal in the Mt. Emily and Canyon Creek areas.

Archers were issued a free permit authorizing them to hunt in any archery area. A return card was attached to the permit for submitting information on success of the hunt. Regular deer and elk tags were attached to game bagged.

Archery hunting provides the maximum recreation to those who participate. Emphasis is on sport and skill connected with stalking rather than meat bagged. Success of past seasons has averaged 3 per cent to 10 per cent which is much lower than the success experienced by rifle hunters. With the increasing pressure now being exerted on Oregon's big game herds, any method of hunting which emphasizes recreation rather than meat is to be encouraged.

A recapitulation of 1949 archery seasons is provided on the following page.

Name of Area	Dates of Season	Number of Archers	Archery Seasons					% of Archers Successful
			Bucks	Does	Fawns	Elk	Total	
Tillamook Burn	9/17 - 28, incl.	413	7	28	10		45	10.9%
Mt. Emily	9/17 - 28, incl.	147	3	5		1	9	6.1%
Canyon Creek	9/17 - 10/20 incl.	97		6			6	6.2%
Totals & Averages		657	10	39	10	1	60	9.1%

A total of 657 archers bagged 60 big game animals including 10 bucks, 39 does, 10 fawns, and 1 cow elk. Average success was 9.1 per cent, exceptionally high for archery seasons in Oregon.

Heaviest hunting pressure and kill occurred in the Tillamook Burn which offered open terrain, high deer densities, and accessibility to the centers of population.

GENERAL ELK SEASON:

The 1949 general elk season extended from October 25 through November 3 in all of Oregon west of U. S. Highway 97 with the exception of Washington, Tillamook, and eastern Douglas Counties. Harvest was restricted to bulls with three or more points per antler.

The season in Eastern Oregon extended from October 25 through November 20 and included both sexes with the exception of the Starkey area in Union County and the Chesnimus area in Wallowa County where the kill was restricted to bull elk with antlers. Either-sex hunting was extended through December 31 on the east slope of the Blue Mountains in Baker County.

Although the weather was dry at the opening of the Eastern Oregon season, concentrations of hunters in either-sex areas resulted in heavy kills the first three days. Some snow fell at mid-season but did not remain. The last of the season continued dry and warm. In Western Oregon rain restricted hunter success as in past years.

Return cards have been submitted by elk hunters for several years and have provided reliable information on the kill. During the past two years, a machine analysis has been conducted as with the deer kill to secure statistical information. Unreturned cards are pro-rated on the basis of those received and analyzed in order to determine the total kill.

Information on the 1949 elk season is summarized below:

1949 General Elk Season

County	Number of Hunters	K I L L				% Successful Hunters	% Spike Bulls
		Bulls	Cows	Calves	Totals		
Clackamas	7	-	-	-	0	0.0	-
Clatsop	1,028	185	-	-	185	18.0	-
Columbia	63	5	-	-	5	0.8	-
Coos	752	184	-	-	184	24.5	-
Curry	63	10	-	-	10	15.9	-
Deschutes	26	3	-	-	3	01.2	-
Douglas	252	30	-	-	30	11.9	-
Hood River	4	2	-	-	2	50.0	-
Klamath	13	2	-	-	2	15.4	-
Lane	210	10	-	-	10	04.8	-
Lincoln	60	12	-	-	12	20.0	-
Wasco	13	0	-	-	0	0.0	-
Yamhill	13	6	-	-	6	46.2	-
WESTERN OREGON							
SUB-TOTAL:	2,504	449	-	-	449	17.9	-
Baker	2,004	173	229	58	460	22.9	22.8
Crook	252	10	13	8	31	12.3	-
Gilliam	13	-	-	2	2	15.4	-
Grant	3,758	457	646	323	1,426	37.9	17.6
Harney	312	17	28	16	61	19.5	-
Jefferson	26	-	-	2	2	07.7	-
Lake	26	1	-	-	1	03.8	-
Malheur	3,507	21	27	20	68	01.9	44.4
Morrow	1,253	186	301	172	659	52.6	26.4
Umatilla	6,011	822	1,370	731	2,923	48.6	35.1
Union	3,507	548	1,187	457	2,192	62.5	30.7
Wallowa	1,754	365	274	183	822	46.9	30.0
Wheeler	125	14	14	10	38	30.4	54.5
EASTERN OREGON							
SUB-TOTAL:	22,548	2,614	4,089	1,982	8,685	38.5	28.9
Tagholders Who Did Not Hunt	1,044						
STATE TOTALS & AVERAGES:	26,096	3,063	4,089	1,982	9,134	35.0	31.9

The generous either-sex season in Eastern Oregon resulted in a very high kill of elk. A total of 26,096 tags were sold and 9,134 elk were bagged, an average success of 35 per cent. Of the total kill, 3,063 or 33 per cent were bulls, 4,089 or 45 per cent were cows, and 1,982 or 22 per cent were calves.

In Western Oregon, 449 bulls were bagged by hunters in the Coast and Cascade Ranges. The average success was 17.9 per cent, an increase over the 11.4 per cent success in 1948 when 409 bulls were harvested. As in past years, the heaviest Western Oregon kill was in Clatsop and Coos Counties which support the greatest numbers of elk. The 185 bulls killed in Clatsop County where annual seasons have been maintained is remaining constant under the three-point regulation which protects immature males for future breeding purposes.

A total of 22,548 hunters removed 8,685 elk in Eastern Oregon during the 1949 season, averaging 38.5 per cent success. The highest kills were recorded in Umatilla County (2,923), Union County (2,192), and Grant County (1,426).

The following chart reviews the experience of elk hunters since 1933 when the first recent elk season was permitted.

Summary of General Elk Seasons								
Year	Licenses Sold	Hunters Checked Out	Eastern Ore.		Western Ore.		Totals	#Hunter's Success Ratio
			Bulls	Cows	Bulls	Cows		
1933	2,440		579				579	
1934	3,140	3,169	752				752	23%
1935	2,743	2,446	692				692	28%
1936	3,947	2,611	547				547	21%
1937	3,064	2,548	634				634	25%
1938	3,867	2,463	734		294		1,028	42%
1939	4,378	3,022	842	379	227		1,448	48%
1940	6,152	4,245	1,152	1,179	198		2,529	60%
1941	9,203	8,733	1,169	2,388	184		3,741	43%
1942	9,753	9,432	1,296	1,067			2,363	25%
1943	13,471	10,538	1,375	882	696		2,953	28%
1944	10,513	6,995	1,204	351	439		1,994	29%
1945	12,625	7,270	2,243	*	222		2,465	34%
1946	15,939	11,106	1,945	1,365	256		3,566	32%
1947	16,689	10,836	1,519	243	356		2,118	20%
1948	22,536	17,911	2,534	2,347	409		5,430	24%
1949	26,096	17,273	2,614	6,071	449		9,134	35%
TOTALS	166,556	120,598	21,831	16,272	3,730		41,973	
AVERAGES								31%

*Sex not indicated on cards

#Based on check-out cards rather than total license sale.

With the exception of 1944 when wartime restrictions curtailed hunting, the general trend in number of elk hunters has shown a consistent increase. The kill has varied, dependent upon the type of regulations in effect but an increased harvest is evident over the years. Hunting pressure and kill in 1949 exceeded by an appreciable amount the records for any previous year. Census data obtained in the early spring of 1950 indicates a reduction in numbers of elk, resulting from the liberal either-sex season in 1949; but that adequate breeding populations remain intact and some critical winter ranges are still over-stocked.

ANTELOPE SEASON:

Substantial increases of antelope since 1947 have produced surpluses of bucks. If the harvest is restricted to mature males, such surpluses can be removed without jeopardizing desired future increases.

In order to realize maximum utilization of the antelope crop, a season was authorized in 1949. One thousand permits were available and approximately 5,000 hunters applied so it was necessary to hold a drawing to determine successful applicants.

The season was held from August 20 through August 25. Antelope breed early in September, and loosening of the horn sheaths occurs shortly thereafter. A late August hunt is desirable to assure the harvest of prime trophy bucks and prevent interference with the rut.

Hunting was restricted to those areas in Lake, Harney, and Malheur Counties east of U. S. Highway 395 and south of U. S. Highway 20. Bucks with horns longer than the ears were legal.

To emphasize the differentiation between bucks and does and the values of trophy selection, a letter and descriptive bulletin were mailed to each tagholder. A copy of the letter follows on the next page.

A summary of statistics on the 1949 season follows:

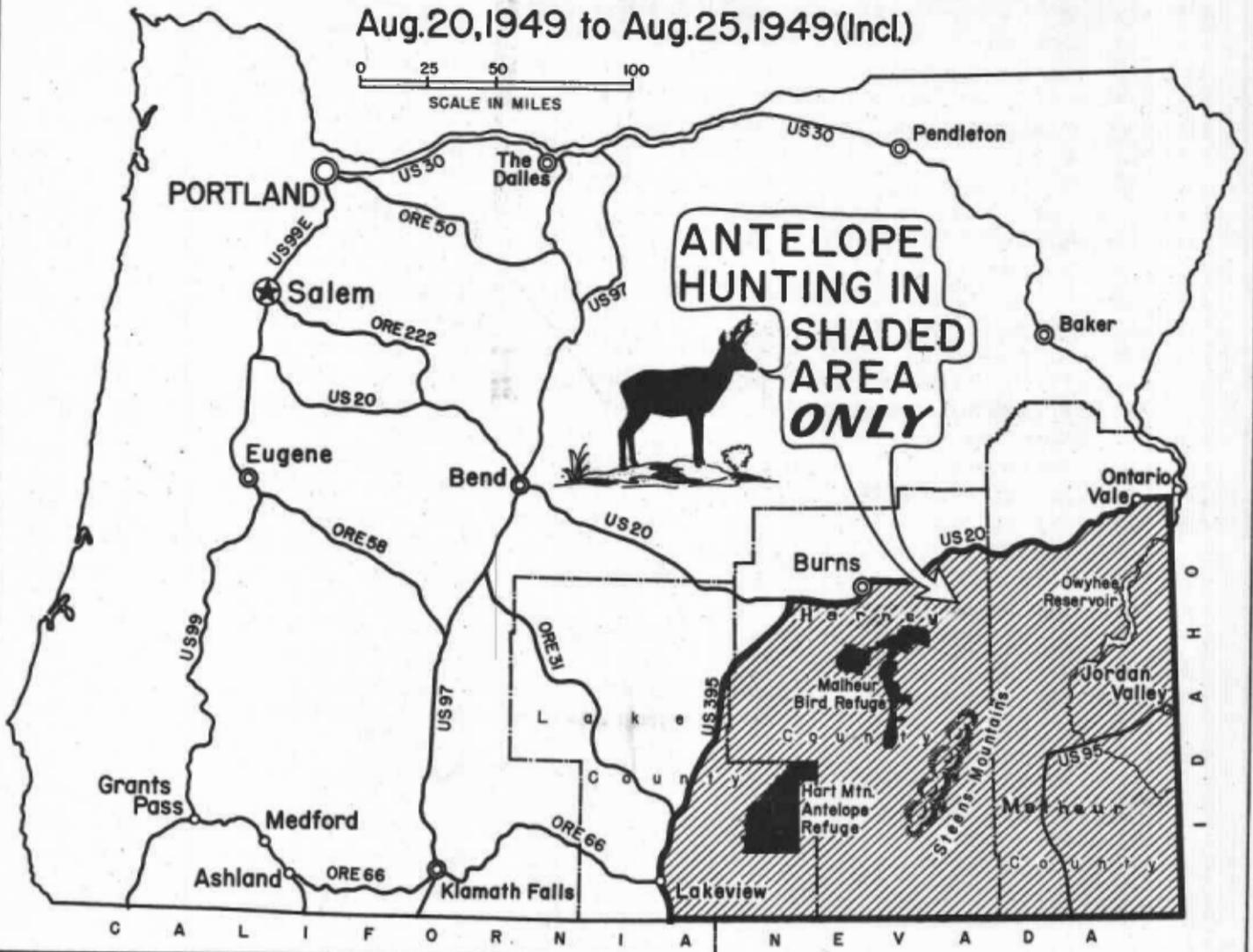
County	Number of Hunters	1949 Antelope Season		Per Cent of Successful Hunters
		K I L L No.	%	
Lake	499	308	53	62
Harney	321	196	33	61
Malheur	109	82	14	75
Totals & Averages	929	586	100%	63%

A total of 929 hunters killed 586 bucks for an average success of 63 per cent. Lake County, particularly the Drakes Flat and Guano Valley areas, supported the heaviest hunting pressure. Success in Malheur County was highest, averaging 75 per cent.

PRONGHORN (ANTELOPE) HUNTING AREA 1949

Aug. 20, 1949 to Aug. 25, 1949 (Incl.)

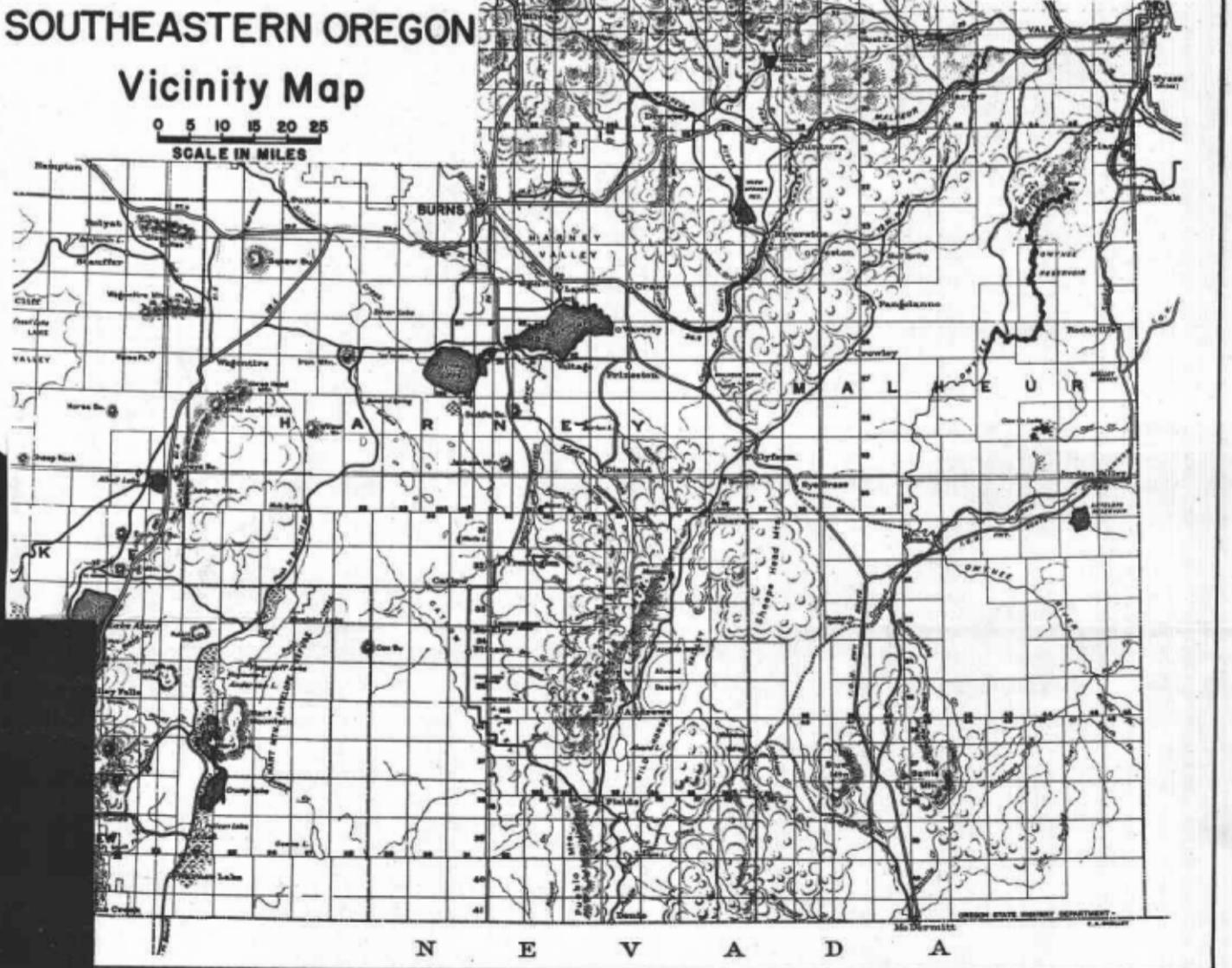
0 25 50 100
SCALE IN MILES



SOUTHEASTERN OREGON

Vicinity Map

0 5 10 15 20 25
SCALE IN MILES



Mr. Hunter:

You have been successful in drawing a tag for the antelope season for 1949. Since only a limited number are available, you are fortunate in being able to participate.

This will be the first antelope hunt in Oregon since 1945. Prior to that time antelope numbers declined throughout southeastern Oregon and several years of closed seasons were necessary. Modest increases have taken place since that time and a limited season is now possible. Since antelope are polygamous and further increase and a more widespread distribution are desirable, the hunt must be restricted to bucks only. By managing the kill on a buck only basis, recreation to you and other sportsmen will be assured without detriment to the antelope herds. At the same time, hunting may serve an objective by distributing herds to adjacent ranges that are unoccupied at the present time.

The area in Oregon open to antelope hunting this season is bounded on the WEST by U. S. Highway 395 (from its junction with U. S. 20 to the California State Line), on the NORTH by U. S. Highway 20 (from its junction with U. S. 395 to the Idaho State Line), on the SOUTH by the Calif. and Nevada State Lines and on the EAST by the Idaho State Line.

This year, as in 1945, hunting will be for bucks with horns longer than the ears. In 1945 no difficulty was experienced in identifying bucks. Definite characteristics serve to distinguish between the sexes (see cuts).

The season will be held August 20 to August 25, both dates included. These dates are the most practical since antelope begin rutting early in September and it is not desirable to hunt them during the critical breeding season. Later in the fall the horn sheaths begin to loosen with the result that the head loses its value as a trophy. By hunting late in August better quality of meat will be assured as well as prime trophy heads. At the same time antelope will not be disturbed during the important rutting season.

It is to be emphasized that the summer has been dry and a fire hazard will exist. Much of the antelope range is public land, administered by the U. S. Bureau of Land Management. This agency welcomes an opportunity to provide recreation to you. They are particularly desirous that you be cautious in regard to fires so that the forage resources, which antelope depend upon for survival, will not be destroyed.

Experienced hunters have agreed that for the greatest personal satisfaction, and to secure the most desirable trophy head, it is always advisable for the hunter to stalk his quarry individually. One man stalking one animal is true sport. An army of hunters firing wildly at everything that runs before them is poor sport and usually produces a high crippling loss and dissatisfaction on the part of the individual.

The vast area of antelope habitat included in southern Harney and Malheur counties offers almost unlimited opportunities for the best kind of antelope hunting.

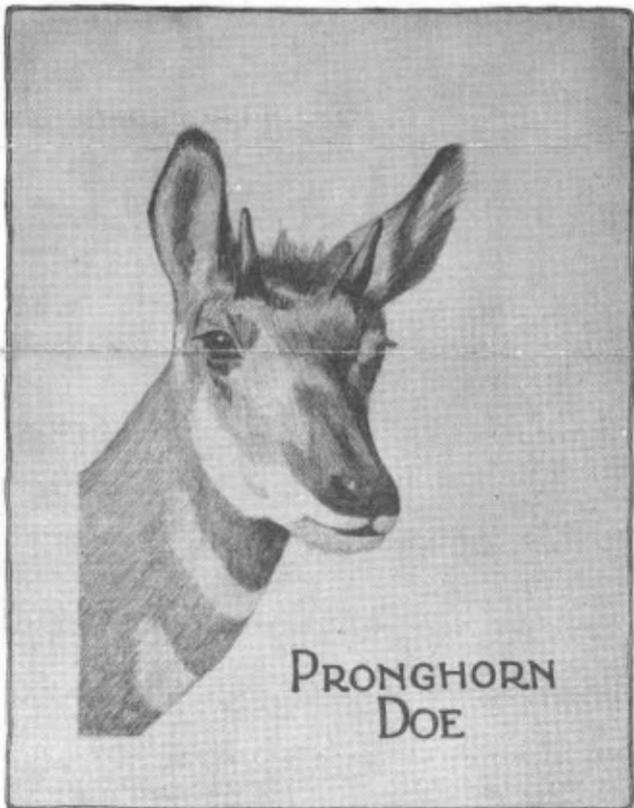
No checking station will be maintained and you will not be required to check in and out of the area. THE ANTELOPE TAG AND HUNTING LICENSE MUST BE IN POSSESSION WHILE HUNTING. THE ANTELOPE TAG MUST BE AFFIXED TO THE HORNS OF THE ANIMAL AFTER KILLING, AND RETURN CARD MAILED TO THE OREGON STATE GAME COMMISSION IN PORTLAND, OREGON.

Extreme care must be exercised in regard to fire and in selecting the adult buck at which you shoot. Law enforcement personnel will probably contact you in the field and an aerial patrol will be maintained.

Your cooperation and care will insure perpetuation of the sport of antelope hunting. Good luck and we hope to meet you in the field.

Sincerely yours,
OREGON STATE GAME COMMISSION

C. A. Lockwood
C. A. Lockwood
State Game Director



BIG GAME DAMAGE CONTROL:

With maintenance of high densities of big game animals and a continuous expansion of agricultural enterprises, conflicts are inevitable.

Elk and deer are the most frequent offenders and the types and seriousness of damage varies with game densities and types of crops produced.

Damage problems are normally confined to fringe areas at the edge of suitable big game habitat and in small, isolated farmlands within boundaries of good habitat.

Such problems have been in existence since the earliest agricultural developments and have been accepted by landowners as one of the hazards of normal operation. During recent years, changes of political philosophy, combined with high market values, have induced many landowners to question the rights of wildlife on private property. Although Oregon's game laws are based upon the premise that wildlife as public property has a right of access to all lands within the state, the courts have not upheld that premise in areas where damage occurs, and the Commission has recognized a moral obligation to assist with the prevention of substantial damage to private property.

The only direct provision in Oregon's laws for control of damage by game is stated in Section 82-330 O.C.L.A. and provides that upon complaint of any freeholder the Game Commission is authorized to issue a permit for the killing of such offending animals to the complainant or arrange for removal of the animals by state employees.

In addition, the Commission has been searching for other methods of control and chemical and mechanical repellents are now being used extensively throughout the state.

Recognizing that all successful control practices require full cooperation of the complainant, every effort is made to investigate complaints promptly and approach the complainant with some degree of diplomacy. In most instances an explanation of the problem and available control methods results in a mutual understanding and landowners are willing to cooperate if they have a justifiable complaint. Some radical complainants are not willing to render any assistance for control and, in these instances, the damage problem most often continues.

The Commission recognizes that it is not practical to attempt to produce or maintain big game animals on agricultural lands. Since invasions of croplands can be frequently expected, the Commission has adopted a program to control such depredations by the following methods:

1. Apply mechanical and chemical repellents.
2. Assist landowners in fencing high-value crops and haystacks where continuous problems can be expected and removal of the animals is impractical.
3. Harvest offending animals by special seasons or permits to complainants.
4. Continue search for new methods of control.

Chemical Repellents:

Two chemicals, Leckenby Deer Repellent and Good-rite z.i.p., have been experimented with for the past two years to determine their effectiveness in controlling deer damage. Prior to that time, a three-year research project failed to show any promise for the many chemicals tried.

The Leckenby product has not proved effective in Oregon. Good-rite z.i.p is manufactured by the Goodrich Chemical Company and results are encouraging. The material contains a repellent material and an adhesive sticker which clings to the plants. Good-rite is manufactured as a concentrated paste. Before spraying, the paste is mixed with water at the rate of 1 pound to $2\frac{1}{2}$ gallons.

With small gardens or other limited plantings, Good-rite appears to have some value as a temporary control of deer damage. Quantities are available and are supplied to Field Agents upon request. The high cost (75¢ per pound) and the necessity for repeated applications as new leaf growth develops render the repellent impractical on large acreages.

Fencing:

Since the summer of 1949, a program has been underway to assist in the fencing of high-value agricultural crops against deer and elk damage.

Under the program, the Commission agrees to reimburse cooperative landowners at the rate of \$2.50 per rod of fence completed according to specifications. The present cost of fencing materials, exclusive of posts, averages approximately \$2.00 per rod. Landowners pay for the cost of posts above the remaining 50¢ and furnish all labor. Since many farmers are able to cut posts on their own property, the outlay of capital for materials is minor. Those who do their own construction during the off-season are able to build a deer-proof fence very reasonably.

Specifications call for treated posts, preferably cedar or juniper, $10\frac{1}{2}$ feet long and sunk at least $2\frac{1}{2}$ feet into the ground. Posts are spaced not more than 12 feet apart. Two 39-inch width of new woven wire fencing with six-inch stays are used. Minimum sizes call for 10-gauge top and bottom wires and $12\frac{1}{2}$ -gauge filler wire. The widths of woven wire are secured together by means of hog rings clamped at 12-inch intervals. A strand of barbed wire is placed at ground level while a second strand is used above the top width of woven wire. The total height averages 84 inches, depending on the distance the barbed wire is placed above the woven wire. Not less than 15 staples at least $1\frac{1}{2}$ inches long are used per post.

At the time of signing a fencing agreement, a completion date is agreed upon. Extensions can be provided by agreement between the Commission and the cooperator. Maintenance for a minimum of ten years is required of the landowner.

Magnitude of the program is limited by the specifications. Since all labor and a portion of the post cost must be borne by the landowner, it is not economical to fence low-value crops such as grain, forage, and range.

Where the gross return per acre is high, landowners are particularly anxious to fence and accept the program willingly. Not only is deer or elk damage eliminated but the fence represents a capital asset on their property.

Deer- and elk-proof fences are particularly applicable in Western Oregon. Crops such as strawberries, cranberries, cane berries, orchards, flower bulbs, commercial and private gardens, and clover seed are usually limited in size and fence protection can be afforded at a reasonable cost. In areas surrounded by deer and elk habitat where a continuous influx of animals can be expected, fences provide complete protection and are the most economical control over a long period of time. From the Commission's standpoint, one of the most important advantages of fencing is to release personnel for duties other than constant attention to chronic complaints.

A recapitulation of fencing agreements signed since landowners were first contacted last November follows:

Fencing Agreements			
Counties by Supervisory Districts	Number of Fencing Agreements	Rods To Be Fenced	Money Committed
Clackamas	2	374	\$ 935.00
Clatsop	5	534	1,335.00
Columbia	5	1,015	2,542.75
Lane	1	115	287.50
Marion	3	361	902.50
Multnomah	2	462	1,155.00
Polk	1	100	250.00
Washington	6	1,072	2,681.25
Yamhill	3	624	1,560.62
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NORTHWEST DISTRICT	28	4,657	\$11,649.62
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Coos	28	2,488	6,220.00
Curry	9	986	2,465.00
Douglas	2	68	170.00
Jackson	3	309	664.50
Josephine	6	2,283	5,707.98
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SOUTHWEST DISTRICT:	48	6,134	\$15,227.48
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TOTALS:	76	10,791	\$26,877.10

A total of 76 fences have been contracted. The sum of \$26,877.10 has been committed for the construction of 10,791 rods of fence. Coos County leads all others in the number of fences under contract. The number of small cranberry bogs that can be fenced effectively accounts for this demand. A total of 2,283 rods are under contract in Josephine County, particularly on large clover seed producing acreages.

To date, 11 fences have been completed. The sum of \$4,241.87 has been expended for the construction of 1,696 rods of fence. A summary of completed fences follows:

County	Fences Completed		
	Number of Fences	Rods Fenced	Money Expended
Clackamas	2	374	\$ 935.00
Clatsop	1	56	140.00
Curry	3	403	1,007.50
Polk	1	100	250.00
Washington	3	595	1,488.75
Yamhill	1	168	420.62
Totals:	11	1,696	\$4,241.87

In many orchard areas, deer damage occurs to young trees up to the time that they are four to five years old. Damage is in the form of browsing and antler rubbing by the bucks during the fall. Where only a few trees are involved, a fence is impractical. A modification of the fencing program has been devised whereby the Commission furnishes wire and stakes for the construction of tree cages. Three 2 x 2 wooden stakes are driven into the ground around the young tree and five-foot woven wire placed around the stakes to form a protective cage. The average diameter of the tree cage is 36 inches. Since the Commission retains ownership of all materials, tree cages can be re-used on other complaints when no longer needed.

A total of 1,420 rods of wire has been distributed to the Hood River, Chehalem Hills, and Rogue River Valley sections. The required number of stakes has been purchased locally. At an average of 11 feet of wire per cage, 2,130 trees will be protected with the materials on hand.

Panelling:

Experience has indicated that haystacks can be effectively protected against deer and elk with wooden panels. The panels are constructed of 1-inch lumber with 2-inch spaces between the boards. A "Z" brace is provided on one side for strength. Dimensions are eight feet by eight feet, permitting them to be trucked on the highway. Panels are placed vertically against the hay and wired together at the top and bottom.

Where natural winter range is available, big game can be produced adjacent to hay lands if the stacks are protected from damage.

Panels are provided ranchers on a loan basis and may be removed to other areas if damage discontinues. This policy permits shifting of panels to meet local emergencies.

The program is approved by ranchers suffering severe damage. One difficulty is that the panels are too heavy for one man to handle. However, they must be constructed heavy enough to insure adequate protection against elk and deer.

A summary of panels now distributed in eastern Oregon is provided.

Haystack Panelling				
Counties By Supervisory District	Number of Landowners	Number of Panels	Number of Haystacks Protected	Number of Panels In Reserve
*Baker	35	3,200	160	-
Grant	14	688	40	190
Umatilla	3	68	4	-
*Union	20	1,800	90	-
Wallowa	13	479	30	13
<hr/>				
NORTHEAST DISTRICT:	85	6,235	324	203
<hr/>				
Deschutes	2	43	2	-
Crook	15	1,149	76	-
<hr/>				
CENTRAL DISTRICT:	17	1,192	78	-
<hr/>				
Lake	17	783	40	7
Malheur	5	124	7	-
<hr/>				
SOUTHEAST DISTRICT:	22	907	47	7
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TOTALS:	124	8,334	449	210

*Estimates

Figures on panel distribution in Union and Baker Counties are not complete and are estimates. The large numbers distributed, many of which were constructed by Commission personnel, renders the compilation of a true summary difficult at this time. Revisions will be made when the records are complete.

On the basis of information available, a total of 8,334 panels have been distributed to protect 449 haystacks on 124 different ranches. At an average cost for construction and distribution of \$4.00 each, \$33,336.00 have been expended on this activity.

Control of Animals:

Although chemical repellents and fences can be used successfully in many instances, most serious damage problems demand some form of immediate control.

The obvious immediate solution is to remove the animals either by driving them away or killing them. Unfortunately, attempts to drive habitual offenders away from farmlands are seldom successful. However, in some instances herders have been hired to patrol croplands through the night and in this way have temporarily alleviated some problems. Herding is a very time consuming job and is only successful when efforts are so persistent that animals do not have a chance to feed without being molested.

Permits authorizing complainants to kill offending animals are commonly used in areas where small numbers of big game animals have taken residence within major agricultural areas where they are not hunted and are a continuous source of damage. This procedure is also frequently used in fringe areas where a small number of habitual offenders is involved.

Damage problems resulting from a general over-population of big game can best be controlled by allowing hunters to harvest the available surpluses at the time the damage problem occurs. During the past 10 years a series of such special seasons have been held in Oregon and, although numbers of game harvested have not been substantial, they have had a very beneficial effect in most areas.

The east slope of the Blue Mountains in Baker County is an example of damage control through special seasons.

In the fall of 1949, a general either-sex season on elk in Northeastern Oregon substantially reduced complaints from that area this winter and a special season on deer in the John Day Valley was initiated to reduce damage to range and agricultural lands.

Hunting seasons designed to hold big game numbers at compatible levels are by far the most practical damage control method; however, it is extremely difficult to design regulations that will selectively remove offenders and not disturb adjacent areas that do not present a problem.

In problem areas where the terrain or number of animals involved renders use of repellents or issuance of permits to complainants impractical, experience indicates that continuous hazing by assigned herders frequently has a beneficial effect. This procedure is normally used as a temporary control measure to alleviate the immediate problem until other more permanent corrective measures such as special seasons can be applied.

Search For New Methods of Damage Control:

Research is being continued by the Oregon Cooperative Wildlife Research Unit in testing repellent properties of chemicals.

The basic field program of fact finding is aimed at measuring all factors affecting big game, including the damage problem. A project is underway to determine the extent and effects of deer use on perennial grass during the early spring months. No guide is available to judge the degree of allowable competition between big game and livestock on natural ranges. It is hoped that continued range research will provide information useful in maintaining game at compatible levels.

A continued search will be made for information and methods applicable in the control of big game damage.

UPLAND GAME

Oregon's current upland game management program provides for an annual evaluation of all available upland game habitat, including a measure of population trends and limiting factors of major game species so that the Game Commission can have sound information upon which they can base regulations and management.

Artificial propagation of pheasants continues to be a major activity and other procedures, such as trapping and transplanting, have been applied to increase the distribution and densities of upland game species.

A classification of the available upland game habitat indicates that only approximately half of the six million acres of agricultural land in Oregon can be presently classified as suitable upland game habitat or productive of an annual surplus for harvest. With the hope of bringing a part of this marginal land into production and increasing the production of game birds on suitable habitat, a habitat improvement program is underway to provide the lacking essential requirements of game birds.

Seed stock refuges have been established and maintained in areas lacking escape cover so that a nucleus of game birds will be protected during open hunting seasons. In addition, much publicity has been given to the merit of protecting females of polygamous species and other hunting regulations designed for the protection of game birds and the future of upland game hunting.

The ring-necked pheasant continues to be Oregon's most popular upland game bird, but with the increasing hunting pressure more hunters are pursuing quail, rabbits, and other small game species than during previous years.

Location of suitable areas for liberation of farm-reared pheasants is becoming more difficult in Eastern Oregon each year. Liberation sites must meet all requirements of pheasants. Such areas are generally well-populated with birds already and many landowners feel that a maximum density has been attained.

The current rapid increase in human density and economic development in Oregon are hastening the day when maintenance of game populations will be no greater problem than providing access to private lands for public recreation. At the present time, a high percentage of the lands in the more popular upland game hunting areas are posted to prevent trespass or hunting and landowners frequently refuse to cooperate in plans for the production of more game because of the many hazards encountered during hunting seasons. An appeal to sportsmen through news releases and posters is believed to have had some effect in the past two years but a well-planned program for the promotion of better farmer-sportsman relationships is needed if a serious access problem is to be avoided in future years.

Other activities, such as winter feeding and predator control, have been undertaken during the past year but an accurate measure of their effect upon upland game populations is not at present available.

Although weather conditions during the past winter resulted in a heavier than normal loss of game birds by predation and exposure and a slight decline is indicated in the number of breeding birds available this spring, the present average state densities are higher than the average for the past five years and

with normal reproduction a surplus will be available for harvest in the fall of 1950.

The following paragraphs summarize the information obtained and activities of the upland game department from May 1, 1949, to May 1, 1950.

RING-NECKED PHEASANTS:

Chinese and Mongolian pheasants continue to carry most of the upland game hunting pressure in Oregon, and as a result, the pheasant receives substantially more attention than other upland game species.

Population Trends:

A comparison of pheasant density measurements by county from 1946 to 1950 is included in the attached table. It will be observed that, although some counties show an increase of pheasants, the state-wide average is down slightly from 1949. This reduction is probably due to extremely severe winter conditions.

The Eastern Oregon densities are greater and ample breeding stock is present in most counties. Western Oregon counties show a substantial decline in pheasants. Extremely severe winter conditions may have been partially responsible, but changing agricultural methods have much to do with this situation in Western Oregon. Development of hormone brush killers, intensive draining of low-grade lands and clean farming practices are constantly reducing winter feed and cover, particularly in the Willamette Valley.

For the past three years an effort has been made to measure the effect of hunting seasons by conducting an upland game census of representative counties before and after the hunting season. A state-wide census is made in the spring, just prior to nesting season.

This procedure has provided an index of hunter kill only in areas where all crops are harvested prior to the pre-season census. In irrigated areas where many crops are not harvested before hunting season the post-season census often indicates a higher density than that of the pre-season census. For example, in Malheur County the pre-season census in 1948 showed 29 birds per 100 acres, while the post-season census a month later indicated 54 birds per 100 acres.

Any practical method of measuring population trends requires that census be conducted under the same conditions of cover and bird habits each year.

Seasonal measurements in the fall of 1949 are not as much in error as those of some preceding years because the October 21 opening of the hunting season allowed for a more uniform measurement.

Disadvantages of pre-season and post-season census data indicate that the value of such a program is questionable. The best value of this measurement is the sex ratio data obtained. Sex ratios indicate the efficiency of the harvest and give an index to the number of hens illegally killed. Sex ratios could be obtained by car counts in concentration areas at a substantial saving in man-days worked. Only areas where pheasants were concentrated would need to be sampled, permanent census samples in areas of low pheasant density could be eliminated.

1946 - 1949
UPLAND GAME - SPRING CENSUS

County District	Pheasants Per 100 Acres				Sex Ratio	Valley Quail Per 100 Acres				Bob-White Quail Per 100 Acres				Hungarian Partridges Per 100 Acres			
	1946	1947	1948	1949		1947	1948	1949	1950	1947	1948	1949	1950	1947	1948	1949	1950
Columbia	6.0	10.0	17.0	9.9	6.7	-	-	-	-	-	-	-	-	-	-	-	-
Multnomah	6.0	11.0	14.0	11.7	2.6	5.0	7.7	2.7	4.6	2.4	7.6	-	-	-	-	-	-
Clackamas	5.0	8.0	21.0	6.6	1.2	-	-	-	-	1.4	1.4	-	-	-	-	-	-
Washington	7.0	13.0	5.0	7.2	6.8	-	-	-	-	0.01	0.01	-	-	-	-	-	-
Yamhill	5.0	6.0	7.0	6.4	3.6	7.3	3.6	9.9	4.8	4.2	2.8	0.01	-	-	-	-	-
Marion	8.0	4.0	13.0	10.3	5.1	-	3.7	5.1	1.1	-	0.6	2.9	0.01	-	-	-	-
Polk	6.0	7.0	11.0	10.4	13.3	3.0	3.4	7.2	3.0	-	2.0	0	0.001	-	-	-	-
Benton	12.0	29.0	40.0	37.2	29.6	4.0	3.8	6.3	6.0	-	.5	.01	1.9	-	-	-	-
Linn	14.0	24.0	42.0	35.8	19.8	1.3	2.8	2.9	2.5	4.4	2.4	5.2	1.25	-	-	-	-
Lane	8.0	14.0	29.0	14.7	8.5	-	1.0	-	2.4	-	6.3	7.3	.4	-	-	-	-
Willamette	8.0	15.0	23.0	18.2	12.8	1.7	2.7	3.8	2.5	1.2	2.2	3.0	.85	-	-	-	.05
Douglas	15.0	12.0	6.2	8.6	4.0	2.0	4.1	3.9	-	0	0	1.0	0	0	0	0	0
Josephine	-	13.0	17.7	13.3	6.5	73.0	21.6	66.6	23.0	0	0	0	0	0	0	0	0
Jackson	29.0	16.0	14.2	20.5	17.0	32.0	32.0	36.6	2.3	0	0	0	0	0	0	0	0
Southwest	20.0	13.0	10.0	14.0	5.2	30.0	11.7	24.2	3.1	0	0	.5	0	0	0	0	0
Coos	-	.3	2.3	1.1	.9	25.0	15.6	9.0	10.9	0	0	0	0	0	0	0	0
Curry	-	-	2.3	1.1	.4	-	-	-	16.0	0	0	0	0	0	0	0	0
Southcast	-	.3	2.3	1.1	.7	25.0	15.6	9.0	12.0	0	0	0	0	0	0	0	0
Western Oregon	-	-	-	-	.4	-	-	-	-	0	0	0	0	0	0	0	0
Sub-Total	10.0	14.0	19.5	16.0	10.5	6.0	5.2	7.5	3.4	.9	1.7	2.3	.62	0	0	0	0
Hood River	7.0	9.0	8.0	7.7	NC	-	-	-	NC	0	0	0	NC	0	0	0	0
Wasco	6.0	11.0	15.5	33.5	28.0	12.0	27.0	32.0	17.5	0	0	0	0	0	0	0	.04
Jefferson	1.0	3.0	5.5	4.0	8.2	55.0	46.0	25.0	62.5	0	0	0	0	0	0	0	1.0
Wheeler	-	20.0	13.0	11.0	13.1	117.0	104.0	103.0	41.6	0	0	0	0	0	0	0	.7
Sherman	9.0	14.0	14.7	27.4	13.1	86.0	52.0	33.0	1.6	0	0	0	0	0	0	0	5.0
Gilliam	13.0	10.0	16.6	17.0	27.4	28.0	39.0	16.6	46.3	0	0	0	0	0	0	0	2.0
Columbia	7.0	13.0	13.0	20.5	17.1	50.0	48.0	34.9	36.2	0	0	0	0	0	0	0	1.0
Umatilla	38.0	58.0	69.1	69.0	50.8	27.0	37.0	54.4	15.0	-	.5	1.8	3.3	5.0	3.5	2.6	1.3
Morrow	32.0	33.0	36.6	41.8	57.1	24.0	26.0	54.9	36.1	0	0	0	0	3.0	.3	7.8	3.8
Umatilla	30.0	45.0	61.0	59.3	52.5	26.0	34.0	54.5	20.4	-	.4	1.3	2.5	4.0	2.7	4.5	1.9
Wallowa	6.0	14.0	7.3	9.7	18.9	2.0	1.2	-	-	0	0	0	0	2.0	.4	-	-
Union	9.0	12.0	16.5	15.6	12.7	10.0	4.6	.2	-	0	0	0	0	1.5	2.6	1.4	3.1
Baker	9.0	35.0	22.5	11.6	13.1	-	-	-	1.8	0	0	0	0	-	1.1	.6	1.1
Northeast	9.0	24.0	18.0	13.2	12.9	4.0	2.0	.08	1.0	0	0	0	0	1.0	1.5	.9	1.9
Malheur	-	60.0	38.7	40.5	45.2	0	0	.6	2.8	1.0	-	1.8	5.3	15.0	6.4	6.2	5.6
Grant	14.0	22.0	24.7	33.0	NC	280.0	90.7	36.0	NC	0	0	0	NC	1.0	.5	-	NC
Harney	12.0	21.0	23.4	24.6	29.8	27.0	7.2	6.6	11.1	0	0	0	0	-	-	.1	-
Grook	6.0	7.4	18.7	6.3	9.8	24.0	33.6	12.8	13.7	0	0	0	0	-	-	-	.35
Deschutes	1.0	.7	.4	2.1	1.8	8.0	16.7	15.0	11.6	0	0	0	0	-	-	.7	.2
Central	4.0	5.0	10.5	4.5	6.4	15.0	26.0	13.7	11.9	0	0	0	0	-	.3	.1	.30
Lake	-	-	-	-	9.4	-	-	-	10.9	0	0	0	0	-	-	-	-
Klamath	-	15.0	13.1	12.7	39.1	7.0	-	-	1.4	0	0	0	0	-	-	-	-
Lake-Klamath	-	15.0	13.1	12.7	24.6	7.0	-	-	1.4	0	0	0	0	-	-	-	-
Eastern Oregon	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Sub-Total	13.5	30.0	28.5	25.3	27.0	50.0	21.2	16.3	13.7	.2	.08	.4	1.1	2.0	1.2	2.0	2.5
State Total	13.0	22.0	25.1	21.6	20.8	33.0	15.4	12.6	9.8	1.0	1.5	1.2	.95	1.3	.8	1.3	1.5

* N C - No Census

SUMMARY 1950 UPLAND GAME CENSUS - SPRING

District	Samples	No.	Acres	Pheasants			Total	Per 100 Acres	Valley Quail		Bob-White		Huns		Cottontails	
				Cocks	Hens	No.			Per 100 Acres	No.	Per 100 Acres	No.	Per 100 Acres	No.	Per 100 Acres	
Willamette		119	7,673	459	430	982	12.8	192	2.5	65	.85	-	-	-	-	
Southwest		18	1,620	26	59	85	5.2	50	3.1	-	-	0	0	-	-	
South Coastal		11	900	4	2	6	0.7	108	12.0	0	0	0	0	-	-	
Western Oregon																
Sub-Total		148	10,193	489	491	1,073	10.5	350	3.4	65	.62	0	-	-	-	
Columbia		39	3,183	197	324	543	17.1	1,153	36.2	0	0	238	7.5	21	0.7	
Umatilla		55	3,300	360	899	1,729	52.5	673	20.4	81	2.5	64	1.9	-	-	
Wallowa		23	1,725	106	220	326	18.9	-	-	0	0	-	-	-	-	
Northeast		42	2,520	139	156	326	12.9	25	1.0	0	0	49	1.9	-	-	
Malheur		35	2,121	116	637	958	45.2	59	2.8	112	5.3	60	2.8	-	-	
Grant																
Harney		18	1,037	117	192	309	29.8	115	11.1	0	0	-	-	-	-	
Central		33	1,980	35	92	127	6.4	235	11.9	0	0	6	.3	9	0.6	
Lake Klamath		18	1,102	39	232	271	24.6	67	6.1	0	0	-	-	-	-	
Eastern Oregon																
Sub-Total		263	16,968	1,109	2,725	4,589	27.0	2,327	13.7	193	1.1	417	2.5	30	0.2	
State Totals		411	27,161	1,598	3,243	5,662	20.8	2,677	9.8	258	.95	417	1.5	30	0.1	

- Species present but not observed on samples

Seasonal Measurement of Upland Game
Densities and Sex Ratios

County	Pheasants Per 100 Acres			Cock:Hens Sex Ratio		
	Oct. 1949	Nov. 1949	Spr. 1950	Oct.	Nov.	Spring
Linn	39.0	19.4	19.8	1:0.7	1:1.08	1:0.86
Jackson	No Census	18.0	17.0	No Census	1:3.1	1:3.6
Wasco	27.8	24.3	28.0	1:1.41	1:3.03	1:1.27
Malheur	41.2	41.3	45.2	1:1.2	1:4.7	1:5.5
Crook	19.6	14.7	9.8	1:1.0	1:3.0	1:3.5
Grant	68.0	No Census		1:0.6	1:1.7*	No Census

*January

Production:

Each pheasant hen available in the spring has a potential productivity of at least 12 pheasants. If this potential production were attained with a sex ratio of 1 cock to 2 hens there would be 9 pheasants available in hunting season for every one available in the spring. Census data and brood counts indicate that the normal increase is more nearly 2 to 1. Therefore, the greatest loss must occur during the nesting and rearing season.

Inclement weather affects the survival of young pheasants on game farms; however, past attempts to correlate monthly precipitation and average temperatures with pheasant production failed to show any direct relationship. Weather is an important factor in the growth of cover, time of mowing and other related agricultural activities. Weather has very little effect on the time pheasants begin laying.

The attached table summarizes 1949 brood counts by district. Nesting conditions appeared much more favorable than in 1948, and the number of chicks per hen was higher than the preceding year. However, Western Oregon, which should have been producing a bumper crop, dropped in production. It is difficult to account for changes in production and obviously there must be unknown factors influencing production in spite of apparently excellent nesting seasons.

The study of pheasant nest predation instituted in 1948 was continued in May and June, 1949, on a reduced scale. It is probable that losses of pheasant nests were lower than results of this study indicate but the study does illustrate the hazards present.

Pheasant Brood Counts

June 27 to July 5, 1949

District	Hens Observed	Hens With Broods		Average Chicks Per Brood	Average Chicks Per Hen		
		No.	%		1949	1948	1947
N. Coastal	2	1	50%	10.0	5.0	-	-
S. Coastal	8	3	37%	9.0	3.4	-	-
Willamette	79	53	66%	7.1	4.8	3.7	4.6
Southwest	53	43	81%	6.0	4.9	6.1	5.7
WESTERN OREGON:	142	100	70%	6.7	4.7	4.8	4.9
Lake-Klamath	119	53	45%	6.5	2.9	0.7	2.5
Central	66	34	52%	8.1	4.2	1.3	3.5
Columbia	59	45	76%	10.7	8.0	5.9	4.8
Umatilla	172	94	55%	5.4	3.0	3.5	4.7
Northeast	52	28	54%	7.3	3.9	0.7	4.4
Wallowa	44	7	16%	10.0	1.6	-	-
Malheur	90	39	43%	4.6	2.0	1.9	3.7
Harney	18	12	66%	9.0	6.0	4.6	5.4
Grant	10	10	100%	9.5	9.5	0.8	5.2
EASTERN OREGON	630	322	51%	7.1	3.6	2.7	4.3
STATE TOTAL:	772	422	55%	6.9	3.8	3.3	4.5

Pheasant Nest Mortality, 1949

District	Number of Dummy Nests	Number Destroyed	Per Cent Destroyed
Willamette	40	18	45%
Umatilla	40	17	85%
Malheur	57	31	54%
TOTAL:	137	66	48%

The majority of the nests destroyed in Eastern Oregon were destroyed by avian predators. Heaviest destruction in the Willamette Valley was due to mammalian predators.

Records of past brood counts indicate that brood ratios are constantly changing and later observations are most valid. It is extremely difficult to secure an accurate measurement of the year's bird production until crops have been harvested in August, but such complete information will be of little use when hunting regulations must be made in July.

Several small special studies were undertaken in certain districts to secure some measure of losses from other factors. Records of highway mortality were made in the Willamette Valley. The three game agents covered approximately the same mileage each month. The study indicates how vulnerable young pheasants are to automobiles.

Month	Number of Highway-Killed Pheasants Seen
May	8
June	29
July	92
August	113
TOTAL:	242

In Malheur County 16 farmers were selected at random and interviewed regarding pheasants destroyed in mowing operations. Results indicated that 33 hens were killed per 100 acres and 187 nests were destroyed per 100 acres of mowing operation.

No. Samples	Acres Mowed	Hens Killed		Nests Destroyed	
		No.	Per 100 Acres	No.	Per 100 Acres
16	480	160	33	900	187

These figures are extremely high and only indicate the loss, as the sample is too small to permit direct application of the data to the entire county.

A small experiment was conducted on the necessity of water for young pheasants in the Willamette Valley. Summer water may be a limiting factor. Ten pheasants were used in each test group.

Days of Survival	No. Young Pheasants Surviving Without Water	No. Young Pheasants Surviving With Water
2	7	10
4	5	10
6	0	10

Umatilla County had some of the most severe winter conditions in the state. Crusted snow and sub-zero temperatures prevailed for long periods. Losses noted during the spring census were 25 birds (3 cocks and 22 hens). This points out the high survival ability of the pheasant.

Hunting:

<u>Area</u>	<u>Season</u>	<u>Bag Limit</u>
Willamette Valley	Noon, Oct. 21 to	2 cocks a day
Coos and Klamath Co.	Oct. 26, incl.	6 a season
Josephine, Jackson, Deschutes, Crook, Morrow, Jefferson, Umatilla, Union, Hood Riv. Wallowa, Baker, Wheeler Grant, & Harney, Wasco	Noon, Oct. 21 to Oct. 30, incl.	3 cocks a day 9 a season
Malheur County	Noon, Oct. 21 to Nov. 9, incl.	4 cocks a day 9 a season

The following chart summarizes information obtained through a field check of hunters during the 1949 open season. The success ratios are low because most of the hunters are checked in the field rather than after the day's hunt is completed.

It will be noted that the average kill per man increased, although the birds killed per hour hunted decreased from that measured in 1949.

Hunting conditions were excellent in Eastern Oregon. In Western Oregon, all day fog reduced the kill and hunting pressure far below that expected for the short season.

Age classification of 584 pheasants showed 51% to be young birds. The 1948 kill was 70% young birds. In view of the fact that the average chicks per hen was higher in 1949 than in 1948, it is difficult to account for the decrease in young birds bagged. Assuming all measurements to be statistically valid, there must have been a heavy loss of chicks in August, September, and October.

Of 519 birds classified in Eastern Oregon, only 91 or 18% showed predominantly Mongolian characteristics.

Field Agents were again provided posters urging hunters to protect pheasant hens. Observations indicate that these signs had a beneficial effect; relatively few of them were destroyed.

Tagging stations in Malheur County accommodated 2,128 hunters and tagged 10,599 birds, an average of 4.98 pheasants per hunter, a substantial

1949 PHEASANT SEASON

District	Hunters		Pheasants		Valley quail		Pheasant Age Classes			Pheasant Species	
	No.	Hours	No.	Per Hunter	No.	Per Hunter	Young	Old	China	Mongolian	
Willamette	134	500	95	.70	No Season		76 - 64%	43 - 36%	95 - 100%	0	
Southwest	23	20	3	.13	None Checked						
South Coast	5		1	.20	No Season						
Western Oregon											
Sub-Total	162	520	99	.61	None Checked		76 - 64%	43 - 36%	95 - 100%	0	
Columbia	207	604	107	.52	134	.65	32 - 30%	75 - 70%	92 - 86%	15 - 14%	
Umatilla	177	505	208	1.17	14	.08	119 - 57%	89 - 43%	179 - 86%	29 - 14%	
Malheur	131	776	204	1.56	No Season						
Harney	157	251	102	1.54	No Season		45 - 44%	57 - 56%	91 - 89%	11 - 11%	
Grant	25	68	46	1.84	59	2.36	-	-	25 - 54%	21 - 46%	
Central	40	152	48	1.20	70	1.76	26 - 54%	22 - 46%	33 - 69%	15 - 31%	
Eastern Oregon											
Sub-Total	737	2,360	715	.98	277	.62*	222 - 48%	243 - 52%	420 - 82%	91 - 18%	
State Average											
1949	899	2,880	814	.91	277	.59*	298 - 51%	286 - 49%	515 - 85%	91 - 15%	
State Average											
1950	1,238	3,396	750	.61	373	.30	479 - 70%	205 - 30%	635 - 93%	49 - 7%	

* Data computed on basis of areas having open quail season.

increase in birds over the 6,969 tagged in 1948. In addition, the State Police report checking 2,736 hunters and 7,324 pheasants. Many of these were tagged in the field so a direct comparison is not applicable.

The total number of birds checked by all agencies in Malheur County reveals that 18,127 cock pheasants were checked during the 1949 season. It is estimated that this is not more than 20 or 25 per cent of the total kill.

Tagging stations are of questionable value in law enforcement as well as being expensive and cumbersome to operate. Hunters must often drive some distance and then stand in line to have their birds checked. Initiation of a paper tag system would satisfy the law enforcement aspects of tagging as well as remove most of the expense to the Commission and inconvenience to the sportsmen. In addition, the responsibility would be placed on the hunter as it is now with deer and salmon tags.

State Police officers maintained records of upland game birds checked during the 1949 season. This data has been tabulated by comparable areas and follows in this report. This data also includes birds tagged and is, therefore, not directly comparable with that obtained by Game Commission Field Agents.

1949 Upland Game Kill Data
Reported by State Police

District	Pheasants	Quail	Huns	Hunters	Pheasants Per Hunter
Willamette	438			1,390	.32
Southwest	279	80		1,089	.26
South Coastal	5			8	.62
WESTERN OREGON:	722	80		2,487	.29
Columbia	821	838		724	1.14
Central	22	110		60	.37
Lake-Klamath	213	229		154	1.40
Umatilla	617	157	1	712	.86
Grant	75	136		180	.41
Wallowa	207			105	1.96
Northeast	1,441		1	1,766	.82
Malheur	7,324		350	2,736	2.69
EASTERN OREGON:	10,720	1,470	352	6,437	1.82
STATE AVERAGE:	11,442	1,550	352	8,924	1.28

Sportsman-Farmer Relationships:

Observing a steady increase in the quantity of private lands being posted to control or prevent hunting of small game. The Commission authorized an experimental program to determine ways and means of providing access for the public and protecting the rights and property of landowners.

Only one such project was operated in 1949, and it was located in the vicinity of the suburban community of Orenco which is approximately three miles northeast of Hillsboro and fifteen miles west of Portland. The procedure applied was patterned after one successfully used in Pennsylvania.

Each landowner within a tract of approximately 2,000 acres signed an agreement which provided that the Oregon Game Commission would post and patrol vulnerable portions of his property to prevent all hunting and the landowner agreed to permit the public to hunt on portions of his lands that were not posted. The closed areas were not to include more than one-third of the cooperator's property and were normally confined to farmsteads, orchards, and pastures.

In May, 1949, a trapper was assigned to remove red fox and other predators that occupied the area.

In June a graduate student from Oregon State College was assigned to the project, with the understanding that his findings would provide material for a Master's thesis. His first project was to propagate pheasants on the area. These birds were hatched at the Eugene Game Farm and were transported to the area late in June. A total of 2,706 chicks were started and, although accurate counts were not possible to obtain, it was estimated that approximately 1,500 pheasants were raised to an age of 7 weeks. Dispersal was so rapid after that age that few of the birds could be accounted for.

In September the area was posted as per agreement with landowners and the area was frequently patrolled by both State Police and Game Commission agents during the months of September and October. An orientation map and explanation of the project was prepared and distributed to sportsmen through organized clubs and farmer cooperators on the area.

The area was heavily used by dog trainers during the month of September and possibly that factor is partially responsible for the fact that by October pheasant densities within the project area were not substantially higher than on adjacent lands.

Recognizing that the field-reared birds were widely scattered and desiring to provide good hunting which would attract sportsmen and give the public access area a fair trial, the area was stocked with 278 mature, banded cocks on October 20 and 22.

The 1,500 pheasants raised on the area were toe-marked so that they could be identified in the hunters' bags.

COOPERATIVE FARM GAME
MANAGEMENT AREA
Orengo Oregon
Closed Area



ORENCO

EXPLANATION OF ORENCO COOPERATIVE FARM-GAME PROJECT

Dear Hunter:

The aerial photograph on the back of this letter shows an area in the vicinity of Orenco, Oregon, on which the Oregon State Game Commission and the landowners are participating in a cooperative farm-game project. This area comprises some 2,000 acres of pheasant habitat developed to provide an improved upland game hunting area and, at the same time, to protect the rights and property of the landowner.

This program provides that certain portions of each owner's property will be set aside as inviolate refuges where no hunting will be permitted. In the remainder of the project area, the owners have agreed to permit hunting on their lands. In addition, landowners are cooperating in a program to increase the number of game birds on the area by permitting the Game Commission to develop water, cover and food for game birds on their lands and to stock the area with artificially propagated and trapped game birds.

This summer approximately 1,500 pheasants were raised on this area and allowed to disperse as they became mature. This stocking program was preceded and followed by an intensive predator control campaign which took a heavy toll of foxes, weasels, hawks and owls from the area.

The principal objectives in this plan are to increase the production of game through the cooperative efforts of both the landowners and the Game Commission and to bring about, through the cooperation of sportsmen, an orderly harvest of surpluses in a manner that will provide the maximum of recreation for hunters with a minimum of hazard for landowners.

This brief explanation has been prepared to inform the sportsmen and other interested parties of the purposes of this farm-game project and the conditions under which it may be used. In general, the project lies between the Sunset Highway and the town of Orenco. The closed areas are shown in color on the aerial photograph and are also plainly posted on the ground. This should enable hunting parties to plan their hunting routes with a minimum of confusion. Some of these refuges were established for the sole purpose of protecting game but most of them are dual-purpose closures that will protect farm buildings, pastures, orchards, and other valuable property as well as game.

The landowners' agreement to permit hunting does not release the hunters' obligation to ask for permission to hunt and show appreciation for the landowners' effort to provide more recreation on his land.

The open season for pheasants on this project will extend from noon, October 21 to October 26, 1949, inclusive, and the hunters are allowed a bag limit of 2 cock pheasants per day or 6 during the entire season.

It shall be unlawful to kill hen pheasants or quail on this area this year. It is imperative that sportsmen recognize the importance of hen pheasants because they are the seed for future pheasant crops on this land and future hunting will be in direct proportion to the number of hens that are available to produce broods in future nesting seasons.

Hunters or dogs will not be permitted within the refuge areas with the exception that it will be permissible to retrieve dead or badly crippled birds from refuges if the hunter leaves his gun at the refuge boundary and has his dog on a leash.

This project is an experiment and its success or failure may influence future programs for upland game management in Oregon.

Your earnest cooperation in respecting the rights of the landowners and in obeying the game laws will be greatly appreciated.

Sincerely yours



C. A. Lockwood
State Game Director

A GOOD SPORTSMAN WILL --

--RESPECT THE LANDOWNERS' RIGHTS AND PROTECT HIS PROPERTY

--OBSERVE THE GAME LAWS AND REPORT ALL VIOLATIONS

--BE VERY CAREFUL WITH HIS GUN

From 4 to 6 men patrolled the area throughout the 5 $\frac{1}{2}$ -day season (Noon, October 21 through October 26) to enforce game and trespass regulations and obtain information. The information collected from hunters is displayed in the following chart.

Hunter Success at Orenco Project								
Date	Hunters Checked	Hours Hunted	Pheasants Bagged					
			Toe-Marked	Banded	Wild	Total	Per Hunter	Per Hr.
10/21	142	352	31	36	19	86	.6	.24
10/22	63	161	12	11	5	28	.44	.17
10/23	47	141	2	34	0	36	.76	.25
10/24	14	28	1	3	0	4	.28	.14
10/25	31	77	5	6	0	11	.35	.14
10/26	14	35	0	0	0	0	.0	.0
Totals:	311	794	51	90	24	165	.53	.21

Dense morning fog made it very difficult for patrolmen to contact a high percentage of the hunters using the area because many would come out for a short hunt before going to work at 8 A.M. and would leave the area before being checked. It is known that not all of the hunters were checked because 14 additional bands were returned from the area by mail after the season closed. It is estimated that the above indicated totals may include only approximately half the hunters and birds.

Residence of the 311 hunters checked on the area was as follows:

Residence	Number	Percent
Portland	135	43
Hillsboro	132	42
Beaverton	29	9
Corvallis	8	3
Forest Grove	3	1
North Plains	2	1
Nehalem	2	1

Hunting was very good on the area on the opening afternoon; however, not all hunters successfully bagged the limit of 2 cocks. Indicated ratios of birds per hunter are admittedly low because most hunters were checked before they had completed their hunt and additional birds killed were not checked.

Dense patches of hardwood timber with an understory of shrubs provided good escape cover and, after the first afternoon, hunting was much more difficult.

On the evening of October 22, the second day of the season, 129 banded cocks were scattered over the area but dense fog on the following Sunday morning made it very difficult to obtain a measure of numbers harvested. Only 47 hunters were checked on the area Sunday. They bagged 36 birds, 34 of which were released the evening prior.

The banded cocks released immediately before the season provided excellent recreation in that they were strong-winged and would hold for dogs much better than the wild or field-reared birds that had been harassed by dogs for the preceding two months.

Only one arrest was made during the season and sportsmen as a group conscientiously complied with the regulations in force.

Landowners were contacted after the season and they enthusiastically endorsed the project as a means of providing recreation without substantial hazard to their property.

Some landowners indicated that they would prefer to retain the privilege of hunting in the closed areas. Pennsylvania allows this concession but it makes enforcement of the closures much more difficult.

Idaho also experimented with the Pennsylvania system in 1949. They permitted landowners to hunt in closed areas but did not attempt to patrol the areas intensively during the season. Their findings were that with adequate publicity and posting, sportsmen would cooperate and intensive patrol work was not mandatory.

There is an obvious need for such cooperative programs in many parts of the state and particularly in livestock-producing counties in Central Oregon. Similar projects are planned for the 1950 season with the hope that through experience a most efficient method of controlling access problems will be developed.

Artificial Propagation:

Oregon's four game farms produced a total of 61,557 pheasants during the 1949 season and liberated 60,632 birds during the year. Of the pheasants released, 9,553 were carried over from 1948 for breeding stock and early spring release; 15,700 were field-reared in the habitat to be stocked and allowed to disperse as they became mature; and 35,379 pheasants were released from the game farms during the summer and fall months.

The distribution and source of pheasants released is indicated in the following summary:

1949 Pheasant Liberations

District County	Pheasant Shipped			Shipping Loss	Total Liberated
	Mature	Young	Total		
Willamette District					
Clatsop		3	3	0	3
Columbia		3,316	3,316	0	3,316
Washington	625	1,915	2,540	16	2,524
Multnomah		87	87	0	87
Clackamas	384	1,293	1,677	3	1,674
Marion	1,283	1,676	2,959	24	2,935
Yamhill	930	1,885	2,815	6	2,809
Polk	504	1,776	2,280	1	2,279
Benton	327	1,050	1,377	1	1,376
Linn	738	1,200	1,938	6	1,932
Lane	190	2,250	2,440	1	2,439
Willamette Total:	4,981	16,451	21,432	58	21,374
Research Unit	119		119	0	119
Southwest District					
Douglas	940	2,255	3,195	1	3,194
Coos		38	38	0	38
Josephine		1,186	1,186	8	1,178
Jackson		2,523	2,523	32	2,491
Southwest Total:	940	6,002	6,942	41	6,901
WESTERN OREGON SUB-TOTAL:	6,040	22,453	28,493	99	28,394
Southeast District					
Klamath	1,210	1,804	3,014	202	2,812
Lake		2,200	2,200	0	2,200
Harney		1,804	1,804	1	1,803
Malheur		120	120	0	120
Southeast Total:	1,210	5,928	7,138	203	6,935
Central District					
Deschutes	168	810	978	5	973
Crook	232	1,919	2,151	9	2,142
Jefferson		2,710	2,710	17	2,693
Wheeler	400	640	1,040	0	1,040
Hood River		640	640	1	639
Wasco	400	1,920	2,320	5	2,315
Sherman	400	676	1,076	4	1,072
Gilliam	474	640	1,114	1	1,113
Central Total:	2,074	9,955	12,029	42	11,987

District County	Pheasant Shipped			Shipping Loss	Total Liberated
	Mature	Young	Total		
Northeast District					
Morrow	235	1,333	1,568	1	1,567
Umatilla	111	2,259	2,370	6	2,364
Grant		1,800	1,800	2	1,798
Union	734	2,193	2,927	21	2,906
Wallowa		2,415	2,415	2	2,413
Baker	701	1,910	2,611	13	2,598
Northeast Total:	1,781	11,910	13,691	45	13,646
EASTERN OREGON SUB-TOTAL:	5,065	27,793	32,858	290	32,568
STATE TOTAL:	11,105	50,246	61,351	389	60,962

Farm	1949 Pheasant Production				Total Liberation	Total Production
	Spring Release	Summer Release	Fall Release	Pheasants On Hand 1/1/50		
Corvallis Farm	3,036	11,620	1,403	2,174	16,059	15,197
Eugene Farm	1,500	0	101	0	11,801	10,301
Roseburg		2,200				
Coburg		1,600				
Ballston		900				
Hopewell		700				
Oreco		1,500				
Sauvies Island		3,300				
		<u>10,200</u>				
Hermiston Farm	2,012	9,376	48	2,378	15,236	15,602
Enterprise		2,400				
Madras		1,400				
		<u>13,176</u>				
Ontario Farm	3,005	12,831	0	5,926	17,536	20,457
Summer Lake		1,700				
		<u>14,531</u>				
4-H Clubs		719			719	719
TOTALS:	9,553	50,246	1,552	10,478	61,351	62,276

*The term "Field Project" refers to the practice of transporting rearing equipment and day-old pheasants with brood hens to refuges, or other areas in need of stocking, and assigning a caretaker to raise the birds within the habitat to be occupied, thus avoiding sudden changes of living conditions and possibly inducing a higher survival. These projects are operated on game farm allocations of funds and labor, with the exception of the Madras Project in which case the Oregon Cooperative Wildlife Research Station provided the required labor.

4-H Club Pheasants:

The Oregon Game Commission has participated in a cooperative educational program for 4-H Club members for approximately 15 years. Club members order pheasant eggs through their respective 4-H Club Agents, who make sure that satisfactory equipment is available, the eggs are shipped from the game farms without cost and all pheasants successfully raised to an age of 10 weeks are purchased by the Commission at \$1.00 per bird. These pheasants are frequently released on the Club members' property to stimulate further interest in the conservation and care of wildlife.

During the 1949 season, 58 Club members received 3,702 eggs and raised 719 birds. This average of one pheasant for each 5 eggs is exceptionally high.

It is believed that these pheasant-rearing projects for youth groups have high educational values; however, there is a need for a more versatile program.

Game Farm Operations:

Although game farms successfully achieved the goal of producing over 60,000 pheasants in 1949, their operations were not without hazards.

The Corvallis and Eugene farms suffered heavy losses early in the season as a result of an inferior starting ration. This condition was corrected by changing the source of supply but the losses could not be replaced.

At Hermiston an epizootic of Coryza, (contagious cold) caused the loss of over 5,000 birds that were near liberation age. Pheasants that show any evidence of disease are not released and normally it is more practical to eliminate the diseased birds than to attempt to nurse them through the infectious period.

The Ontario farm, which is equipped to mix its own food supplies enjoyed a successful rearing season.

The quantity and quality of setting hens available continues to be a major limiting factor of game farm production. Most commercial poultrymen are selectively breeding for either meat or egg production and neither of these types are satisfactory brood hens.

A 28' by 140' chicken house was constructed on the Hermiston farm in 1949 and 1,740 Buff Orpington pullets were raised for use as setting hens in 1950. The average cost per hen at an age of 16 weeks was \$1.03. Completion of analysis of costs and operating efficiency at the close of the 1949 season should provide some indication of the practicability of maintaining a flock of suitable brood hens at each farm.

The average cost per hen purchased for the 1949 season was approximately \$1.90 and the average resale value in August and September was approximately \$1.13. This drop in market values, combined with inefficiency of the 11,000 hens used in 1949, contributes to the high operating costs that season. The average cost per bird raised was \$1.92.

Setting hens are not available in desired quantities this year but market values are substantially lower.

Game farm operations for the 1949 season are summarized in the following chart:

Summary 1949 Game Farm Operations

	Corvallis	Eugene	Hermiston	Ontario	Totals
Pheasants on Hand 1/1/49	3,165	1,528	2,430	3,661	10,784
Pheasants Released 3/49	1,952	560	462	1,313	4,287
Breeders Lost and Escaped	129	28	418	656	1,231
Breeders Released 6/49	1,084	940	1,550	1,692	5,266
Total Eggs Gathered	48,812	37,548	53,895	49,519	189,774
Eggs Laid Per Hen	48.2	49.5	41.4	35.5	
Total Eggs Set	30,400	30,400	49,621	48,960	159,381
Eggs to 4-H Clubs	3,213	0	30	459	3,702
Eggs to Private Cooperators	438	3,337	170	100	4,045
Total Chicks Hatched	20,698	22,776*	28,484	28,688	100,646
Average Per Cent Hatch	68%	75%	57%	58%	63%
Loss and Escapement	8,942	7,809	12,882	9,456	39,089
Per Cent Birds Lost	37%	43%	45%	32%	39%
Total Pheasants Raised	15,197	10,301	15,602	20,457	61,557
Summer Liberations	11,620	10,200	13,176	14,531	49,527
Fall Liberations	1,403	101	48	0	1,552
Total Liberations, 1949	16,059	11,801	15,236	17,536	60,632
Pheasants On Hand 1/1/50	2,174	0	2,378	5,926	10,478

Operating Costs:

	Corvallis	Eugene	Hermiston	Ontario	Totals
Salaries and Wages	\$18,539.92	\$12,502.50	\$20,049.39	\$18,602.82	\$69,699.63
G. O. M.	15,173.34	10,904.16	21,683.85	20,900.03	68,661.38
Gross Cost	33,713.26	23,406.66	41,733.24	39,507.85	138,361.01
Revenues	3,000.00 -	2,680.31 -	7,512.91 -	5,469.69 -	18,662.91 -
Inventories	-	-	848.40 -	844.09 -	1,692.49 -
Net Operating Cost	\$30,713.26	\$20,726.35	\$33,371.93	\$33,194.07	\$118,005.61
**Net Cost Per Bird	2.02	2.01	2.14	1.62	1.92

*3,441 Chicks hatched at Eugene were raised at Corvallis farm.

1,225 Chicks hatched at Eugene were raised at Summer Lake C/o Ontario.

**Inequalities in numbers of mature birds held over winter and other variable factors invalidate direct comparisons of net cost per bird on different farms. However, it is obvious that the 1949 record of the Ontario farm is outstanding.

In view of the fact that pheasants are at present established in all of the suitable habitat available in the state and current densities exceed the tolerance of landowners in some counties, it appears advisable to diversify the artificial propagation program by producing Hungarian and Chukar partridge, Bob White quail, and other exotics that have potentialities but are not at present well established throughout the state.

Chukar partridge eggs will be received from the states of Washington, Idaho and possibly Montana in 1950, and 750 Hungarian partridge eggs have been ordered from Denmark by the Oregon Cooperative Wildlife Research Station. All, or a major part of the birds obtained from these sources, will be held as breeding stock to provide a source of eggs for the 1951 season.

Survival Studies:

With an annual expenditure of over \$100,000 per annum for propagation of pheasants, it is mandatory that most efficient methods of utilization be determined in order to assure returns to the hunter that are commensurate with costs.

The Oregon Cooperative Wildlife Research Unit has conducted a series of investigations of the productivity and survival of released pheasants under controlled conditions. These studies are summarized in a following section.

In addition to studies conducted by the Research Unit, a study of the survival of different age classes and types of released birds has been conducted in Summer Lake Valley since 1936 with the aid of the Pittman-Robertson Division of the Fish and Wildlife Service and Federal Aid Funds and returns from marked birds have contributed some information.

Summer Lake:

The objectives of the 1949 pheasant studies at Summer Lake were as follows:

1. To compare survival of pheasants from game farms with those raised on the area in a field-rearing project.
2. To compare the survival and habits of Chinese and Mongolian pheasants on a meadow-type habitat.
3. To measure the return of marked birds released in previous years.

A field rearing project was operated in a twelve-acre field of barley and wheat adjacent to an irrigation ditch and good cover. A total of 2,725 day-old chicks were placed on the area, of which 1,500 were Mongolians from the Ontario game farm, and 1,225 were Chinese strain from the Eugene farm. Feeding schedules and other procedures were the same as those of other field-rearing projects. The hens were removed when the chicks were seven weeks old and by that time the known losses were 390 Mongolian and 520 Chinese pheasants. An outbreak of botulism was responsible for the largest portion of this loss. In addition, 285 birds were trapped and liberated outside the study area. When the birds were eight weeks old, 630 were trapped, banded, and released at seven liberation sites in the valley in comparable numbers of Chinese and Mongolians. In addition, 500 seven-week-old farm-reared birds from Ontario were liberated at these sites.

Dispersal of all birds from the liberation sites for about one-half mile occurred. There was no apparent difference between the dispersal of field-reared and farm-reared birds.

The 1949 hunting season was concurrent with the waterfowl season and extended from noon, October 21 to November 9, inclusive, and from noon, December 19 to January 7, inclusive. The daily bag limit was four pheasants of either sex a day and not more than twelve during the season. It is interesting to note that 80 per cent of the kill was made the first three days of the season.

A total of 497, or 24 per cent, of the 2,024 pheasants liberated on the area were taken by hunters. In 1948, 38 per cent of the birds were taken.

A summary of all returns to date is provided in the following chart:

Summer Lake Pheasant Survival										
Liberation Date	Age Class	No. Birds	Known Losses	Harvest					Per Cent Harvested	
				1945	1946	1947	1948	1949		Total
8/16/45	8 Wks.	596	2	47	15	0	1	-	63	15.7
11/28/45	5 Mos.	501	8	-	18	0	0	-	18	3.6
8/27/46	8 Wks.	390	9	-	211	0	0	-	211	54.1
8/27/46	16 Wks.	176	14	-	101	0	0	-	101	57.4(=)
3/19/47	Adult	475	31	-	-	17	2	-	19	4.0 11%
8/30/47	8 Wks.	196	5	-	-	15	0	-	15	7.6 15%
8/30/47	6 Wks.	200	9	-	-	21	0	-	21	10.5 21%
8/15/48	7 Wks.(1)	1,232	8	-	-	-	526	15	541	43.9) 33%
8/15/48	6 Wks.(1)	875	6	-	-	-	266	18	284	32.4)
8/28/49	7 Wks.	500	35	-	-	-	-	94	94	18.8
9/1/49	8 Wks.(1)	932	20	-	-	-	-	292	292	31.3
9/1/49	8 Wks.(2)	592	15	-	-	-	-	111	111	18.7
Totals:		6,665	162	47	345	53	795	530	1,770	26.6
Unmarked Birds Harvested:					547	107	359	455	1,468	
					61%	67%	31%	48%	45%	

- (*) Incomplete count. (Study started in 1946)
- (=) Per cent of cocks harvested. (Hens were protected in 1947)
- (1) Field-reared Mongolians
- (2) Field-reared Chinas.

In 1946, eight-week and 16-week-old birds were liberated in late August and hunters harvested 55 per cent of these birds.

Summer Lake is better isolated for a study of this type than any known area in the state. Nevertheless, the many uncontrolled conditions, such as length of the waterfowl season, weather conditions, hunting pressure, etc., make it extremely difficult to achieve consistent results. The 1946 season was longer and had heavier hunting pressure than the later seasons and it is believed that a higher percentage of the birds were harvested. However, only 51, or 1.1 per cent, of 4,641 birds have appeared in the harvest a second season after their liberation.

These measurements of survival are not conclusive but they may be taken as

a guide for future management in Eastern Oregon. It can be seen that liberation of birds after the season and liberation of mature birds in the early spring are of little value. There is not any substantial difference in the survival of different age classes liberated in the summer. A loss of at least 50 per cent of these birds may be expected before hunting season. Little carry-over of liberated birds from one year to the next is evident, and even in the fact of extremely heavy liberations, wild birds have furnished 45 per cent of the total kill.

Another field-rearing project is planned for the summer of 1950. Releases were made of comparable numbers of winter hold-over game farm birds and wild-trapped stock from the Malheur Refuge in Harney County to obtain comparisons of survivals.

Field Rearing Projects and Other Special Liberations:

Field-rearing projects were operated at Sauvies Island, Orenco, Hopewell, Ballston, and Coburg in the Willamette Valley and other projects were located at Roseburg, Summer Lake, Madras, and Enterprise. All birds were toe marked for identification but varying intensity of patrol on the different areas does not provide a measure of relative success.

The best checks were obtained at Sauvie Island and Summer Lake where hunters were required to use checking stations. At Sauvie Island an estimated 3,300 birds were raised and 112 cocks were checked from the area all but three of which were toe marked. It is known that many additional field-reared birds were killed on private lands adjacent to the project, where no check was obtained.

Returns obtained at Summer Lake are summarized on page 18. Of 2,024 pheasants released during the summer of 1949, 497, or 20 per cent, were harvested by hunters. The return from Mongolian pheasants raised on the area was higher than either the field-reared Chinese or farm-reared Mongolians released.

On the Orenco project where an intensive patrol made it possible to check at least half of the birds taken from the area, a total of 104 bands were recovered from 278 banded cocks released immediately before and during the season and it is estimated that over 60 per cent of the cocks were harvested. Only 51, or 6.7 per cent, of the estimated 750 cocks raised on the area were checked, and it is estimated that the total kill on the management area did not exceed 14 per cent. It is entirely possible that additional field-reared birds were harvested outside the boundaries of the 2,000-acre project.

At Roseburg where an estimated 2,200 pheasants were raised, 137 hunters were checked during the season with 16 toe-marked birds and 22 wild birds.

At Enterprise where an estimated 2,400 pheasants were raised 52 marked birds were found in random hunter checks.

Patrolmen operating in the vicinity of the Ballston, Hopewell and Coburg projects reported very few hunters and no marked birds.

A total of 1,444 banded cocks were released in Willamette Valley counties during the week preceding opening of the season and a total return of 167 bands, or 11.5 per cent, was received. This is considered high for wing-banded birds because many hunters do not find the bands and few of the bands found are voluntarily returned. In 1940 and 1941, 35,681 banded birds were released in Western Oregon counties and only .8 per cent were voluntarily returned.

Summary:

Accurate measures of the survival of released pheasants are very difficult to obtain; however, studies conducted in Oregon and by other states and agencies reveal that the return to hunters is in direct proportion to the time interval between release and the hunting season.

Survival of all classes of pheasants during the period between release and hunting season appears extremely low.

Mature birds released in fall	4 per cent
Mature birds released in spring	15 per cent
Young birds released in summer	50 per cent

The only evidence that field-reared pheasants may survive better than farm-reared stock is that during the 1949 hunting season 33 of the 2,107 Mongolian pheasants field-reared at Summer Lake in 1948 were bagged during their second year. A similar carry-over is unusual in past studies of farm-reared pheasants.

In view of the information available, it appears feasible to continue to release a high percentage of the pheasant production during the summer months when environmental conditions are at their best and hold as many cocks as possible for stocking of heavily hunted areas immediately prior to the season. It is believed that the liberation of pheasant hens in March is practical in Western Oregon counties but is not commensurate with costs in Eastern Oregon where nesting cover is not normally available until May.

VALLEY QUAIL:

The California Valley quail (Lophortyx californica vallicola) is an exotic in all but the southwestern part of Oregon. This species, with some assistance through trapping and transplanting and artificial propagation, has become established and attained varying densities in all counties except Malheur.

This species does not normally conflict with agriculture and is recognized as an asset by most landowners.

Hunters are only beginning to appreciate the value of quail as game birds because their past preference has been for the larger pheasant. With the increase of hunting pressure, it appears that more hunters are specifically hunting quail because they provide more sporting shooting and can be hunted on marginal lands without conflict with landowners or other hunters.

Population Trends: (Statistics page 3)

The 1949 spring census indicates that with certain exceptions Valley quail have decreased throughout the state. The only areas where increases were noted were Coos, Curry, Gilliam, Jefferson, and Malheur counties.

During the past winter deep, crusted snows and long periods of sub-zero

temperatures caused heavy losses of quail in most counties of the state. It was especially noted in Central Oregon that quail densities were in almost direct proportion to the depth of the narrow valleys providing habitat. The narrow valley with high rims maintained a higher quail population than did the more open valleys.

Many areas do not have quail established, however, with a good nesting year surpluses may be available for harvest in Southwestern Oregon, Central Oregon, and the Umatilla area.

An increase of quail densities from .6 birds per 100 acres to 2.8 birds per 100 acres was noted in Malheur County. Valley quail were first introduced into that area in 1948 as a small live-trapping and transplanting project.

Trapping and Transplanting:

The trapping and transplanting program initiated during the winter of 1949 was continued during 1950. Heavy snows made Central Oregon secondary roads impassable for long periods, while blocked mountain passes made liberation hauls virtually impossible. Therefore, it was necessary to use the Columbia River Highway and release most of the quail in the Willamette Valley.

The following tabulation shows disposition of trapped quail:

Quail Trapping and Transplanting 1950		
<u>County</u>	<u>Quail Trapped</u>	<u>Quail Liberated</u>
Polk	47	12
Yamhill	47	379
Clackamas		
Washington		153
Marion		190
Gilliam	60	
Wheeler	643	60
Totals:	797	794
Shipping Loss - 3 quail		

Experience gained in 1949 shows that it is not advisable to hold trapped quail on the game farms until spring. Disease losses are responsible for a greater loss than would be experienced with winter liberations at suitable sites.

Eastern Oregon quail apparently do not "stay put" when liberated in the Willamette Valley. Quail are found in only one-half of the areas where they were liberated.

Hunting: (Statistics page 8)

Season: Noon, October 21 to October 30, inclusive
Bag limit: 8 per day; 24 per season
Open area: Southwestern and Central Oregon

As usual, a measure of hunting success showed the greatest hunting pressure and highest hunter success in Crook, Deschutes, and Grant counties. This section does not support high pheasant densities and many hunters hunt specifically for quail. Other areas in the Columbia Basin have high densities of both pheasants and quail, but hunters are out specifically for pheasants and most quail are killed only incidentally.

HUNGARIAN PARTRIDGE:

The first Huns were brought into Oregon in 1900 and released in Multnomah and Marion counties. Later the game farms raised Huns and they became most successfully established in Umatilla, Wallowa, and Malheur counties.

Census data indicates a fair distribution of Huns in most Eastern Oregon counties but densities have been low since 1945. The current census indicates a slight increase in Hun numbers in some counties. (Statistics page 3)

The spring census does not provide a measure of Hun densities that can be compared with other upland game species because Huns normally begin pairing off in February and, for this reason, a smaller percentage of the Huns present are observed. Huns also inhabit foothill grass ranges not normally included in the pheasant quadrats. However, it is assumed that by consistently recording the Huns observed upon established census samples at a similar time each year an index of trends will be obtained.

Remnants of the past releases of Huns persist in Yamhill, Marion, and Linn counties but these few scattered coveys have not increased noticeably during the past ten years. Linn County coveys appear to be decreasing while Yamhill coveys remain the same.

The Wildlife Research Station has undertaken a project for the introduction of Huns from Denmark or other humid European areas, which may be better adapted to Western Oregon habitat.

With favorable reproduction this year, it is probable that a surplus of Huns will be available in Sherman, Jefferson, Wheeler, Morrow, Umatilla, and Malheur counties. Huns appear to be increasing in Umatilla, Morrow and possibly Malheur counties in the foothill areas.

An open season was held in Malheur County concurrent with the pheasant season. The bag limit was 3 a day or 6 in the season. One hundred thirty-one hunters were checked afield with 17 Huns. Kill per hunter was 0.13 and kill per hour hunted was 0.02. Nine hundred and three Huns were tagged at Game Commission stations, averaging 0.43 birds per hunter.

BOB-WHITE QUAIL:

At the present time, Bob White quail are present in limited numbers in the Willamette Valley, Malheur, and Umatilla counties. *The original introduction in the Willamette Valley was from Indiana in 1882 and the quail were released in Linn County. The Bob Whites in Malheur County are credited to a planting in the Boise Valley, Idaho, in 1875.

In recent years, this species has not produced surpluses for harvest; however, the current spring census indicates a substantial increase in Bob Whites in Malheur and Umatilla counties. Willamette Valley populations dropped substantially during the severe winter. Many coveys disappeared altogether. Eleven dead Bob Whites were found on one Benton County quadrat.

This species has a very high aesthetic value because of its inoffensive habits and cheerful call but is handicapped by its habit of roosting on the ground in sparse cover and does not appear to have the potentialities of Valley quail and pheasants as a sporting bird.

An increase in the distribution of the species through artificial propagation or trapping and transplanting would be desirable and an excellent public relations factor with landowners.

MOUNTAIN QUAIL:

Oregon's native Mountain quail at one time maintained high densities in Western Oregon and in Central Oregon counties on ranges that are now occupied by Valley quail.

A common theory of residents is that the two species are not compatible and that the Valley quail have driven the Mountain quail away. There are no observations to substantiate this theory but it is true that Mountain quail are now most commonly found on foothill or sagebrush ranges and are seldom observed in agricultural areas where Valley quail are most common.

A measure of population trends in coastal counties indicates a substantial increase in numbers of Mountain quail in that area and reports from Eastern Oregon districts indicate a similar increase on Central and Southeastern Oregon ranges. Initial measurements in Klamath County show .3 quail per mile. (346 miles, 104 quail).

The effects of the current severe winter on Mountain quail densities has not been determined, but it is probable that losses occurred on isolated ranges where the quail did not have access to waste foods around farmsteads.

An increase of the distribution of this species through trapping and transplanting or artificial propagation appears practical because many recently logged areas provide excellent habitat that is not at present stocked.

*Gabrielson and Jewett; Birds of Oregon

GROUSE AND MOUNTAIN QUAIL TRENDS
IN WESTERN OREGON

County	Miles Travelled	Blue Grouse				Ruffed Grouse				Mountain Quail			
		No.	Per Mile			No.	Per Mile			No.	Per Mile		
			1949	1948	1947		1949	1948	1947		1949	1948	1947
Clatsop	116	38	.33	.36	.21	15	.13	.14	.08	4	.03	.5	.23
Tillamook	196	74	.38	.28	.10	16	.08	.11	.03	36	.18	.47	.27
Lincoln	61	18	.30	.30	.07	31	.51	.10	.03	144	2.4	3.17	1.2
West Lane	23	1	.04	.00	.04	0	0	0	.04	17	.74	.5	.13
West Douglas	21	0	0	.12	.04	19	.90	.35	.5	27	1.3	.23	.07
Coos	169	46	.27	.21	.23	7	.04	.02	.03	450	2.6	.7	.64
Curry	87	17	.20	.18	.13	4	.05	.03	.02	49	.56	.5	.35
Douglas	20	4	.20	.05	.03				.02			.1	.1
Jackson	59	14	.23	.05	.03	3	.05	.02	.01	33	.56	.3	.2
Josephine	99	19	.19	.01	.01	13	.13	.01	.01	28	.28	.06	.07
Willamette Basin	85	61	.72	-	-	Increase	-	-	-	Decrease	-	-	-
TOTAL	936	292	.31	.18	.10	108	.12	.06	.04	788	.84	.55	.33

RUFFED AND BLUE GROUSE:

The native Ruffed and Blue Grouse are well distributed throughout the timbered sections of the state. High densities have not been reached recently, however, in coastal counties densities have continued to increase with a modest hunting season. The possibility of a maximum density factor must be considered for grouse. All grouse are more or less cyclic and, therefore, populations may be expected to fluctuate.

A measure of grouse population trends is obtained in Western Oregon by recording all grouse observed on big game census samples. In Eastern Oregon, most big game samples are done in winter and density measurements of grouse are not practical. District Agents are attempting to solve this problem and the following initial data have been obtained.

Umatilla County	162 miles	.28 Blue Grouse per mile
	162 "	.04 Ruffed Grouse per mile
Klamath County	346 "	.03 Sierra Grouse per mile

Nine Ruffed grouse were observed in Harney County, the first seen by Field Agents in four years.

Estimates indicate that Blue grouse continue to increase in Eastern Oregon, while Ruffed grouse remain static.

SAGE GROUSE:

The present distribution of Sage grouse is very similar to antelope except that Sage grouse extend into Grant, Union, Baker, and Wheeler counties.

Measurement of Sage grouse trends is made by spring counts of males on their strutting grounds. This activity is slowly gaining momentum. Strutting grounds are difficult to locate and must be visited several times at dawn. For this reason, variations may be large on limited observations between any two years.

However, observations over a period of several years should furnish trend measurements.

Information obtained in 1950 is given in the attached table. Trend data indicates a continued increase of grouse numbers in Southeastern Oregon. The decrease shown in Deschutes and Baker counties is not based on enough samples to prove a decline. However, should a new cyclic decline be starting, it would probably start on the outer limits of grouse range.

Comparative Trend Data
4 Years' Observations

County	No. Strutting Grounds	Males Counted			
		1947	1948	1949	1950
Baker	2	29	18	105	73
Harney	2	102	130	135	180

Comparative Trend Data
2 Years' Observations

County	No. Strutting Grounds	Males Counted	
		1949	1950
Deschutes	2	305	124
Harney	2	145	185

In addition to census of strutting grounds, a count of birds utilizing water holes in Southeastern Oregon is of value in determining population fluctuations of Sage grouse. The following records made in Malheur County will be of value for comparison with future data:

Month	Area	Sage Grouse
September, 1949	Cow Lakes	550
September, 1949	Jordan Valley	600
September, 1949	Antelope Flat	1,400
September, 1949	Beulah Reservoir	42
August, 1949	Ironside	70
August, 1949	Crooked Creek	200

Sage Grouse Population Trends
From Strutting Ground Counts

County	Strutting Grounds	Male Grouse Counted			
		1947	1948	1949	1950
Baker	Friday Mine	0	0	50	51
	New Highway	29	18	55	22
	Virtue Flat	45	67	75	Inaccessible
	(Unnamed)	-	-	-	13
Deschutes	Four Corners	-	-	212	71
	Con Guney	-	-	93	53
Harney	French Glen	67	85	95	120
	Lone Pine Road	35	45	40	60
	Oakerman Lake	-	-	100	125
	Palimano Buttes	-	-	45	60
	Willow Creek	-	-	-	-

Live-Trapping:

Sage grouse live-trapping commenced the last of September in Malheur County. Eight of the first birds trapped died the first night. Field autopsies revealed that seven of these were heavily infested with tapeworms. The remainder of the birds were then released.

Field Agents in Southeastern Oregon were instructed to collect specimens and forward them to the State College for autopsy. Eleven specimens were taken. Four of these were infested with tapeworms. All the infected birds were from the southern one-third of Malheur County.

Trapping was again attempted in an area where no tapeworms were found. Forty-two grouse were taken by truck to Sherman County. Four birds died in transit and the remaining 38 were liberated on September 25, 1949.

Hunting:

An open season from October 1 to 5, inclusive, was allowed in Malheur and Harney counties. The bag limit was 2 grouse for the season.

Field Agents were unable to locate any hunters in Malheur County. State Police checked only 8 birds. The hunting season in Harney County was successful with relatively light hunting pressure. Only one out of 9 birds checked had tapeworm. All hunters contacted in the field thought the grouse were extremely palatable.

Weights were obtained on 11 undressed grouse:

2 mature males	-	3 $\frac{1}{4}$ lbs. average
2 mature females	-	3 " "
4 immature females	-	1 $\frac{3}{4}$ " "
3 immature males	-	1 $\frac{3}{4}$ " "

It is anticipated that more extensive live-trapping will be practicable in 1950. Areas for trapping will be selected where no tapeworm infections are found.

WILD TURKEYS:

A few wild turkeys survive in Southwestern Oregon. Disease and poaching have provided a continuous drain on their numbers. There were an estimated 250 turkeys in 1949. Only a few are now left and only 11 have been seen this spring.

It is questionable whether future introductions would be of value. Turkeys are primarily a wilderness bird and the foothill country of Southwestern Oregon is no longer a wilderness area.

OTHER SPECIES:

The U. S. Fish and Wildlife Service has recently assigned an agent to study potentialities of a wide variety of exotic species in their native habitat with the hope of finding new species that may be more productive in portions of this country than the established natives and exotics.

This agent spent the summer of 1949 studying Black grouse and Capercaillie in Scandinavian countries and reports that the species may have good potentialities in the Northern tier of states but only a very limited amount of suitable habitat is available in Oregon.

Investigations this year will be centered in Turkey and the Himalayan Mountains to study the many varieties of partridge that occupy that area. It is possible that he may find species or sub-species that are better adapted to Oregon habitat than the present strains of Hun and Chukar partridge.

WINTER FEEDING:

Severe winter conditions in most of the state in January and February resulted in establishment of another winter feeding program.

Although deep snow and extreme cold temperature definitely handicap small game species and often result in higher than normal losses by predation and exposure, it does not appear that heroic efforts to provide emergency rations substantially alleviate the problem. Normally under such adverse conditions, the only birds that can be reached are those along main travelled roads and farmsteads and in those locations the birds have access to manure piles, feed lots, etc., which normally provide adequate food supplies.

The feeding of waterfowl in the Umatilla and Malheur counties was necessary and undoubtedly saved many birds.

Quail feeding is valuable but as only a fraction of the coveys needing sustenance can be fed, the number of birds surviving as a result of feeding is small.

The attached chart summarizes feeding operations for the winter of 1950.

Winter Feeding of Small Game
January and February, 1950

District	Amount of Grain	Species Fed		
		Pheasant	Quail	Waterfowl
Willamette	9,335 lbs.*	X	X	X
Southwest	1,000 lbs.	X	X	
Columbia	15,679 lbs.	X	X	
Central	6,000 lbs.	X	X	
Umatilla	20,000 lbs.**			X
Malheur	1,500 lbs.			X
<hr/>				
Totals:	53,514 lbs. or 26 3/4 tons	Approx. 14,514 lbs. or 7 1/2 tons	Approx. 13,340 lbs. or 6 1/2 tons	Approx. 25,660 lbs. or 12 3/4 tons

* 6,260 lbs. on hand from 1949

**Fish and Wildlife Service furnished 5 tons.

In addition, feed hoppers were operated in Grant and Harney counties as part of the habitat improvement program. Approximately 2 1/2 tons of grain were fed in hoppers.

Both sportsmen and farmers cooperated in the 1949 feeding program and only one serious complaint was received. In this instance, large quantities of grain were dumped in piles within a fenced pasture and, as a result, one cow died and two others were seriously foundered. In some areas grain was scattered along main travelled roads and probably caused a higher loss than would have occurred without feeding. These conditions could be avoided by refusing to issue grain to other than state employees but public enthusiasm and the size of the job demands that all willing persons participate.

UPLAND GAME REFUGES:

It has been the policy of the Commission to maintain seed stock refuges for the protection of upland game birds in heavily hunted areas that are lacking in escape cover. These contract refuges are not made for the convenience of the landowner alone, but must have a definite game value. It is anticipated that refuges will not be set up in the future unless the landowner will cooperate in habitat improvement projects.

The present status of upland game refuges is indicated in the following tabulation by districts.

Upland Game Refuges

District	Legislative		Contract		Total		% of Suitable Habitat
	No.	Acres*	No.	Acres	No.	Acres	
Willamette	5	17,300	59	52,711	64	70,011	5.5%
Southwest			2	3,364	2	3,364	1.4
Columbia			13	17,694	13	17,694	6.3
Umatilla	4	5,440	19	23,479	23	28,919	11.4
Central			1	414	1	414	.6
Northeast	1	1,000	5	5,240	6	6,240	3.6
Wallowa			2	739	2	739	1.5
TOTALS:	10	23,740	101	103,641	111	137,381	4.9%

*Estimated useful area.

The Legislative refuges referred to in the above chart include state lands declared refuges by proclamation of the Governor and permanent refuges established by acts of the state legislature. The principal objective of most of these refuges is to protect lives and property in the vicinity of State institutions and densely settled suburban communities.

The Contract refuges are established by the Oregon Game Commission through an easement with each individual landowner within the refuge area.

These agreements are legally recorded and normally extend over a five-year period.

MIGRATORY BIRDS

WATERFOWL:

Accumulation of waterfowl data increased somewhat over last year. The major portion of this work has been standardized and reported as a portion of the work of the Pacific Flyway Committee. For more specific details refer to flyway reports 7, 8, 9, and 10. A total of 11 key waterfowl areas are censused weekly and 10 banding stations are operated.

Census:

Field agents of the Game Commission participated in the annual nation-wide waterfowl inventory for the third year. Data obtained on permanent census samples by these agents are presented. It is believed that these systematic measurements by trained observers are more accurate than measurements made by untrained observers. For that reason, only data obtained by Game Commission agents are used.

An overall increase of 29.4 per cent for wintering waterfowl was noted from the previous year. This increase occurred in the coastal counties and Columbia Basin.

Data released by the Fish and Wildlife Service show that 31 per cent of the North American waterfowl are in the Pacific Flyway. Twenty-four per cent of the kill and twenty-one per cent of the duck stamp sales are made in the Pacific Flyway. Wintering waterfowl in the six states of the flyway declined 19.5 per cent from 1949.

Some concern has been expressed that competition from coots is detrimental to ducks. Coot populations in this flyway are only half as great as in 1948 and at the present time coots comprise only five per cent of the flyway waterfowl population.

Full data obtained during the weekly key area census may be obtained in the flyway reports previously referred to.

	<u>January Inventory, 1950</u>		
<u>Species:</u>	<u>1950</u>	<u>1949</u>	<u>1948</u>
Mallard	84,119	44,611	73,288
Gadwall	1,269	208	0
Baldpate	20,212	27,841	8,443
Green-Winged Teal	5,868	1,759	573
Shoveller	1,866	253	114
Pintail	25,504	13,228	9,926
Wood Duck	13	68	63
Redhead	91	52	11
Canvasback	2,133	1,632	1,435
Scaup	3,080	2,232	1,972
Ring-Necked Duck	281	258	91
Golden-eye	778	228	173
Bufflehead	635	445	796
Ruddy	669	732	486
Unidentified Ducks	8,694	14,863	3,300
Coot	9,483	7,596	5,683

January Inventory, 1950 (Cont'd)

<u>Species</u>	<u>1950</u>	<u>1949</u>	<u>1948</u>
Scoter	634	245	186
Merganser	543	230	310
Snow Goose	0	36	0
Cackling Goose	1,390	1,065	975
White-Fronted Goose	0	0	2
Canada Goose	7,244	19,236	12,542
Black Brant	3,600	803	2,614
Swan	165	165	209
TOTALS:	178,271	137,786	123,192

Change from previous year: \neq 29.4% \neq 11.8%

For the past four years a species composition census has been conducted in the Coquille Valley, Coos County, during February.

SPECIES COMPOSITION

<u>Species</u>	<u>COQUILLE VALLEY</u>			
	<u>Per Cent of Population</u>			
	<u>1947</u>	<u>1948</u>	<u>1949</u>	<u>1950</u>
Pintail	40.6	29.4	27.6	19.4
Mallard	29.3	23.5	9.2	28.8
Baldpate	5.1	18.1	28.5	17.8
Scaup	1.3	1.7	1.8	3.4
Shoveller	2.4	0.0	0.3	9.2
Wood Duck	1.8	.2	.4	-
Green-Winged Teal	3.9	2.0	4.3	3.5
Hooded Merganser	0.6	0.0	0.2	-
Ruddy Duck	0.0	0.8	0.0	6.0
Bufflehead	0.0	1.3	0.0	2.0
Coot	14.8	23.2	27.1	14.1
Whistling Swan	0.0	0.0	1.6	-
Gadwall	0.0	0.0	0.0	1.2

Harvest:

Season: Noon, October 21 to November 9, inclusive, and
Noon, December 19 to January 7, inclusive.

Bag Limit: 5 ducks a day or 10 in possession.
6 geese a day or 6 in possession.

Hunter kill data obtained from a random bag check throughout the state are presented in the following tables. A comparative trend measurement of hunter success for the past four years is of general interest.

Year	Birds Per Man-Day
1946	1.53
1947	1.52
1948	2.27
1949	2.00

Weather was generally poor. The first half of the split season was clear, warm, and unfavorable for duck hunting throughout the state. Considerable public agitation has been evident in favor of a continuous season next year.

SUMMARY STATE-WIDE HUNTING SUCCESS

	1949		
	East of Cascades	West of Cascades	State-Wide Total
Hunters Checked	369	609	978
Waterfowl Killed	855	1,043	1,961
Success Ratio (Birds per man-day)	2.31	1.71	2.00

STATE-WIDE HUNTING CHECK BY SPECIES, 1949

Species	Kill		Total State-Wide
	East of Cascades	West of Cascades	
Mallard	608	430	1,038
Baldpate	68	145	213
Pintail	57	153	210
G. W. Teal	58	96	154
Scaup	25	21	46
Wood Duck	-	27	27
Bufflehead	1	11	12
Gadwall	5	11	16
Shoveller	6	22	28
Canvasback	5	11	16
Goldeneye	13	1	14
Ruddy	1	2	3
Ring-neck	-	8	8
B. W. Teal	2	-	2
Redhead	4	1	5
Merganser	-	1	1
Unclassified	2	2	4
Total Ducks:	855	942	1,797

STATE-WIDE HUNTING CHECK BY SPECIES, 1949
(Cont'd)

Species	Kill		Total State-Wide
	East of Cascades	West of Cascades	
Snow Goose	3	3	6
Canada Goose	47	17	64
W. F. Goose	2	-	2
Black Brant	-	19	19
Cackling Goose	11	31	42
Lesser Canada Goose	-	8	8
Total Geese:	63	78	141
Coot	-	23	23
Total all Waterfowl:	918	1,043	1,961

A comparison of the percentage of harvest to the percentage of population follows. Population composition was obtained by adding all waterfowl of each species counted between October 1, 1949, and December 31, 1949, on the various key area census samples and using the resulting figures as a base. Mallard, Green-Winged Teal, Scaup, and Wood Duck, are the species apparently being shot in excess of the population percentages.

COMPARISON OF PERCENTAGE OF HARVEST
TO PERCENTAGE OF POPULATION, 1949

Species	East of Cascades		West of Cascades	
	% of Bag	% of Population	% of Bag	% of Population
Mallard	66.3	24.7	41.1	23.7
Baldpate	7.4	6.7	13.9	35.0
Pintail	6.2	9.9	14.6	29.4
Green-Winged Teal	6.3	2.8	9.1	2.0
Scaup	2.7	1.3	2.0	1.3
Wood Duck	-	-	2.6	.4
Bufflehead	.1	.3	1.1	.3
Gadwall	.5	3.5	1.1	.01
Shoveller	.6	1.3	2.1	0.4
Canvasback	.5	.9	1.1	1.4
Golden-eye	1.4	.1	0.1	.5
Ruddy	.1	.01	0.2	.4
Ringneck Duck	-	.5	0.8	.8
B. W. Teal	.2	*	-	-
Redhead	.4	1.3	0.1	-
Merganser	-	.2	0.1	.09
Unclassified	.2	.3	0.2	.8
Snow Goose	.3	12.1	0.3	-
Canada Goose	5.1	5.8	1.6	1.6
W. F. Goose	.2	.5	-	.02
Brant	-	-	1.8	1.7
Cackling Goose	1.2	1.2	3.0	.01
Lesser Canada Goose	-	.4	0.8	.04
Scoter				.3
Coot	0	25.4	2.2	1.8

Sex and age data are presented. Age data on Mallards are not believed to be indicative of the true population age classes. Other species probably represent a cross section of the population.

PERCENTAGES OF WATERFOWL KILLED BY SEX
STATEWIDE, 1949 SEASON

Species	Male:Female %		No. Checked	Male:Female %		No. Checked	Male:Female %		No. Checked
	First Half			Second Half			Entire Season		
Mallard	50 - 50		312	59 - 41		831	56 - 44		1143
Baldpate	49 - 51		173	52 - 48		257	51 - 49		430
G. W. Teal	39 - 61		120	44 - 56		158	42 - 58		278
Pintail	45 - 55		180	46 - 54		203	45 - 55		383
Spoonbill	26 - 74		27	-		13	35 - 65		40
Gadwall	61 - 39		18	-		11	62 - 38		29
Scaup	61 - 39		28	63 - 37		19	62 - 38		47
Canvasback	-		8	59 - 41		17	60 - 40		25
Golden-eye	-		10	-		-	32 - 68		25
Wood Duck	37 - 63		16	-		7	43 - 57		23
Canada Goose	65 - 35		29	68 - 32		19	67 - 33		48
Cackling Goose	43 - 57		21	-		5	46 - 54		26

AGE RATIO OF WATERFOWL KILL, STATEWIDE, 1949

Species	First Half		Second Half		Season Total		Ratio Total Adult To Total Imm.
	Male	Female	Male	Female	Male	Female	
	Ad. Imm.	Ad. Imm.	Ad. Imm.	Ad. Imm.	Ad. Imm.	Ad. Imm.	
Mallard	1:0.48	1:0.50	1:0.86	1:1.57	1:0.65	1:1.085	1:0.75
Pintail	1:0.9	1:1.15	1:1.16	1:2.03	1:1.01	1:1.49	1:1.26
Baldpate	1:2.85	1:2.77	1:3.47	1:1.94	1:3.20	1:2.27	1:2.69
G. W. Teal	1:1.78	1:1.65	1:0.90	1:0.80	1:1.23	1:1.17	1:1.19
Shoveller	-	1:5.69	-	-	-	1:7.65	1:5.17
Gadwall	-	-	-	-	-	-	1:2.25
Scaup	-	-	-	-	1:1.50	-	1:1.06
Canada Goose	1:0.73	1:0.67	-	-	1:1.15	-	1:0.91
Cackling Goose	-	-	-	-	-	-	1:1.16

The data presented in the preceding tables do not include a measurement of hunting success on the four public shooting areas operated by the Oregon Game Commission. Public shooting grounds attract a large proportion of novice or inexperienced hunters and, therefore, do not express the state-wide hunting results. The following special report summarizes data from the public hunting grounds.

PUBLIC SHOOTING GROUNDS, 1949

The 1949 waterfowl season showed no perceptible change in the number of hunters from the 1948 season.

Unfavorable weather conditions resulted in a much lower total kill, especially of geese. Sauvie Island was in operation for the first time.

Results of the season are presented in the following tables:

Hunting Pressure

<u>Area</u>	<u>Permits Issued</u>	<u>Resident</u>	<u>Non-Resident</u>
Summer Lake	3,684	3,641	43
Malheur	1,401	1,324	77
Chewaucan	190	190	-
Sauvie Island	1,665	-	-

Hunting Success

<u>Area</u>	<u>Success Ratio:</u>		<u>Birds Per Man Day</u>
	<u>Ducks</u>	<u>Geese</u>	
Summer Lake	1.40	0.16	1.56
Malheur	1.20	0.26	1.46
Chewaucan	2.24	0.82	3.06
Sauvie Island	1.16	0.02	1.18

Waterfowl Killed

<u>Area</u>	<u>Ducks</u>	<u>Geese</u>	<u>Total</u>
Summer Lake	5,061	589	5,650
Malheur	1,681	360	2,041
Chewaucan	412	151	563
Sauvie Island	1,896	30	1,926
<u>TOTAL:</u>	<u>9,050</u>	<u>1,130</u>	<u>10,180</u>

WATERFOWL KILL BY SPECIES

Species	Summer Lake	Malheur	Chewaucan	Sauvie Island	Total
Mallard	1,849	237	320	768	3,174
Pintail	851	118	31	340	1,340
Baldpate	819	700	12	508	2,039
Green-Winged Teal	890	37	22	233	1,182
Shoveller	189	76	-	15	280
Canvasback	18	96	10	18	142
Gadwall	141	349	7	1	498
Redhead	112	11	-	2	125
Scaup	28	17	7	1	53
Ruddy	24	7	-	-	31
Golden-eye	9	15	2	-	26
Bufflehead	11	8	1	3	23
Cinnamon Teal	-	-	-	-	-
Merganser	2	-	-	-	2
Scoter	-	2	-	-	2
Wood Duck	2	-	-	-	2
Coot	115	5	-	2	123
Ring-Necked	-	3	-	5	8
TOTAL DUCKS:	5,061	1,681	412	1,896	9,050
Snow Goose	298	31	28	-	357
Canada Goose	102	257	64	21	444
Cackling Goose	103	11	46	6	166
White Fronted Goose	71	2	12	-	85
Lesser Canada Goose	14	56	1	3	74
Ross's Goose	1	3	-	-	4
TOTAL GEESE:	589	360	151	30	1,130
TOTAL WATERFOWL:	5,650	2,041	563	1,926	10,180

Estimated State Kill:

The following data shows the computation of the estimated state-wide kill, based on duck stamp sales from July 1, 1949, to January 1, 1950.

Duck Stamp Sales	52,049
Less 14% Non-Hunters (Obtained from Fish & Wildlife Service)	44,762
Number of Trips Per Hunter (Personal Contact Survey)	4.7 Times
Number of Birds Per Day	2.0 Birds
TOTAL STATE RECOVERED KILL:	420,763
Non-Recovered Cripples 202/day (Based on 351 Hunters, 71 birds lost)	9,042
TOTAL HUNTING KILL	429,805

Waterfowl Losses:

The only measurement of other losses was obtained in the Umatilla County area in northeastern Oregon. An extract of the District Biologist's report follows:

Waterfowl Winter Loss:

Following the break-up in the severe winter weather on February 8, a tabulation was made of all duck losses found in the Umatilla Basin area. Some losses were found in conjunction with other work while actual surveys were made on some drain ditches and sloughs that had been open during the cold weather. A total of 697 dead ducks have been counted to date -- a breakdown of which is shown below: (Only those that could be positively identified as recent losses were counted.)

<u>Species</u>	<u>Total</u>	<u>Male</u>	<u>Female</u>	<u>% of Total Loss</u>
Mallard	465	261 (56%)	204 (44%)	66.7%
Baldpate	137	69	68	19.7
Pintail	28	17	11	4.0
G. W. Teal	64	29	35	9.2
Gadwall	3	3	0	0.4
<u>TOTALS:</u>	<u>697</u>	<u>379</u>	<u>318</u>	<u>100.0%</u>

On the basis of these findings, it is estimated that between 2,000 and 3,000 ducks were lost in the basin area during the past winter. Basing per cent of loss on the estimated 30 to 50,000 ducks that were in the area at various times during the winter, the loss would run between 5 and 10% for the winter.

Of the 697 ducks examined, 7 were banded. (Some 80% of those found still had both legs intact.) Five of these were banded at the Hermiston trap and two at some other unknown station. Three of the ducks banded at the Hermiston trap were found within one mile of the station, one approximately 8 miles away, and the other some 10 miles distant near Cold Springs Reservoir. Many of the ducks found were in extremely emaciated condition while others were in good flesh -- the latter possibly indicating normal loss from old age, poisoning, or the like. The heavier loss in males among the mallards may be due to the presence of a higher percentage of males in this species in the area. Of the 2,516 mallards banded at the Hermiston trap during the winter, 1,597 or 62% were males. This compares reasonably close with the 56% mallard males found among the losses.

Losses were found in all areas -- those where no feeding was done as well as in the areas where extensive feeding was conducted. However, losses were apparently heaviest in the areas where no feeding was conducted -- particularly in the isolated sloughs and open drain ditches. Heaviest loss was found on the drain ditch originating at the base of the Cold Springs Reservoir and emptying into the Columbia River. A total of 257 dead ducks were found along this stream. Sixty baldpates were found in one drain ditch where only 12 of the other species were found. Many

losses were found around grain stacks, stubble fields and feed lots.

Apparently loss among the geese using the area was similar to that suffered by the ducks. These are much more difficult to find, but judging by the extremely emaciated condition of the 16 geese found, it could probably be assumed that loss was heavier than indicated by this small number. Some 4 to 6,000 geese were in the area during the first freeze but practically all of these left about three days after the second cold period started.

Some loss has occurred in the Milton-Umapine area and in the Willow Creek section but as no survey has been made to date, no estimate of the loss is possible.

In addition to the duck and goose losses indicated above, 13 coots and 8 blue herons have been found.

Disease:

Approximately 300 ducks died during October, 1949, on the grounds of the State Penitentiary at Salem, Oregon. Cause of death was a fungus, aspergillosis which caused an infection of the lungs. Source of the fungus was a large mass of decaying corn waste from the prison cannery.

The situation was eliminated by burning the pond border vegetation with fuel oil and three intensive chlorination treatments of the water in the pond.

Waterfowl Production:

Permanent census samples were established to measure the population of waterfowl breeding in the state and to measure the production of young waterfowl. Data obtained are expressed as breeding pairs per square mile and young ducks per square mile. These figures will establish a trend index to determine production in future years.

The following brood classes are used:

- Class 1 - Under 1/3 grown
- Class 2 - 1/3 to 2/3 grown
- Class 3 - Over 2/3 grown

Nesting conditions were generally very good throughout the state. Summary tabulations of the data obtained follow. This is the first season's work on this census. There are no figures to compare this data with; therefore, it is submitted without comment.

Summary of Breeding Populations

	<u>Pairs Per</u> <u>Sq. Mile</u>	<u>Single Drakes</u> <u>Per Sq. Mile</u>	<u>Total Population</u> <u>Per Sq. Mile</u>
East of Cascades	9.05	3.07	21.17
West of Cascades	1.06	0.53	3.73

OREGON WATERFOWL BREEDING POPULATION, 1949

EAST OF CASCADES

SQ. Mile Censused	Species	Pairs Seen	Single Drakes Seen	Total	Pairs Per Sq. Mile	Single Drakes Per Sq. Mi.	Total Per Sq. Mi.
68.5	Mallard	155	78	388	2.26	1.12	5.64
	Pintail	21	1	43	0.31	0.01	0.63
	Cin. Teal	129	12	270	1.88	.17	3.94
	B. W. Teal	2	-	4	0.03	-	0.06
	Gadwall	40	7	87	0.58	.12	1.27
	Redhead	69	8	146	1.03	.12	2.15
	Shoveller	11	7	29	0.16	.12	0.48
	Baldpate	9	6	24	0.13	0.09	0.35
	Ruddy	6	20	32	0.09	0.29	0.47
	Can. Goose*	178		427	2.59	1.17	6.23
TOTALS:		620	210	1,450	9.05	3.07	21.17

*No attempt made to break down number of nesting birds.

WEST OF CASCADES

24.5	Mallard	26	14	66	1.06	0.57	2.69
	Wood Duck	7	1	15	0.29	.04	0.61
	Canvasback	-	1	1	-	0.04	0.04
TOTALS:		33	16	82	1.35	0.65	3.35

1949 BROOD CENSUS SUMMARY

EAST OF CASCADES

Period	Census Area Sq. Mi.	Species	Total		Average Brood Size No.			No. Broods Per Sq. Mi.	No. Young Per Sq. Mile
			Females Censused	% Fem. W/Broods	Class 1	Class 2	Class 3		
May 2d Half	63.5	Mallard	83	10	8.2			0.1	1.0
		Pintail	1	0					
		Cin. Teal	17	13	7.5			0.03	0.2
		Gadwall	18	0					
		Redhead	38	3	6.0			0.01	0.1
		Ruddy	6	0					
	Can. Goose	46	100*	4.4	5.5	6.5	0.7	3.6	
TOTAL:							.9	4.9	

*No attempt made to count female Geese without broods.

1949 BROOD CENSUS SUMMARY (Cont'd)
EAST OF CASCADES

Period	Census Area Sq.Mi.	Species	Total		Average Brood Size No.			Broods Per Sq.Mi.	No. Young Per Sq. Mile
			Females Censused	% Fem. W/Broods	Class 1	Class 2	Class 3		
June 1st Half	63.5	Mallard	75	16	7	5	10.5	0.2	1.4
		Pintail	16	0					
		Cin.Teal	15	0					
		Gadwall	4	0					
		Redhead	25	4	3			0.01	.05
		Ruddy	5	0					
		Wood Duck	7	29		4.5		.03	.1
		B.W.Teal	17	0					
		Shoveller	4	0					
		Scaup	1	0					
Can.Goose	10	100*					0.2	1.1	
TOTAL:								.41	2.8
June 2d Half	49.5	Mallard	39	33	8.7	7	11	0.3	1.9
		Pintail	3	0					
		Cin.Teal	3	33	9			.02	.2
		Gadwall	4	25	4			.02	.1
		Redhead	10	40	5.7	2		.08	.4
		Ruddy	1	100		8		.02	.2
		Wood Duck	1	100	4			.02	.1
		B.W. Teal	14	0					
		Shoveller	1	0					
		Can.Goose	8	100*		5.5	14.3	.2	2.0
TOTAL:								.59	4.7
July 1st Week	52	Mallard	36	28	7	6.2	5.3	.2	1.3
		Cin.Teal	10	100	9.8	3	9	.2	1.7
		Unident.Teal	4	100	7.8			.08	0.6
		Gadwall	12	83	9.4			.2	1.8
		Redhead	14	93	9.1	9		.25	2.3
		Ruddy	1	100	7			.02	0.1
		Shoveller	1	100			10	.02	.2
		Can. Goose	8	100*			11	.15	1.7
		TOTAL:							
July 2d Week	54	Mallard	77	65	6.5	7.8	5.5	0.93	6.0
		Pintail	8	75	7.5	6.5		0.11	.8
		Cin.Teal	23	69	5.5	5.4	4.0	0.29	1.6
		G.W. Teal	5	60	7	5		0.09	.3
		Gadwall	21	86	6.8	5.5		0.33	2.2
		Redhead	9	89	8	6	3	0.15	0.9
		Baldpate	1	100	10			0.02	0.2
		Shoveller	4	75	6			0.06	0.3
		Ruddy	14	43	6.3			0.11	0.7
		Can.Goose	15	100*			5.2	0.28	1.4
TOTAL:								2.33	14.46

*No attempt made to count female Geese without broods.

WEST OF CASCADES

Census Area	Sq.Mi.	Species	Total		Average Brood Size			No. Broods Per Sq.Mi.	No. Young Per Sq. Mile
			Females Censused	% Fem. W/Broods	Class 1	Class 2	Class 3		
May 1st Half	2	Mallard	5	40	10.5			1	10.5
TOTAL:								1	10.5
May 2d Half	19.5	Mallard	20	20	9.0	8	7	0.2	1.6
		Wood Duck	6	50	3.7			0.15	0.6
TOTAL:								0.36	2.2
June 1st Half	14.7	Mallard	21	52	5.4	3	8	0.75	3.9
		Wood Duck	11	18	8.5			0.13	1.2
		B.W.Teal	2						
TOTAL:								0.88	5.1
June 2d Half	10.5	Mallard	5	0					
		Wood Duck	2	0					
TOTAL:								0	0
July 1st Half	10.59	Mallard	7	54		4	5	0.38	1.8
		Wood Duck	7	54		10.7	6	0.38	3.6
		B.W.Teal	3	67	9			0.19	1.7
TOTAL:								0.94	7.1

Banding:

Five additional banding stations were established during the past year. The ten banding stations operated by the Commission are located as follows:

Summer Lake	- Lake County
Lake Lyttle	- Tillamook County
New Lake	- Curry County
Hermiston	- Umatilla County
Ontario	- Malheur County
Sauvie Island	- Columbia County
Warner Valley	- Lake County
Amity	- Yamhill County
Nehalem Bay	- Tillamook County
Lakeview	- Lake County

Banding is done by the local District Agent. Banding at Summer Lake and Sauvie Island is done by the Refuge Biologist. The banding trap at La Grande was dismantled when drainage operations destroyed its usefulness. Birds banded are presented in the attached tables. For a complete break-down by sex and age, see the appropriate flyway reports.

Band Recoveries:

Band recoveries for the period May 1, 1949, to April 30, 1950, are presented in the attached tables. Not enough returns have been received to date to indicate intrastate flyways. Indications are that the majority of birds wintering in Northeastern Oregon nest in Alberta.

BAND RECOVERIES
May 1, 1949 to April 30, 1950
Recoveries of Birds Banded at Summer Lake
Place of Recovery

Species	Local	Grant County	Malheur County	Klamath County	Calif.	Wash.	Idaho	Utah	Alberta	Mexico	TOTAL
Mallard	44		1	1	2				1		49
Pintail	7				2						9
Baldpate	3			1			1				5
G. W. Teal	8					1					9
Cinnamon Teal										1	1
Gadwall	15				3	1				1	20
Redhead	2			1			1	1			5
Canada Goose	8	1				1			1		11
Snow Goose	1										1
TOTAL	88	1	1	3	7	3	2	1	2	2	110

WATERFOWL BANDING

May 1, 1949 to April 30, 1950

Species	Summer Lake	La Grande	Ontario	Hermiston	Lake Lyttle	Sauvie Island	Warner Valley	Lakeview	Amity	Nehalem	TOTAL
Mallard	333	46	542	2,508		16	191	37	4	11	3,688
Pintail	59		77	27		115	132			6	416
Baldpate	49		37	8		76	5	2			177
G. W. Teal	105		3	3		24	5		2		142
Cinnamon Teal	113	3					31				147
Gadwall	93						10				103
Shoveller							2				2
B. W. Teal						3					3
Wood Duck						3					3
Redhead	40				3		31				74
Canvasback					16						16
Greater Scaup					72					56	128
Lesser Scaup					29						29
Ring-Neck					22						22
Surf Scoter					2						2
Canada Goose	36						11	8			55
Lesser Canada Goose								3			3
Cackling Goose				1							1
Snow Goose	4										4
Coot	2										13
TOTAL	834	49	659	2,547	155	237	418	50	6	73	5,028

RECOVERIES OF BIRDS BANDED AT LA GRANDE

Species	Place of Recovery							Total
	Local	Calif.	Wash.	Montana	Texas	Alberta	Alberta	
Mallard	2	1	2	2	1	1	1	8
Redhead								1
TOTAL	2	1	2	2	1	1	1	9

RECOVERIES OF BIRDS BANDED AT ONTARIO

Species	Local	Place of Recovery							TOTAL
		Baker County	Calif.	Wash.	Idaho	Montana	Alberta	Alaska	
Mallard	4	1	1	9	3	2	1	22	
Pintail	1							1	
Baldpate	1							1	
Canada Goose						1		1	
TOTAL	6	1	1	9	3	3	1	25	

RECOVERIES OF BIRDS BANDED AT HERMISTON

Species	Local	Place of Recovery							Total	
		Baker County	Wash.	Idaho	Dakota	Iowa	British Columbia	Alberta		Sask.
Mallard	10	1	6	2	1	1	1	9	3	36

Recoveries of Birds Banded in Warner Valley

Species	Place of Recovery				Total
	Local	California	Nevada	Idaho	
Mallard	3	5	1	1	10
Pintail	1	2			3
Baldpate		1			1
Gadwall		1			1
Redhead		1			1
TOTALS:	4	10	1	1	16

Recoveries of Birds Banded at Sauvie Island

Species	Place of Recovery			Total
	Local	Coos County	Washington	
Pintail	4		1	5
Baldpate	2	1		3
TOTALS:	6	1	1	8

Recovery of Birds Banded in Coos County

<u>Species</u>	<u>Local</u>
Mallard	1

BIRDS RETRAPPED THREE MONTHS TO ONE YEAR AFTER BANDING

Place Banded	Species	Placed Retrapped		
		Local	Idaho	Wash.
Summer Lake	Mallard	1		
	Pintail	1		
	Gadwall	1		
Ontario	Mallard	1	1	
Hermiston	Mallard	7		1
Tillamook County	Canvasback	1		
	Ring-Necked	1		
	G. Scaup	4		
	L. Scaup	1		
	Coot			1
TOTALS:		18	1	2

SNIPE:

Densities of Jack snipe are measured in Western Oregon during the upland game spring census.

Snipe Densities, Western Oregon			
District	Birds Per 100 Acres		Area Censused
	1949	1950	
Willamette	1.6	1.8	7,673 acres
Southwest	-	0.31	1,620

MOURNING DOVE:

Dove census work consists of two phases. A measurement of densities of wintering birds in the Willamette Valley and a state-wide census in August. The August census consists of car strips and densities are recorded as doves per mile. Many doves were winter killed in the Willamette Valley.

1950 Spring Dove Census
Western Oregon

District	Birds Per 100 Acres		Area Censused
	1949	1950	
Willamette	3.1	3.4	7,673 acres
Southwest	8.2	2.8	1,620

1949 Dove Census
Last Half of August

District	County	Miles Traveled	Doves Observed	Doves Per Mile Traveled
Central	Deschutes	50	74	1.5
	Crook	50	640	12.8
Umatilla	Umatilla	70	133	1.9
	Morrow	64	122	1.9
Grant	Grant	37	57	1.5
Wallowa	Wallowa	193	107	0.6
Northeast	Baker	81	22	0.3
	Union	57	7	0.1
Harney	Harney	38	17	0.4
Malheur	Malheur	50	77	1.5
Total Eastern Oregon:		690	1,256	1.8
Willamette	Yamhill	46	32	0.7
	Marion	19	12	0.6
	Polk	29	14	0.5
	Lane	156	33	0.2
	Benton	56	13	0.2
	Linn	56	41	0.7
Total Western Oregon		362	145	0.4

Harvest:

Regulations of the Federal Government provide for a 15-day season with a daily bag and possession limit of ten birds. Migrations have started by the September 1 opening date, and few doves are to be found in the north portions of Eastern Oregon. However, the birds raise more than one brood and an earlier season would leave many orphaned young still in the nest. Hunting intensity has greatly increased on doves.

Success ratios obtained in Eastern Oregon since hunting checks started are:

Year	Birds Per Day
1946	2.55
1947	6.94
1948	4.68
1949	5.16

1949 Dove Hunting Success
By County and District

County and District	Hunters Checked	Doves Killed	Success Ratio 1949	Success Ratio 1948
Crook	27	80	3.0	-
Deschutes	36	163	4.5	-
Jefferson	54	318	5.9	-
Lake (North portion)	4	40	10.0	-
Sub-total Central District*	121	601	5.0	6.39
Umatilla	34	215	6.3	-
Harney	9	19	2.1	1.18
Malheur	16	107	6.7	-
Wasco	8	28	3.5	-
Total Eastern Oregon	188	970	5.16	4.68
Josephine and Jackson	27	8	0.3	0.35
Total Western Oregon	27	8	0.3	0.35

*Crippling loss - 49

A small age and sex sample was obtained and is recorded for future comparison:

<u>Males</u>	<u>Females</u>	-	<u>Adult</u>	<u>Young</u>
16	14		30	34

Mourning dove hunting is growing in popularity. The annual crop is greatly under harvested; however, field measurements now in use should provide accurate information on population trends and enable management techniques to be applied when they may be needed.

BAND-TAILED PIGEON:

The population status of pigeons has been determined primarily from hunter bag checks. Experimental census work in the North Coast District shows promise and a census in late August will be made throughout Western Oregon.

Intensive hunting pressure, commercialization, and decline in pigeon numbers give cause for concern. It should again be emphasized that all authorities agree that the band-tailed pigeon lays only one, or occasionally two eggs per year. Intensive shooting and a low reproductive potential mean that decimated populations would take years to recover.

Census:

Census data obtained at Nehalem Bay, Tillamook County, are presented. Birds were counted from daylight to 11:00 A.M. the last day of August at one concentration point.

<u>Year</u>		<u>Pigeons Counted</u>
1946	-	270
1947	-	1,007
1948	-	817
1949	-	561

Harvest:

The special report of the 1949 pigeon season is presented. The season was from September 1 to September 30, inclusive. Bag limit was 10 a day and in possession. In the Willamette Valley the limit was 5 a day and not to exceed 24 birds during the season. Intensive field checks aided in enforcing this season limit and it is believed that substantial reductions in the kill were attained.

1949 Band-tailed Pigeon Hunting Season:

Field measurements made during the 1949 pigeon season indicate that the decline in pigeon numbers is continuing and in many cases is accelerated. This is due to continued over-shooting and to a purported large kill of birds during

the winter of 1949 in California. This kill was due to grain damage. It must be understood by all concerned that pigeons are incapable of scratching out drilled seed. They eat only waste grain left on the surface of the ground.

Methods:

Population data on pigeons are based almost entirely on kill data. Experimental census methods on trial in the North Coast District show the same general decline in pigeon numbers. Hunting pressure is constantly increasing. The size of the kill sample is likewise increasing. Both of these factors have a tendency to invalidate the data from a purely statistical viewpoint. However, decreases are borne out by general observations. The data presented in this report are believed to be the only factual measurements on pigeons for the West Coast, and therefore, is the only reliable information available today.

Trend Data:

The over-all pigeon kill data for the last four years is presented in the table below. It should be noted that the trend expressed in the success ratio column has been constantly downward.

Western Oregon Band-tailed Pigeon Hunting Check			
Year	Hunters Checked	Pigeons Killed	Success Ratio Birds Per Man-Day
1946	74	394	5.32
1947	304	1,053	3.41
1948	466	1,405	3.01
1949	1,200	2,678	2.23

Hunting pressure and pigeon habits vary a great deal in different sections of Western Oregon. It is interesting to compare kill data by geographic sections of the state. This has been done in the following table. Pigeon flocks did not migrate through Southwestern Oregon until after the season had closed in 1949. Therefore, hunter success in that region was zero.

Kill Data by Geographical Locality		
Area	1948 Success Ratio	1949 Success Ratio
North Coast	3.31	2.00
South Coast	4.22	3.62
Willamette Valley	2.89	2.19
Southwestern Oregon	2.83	0.00

The heaviest hunting pressure is found in the Willamette Valley. Naturally, therefore, the most intensive field check of hunters is made there. Hunting is done at pigeon stands where birds are attracted by mineral springs. Ten new stands were located this year, bringing the total number of known stands to 25. It is felt that we have located about half of these stands to date.

Comparative data on individual shooting stands are presented in the table below. It will be noted that several of these areas show a higher kill per man in 1949 than in 1948. The 1949 data was gathered at the first of the season when the kill was heaviest. In some instances, the small size of the sample taken in previous years may not be statistically valid. More probably, there were more pigeons in these areas, as pigeons are a migratory bird. However, increases were generally quite small, while the more numerous decreases were larger. The apparent decrease in pigeons is still continuing.

Willamette Valley Pigeon Kill By Area

Area	County	Hunters 1949	Kill 1949	Success Ratio			Admitted Crippling Loss, 1949
				Birds Per Man-Day 1947	1948	1949	
Dutch Canyon	Columbia	31	70	.	.	2.3	16
Aurora	Marion	197	492	.	3.4	2.5	132
Silver Springs	Yamhill	9	39	.	5.3	4.3	16
Baker Creek	Yamhill	Closed by owner. No birds.					
Salt Creek	Polk	2	5			2.5	
West Monmouth	Polk	36	144	6.1	3.8	4.0	29
Whitaker Springs	Polk	36	152			4.2	39
Kester Springs	Benton	13	56		4.4	4.3	9
Sulfur Springs	Benton	78	60	.9	1.3	0.77	10
Pigeon Butte	Benton	50	121	4.7	1.7	2.4	21
Twin Pine Club	Benton	21	65	5.6	3.6	3.1	18
Cheshire	Lane	25	74		4.5	3.0	
Waterloo	Linn	284	296		1.0	1.04	145
Crawfordsville	Linn	187	567	3.5	2.8	3.00	40
Valley Junction	Polk	53	91			1.7	17
Blue Lake	Multnomah	3	14			4.7	
TOTAL:		1,025	2,246	2.95	2.89	2.19	492

Age Ratio:

All birds were reclassified for age when time permitted. The absence of a white-neck ring indicates a young bird. Autopsies indicate that this method is not completely accurate. Some birds hatched early in the season are developing white-neck bands by September. A large enough sample to determine the percentage of error has not been made. Age classification based on neck bands is presented in the following table.

1949 Age Classification of
Pigeon Kill

District	Total				Old-Young Ratio
	Birds Examined	Adult	Young	Unclass.	
North Coast	128	98	30	-	3.27:1
South Coast	304	232	26	46	8.9:1
Willamette Valley	2,246	1,586	502	158	3.16:1
1949 Total:	2,678	1,916	558	204	3.43:1
1948 Total:	161	111	40	10	3.61:1

Assuming that 10 per cent of the birds classed as adults are young birds, the age ratio is still 2.29 old birds to one young bird. This figure certainly validates the low breeding potential listed for pigeons.

Other Data:

A kill frequency table was prepared and is presented in the following table. A glance at this tabulation will show, in general, the number of birds that may be saved by reducing the bag limit. Consideration must be given to the estimated 50 per cent crippling loss that is present on pigeons.

Kill Frequency Table

No. Pigeons Killed	Number of Hunters Making Kill by District				Total	Per Cent of Total
	North Coast	South Coast	Willamette Valley	South-west		
0	8	11	327	27*	346	29.8
1	17	14	162		193	17.6
2	9	12	164		187	16.5
3	4	11	106		121	10.5
4	-	7	85		92	7.9
5	7	6	68		81	7.0
6	2	8	33		43	3.7
7	2	6	21		39	3.4
8	-	1	48		49	4.2
9	-	3	xxx		3	.3
10	-	5	xxx		5	.4
TOTAL:					1,159	

*Migrations of pigeons did not reach this district until after the open season.

Management Methods:

It is well to review and restate the available practical management methods that have been listed in the past. Certain facts and observations made during the 1949 season have modified the concept of some of these potential methods.

1. Reduce Bag Limits: The table on page M-22 shows an approximation of the amount the kill would be reduced by reducing the bag to any given number below 8. Data gathered during 1949 indicates that the daily bag limit and season limit should be the same for all of Western Oregon.
2. Shorten Season: Most pigeons have migrated south by September 20. An effective reduction of the season must be done at the beginning. The Labor Day weekend is particularly bad as far as kill and crippling are concerned.
3. Special Closures: Areas which seem to be shot out could be closed. Refuges (small) could be established surrounding the mineral springs. The cooperation of the landowners must be secured for this method to succeed. It will undoubtedly be necessary to lease such refuges as the landowner has usually been receiving a cash income from pigeons.
4. Shooting on selected days only: for example, Saturday, Sunday, and Wednesday of each week. Some landowners are now doing this and more are planning to do so in 1950. This will give the birds an opportunity to drink mineral water at the springs. Observations indicate that the birds appear desperate for this water by the third day of intensive shooting at these springs.
5. Continued public education: Most hunters are interested in pigeons and agree that further kill restrictions are necessary to insure perpetuation of the sport.

HABITAT IMPROVEMENT

The Department of Habitat Improvement has completed its second year of operation during this period. During the year, the Commission adopted a statement of general policies and outlined a general program in both of which it is stated that, "Improvement of habitat shall be vigorously carried out." The scope of the program is stated to be as follows:

- a. To test practices and develop plans for the improvement of wild-life habitat for all game species.
- b. To direct attention to the desirability of establishing such practices and, wherever possible, point out any multiple-use values.
- c. To participate financially in the development of certain cover, food or water improvement projects on public as well as private lands when such projects are approved by the Commission.
- d. To provide technical assistance in the matter of habitat improvement to anyone upon reasonable request.
- e. To provide materials, such as plants and seeds, under certain limitations, to cooperating landowners.
- f. To establish demonstration areas for the purpose of testing practices and demonstrating recommendations to the public.

The department has been conducting all of these activities during the past year. Plans are developed, and revisions made as experience indicates the need. The program is publicized through the Bulletin, press releases, talks to farm and sportsmen's groups, and participation in such events as the Soil Conservation Service Field Day at Stayton last summer. Each County Agent is notified of the location of planting projects within his county. Most districts now have at least one established demonstration area available for the public's inspection. A quantity of metal signs reading, "Cooperative Habitat Improvement Project" is on hand to be used for calling attention to demonstration areas and larger projects.

Personnel:

Three trained field men have been employed to work primarily on habitat improvement. They have been assigned to the Northwest (Willamette), Central, and Northeast Districts and were in immediate charge of the planting crew operations this spring. In addition, one nurseryman is employed with headquarters at the Hermiston Game Farm. Much of his time since entering the Commission's employ in March has been spent on a planting crew so that he could gain first-hand knowledge of the planting program. One planting crew worked part of the winter in Western Oregon. Three three-man crews conducted shrub and tree planting this spring in Eastern Oregon. Transportation and farming equipment was purchased to outfit two crews. A tractor purchased for the nursery was used by the third crew; other equipment was borrowed or rented. In districts not worked by the crews the District Game Agents set out less extensive plantings with local assistance. Most of the practices undertaken during the year have been accomplished by the Game Agents with the assistance of trappers, game farm, fisheries, and other personnel.

Nursery:

The procurement of desired shrub species in large quantities has been a serious limiting factor in the expansion of our cover and emergency food planting program. For this and other reasons, a fenced tract of approximately 10 acres at the Hermiston Game Farm has been set aside for shrub and tree production. Current production goals are as follows:

1950	-	50,000	1952	-	250,000
1951	-	150,000	1953	-	500,000

Once sufficient propagating stock becomes available, the annual output can be geared to the demand. The first permanent plantings have been set out at the game farm to serve as a future source of propagating materials. They are as follows:

1,000 Multiflora rose	150 Bladder senna
310 Golden currant	100 American plum
270 Skunkbrush sumac	58 Southernwood
200 Snowberry	

In addition 50,000 multiflora rose cuttings have been set out to root for future transplanting. Approximately 625 willow cuttings were set out to root and provide future stock. About one-half pound of bladder senna seed, secured from the Moro Experiment Station, has been planted on the nursery.

An equal amount of rose cuttings and bladder senna seed has also been set out on Camp Adair. It is believed that all our Western Oregon needs can be produced on a few acres at Camp Adair without using additional personnel or equipment except possibly some seasonal student labor from the college.

COOPERATION:

In line with the Commission's policy that cooperation shall be maintained with other agencies and groups, the habitat improvement program includes the making of cooperative agreements with responsible conservation or landowning groups. A summary concerning agreements with these agencies was included in the last annual report. The following account covers developments during the interim.

Federal:

Soil Conservation Service. The Nursery Division of the Pacific Coast Region supplied at cost 86,270 shrubs of ten species. This allotment was based on a request for 200,000 shrubs this spring. The same number has been requested for 1951.

Bureau of Reclamation. Due to several factors beyond our control, including government maintenance activity on the preferred sites, all habitat improvement work on the canal banks was postponed.

Fish and Wildlife Service. Development of the McKay Reservoir refuge has continued. The Service seeded 40 acres and the Commission about 5 acres to grain.

The 7,200 shrubs planted by Commission personnel in 1949 have grown very well except for a considerable loss of roses due to gophers. Some rodent control work has been done. This spring 8,554 additional shrubs, including replacements, have been set out on the refuge.

Forest Service. A second agreement was completed in October, 1949, whereby the Service constructed at cost three additional waterholes north of the Deschutes Game Refuge. Six waterholes have now been completed here to date.

Bureau of Land Management. Six waterholes were constructed in the high desert country of Malheur County at cost on sites designated by Commission personnel for the purpose of providing water on dry antelope ranges.

State:

Extension Service. Liaison between the two departments is increasing. Our field agents inform local County Agricultural Agents of our program, and secure information and advice from them. Several County Agents have taken an active interest in the Commission's planting program and are rendering their support. Several extension specialists have been very helpful; especially the Farm Forestry Specialist who is actively promoting our planting program within his organization.

The J. J. Astor Experiment Station at Astoria, and local seed growers, donated 570 pounds of lotus seed for improvement seeding in the Tillamook Burn.

Board of Forestry. Permission was received to seed five sites on state-owned lands within the Tillamook Burn. A requested 3,000 evergreen seedlings were provided without cost from the Oregon Forest Nursery.

Washington State College. A total of 19,500 seedling shrubs, of 150,000 requested, were received from the Washington State Pine Nursery through agreement with the college.

Others:

Soil Conservation Districts. Cooperation with this program has progressed very favorably during the year. A number of district board meetings were attended at which time our program was discussed. The following five districts have signed, in the order named, a Memorandum of Understanding, thereby agreeing to cooperate with the habitat improvement program.

1. Central Wasco
2. North Wasco
3. Gilliam
4. Sherman
5. Lakeview

The first four named are located in the Columbia Basin wheat belt, an area having great potentialities for habitat improvement for upland game. Active cooperation with the two Wasco districts was begun with plantings last fall. One planting crew concentrated its work in the Gilliam and two Wasco districts this spring.

Requests from these districts exceeded our supply. Present plans call for increasing concentration of planting activity; the Columbia Basin wheatlands have high priority. A large proportion of the approximately 35,000 shrubs planted in Wasco and Gilliam Counties this past year has been with the cooperation of the Soil Conservation Service technicians in the three districts.

Southern Pacific Company. Further plantings were made on both right-of-way sites in Klamath County covered by the formal agreement in effect with this railroad. Six shrub species totaling 4,480 plants were set out this spring.

Great Northern Railway. Formal agreement was completed on September 21, 1949, permitting the Commission to plant shrubs on a three-quarter mile strip of right-of-way on both sides of the track near Stone bridge, Klamath County. Seven species totaling 3,830 plants have been set out.

HABITAT IMPROVEMENT FOR UPLAND GAME:

The greatest amount of effort has so far been devoted to improvement of cover, food and water conditions for upland game within the cultivated areas of the state. It is believed that development work in this category will produce the quickest results and benefit the greatest number of people. During the first year of the department's existence an effort was made to establish test plantings on a wide variety of sites. This is resulting in the accumulation of considerable data concerning the species used, and is serving as a guide to subsequent activities. As rapidly as it is feasible major areas will be selected for concentrated development programs.

Of a total of 220 new projects (locations or properties improved by one or more practices) worked during the past year, 196 were designed to benefit upland game.

Cover:

Shrub Planting. Again this year the great majority (180) of physical developments undertaken to date have consisted entirely, or in part, of shrub plantings. All species used in this program are being recommended by other conservation agencies for soil conservation or other direct farm uses.

It is calculated that approximately 57 miles of multiflora rose hedge have been planted by Commission personnel during this period. With the 23 miles set out last year, the 286,888 rose bushes (exclusive of replacements) now total about 80 miles of living fences.

Table I lists the source of planting stock received to date.

Table 1.
Source of Shrubs and Trees Received

	1948-49	1949-50
Commercial nurseries	110,175	147,650
U. S. Soil Conservation Service	-	86,270
Washington State Forest Nursery	8,100	19,500
Oregon State Forest Nursery	2,800	2,000
Oregon Game Commission production	-	19,050
Totals	121,075	274,470

Table II lists the various shrubs and trees used, and shows the amounts planted as of May 1, 1950. The quantities listed are, in general, an indication of their availability, and acceptability by the landowners, rather than a rating of their habitat improvement value. The list has been carefully selected, however, and the species were chosen because of attributes which fit them for special purposes. This list should be improved and condensed as future experience shows which species best fulfill all the requirements of the program.

Table II
Shrubs and Trees Planted

Common Name	Scientific Name	1948-49	1949-50	Total
Multiflora rose	Rosa multiflora	93,175	209,894	303,069
Southernwood	Artemisia abrotanum	3,445	22,045	25,490
American plum	Prunus americana	2,925	7,708	10,633
Bladder senna	Colutea arborescens	2,330	3,620	5,950
Golden willow	Salix vitellina	-	5,478	5,478*
Caragana	Caragana arborescens	890	3,650	4,540
Skunkbush sumac	Rhus trilobata	-	4,180	4,180
Matrimony vine	Lycium halimofolium	-	4,000	4,000
Snowberry	Symphoricarpos racemosus	-	3,400	3,400
Western dogwood	Cornus occidentalis	-	2,840	2,840
Chinese arborvitae	Thuja orientalis	-	693	693
Black locust	Robinia pseudoacacia	-	614	614
Russian olive	Eleagnus angustifolia	500	81	581
Scotch pine	Pinus sylvestris	0	581	581
Golden currant	Ribes aureum	-	400	400
Ponderosa pine	Pinus ponderosa	50	120	170
Mulberry	Morus alba	50	-	50
Totals:		103,365	269,304	372,669

* See also under Furbearers.

Table III summarizes the shrub plantings by County for Western Oregon. To date multiflora rose is the only woody plant used in any quantity under this program west of the Cascades. There are other desirable species which should be used as they become available; however, this rose has considerable popular appeal and is in increasing demand by farm landowners, generally for use as livestock-proof hedges. Experience during the past two years indicates that this species is well adapted to conditions in the Willamette Valley. In fact, only one planting in Western Oregon has needed replacement. This was in Douglas County where a row of 1,050 bonfire rose and 400 multiflora rose was entirely replaced with 1,400 multifloras. Plantings in the Willamette Valley have grown well without special cultivation or irrigation. The Department of Animal Husbandry at Oregon State College was provided with 500 multiflora rose which they have planted on their Hill Pasture on the campus for test purposes.

Sportsmen's clubs were invited to request a supply of this rose from the Commission for a club-sponsored project on sites of their own selection. The response was as follows:

Eugene, I. W. L. Willamette Chapter received 1,800 roses
 Milwaukie Sportsmen Rod & Gun Club recommended one site
 Newberg Rod and Gun Club desired to arrange for a demonstration on their club grounds. Unfavorable weather caused postponements. It will probably be held this fall.

Table III. SHRUBS PLANTED - WESTERN OREGON

County	Number of Cooperators				Total	Multiflora Rose				
	1948-9 Total	1949-50 New	Projects Old	Total		1948-9 Total	1949-50 New	Projects Old	Total	Total
Benton	-	4	-	4	4	-	3,250	-	3,250	3,250
Clackamas	-	9	-	9	9	-	3,375	-	3,375	3,375
Clatsop	-	1	-	1	1	-	200	-	200	200
Columbia	1	-	-	-	1	1,000	-	-	-	1,000
Coos	3	-	-	-	3	1,000	-	-	-	1,000
Curry	13	-	-	-	13	4,250	-	-	-	4,250
Douglas	1	6	(1)*	7	7	400**	4,000	1,400*	5,400	5,800
Jackson	3	13	3	16	16	1,350**	5,900	3,000	8,900	10,250
Josephine	3	2	-	2	5	250	800	-	800	1,050
Lane	-	6	-	6	6	-	6,550	-	6,550	6,550
Linn	-	3	-	3	3	-	3,150	-	3,150	3,150
Marion	2	17	1	18	19	750	17,050	700	17,750	18,500
Multnomah	-	7	-	7	7	-	2,650	-	2,650	2,650
Polk	1	1	-	1	2	1,000	500	-	500	1,500
Washington	-	7	-	7	7	-	3,100	-	3,100	3,100
Yamhill	4	3	1	4	7	1,750	1,800	2,800	4,600	6,350
Totals	31	79	6	85	110	11,750	52,325	7,900	60,225	71,975

*Replaced **Corrected figures.

Table IV lists by species and counties the number of shrubs and trees planted in Eastern Oregon during the year ending May 1, 1950. Sixteen species were used; they were set out in all counties except Hood River. Use of multiflora rose outnumbered all other species combined in each county, except one. Nearly three-fourths of the total available stock was of this species.

Table V summarizes by counties the number of cooperating landowners on whose property one or more sites were planted. More than one-third of the landowners cooperating last year again participated by extending their plantings, although no special favor was shown except in some instances where losses were replaced. The total numbers planted in the various counties is also shown. Six per cent of the total was used for replacements.

The only sportsmen's organization to assist in planting these shrubs was the Harney County I. W. L. of Burns. This club received 2,700 multiflora rose bushes.

TABLE IV. SHRUBS PLANTED - EASTERN OREGON

County	Rose	Southern- wood	Plum	Willow	Matrimony Vine	Bladder Senna	Snowberry	Sumac	Dogwood	Caragana	Arborvitae	Locust	Scotch Pine	Currant	Ponderosa Pine	Olive	Totals 1949-50
Baker	32,555	90		140		40	400	100				50	50				33,425
Crook	2,700	350	240							300							3,590
Deschutes	5,400	750	150	150						200			50				6,700
Gilliam	9,930		670				100		40	400	130	45	80				11,395
Grant	1,900	3,500	750								50						6,250
Harney	5,050	800	600							50					50	25	6,525
Jefferson	3,000	100	340	790					100		83	60	100				4,573
Klamath	16,925	7,310	560				660	690	60	700	100		25				27,050
Lake	9,200	2,000	40	800	2,000	300			300	250		9		400	20	56	15,375
Malheur	2,900	800	50			100				100							3,950
Morrow	63														30		93
Sherman	6,590	1,500	850	1,500		440	80	150	900	100	33	25	30				12,198
Umatilla	10,446	2,545	1,500		1,000	1,280	250	790	500		55	300	54		20		18,740
Union	11,550	250		800		60	100	200			180		180				13,320
Wallowa	12,500	1,800	775	160		220	1,000	1,600		1,000							19,055
Wasco	15,560	250	1,183	1,138	1,000	1,160	810	650	940	550	12	175	12				23,440
Wheeler	1,000																1,000
Totals	147,269	22,045	7,708	5,478	4,000	3,620	3,400	4,180	2,840	3,650	693	614	581	400	120	81	206,679

Table V.

Summary
SHRUBS PLANTED - EASTERN OREGON

County	NO. OF COOPERATORS				Totals	NO. OF SHRUBS PLANTED				
	1949 Totals	1949-50 Projects		1949 Totals		1949-50 Projects		Replaced	Totals	
		New	Old	Total		New	Old			
Baker	3	9	2	11	12	2,375	22,155	10,470	800	35,800
Crook	4	5	2	7	9	2,225	2,245	1,345	0	5,815
Deschutes	6	6	6	12	12	3,290	4,700	1,875	125	9,990
Gilliam	4	6	1	7	10	1,800	10,095	1,300	0	13,195
Grant	11	6	5	11	17	4,295	2,400	3,850	0	10,545
Harney	5	3	1	4	8	5,775	3,400	3,125	0	12,300
Hood River	2	0	0	0	2	40	0	0	0	40
Jefferson	1	3	0	3	4	100	4,573	0	0	4,673
Klamath	25	8	13	21	33	26,780	7,500	12,040	7,510	53,830
Lake	21	8	2	10	29	5,650	12,475	2,900	0	21,025
Malheur	8	5	2	7	13	4,700	2,850	1,050	50	8,650
Morrow	2	0	1	1	2	1,070	0	30	63	1,163
Sherman	7	4	1	5	11	6,640	3,960	8,238	0	18,838
Umatilla	11	3	8	11	14	20,125	3,860	11,037	3,843	38,865
Union	3	8	0	8	11	3,150	13,320	0	0	16,470
Wallowa	1	3	0	3	4	320	19,055	0	0	19,375
Wasco	5	23	1	24	28	2,530	21,720	1,720	0	25,970
Wheeler	1	1	0	1	2	250	1,000	0	0	1,250
TOTALS	120	101	45	146	221	91,115	135,308	58,980	12,391	297,794

Shrub Survival. One of the most urgent determinations to be made is the proper selection of plant species to be recommended for use under the various environmental conditions prevailing in Oregon. The first demonstration plantings of several non-indigenous shrubs were set out last spring in Eastern Oregon. None of these plants had the advantage of being propagated from acclimated stock. In most instances there was no maintenance. The abnormal drought of last summer is believed to have accentuated losses. Official weather records state that precipitation in Oregon was less than one-half the long-time average during July, 1949, and less than one-third for August. Other reported causes of loss included: poor planting stock, destruction by farming machinery, careless use of sprays, and severe feeding by livestock, rodents, and grasshoppers. Fall planted shrubs in Wasco, Sherman, and Wallowa Counties coincided with favorable growing conditions and are reported to be thriving.

A state-wide check-up at the close of the growing season in November, 1949, indicated average survivals by game districts or counties, as follows:

Multiflora Rose

Less than 25%

Southwest
Lake-Klamath
Union
Harney
Malheur

25 to 50%

Umatilla
Grant

Central
Umatilla
Grant

More Than 50%

Willamette
South Coastal
Central
Columbia
Baker

Southernwood

Klamath
Harney

Central
Umatilla
Grant

Columbia
Union

American Plum

Umatilla
Grant

Klamath

Central

Scattered reports from the districts indicate little serious loss due to winter-kill. Fall planted roses in Wasco County are showing good growth this spring. Roses set out last winter in Jackson and Josephine Counties, except for a planting at Camp White, are reported to be in excellent condition this spring. Grant and Harney Counties report very poor survival of 1949 roses. In Malheur County, most of those surviving the summer drought were severely pruned by rabbits during the winter.

Weather and soil conditions this spring have been much more favorable than last year. This, plus the fact that planting operations were underway at the earliest practicable date in each area, has given most plants a good start in their new environments.

Grass and forb seeding. Little, if any, seeding was done for upland game cover during this period. As previously stated, the plans for seeding grass on Klamath Project canal banks were necessarily postponed. A fall seeding of rye, sub-clover, and alta fescue totaling 70 pounds was completed on the Winchester project in Douglas County.

Cover Protection. This important function receives constant consideration by field agents and is emphasized in day to day contacts with landowners. An increasing number of verbal agreements are being reached, especially in the Willamette Valley. Consideration for the needs of wildlife is being stipulated on all new contract refuges in the Willamette District. The railway agreements are still in effect as well as those concerning county roads and several private tracts in Harney Valley announced a year ago. Demonstration areas emphasize the importance of cover. These efforts directly in the interest of our upland game are of immeasurable benefit. Perhaps the most significant gains, however, are to be made through education of the public in principles of proper land use with emphasis on values other than wildlife.

Food:

Shrub Planting. Most of the shrub species being used to provide permanent cover also produce edible fruits which remain available for emergency food during critical periods of winter weather.

Standing Grain. Purchase of small grain strips was continued on a small scale. A total of seven strips, averaging between one-quarter and one-half acre, were purchased in Klamath, Umatilla and Union Counties. The Umatilla District Agent reported extensive use of the grain. Somewhat larger areas were purchased in the Willamette Valley. (Table VI)

Grain Planting. Most grain plantings are intended to benefit waterfowl as well as upland game, however, the projects listed in Table VI were established primarily for the latter group.

Table VI
Feeding Areas Primarily For Upland Game

County	Acres	Crop	Remarks
Planted:			
Benton*	163	-	Plowed for spring seeding at Camp Adair
Douglas	11	Grain; sudan	Used by pheasants; doves. 41 pheasants observed on October 1.
Polk	4	Sudan	Good use by upland game
Umatilla	3	Wheat	Fall planted by Federal personnel.
Umatilla	5	Wheat, sunflower	Planted spring, 1950.
Wallowa	15	Barley	Good crop used by pheasants.
Yamhill	4	Sudan	Excellent upland game use.
Purchased:			
Klamath	1	Grains	Three strips on demonstration area.
Marion	?	Corn	Strip left standing
Polk	1.2	Barley	Donated by owner. Pheasant use.
Umatilla	0.5	Wheat	Extensive pheasant use.
Union	1.2	Grains	Three strips standing grain
Yamhill	1.4	Rye	Heavy use by pheasants

***In Progress**

Food Plots. The Willamette, Southwest, and all Eastern Oregon game districts were recently furnished with small quantities of various seeds, such as dwarf sunflower, sweet clover, millet, and sudan grass, to make trial plantings of various mixtures which may later be recommended locally for winter food plots. Projects of this kind are desired in the youth education program. They might also be recommended to sportsmen's clubs and other groups, and could be incorporated into some permanent planting projects of the Commission. Recommended seed mixtures might eventually be supplied to responsible groups for this purpose.

Feeding Stations. Feed hoppers were again in use during the winter months by five districts, as follows:

Central, 5	Grant, 21 (11 newly constructed)
Umatilla, 6	Harney, 15
Wallowa, 1	

Water:

The concrete watering device, commonly known as a guzzler, constructed in Umatilla County in the fall of 1948 has filled automatically and held water year-round. The district report of last July stated, "Indications are that these birds (pheasants) have been utilizing the guzzler to some extent for the past month." Four more of these cisterns were built in the same district last fall; all have filled satisfactorily. It was reported this spring that one of a group of pheasants was observed drinking at the ramp.

Only one water barrel of the type with float valve was in operation last season. Apparently it was not used by game birds.

HABITAT IMPROVEMENT FOR WATERFOWL:

As stated in the previous report the primary habitat improvement needs of waterfowl in Oregon appear to be resting sites during the hunting season and winter feeding areas. To date, projects under this program designed to benefit waterfowl have been undertaken only in the Willamette Valley. Both of the above-mentioned needs are receiving consideration.

Refuge System. The basic development plan is a proposal to establish a series of small resting ponds throughout the Valley. Progress has not been as rapid as desired. The Willamette District personnel have actively engaged in a search for available sites. Probably the two main retarding factors are: (1) Clubs and individuals hold practically all the best areas for their own shooting; (2) Landowners generally are farming every possible acre. At the present time, the two refuges described below are in operation.

Benton County. Cooperator, V. Buchanan. Five acres rented of which approximately one acre is a constructed pond. Land was in sweet corn; portion within the rented area was purchased and left standing. Ducks began using pond two days after its construction. On December 16 an estimated 800 waterfowl were observed using the site. About five acres of millet, and possibly some corn, will be planted this spring.

Washington County. Cooperator, A. Evers. Five acres including a natural depression of two or more acres holding water most of the year. Immediate area growing reed canary grass. A district report states, "The Evers' impoundment drew ducks all season in varying numbers, but they really crowded the pond on weekends when the surrounding area was heavily gunned." Reports state that 200 to 300 ducks and geese have been using the site this spring.

Feeding Areas. Supplementing the refuges, it is desired to provide feeding areas of grain located strategically with respect to the flight lanes and concentration points of the birds. The progress of this activity is summarized in Table VII.

Table VII
Feeding Areas Primarily For Waterfowl

County	Acres	Crop	Remarks
Planted:			
Lane	65	Grain	Gibson Is., Fern Ridge, Fall planted. Estimated 1,000 geese using area this spring.
Yamhill	1	Barley	Heavily used. Estimated 50 ducks in March
Purchased:			
Benton	4	Corn	Buchanan refuge pond
Linn	6	Sudan grass	Approximately 500 ducks using area on December 29.

The 26 acres planted to barley and sudan grass at Fern Ridge last spring was used extensively by local ducks; also by pheasants and quail. A neighboring farmer reported that thousands of ducks were using the area during the first two weeks of the first half of the duck season. Barley is volunteering well on the tract this spring.

HABITAT IMPROVEMENT FOR BIG GAME:

Projects established to benefit this game category have consisted of range reseeding, browse pruning, and water developments. The problem of acquiring land has not been considered by this department. Projects of very large scope and cost, particularly land acquisition, have by mutual agreement been considered the province of the Federal Aid program.

Range Reseeding:

North Coastal. With the permission of the State Board of Forestry, five sites on state lands were selected and seeding during March, 1950, on different drainages within the Tillamook Burn. In all, 11 sites were broadcast seeded in Tillamook County over an estimated 215 acres, and 33 test plots averaging one-tenth acre were seeded and hand raked. A total of 867 pounds of seed of the following species were used: lotus major, burnet, orchard grass, alta fescue, white clover, creeping red fescue, timothy, hairy vetch, black medic, Astoria bent, and sub-clover. All of these varieties were recommended for trial by the State Extension Service. In addition, 1,000 seedling Douglas Fir and 2,400 multiflora rose were set out on about half of the sites for the purpose of observing use by deer.

Willamette. Approximately 4 acres of a totally burned area near McDonald Forest in Benton County were broadcast seeded shortly after an October fire on private land. About 75 pounds of seed of the following species were used: rough pea, alta fescue, Tualatin meadow oatgrass, birds foot trefoil, and sub-clover.

In Yamhill County an estimated 4.5 acres of old burn were seeded in March, 1950, to 18 pounds of rough pea and burnet.

Northeast. The Keating range project in Baker County has been seeded and the fence repaired. Approximately sixteen acres were plowed, harrowed and drilled to a mixture of big bluegrass, crested wheatgrass and beardless wheatgrass at the rate of 9 pounds per acre. Twelve pounds of intermediate wheatgrass were seeded on 1 3/4 acres.

Browse Pruning:

The Grant County pruning project on mahogany and juniper stands on heavily used deer winter ranges was continued during December. Past work indicates that top pruning of these species results in stimulation of basal twig production, thus providing an increase in available food.

Water Development:

Deschutes. Three additional waterholes have been constructed through cooperation with the U. S. Forest Service in the area just north of the Deschutes Game Refuge. Six of these permanent-type improvements have now been completed on this otherwise waterless range. One old reservoir at Swamp Wells was deepened. All waterholes have been treated with bentonite to make them water-tight. It was necessary to haul water to these sites last summer due to a poor natural runoff. All holes are well filled this spring. Deer tracks at these reservoirs prove they are well used. A district report states, "Indications are that deer are increasing on the upper portion of the Bessie Butte range where the water development program is taking place."

Malheur. Through cooperative agreement with the Bureau of Land Management, they have now constructed eight reservoirs on sites designated by the local game agent. These are all located on dry ranges where it is desired to increase the antelope populations through improved distribution.

HABITAT IMPROVEMENT FOR FURBEARERS:

Willow Planting:

The only practice attempted thus far for furbearers is the willow planting on mountain streams where beaver could be transplanted if a food supply could be re-established. The setting out of willow cuttings has been tried in the past and by other agencies with rather poor success. Various techniques are now being tested on a small scale. Cuttings treated with a root-stimulating hormone were set out two years ago; only 5 per cent have survived. Root planting stock was used last spring. The project located in the Ochoco National Forest, the only one reported on to date, had a 75 per cent survival last fall for enclosed plants and 25 per cent for those unprotected from grazing. The projects are to be continued; further plantings will be made this spring as the areas become accessible.

SUMMARY: Table VIII summarizes by districts the number of new projects undertaken in the various game categories during the past year. It portrays the number of new cooperators in the case of cover plantings. In addition, shrub plantings were continued (including some replacements) on the farms of 51 former cooperating landowners. Additional work on other established projects, such as browse pruning, and willow planting for beaver, are not included. Landowner agreements to protect existing cover, the continuation of planted grain projects where an adequate crop is volunteering, and the temporary operation of approximately 50 upland game feed hoppers have not been entered in this table. On the other hand, there are some 10 temporary projects, such as the standing grain strips and barrel-type watering devices which are no longer functioning and might now properly be deducted from the 1948-49 totals.

TABLE VIII.

SUMMARY, NUMBER OF ESTABLISHED PROJECTS

Game District	1948-9 Total	1949-50				WATERFOWL		BIG GAME		Totals	1948-50 Totals
		Cover	UPLAND GAME Food	Water	Water	Food	Food	Water			
N. Coastal	0	1					11		12	12	
S. Coastal	17	57	5			2	4	2	0	17	
Willamette	10	21	1						70	80	
Southwest	7	79	6			2	4	13	22	29	
Western Oregon	34								104	138	
Lake-Klamath	50	16	1						17	67	
Central	16	11					3		14	30	
Columbia	21	37							37	58	
Umatilla	14	3	3		4				10	24	
Northeast	9	17	1						18	27	
Grant	13	6						6	6	19	
Harney	11	3						3	3	14	
Malheur	11	5					2		7	21	
Wallowa	14	3	1						4	5	
Eastern Oregon	1	101	6		4			5	116	265	
TOTALS	183	180	12	4	2	4	13	5	220	403	

CURRENT RESEARCH PROJECTS
of the
OREGON COOPERATIVE WILDLIFE RESEARCH UNIT

On September 20, 1950, the Oregon Cooperative Wildlife Research Unit will have been in existence 15 full years. It is the only Cooperative Research Unit under the national plan still staffed by its original leaders.

The program of the Unit is expanding. The Oregon Game Commission has assigned one of its staff to the Unit as a permanent liaison man. He partakes in Unit activities and cooperates with the staff of the Commission. In this manner applicable research findings result in action. At the present time organizational steps are underway to include game fisheries research under the plan also. In this resume report we should perhaps turn to our original instructions and state the policy upon which the Unit operates.

The original conception of the Cooperative Wildlife Research Unit Program included three activities: (1) Basic research. This can be explained as a search for factual data that may be applied in practical management to the end that stabilization, sustained yield, and, where practicable, even increased abundance of wildlife might be attained. (2) Education and training. This combines fundamental knowledge and the ability to apply these facts, thereby providing a source of self-sufficient personnel for conservation fields. The fish and game courses of Oregon State College are an essential part of this program. (3) Demonstrations. This is the practical side of research findings; an activity wherein people interested in game management can see, draw their own conclusions, and be convinced of proper procedures by close association with the applied techniques and management principles. These three basic responsibilities are kept before us continually.

Basic research will be reported in the succeeding paragraphs dealing with specific problems. Education is a concern of the Unit activity in the educational program at Oregon State College wherein approximately 180 students received training this year. Under the Unit's applied training program, six graduate assistants were assigned to definite problems in the past year. The Oregon Cooperative Wildlife Research Unit has several field demonstration areas, such as the Murderers Creek browse trial plots, the Madras game management area, and the life history and management research center at Eliza Island, Washington. Each has contributed factual data of considerable importance. Because of the nature of the Eliza Island research center, this 158-acre unit offers perhaps the finest opportunity existing anywhere in the search for life history and management data to be found at the present time. The field day held annually at the termination of a completed experiment each fall is of common interest amongst the conservationists from the Northwest. The last field day held on November 5, 1949, was well attended by the leaders in management and conservation programs.

A sketch outline of the active projects and service activities follows.

Problem A - Problems of Small
Game in the Willamette Valley

Further experiments with the field-rearing of day-old chicks utilizing brood hens and field coops were again carried out in the past fiscal year. Operations were carried on in the Madras irrigation project of Central Oregon under the conditions outlined in our earlier experiments in the Willamette Valley. The findings indicate that this is a practical program as far as rearing birds is concerned. There are elements of chance based on food and weather conditions, but the birds so produced are adapted to the habitat where they are reared. The cost is only a fraction of the usual game farm reared bird. In the experiments conducted in 1949 in the Northwest, costs varied between 42¢ and \$1.00 per bird. The mere raising of birds in the field by this method is not an entire answer to the problem of pheasant stocking, however. It is a practical method of getting breeding stock established if continued protection of these birds is carried out. Predators of all kinds must be controlled due to their concentration on these well-stocked areas. Dispersal from the rearing sites is general but several months must elapse before it becomes a reality. The quality of the field reared birds depends greatly on their care: Wildness cannot be expected if the pheasants are treated like domestic chickens.

An Economical Ration For Wintering Pheasants:

The findings of research on the island study areas prove it impractical to release game farm reared hen pheasants in the fall. This is because winter losses usually account for from 50 to 70 per cent of the released birds. Through further experiments it became obvious that breeding hens should be held over until the following spring for April release. This naturally would increase costs. In making a search for a suitable game farm ration to accomplish this purpose and still hold costs down, waste weed seeds from the feed cleaning plants offered possibilities. Experimental work has been conducted for three years and under the most trying winter conditions. In a comparison of the final costs for the past winter, a 157-day period, weed seed rations were determined to be about 15¢ per bird. Game farm rations cost 63¢ per bird.

Throughout the experimental feeding, the birds were maintained in excellent condition. Egg production was not impaired and fertility was higher than the usual level obtained at the game farm. The wintering of hens on game farms with waste weed seeds from the cleaning mills add little cost to the practice and also insures the survival of each hen. Her release in April results in the effective use of game farm stock. Fall releases are largely wasted. The plan seems to offer a better method of using artificial propagation.

Problem A-2 - A Study of the Upland Game Birds
Upon an Island Under Natural Conditions.

This program consists of a series of experiments with both game farm and wild reared birds to determine the best methods of management. This work began in 1937 and there is a sufficient amount of data now at hand to begin the compilation of a monograph on the species which will provide new data and will perhaps change many of the concepts of pheasant management since many unsupported theories can be answered satisfactorily. During the past year two outstanding research findings might be mentioned among the numerous determinations.

The first and perhaps most important fact applicable to all of the pheasant habitats everywhere is the low survival power of the pheasant hen. Although there may be some slight variation between wild reared and game farm reared hens, both groups are highly vulnerable and their lifespan is short. It is obvious that the general practices of pheasant management do not sufficiently emphasize the care of the hen. In the few books on game management this subject has not been raised as a vital issue. Following a series of research reports and field experiences, the Oregon Game Commission personnel have begun a well-organized publicity and educational campaign to guide Oregon's hunters. If the hen, the vital link in pheasant production, can be adequately safeguarded it can be proven that long cock bird seasons can be enjoyed each year since, in comparison with hens, both the wild and the game farm reared pheasant cocks show superior staying powers.

A second finding is of considerable importance and shows the need for systematic measurement of pheasant densities in each habitat periodically. This means adequate field men to carry out this vital part of management. This need stems directly from the findings that pheasants kill chicks of their own kind when the levels exceed approximately 1 bird to the acre. In other words, in habitat areas where the cover is not dense, pheasants living in close proximity to one another are irritated and destroy pheasant chicks. There is a natural limitation to densities of pheasants that can be maintained. Inattention to pheasant abundance and neglecting periodic censuses will result in high mortality amongst newly hatched chicks where levels are too high. This means that much stock will be wasted.

This does not apply in areas where ground cover is exceptionally good. The cover offered by heavy stands of grain or in rice fields usually offer full protection and birds of different broods may get along well as the heavy vegetation conceals their presence from each other. Ideal habitat conditions are not common, however, in the Northwest and attention to abundance will aid management.

The killing of chicks persisted on the Eliza Island study area until the birds were approximately five weeks of age. This phenomena, although reported before on another study area and on Eliza for the past two seasons, was more aggravated in 1949 than in 1948 because of a larger stock of adult birds on the area. Hens were observed as the active culprits in this practice. These findings place a natural limit on what we should consider as well-stocked pheasant areas. Field workers must classify habitat and measure population regularly.

Problem I - A Diagnostic Research on The Columbian Black-tailed Deer.

This is a continuing program and will be conducted for several years more; the work being closely associated with game management plans in the State of Oregon. An important conclusion maturing in the past year is that areas burned repeatedly finally produce little deer food. Successive burns reduce soil values in direct relationship to the intensity of the burn. Some areas under study were burned three times. Crude protein values were hardly above the critical level in the second season following the third burning.

It can be stated now that burns and logging slashes should be closed as soon as is practicable after the burn or slash. If deer stocks are present, periodic measurements of densities should follow and when populations reach from 10 to 15 deer per section, including both sexes, an open season should be held. By comparison with the yield of mule deer in some of the best habitats in the West, we find the managed black-tailed deer areas of the Oregon Coast exceed the production per square mile of mule deer by a wide margin. The average number of deer bagged in the mule deer country is about .5 deer per square mile. In the managed burns or logging slash areas, black-tailed deer production may average closer to three per square mile. Since in Oregon the black-tailed deer ranges are closer to the centers of population with heavy hunter pressure, it seems advisable to pay close attention to the black-tailed deer management program. Good results can be expected by encouraging a greater utilization of such areas and reducing the mule deer population in problem areas to a level that their nuisance affect is held at a minimum. Continued attention to the research aspects of this problem is being given.

Problem J - Hungarian Partridge Research.

Liberations of the grey partridge occurred in the Willamette Valley as early as 1913. These birds came from the high levels and steps of Hungary and Czechoslovakia from elevations of about 5,000 to 6,000 feet. From that date until today a few Hungarians have persisted in the valley, but have not had suitable conditions to determine whether they can be encouraged to produce on a sustained yield basis. Habitat conditions in their native range do not compare with the Willamette Valley either in elevation, climate or vegetation. Birds of this species originating from low land areas similar to local conditions seem more desirable as a stock from which to make these research determinations. Work began on this problem several years ago, although success in securing eggs did not occur until the spring of 1949. These eggs were flown to Portland, placed under brood hens at the Corvallis game farm, and hatched. The hatch was good - 70 per cent. Seven hundred and fifty eggs were ordered from the same source in Denmark and the plans are now under way for a full-scale test which includes two activities: (1) A field liberation under ideal conditions and a study of their natural habits, tendencies to disperse and adjustment to Willamette Valley terrain. (2) An attempt to build up a good breeding flock by retaining the bulk of the birds in captivity to be used in successive years as a foundation stock if the field rearing experiences prove satisfactory. The entire program has been outlined. Equipment has been assembled and personnel retained with plans projected into the next year at least. Developments will determine the course after the first trial.

Problem K - Upland Game and Waterfowl Program In a Newly Irrigated Section of Oregon

This program is perhaps one of the first in which a newly reclaimed piece of irrigated land has game management attention and planning coordinated with the farming program. It is a matter of developing management and long-range plans in the light of experience.

Simple closure has affected the resident population of quail and Hungarian partridges very favorably, but ring-neck pheasants have not made any substantial increases in spite of field rearing of birds and from liberation. Although there has been some winter loss due to the unusual severity of the past two winters, there is evidence that the present levels have been influenced more by natural and human predation. Habitat improvement is being undertaken both by the State and the Unit and the natural sequence of events in the farming practices are improving conditions for the best and providing better cover. Work early in the spring centered around full-scale attempts at stocking pheasants, both by liberation and field rearing. The latter activity is scheduled for mid-June. Approximately three acres of newly irrigated field cover have been prepared and two observers are to be stationed with the young birds throughout the year to make final determinations before recommendations to the Oregon Game Commission for the over-all policy are made.

Service Work.

A considerable amount of service work is carried on each year. It is hoped that much of this can eventually be avoided as the staff of the Oregon State Game Commission grows: However, there are issues of a local nature that can be met beneficially. During the past year tests have been run on repellents in deer problem areas. In time, an accumulation of data will justify some conclusions which will be publicly released. The Oregon Game Commission has a recently acquired 1,610 acres of land formerly within the boundaries of Camp Adair. The Unit worked actively on this ground before it became a military area. Cooperation has continued and because of the fine chance to learn new facts, many of the planted areas will be observed to determine food preferences for our valley game.

A similar opportunity exists in a timber stand cutting program carried on by the U. S. Forest Service in the Blue River area. Here is a chance to study the affect of clear cuttings in relation to deer habitats. Since much of Western Oregon will be logged with varying rapidity within ensuing years, valuable information on forage and deer management can be gathered by this observation. It will be carried out in close relationship with the U. S. Forest Service, the logger who has the contract and the management division of the Oregon Game Commission.

The Leader devoted some time in 1949 to adjacent states where pheasant observations would offer a broader scope of knowledge applicable locally.

Material for publication was prepared for the North American Deer Monograph. The Unit contribution was the chapter on Life History of the Mule Deer. It will be published in the near future according to present plans.

New Problems:

New activities have been limited to one study in the grazing areas of Central and Eastern Oregon where the effect of salt in manipulating deer and elk and domestic animals will be carefully scrutinized. This work will be actively underway this summer. It is a long-range program.

FEDERAL AID

For the fiscal year 1949, Congress appropriated the entire receipts of the 10 per cent excise tax on firearms and ammunition to the Federal-Aid program. The basis for Federal-Aid apportionment was given on pages 80 and 81 of the 1949 report and need not be repeated here as very little change has occurred.

1949 Funds	
Total Receipts Fiscal Year 1949	
Available July 1, 1949	\$10,378,538.42
Administration Costs for	
U. S. Fish and Wildlife Service	415,141.54
Oregon's Share	250,846.11
State Matching Money	83,615.37
Fiscal Year Budget	334,461.48
Reversion to Migratory Bird	
Fund From Oregon	None
Carry-over of Unobligated Funds	
(State and Federal)	69,201.66
Total Funds Available For	
Obligating in Oregon on July 1, 1949	403,663.14

The backlog of \$13,467,468.61, ear-marked for Federal-Aid activities still remains in the U. S. Treasury. According to rumors from Washington, D. C., it appears doubtful if any of this backlog will be appropriated this year.

At this time, Congress has taken no action on the Federal-Aid appropriation for the next fiscal year. However, hearings on the appropriation have been held before the Budget Committees with apparently favorable results. It appears that the entire 10 per cent tax will be appropriated.

The receipts from the excise tax have decreased during the past several months. For the first eight months, the total receipts were \$6,062,539.96 or \$1,831,000.00 less than the collections for the same period a year ago. Forecasting on this basis, Oregon should receive approximately \$191,000.00 on July 1, 1950.

Statisticians have investigated the fluctuations in the excise tax totals, trying to establish some meaning or criteria to the rises and falls that occur for the purpose of planning on a more far-sighted basis. So far, they have established no "Rhyme or Reason" to the fluctuations.

Agitation for the use of Federal-Aid funds for Public Relations and

Education Activities that was so strong a year ago appears to have subsided. The present "Economy talk" in congressional circles may eventually effect this appropriation. However, to our knowledge no material threat has developed to date.

During the past year the so-called "Dingell Bill" that would benefit fish in the same general way that the Pittman-Robertson Bill benefits game, was passed by Congress only to be vetoed by the President. The President's action was taken on the recommendations of the Treasury Department personnel who opposed the bill. The Treasury Department's opposition was based on the methods and mechanics of handling the funds, and not on the general intent of the act. It is reported that a new bill has been so written that the basis for the Treasury Department's opposition has been removed and it is believed that, if this can be ushered through Congress again, the President's approval will follow. Of course, the present "Economy Wave" makes it more difficult to get the appropriation passed.

The "Dingell Bill" would not create a new tax as the excise tax on fishing tackle is now in existence. The bill would merely remove the money from the Federal Government's general fund and ear-mark it for fisheries restoration activities.

Federal Aid Activities in Oregon:

Fiscal Year	Federal Appropriation	State Share	Total Money Available	Money Obligated By Projects	
				Type of Projects	Amount Obligated Total
1939	\$ 19,250.23	\$ 6,416.74	\$ 25,666.97	See pages 78 - 80 - 1949 report	
1940	30,281.25	10,093.75	40,375.00	"	
1941	49,519.26	16,506.42	66,025.68	"	
1942	56,415.32	18,805.11	75,220.43	"	
1943	25,186.89	8,395.63	33,582.52	"	
1944	20,667.36	6,889.12	27,556.48	"	
1945	18,342.60	6,114.20	24,456.80	"	
1946	21,374.70	7,124.90	28,499.60	"	
1947	55,360.81	18,453.60	73,814.41	"	
1948	260,542.10	86,847.37	347,389.47	"	
1949	250,846.11	83,615.37	334,461.48		
				<u>Acquisition</u>	
				Sauvie Island	
				Boundary survey Cooper tract	\$ 493.35
				Bollenback tract	
				23.9 acres	2,601.00
				Columbia Co. Lbr. Co.	
				289.49 acres	25,000.00
				Hall tract 5.76 A	1,000.00
				Giselman Tract 48.20 A	1,901.00
				Pope & Talbot 666.08 A	29,000.00
				Harder 109.10 A	5,976.00
				Minoggie 125.29 A	3,051.00
				Brannan 59.00 A	4,250.00
				Government Island	
				Jacob 321.24 A	29,600.00

Federal Aid Activities in Oregon (Cont'd.)

Fiscal Year	Federal Appropriation	State Share	Total Money Avail.	Money Obligated By Project	
				Type of Projects	Amount Obligated Total
<u>Acquisition - Government Island (Cont'd)</u>					
				Bartlett 625.45 A.	\$50,600.00
				Hood tract 233.06 A	20,300.00
				Devine tract 617.79 A	62,500.00
				<u>Land Lease</u>	
				Calkins - Summer L. 120.00A	350.00
				Kittredge-Pennington	
				Summer L. 1,527.00 A	650.00
				State Lands - Sauvie	
				3,470.00 A	<u>500.00</u>
					\$237,772.35
				<u>Development</u>	
				Summer Lake	
				Dikes, Water Controls	16,083.24
				Dike Repair	1,500.00
				Riprapping dikes -	
				Water controls	<u>31,143.64</u>
					\$ 48,726.88
				<u>Maintenance</u>	
				Summer Lake	16,500.00
				Sauvie Island	<u>24,249.50</u>
					\$ 40,749.50
				<u>Investigation</u>	
				Summer L. Pheasant Study	2,011.31
				Habitat Investigation	<u>23,955.22</u>
					\$ 25,966.53
				<u>Coordination</u>	<u>10,574.58</u>
					\$ 10,574.58
					<u>\$363,789.84</u>

Federal Aid Activities in Other States:

In the early years of Federal-Aid the states leaned heavily toward surveys and investigational work. During the war years, survey and investigational work took a strong drop, apparently due to the lack of man-power. At the end of the war the percentage of this type of work jumped up to a new high but now seems to be tapering off.

Acquisition hit its peak during the war years when, due to lack of man-power and shortage of materials, land acquisition became the most feasible method of obligating the Federal-Aid funds. Otherwise, acquisition has remained fairly constant.

Development work, including live-trapping and transplanting, started fairly slow and has shown a fairly constant increase, except during the war years, as could be expected with a new and growing program.

Amendments to the Federal-Aid Act provided for coordination in 1941 and maintenance work in 1947.

Net Obligations By Type of Projects
Fiscal Years 1939-1948, Inclusive

Fiscal Year	Surveys and Investigations Percentage	Land Acquisition Percentage	Developmental Percentage	Maintenance Percentage	Coordination Percentage
1939	50.5	27.3	22.2	-	-
1940	40.6	24.8	34.6	-	-
1941	38.3	25.5	33.0	-	3.2
1942	19.3	44.9	30.1	-	5.7
1943	21.4	47.1	24.3	-	7.2
1944	21.2	48.7	24.2	-	5.9
1945	21.0	36.0	34.0	-	9.0
1946	42.0	23.0	26.0	-	9.0
1947	39.1	11.8	40.2	1.2	7.7
1948	31.5	19.2	41.2	2.1	6.0
Totals & Percentages	31.8	27.2	34.6	0.9	5.5
1st Quarter 1949	13.4	23.3	54.1	5.5	3.7
Oregon's Activities 1949	7.1	65.4	13.4	11.2	2.9

Federal-Aid activities in other states were summarized on pages 85 - 90 in the 1949 Annual Report and have not changed sufficiently to warrant revision at this time.

Summary of The Details of Oregon's Federal-Aid Projects:

A. Game Management Areas				
Area	County	Acreage	Approximate % of Completion	
			Acquisition	Development
Summer Lake	Lake	13,345	95%	70%
Camas Swale	Lane	2,426	Being advertised for sale	
Sauvie Island	Multnomah, Columbia	10,500	66%	4%
Ladd Marsh	Union	7,000	Project Terminated	
Government Island	Multnomah	2,565	75%	0
Klamath Area	Klamath	10,000	0	0
Warner Valley	Lake	40,000	0	0

SUMMER LAKE:

During the past year the domestic water supply was completed and water controls and dikes were brought nearer to completion. Within the next year it is planned to complete the major work on the water controls and dikes, build a manager's residence, and renovate the existing residence for office and checking station quarters.

Farming is continuing as in the past. The 1949 grain crop on the 349 acres of farmland was fair and game utilization on the standing grain seems to be increasing.

Dikes and water controls have expanded the three-square tule marsh from approximately 4,000 acres to 7,000 acres and have about doubled the surface and number of meadow area ponds.

In the past, the muskrat trapping at Summer Lake has been accomplished by refuge personnel. This season it was done on a 50-50 share basis with private trappers. One thousand two hundred and twenty-four muskrats were taken and sold at the Seattle Fur Exchange. Selling at the Fur Exchange for the first time exposed these rats to new buyers, and brought out considerable favorable comment on the quality of Summer Lake muskrats.

The data on the public shooting operations are given under the Waterfowl and Upland Bird sections of this report.

CAMAS SWALE:

This 2,426 acre area in Lane County has been disbanded and is being advertised for sale. Purchase bids will be opened June 1, 1950. Federal-Aid funds in the amount of \$80,689.46 were invested in this project. The advertised minimum bid acceptable is \$84,250.00, so if the property sells there will be no loss of funds.

SAUVIE ISLAND:

A comprehensive survey, being done by N. W. Haner and associates, consulting engineers, is now underway. It will be utilized to lay the ground-work for further construction projects, such as roads, dams, and miscellaneous water controls.

Minor developments in the form of renovation of buildings acquired with the land have been initiated. To date no suitable headquarters site has been acquired or selected.

In 1949, 131.8 acres of land were planted for wildlife utilization. An additional 60 acres is being cleared of brush and willows in preparation for the 1950 season.

Fifty-six acres of grain; namely, barley, oats, ryegrass and mixed grains were allowed to drop seed and volunteer for green feed during the winter. However, due to a scarcity of baldpates, very little of this green feed was consumed by waterfowl. Pheasants, however, took full advantage of the grain crop. All of the millets, buckwheats, and sudan grass seeds were readily consumed. In fact, they were consumed too soon, and failed to serve their purpose as a late winter and early spring emergency food.

The crops of corn, sunflower and potatoes were the three main food plantings used by wintering waterfowl.

Over 425 acres of land will be under various stages of farming during 1950. This is in addition to about 100 acres of wapato, 40 acres of wild millet stands and unknown acreages of various other species of native wildlife food plantings already established on the area.

Farming:		Wildlife Food Crop Planting For 1949	
Date Planted	Species	Acreage	Remarks
1949			
May 13	Barley, Hanchean	20.7	Not all used
May 13	Clover, native white	20.7	Planted as green crop, some usage
June 3	Safflower	3.22	Experimental, unsuccessful because of dry weather and aphids.
June 14	Sudan grass	2.3	Replant portion of barley above, good early usage.
June 20	Corn	4.89	Good usage, poor crop - dry
June 20	Sunflower, tall	7.57	Fair usage, poor crop - dry
June 24	Oats, white	4.25	Medium usage
June 25	Millet, early fortune	6.50	Good usage
June 25	Barley, Hanchean	8.30	Fair usage
June 30	Millet, hog	12.56	Excellent usage, early
July 12	Sudan grass	11.31	Excellent usage, early
July 16	Buckwheat, Jap	8.60	Excellent early usage.
July 20	Barley, clean seed	4.00	Fair usage
July 6	Potatoes, netted gem	4.17	Good usage in winter if covered with water
July 25	Grain, gov't. mixture	4.74	Some usage
July 25	Barley, Trebi	1.32	Some usage
August 3	Buckwheat, Jap	.66	Good usage
July 25	Grain, Gov't. mixture	10.00	Poor usage
August 9	Buckwheat, Jap	6.6	Poor crop - dry
October 1	Rye, Abruzzi	8.0	Fall plant, some goose usage, good seed crop coming
	Corn, co-op planting	4.5	
Total Crops Planted		154.89	

Replanting:

Clover, May 13 20.7
 Sudan grass, June 14 2.3

23.00

Total Acreage in Crops 131.89

Additional Acreage clean for farming 60.00

191.89

Weed Control*
 1949

Man-Days	Acreage Sprayed (Estimate)	Acreage Hand Cut (Estimate)	Species
20	50	5	Canadian Thistle Bull Thistle Morning Glory

*Not including hand or machine cultivation of row crops.

Maintenance:

Maintenance work on the project included many numerous items as follows: Repair of the old Rentenaar barn and house; miscellaneous repair to the head-quarters building; temporary fence repairs; Lyons building repair and clean-up; posting of the area; Sturgeon Lake Game Reservation posting and maintenance; emergency feeding; and razing the Powder or Oregon Iron and Steel house, barn, and miscellaneous buildings, and one Domeyer barn.

Recreation:

A. Waterfowl Hunting:

1. Acreages:

Refuge	3,898.79	63%	Inc. Sturgeon Lake Refuge
Public Shooting Ground	2,486.73	37%	

2. Method of Operation:

The area selected for operation as a public shooting ground was divided into four parts, based on geographical location and ease of access. One checking station was established at the main channel of access to each area and parking areas were provided so that, as far as possible, hunters were checked out before they reached their cars. One station was established at the mouth of Cunningham Slough to check hunters using boats on Cunningham Lake.

Portable and field blinds were constructed and installed to take

advantage of known blind locations formerly used by private parties. This allowed the maximum use of the available hunting space without undue crowding. Blinds were numbered and directional signs and white posts were used to direct hunters to their assigned spots. All blinds were assigned as doubles. Two free-lance areas were established. During the regular pheasant season, the pheasant habitat area was also free-lance for both pheasants and ducks, the number of hunters merely being limited to 60 at one time.

Hunters made applications for hunting permits to the main Portland office by mail or in person and, if they had not hunted on the area before, were given a choice of available blinds. Each permit was good for one day only. Upon receiving a permit, each hunter was assured of a blind on a particular day regardless of the time he was able to start hunting. Slight relaxation of the above rules were made as the season progressed when cold weather and poorer hunting existed.

Vacant blinds not sold at the Portland office by 5 P.M. on the previous business day were sold on a first come, first served basis at the individual checking station the next hunting day. If applicants had hunted the area before, they could apply at the grounds and take a chance on securing a vacancy. Any blind cleared of hunters during the day when it could be determined that they could or would not return were sold for the remaining portion of the day to additional hunters.

In general, it is believed that so far as field personnel were able to observe, the system worked very well. Some administrative confusion existed at first, but it was easily straightened out. Very few complaints were received except about weather and the individuals' opinion of poor hunting. Most hunters seemed satisfied with the reservation features of the hunt, although a few did want free-lance hunting. Both available free-lance areas were not fully occupied during the season.

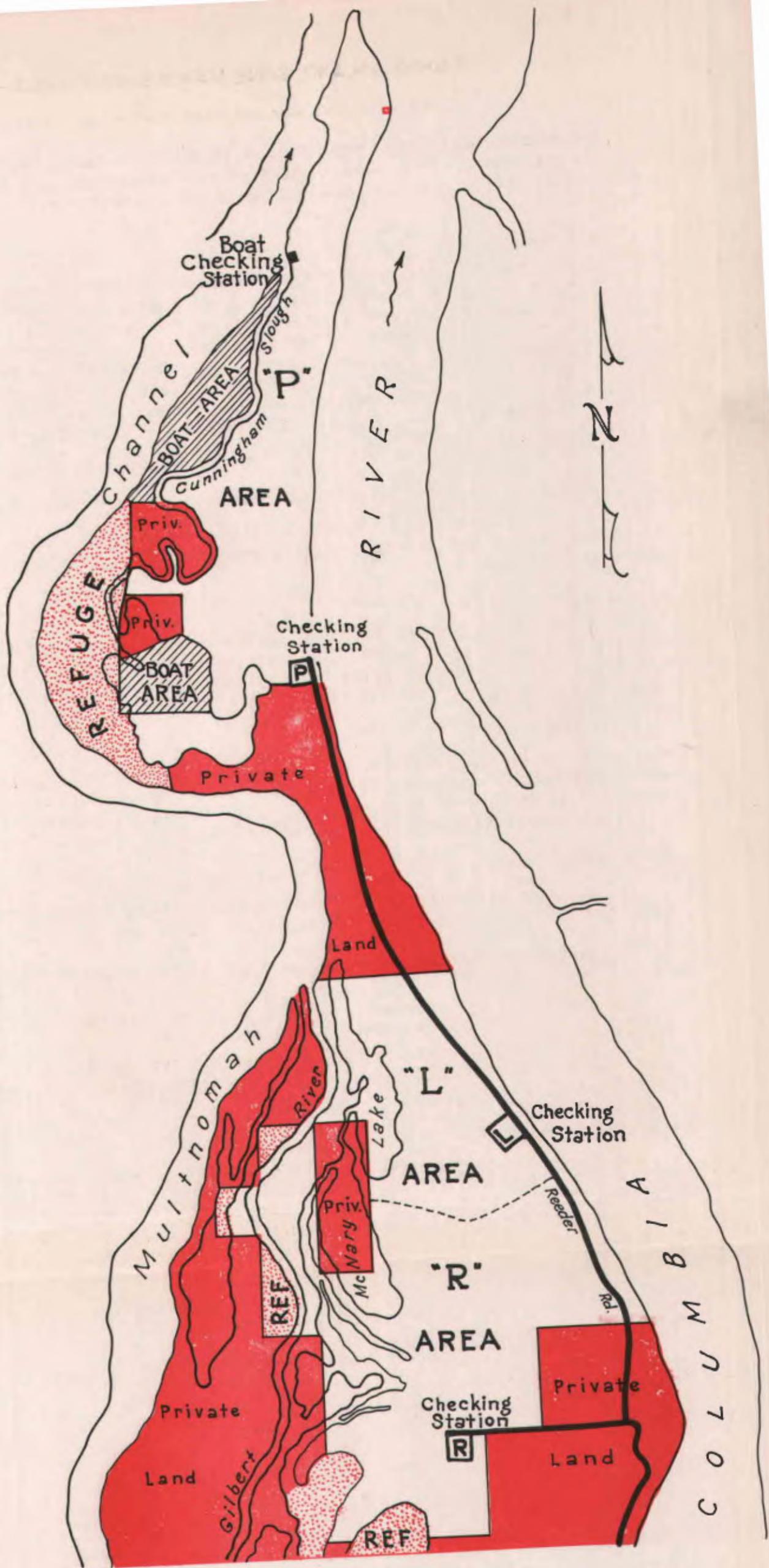
A master map of the entire area complete with trails, blinds, and checking station locations and numbers was maintained at the Portland office as well as individual area maps at each checking station.

The shooting ground area was opened to hunting only on specified days, usually Wednesday, Saturday, Sundays, opening and closing days, and certain holidays. This was done to avoid excessive hunting pressure and to give the waterfowl a rest day.

Note: The hunting season data is reported under the Upland Bird and Waterfowl sections of this report.

B. Crow Hunting:

A special crow hunting area was established on February 1, 1950, for hunters to hunt crows only. No facilities for measurement of hunters actually hunting or their success ratio is available. Twenty-seven permits were issued up to April 20, 1950. Few hunters to date have made use of the area.



SAUVIE ISLAND GAME MANAGEMENT AREA

1949 WATERFOWL AND PHEASANT HUNTING SEASONS

THE OREGON STATE GAME COMMISSION IS OPERATING A PUBLIC SHOOTING AREA ON PARTS OF THE SAUVIE ISLAND GAME MANAGEMENT AREA DURING THE 1949 SEASONS ON AN EXPERIMENTAL BASIS. THE FOUR SHOOTING AREAS AND THE METHODS OF HUNTING ARE AS FOLLOWS:

AREA "R"

THIS SECTION IS LOCATED IN THE SOUTHERN PART OF THE SHOOTING GROUND. IT CONSTITUTES THE MAJOR PART OF THE AVAILABLE PHEASANT HABITAT AND OFFERS LIMITED WATERFOWL SHOOTING. SIXTY (60) RESERVATIONS PER SHOOTING DAY ARE AVAILABLE DURING THE PHEASANT SEASON TO HUNT BOTH PHEASANTS AND WATERFOWL. DURING THIS PERIOD HUNTERS MAY ROAM THE ENTIRE SOUTH UNIT (AREAS "R" AND "L"). HUNTERS WILL CHECK IN AT "R" CHECKING STATION AND WILL NOT BE LIMITED TO SPECIFIED SHOOTING STATIONS. AT THE CONCLUSION OF THE PHEASANT SEASON, FREE LANCE HUNTING WILL STOP ON THIS AREA. FOR THE REMAINDER OF THE WATERFOWL SEASON HUNTERS WILL BE DEFINITELY ASSIGNED TO THE BLIND OR STATION SPECIFIED ON THE RESERVATION TICKET.

AREA "L"

THIS AREA IS INCLUDED AS A PART OF AREA "R" DURING THE PHEASANT SEASON. DURING THE REST OF THE WATERFOWL SEASON HUNTERS WILL BE ASSIGNED TO DEFINITE BLINDS OR STATIONS.

AREA "P"

THIS AREA HAS A LIMITED NUMBER OF BLINDS AVAILABLE AND IN ADDITION IT ALSO HAS A FREE LANCE AREA THAT IS DESIGNATED ON THE RESERVATION TICKET BY THE NUMBERS 41 TO 45. THIS IS BEING TRIED EXPERIMENTALLY AS THE LAND IS IN AN ISOLATED PORTION OF THE GAME MANAGEMENT AREA.

BOAT AREA

ACCESS TO THE BOAT AREA CAN ONLY BE HAD BY BOAT VIA THE MOUTH OF CUNNINGHAM SLOUGH WHICH IS LOCATED ABOUT A MILE SOUTH OF ST. HELENS, OREGON. A CHECKING STATION WILL BE MAINTAINED AT THE MOUTH OF THE SLOUGH. HUNTING IS FREE LANCE. CHECKING HOURS, 5 a.m. TO 7 p.m. ONLY

GENERAL REGULATIONS:

TO CONDUCT A WELL-MANAGED SHOOT AND TO GIVE AS NEARLY EQUAL OPPORTUNITIES TO ALL HUNTERS, THE FOLLOWING GROUND RULES WILL BE IN EFFECT:

1. HUNTERS MUST CHECK IN AND OUT OF AREAS AT THE CHECKING STATION DESIGNATED ON THE RESERVATION TICKET.
2. FOLLOWING THE PHEASANT SEASON ALL HUNTERS ASSIGNED TO A BLIND OR STATION WILL BE LIMITED TO HUNTING AT THAT POINT ONLY.
3. FREE LANCE HUNTING IS PERMITTED DURING THE WATERFOWL SEASON ON A PORTION OF THE "P" AREA AND IN THE BOAT AREA BY RESERVATION ONLY SEE MAP ON BACK OF THIS SHEET.

DIRECTIONS TO REACH AREAS:

VIA U. S. 30, (LOWER COLUMBIA RIVER HIGHWAY), TO BURLINGTON, ABOUT 3 MILES NORTH OF PORTLAND CITY LIMITS TURN RIGHT AND TAKE FERRY TO SAUVIE ISLAND. FOLLOW DIRECTIONAL SIGNS, "SAUVIE ISLAND GAME MANAGEMENT AREA" (IA REEDER ROAD TO DESIGNATED POINTS "R", "L" OR "P". BOAT AREA IS ACCESSIBLE VIA BOAT THROUGH CUNNINGHAM SLOUGH ONLY.

FERRY SCHEDULE

5:30 a.m. TO 1:30 a.m. (FOLLOWING MORNING)
ALL NIGHT SATURDAY NIGHT ONLY.

OREGON STATE GAME COMMISSION

C. Other Recreation:

1. Oregon Retriever Trial Club
Picnic trial February 26, 1950
License trial March 24, 25, and 26, 1950.

Attendance at License trial: On Sunday, the third and last day of the trial, 198 cars and 423 people were checked in. The trials occurred in the vicinity of the "R" checking station.

D. Fishing:

The management area is open to fishermen. During the spring and summer, this type of recreation is well patronized. The species of fish taken are catfish, bass, crappies, blue gills, and a few sea-run trout along the bank of the Columbia River.

Miscellaneous:

Pheasant field-rearing project:

June 25, 1949	4,650 day-old chicks on area
August 26, 1949	1,275 known losses
Kill - 1949 Season	
Native birds	3
Project birds	<u>109</u>
Total Kill	<u>112</u>

LADD MARSH:

The 7,000-acre project in Union County was abandoned in 1949. Two hundred acres had been acquired with State Game Funds. This was offered for sale but, as no satisfactory bids were received, the property remains a Game Commission refuge.

KLAMATH COUNTY:

This project is composed of several units that may be worked into a management area. None of the units are under our control at this time but efforts are being made to secure control and set up a management area. The units are:

Unit	Type of Area	Acreage	Efforts Being Made To Effect Control
Aspen Lake	Shallow. Semi- type lake with limited water supply.	3,800	Negotiations on a cooperative program between Weyerhaeuser Timber Co. and Oregon State Game Commission.
Hanks Marsh	Deep water marsh on perimeter of Upper Klamath Lake.	1,200	Requested executive order to set aside public lands for recreational purposes.

Unit	Type of Area	Acreage	Efforts Being Made To Effect Control
Furber Marsh	42% cropland 36% grazing 20% marsh 2% ponds	3,210	Land appraisals made. Federal approval obtained. Acquisition offers made but not accepted to date.
Miller Lake	Drained lake bed.	1,700	Proposed Reclamation projects if completed will make water available. Acquisition would then be planned.
Surplus U. S. Reclamation Lands	5 scattered parcels of croplands.	520	Requested withdrawal for wildlife use.

There are several other units in the Klamath Basin having sufficient game potential to warrant consideration but nothing more than casual surveillance is being done at this time. Most prominent among these are Copco Ranch, Manning Marsh, Spring Lake, and Shoalwater Bay.

Waterfowl damage to cereal crops and clover, especially in the spring, is a serious problem in this area. The need for waterfowl food crops is recognized for a dual purpose, propagation of waterfowl and game damage control. The units listed were selected as the basis for a management area, realizing that the crop lands thereon are limited and that it would be necessary to extend beyond the unit boundaries to secure croplands through acquisition, lease, or contracts.

WARNER VALLEY:

A. B. Claggett was assigned to Warner Valley April 1, 1949, on a full-time basis to obtain information required for the preparation of adequate waterfowl management plans. Proposed reclamation and agricultural developments in Warner Valley necessitates the preparation of plans to compensate for the habitat that will be lost by these developments.

Work in Warner Valley included:

The location of federal, state, and private property boundary lines; and the location of survey hubs and meander lines.

The preparation of detailed ownership maps.

Determination of land usage on state and federal lands. This included determination of uses detrimental to waterfowl.

Determination of the extent of the land covered during high water and examining the possibilities for water control systems to stabilize water levels during high and low water stages.

Location of the more important nesting areas. An aerial survey was made to get the approximate location and numbers of waterfowl using specific areas. Later these areas were checked on foot and by boat to obtain a detailed nesting census. This census revealed approximately 1,400 duck and 400 goose nests in the valley.

Ascertaining brood count numbers. Five hundred and twelve duck broods were counted with an average of 8.2 birds per brood. This figure dropped to 7.4 birds per brood by the time the birds reached the flapper stage. Canadian geese broods averaged four birds per brood at all ages.

Duck trap construction. A duck trap was erected and used at three different locations in North Warner Valley. Resident birds were banded to determine their routes of migration. A total of 240 ducks and 11 Canadian geese were banded.

Preparation of cover maps.

Censusing waterfowl weekly to determine the total numbers in the valley, numbers by species, and arrival dates of each. The highest concentration of waterfowl was noted between the 12th and 15th of March. During this period there were over 66,000 waterfowl in the valley at one time.

Gathering hunting data. This included determining the hunting pressure on various areas, and gathering kill data. During the first half of the waterfowl season an estimated total of 1,544 hunters utilized the valley. Their kill included a total of 2,335 geese and 739 ducks.

During the second half of the season, very few birds were left in the valley, and after the first three days, the 22 hunters checked in the area had forced the remaining birds out of the area.

Preparation of management plans. The Greaser Ridge area, Crump Lake area, Petri Marsh area, Fischer Lake area, and the North Warner pothole area have been carefully studied and mapped, and detailed management plans for them have been prepared.

Activities, relevant to Warner Valley, by other personnel included aiding in the gathering of hunting statistics, compilation of water rights, aiding in duck trap construction, preparation of the report, Wildlife Management in Warner Valley, dated March, 1950, and conferences with the State Land Board regarding waterfowl management plans to compensate for destroyed habitat.

OTHER HABITAT UNITS UNDER SURVEILLANCE FOR DEVELOPMENT AND/OR MANAGEMENT

Waterfowl:

EASTERN OREGON WATERFOWL AREAS

Name of Area	County	Acreage	Ownership	Type of Area	Present Waterfowl Use	Management Would Accomplish
Antelope Reservoir	Malheur	100 to develop.	Public	Lake and sage-brush.	Nesting and migration.	Increase nesting and provide feed for migrants.
Arcadia Lake	Malheur	200	Private	Marsh (20A) and crop land.	Nesting	Maintain nesting. Provide waterfowl and pheasant feed and hunting.
Baldock Slough	Baker	200 to 400	Private	Agriculture	Some nesting and migration.	Increase nesting and hunting potential.
Barton Lake	Harney	1,000	Private and State	Lake and grain land.	Moderate nesting. Geese migration.	Provide access for public.
Batch Lake Cow Lakes	Malheur	2,000	50% Public 50% Private	Lake, sage-brush, meadow, and hay land.	Nesting and migration.	Provide public hunting. Provide refuge on part of area. Increase resting & feeding use.
Beulah Reservoir	Malheur	75	Bureau of Reclamation	Artificial lake.	Limited resting use (migration)	Increase waterfowl production and feed for migrants.
Brogan Reservoir	Malheur	100	Bureau of Reclamation	Artificial lake.	Limited nesting and migration use.	Increase waterfowl production and feed for migrants.
Copco Ranch	Klamath	6,000	Private (Tulana Farms)	Marsh and agriculture.	Heavy migration use.	Provide public shooting grnds. Prevent further drainage.
Hanks Marsh	Klamath	1,200	1,080 acres Bureau of Reclamation.	Marsh	Heavy nesting and migration	1. Prevent drainage of marsh. 2. Provide access for hunting.
Lone Reservoir	Baker	500	Willingham	Reservoir	Resting	Increase feeding and resting value
Lower Powder River	Baker	Unlimited	Private	Meadows and stream.	Limited nesting and moderate migration use.	Increase all year use.
Mannings Marsh	Klamath	2,000	Manning	Marsh	Nesting and heavy migration.	1. Prevent drainage 2. Provide public hunting 3. Increase nesting and migration use.
Midland Marsh (Muskrat Gun Club)	Klamath	1,500	Private gun club.	Marsh	Heavy nesting and migration.	Provide public shooting grounds.
Miller Lake (Lower Klamath)	Klamath	1,700	Mostly federal and county.	Dry lake bed.	None	1. Provide public hunting. 2. Provide nesting, feeding and resting habitat.
Morgan Lake	Union	25	Power Company	Artificial lake.	Resting	-
Owyhee Reservoir	Malheur	700 for development	Bureau of Reclamation	Resting lake.	Needs investigation.	-

EASTERN OREGON WATERFOWL AREAS
(continued)

Name of Area	County	Acreage	Ownership	Type of Area	Present Waterfowl Use	Management Would Accomplish
Peterson's Muskrat Farm	Malheur	200	Private	Bottom land, ponds and canals.	Nesting and migration.	Provide refuge in heavily hunted Snake River area.
Shoalwater Bay	Klamath	600	California Oregon Power Company.	Marsh	Heavy nesting and migration use.	1. Keep area open to public for hunting. 2. Prevent drainage.
Snake River	Malheur	600 for development.	Private and state.	Islands in Snake River	Moderate to heavy.	Reduce damage complaints on adjacent land and improve hunting.
Spring Lake	Klamath	350	Bureau of Reclamation	Irrigation sump and surrounding land.	Heavy migration use.	Increase nesting and migration use.
Thief Valley Reservoir	Union Baker	150	Bureau of Reclamation	Artificial lake.	Resting and some nesting.	-
Umatilla Meadows	Umatilla	8,000	Private	Meadow hay land.	Heavy migration	1. Provide public hunting. 2. Increase nesting and migration use.
Unity Reservoir	Baker	-	Irrigation Co.	Reservoir	Resting	-
Wampler Marsh	Klamath	250	I. W. Wampler	Marsh being reclaimed.	Was heavy nesting migration.	1. Prevent drainage. 2. Increase nesting.
Warm Springs Reservoir	Malheur	To use 110.	Bureau of Reclamation	Artificial lake.	Migration use for resting.	Provide feed for migrants and improve nesting and hunting.
Abert Lake	Lake	1,000	Public and private.	Marsh and mud and saltgrass flats.	Breeding and migration.	1. Increase nesting and hunting potential.

WESTERN OREGON WATERFOWL AREAS

Name of Area	County	Acreage	Ownership	Type of Area	Management Would Accomplish
Henderson Marsh	Coos	600 (?)	Private	Marsh	Increase waterfowl habitat.
Coburg	Lane	900	Private	80% pasture 20% cropland	Increase waterfowl habitat, provide some public shooting.
Muddy Creek	Benton	3,500	Private	30% cultivated 30% marsh 40% pasture	Increase waterfowl habitat, provide some public shooting.
Sydney	Marion	1,000	Private	Lowland	Increase waterfowl habitat, provide some public shooting.
Wapato	Washington	2,000	Private	Drained Marsh land	Increase waterfowl habitat, provide some public shooting.
Beaver Creek	Linn	925	Private	Drained Marsh land	Increase waterfowl habitat.

WESTERN OREGON WATERFOWL AREAS

Name of Area	County	Acreage	Ownership	Type of Area	Management Would Accomplish
Troutdale	Multnomah	550	Federal	10% brushy lakes 5% marsh 85% wasteland	Provide feeding and nesting refuge for waterfowl.
Basket Slough	Polk	800	Private	Drained intermittent marsh	Provide nesting and feeding refuge.
North Plains	Washington	940	Private	Low farms and pasture land.	Provide nesting and feeding refuge.
Sutton & Mercer Lakes	Lane	-	Private Forest S. County (Predominantly public)	Lake, marsh, farmland	Improve waterfowl habitat.
Coquille Valley	Coos	-	Private	Pasture	Improve waterfowl habitat.
Dairy Creek Areas	Washington	3 tracts total area 1,000 acres	Private	Pasture	Increase waterfowl habitat.
Carlton Lake	Yamhill	550	Private	Log booming impoundment.	Increase feed on this refuge.
Gold Ray Dam	Jackson	800	-	Impoundment and marsh at upper end	Improve food conditions.
South Salem	Marion	170	50% Private 50% State	Overflow lands	Improve habitat.
South Slough	Coos	-	Private	Bay Arm	Improve habitat.
Hughes Swamp	Curry	300	Private	Marsh land	Improve habitat.
Loon Lake Marsh	Douglas	250	Private State	Dairy farms	Improve waterfowl habitat.
Sunset Lake	Clatsop	150	Private State	Deep dune lake with very little brush	Improve food conditions.
Benton Lakes	Benton	200	Private	Oxbow Lakes brushy shores	Improve waterfowl habitat.
Linn Lakes	Linn	200	Private	Oxbow lakes brushy shores	Improve waterfowl habitat.
Valsetz Lake	Polk	900	Private	Impoundment	Increase waterfowl habitat.
Cullaby Lake	Clatsop	375	20% Private 80% State	Dune Lake	Increase available habitat.
Warrenton Lakes	Clatsop	700	50% Private 50% Public	Dune lakes and swamps	Improve habitat.
Devil's Lake	Lincoln	1,800	50% Private 50% State	Large Dune lake	Improve habitat.

FEDERAL-AID INVESTIGATIONS:

The Summer Lake Pheasant Studies has been continued through 1950. William Foree has replaced John Parrish at Summer Lake and taken over this project assignment. The data collected under this project are presented under the Upland Bird section of this report.

The investigation of specific game habitat areas has been continuing along the same lines that were originally set up. Activities and findings are outlined in the following tables.

Personnel: Mel Cummings - Project Leader
Boyd Claggett - Special Assistant assigned to Warner Valley
Wm. Foree - Assistant assigned to Summer Lake
Paul Ebert - Assistant assigned to Sauvie Island. Ebert was transferred to the Wasco District as District Agent in January, 1950.
Albert Hoffmeister - Assistant assigned to Sauvie Island in January, 1950
Fred Briggs - Assistant assigned to Eastern Oregon general. Briggs transferred from this project to the district organization on February 1, 1950, and has not been replaced to date.

Surveys have been completed on the following areas and copies of these reports and accompanying maps are available in the Portland office.

A. Waterfowl

<u>Area</u>	<u>County</u>
G. I. Ranch	Crook
South Coast	Lane, Douglas, Coos & Curry
New Lake	Coos and Curry
North Coast	Tillamook
Banks	Washington
Cheshire	Lane
Big Slash	Lin
Aspen Lake	Klamath
Furber Marsh	Klamath
Hanks Marsh	Klamath
Ladd Marsh	Union
Government Island	Multnomah
Leadbetter Estate	Multnomah
Warner Valley	Lake
Turner Slough	Marion

B. Big Game

N. Fk. John Day River	Grant
Troy	Wallowa
Wenaha	Wallowa
Keating	Baker

C. Upland Birds

Camp White	Jackson
Camp Adair	Polk and Benton

PUBLIC SHOOTING GROUNDS:

Four public shooting grounds were operated in 1950. Summer Lake and Sauvie Island Shooting Grounds were operated on state-owned property. The Malheur was operated on the U. S. Fish and Wildlife Service's Malheur Refuge and in cooperation with the federal agency. The Chewaucan shooting ground was continued, not because it was taking care of a large number of hunters but mainly because it was establishing a precedent in operating a public shooting ground on private holdings and proving the compatibility of controlled hunting and agriculture.

Kill data for these shooting grounds are given under the Upland Bird and Waterfowl sections of this report. A brief summary of the Public Shooting Grounds as operated in 1949 follows:

Area	Acres in Refuge	Acres of Public Hunting	Daily Charge	No. of Permits	K I L L		Total	Success Ratio
					Ducks	Geese		
Summer Lake	7,687	5,658	\$2.00	3,684	5,061	589	5,650	1.56
Sauvie Island	3,898.79	2,486.73	2.00	1,665	1,896	30	1,926	1.18
Chewaucan	45,000	3,000	2.00	190	412	151	563	3.06
Malheur	157,000	8,000	None	1,401	1,681	360	2,041	1.46

FURBEARERS

BEAVER:

The average price per pelt on beaver has dropped from \$47.23 in 1946 to approximately \$17.17 this past winter. Since fashions are not demanding beaver coats, very few manufacturers are in the market for these pelts. Also, most states have been building up their beaver populations through management and controlled harvest and now there are more beaver being produced than at anytime since the country was first settled. Therefore, the limited demand and high production has flooded the market, causing the price per pelt to drop \$30.00 from its peak in 1946. The future of beaver is uncertain.

More beaver were trapped in Oregon last winter than at anytime since the open season in 1924. A total of 5,749 pelts were taken last winter, with the next highest catch being during the winter of 1947-48 when 4,355 were taken. All trapping was done on a complaint basis and this number taken despite adverse weather in January when trapping was nearly impossible. Fifty-one trappers were employed to make this catch.

Now that the saturation point has been reached in many streams throughout the state, it is apparent some new legislation must be obtained for proper management of beaver. At present a written complaint of the landowner is necessary before any trapping can be done, yet many streams should be trapped to prevent the beaver from destroying all available food and from becoming so numerous they move into complaint areas. Complete removal of beaver from trouble spots is not the complete answer for management, as more beaver will move in and the complaint continues.

All beaver pelts taken last winter were shipped to either the Seattle Fur Exchange or the Denver Fur Auction Company for sale. This is the first time beaver sales were not held in Portland. The decision to sell through an exchange was made to test their selling power against Game Commission sales and determine where pelts will sell the best. A total of 3,311 pelts have been sold at Seattle and 1,749 pelts at Denver. The balance of 689 pelts have not as yet been sold.

The following table shows the number of beaver taken by county for the past four years. A concentrated trapping program was carried on in Columbia, Multnomah, and Clatsop Counties last winter to reduce the beaver menace in diking areas.

Beaver Dead-Trapping Records By Counties

County	1945-46	1946-47	1947-48	1948-49	1949-50
Baker	198	87	120	132	72
Benton	83	77	111	119	94
Clackamas	36	48	163	191	293
Clatsop	465	492	565	567	527
Columbia	563	405	781	663	1,129
Coos	-	2	12	9	20
Crook	150	185	136	113	218
Curry	-	-	-	2	33

County	1945-46	1946-47	1947-48	1948-49	1949-50
Deschutes	85	72	118	54	60
Douglas	48	115	48	103	322
Gilliam	23	34	18	13	37
Grant	229	196	342	218	425
Harney	124	383	302	108	278
Hood River	33	17	22	5	20
Jackson	17	22	44	32	59
Jefferson	36	11	17	19	102
Josephine	-	-	3	10	8
Klamath	19	29	52	27	33
Lake	42	98	72	15	152
Lane	108	216	400	450	478
Lincoln	6	15	2	1	8
Linn	158	104	260	224	257
Malheur	132	236	169	161	132
Marion	83	205	188	193	212
Morrow	30	42	80	86	74
Multnomah	24	67	134	93	154
Polk	7	19	35	24	16
Sherman	2	13	9	5	-
Tillamook	47	17	25	45	121
Umatilla	80	56	133	87	102
Union	70	111	51	33	37
Wallowa	42	35	38	49	77
Wasco	53	70	38	20	41
Washington	1	37	30	25	65
Wheeler	16	24	53	48	70
Yamhill	-	2	13	10	27
Totals:	3,012	3,542	4,584	3,954	5,749

The following chart shows the trappers' catch and sale value of pelts sold. Landowners 33 1/3 per cent share has not been computed and is, therefore, included with the Game Commission's share.

Trapper	Address	No. Beaver			Net Sale Price	Trappers Share	Game Comm. & Landowners Share		Av. Price Per Pelt
		Pelted	Unsold	Sold			Share	Share	
Mason Anderson	Nehalem	114	-	114	\$ 2,159.76	\$ 215.98*	\$ 1,943.78	\$18.95	
Carl Belshaw	Mt. Vernon	12	-	12	191.28	63.76	127.52	15.94	
Alvin Bennett	La Grande	86	46	40	620.88	62.08*	558.80	15.22	
Don Bradshaw	La Grande	96	21	75	1,187.04	118.71*	1,068.33	15.83	
Ray Brock	Portland	145	14	131	2,548.08	849.36	1,698.72	19.45	
Leonard Carlson	Lakeside	155	-	155	2,746.08	274.61*	2,471.47	17.72	
Don Cellers	Hermiston	98	3	95	1,585.68	158.56*	1,427.12	16.69	
Conn & Tiedeman	Jewell	673	262	411	7,732.42	2,577.47	5,154.95	18.81	
John Dahlman	Clatskanie	14	1	13	282.00	94.00	188.00	21.69	
Fred Dean	Glendale	30	9	21	287.28	95.76	191.52	13.68	
Frank Elder	Monument	94	-	94	1,449.17	144.92*	1,304.25	15.42	
C. R. Friesz	John Day	49	4	45	703.44	234.48	468.96	15.63	
Frank Gentry	Heppner	97	-	97	1,507.20	150.72*	1,356.48	15.54	
Don German	Eugene	428	21	407	6,793.34	2,264.45	4,528.89	16.69	
Barney Greenwood	John Day	30	1	29	423.65	141.22	282.43	14.61	
Woodrow Holderman	Philomath	215	29	186	2,971.63	297.16*	2,674.47	15.01	
H. E. Jones	Bend	23	1	22	419.76	139.92	279.84	19.08	
William Justice	Dayton	19	8	11	158.74	15.87*	142.87	14.43	
Miles Langdon	Burns	161	-	161	2,916.00	291.60*	2,624.40	18.11	
Clyde Long	Nyssa	130	10	120	2,076.72	207.68*	1,869.04	17.31	
Melvin Lord	Mitchell	6	-	6	100.08	10.01*	90.07	16.68	
Malheur Refuge	Burns	34	-	34	561.84	280.92*	280.92	16.52	
Verne Mallery	Redmond	147	-	147	2,793.84	279.39*	2,514.45	19.01	
Willis Mallery	Prineville	136	1	135	2,770.56	923.52	1,847.04	20.52	
Nils Manninen	Clatskanie	41	2	39	724.80	241.60	483.20	18.58	
Fred March, Jr.	Freewater	5	-	5	64.08	21.36	42.72	12.81	
Leslie Martin	Dayville	28	-	28	446.69	148.90	297.79	15.95	
Ferrel McKinney	Amity	40	-	40	802.32	80.23*	722.09	20.06	
Kenneth Meservey	Frenchglen	15	-	15	209.76	69.92	139.84	13.98	
Raymond Morehouse	Iapine	4	-	4	63.36	21.12*	42.24	15.84	
Maurice Naggiar	Lakeview	143	102	41	662.88	-	662.88	16.17	
Vic Olsen	Canby	151	22	129	2,251.44	750.48	1,500.96	17.45	
Wendell Olsen	Canby	139	6	133	2,338.66	779.55	1,559.11	17.58	
Ben Parsons	John Day	6	2	4	26.88	8.96*	17.92	6.72	
Ralph Rhea	John Day	147	5	142	2,028.96	202.89*	1,826.07	14.29	
Alvin Richey	Bly	33	2	31	468.96	156.32	312.64	15.13	
Bob Rintoul	Cliffs, Idaho	3	-	3	30.72	10.24	20.48	10.24	
Frank Schneider	Venator	126	7	119	1,511.47	503.82	1,007.65	12.70	
State		10	-	10	83.86	-	83.86	8.39	
Harry Stokes	Grants Pass	79	1	78	1,649.04	164.90*	1,484.14	21.14	
Guy Taylor	Portland	154	6	148	2,846.40	284.64*	2,561.76	19.23	
Harold Taylor	Scappoose	427	25	402	6,419.28	2,139.76	4,279.52	15.97	
Homer Taylor	Troutdale	288	29	259	4,741.20	1,530.40	3,210.80	18.31	
Lee Taylor	Troutdale	265	25	240	4,076.45	1,358.82*	2,717.63	16.99	
Malcolm Taylor	Dufur	182	-	182	2,959.44	295.94*	2,663.50	16.26	
James Trent, Jr.	Cloverdale	9	3	6	84.72	28.24	56.48	14.12	
A. O. Weekly	Myrtle Creek	138	6	132	2,084.59	694.86	1,389.73	15.79	
J. O. Weldon	Albany	224	5	219	3,822.05	1,274.02	2,548.03	17.45	
Gerald Windsor	Hood River	15	-	15	290.64	96.88	193.76	19.38	
Otto Windsor	Hood River	15	-	15	312.00	104.00	208.00	20.80	
Arthur Woolley	Drain	67	10	57	885.74	295.25	590.49	15.54	
Alfred Zollman	Joseph	3	-	3	25.01	8.34	16.67	8.34	
		5,749	689	5,060	\$86,897.87	\$21,163.59	\$65,734.28	\$17.17	

* Salaried trappers receive 10%

Malheur Refuge receives 50%

X Naggiar receives no commission

Balance of trappers receive 33 1/3%

Nine trappers are employed on a permanent basis and live-trapped and transplanted 227 beaver last summer. All beaver liberated were ear-tagged. The following is a list of counties in which beaver were transplanted along with the total number of beaver transplanted since the Game Commission commenced live-trapping operations in 1939.

County	1949	Total
Baker	7	122
Benton	27	65
Clackamas	-	43
Clatsop	4	94
Columbia	-	23
Coos	12	114
Crook	1	24
Curry	4	92
Deschutes	2	70
Douglas	2	203
Gilliam	-	4
Grant	4	57
Harney	11	214
Hood River	-	12
Jackson	3	26
Jefferson	4	30
Josephine	4	84
Klamath	-	85
Lake	6	193
Lane	6	100
Lincoln	16	76
Linn	5	37
Malheur	43	283
Marion	-	59
Morrow	-	-
Multnomah	7	16
Polk	2	28
Sherman	13	15
Tillamook	1	67
Umatilla	9	24
Union	9	61
Wallowa	2	17
Wasco	21	134
Washington	-	16
Wheeler	1	1
Yamhill	-	3
Total:	227	2,492

Because of the low price on beaver, fewer were taken by Indians from their reservations, where they have the right to trap free at anytime of the year. They are not governed by state laws; however, all pelts are submitted to the Game Commission for tagging before they are sold.

Beaver Taken By Indians From Reservations

Reservation	1944	1945	1946	1947	1948	1949	1950
Klamath	89	99	157	62	129	49	57
Umatilla	22	60	54	74	64	27	26
Warm Springs	72	80	78	67	103	65	31
Totals:	183	239	289	203	296	141	114

OTHER FURBEARERS:

Although the nation is still in a post-war prosperity period, the prices of furs have dropped to near depression levels. Trappers have found mink to be the only animal valuable enough to justify the time and expense of trapping. The following table shows the price trend on furs since 1943.

Average Price Per Pelt

	1943-44	1944-45	1945-46	1946-47	1947-48	1948-49	1949-50
Mink	11.95	12.85	21.24	13.38	21.99	11.94	15.17
Muskrat	1.89	1.54	2.08	1.31	1.92	1.13	.89
Marten	*	*	33.88	17.08	*	*	*
Otter	15.75	14.71	24.15	22.00	19.33	15.02	11.09
Wildcat	8.31	5.73	4.60	1.99	1.82	.77	.81
Coyote	8.55	3.26	3.08	1.58	2.24	.81	.81
Badger	2.23	1.33	1.00	.82	.97	.92	1.75
Raccoon	3.39	1.79	1.65	.97	1.06	.74	.53
Fox	3.37	1.73	1.55	.86			
Red					1.41	1.23	1.35
Gray					.66	.47	.30
Skunk	2.14	1.36	1.18	.87	.63	.65	.33
Civet Cat	.77	.59	.84	.50	.36	.25	.69
Weasel	.69	.66	.94	.91	.99	.94	.80
Nutria	1.14	#	1.64	1.67	.75	1.44	1.53
Opossum	.25	.28	.40	.24	.24	.20	.39

* Closed Season

No catch reported.

Women's fashions today demand mink and mink only. This is the same trend fashions have been following since the war, much to the detriment of the fur industry. Most manufacturers are now devoting full time to the production of mink garments and neglecting all other furs. The 200 mink farms in Oregon are continuing to exist but despite the "wanted" tag on mink, the price is not up in proportion with wages and the cost of living.

Several factors contribute to the present poor condition of the fur industry.

(1) Mink being the only wanted item because of the dictates of fashion; (2) The 20 per cent excise luxury tax on all fur garments; and (3) The importation of millions of dollars worth of fur, mainly from Russia, duty free.

At the last session of the legislature, trapping licenses were doubled -- from \$3.00 to \$6.00. This along with the extremely poor prices being offered for pelts has resulted in the selling of only 1,501 licenses, as compared with 2,272 the previous winter and 2,581 in 1947-48.

With less and less trapping effort being devoted to the taking of long-haired fur animals, the problem of predation is steadily rising. Raccoons and skunks, which were formerly quite valuable, are now practically worthless. Their predatory habits are causing complaints from all sections of the state, but especially throughout the Willamette Valley. Because of the increased raccoon population, the season was set from November 15, 1949, to October 15, 1950. This allows land-owners to trap these animals legally whenever they become a nuisance.

Summer Lake Refuge was trapped by share trappers for the first time last winter. Previously employees at the refuge had done the trapping. The share trappers cropped 1,114 muskrats which sold for a net sum of \$1,225.99. Fifty per cent of this sum was paid to the trappers and 50 per cent retained by the Game Commission. These pelts averaged \$1.10 per pelt which is considerably better than the .89¢ over-all average for the state.

1949-50 FUR CATCH

COUNTY	OTTER	MINK	MUSKRAT	RACCOON	SKUNK	GIVET CAT	WEASEL	WILDCAT	COYOTE	RED FOX	GRAY FOX	OPOSSUM	BADGER	BEAR	COUGAR	NUTRIA
Baker-49	1	172	3177	12	1	3	14	19	1	-	-	-	-	-	-	-
Benton-26	-	62	327	80	1	-	1	3	7	2	3	-	-	-	-	-
Clackamas-57	5	166	556	121	16	18	6	6	4	-	36	-	-	1	-	-
Clatsop-138	13	438	2855	70	7	21	16	35	8	-	-	22	-	2	-	-
Columbia-85	13	187	2787	43	2	8	2	21	2	-	-	-	-	1	-	-
Coos-69	11	316	544	44	-	2	5	14	-	-	-	-	-	-	-	-
Crook-6	-	13	206	1	-	-	1	-	-	-	-	-	-	2	-	-
Curry-17	11	67	244	34	-	2	1	3	2	-	-	-	-	2	-	-
Deschutes-15	-	16	757	1	-	-	1	1	2	-	-	-	-	-	-	-
Douglas-92	15	453	418	324	14	21	3	28	10	-	-	-	-	2	-	-
Gilliam-1	-	-	3	-	-	-	1	1	-	-	-	-	-	-	-	-
Grant-15	-	72	231	10	-	-	-	3	-	-	-	-	-	-	-	-
Harney-24	-	181	21,993	13	19	1	11	10	4	-	-	-	-	-	-	-
Hood River-24	-	41	200	4	4	1	2	4	-	-	-	-	-	-	-	-
Jackson-74	1	43	2994	125	6	2	2	49	104	-	2	-	-	8	-	-
Jefferson-3	3	8	10	-	7	10	1	-	13	-	-	-	-	2	-	-
Josephine-26	-	51	947	37	-	1	1	19	1	-	-	-	-	-	-	-
Klamath-24	-	10	2009	-	-	1	1	5	1	-	-	-	-	-	-	-
Lake-16	-	16	2355	-	-	-	1	4	2	-	-	-	-	1	-	-
Lane-147	15	730	2340	77	4	18	13	70	19	-	-	-	1	1	7	-
Linn-69	5	385	447	89	1	43	17	46	22	-	-	-	-	3	-	9
Linn-66	7	224	1624	190	8	-	4	9	1	8	36	-	-	-	1	-
Malheur-85	2	12	8191	14	1	-	9	4	7	-	-	-	-	-	-	-
Marion-88	2	132	1054	146	30	8	2	4	-	12	47	-	2	-	1	-
Morrow-7	-	6	341	-	-	-	-	4	-	-	-	-	-	-	-	-
Multnomah-30	11	73	1231	19	2	-	2	2	5	1	-	-	-	-	-	-
Polk-10	-	17	76	57	3	-	4	6	-	-	-	-	-	-	-	-
Sherman-0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Tillamook-63	16	302	1333	60	-	7	15	2	1	-	-	-	-	-	-	-
Umatilla-49	-	137	3367	31	-	-	4	-	7	-	-	-	-	-	-	-
Union-26	-	101	1291	3	-	-	19	-	-	-	-	-	-	-	-	-
WallaWalla-31	-	14	2357	4	-	-	249	15	45	-	-	-	7	-	-	-
Wasco-13	2	52	103	16	-	10	2	1	1	-	16	-	-	-	-	-
Washington-24	1	43	416	42	13	9	4	1	4	-	-	-	-	-	-	-
Wheeler-2	-	2	7	2	-	-	-	17	4	20	26	-	-	-	-	-
Yamhill-25	2	23	62	137	15	-	-	-	4	-	-	-	-	-	-	-
TOTAL: 1496	136	4565	66,855	1806	154	185	412	401	276	43	166	22	11	22	9	9

PREDATOR CONTROL

Oregon's predatory animal control program is largely administered by the Predator Control Division of the U. S. Fish and Wildlife Service, operating on funds supplied by the various counties, State Department of Agriculture, State Game Commission and Federal Government. The Game Commission's contribution to this matching fund is set by legislative act at \$12,000.00 per annum. Counties last year appropriated \$80,300.00, the State Department of Agriculture \$20,500.00, and the Federal Government \$9,200.00. The Federal Government's appropriation is in addition to the cost of administration.

State and Federal funds are matched and appropriated for use in counties which have also contributed, in proportion to the amount the county has set aside. No state or federal funds are expended in any county which fails to budget a predator control fund.

The primary job of the trappers is to remove predators where they are causing damage to livestock, poultry, game animals, and game birds. Excellent cooperation has existed between the Game Commission and Fish and Wildlife Service; and their employees have done an excellent job of reducing predation on antelope kidding grounds, deer wintering areas and areas adjacent to pheasant rearing projects.

Because of the extensive poisoning campaign in Eastern Oregon coyotes are scarce and have not been a serious predator on deer or antelope. In Western Oregon little poison is used and predatory animals are still on the increase.

With the funds available the Fish and Wildlife Service employed 40 trappers between April 30, 1949, and May 1, 1950. Their records show the following animals taken:

Coyote	3,391	Skunk	381
Bobcat	636	Raccoon	685
Bear	98	Badger	178
Fox	632	Porcupine	610
Cougar	17	Weasel	1
Housecat	104	Opossum	2

In addition to the matching fund, the Game Commission has employed 14 Federal trappers on a temporary basis of not over two months in counties where funds have been exhausted before the end of their fiscal year. This gives year-round control work and keeps experienced trappers on the job. These trappers remain under Fish and Wildlife Service administration but are paid from Game Commission funds. In this manner \$5,000.00 is used on predator control work above the \$12,000.00 legislative limit.

Predator control work carried out by Game Commission employees is mostly incidental to other activities. Incomplete reports indicate the following take of predators exclusive of game farms and management areas where of necessity more intensive control is exercised.

Magpie	775	Bobcat	3
Crow	671	Fox	19
Raven	52	Housecat	118
Hawk	74	Skunk	7
Owl	14	Squirrel	94
Coyote	10	Raccoon	5

A small amount of aerial coyote shooting was carried on around waterfowl areas after the waterfowl season. Bad flying weather had a great deal to do with the poor success, but there were also fewer coyotes than ever before. A total of 74½ hours of flying time at \$13.50 per hour was used in taking 136 coyotes.

Although the Game Commission has been instrumental in constructing 146 magpie traps in previous years for use of sports clubs, very few of these were used during the past winter for lack of interest. Wallowa County paid a bounty on 8,000 magpies and crows.

Cull pheasant eggs were poisoned and set out in most districts and, although on a small scale, good success was obtained in killing the raiding avian predators.

A contemplated blasting of a crow rookery along the Snake River near Ontario failed to materialize as the crows, after having been harassed by Idaho, failed to congregate in large enough flocks to make blasting feasible.

The Game Commission paid out bounties amounting to \$8,850.00 on 117 cougar and \$3,860.00 on 1,544 bobcats between June 1, 1949, and May 31, 1950. The following table shows the number of each of these animals bountied during this same period for the past three years.

County	Bobcat			Cougar		
	1947-48	1948-49	1949-50	1947-48	1948-49	1949-50
Baker	70	60	84	3	3	2
Clackamas	66	57	35	16	12	8
Clatsop	176	102	65	1	-	2
Columbia	32	94	38	-	1	-
Coos	118	90	83	8	4	3
Crook	174	75	1	-	-	-
Curry	69	39	47	16	14	7
Deschutes	58	31	114	-	-	-
Douglas	158	204	178	34	44	47
Hood River	-	-	-	1	-	-
Jackson	204	246	287	6	16	15
Jefferson	20	-	-	-	6	1
Josephine	97	113	75	4	12	12
Lane	81	112	158	35	31	41
Lincoln	82	78	91	5	4	4
Linn	25	16	54	31	13	9
Malheur	-	-	-	-	2	-
Marion	1	26	3	1	13	10
Morrow	-	1	-	-	-	-
Multnomah	15	10	5	8	11	1
Polk	28	28	14	5	9	1
Tillamook	167	84	24	1	-	-
Union	-	-	-	1	1	4
Wallowa	58	76	101	10	5	9
Wasco	16	21	27	-	-	1
Wheeler	46	16	58	-	-	-
Yamhill	-	-	2	-	-	-
Totals:	1,761	1,579	1,544	186	201	177

SUMMARY

Analysis of the information contained in this report reveals that Oregon's game resources are in good condition as far as numbers are concerned. However, as management approaches the established goal of producing and maintaining the maximum compatible numbers of birds and animals on all of the available habitat, it is obvious that frequent problems will arise.

Statistical summaries have been provided with each section of this report and a general statement of findings with respect to each game resource follows:

Blacktailed Deer:

Measurements indicate increases in black-tailed deer throughout their range during the past five years. However, due to the abundance of forage available and limited seasonal movement of the species, few over-population problems have occurred.

The major management problem at present is to control damage to crops within and immediately adjacent to Western Oregon deer habitat.

New burns and logging areas provide the most productive black-tail habitat and the returns from such areas are commensurate with costs of intensive management.

Mule Deer:

With an efficient predator control program and control of other limiting factors, several major mule deer herds have exceeded the carrying capacities of their winter ranges and control of numbers is mandatory for future maintenance of the deer herds in question.

Mule deer herds in this category are as follows:

Interstate Herd	Sprague River Herd
East Goose Lake Herd	Crooked Creek Herd
Warner Mountain Herd	North Silver Lake Herd
South Silver Lake Herd	Devil's Garden Herd
North Fork Crooked River Herd	Dry Mountain Herd
Izee Herd	Northside John Day Herd
Burnt River Herd	Baker Herd
Catherine Creek Herd	

Roosevelt Elk:

Hunting of bulls with three or more points has resulted in maintenance of satisfactory sex ratios and has induced a gradual increase in the density and distribution of elk in Western Oregon.

The most serious current problem with this species arises in Clatsop County where re-growth of trees is crowding elk out of remote ranges onto agricultural lands.

Rocky Mountain Elk:

The liberal either-sex season authorized in 1949 to reduce elk numbers to compatible levels had a measurable effect upon densities. However, not all winter range and damage problems were corrected.

The Chesnimnus and Grande Ronde herds were protected in 1949 because they were believed too vulnerable to permit unlimited either-sex hunting. Both of these ranges are now over-stocked partially due to a drift of elk onto these ranges during the 1949 season.

Continued control of elk numbers on browse-type deer ranges appears feasible and liberal seasons can be allowed in remote areas where access is difficult.

Upland Game:

An unexplained poor survival of pheasant broods in Western Oregon Counties in 1949 is believed the major factor responsible for a general decline in pheasant and quail densities in that area.

Pheasants have increased and quail have declined in most Eastern Oregon Counties.

Severe winter temperatures are largely responsible for declining quail densities; however, ample breeding stock is available and with favorable conditions for reproduction, harvestable surpluses of both pheasants and quail can be anticipated for the fall of 1950.

Migratory Birds:

Local information indicates that Oregon wintered more waterfowl than in previous years. However, coordinated reports from all states within the Pacific Flyway indicate a substantial reduction in all species except Pintails. As with upland game, the surplus of waterfowl available for harvest in the fall of 1950 is dependent upon success of current reproduction.

The major management problem of waterfowl in the Pacific Flyway is the maintenance and development of adequate winter feeding areas.

Furbearers:

Although measurements of population trends of fur species have not been obtained, observations of game agents and trappers indicate a general decline in mink numbers during the past few years.

Beaver continue to increase and the problem of controlling beaver damage in agricultural areas is extremely difficult with present legislative limitations. There were 5,749 beaver dead-trapped from complaint areas this winter in spite of unfavorable trapping weather.